FARGO

Pro-LX Laminating Card Printer/Encoder User Guide (Rev. 4.0)

Part Number: L000700

Pro-LX Laminating Card Printer/Encoder User Guide (Rev. 4.0), property of FARGO Electronics, Incorporated

The revision number for this document will be updated to reflect changes, corrections, updates, and enhancements to this document.

Revision Control Number	**Date**	**Document Title**
Revision 4.0	15 September 2003	Pro-LX Laminating Card Printer/Encoder User Guide (Rev. 4.0)

These reference documents were thoroughly reviewed to provide FARGO with professional and international standards, requirements, guidelines, and models for our technical, training, and user documentation. At all times, the *Copyright Protection Notice* for each document was adhered to within our FARGO documentation process. This reference to other documents does not imply that FARGO is an ISO-certified company at this time.

- ANSI/ISO/ASQ Q9001-2000 American National Standard, (sub-title) Quality Management Systems - Requirements (published by the American Society of Quality, Quality Press, P.O. Box 3005, Milwaukee, Wisconsin 53201-3005)
- The ASQ ISO 9000:2000 Handbook (editors, Charles A. Cianfrani, Joseph J. Tsiakals, and John E. West; Second Edition; published by the American Society of Quality, Quality Press, 600 N. Plankinton Avenue, Milwaukee, Wisconsin 53203)
- Juran's Quality Handbook (editors, Joseph M. Juran and A. Blanton Godfrey; Fifth Edition, McGraw-Hill)

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How to use the manual

The Pro-LX Laminating Card Printer/Encoder User Guide (Rev. 4.0) is, in fact, the troubleshooting and field service manual for the entire Pro-LX Card Printer. The manual is designed to provide installers and technicians with quick, efficient lookup of related procedures, components, and terms. The manual can be used effectively in either soft or hard copy, depending on the preference of the installer or technician.

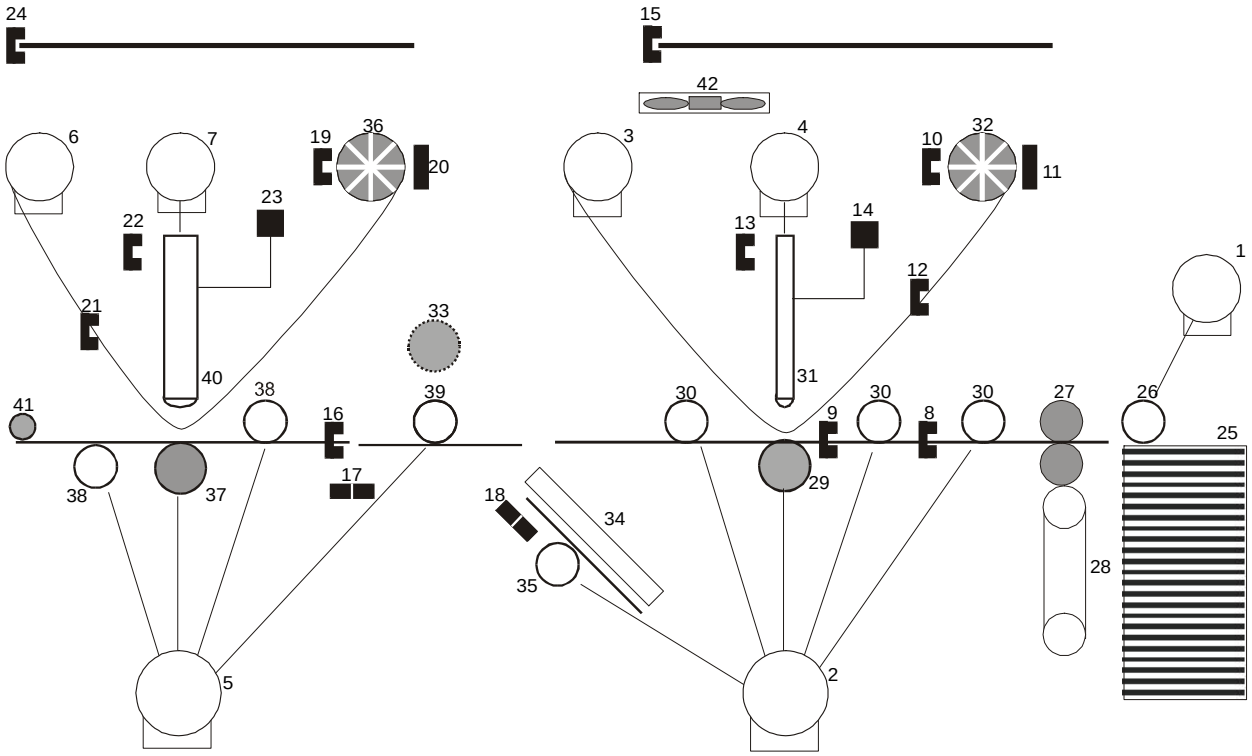
Manual	**Description**
Sequence of Operations, Glossary of Terms, and Technical/Functional Specifications (hyper-linked)	You can go directly to the Sequence of Operations, Glossary of Terms, Technical Specifications, and Functional Specifications to learn how to use the processes, procedures, functions, and windows for the Pro-LX Laminating Card Printer/Encoder within concise, correlative tables.
Table of Contents (hyper-linked)	You can use the automated Table of Contents to quickly locate, for example, an error message, a procedure, the index, or an appendix.
Troubleshooting, Replacement, Removal, Diagnostic, and Navigation Procedures (in hyper-linked Sections)	You can go directly to Specifications (Section 1), General Troubleshooting (Section 2), Printer Adjustments (Section 3), Parts Replacement (Section 4), Printer Packing (Section 5), and Board Level Diagnostics (Section 6) to find troubleshooting, removal, and replacement procedures. The section titles are always labeled according to their function for consistent usage.
Cross-Referencing (hyper-linked)	You can use the cross-referencing links to quickly locate, for example, an error message or a procedure.
Comprehensive Index (hyper-linked)	You can use the COMPREHENSIVE INDEX to quickly locate information on the Pro-LX Laminating Card Printer/Encoder, relating to a specification, a procedural step, a window or screen, a component, a term, a qualifier, or a related feature to this printer.
Appendices	You can use Appendix A and B to locate information relating to engineering drawings and technical updates, which are specific to the Pro-LX Laminating Card Printer/Encoder.

Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury.** Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution: 	**This device is electrostatically sensitive. It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Pro-LX Ribbon and Cards from the printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the printer.

Pro-LX Laminating Card Printer/Encoder Overview

Reviewing Pro-LX Block Diagram



Motors	
1	Card Feed
2	Print Stepper
3	Ribbon Drive
4	Print Headlift
5	Lamination Stepper
6	Lamination Drive
7	Lamination Headlift

Sensors	
8	Card Feed
9	Print TOF (Top Of Form)
10	Ribbon Encoder Wheel
11	Ribbon Core ID
12	Ribbon Sensor
13	Head Lift
14	Thermistor
15	Print Cover Interlock
16	Lamination TOF
17	Flipper Home
18	Mag Feed TOF
19	Lam Encoder Wheel
20	Lam Core ID
21	Laminate Ribbon Sensor
22	Lam Headlift
23	Thermocouple
24	Lam Cover Interlock

Parts	
25	Input Stack
26	Card Feed Roller
27	Cleaning Roller
28	Cleaning Tape
29	Print Platen
30	Print Drive Rollers
31	Printhead
32	Print Encoder Wheel
33	Flipper Clutch
34	Encode Section
35	Mag Drive Roller
36	Lam Encoder Wheel
37	Lam Platen Roller
38	Lam Drive Rollers
39	Flipper Drive Roller
40	Lam Roller
41	Flattener Roller
42	Printhead Cooling Fan

Reviewing Pro-LX Boot Up Sequence

Step	Process
1	On Power up, print and the Lam Stepper Motor engage.
2	Print and Lamination Headlift Sensor checks for current open/closed state. If either Sensor registers closed, the appropriate Headlift Motor engages until Headlift Sensor detects open state.
3	Check SmartCard and Mag Sensors for presence of card. If there is a card found in either location, the print and Lam Stepper Motors engage to back the card out onto the flipper table.
4	Print TOF, Card Detection and LAM TOF Sensors check for presence of card. If any Sensor finds a card, the card is fed onto the flipper table. The flipper table then rotates and ejects the card into the reject bin.
5	The Flipper Clutch activates.
6	The Lam Stepper Motor engages.
7	The Flipper Home Sensor detects the homing flag and the Flipper Table levels.
8	The Flipper Clutch disengages
9	The Lam Stepper Motor disengages.

Reviewing Pro-LX Sequence of Operations

The following sequence describes a dual sided full color print job with magnetic encoding and single sided Lamination.

Step	Process
1	The File information is received from the PC
2	The Printer checks the installed Ribbon type stored in memory against the Ribbon type command that was sent from the printer. a. If Ribbon type does not match, a **Wrong Ribbon Error** is displayed on the LCD.
3	The Card Input Motor and Print Stepper Motor engage.
4	The Card detection Sensor detects leading edge of card and disengages the card input Motor.
5	The Print Stepper drives card to the Print TOF Sensor. The Print Stepper disengages
6	The Print Ribbon drive engages.
7	The Print Ribbon Sensor looks for the color transition from Yellow to Magenta. The Print Ribbon Encoder detects number of revolutions required to use an entire color panel.
8	The Print Stepper Motor engages.
9	The Print TOF Sensor detects trailing edge of card.
10	The Print Stepper Motor queues card to the middle of the platen roller. All Stop
11	The Print Headlift Motor engages.
12	The Print Headlift Sensor detects closed state.
13	The Print Headlift Motor disengages.
14	The Print Stepper Motor engages.

Continued on the next page.

Reviewing Pro-LX Sequence of Operations (continued)

Step	Process
15	The Print Cover Sensor checks for a closed state.
16	The Ribbon Drive Motor engages.
17	The Image Data is burned by the printhead until image data is depleted. All Stop.
18	The Thermistor engages Printhead Cooling Fan to maintain proper operating temperature.
19	The Headlift Motor engages.
20	The Print Headlift Sensor detects an open state.
21	The Print Headlift Motor disengages.
22	The Print Stepper Motor engages.
23	The Print Ribbon drive engages.
24	After the Ribbon advances a few encoder clicks, assume the Ribbon is free of cards. All Stop.
25	Repeat steps 10 through 24 for the appropriate number of color and overlay panels.
26	The Print and the Lamination Drive Stepper Motors engage.
27	The Lamination Card Sensor detects presence of card. All Stop.
28	The Lam Stepper engages.
29	The Card feeds back to the Flipper Table.
30	The Flipper Clutch engages
31	The Flipper Table rotates 180 degrees
32	The Flipper Table Clutch disengages. All Stop.
33	The Print and Lam Stepper Motors are activated.

Continued on the next page.

Reviewing Pro-LX Sequence of Operations (continued)

Step	Process
34	The card is fed past the Print TOF Sensor. All Stop.
35	The Flipper Table Clutch engages.
36	The Lamination Stepper engages.
37	The Flipper table rotates to level. All Stop.
38	Repeat steps 10 through 18 for appropriate number of color/overlay panels.
39	The Print and Lamination drive Stepper Motors engage.
40	The Lamination Card Sensor detects presence of card. All Stop.
41	The Lam Stepper engages.
42	The Card feeds back to the flipper table.
43	The Flipper Clutch engages
44	The Flipper Table rotates to encoding angle.
45	The Flipper Table Clutch disengages. All Stop.
46	The Print and Lamination Stepper Motors activate.
47	The Encoding TOF Sensor detects leading edge of card.
48	The Card feeds to below the magnetic encoder head. All Stop.
49	The Print and Lamination Stepper Motors are engaged.
50	The Magnetic Encoding Head is activated.
51	The Card feeds to the Encoding TOF Sensor. All Stop.
52	Repeat steps 40 through 45 for each verification pass.
53	The Card is fed onto the Flipper Table.

Continued on the next page.

Reviewing Pro-LX Sequence of Operations (continued)

Step	Process
54	The Flipper Clutch engages.
55	The Flipper table returns to level.
56	The Flipper Clutch disengages.
57	The Card feeds back to Print TOF Sensor then forward to the Lamination card Sensor. All Stop.
58	The Laminate Ribbon Drive activates until Laminate Ribbon Sensor detects patch mark. At this time the Thermocouple is checking the temperature of the Laminate roller and activating the heater core if needed.
59	The Lamination Stepper is activated.
60	The Card is fed to the platen roller. All Stop
61	The Lamination Cover Sensor checks for closed state.
62	The Headlift Motor engages.
63	The Headlift Sensor detects closed state.
64	The Headlift Motor disengages.
65	The Lamination Stepper Motor and Laminate Ribbon drive engage for the distance of the card. All Stop.
66	The Headlift Motor engages.
67	The Headlift Sensor detects open state.
68	The Headlift Motor disengages.
69	The Lamination Stepper Motor is activated and card is fed out of the printer.

Table of Contents

Section 1: Specifications

The purpose of this section is to provide the User with specific information on the Regulatory Compliances, Agency Listings, Technical Specifications and Functional Specifications for the Pro-LX Laminating Card Printer/Encoder (Rev. 3.0).

Regulatory Compliances

Term	Description
CSA	The Printer manufacturer has been authorized by UL to represent the Card Printer as CSA Certified under CSA Standard 22.2. **File Number:** E145118
FCC	The Card Printer complies with the requirements in Part 15 of the FCC rules for a Class B digital device. (**Note:** These requirements are designed to provide reasonable protection against harmful interference in a residential installation.) If equipment operation in a residential area causes unacceptable interference to radio and TV reception, the operator is required to take whatever steps are necessary to correct the interference.
ITS-EMC	The Card Printer has been tested and complies with EN55022 Class B: 1995 and EN82082-1: 1997 standards for EMI emissions. (**Note:** Based on the above testing, the Printer manufacturer certifies that the Card Printer complies with all current EMC directives of the European Community and has placed the CE mark on the Card Printer.) **License Number:** J99032510
TÜV-GS	The Card Printer has been tested and complies with IEC950 and bears the TÜV-GS mark. **License Number:** S9971826
UL	The Card Printer is listed under UL 1950 INFORMATION TECHNOLOGY EQUIPMENT. **File Number:** E145118, Volume 1, Section 15

Agency Listings

Term	Description
Emissions Standards	CE, FCC, CRC c1374, BSMI, ITS (EN 55022 Class B:1995, FCC Class B, EN 82082-1:1997).
Safety Standards	UL 1950, CSA C2.2 No.950-95 and TüV-GS (EN 60950 A1-A4, A11).

Technical Specifications

Term	Description
Accepted Standard Card Size	CR-80: 3.375 in. x 2.125 in. (85.6mm x 54mm)
Accepted Card Thickness	.020 in. (20 mil) to .040 in. (40 mil) (.508mm to 1.02mm).
Accepted Card Types	PVC or Polyester cards with polished PVC finish
Card Capacity	100 cards (30 mil).
Colors	Up to 16.7 million colors and 256 shades per pixel.
Dimensions	10.44 in. H x 24.79 in. W x 10.3 in. D (265mm x 630mm x 260mm).
Encoding Options	• ISO Magnetic Stripe Encoding Module, dual high- and low-coercivity, Tracks 1, 2 and 3 • JIS II Magnetic Stripe Encoding Module • E-card Docking Station (required for 3rd party smart card encoding)
Humidity	20% to 80% Non-Condensing.
Interface	Centronics parallel, IEEE-1284 Compliant
Memory	4 MB RAM; expandable to 16 MB RAM.
Operating Temperature	65ºF to 80ºF (18ºC to 27ºC).

Technical Specifications (continued)

Term	Description
Overlaminate Options	• Thermal Transfer Overlaminate, .25 mil thick, 500 prints • PolyGuard Overlaminate, .6 mil thick, 250 prints • PolyGuard Overlaminate, 1.0 mil thick, 125 prints All overlaminates available in either clear, holographic globe design or custom holographic design; can also be optimized for use with smart cards and Magnetic Stripes
Printing Method	Dye Sublimation/Resin Thermal Printer
Printing Resolution	300 dpi (11.8 dots/mm).
Print Speed-Batch Mode	• 8 seconds per card / 450 cards per hour (K)* • 15 seconds per card / 240 cards per hour (BO)* • 30 seconds per card / 120 cards per hour (YMCKO)* • 30 seconds per card / 120 cards per hour (YMCK/lamination) • 37 seconds per card / 97 cards per hour (YMCKK/lamination) Print speed indicates an approximate batch print speed and is measured from the time a card feeds into the Printer to the time it ejects from the Printer. Print speeds do not include the time needed for the PC to process the image. Process time is dependent on the size of the file, the CPU, amount of RAM and the amount of available resources at the time of the print. (**Note:** The single card print speeds will be slower than the batch print speeds listed above since batch print speed is enhanced by the Printer's multi-tasking capabilities when printing multiple cards in succession.)

Technical Specifications (continued)

Term	Description
Print Ribbon Options	• Full Color with resin black, YMCKO*, 250 prints • Full Color with two resin black panels, YMCKOK*, 250 prints • Full Color with resin black, no overlay panel, YMCKK*, 250 prints, must be used with overlaminate • Dye-Sublimation black, BO*, 500 prints • Resin black, green, blue, red, white, silver, gold, scratch-off, 1000 prints *Indicates the ribbon type and the number of ribbon panels printed where Y=Yellow, M=Magenta, C=Cyan, K=Resin Black, O=Overlay, B=Dye-Sublimation Black
Print Area	CR-80 edge to edge (3.37”L x 2.11”W / 85.5mmL x 53.5mmW)
Supply Voltage	100 to 240 V ac.
Supply Frequency	50 Hz/60 Hz.
Software Drivers	Windows 95/ 98/ ME/ NT/ 2000/XP.
System Requirements	IBM-PC or compatible. Windows 95/ 98/ ME/ NT/ 2000/XP. Pentium™ class 133 MHz computer with 32 MB of RAM or higher, 200 MB free hard disk space or higher and ECP parallel port with DMA access.
Warranty	Printer - One year; optional Extended Warranty Program (U.S. only) Printhead - One year, unlimited pass with UltraCard cards
Weight	40 lbs. (18.2kg).
Kits, Adapters and Cable	• 16MB RAM Upgrade Kit • Printer Cleaning Kit • Ethernet Interface Adapter (Windows only; required for stand-alone networking of Printers) • USB-to-Parallel Interface Cable (Windows 98/ME/2000/XP only)

Functional Specifications

The Card Printer utilizes two different, yet closely related printing technologies to achieve its remarkable direct-to-card print quality for dye-sublimation and resin thermal transfer. (**Note:** The Card Printer will print from any IBM-PC® or compatible running Windows® 95/98/ME, Windows NT 4.0, Windows 2000 or Windows XP.)

The following describes how each of these technologies works:

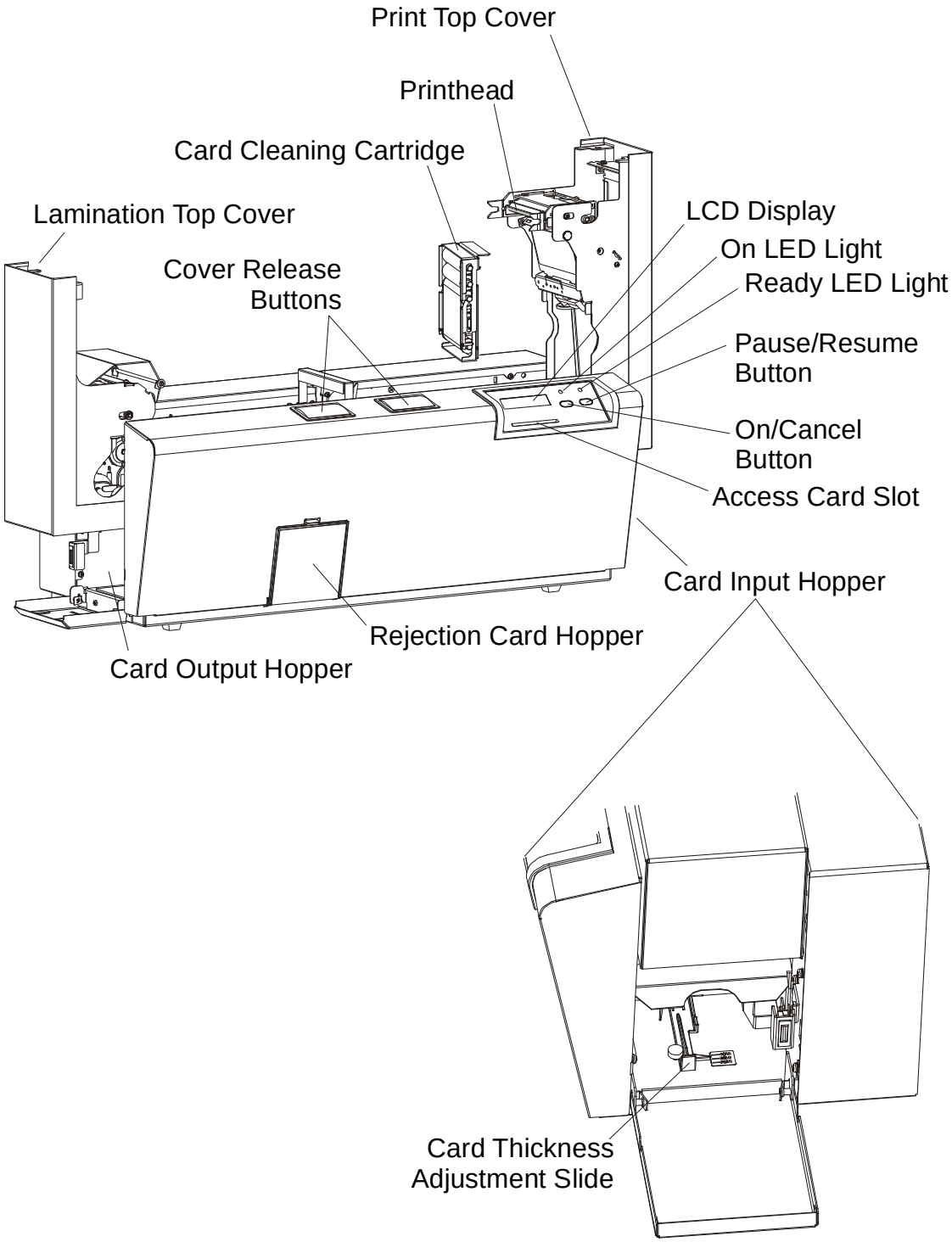
Function	Description
Dye-Sublimation	Dye-Sublimation is the print method the Pro-LX Laminating Card Printer/Encoder uses to produce smooth, continuous-tone, photographic images. This process uses a dye-based ribbon roll that is partitioned by a number of consecutive color panels. • The panels are grouped in a repeating series of these three process colors along the entire length of the Print Ribbon: yellow, magenta and cyan (YMC). • The Printer always prints the yellow panel (first), the magenta panel (second) and the cyan panel (third). • As the Print Ribbon passes beneath the Printhead, thermal elements within the Printhead heat the dyes on the ribbon. (**Note:** When these dyes are heated, the dyes vaporize and diffuse into the surface of the card. A separate pass is made for each of the three color panels on the ribbon.) By combining the colors of each panel and by varying the heat used to transfer these colors, it is possible to print up to 16.7 million different shades of color. This blends one color smoothly into the next, producing photo-quality images with no dot pattern.
Resin Thermal Transfer	Resin Thermal Transfer is the print method the Printer uses to print sharp black text and crisp bar codes that can be read by both infrared and visible-light bar code scanners. Like dye-sublimation, this process uses the same thermal Printhead to transfer color to a card from a resin-only Print Ribbon or the resin black (K) panel of a full color Print Ribbon. The difference, however, is that solid dots of resin-based ink are transferred and fused to the surface of the card to produce durable, saturated printing.

Printer Components: Top Cover to Power Port

Component	Description
Print Top Cover	Opens to allow access to the Printhead, Print Ribbon and card path. (**Note:** This cover must be closed in order for the Printer to begin printing.)
Lamination Top Cover	Opens to allow access to the lamination roller, overlaminate and card path. (**Note:** This cover must be closed in order for the Printer to begin printing.)
Cover Release Buttons	Unlatches the Top Covers.
Printhead	Printer component that prints. (**Note:** This component is fragile and must not be bumped or touched with anything other than a cleaning pen.)
Card Cleaning Cartridge	Automatically cleans cards for higher print quality. (**Note:** Replace the Card Cleaning Tape within this assembly after **every 1,500 cards** or as needed depending on the cleanliness of the card stock and the environment in which the Printer is located. Replace this tape if the cards start showing speckles or debris on the printed surface.)
LCD Display	The LCD display shows the User the current status of the Printer. Since the Printer's printing and laminating functions work independently, the top line of the LCD reports the status of the printing functions, while the bottom line reports the status of the laminating functions. When the Printer is first powered **ON**, the Printer's startup screen will appear displaying the current firmware version and the amount of installed Printer memory (4MB or 16MB). Once the Printer has finished its startup system check, it will then display Printer Ready and Lam Ready to indicate that the Printer is ready for operation. Lam Temp=XX% will display if the Printer's built-in laminator is heating or cooling to its target temperature. When it reaches 100%, lamination will begin. During operation, the LCD will also indicate the specific ribbon panel being printed, whether or not it is laminating and if any printing errors have occurred.
On LED Light	Indicates the Printer power is either **ON** or **OFF**.

Printer Components: Top Cover to Power Port (continued)

This table displays Printer components. Refer to the table in this section.

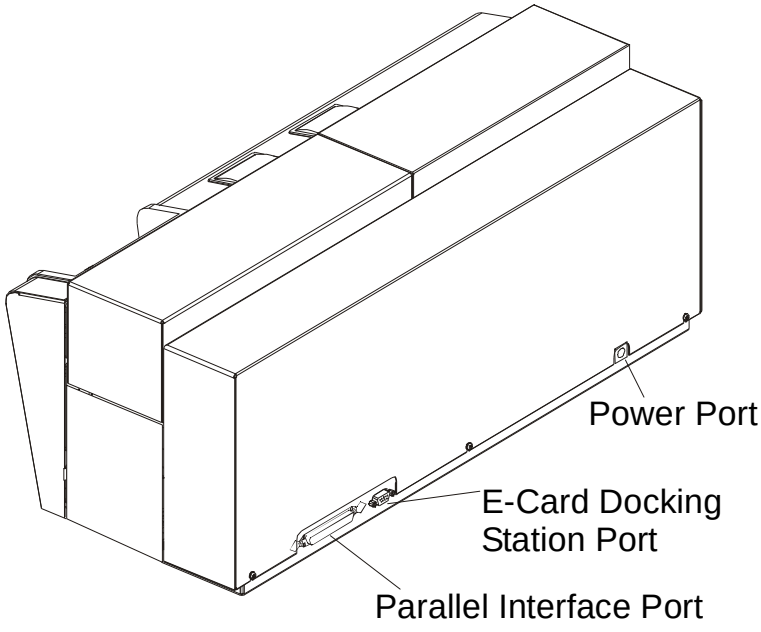


Printer Components: Top Cover to Power Port (continued)

Component	Description
Ready LED Light	When **ON**, this light indicates the Printer is ready for operation. When **OFF**, this light indicates the Printer is either OFF or paused and will not operate. If this light is flashing, a Printer error has occurred. (**Note:** Refer to the Printer's LCD display for the specific type of error that occurred. See the Interpreting LCD Messages for a complete description of all possible LCD error prompts.
On/Cancel Button	The **On/Cancel** button turns the Printer power ON and OFF. It also serves to cancel the current print job and reset the Printer for the next print job if an unrecoverable print error has occurred. If a card is left within the Printer after a print job is canceled, it will automatically be ejected when the Printer is turned back ON. (**Note:** With the Top Cover(s) open, this button can also be used to manually rotate the feed Rollers forward. This is helpful when cleaning the Printer or if clearing jammed media.)
Pause/ Resume Button	The **Pause/Resume** button allows the User to pause the Printer at any time during operation. Note, however, that the Printer will always finish its current task before pausing. If the **Pause/Resume** button is pressed in the middle of printing the magenta ribbon panel, the Printer will pause only after the entire magenta panel has printed. (**Note:** The Ready LED Light will turn **OFF** when the Printer is paused and **ON** again when operation is resumed. With the Top Cover(s) open, this button can also be used to manually rotate the feed Rollers backward. This is helpful when cleaning the Printer or if clearing jammed media.)
Access Card Slot	This is the slot in which a SmartGuard Access Card is inserted when using the Printer's included SmartGuard Security Feature. (**Note:** This unique option prevents the Printer from operating unless a custom access card is inserted. It also allows the User to print custom SmartShield Security Images which glow under ultraviolet light.)
Card Input Hopper	Load blank cards into this Hopper.

Printer Components: Top Cover to Power Port (continued)

Component	Description
Card Thickness Adjustment Slide	Adjusts the Printer to feed varying card thicknesses. See the Resolving the Card Feeding Errors procedure in Section 2, page 46.
Card Output Hopper	Stores printed cards; up to 100, 30 mil cards.
Rejection Card Hopper	Stores cards that have not printed or encoded properly. Helps to separate potential bad cards from a stack of good cards, which eject into the Card Output Hopper. (**Note:** The Printer will automatically eject cards into this Hopper if there is a printing error, encoding error or if a card is left in the Printer after a print job is canceled or the Printer restarted.)
E-Card Docking Station Port - For Smart Card Support	Provided only if the Printer includes an optional E-Card Docking Station. This is necessary for support of third party smart card encoding features.
Parallel Interface Port	Connects to a Windows PC with a parallel cable.
Power Port	Connects to the included power.

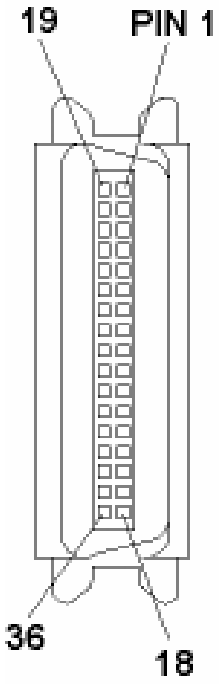


Printer Components: Centronics-Type Parallel Interface

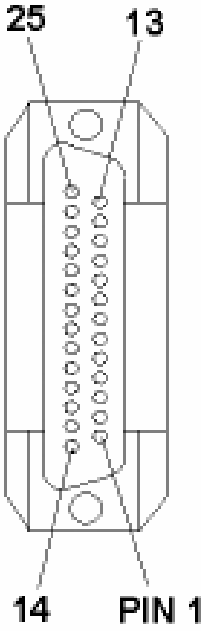
The Card Printer is equipped with a standard 8-bit centronics-type parallel interface port. This communication port is the means through which the Printer receives data from the computer. This section describes the pin assignments and signal specifications for this port.

The Centronics-type parallel interface is the most widely used Printer interface due to its simplicity, speed and standardization throughout the PC industry. The Printer's parallel interface connector is a standard 36-pin Amp type with two metal-wire retaining clips and is ECP (Extended Capabilities Port) compatible. It mates with a standard, bi-directional PC to Printer parallel cable.

For best results, keep the interface cable to less than 6 feet in length.



WIRE DIAGRAM	
DB36P	DB25P
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
19 Through 30	19 Through 25
Shell	Shell



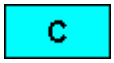
Printer Components: Print Ribbons

The Card Printer utilizes both dye-sublimation and/or resin thermal transfer methods to print images directly onto blank cards. Since the dye-sublimation and the resin thermal transfer print methods each provide their own unique benefits, Print Ribbons are available in resin-only, dye-sublimation-only and combination dye-sublimation/resin versions. (**Note:** A letter code has been developed to indicate the type of ribbon panels found on each ribbon.)

This letter code is as follows:

= Dye-Sublimation Yellow Panel

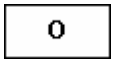
= Dye-Sublimation Magenta Panel



= Dye-Sublimation Cyan Panel

= Resin Black Panel

= Dye-Sublimation Black Panel



= Clear Protective Overlay Panel

Printer Components: Resin-Only Print Ribbons

Resin-only Print Ribbons consist of a continuous roll of a single resin color. No protective overlay panel (O) is provided since resin images do not require the protection of such an overlay.

Type	Description
Standard Resin Black (K) (provides 1,000 prints)	This ribbon provides high resin durability ideal for most general purpose monochrome ID card applications. Resin black bar codes are readable by both infrared and visible-light bar codes scanners. 
Premium Resin Black (K) (provides 1,000 prints)	This ribbon provides maximum resin durability ideal for applications such as access control where cards are repeatedly swiped through a Magnetic Stripe reader. Resin black bar codes are readable by both infrared and visible-light bar codes scanners. 
Colored Resin (provides 1,000 prints)	Colored resin ribbons are available in different colors for customizing or color coding resin-only ID cards.
Metallic Resin (provides 1,000 prints)	Metallic resin ribbons are available for printing resin images with a unique metallic sheen.
Scratch-Off Resin (provides 1,000 prints)	A scratch-off resin ribbon is available for printing over areas of a pre-printed card in order to hide specific information such as a personal identification number.

Printer Components: Dye-Sublimation-Only Print Ribbons

A dye-sublimation-only Print Ribbon is available in a monochrome version. This ribbon consists of dye-sublimation ribbon panels which alternate with a clear protective overlay (O) panel. Dye-Sublimation images must have an overlay panel applied to them or they will quickly begin to wear or fade.

Caution: All color or monochrome dye-sublimation images must have the ribbon's clear overlay panel or an overlaminate applied to them. If a protective layer is not applied, the card's dye-sublimation image will quickly begin to wear or fade. Cards printed solely with monochrome resin text, bar codes or images do not require any type of protective overlay. To apply the ribbon's clear overlay panel, select the Printer Driver's Overlay / Print Area tab. By default, the Printer Driver is setup to automatically apply the overlay panel for a selected a ribbon type that provides an overlay (O) panel. To apply an overlaminate, select the Lamination tab.

(**Note:** The Printer requires specialized Print Ribbons in order to function properly.)

Type	Description
Dye-Sublimation Black (BO) (provides 500 prints)	This ribbon provides a dye-sublimation black panel (B) along with an overlay panel (O) and is used to print smooth, photo-quality black and white photo ID cards. Dye-Sublimation bar codes are readable only by visible-light bar codes scanners. 
Dye-Sublimation-only Print Ribbon	It is available in a monochrome version. This ribbon consists of dye-sublimation ribbon panels which alternate with a clear protective overlay (O) panel. Dye-Sublimation images must have an overlay panel applied to them or they will quickly begin to wear or fade.
Dye-Sublimation/Resin Print Ribbon	The Dye-Sublimation/resin Print Ribbon combines the yellow (Y), magenta (M) and cyan (C) dye-sublimation panels with a resin black (K) panel. By combining both types of ribbon panels, this ribbon can be used to print full-color, photo-quality images with the dye-sublimation panels along with sharp, black text and bar codes with the resin black panel. A clear overlay panel (O) is also included on most ribbons to protect the dye-sublimation images. Dye-Sublimation images must have an overlay panel or overlaminate applied to them or they will quickly begin to wear or fade.

Printer Components: Dye-Sublimation-Only Print Ribbons (continued)

Type	Description
Full-Color (YMCKO) (provides 250 prints)	This ribbon is used to print full-color photo ID cards along with resin black text and bar codes. Both infrared and visible-light bar code scanners can read bar codes printed with resin black. An overlay panel (O) is included to protect the full-color dye-sublimation printing.
Full-Color (YMCKOK) (provides 250 prints)	This ribbon is used for dual-sided printing. By supplying two resin black panels, this ribbon used to print full-color with resin black on one side and resin black-only on the other, without wasting an entirely new set of ribbon panels for the black-only side. An overlay panel (O) is also included to protect the side of the card with full-color dye-sublimation printing. No overlay is necessary for the resin black-only side. Both infrared and visible-light bar code scanners can read bar codes printed with resin black.
Full-Color (YMCKK) (provides 250 prints)	This ribbon is intended to be used for dual-sided printing. By supplying two resin black panels, this ribbon lets you print full-color with resin black on one side and resin black-only on the other, without wasting an entirely new set of ribbon panels for the black-only side. Since no overlay panel is included, this ribbon must be used in conjunction with the Printer's overlaminate feature. No overlaminate is necessary for the resin black-only side. Both infrared and visible-light bar code scanners can read bar codes printed with resin black.

Printer Components: Blank Cards

 **Caution:** Never run cards with a contaminated, dull or uneven surface through the Printer. Printing onto such cards will ultimately lead to poor print quality and will greatly reduce the life of the Printhead. Always store the card stock in its original packaging or in a clean, dust-free container. Do not print onto cards that have been dropped or soiled. Printhead damage caused by contaminated or poor quality cards will automatically void the Printhead's factory warranty.

Type	Description
Card Size	The Card Printer accepts standard CR-80 sized cards (3.375"L x 2.125"W / 85.6mmL x 54mmW) with a thickness of 30 mil (.030"/. 762mm).
Card Design	The Printer will print onto any card with a clean, level and polished PVC surface. Although the Printer is equipped with card cleaning Rollers, it is very important to always print onto cards specifically designed for direct-to-card dye-sublimation printing.
Card Surface	Suitable cards must have a polished PVC surface free of fingerprints, dust or any other types of embedded contaminants. In addition, cards must have a completely smooth, level surface in order for the Printer to achieve consistent color coverage. • Certain types of Proximity cards have an uneven surface that will inhibit consistent color transfer. • Certain types of smart card chips are raised slightly above the cards surface which also results in poor color transfer.
UltraCard Stock	UltraCard stock has a glossy PVC laminate on top and bottom and is optically inspected to provide the scratch- and debris-reduced cards. Two types of these cards are available: UltraCard and UltraCard III. • **UltraCard** stock has a PVC core and offers medium card durability. • **UltraCard III** stock has a 40% polyester core and offers high durability. (**Note:** Both types of UltraCards produce printed images with a glossy, photo-quality finish.)

Printer Components: Laminator

 **Danger:** The Printer's Lamination Roller can reach temperatures exceeding 350 degree F (175° C). **Use extreme caution when operating the Laminator**. Never touch the Lamination Roller unless the Printer Power has been turned off for at least 20 to 30 minutes.

Type	Description
Controls	Both the Printer itself and the Printer's software driver control the built-in laminator.
Temperature	Upon initial power up of the Printer, the bottom line of the LCD display will read Lam Temp = X%. (**Note:** This indicates that the laminator is heating up to its preset or default laminating temperature of approximately 300° F (150° C). The percentage number indicates how close it is to achieving 100% temperature.)
Heating Process	This heating process will generally take about 3 to 4 minutes before the laminator is heated to the default temperature. (**Note:** Once the laminator reaches 100% of its default temperature, the LCD display will change to Lam Ready.) (**Note:** The LCD display will read Lam Temp = X% whenever the laminator is heating up or cooling down to the prescribed temperature. When the Lam Temp = 100%, the target temperature has been reached and lamination will begin.)
Temperature Adjustment	To change the temperature of the laminator, adjust its temperature through the Lamination tab within the Printer Driver setup window. (**Note:** Once adjusted, the new temperature settings will be sent down with the next print job along with the rest of the Printer Driver information.)
New Temperature Setting	Before printing begins, the laminator will automatically adjust itself to the new temperature setting. (**Note:** This new temperature setting will remain programmed within the Printer until it is once again changed within the Printer Driver or until the Printer is turned OFF.) Whenever the Printer is turned OFF, the laminator will automatically reset itself and return to its default temperature the next time the Printer is turned ON. Press the **On/Cancel** button to disconnect the Printer's power cord both serve to reset the laminator to its default temperature. The temperature setting within the Printer Driver, however, will stay the same until it is changed.

Reviewing the upgraded 81754 PVC Cards

The upgraded 81754 PVC cards are designed for a sharper card image quality and for reduced debris and defects on Fargo Card Printers. Carefully read these detailed notes and instructions before applying this information to your Fargo printer or printers.

- **Technician Note 1:** The new card lot number starts at **Lot # 2010104** with date codes that started on **04/01/2003**. The photo (below) shows a lot number that starts after **Lot # 2010104**, indicating a new card lot number. The **card lot number** and **date** can be read on the bar code label attached to the shrink-wrapped stack of 100 cards, as shown below. All new Fargo printers with a serial number (S/N) starting with A320 will have factory settings for these new 81754 PVC cards.

- **Technician Note 2:** Do not use the new 81754 PVC card stock with Fargo laminating printers/encoders. This same guideline is used for the existing 81754 PVC card stock. Fargo recommends using the UltraCard III stock with the Fargo laminating printers/encoders.

Reviewing the upgraded 81754 PVC Cards (continued)

Follow these two (2) instructions below:

1. **Instruction for new 81754 PVC card stock:** Increase the Printer Driver's Dye-Sub Intensity to print with the new 81754 PVC card stock on Fargo Card Printers (S/N A319 and older). See the chart provided below. See the appropriate Fargo service documents for specific Printer Driver instructions.

Card	New Printer (S/N A320 and newer)	Old Printer (S/N A319 and older)
New Card	No Change Necessary	Increase the Dye-Sub Intensity as follows: HDP®: N/A Pro-LX/C25: 3 - 5 % DTC500: 5 -10 % C11/C16: 3 - 5 %

2. **Instruction for existing 81754 PVC card stock:** The Printer Driver's Dye-Sub Intensity setting may or may not need to be decreased to print existing card stock. See the chart provided below. See the appropriate Fargo service documents for specific Printer Driver instructions.
   - **Technician Note 1:** To control the brightness of the image, adjust the **Dye-Sub Intensity** slide on the **Image Color** tab of the Printer Driver.
   - **Technician Note 2:** Moving the **Dye-Sub Intensity** slide to the left causes less heat to be used in the printing process, thus generating a lighter print.

Card	New Printer (S/N A320 and newer)	Old Printer (S/N A319 and older)
Old Card	Decrease the Dye-Sub Intensity as follows: HDP®: N/A Pro-LX/C25: 3 - 5 % DTC500: 5 - 10 % C11/C16: 3 - 5 %	No Change Necessary

Printer Components: Laminator

The Printer's internal lamination system is used to choose between both a Thermal Transfer Film overlaminate and a polyester patch overlaminate called PolyGuard™. The Thermal Film overlaminate is a relatively thin material that covers a card edge-to-edge and provides a medium level of ID card durability and security.

- PolyGuard is a much thicker material that does not cover edge-to-edge, but provides an extremely high level of ID card durability and security.
- PolyGuard is available in either a 1.0 or .6 mil thickness and should always be used for those applications requiring the highest degree of ID card durability and security.
- PolyGuard and the Thermal Film overlaminates are available in either a clear or generic "secure" holographic-type design. (**Note:** Custom holographic-type overlaminate designs are also available with specific designs, patterns, logos and security features. Please contact an authorized reseller for more information.)

 **Caution:** If using the Thermal Transfer Film overlaminate, a variety of laminating options are available within the Printer Driver. Refer to the Using the Lamination tab description in Section 3, page 134, for complete details about these options.

Visual Security Solutions (Specifications)

VeriMarkTM Cards - 2-D holographic foil application

VeriMarkTM Cards are a low cost, customized 2-D holographic foil application, that is made in two steps.

- The first step is to emboss a base foil 1.9 cm (L) x 1.3 cm (H) onto the surface of a blank white card.
- The second step is debossing a custom made dye into the surface of the base foil - leaving a customized image, logo or text provided by the customer.
- Two separate color foils are used to contrast the impression.

End Users will be able to choose between 8 different card placements (4 - landscape) and (4-portrait) where the VeriMarkTM can be located. When its time to print through the driver, the End User will select the location on their organizations card design around which no printing and overlay will be placed.

Custom HoloMarkTM Cards

A Custom HoloMark TM Card is a three-dimensional holographic image transferred to metal foil and embossed to blank cards. The image is customer specific and the program mirrors our holographic laminates program with a couple exceptions.

Visual Security - Card Stock Part Numbers

All Visual Security Cards will be offered on the following Fargo Card Stocks only:

- P/N# 81754 Ultra Card
- P/N# 81762 Ultra Card III with hi-coercivity magnetic stripe
- P/N# 81763 Ultra Card III

Visual Security - Fargo Certified Overlaminates (Special Order in 50 quantity minimum)

- Part No. 82255: PolyGuard 1.0 mil for HoloMarkTM and VeriMarkTM Cards, Clear
- Part No. 82256: PolyGuard 1.0 mil for HoloMarkTM and VeriMarkTM Cards, High Resolution Globe design hologram with "Secure" micro-text

Visual Security Card Stock - Tolerances

- Tolerance of base foil placement will equal +/- .010" from the nearest edges of the card
- Tolerance of layered foil will equal +/- .010"

VeriMarkTM - Application Specifications

VeriMarkTM foils will cover a dimensional area of 1.9 cm length x 1.3 cm height. The exclusive areas are as follows:

- VeriMarkTM Card customers will be able to choose 1 of 8 pre-defined placements (corners) via printer driver (4 positions) Landscape and (4 Positions) Portrait mode.
- VeriMarkTM foil placement will not interfere with card punch slots .
- Foil color base is silver; debossed impression is gold foil.
- VeriMarkTM foil placement will be located 0.4 cm from the edges of the card except for the top two locations on portrait orientation cards (positions E & F). The foil will be located 0.9 cm from the top of the card and 0.4 cm from the sides of the card.

HoloMarkTM and Custom HoloMarkTM - Application Specifications

HoloMarkTM and Custom HoloMarkTM foils will cover a dimensional area of 1.5 cm x 1.5 cm. The exclusive areas are as follows:

- HoloMarkTM and Custom HoloMarkTM card end-users will be able to choose 1 of 8 pre-defined placements (corners) via printer driver (4 positions) Landscape and (4 positions) Portrait mode.
- HoloMarkTM foil placement will not interfere with card punch slots.
- Foil Color options will be silver or gold.
- Outside edge placement of Foil impression options on card will be 0.4 cm from edge of card.
- HoloMarkTM foil placement options will be at all four corners of card located 0.4 cm from edge of card.

Section 2: General Troubleshooting

The purpose of this section is to provide the User with specific procedures relating to the LCD/SmartGuard Messages, Communication Errors, Card Feeding Errors, Print Process Errors, Card Jam Errors, Ribbon Errors, Encoding Errors, Diagnosing Image Problems, Running the Self-Test and Interfacing Information for the Pro-LX Laminating Card Printer/Encoder.

LCD/SmartGuard Messages

The LCD display shows the current status of the Printer. Refer to the cause and solution tables in this section for all possible LCD messages. (**Note:** These tables display the LCD messages in alphabetical order. If the LCD message is communicating an error or requires an action, these tables will also offer a solution to what should be done.)

Reviewing the Top Line LCD Messages

Message	Cause
Card Jam: Flip	A card is jammed in the Flipper Table area of the Printer. See the Clearing the Card Jam: Flip Error Message procedure in Section 2, page 56.
Card Jam: Mag	A card is jammed in the Mag Encoding module, beneath the Flipper Table. See the Clearing the Card Jam: Mag Error / Smart Error procedure in Section 2, page 54.
Card Jam: Print	A card is jammed somewhere along the printing path, under the Printer's top-right cover. See the Clearing Card Jam: Print Error procedure in Section 2, page 53.
Card Jam: Smart	A card is jammed in the smart card encoding module, beneath the Card Flipping Mechanism. See the Clearing the Card Jam: Smart Error procedure in Section 2, page 54.
Card Jam: Lam	A card is jammed in the print station of the Printer. See the Clearing the Card Jam: Lam Error procedure in Section 2, Page 55.
Card Out/Not Fed	Either the Card Hopper is out of cards or the Printer is unable to feed a card in from the Card Hopper. See the Clearing Card Jam Error procedure in Section 2, page 53.
Clearing Jam	Indicates error or jam is being cleared.
Feeding Card	Indicates card is feeding properly.
Flipper Jam	Card Flipping Mechanism is unable to rotate. See the Resolving the Flipper Jam Error Message procedure in Section 2, page 48.

Continued on the next page

Reviewing the Top Line LCD Messages (continued)

Message	Cause
Flipping Card	Indicates card is being flipped for backside printing.
Head-down Failed	Printhead is unable to lower itself. See the Resolving the Headlift Error Message procedure in Section 2, page 49.
Head-up Failed	Printhead is unable to raise itself. See the Resolving the Headlift Error Message procedure in Section 2, page 49.
Invalid Key Card	The SmartGuard Access Card is invalid or is inserted backwards or up side down. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Invalid Password	An invalid SmartGuard password was entered. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Key Card Ready	Indicates SmartGuard or SmartShield data has successfully been encoded onto the SmartGuard Access Card. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Key Disabled	Indicates the SmartGuard Security Feature has been disabled. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Key Not Inserted	Attempts are made to print without the SmartGuard Access Card inserted. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.

Continued on the next page

Reviewing the Top Line LCD Messages (continued)

Message	Cause
Key Card Deleted	Indicates the data on the SmartGuard Access Card was successfully deleted. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Lam Error/Out Error Message	Indicates a Lam Error/Out Error Message. See Resolving the Lam Error/Out Error Message procedure in Section 2, page 57.
Low Ribbon/Clean	Indicates the Print Ribbon will soon run out and that the Printer should be cleaned.
Mag Encoding	Indicates the Mag Stripe is being encoded.
Mag Verify Error	The Mag Stripe was not encoded properly. See Resolving Mag Verify Error Message Section 2, page 69.
Mag Verifying	Indicates data on Mag Stripe is being verified.
No Shield Loaded	Attempts are made to print with the Printer Driver's SmartShield option selected (even though the optional SmartGuard Security Feature is not used). **OR** If using the SmartGuard feature, the SmartShield image is not encoded onto the SmartGuard Access Card (currently inserted into the Printer). See the SmartGuard User's Guide for more information.
Print Cover Open	Indicates that the top-right cover is not properly shut. If this appears in error, see the Resolving Cover Open Error Message procedure in Section 2, page 50.
Printer Ready	Indicates the Printer is ready to print.
Printing	Indicates the Printer is printing.

Continued on the next page

Reviewing the Top Line LCD Messages (continued)

Message	Cause
Rasterize Shield	Indicates the Printer is loading the SmartShield security image from the SmartGuard Access Card into its memory. Appears when a valid access card containing a SmartShield image is first inserted into the Printer. (**Note:** If SmartShield image is named, the name will also appear along with this message on the bottom line of the LCD Display. Appears only when using the SmartGuard Security Feature.) See the SmartGuard User's Guide for more information.
Reading Key Data	Indicates the Printer is reading the data from the SmartGuard Access Card. Appears when a valid access card is first inserted into the Printer. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Rib Calib Failed Error	Indicates that an attempt at calibrating the Ribbon Sensor through the Printer Driver has failed. See the Resolving the Skipping Ribbon Panel issues procedures in Section 2, page 59.
Ribbon Error/Out Error	Indicates either the Print Ribbon is out or a ribbon error has occurred. See Resolving Ribbon Low Error Message procedure in Section 2, page 63.
Ribbon Jam/Out Error	The Print Ribbon has become jammed in the Printer Rollers, it is stuck to the surface of the card or it is out. See the Resolving the Ribbon Breaking issues procedure in Section 2, page 64.
Ribbon Low Error Message	Indicates either the ribbon is running low or is out. See Resolving Ribbon Low Error Message procedure in Section 2, page 63.
Sensor Calibrate	Indicates the Ribbon Sensor is calibrating. See the Resolving the Skipping Ribbon Panel issues procedures in Section 2, page 59.

Continued on the next page

Reviewing the Top Line LCD Messages (continued)

Message	Cause
Smart Card Error	Unable to encode smart card.
Smart Card Good	Indicates smart card was successfully encoded.
Smart Encoding	Indicates the Printer is writing or encoding data onto the SmartGuard Access Card. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Writing Key Data	Indicates the Printer is writing or encoding data onto the SmartGuard Access Card. Appears only when using the SmartGuard Security Feature. See the SmartGuard User's Guide for more information.
Wrong Ribbon Error	The wrong Print Ribbon is installed. See the Resolving the Wrong Ribbon error (being displayed incorrectly) procedure in Section 2, page 62.

Reviewing the Bottom Line LCD Error / Status Messages

Message	Cause
Card Jam: Lam Error	A card is jammed somewhere along the laminating path, under the Printer's Lamination Top Cover. See the Resolving the Card Jam: Lam Error procedure in Section 2, page 55.
Clearing Jam	Indicates error or jam is being cleared. See Card Jam Errors in Section 2, page 53.
Lam Calib Failed	An attempt at calibrating the Lamination Sensor through the Printer Driver has failed. See the Resolving the Lam Error/Out Error Message procedure in Section 2, page 57.
Lam Cover Open	The Lamination Top Cover is not properly shut. If this appears in error, see the Resolving Cover Open Errors procedure in Section 2, page 50.

Continued on the next page

Reviewing the Bottom Line LCD Error / Status Messages (continued)

Message	Cause
Lam Error/Out	The overlaminate is either out or an error has occurred. See the Resolving the Lam Error/Out Error Message procedure in Section 2, page 57.
Lam Jam/Out Error	The overlaminate has either become jammed in the Printer Rollers, stuck to the surface of the card, broken or has run out. See the Resolving the Lam Error/Out Error Message procedure in Section 2, page 57.
Lam Ready	Indicates Printer is ready to laminate. See the Using the Lamination tab Section 3, page 134.
Lam Temp = X%	Indicates the laminator is heating or cooling to its target temperature. When the Lam Temp = 100%, the target temperature has been reached and lamination will begin. See the Selecting the Lamination Dwell Time and Temperature in Section 3, page 138.
Lam Turned Off	Indicates laminator is OFF. The laminator can be turned off by setting Switches 4 and 5 of the Printer's internal switches down (towards the circuit board). See the Using the Lamination tab Section 3, page 134.
Laminating	Indicates Printer is laminating. See the Using the Lamination tab Section 3, page 134.
Roller-dn Failed	The Lamination roller is unable to lower. See the Resolving the Headlift Error Message procedure in Section 2, page 49.
Roller-up Failed	The Lamination roller is unable to rise. See the Resolving the Headlift Error Message procedure in Section 2, page 49.
Sensor Calibrate	Indicates the Lamination Sensor is calibrating. See the Using the Lamination tab Section 3, page 134.
Wrong Lam Type Error	The wrong overlaminate is installed. See the Resolving the Wrong Ribbon error procedure in Section 2, page 62.

Continued on the next page

Reviewing the BOTH Line LCD Error / Status Messages (continued)

Message	Cause
CANCEL=Abort RESUME=Continue	Appears when the **Pause/Resume** button is pressed any time while the Printer is powered ON. Also appears when the **On/Cancel** button is pressed during a print job.
CANCEL=Abort RESUME=Reprint	Appears when the **On/Cancel** button is pressed after an error has occurred.
Delete Key Data? RESUME=Delete	Appears when deleting a SmartGuard Access Card. Appears only when using the SmartGuard Security Feature.
DRAM Memory Bad! Service Required	The Printer's 4 MB or 16 MB memory module is bad or not installed properly. See the Resolving the DRAM Memory Error procedure in Section 6, page 196.
EE Memory Error! RESUME=Clear Mem	Indicates problem with permanent circuit board memory. See the Resolving the EE Memory Error procedure in Section 6, page 195.
EE Memory Error! RESUME=Retest	Permanent circuit board memory is bad. See the Resolving the EE Checksum Error procedure in Section 6, page 195.
Insert New Key RESUME=Duplicate	Appears when trying to duplicate a SmartGuard Access Card. Appears only when using the SmartGuard Security Feature.
Invalid Shield Send New Shield	Appears if the SmartShield data on the SmartGuard Access Card has somehow become corrupt. Appears only when using the SmartGuard Security Feature.
Preparing Card Count=xxxxxxxx	Appears when initiating a card count report from the Printer.
Press ON to Initialize	Appears when the **On/Cancel** button is pressed before a print job is sent provided that the Printer is in its Ready mode.

Communications Errors

Resolving the Communication Errors

Symptom(s): Incorrect output, communications error on PC or Printer, stalling, no response from Printer, no job printed, “paper out” error.

Step	Procedure
1	Confirm that the system meets the minimum requirements, as shown here: • IBM-PC or compatible • Windows 95/98/ME/NT/2000/XP Pentium™ class 133 MHz computer with 32 MB of RAM or higher • 200 MB free hard disk space or higher • ECP parallel port with DMA access
2	Confirm the correct installation of the Printer Driver. a. Close the software program and check the Printer Driver. b. Reboot the computer. c. Make sure the Printer Driver is installed correctly. (**Note:** Especially if an obsolete driver was recently removed.) d. Be sure the correct setup options within the Printer Driver are selected. e. Confirm that the driver is current by checking at: www.fargo.com
3	Verify the use of an adequate data cable. a. Use a double-shielded parallel cable (no longer than six feet in length). (**Note:** Data transmission failure can be attributed to a long or faulty parallel cable.) b. Use a double-shielded, I-EEE 1284 compliant cable to reduce the effect of radio emissions from computers, monitors and other equipment that may broadcast Radio frequency interference (RFI).

Continued on the next page

Resolving the Communication Errors (continued)

Step	Procedure
4	Determine if there is interference from an external device. a. Do not use an A/B switch box or other peripheral in line with the parallel cable. b. If using a switch box or other peripheral, remove it while testing communication between the computer and the Printer. c. If needed, replace the switch box or other peripheral (once it is determined that the cause of the interference is not the switch box or peripheral). d. **Alternative:** Add a second parallel port into the computer (if a second Printer is required).
5	Determine the problem with printing from the application. a. Print a self-test from the Printer as described in the Running the Self-Test procedure in Section 2, page 87, to ensure that the Printer (itself) is functioning properly. b. Print the Windows test page that is located in the General tab of the driver. c. Use WordPad (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). • Open the program and type: This is a Test. • Select **File > Print** on the Menu Bar.
6	Determine if the parallel port mode is set correctly or incorrectly. a. Ensure that the parallel port is set to the Enhanced Communication Port (ECP) mode. (**Note:** The port mode can be determined by checking the Device Manager tab in the system control panel.) b. If the port mode is not set to ECP, it will need to be changed in the computers BIOS. (**Note:** Refer to the appropriate computer manual for instructions on how to change the Parallel Port mode.)

Continued on the next page

Resolving the Communication Errors (continued)

Step	Procedure
7	Determine whether there is an adequate or inadequate hard drive space.  **Caution:** A large volume of temporary files on the computer can cause communications errors. Access the temporary files by following this process: • Search for all folders called TEMP. Once found, clear out the contents of the folders. • If using Windows 95/98/ME/2000/XP, run the System Tool - Disk Defragmenter found in the Accessories folder of the **Start** Menu. • Use a disk cleanup utility (such as **Disk Cleanup** found in the System Tools folder of the Start menu) or use a third party application.

Card Feeding Errors

Resolving the Card Feeding Errors

Symptom: Two or more cards feed at the same time or the cards will not feed at all.

Step	Procedure
1	Clean the Input Roller. a. Open the Printer's top covers and remove all cards, Print Ribbons and overlaminate from the Printer. b. Leave the Printer power **ON** and the top covers open throughout this procedure. (**Note:** The card cleaning cartridge can also remain within the Printer during this cleaning process.) c. Use a cleaning card from the Printer Cleaning Kit and remove its adhesive backing paper. d. Insert the cleaning card into the card Hopper, above the card input tray, as normally done on any other type of card. • Verify that the shortest non-adhesive end of the cleaning card enters the Printer first and that the sticky side is facing UPWARD. • Ensure the card was not inserted with the sticky side facing downward because then it would stick to the card input tray and not feed properly. e. Run a self-test by following these steps. 1. Unplug power from the Printer. 2. While holding down the **Pause / Resume** button, reapply power. 3. Release the **Pause / Resume** button once the self-test has begun. 4. The cleaning card will feed into the Printer. 5. An error will be displayed when feeding the card. 6. Remove the cleaning card. 7. Reset the Printer by unplugging the power and reapplying.

Continued on the next page

Resolving the Card Feeding Errors (continued)

Step	Procedure
2	Ensure the Card Thickness Slide is set correctly. a. Loosen the Slide Lock by rotating it counter clockwise and then push the Card Thickness Slide forward or backward to the appropriate setting. b. With any of the **Card Thickness** settings, move the slide slightly toward a higher setting until the cards begin feeding (if the Printer seems unable to feed cards at the selected setting). c. Move the slide slightly toward a lower setting if the Printer seems to double-feed cards. (**Note:** The card thickness slide is adjustable to accommodate card thickness variations that often occur even within standard card sizes.)
3	Check for static build up between cards. • Occasionally, a static charge will build up between the surfaces of two or more cards causing them to stick together. • By separating the cards manually before placing them in the input Hopper, this static charge can be reduced or eliminated.

Resolving the Flipper Jam Error Message

Symptom: A Flipper Jam error is displayed on the LCD.

Step	Procedure
1	Check for any obstruction. a. Open the lamination top cover. Manually rotate the Flipper Table at a full 360-degrees rotation. b. Visually ensure that there is no obstruction in the path of the Flipper Table's rotation.
2	Verify the flipper clutch operation. a. Unplug the Printer. Open the Top Lamination Cover. b. Reapply power to the Printer. Verify that the Flipper Table rotates and stops level with the card feed path.
3	Test the flipper home Sensor. a. Remove the rear cover. b. Using a digital voltmeter, connect the negative lead to its ground. c. Connect the positive lead to Pin 2 of J8. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC
4	Verify the motor operation. a. Open the Top Lamination Cover. b. Press and hold the **On/Cancel** Button. Verify the following: • The Rollers on the lamination side of the Printer should begin to roll. • The card feed Rollers on the card path and on the Flipper Table should be rolling. • The platen roller and the flattener roller should be rolling. c. Replace (as needed) the Lamination Stepper Motor if none of the Rollers are turning. Inspect the gear configuration in the front of the Printer if any one of the Rollers is not turning.
5	Verify the current reject Hopper capacity. a. Open the Reject Hopper door. b. Ensure that the card reject Hopper is not full.

Print Process Errors

Resolving the Headlift Error Message

Symptom: The Head Up/Down Error or Roller Up/Down Error is displayed on the LCD.

Step	Procedure
1	Cycle the headlift motors. a. Remove the front cover. b. Open both the Lamination and the Print Covers. c. Press both buttons on the front control panel at the same time. d. Verify that the Headlift Motors are cycling by watching the Sensor flag rotate through the Sensor. e. If the Motor does not turn, continue to step 2.
2	Test the headlift motors. a. Unplug the Printer. b. Remove the back cover. c. Disconnect the Headlift Motor from the main board (J27 for Print Side) and (J29 for Lam Side). d. Connect a 9-volt battery to the Head Motor (that did not cycle). e. If the motor does not turn, replace it. f. If the motor does turn, continue to Step 3.
3	Test the Headlift Sensors. a. Remove the back cover. b. Attach the positive lead from a Digital Voltmeter to Pin 1 of J3 for print side or Pin 1 of J4 for lamination. Attach the negative lead to the Printer Chassis for its ground. • If **unblocked**, the Sensor should read 0.17 to 0.9 VDC. • If **blocked**, the Sensor should read 3.5 to 3.8 VDC. c. Replace the Sensor if the voltages do not read correctly.

Resolving the Cover Open Error Message

Symptom: A Cover Open error is displayed when the cover is closed or the Rollers do not operate (when the cover is open).

Step	Procedure
1	Test the Sensor by following these steps. a. Remove the Rear Cover. b. Use a Digital Voltmeter to: • Attach the negative lead to ground. • Attach the positive lead to Pin 2 of J11 to test the Print Cover Sensor operation. c. Connect the positive lead to Pin 2 of J12 to test the Lam Cover Sensor operation. Replace the Sensor if the voltages are incorrect. • Verify that the voltage reads 5 VDC with the cover closed. • Verify that the voltage reads 0.12 to 0.17 VDC with the cover open.

Resolving the Blank Output issues

Symptom: A card is ejected blank (that should be printed).

Step	Procedure
1	Run a self-test. a. Clear any card jams. b. Unplug power from the Printer. c. While holding down the **Pause / Resume** button, reapply power. d. Release the **Pause / Resume** button once the Self-test has begun. e. A self-test card will be printed.
2	Look for an image on the ribbon. a. After a self-test has been run, open the top cover. b. Remove the Print Ribbon from the Printer. c. Visually inspect the set of panels that were last used by the Printer. d. If an image is noticeable on the used ribbon, continue to step 3. e. If an image is not noticeable on the used ribbon, continue to step 4.
3	Adjust the placement. a. Reset the Printer to clear any Error Messages by removing the power and reapplying it. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Adjust the Image Placement setting by +5. f. Click on the **OK** button.

Continued on the next page

Resolving the Blank Output issues (continued)

Step	Procedure
4	Check the Printhead connections. a. Open the top print cover. b. Remove the two (2) thumbscrews from the Printhead cover plate and remove the cover plate. c. Check to ensure that Power and Data Cables (that connect to the Printhead) are properly seated. d. Remove the Back Cover. e. Ensure that the Printhead Power Cable is properly seated on J15 on the main board. f. Ensure that the Printhead Data Cable is properly seated on J16 on the main board.
5	Ensure that the proper voltage is being applied to the Printhead. a. Remove the back cover. b. Using a Digital Voltmeter, connect the negative lead to ground. c. Probe Pins 1 to 5 of the Printhead power connection on J15. d. Ensure that a voltage between 22 to 23 VDC is read on each pin. e. If less than 22 volts is read on any of the pins, ensure that the Power Supply for the Printer is outputting 23 to 24 VDC by testing the power connection to the Printer with a voltmeter. f. If the power supply is operating properly, the Main Board may need to be replaced. g. If 22 to 23 volts is read from Pins 1 to 5 on J15, check to ensure that the wires from the Printhead Harness cable are in good condition and are not pinched. h. If the Printhead harness cable is in good condition, replace the Printhead (as needed).

Card Jam Errors

Resolving the Card Jam: Print Error Message

Symptoms: The card is physically jammed in the Printer or a Card Sensor is reporting a card is present.

Step	Procedure
1	Look for a jammed card in the Printer. a. Open the Printer's top cover. b. Remove the ribbon from the Printer. c. Check to see if a card is jammed in the print station of the Printer. d. If a card is jammed in the Printer, use the **Pause / Resume** button and the **On / Cancel** buttons to move the feed Rollers and free the card. (**Note:** The card can then be fed out of the Printer.) e. If no card was found in the print station, continue to Step 2.
2	Clean the inside of the Printer. a. Open the Print and Lamination Top Covers. b. Use a can of deionized to blow any dirt or debris from the Printer.
2	Test the Card Feed Detection Sensor. a. Remove the rear cover. b. Using a Digital voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 1 of J6. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. d. If the voltages do not read correctly, replace the Sensor.
3	Test the TOF Sensor. a. Remove the rear cover. b. Using a Digital voltmeter, connect the negative lead to ground. Connect the positive lead to Pin 1 of J5. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. c. If the voltages do not read correctly, replace the Sensor.

Resolving the Card Jam: Mag Error / Smart Error Message

Symptoms: The Card Jam: Mag Error or Card Jam: Smart Error is displayed on the LCD.

Step	Procedure
1	Look for a jammed card in the Printer. a. Open the Printer's top cover. b. Remove the ribbon from the Printer. c. Check to see if a card is jammed in the print station of the Printer. d. If a card is jammed in the Printer, use the **Pause / Resume** button and the **On / Cancel** buttons to move the feed Rollers and free the card. (**Note:** The card can then be fed out of the Printer.) e. If no card was found in the print station, continue to Step 2.
2	Check the Magnetic Offset Setting. a. Reset the Printer to clear any Error Messages by removing the power and reapplying it. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Ensure that the Magnetic Offset setting matches the value (that is written on the back of the Printer).
3	Test the Card Detection Sensor. a. Remove the rear cover. b. Using a Digital voltmeter, connect the negative lead to ground. Connect the positive lead to Pin 1 of J31. • If **blocked**, the voltage should read 3.8 to 3.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. c. If the voltages do not read correctly, replace the Sensor.

Resolving the Card Jam: Lam Error Message

Symptom: The Card Jam: Lam Error is displayed on the LCD.

Step	Procedure
1	Look for a jammed card in the Printer. a. Open the Printer's top cover. b. Remove the ribbon from the Printer. c. Check to see if a card is jammed in the Lam Station of the Printer. d. If a card is jammed in the Printer, use the **Pause / Resume** button and the **On / Cancel** buttons to move the feed Rollers and free the card. (**Note:** The card can then be fed out of the Printer.) e. If no card was found in the Lam Station, continue to Step 2.
2	Test the TOF Sensor. (**Note:** If the Printer has begun laminating the card and then jams, it may be possible that the centering of the lamination of the card has caused the jam.) a. Inspect the card and determine if the lamination is centered on the card. b. If the Lamination is hanging off the leading or trailing edge of the card, see Using the Lamination Placement option procedure in Section 3, page 105.
3	Test the Card Detection Sensor. a. Remove the rear cover. b. Using a Digital voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 1 of J6. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. d. If the voltages do not read correctly, replace the Sensor.

Resolving the Card Jam: Flip Error Message

Symptom: A Card Jam: Flip Error is displayed on the LCD.

Step	Procedure
1	Run a Self test. a. Clear any card jams. b. Unplug power from the Printer. c. While holding down the **Pause / Resume** button, reapply power. d. Release the **Pause / Resume** button once the self-test has begun. (**Note:** A test card will be printed.) e. If successful, this will ensure proper flipper operation on a simple double-sided print.
2	Check the Flipper Offset. a. Clear any card jams. b. Open the top covers. c. Unplug power from the Printer and reapply. (**Note:** The Flipper Table will cycle on startup.) d. When finished, the Flipper Table should be completely level with the card feed path. If it is not, adjust the flipper offset (as needed).
3	Check for warpage. (**Note:** When laminating both sides of the card, the card is subjected to excessive amounts of heat. This can cause the card to warp significantly, depending on the composition of the card.) a. Print a card that is only laminated on one side. b. Once the card is ejected, lay the card on a flat surface. c. Ensure that the warpage amount is less than 30 mil. d. Slide a standard, 30-mil card under the laminated card. If there is substantial clearance, see Adjusting the Card Flattener in Section 3, on page 107.

Ribbon Errors

Resolving the Lam Error/Out Error Message

Symptom: The Printer seems to skip PolyGuard overlaminate patches or simply wind the overlaminate until the Printer's Ready LED flashes.

Step	Procedure
1	Check that the proper Over-Laminate type is installed according to the **Lamination Type** option selected in the Printer Driver. a. Open the Printer control panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. b. Click on the Lamination tab. c. Ensure that the Lamination Type (selected) matches the Lamination type installed in the Printer.
2	Calibrate the Lamination Sensor. a. Reset the Printer to clear any Error Messages by removing Power and reapplying it. b. Open the Printer control panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Sensors** button. e. Remove the Laminate ribbon and close the top cover. f. Click on the **Send** button for a Lamination Sensor Calibration.

Continued on the next page

Resolving the Lam Error/Out Error Message (continued)

Step	Procedure
3	Check the Laminate Ribbon Clutch to determine if it is too loose. a. Remove the back cover. b. Use a 7/16” wrench to tighten the nut on the end of the encoder wheel by ½ - turn.
4	Test the Encoder Sensor. a. Remove the back cover. b. Using a Digital voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 4 of J13. • If **blocked**, the voltage should read 4.9 to 5.5 VDC. • If **unblocked**, the Sensor should read 0.15 to 0.18 VDC. d. If the voltages do not read correctly the Sensor should be replaced.

Resolving the Skipping Ribbon Panel issues

Symptom: The Printer is using more than one set of ribbon panels to print one side of a card.

Step	Procedure
1	Calibrate the Ribbon Sensor. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. Click on the Calibrate tab. c. Click on the **Sensors** button. d. Remove the ribbon and close the top cover. e. Click on the **Send** button for a Ribbon Sensor calibration. Verify that the Printer beeps twice and the LCD displays **Sensor Calibrate.**

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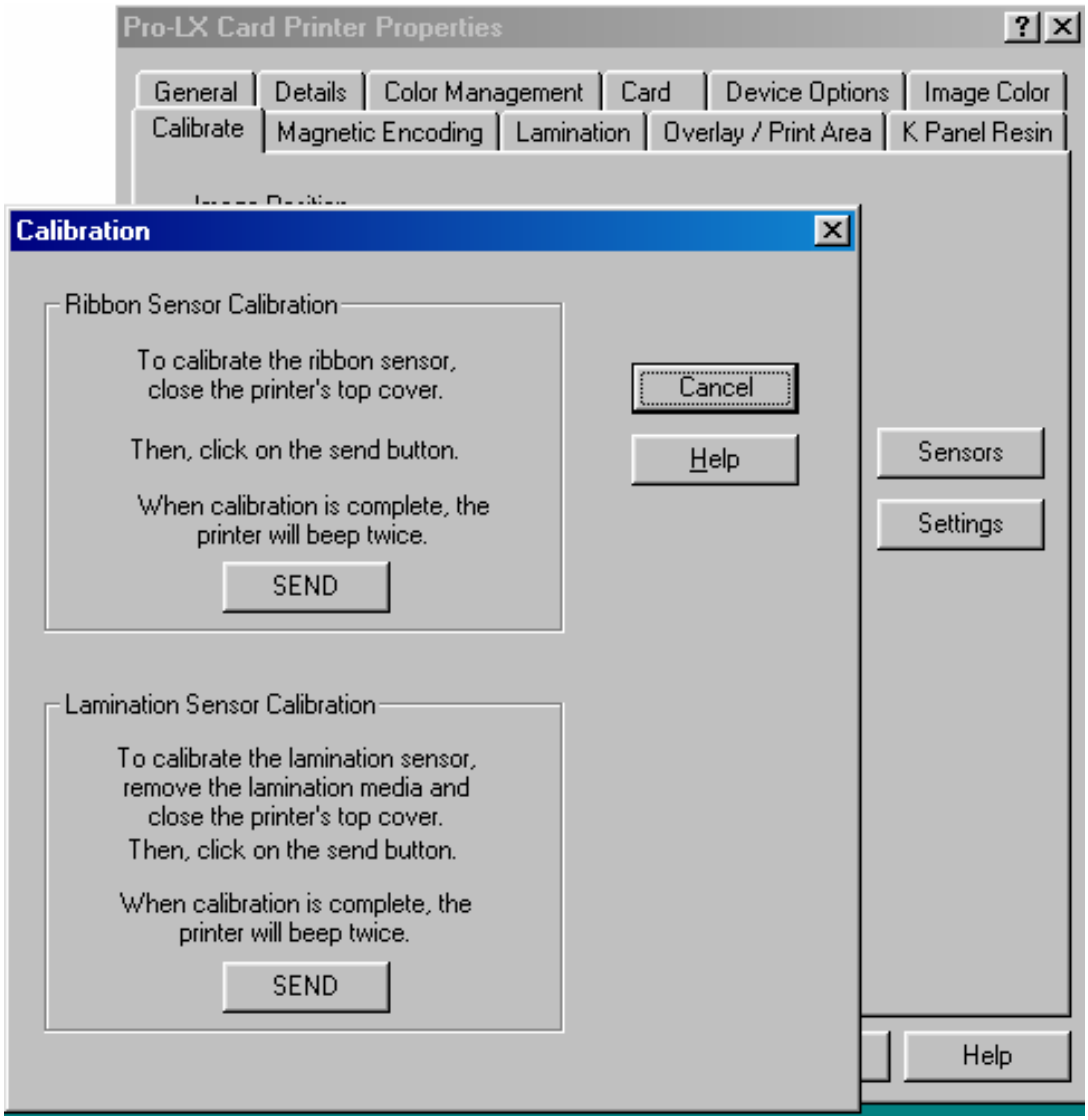
Resolving the Skipping Ribbon Panel issues (continued)

Refer to the previous procedure.



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Resolving the Skipping Ribbon Panel issues (continued)

Step	Procedure
2	Adjust the Ribbon Clutch a. Remove the back cover. b. Use a 7/16th wrench to tighten the nut on the end of the encoder wheel by a ½ - turn.
3	Test the Encoder Sensor. a. Remove the back cover. b. Using a Digital Voltmeter, connect the negative lead to ground. c. Connect the positive lead to Pin 4 of J13. • If **blocked**, the voltage should read 4.9 to 5.5 volts DC. • If **unblocked**, the Sensor should read 0.15 to 0.18 volts DC.

Resolving the Wrong Ribbon error (being displayed incorrectly)

Symptom: A Wrong Ribbon Error is displayed on the LCD even though the correct ribbon is installed in the Printer.

Step	Procedure
1	Verify the driver settings are correct. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. b. Click on the Device Options tab. c. Ensure that the Ribbon Type setting that is listed matches the ribbon that is installed in the Printer. (**Note:** It may be possible to have driver settings that are different from those found in the Printer control panel through the software.) d. Check any page setup functions in the software to ensure that the Ribbon type matches.

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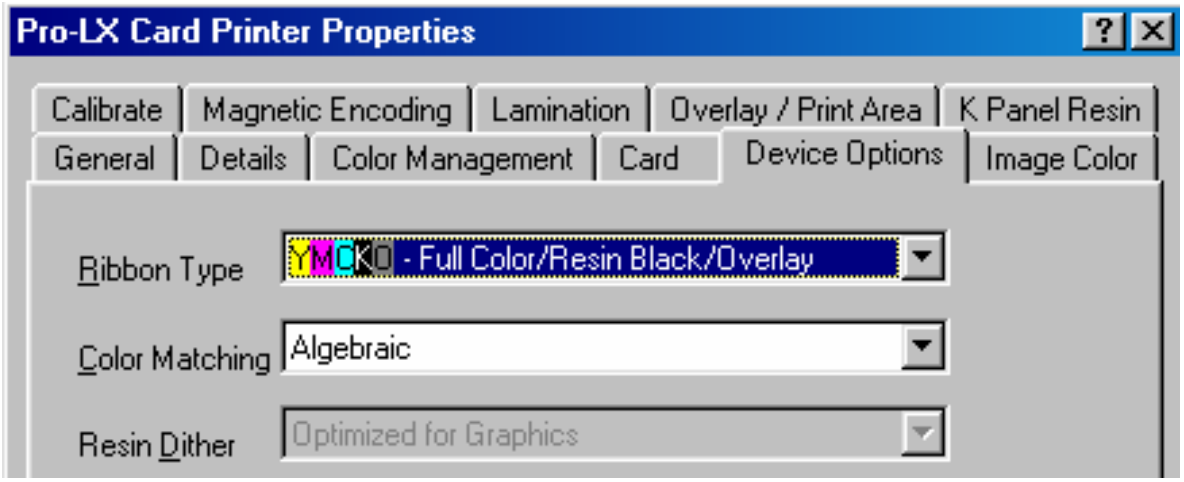


Resolving the Wrong Ribbon error (being displayed incorrectly) (continued)

Step	Procedure
2	Test the Ribbon ID Sensor. a. Unplug the Printer. b. Remove the back cover. c. Flip switches 3 and 4 on the bank of DIP switches in the Main Board corner. d. With the top covers closed, apply power to the Printer while holding down the **Pause/Resume** button. e. Once the LCD screen displays **RUNNING SELF TEST #12**, release the **Pause/Resume** Button. f. Open up the top Print cover. g. Slowly rotate the supply side of the ribbon. (**Note:** As the spool is rolling, the Printer should emit a beep every time a metal pin from the ribbon ID core passes the Sensor.) h. Replace the Ribbon ID Sensor if the Printer responds by emitting no beeps or if one long set of beeps is emitted (regardless of the ribbon's position).

Resolving the Ribbon Low Message

Symptoms: The Printer beeps just before each ribbon panel is printed. The ribbon is running low, which indicates the Print Ribbon is running low and that it will soon run out. When this message is displayed, there should be 10 to 20 additional prints left on the ribbon.

Step	Procedure
1	Print until the ribbon is gone and replace the ribbon as needed.

Resolving the Ribbon Breaking issues

Symptom: The Ribbon breaks when printing or a Ribbon Jam Error is displayed on the LCD

Step	Procedure
1	Calibrate the Ribbon Sensor. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. From the Computer, open the Printer control panel. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Sensors** button. e. Remove the Ribbon and close the top cover. f. Click on the **Send** button for a Ribbon Sensor Calibration.

Continued on the next page

Resolving the Ribbon Breaking issues (continued)

Step	Procedure
2	Determine where the ribbon is breaking. a. Open the Top Print Cover. b. Remove the ribbon from the Printer. c. Inspect the ribbon at the break point. • If the Ribbon broke before any print was applied to the card, continue to Step 3. • If the Ribbon broke after applying the print to the card, continue to Step 4.
3	Adjust the Image Placement. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Adjust the **Image Placement** setting by +10. f. Click on **OK**. g. Print a Self-Test. h. After adjusting the Image Placement, if a white edge appears on the card, adjust the image placement back toward its original value in increments of 2 until the white edge is gone.

Continued on the next page

Resolving the Ribbon Breaking issues (continued)

Step	Procedure
4	Adjust the Image Placement. a. Reset the Printer to clear any Error Messages by removing Power and reapplying. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Adjust the **Image Placement** setting by -10. f. Click on **OK**. g. Print a Self-Test. h. After adjusting the Image Placement, if a white edge appears on the card, adjust the image placement back toward its original value in increments of 2 until the white edge is gone.

Resolving the Lamination (not adhering to the card surface) problem

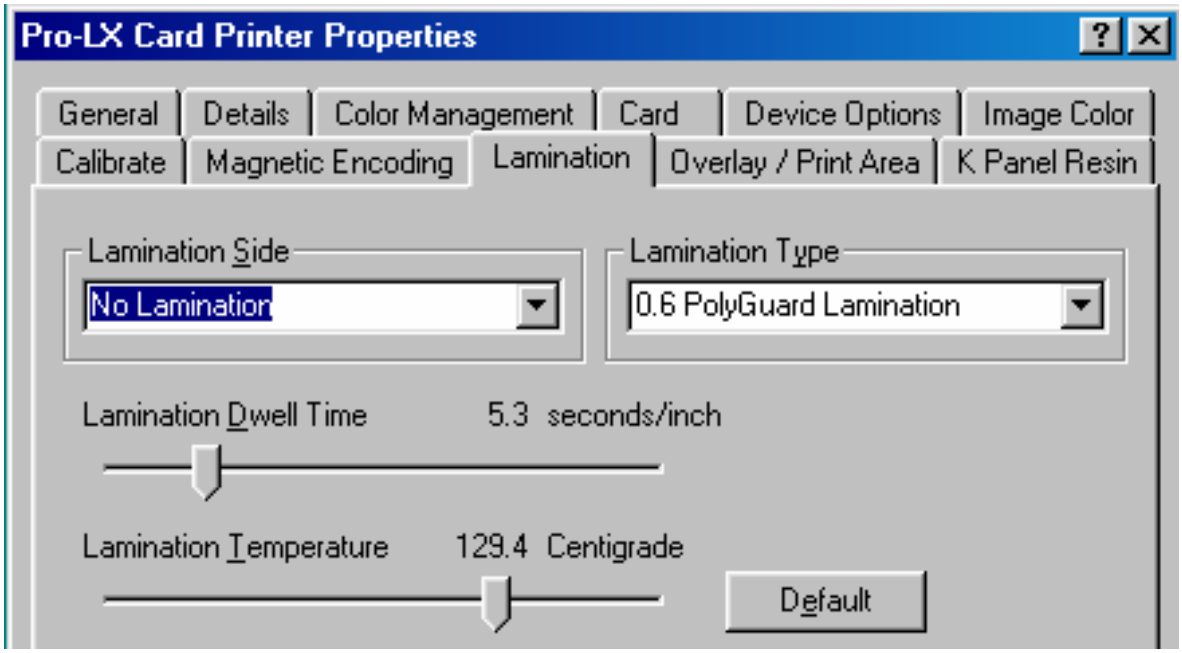
Symptom: The lamination will not transfer to the card or is easily peeled off the card.

Step	Procedure
1	Ensure the Card quality by verifying that these requirements are met: a. **Requirement 1:** That the Printer does print onto any card with a clean, level and polished PVC surface. (**Note:** Although the Printer is equipped with card cleaning Rollers, it is very important to always print onto cards specifically designed for direct-to-card dye-sublimation printing to ensure proper print quality.) b. **Requirement 2:** That suitable cards display a polished PVC surface free of fingerprints, dust or any other types of embedded contaminants. (**Note:** In addition, cards must have a completely smooth, level surface in order for the Printer to achieve consistent color coverage.) c. **Requirement 3:** That certain types of Proximity cards with an uneven surface (which can inhibit consistent color transfer) are identified. (**Note:** Likewise, some smart card chips are raised slightly above the cards surface, which also results in poor color transfer.) d. **Recommendation:** That high-quality blank cards (e.g., a factory-approved card stock called UltraCard™ are in use. • UltraCard stock has a glossy PVC laminate on top and bottom and is optically inspected to provide the cleanest, most scratch and debris-reduced cards possible. • UltraCard stock, which has a PVC core and offers medium card durability. UltraCard III stock has a 40% polyester core and offers high durability. • Both types of UltraCards produce printed images with a glossy, photo-quality finish. For the flattest possible cards when laminating, it is recommended use of UltraCard III card stock.)

Continued on the next page

Resolving the lamination (not adhering to the card surface) problem (cont.)

Step	Procedure
2	Check Lamination Temperature. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. b. Click on the Lamination tab. c. Increase the Lamination Temperature by +5 degrees. d. Click on the **OK** button. e. Print and Laminate a card from the software. f. Continue to adjust the **Lamination Temperature** until the lamination adheres completely and cannot be peeled off. g. Adjust (as needed) the card flattener if increased temperature is causing the cards to bow.



Encoding Errors

Resolving the Mag Verify Error Message

Symptoms: A Mag Verify error is displayed on the LCD when attempting to encode.

Step	Procedure
1	Check to ensure that the cards are loaded with the Magnetic Stripe facing down and towards the back of the Printer.
2	Verify the Driver settings if cards are loaded properly. Properly loaded cards will be oriented with the mag stripe facing down and toward the back of the Printer. See the Using the Magnetic Encoding tab procedure in Section 3, page 118.
3	Verify that data is being encoded to the Magnetic Stripe. a. Clear any Error Messages from the LCD by unplugging the Printer and reapplying power. b. Remove the failed card from the Reject Hopper. c. Use a Magnetic Stripe reader or magnetic developer spray to determine if data is being written to the Magnetic Stripe. • If data is not being written to the Magnetic Stripe, remove the back cover and verify that the magnetic head is plugged into J100 on the main board. • If the Magnetic head connection is properly seated, replace the magnetic head (as needed). See the Replacing the Mag Head procedure in Section 5, page **Error! Bookmark not defined.**. • If data is being written to the Magnetic Stripe, adjust the Mag TOF (as needed). Refer to the Mag TOF display on the next page. . See the Using the Magnetic Offset option procedure in Section 3, page 103.

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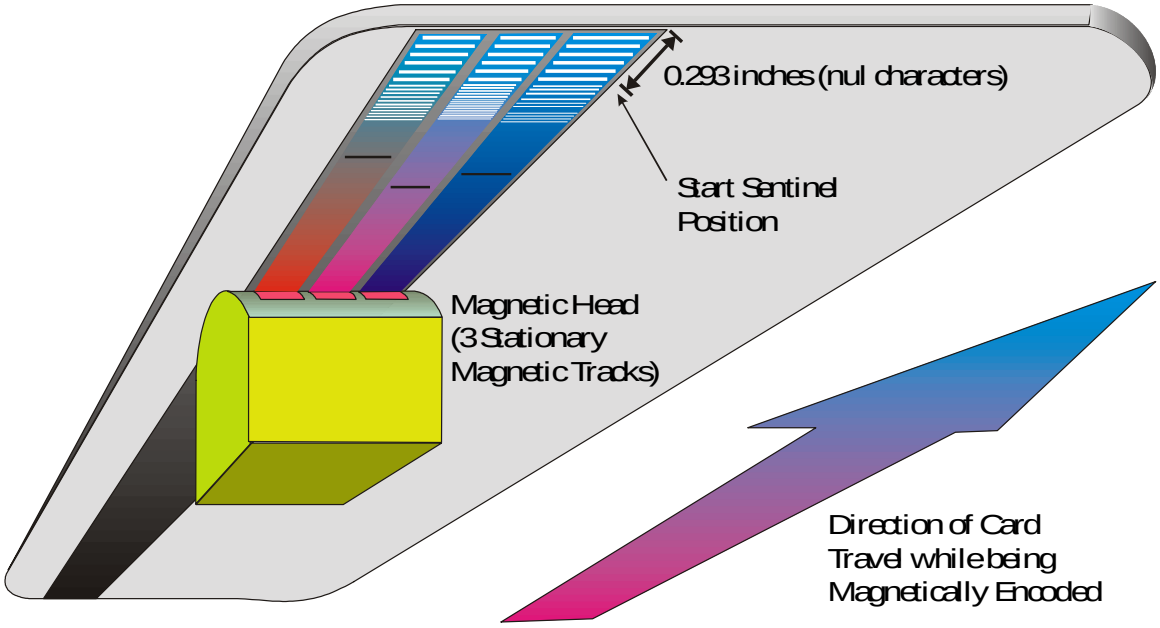
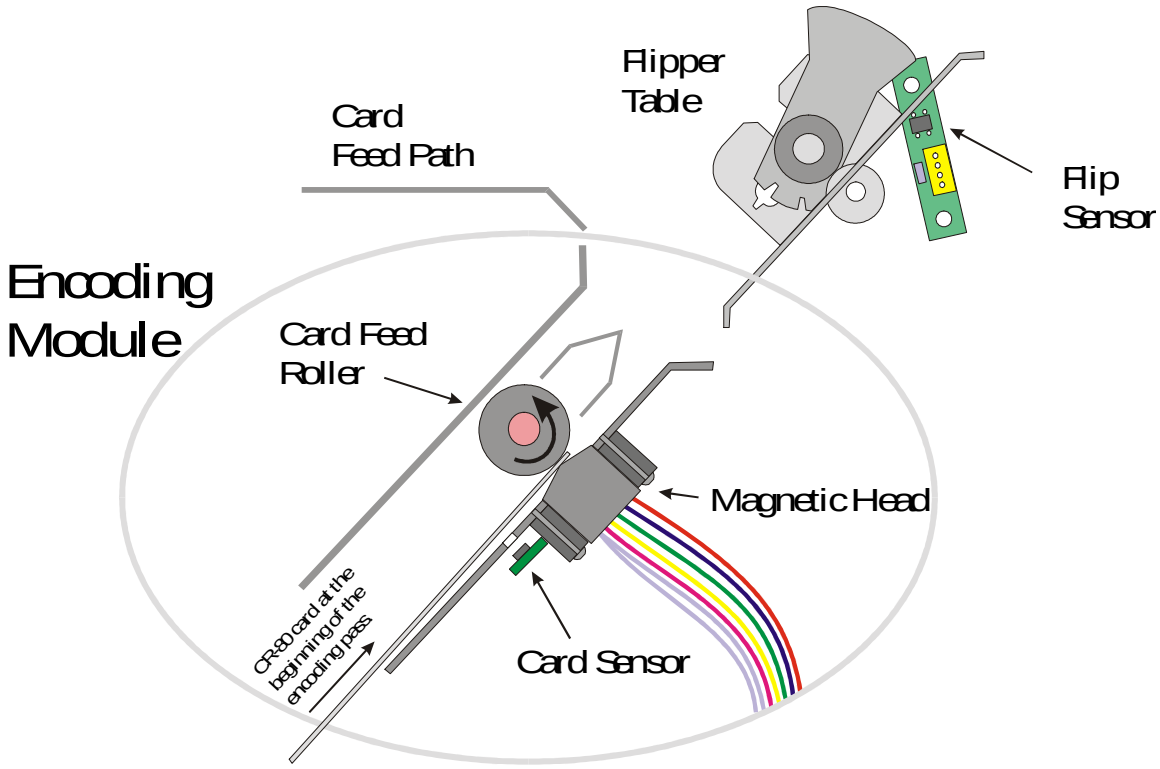
Resolving the Mag Verify Error Message (Continued)

Refer to the previous procedure regarding this display.





Determining why the Printer cannot read encoded data

Step	Procedure
1	Verify that the cards are loaded properly with the Magnetic Stripe facing down and towards the back of the Printer.
2	Verify that the card is encoded with magnetic data by using a Magnetic Imager or Developer Solution.
3	Use **WordPad** (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). a. Go to the **File** menu and select **Page Setup**. b. Click on the **Printer** button and select the Pro-LX Card Printer. c. Click OK and reset all four margins to zero. (**Note:** The WordPad will automatically replace the values with it's minimum margins.) d. Open the program and type: "~1%JULIEANDERSON^1234567890?" then, go to **File** on the menu bar and select **Print**. (**Note:** The Printer should then feed a card into the Encoder and magnetically encode it.)
4	Check the Magnetic Offset Setting. a. Reset the Printer to clear any Error Messages by removing the power and reapplying it. b. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. c. Click the Calibrate tab. d. Click on the **Settings** button. e. Ensure that the Magnetic Offset setting matches the value that is written on the back of the Printer.
5	Verify that the coercivity of the cards matches the setting in the Driver.
6	Compare the settings for the Card Reader to the settings in the Driver.
7	Verify that the Magnetic Stripe on the card is free of scratches or voids.

Resolving data intended for the Magnetic Stripe (being printed on the card) problem

Step	Procedure
1	Confirm that the application is formatting the magnetic string correctly. See the Using the Magnetic Track Selection option procedure in Section 3, page 121.
2	a. Use **WordPad** (a Windows 95/ 98/ ME/ NT/ 2000/XP word processing program in the Accessories Program Group). b. Go to the **File** menu and select **Page Setup**. c. Click on the **Printer** button and select the Pro-LX Card Printer. d. Click OK and reset all four margins to zero. (Note: WordPad will automatically replace the values with it's minimum margins.) e. Open the program and type: "~1%JULIEANDERSON^1234567890?" then, go to **File** on the menu bar and select **Print**. (Note: The Printer should then feed a card into the Encoder and magnetically encode it.)

Diagnosing Image Problems

Resolving the Pixel Failure problems

Symptom: A thin line or scratch travels the entire length of the card.

Step	Procedure
1	Check the card stock for scratches. Replace the cards (as needed).
2	Examine the Printhead for visible damage.
3	Clean the Printhead. See Cleaning the Printhead procedure in Section 4, page 186.
4	Replace the Cleaning Tape. See Replacing the Cleaning Tape procedure in Section 4, page 189.
5	Clean the Platen Rollers. See Cleaning the Platen Rollers procedure in Section 4, page 191.
6	Replace the Printhead if the problem persists. See Replacing the Printhead procedure in Section 5, page **Error! Bookmark not defined.**.

Resolving the Card Surface Debris problems

Symptom: Prints have spots (white or colored voids) and/or dust on them.

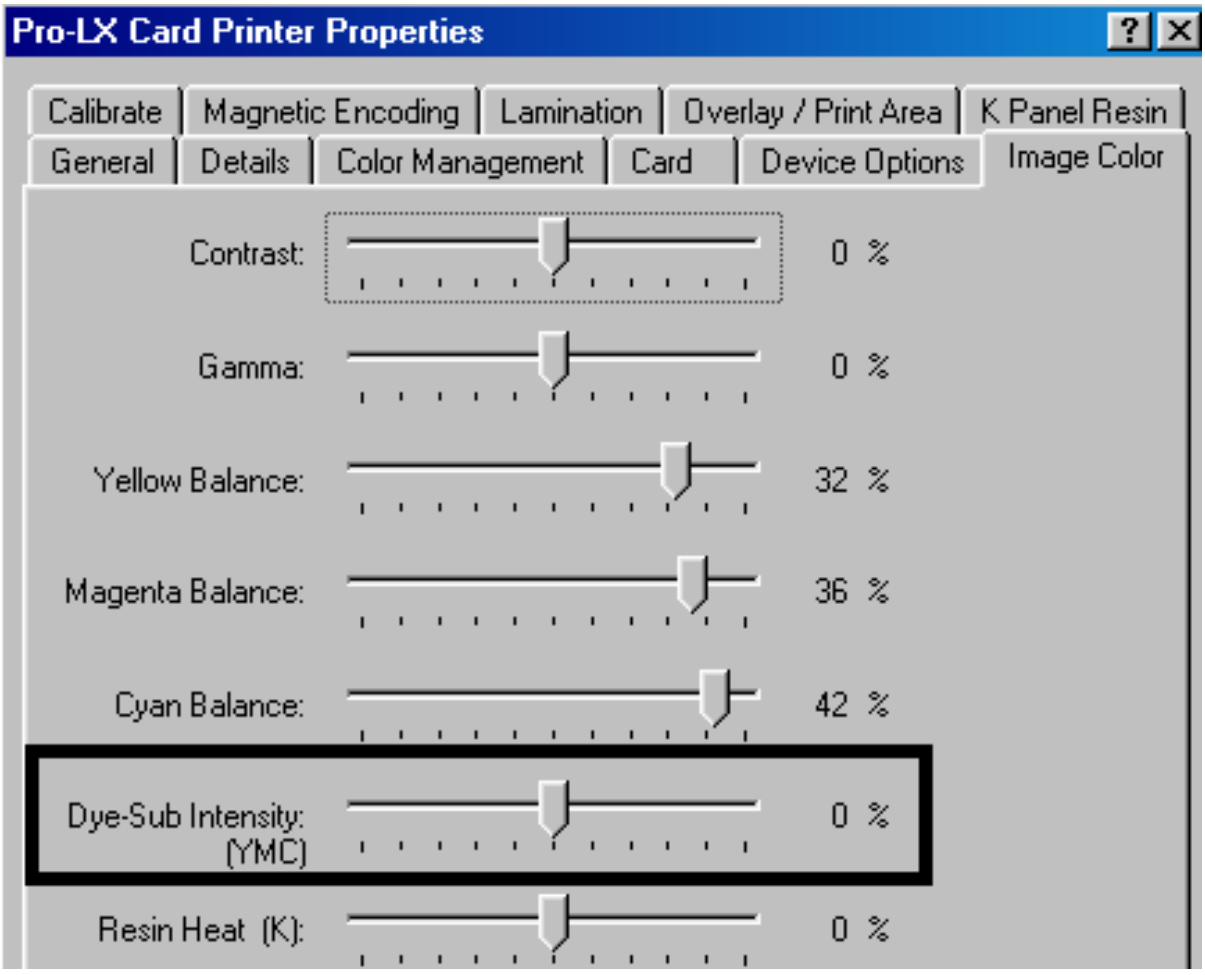
Step	Procedure
1	Be sure the cards are clean and stored in a dust-free environment. Do not use cards with embedded contaminants in the surface.
2	Clean the inside of the Printer. See Cleaning the Printer's Interior procedure in Section 4, page 192.
3	Replace the Cleaning Tape. See Replacing the Cleaning Tape procedure in Section 4, page 189.
4	Clean the Platen Rollers. See Cleaning the Platen Rollers procedure in Section 4, page 191.

Resolving the Incorrect Image Darkness problems

Symptom: Printed cards are too dark or too light.

Step	Procedure
1	Run a self-test to identify problems with the driver settings. See Running the Self Test in Section 2, page 87.
2	Adjust the **Dye-Sub Intensity** setting within the Image Color tab of the Printer Driver. See Using the Image Color tab procedure in Section 3, page 157.

Continued on the next page



Resolving the Incorrect Image Darkness problems (continued)

Step	Procedure
3	Correct the **Image Darkness**. See Using the Image Darkness option in Section 3, page 100.

Resolving the Ribbon Wrinkle problems

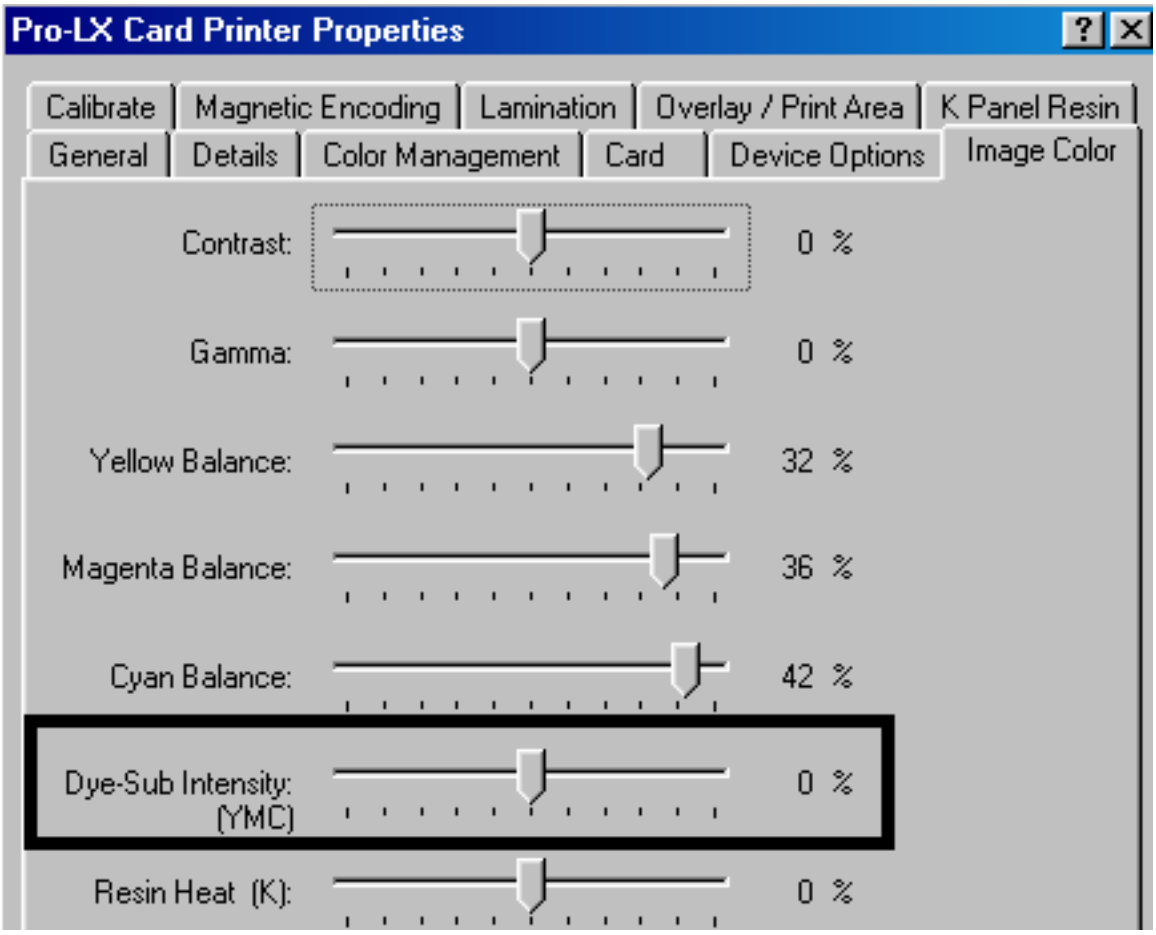
Symptom: Printed cards have off-colored lines or streaks on them.

Step	Procedure
1	Confirm that the Printer is using the most current driver via: http://www.fargo.com
2	Reduce the **Dye-Sub Intensity** setting within the Image Color tab of the Printer Driver. See Using the Image Color tab procedure in Section 3, page 157.

Continued on the next page

Resolving the Ribbon Wrinkle problems (continued)

Step	Procedure
3	Reduce the Image Darkness. See Using the Image Darkness option in Section 3, page 100.
4	Increase the Ribbon tension. a. Unplug the Printer. b. Remove the rear cover. c. Use a 7/16th wrench to tighten the nut on the Ribbon Encoder ½ - turn. d. Reapply power. e. Print a card. • If the wrinkle effect is gone, continue printing. • If the wrinkle effect is diminished, continue tightening the Ribbon Encoder nut, in ¼ - turn increments until the wrinkle is gone.

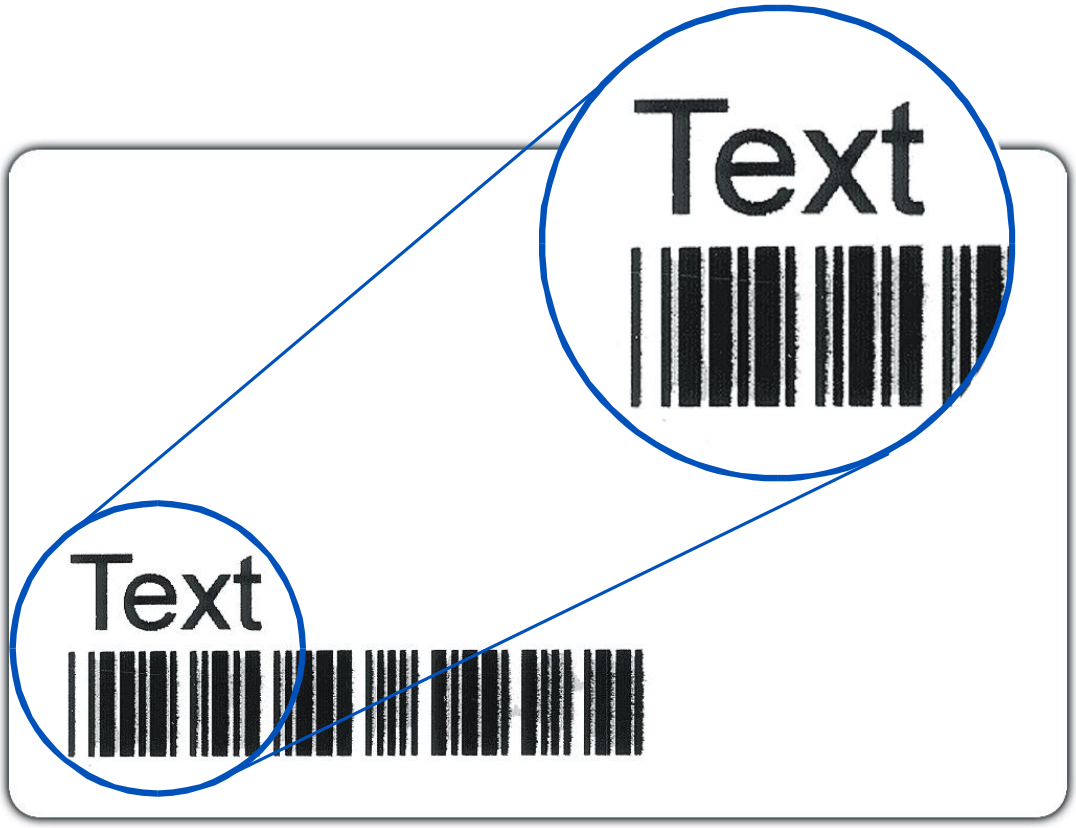


Resolving the Excessive Resin Printing problems

Symptom: Black resin text and barcodes appear smeared or too thick.

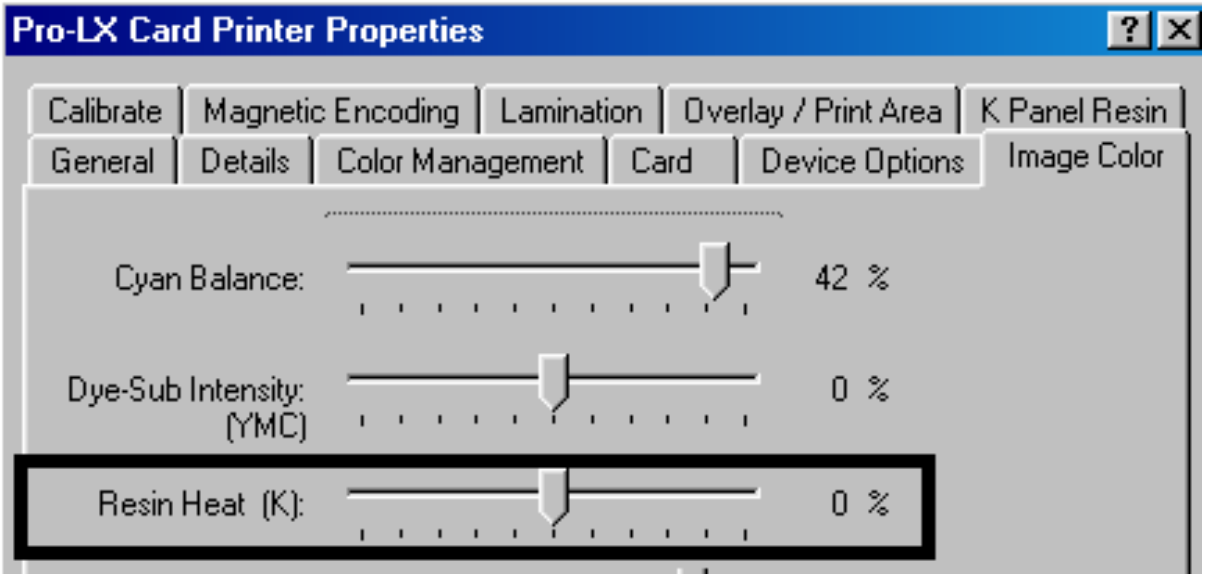
Step	Procedure
1	Reduce the Resin Heat setting within the Image Color tab of the Printer Driver. See Using the Image Color tab procedure in Section 3, page 157.

Continued on the next page



Resolving the Excessive Resin Printing problems (continued)

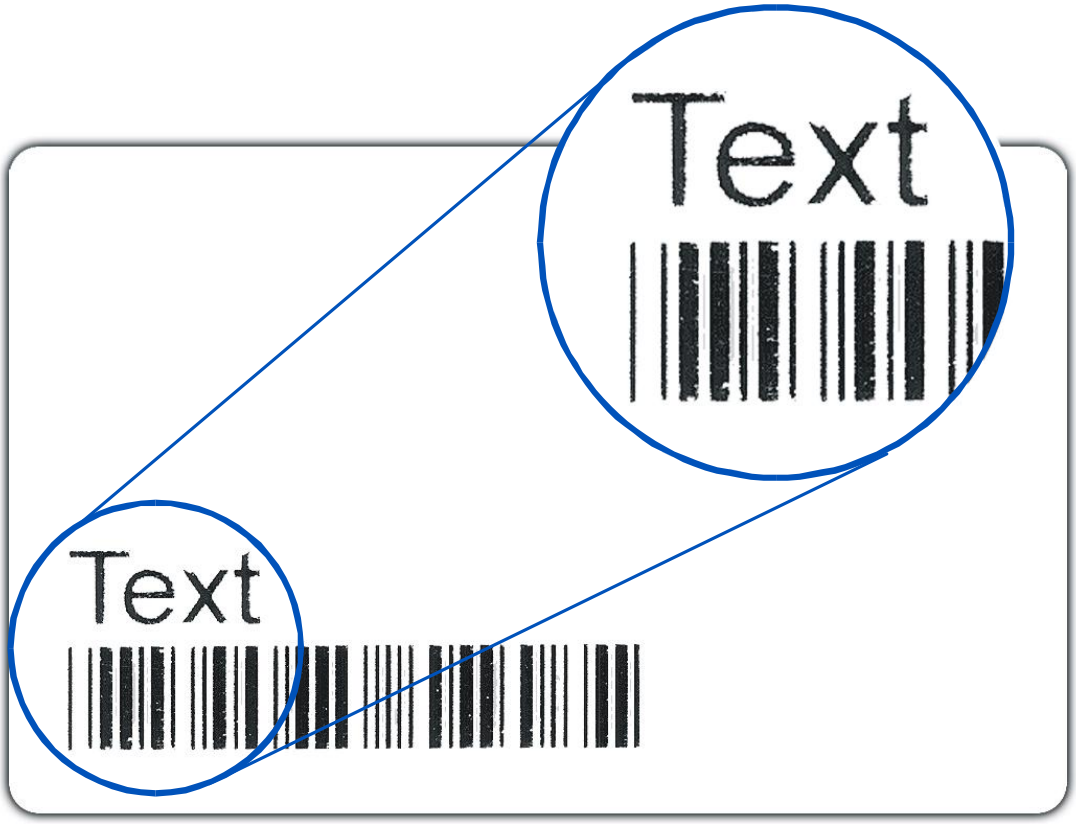
Step	Procedure
2	Reduce the Image Darkness. See Using the Image Darkness option in Section 3, page 100.



Resolving the Incomplete Resin Printing problems

Symptom: Black resin text and barcodes appear faded or too light.

Step	Procedure
1	Increase the **Resin Heat** setting within the Image Color tab of the Printer Driver. See Using the Image Color tab procedure in Section 3, page 157.
2	Increase the **Image Darkness**. See Using the Image Darkness option in Section 3, page 100.



Resolving the Image Placement problems

Symptom: Printing is cut off or is not centered on the card or a white border appears.

Step	Procedure
1	Verify if the Image Position option within the Calibrate tab is set incorrectly. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0, right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. b. Click on the Calibrate tab. c. Adjust the **Vertical** and/or **Horizontal Image Position** settings based on where the white border is on the card.

Continued on the next page

Resolving the Image Placement problems (continued)

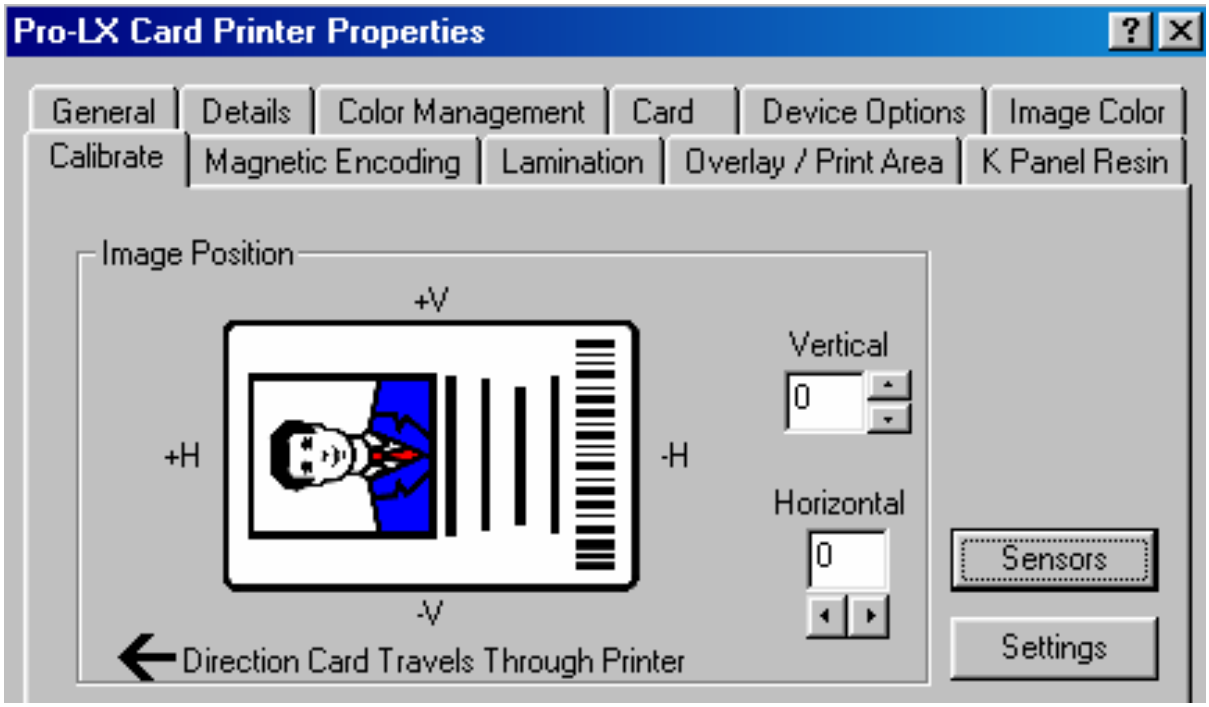
Refer to the previous procedure.

Resolving the Image Placement problems (continued)

Step	Procedure
2	Verify the **Image Placement** setting is set correctly. a. Open the Printer Control Panel from the Computer. • If using Windows 95/98/ME, right click on the Pro-LX Card Printer Icon and select **Properties**. • If using Windows NT 4.0 right click on the Pro-LX Card Printer and select **Document Defaults**. • If using Windows 2000/XP, right click on the Pro-LX Card Printer and select **Printing Preferences**. b. Click on the Calibrate tab. c. Click on the **Settings** button. • If the white border is on the leading edge of the card, adjust the Image Placement value by –2. • If the white border is on the trailing edge of the card, adjust the Image Placement value by +2. d. Click on **OK**. e. Run a self-test. f. If the white border is diminished, continue the adjustment until it is gone.
3	Adjust the Card Guide Bar as needed. a. Open the Top Print Cover. b. Loosen the two screws that hold the Card Guide Bar in Place. c. Remove the back cover. d. Locate the Card Guide adjustment screws. • If the white border is on the side of the card closest to the front side plate, turn both Card Guide Adjustment Screws clockwise ¼ - turn. • If the white border is on the side of the card closest to the backside plate, turn both Card Guide Adjustment Screws counter-clockwise ¼ - turn.

Resolving the Image Placement problems (continued)

Refer to the previous procedure.



Resolving the Poor Image Quality problems

Symptom: Photos on the cards look pixilated or grainy, as shown below.

Step	Procedure
1	Use high-resolution, 24-bit color images to capture an image: • at a 24-bit color setting, • at 300 dpi and • at the same size (that it will be printed on the card, as captured either with a scanner or with a digital camera). **Caution:** If a small or low-resolution image is stretched or "blown up", a pixilated or grainy effect will occur when printing, as shown below (right side).

Good

Bad

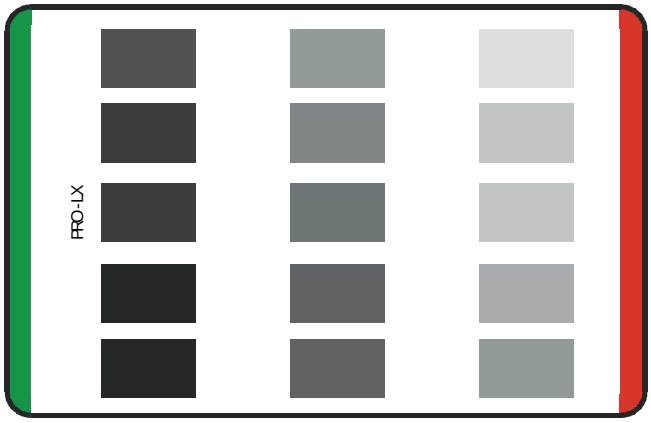
Running the Self Test

Perform a self-test after (a) an initial setup of the Printer, (b) a calibration procedure has been conducted or (c) a part has been replaced to check for proper Printer operation.

Step	Procedure
1	Verify that a full-color ribbon is installed and that cards are properly loaded. **Caution:** If the power is ON, disconnect the Power Cable from the Printer's rear panel.
2	Press and hold the **Pause/Resume** button.
3	While holding down the **Pause/Resume** button, plug the power cable back into the Printer.
4	Once the **On LED** illuminates, release the button. • The Flipper Table will re-align itself. • The Printer will print a 3-color process gray scale on the front, flip the card and print the monochrome black panel on the back. The overlay pass is not printed during the Self-test. • The card will be ejected with the backside face up. Reverse the card to look at the front side and examine the gray scale pattern with the green bar at the top and a red bar at the bottom of the card.

Running the Standard Self Test Print

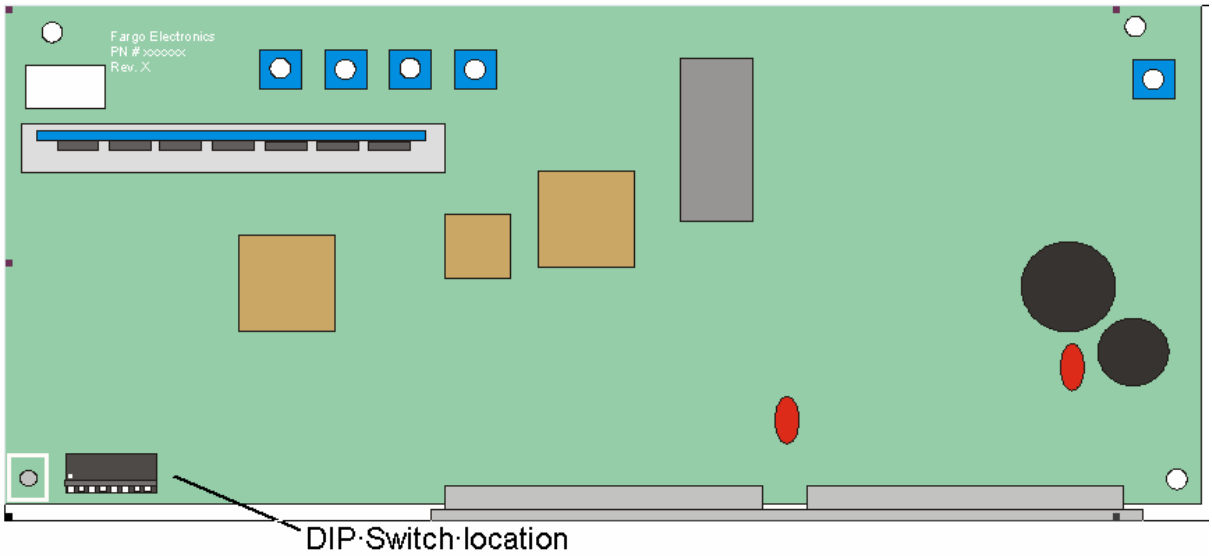
This card will be printed.



Reviewing the Main Circuit Board

Perform the standard self-test and the other test modes (made available by changing the DIP Switch Settings within the Printer). Use these additional self-tests to isolate and diagnose Printer problems and test for proper Printer operation after Printer calibration. (**Note:** The Main Circuit Board (below) displays the location of the DIP switches and how to activate them.)

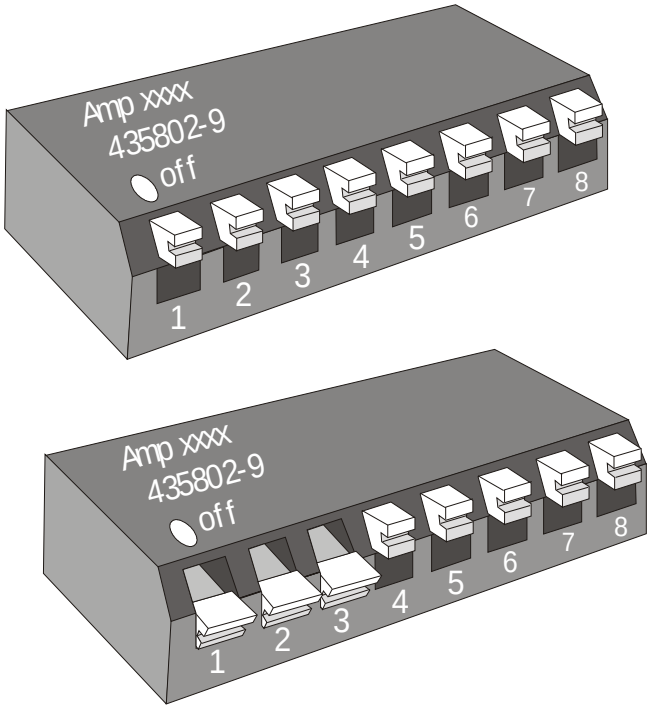
Step	Procedure
1	To remove the rear cover to expose the Main Circuit Board. See Removing the Main Board in Section 5, page **Error! Bookmark not defined.**.
2	To find the DIP switches on the Main Circuit Board, see the figure (below).
3	To activate the DIP switches, see the Setting the DIP Switch Settings in Section 2, page 91.



Using the DIP Switch (Self-test)

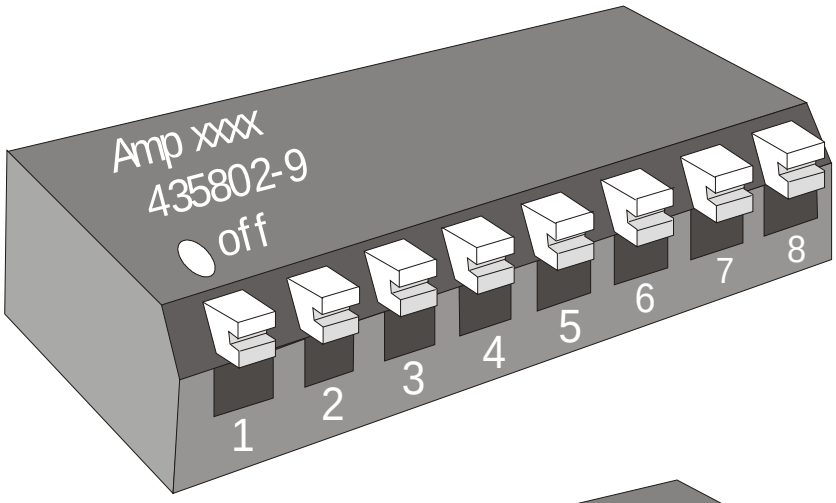
Step	Procedure
1	Activate any of these diagnostic tests and Calibration modes. See Running the Self Test in Section 2, page 87. During the activation of the Self-test, the Printer will: • Detect the change to the DIP Switch Settings. See Using the DIP Switch Self Test in Section 2, page 89. • Operate the Printer in that selected Test or Calibration mode.
2	Return all the DIP switches back to their normal OFF position once the tests are completed.
3	Leave the associated DIP switches activated to operate the Printer this way or temporarily use the settings to test a particular Printer operation. (**Note:** When altering a particular mode-of-operation (e.g., disabling the laminator or magnetic verification), it will affect Printer operation while printing from a computer.)

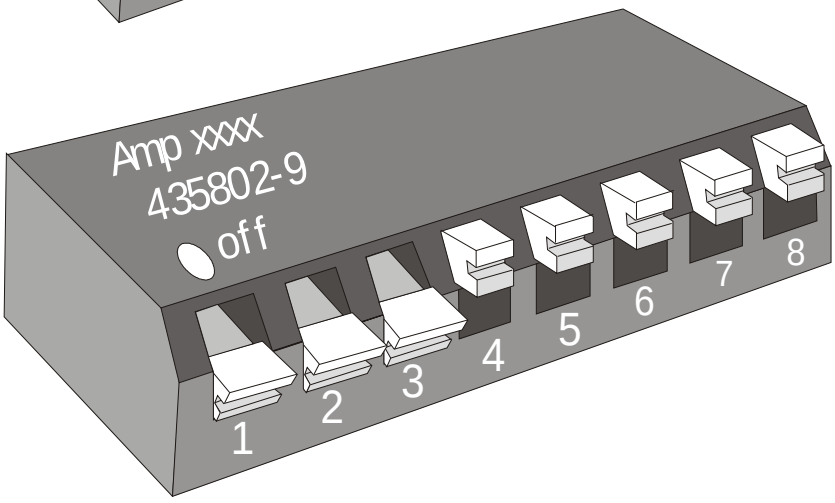
Continued on the next page



Using the DIP Switch (continued)

Step	Procedure
4	When completed, turn OFF the power to the Printer to reset the operating mode of the Printer. • The first illustration (below) shows all eight (8) switches in the normal OFF position. • The second illustration (below) shows Switches No. 1,2 and 3 in the ON position. (**Note:** The Ribbon Sensor calibration without the need of a PC). (**Note:** Refer to the DIP Switch Settings table on the next page for additional diagnostic selections.)





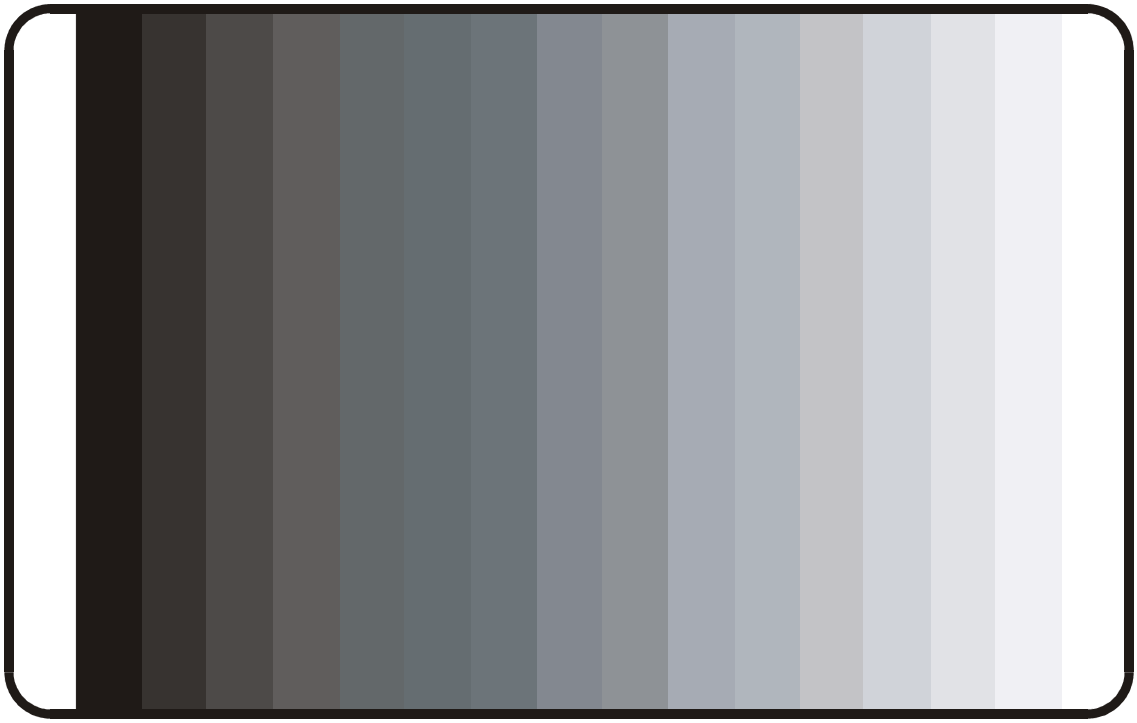
Setting the DIP Switch Settings

(**Note:** The capital letter "**X**" indicates that the switch should be set to ON or DOWN.)

SW1	SW2	SW3	SW4	SW5	SW6	Diagnostic modes
						Standard Self-test (YMC) front, (K or B) on back
X		X				Self test with Monochrome Dye-Sub (B)
	X	X				Self test with Monochrome Resin (K)
X	X	X				Ribbon Sensor Calibration (align on clear or yellow panel, PC not required)
X						15 Shade self-test (YMC) PolyGuard Lamination will be applied.
X			X			15 Shade Self-test (YMC) Film Lamination will be applied
X	X	X	X			Lamination Sensor Calibration (remove lamination material, PC not required)
			X	X		Disables the Laminator
		X				Tests Magnetic Encoding to all three Tracks (No print is applied)
					X	Disables Magnetic Verification
		X	X			Test Core Pins (Print)
X		X	X			Test Core Pins (Lam)

Running the 15-Shade Self Test

This is the Self-test that appears when specific changes are made to the DIP Switch Settings.

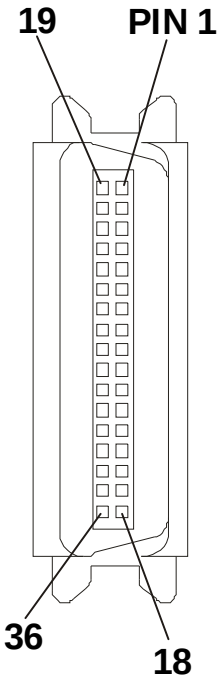


Interfacing Information

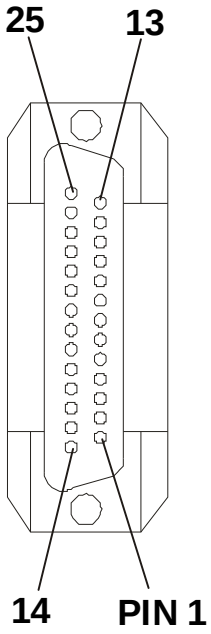
The Printer is equipped with a standard 8-bit Centronics-type Parallel Data Communications Port. (**Note:** The Printer's Parallel Interface Connector is a standard 36-pin Amp type with two metal-wire retaining clips. It mates with a standard PC to Printer parallel cable.)

Caution: For best results, keep the Interface Cable to less than six (6) feet.

Reviewing the Pin Assignments



WIRE DIAGRAM	
DB36P	**DB25P**
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
32	15
31	16
36	17
19 Through 30	19 Through 25
Shell	Shell



Reviewing the Centronics Parallel Pin Assignments

Pin No.	Signal	Direction	Description
1	_____ Strobe		
In	A LOW pulse greater than 1 µs causes the Printer to read one byte of data.		
2	Data 0	In	Data bit 0
3	Data 1	In	Data bit 1
4	Data 2	In	Data bit 2
5	Data 3	In	Data bit 3
6	Data 4	In	Data bit 4
7	Data 5	In	Data bit 5
8	Data 6	In	Data bit 6
9	Data 7	In	Data bit 7
10	_____ Acknlg		
Out	A low pulse is sent by the Printer to indicate that a byte of data has been accepted and that it is ready for more data.		
11	Busy		
Out	A high logic level is sent to the Printer to indicate to the host that it cannot receive data due to a data entry, an error status or a full buffer.		

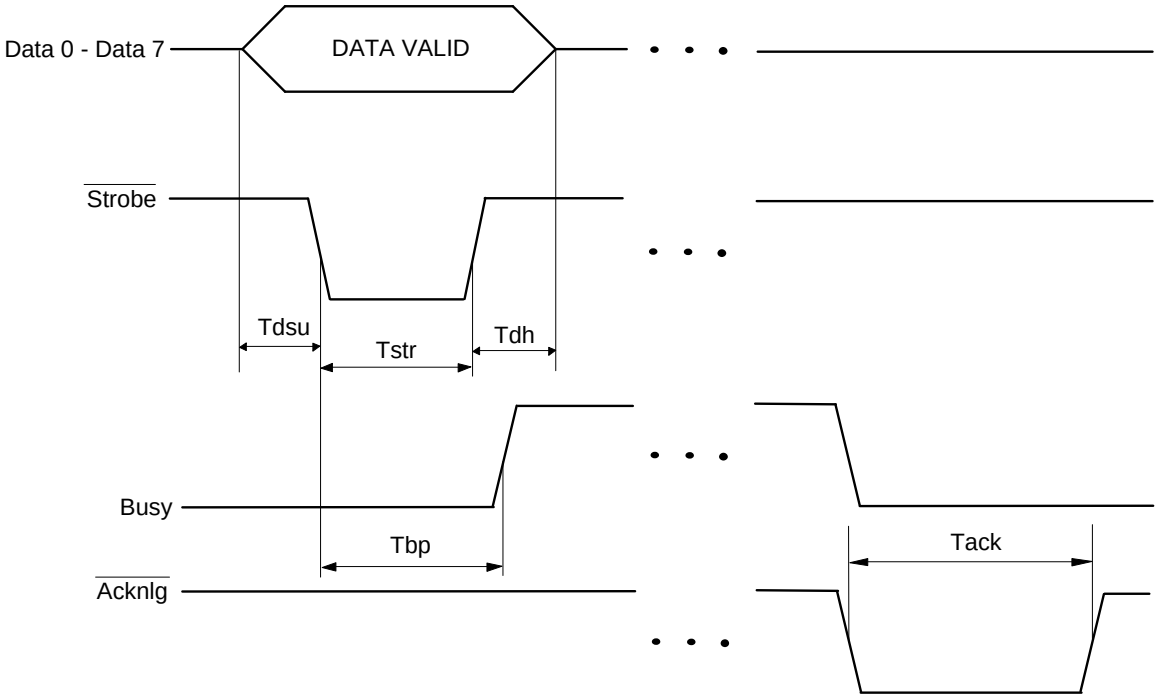
Continued on the next page

Reviewing the Centronics Parallel Pin Assignments (continued)

Pin No.	Signal	Direction	Description
12	Paper Error	Out	Low = OK, High = media error
13	Ready	Out	Low = off-line, High = on-line
14, 15			Not Used
16	Sig Gnd		
17	Chassis Gnd		
18	HI	Not Used	
19 to 30	Sig Gnd		
31	_____ Reset/Input Clean	Not Used	
32	_____ Error	Out	Low = Printer error, High = OK
33 to 36		Not Used	

Reviewing the Printer Timing Diagram

The timing diagram (below) illustrates the data and handshake lines during the transfer of one data byte to the Computer.



Reviewing the Printer Timing

Interval	Description	Minimum Value	Typical Value
Tdsu	Data setup time	0.5 µs	
Tstr	Data strobe width		
1 µs			
Tack			
Acknlg pulse width			
3.75 µs			
Tdh	Data hold time	0.5 µs	
Tsb			
Busy delay time from data strobe			
0.5 µs (max.)			

Section 3: Printer Adjustments

Review this section for specific information on the Safety Messages and the Printer Driver Options; and the Calibrate, Magnetic Encoding, Lamination, Overlay / Print Area, Image Color, Device Options and Card tabs for the Pro-LX Card Printer. (**Note:** Procedures and instructions in this Section may require special precautions to ensure the safety of the personnel performing the operations.)

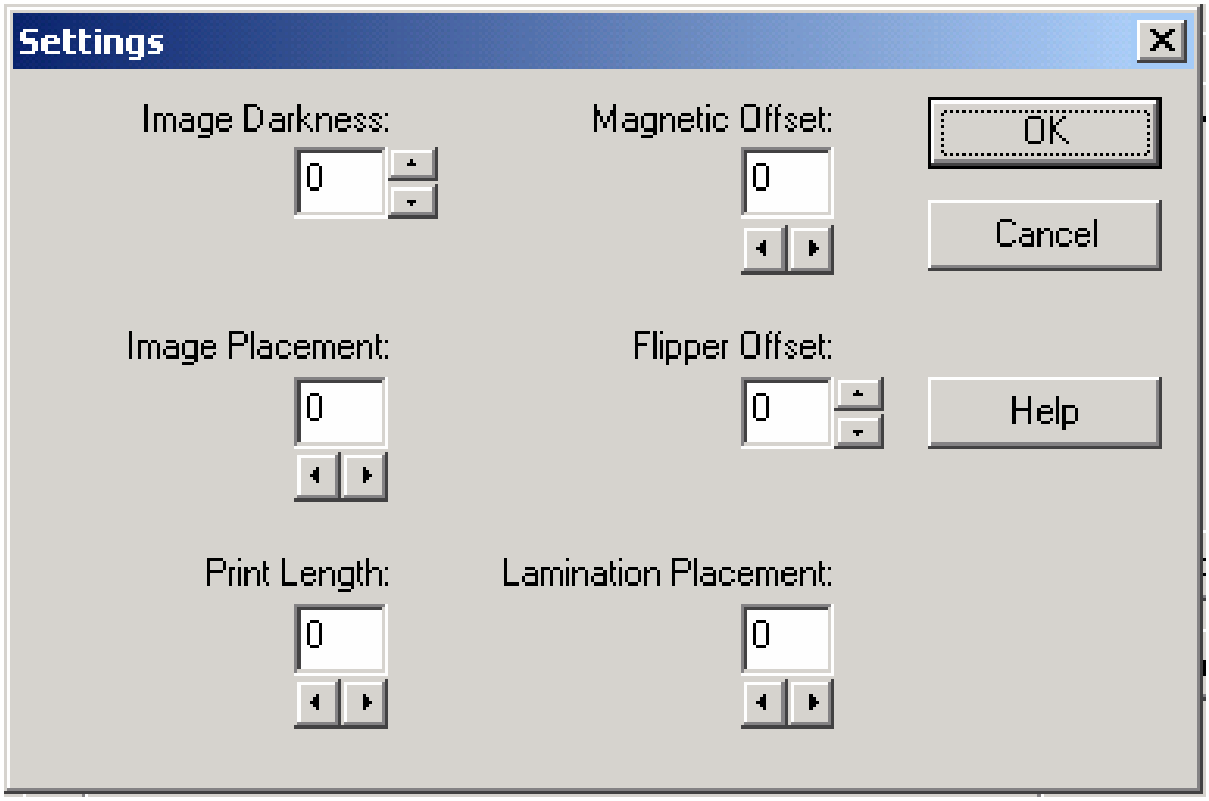
Safety Messages (review carefully)

Symbol	Critical Instructions for Safety purposes
Danger: 	**Failure to follow these installation guidelines can result in death or serious injury**. Information that raises potential safety issues is indicated by a warning symbol (as shown to the below). • **To prevent personal injury**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent personal injury**, always remove the power cord prior to performing repair procedures, unless otherwise specified. • **To prevent personal injury**, make sure only qualified personnel perform these procedures.
Caution: 	**This device is electrostatically sensitive**. **It may be damaged if exposed to static electricity discharges.** Information that raises potential electrostatic safety issues is indicated by a warning symbol (as shown to the below). • **To prevent equipment or media damage**, refer to the following safety messages before performing an operation preceded by this symbol. • **To prevent equipment or media damage**, observe all established Electrostatic Discharge (ESD) procedures while handling cables in or near the Circuit Board and Printhead Assemblies. • **To prevent equipment or media damage**, always wear an appropriate personal grounding device (e.g., a high quality wrist strap grounded to avoid potential damage). • **To prevent equipment or media damage**, always remove the Pro-LX Ribbon and Cards from the Printer before making any repairs, unless otherwise specified. • **To prevent equipment or media damage**, take jewelry off of fingers and hands, as well as thoroughly clean hands to remove oil and debris before working on the Printer.

Using the Settings dialog box

Access the Settings dialog box via the **Settings** button on the Calibrate tab. Use the adjustment mode to change the Printer's internal settings for overall Image Darkness, Image Placement, Print Length, Magnetic Offset, Flipper Offset and Lamination Placement. (**Note:** The Card Printer is equipped with an internal adjustment mode programmable through the Settings dialog box. This dialog box is accessible only if the Printer is powered ON, in Ready Mode and is properly connected to the PC.)

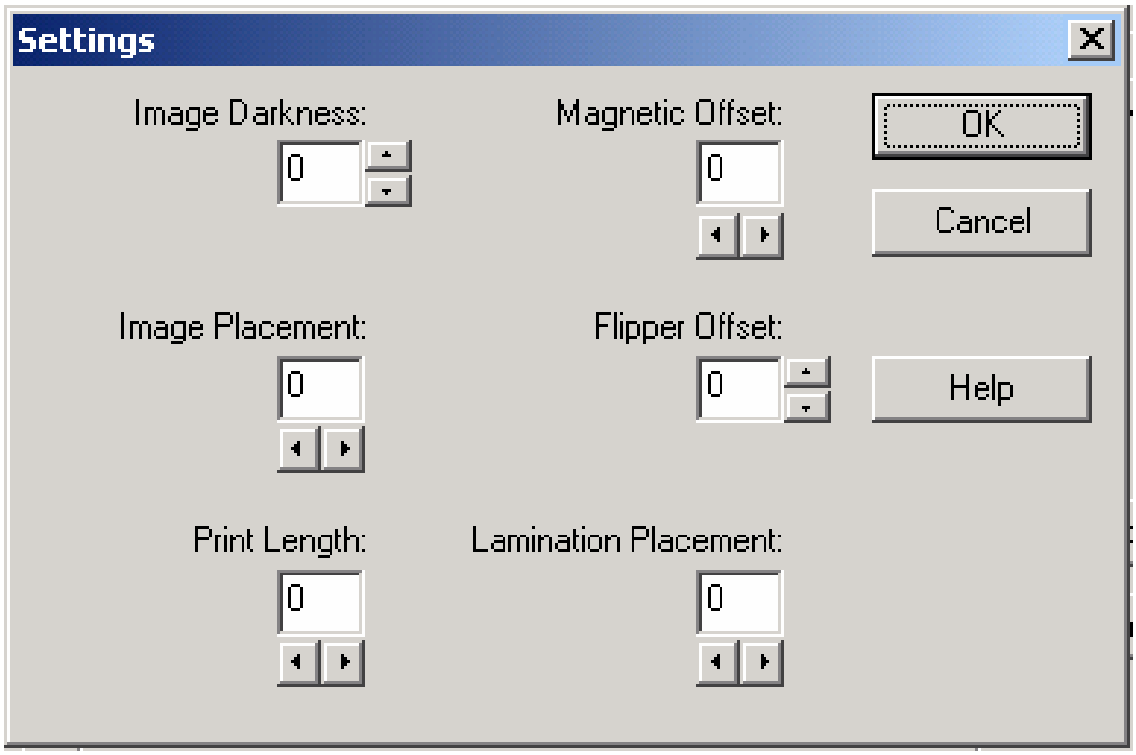
Step	Procedure
1	Change these settings according to the original settings recorded on a label attached to the Printer's base plate or rear panel, then refer to the remainder of this Section. (**Note:** These can be helpful to get back to the Printer's original baseline settings.) **Caution!** These settings are optimized at the factory and in most cases, they will not need to be changed. (**Note:** Do not alter these settings unless absolutely necessary.)



Using the Image Darkness option

Use this option to set the overall darkness of the printed image by increasing or decreasing the amount of heat used by the Printhead when printing.

Step	Procedure
1	Lighten the printed image by clicking the down arrow ▼ to enter a negative value and decrease the amount of Printhead heat. **OR** Darken the image by clicking the up arrow ▲ to enter a positive value and increase the amount of Printhead heat. **Caution #1:** For best results, make slight adjustments of only ± 4 to avoid accidentally over-adjusting the Printhead heat. **Caution #2:** If the positive value is set too high, the Print Ribbon may jam or even break. The maximum adjustment range is ±100.

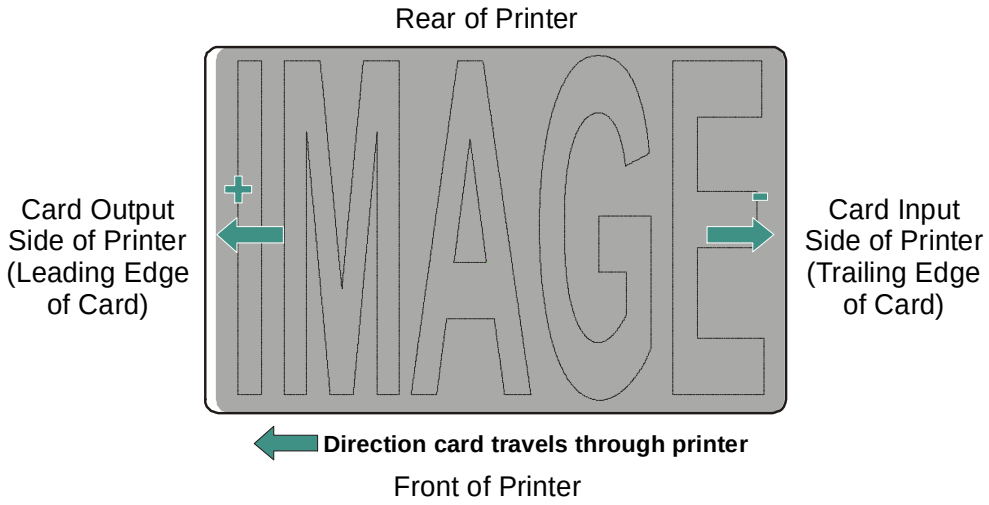


Using the Image Placement option

Use this option to adjust the lengthwise or horizontal position of the printed image on a card so it appears centered. (**Note:** When adjusting this value, keep in mind that cards always remain in the same landscape orientation while moving through the Printer.)

The diagram (below) represents how the printed image will move in relation to the fixed card position as a positive or negative Image Placement value is entered.

Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to move the printed image toward the leading edge of the card or the card output to the side of the Printer. **OR** Click on the right arrow ▸ to enter a negative value to move the printed image toward the trailing edge of the card or the card input to the side of the printer/encoder. • **Printed Image Direction:** The arrows on these buttons indicate the direction the printed image will move on the card. The maximum adjustment range is ±100. As a rule, 10 equals about .060"/. 16mm, which is about twice the thickness of a standard CR-80 size card. • **Maximum Adjustment Range:** The maximum adjustment range when adjusting this option to avoid over-adjusting. **Caution:** If positive value is set too high, the Print Ribbon may break.

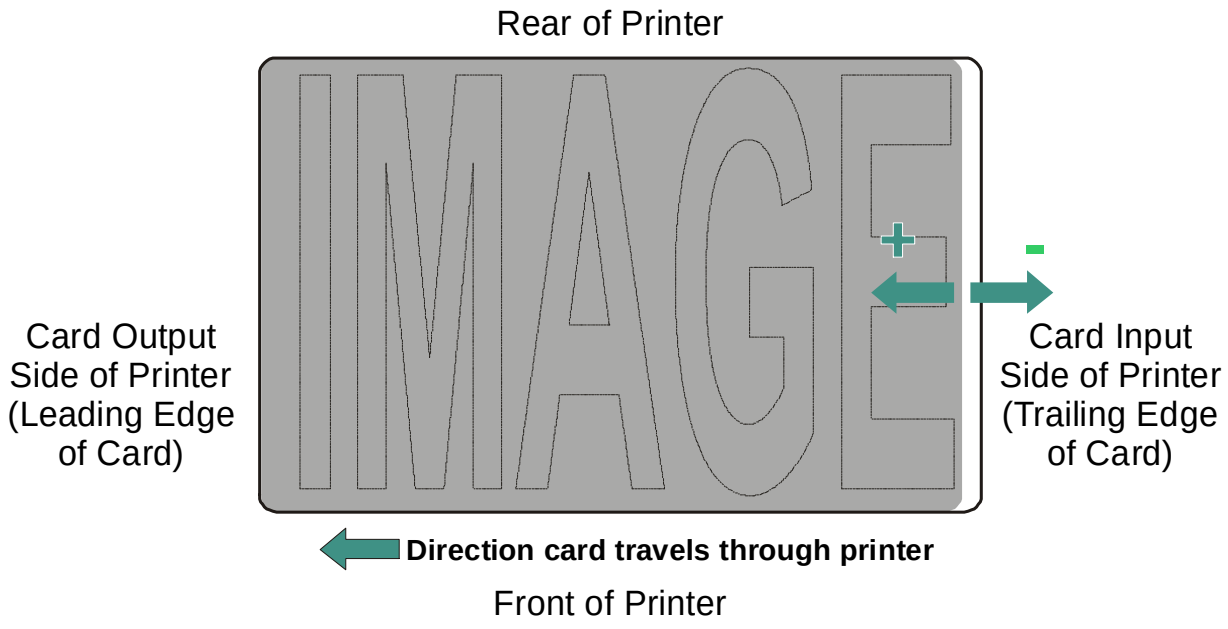


Using the Print Length option

Use this option to reduce or lengthen the overall printable area in order to optimize edge-to-edge printing toward the trailing edge of a card. (**Note:** When adjusting this value, keep in mind that cards always remain in the same position while moving through the Printer.)

The diagram (below) represents how the print length will move in relation to the fixed card position as a positive or negative Print Length value is entered.

Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to reduce the print length and move the end of the printable area more toward the leading edge of the card. **OR** Click on the right arrow ▸ to enter a negative value to increase the print length and move the end of the printable area more toward the trailing edge of the card. • **Printed Image Direction:** Notice the arrows on these buttons indicate the direction the length of the printable area will move on the card. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm, which is about the same as the thickness of a standard CR-80 size card.)

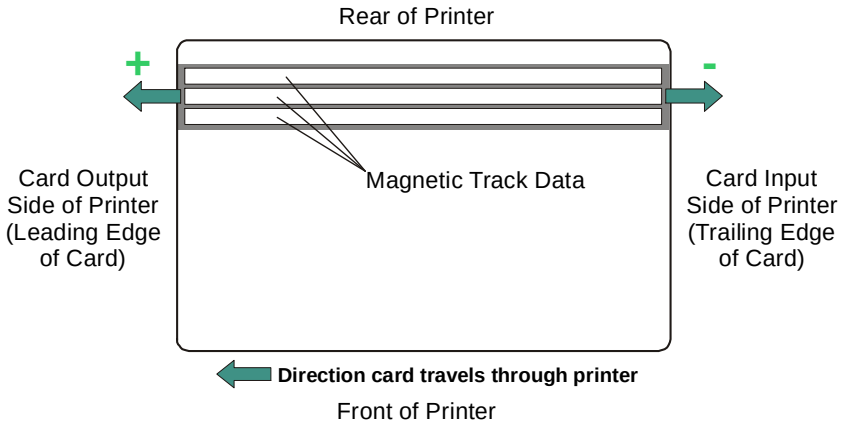


Using the Magnetic Offset option

Use this option only if the Printer has a built-in Magnetic Stripe encoder. (**Note:** If so, use this option to shift the starting point of where the Printer will begin encoding the magnetic Track data on a card's Magnetic Stripe. When adjusting this value, keep in mind that a card and its Magnetic Stripe will always remain in the same relative position as the card travels through the Printer.)

The diagram (below) represents how the magnetic data will move in relation to the fixed position of a card's Magnetic Stripe as a positive or negative Magnetic Offset value is entered. (**Note:** For this diagram, imagine that the card is transparent and the card's mag stripe can be seen through the top or front side of the card.)

Step	Procedure
1	Click on the left arrow ◂ to enter a positive value to move the start of the magnetic data more toward the leading edge of the card or the card output to the side of the Printer. **OR** Click on the right arrow ▸ to enter a negative value to move the start of the magnetic data toward the trailing edge of the card or the card input to the side of the Printer. • **Magnetic Data Direction:** The arrows on these buttons indicate the direction the magnetic data will move on the card's Magnetic Stripe. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm.) (**Note:** Keep this in mind when adjusting this option to avoid over-adjusting.) **Caution:** If the negative value is set too high, the Printer may start encoding before the card's Magnetic Stripe reaches the encoding head.



Using the Flipper Offset option

Use this option to set the position of the flipper so that it is level with the card path.

Step	Procedure
1	Lower the lead-in of the Flipper Table (or offset the Flipper more clockwise) by clicking on the down ▼ arrow to enter a negative value. **OR** Raise the lead-in of the Flipper Table (or offset the Flipper more counter-clockwise) by clicking the up ▲ arrow to enter a positive value.  **Caution #1:** Adjust only ±1 to avoid accidentally over-adjusting the Flipper offset.  **Caution #2:** If the positive value is set too high, the Flipper angle may be too high causing a card jam. (**Maximum Range:** The maximum adjustment range is ±10.)

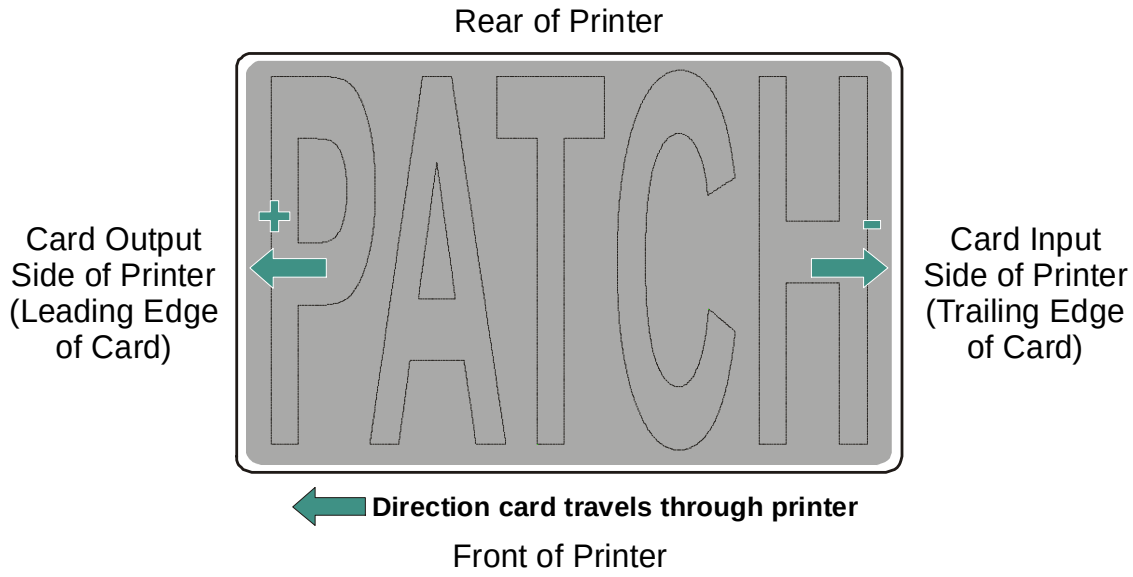
Using the Lamination Placement option

Use this option to adjust the lengthwise or horizontal position of a PolyGuard patch on a card so it appears centered. (**Note:** When adjusting this value, the cards always remain in the same landscape orientation while moving through the Printer.)

The diagram (below) represents how the PolyGuard patch will move in relation to the fixed card position as a positive or negative Lamination Placement value is entered.

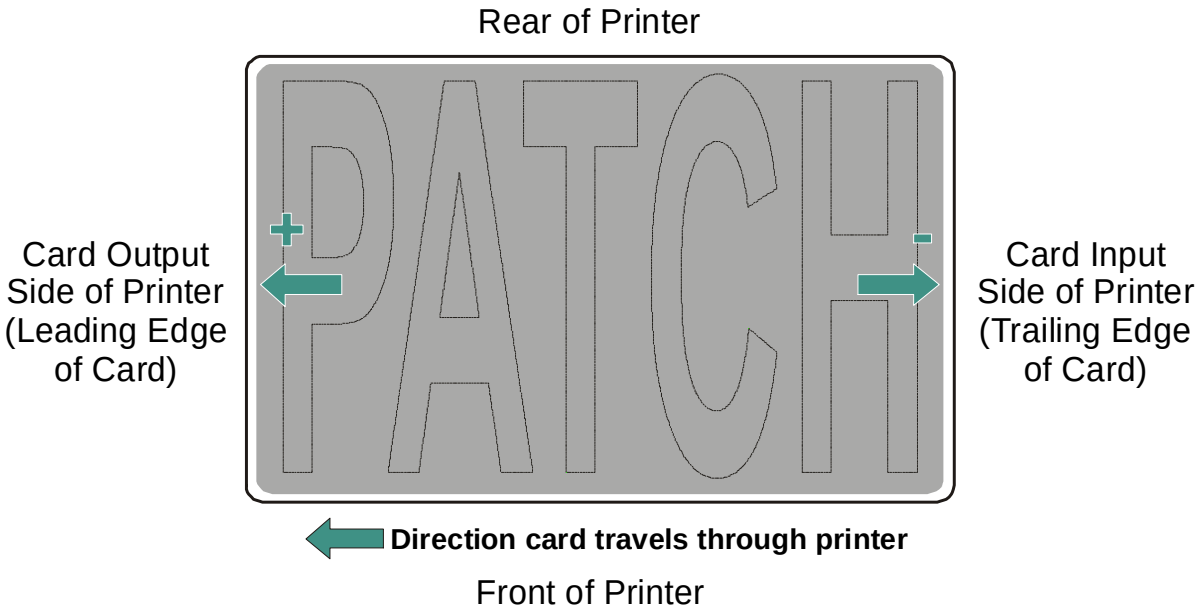
Step	Procedure
1	Move the patch toward the leading edge of the card or card output side of the Printer by clicking the left arrow ◄ to enter a positive value. **OR** Move the patch toward the trailing edge of the card or card input side of the Printer by clicking the right arrow ► to enter a negative value. • **PolyGuard Patch Direction:** The arrows on these buttons indicate the direction the PolyGuard patch will move on the card. • **Maximum Adjustment Range:** The maximum adjustment range is ±100. As a rule, 10 equals about .030"/. 8mm, which is about the same as the thickness of a standard CR-80 size card. (**Note:** Keep this in mind when adjusting this option to avoid over-adjusting.) **Caution:** If the positive value is set too high, the patch will hang off the leading edge of the card.

Continued on the next page



Using the Lamination Placement option (continued)

Step	Procedure
2	Once adjustment is complete, click the **OK** button to save the adjustments or click the **Cancel** button to cancel any adjustments (just made).
3	a. Print a self-test after making adjustments to the **Internal Printer** settings. (**Note:** This self-test print helps determine if these settings are set properly.) b. If the Printer has a Magnetic Stripe Encoder (and the Magnetic Offset option is adjusted, test this adjustment by sending down a command to encode from the specific software program.



Adjusting the Card Flattener

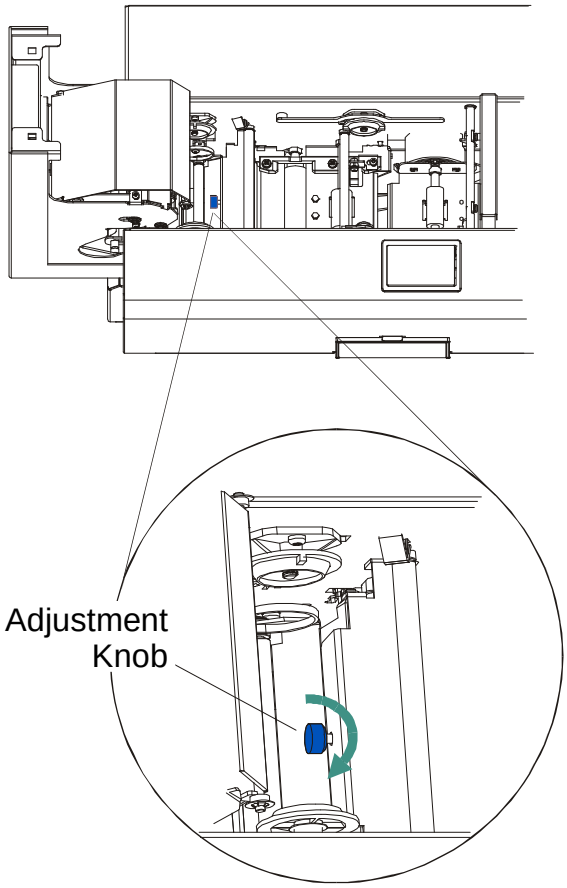
Use the adjustable Card Flattener to fine-tune the flatness of laminated cards. (**Note:** This flattener works by reverse bending cards as they eject from the laminator while they are still warm.)

Step	Procedure
1	Verify there is no card warpage. (**Note:** In most cases, card warpage is only a concern when laminating on a single side of card stock that has a PVC-based core rather than a polyester-based core.)  **Caution:** Cards with a PVC-based core are not as heat resistant and therefore are not recommended for use when laminating.)
2	If experiencing an unacceptable amount of card warpage, refer to Step 5 to in order to adjust the Card Flattener. (**Note:** By default, the Card Flattener is configured at the factory to accommodate UltraCard III type card stock.)
3	Open the Lamination Top Cover.
4	Remove the over-laminated material if installed.

Continued on the next page

Adjusting the Card Flattener (continued)

Step	Procedure
5	If laminated cards are bowing upward, turn the Card Flattener Adjustment Knob **clockwise** or one full rotation, then print and laminate a test card. Repeat this process as necessary. (**Note:** This pushes the flattener roller down to increase the reverse bending pressure.) **OR** If the card is bowing downward, the reverse bending pressure may be too great. In this case, rotate the Adjustment Knob **counter-clockwise**. **Caution:** Some card types have very low heat resistance and may not be acceptable for laminating. (**Note:** Contact the authorized reseller with specific questions about acceptable card stock.)

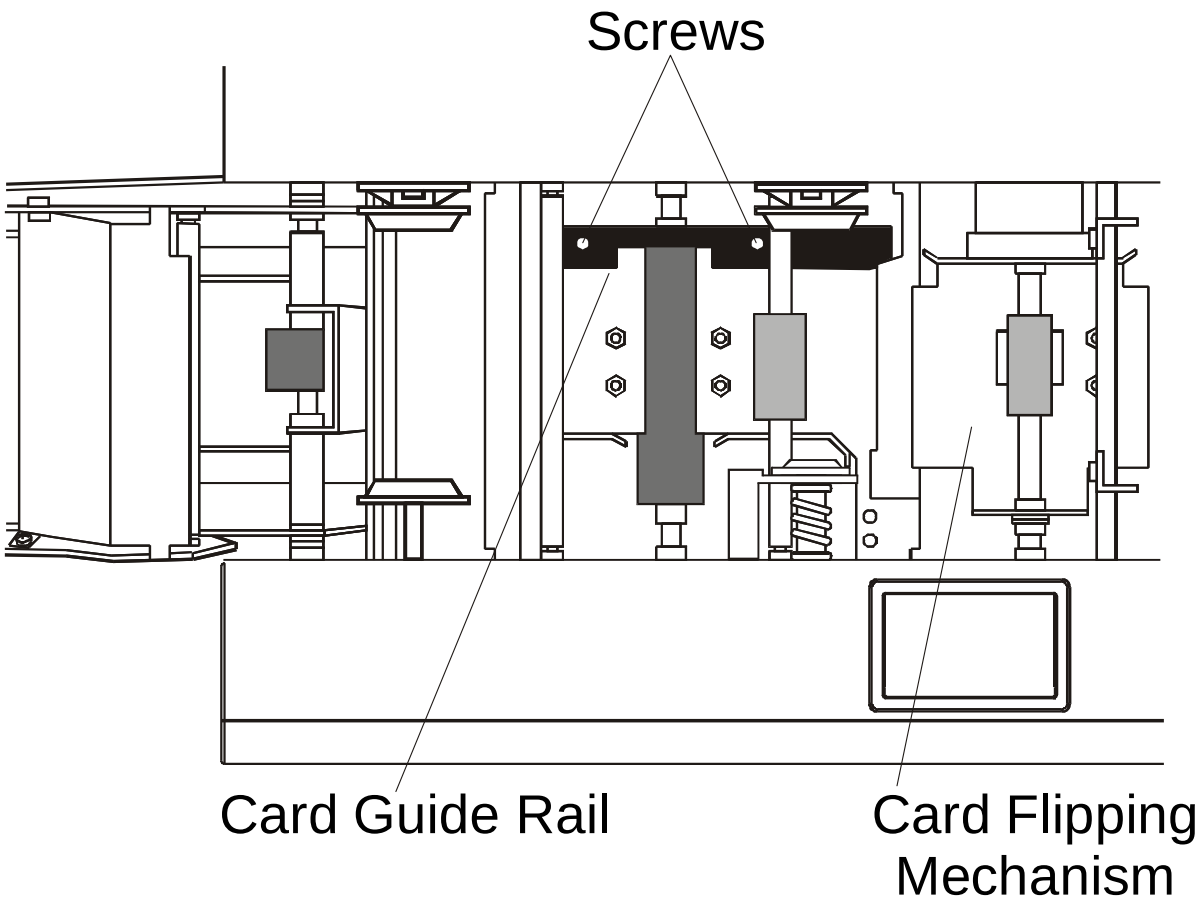


Adjusting the Laminator

Adjust the laminator's Card Guide Rail if the PolyGuard patches are being applied too closely to or overlapping a card's top or bottom edge (as the card travels through the Printer.

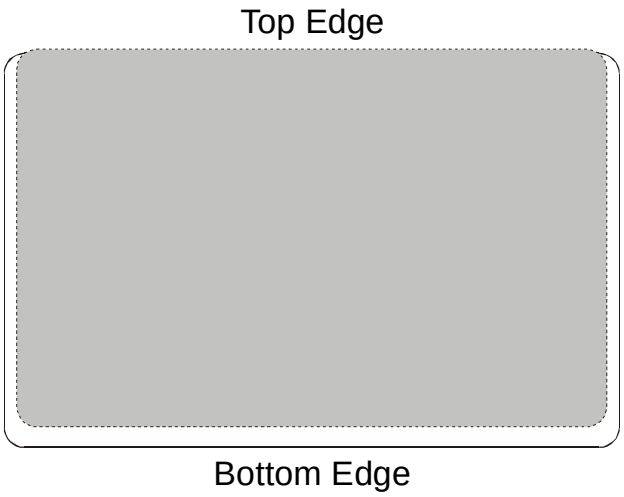
Step	Procedure
1	Loosen the two screws that fasten the Card Guide Rail to the Printer's main chassis.
2	Move the Card Guide Rail slightly toward the rear of the Printer (in the opposite direction that the patch is to move in) if the PolyGuard patch is being placed more toward a card's top edge. See the next page).

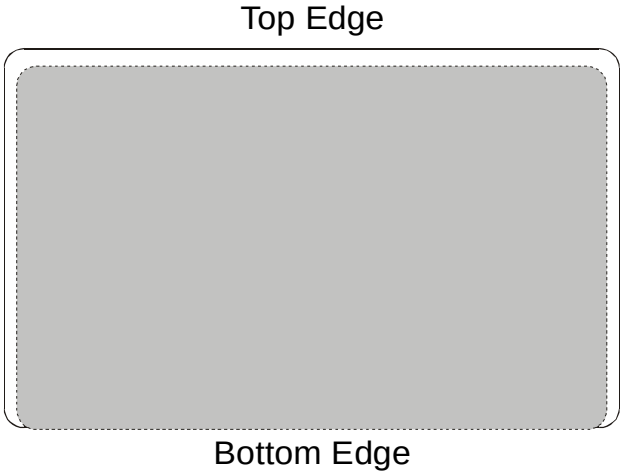
Continued on the next page



Adjusting the Laminator (continued)

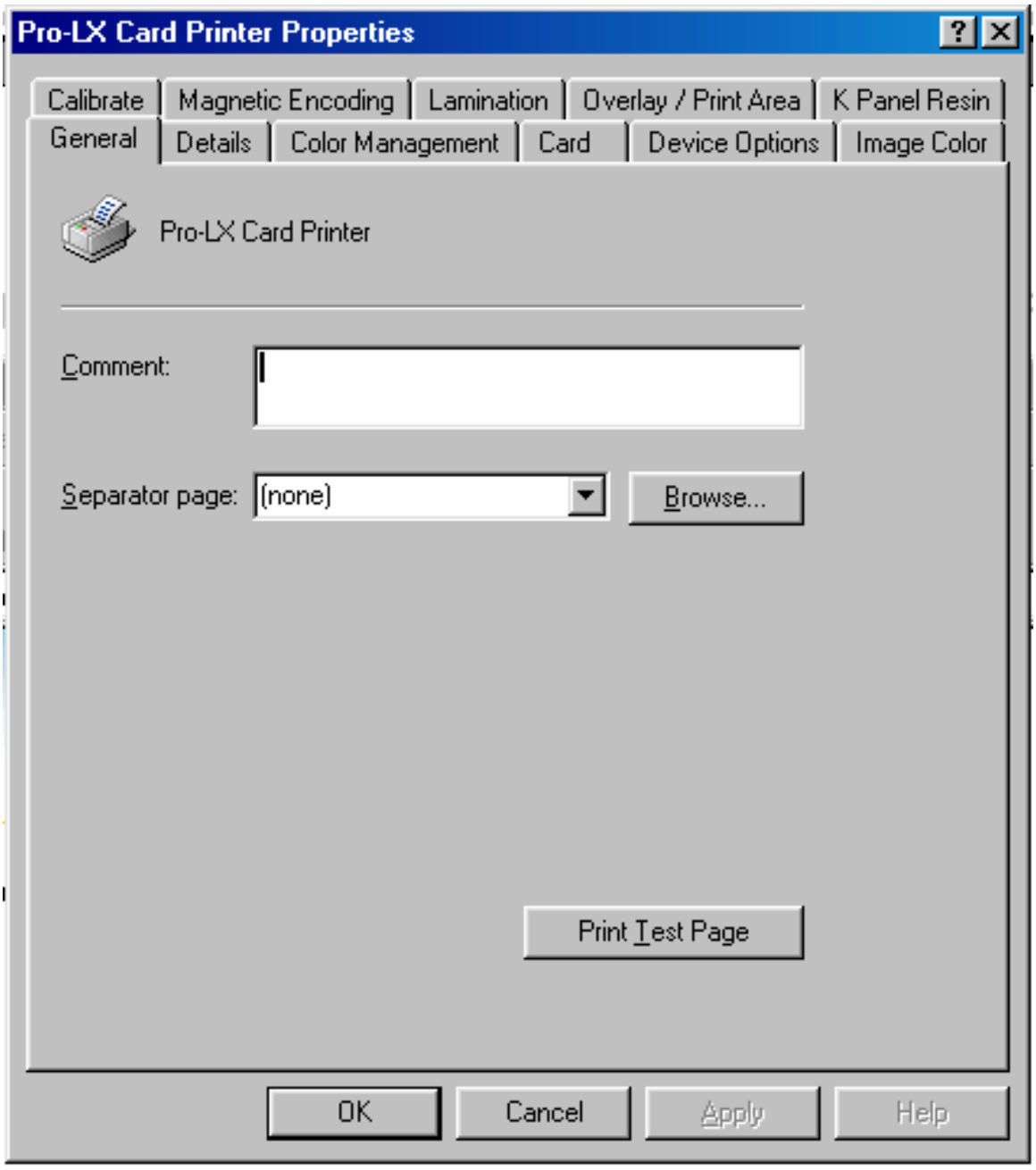
Step	Procedure
3	Move the Card Guide Rail slightly toward the front of the Printer (opposite the direction the patch must move in) if the PolyGuard patch is being placed more toward a card's bottom edge (as shown in the lower display).
4	a. Always make very slight adjustments to the Card Guide Rail and run a test print after each adjustment until the optimum patch position is found. b. Be sure the Card Guide Rail always remains parallel to the card path and that the screws loosened in Step 1 are retightened after each adjustment.





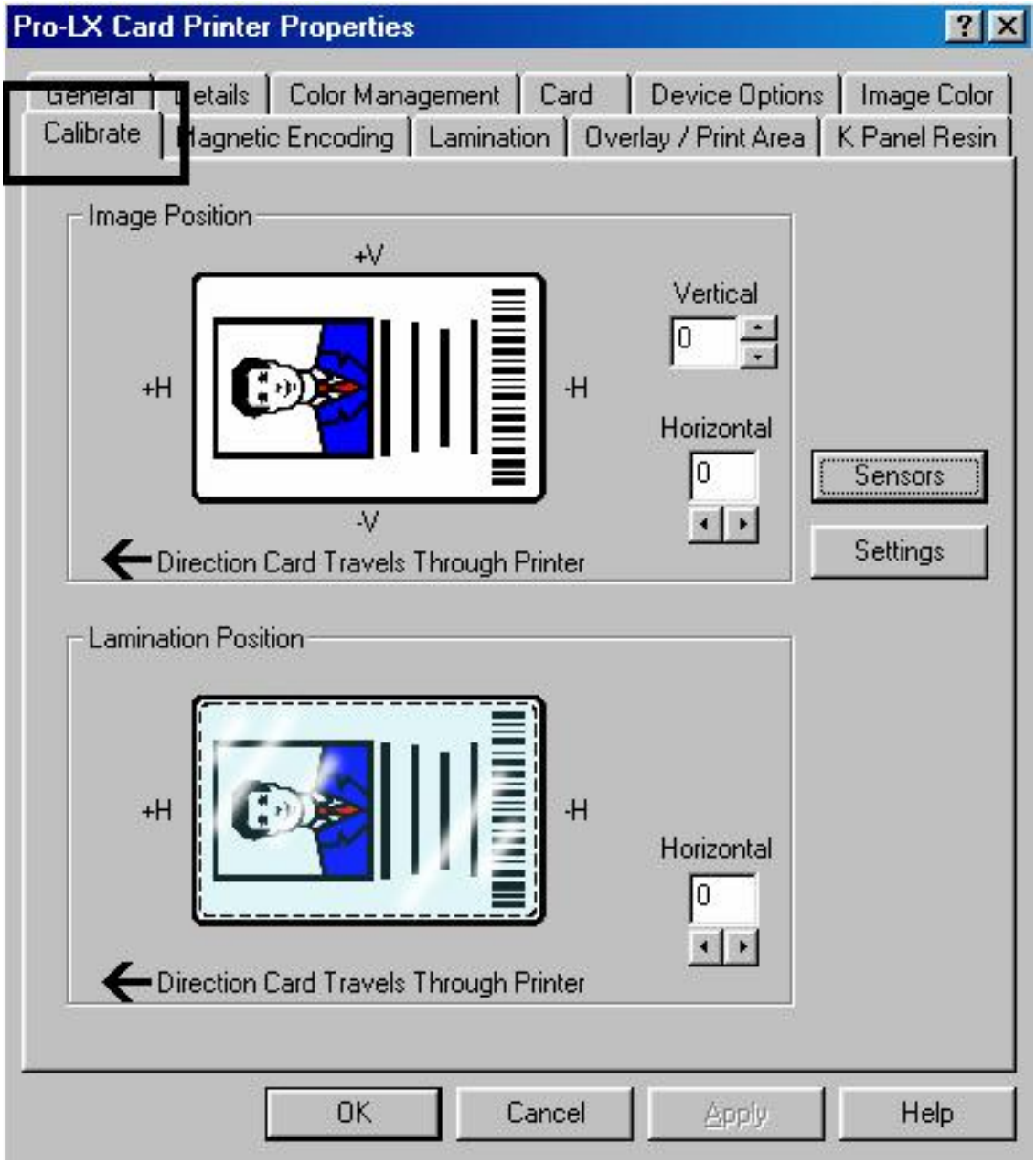
Printer Driver Options

Access the Pro-LX Card Printer Properties window via Start > Settings > Printers > Pro-LX Card Printer (icon) > Pro-LX Card Printer (which brings up the Pro-LX Card Printer Properties window).



Using the Calibrate tab

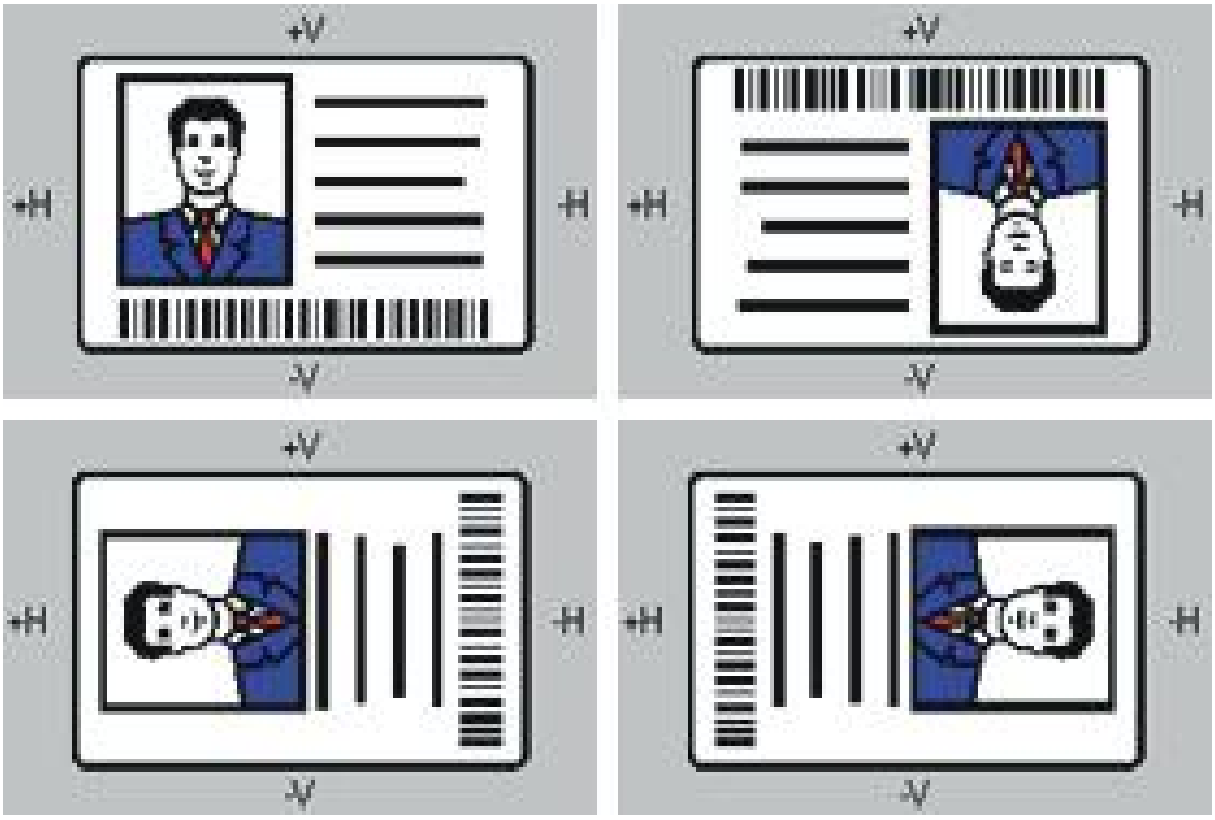
Use this option to (a) control the position of the printable area in relation to the card, (b) calibrate Sensors and (c) adjust the internal Printer settings.



Using Image Position controls

Use the **Image Position** controls to adjust the position of the overall print area to be precisely centered on a card.

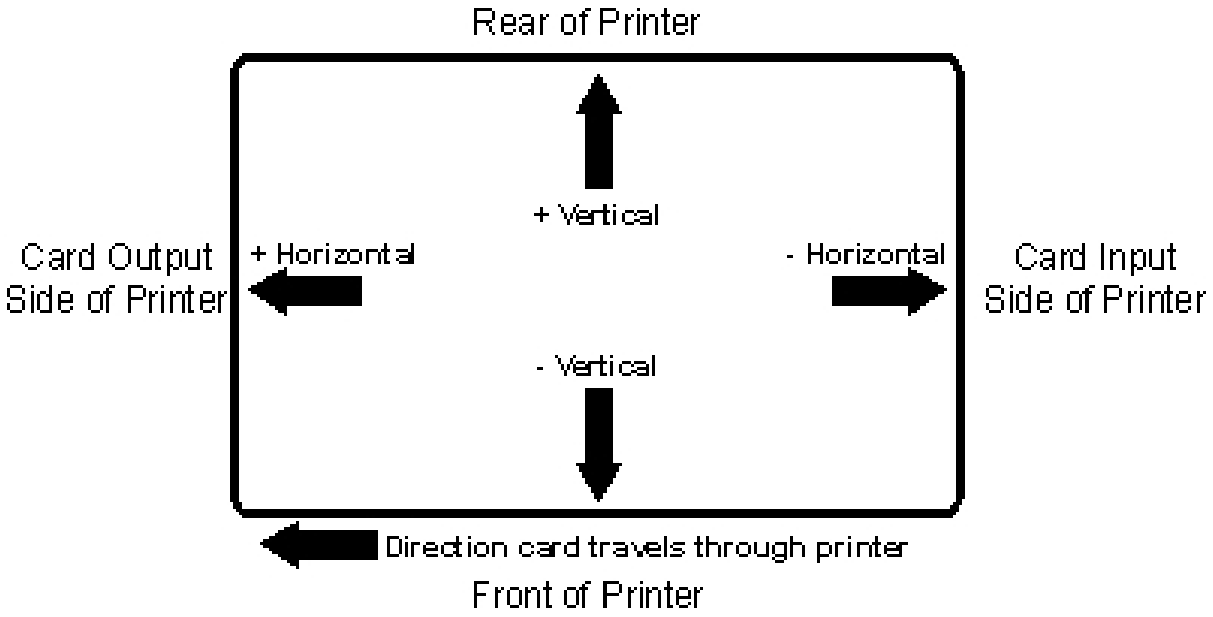
Step	Procedure
1	Click on the **Vertical** and **Horizontal** adjustment arrows to adjust the Image Position values. • When adjusting these values, keep in mind that cards always remain in the same position while moving through the Printer, regardless of image orientation. • To illustrate this, the card illustration shown in the Image Position box will flip and rotate according to the **Portrait**, **Landscape** or **Rotate 180 Degrees** selection. • The outline around the illustration will always remain in the same **Landscape** orientation.



Using Image Position controls (continued)

Review the Image Position diagram, which displays how the printed image will move in relation to the fixed card position as positive and negative image placement values are entered.

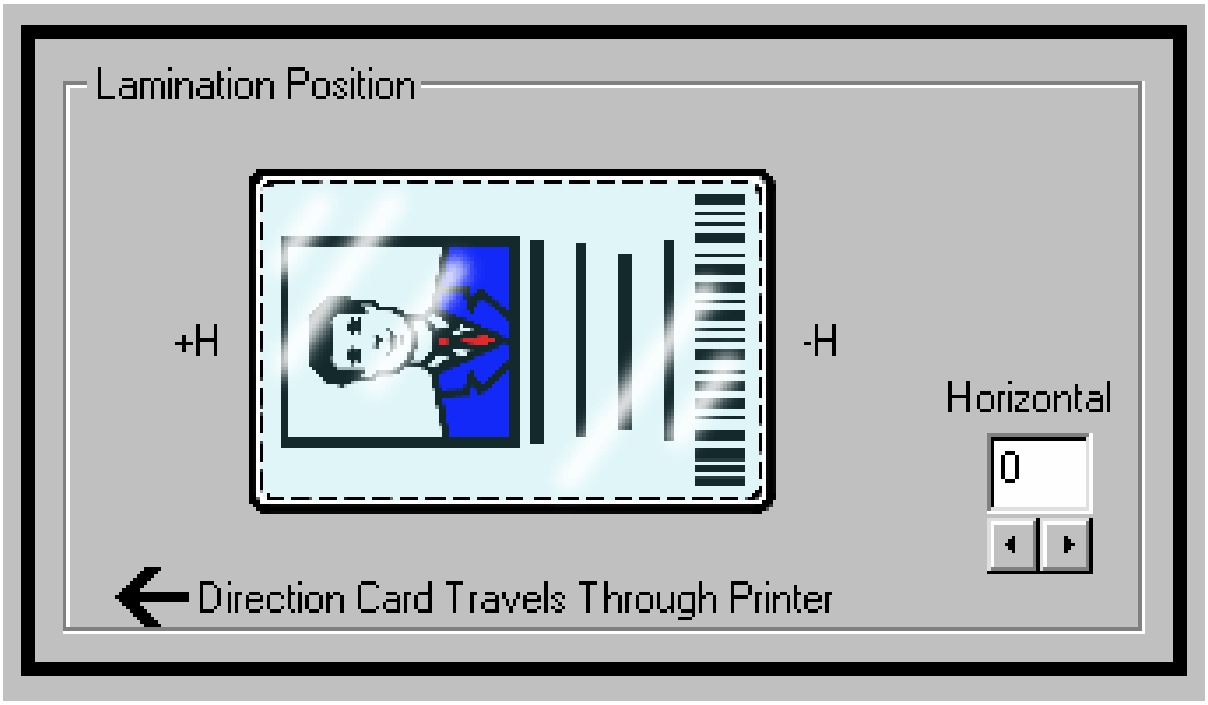
Step	Procedure
2	Use the **Vertical** adjustment to move the image: • Move toward the rear of the Printer if a positive number is entered. • Move toward the front of the Printer if a negative number is entered. **OR** Use the **Horizontal** adjustment to move the image: • Move toward the card output side of the Printer if a positive number is entered. • Move toward the card input side of the Printer if a negative number is entered. (**Note #1:** The maximum value for the **Vertical** and **Horizontal** adjustments is ±100 pixels (10 pixels = about .03"/. 8mm).) (**Note #2:** The **Vertical** and **Horizontal** adjustment arrows point to within the Image Position window, which represents the direction that the printed image moves.



Using the Lamination Position control

Use the **Lamination Position** control to adjust the horizontal position of the PolyGuard overlaminate. (**Note:** This control functions in the exact same fashion as the Image Position controls, except only the horizontal position of the overlaminate requires an adjustment.)

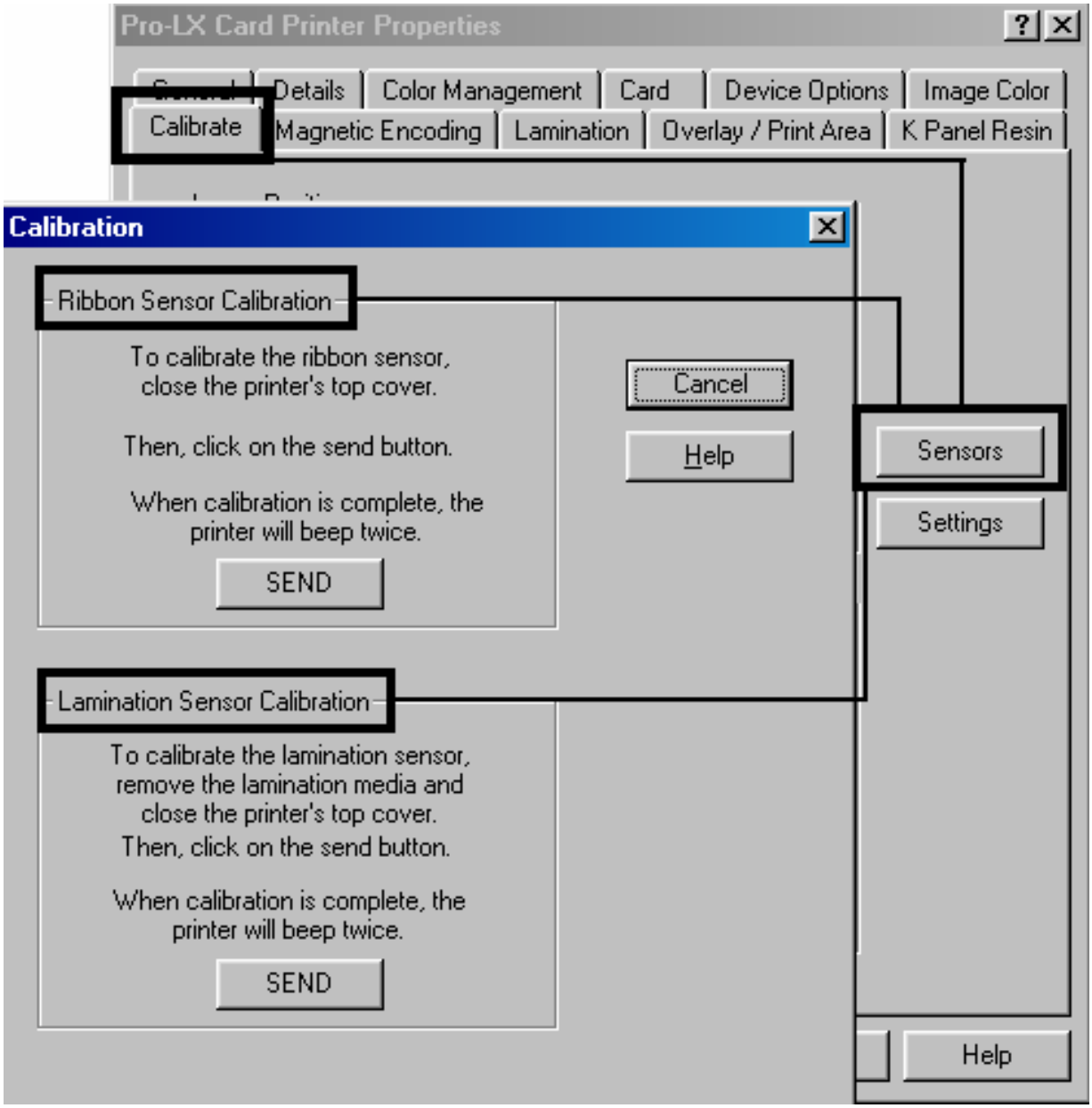
Step	Procedure
1	Click on the Horizontal Adjustment arrows to adjust the **Lamination** position. (**Maximum Value:** The maximum value for the Horizontal adjustment is ±100 pixels (10 pixels = about .03"/. 8mm).)
2	Enter a positive number to move the **overlaminate** more toward the card output side of the Printer. **OR** Enter a negative number to move the **overlaminate** more toward the card input side of the Printer.
3	To adjust the Vertical placement of the PolyGuard overlaminate, see the Adjusting the Laminator procedure in Section 3, page 109.



Using the Sensors and Settings buttons

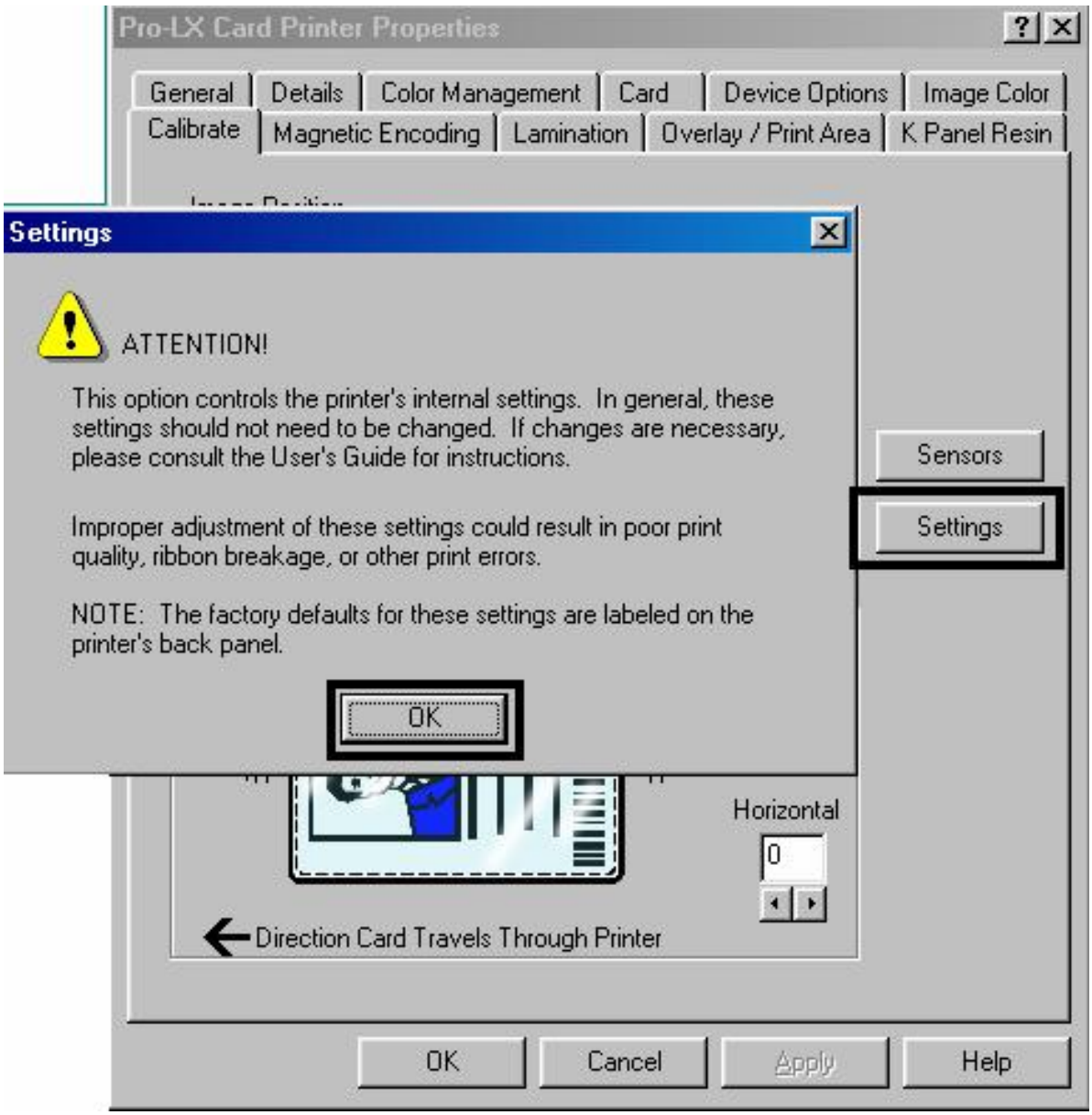
Use the **Sensors** button to bring up a separate dialog box for calibrating the Printer's ribbon and lamination Sensors.

Continued on the next page



Using the Sensors and Settings buttons (continued)

Use the **Settings** button to bring up a separate dialog box for adjusting the internal Printer settings (that are customized for every Printer at the factory and saved directly within the Printer's memory).

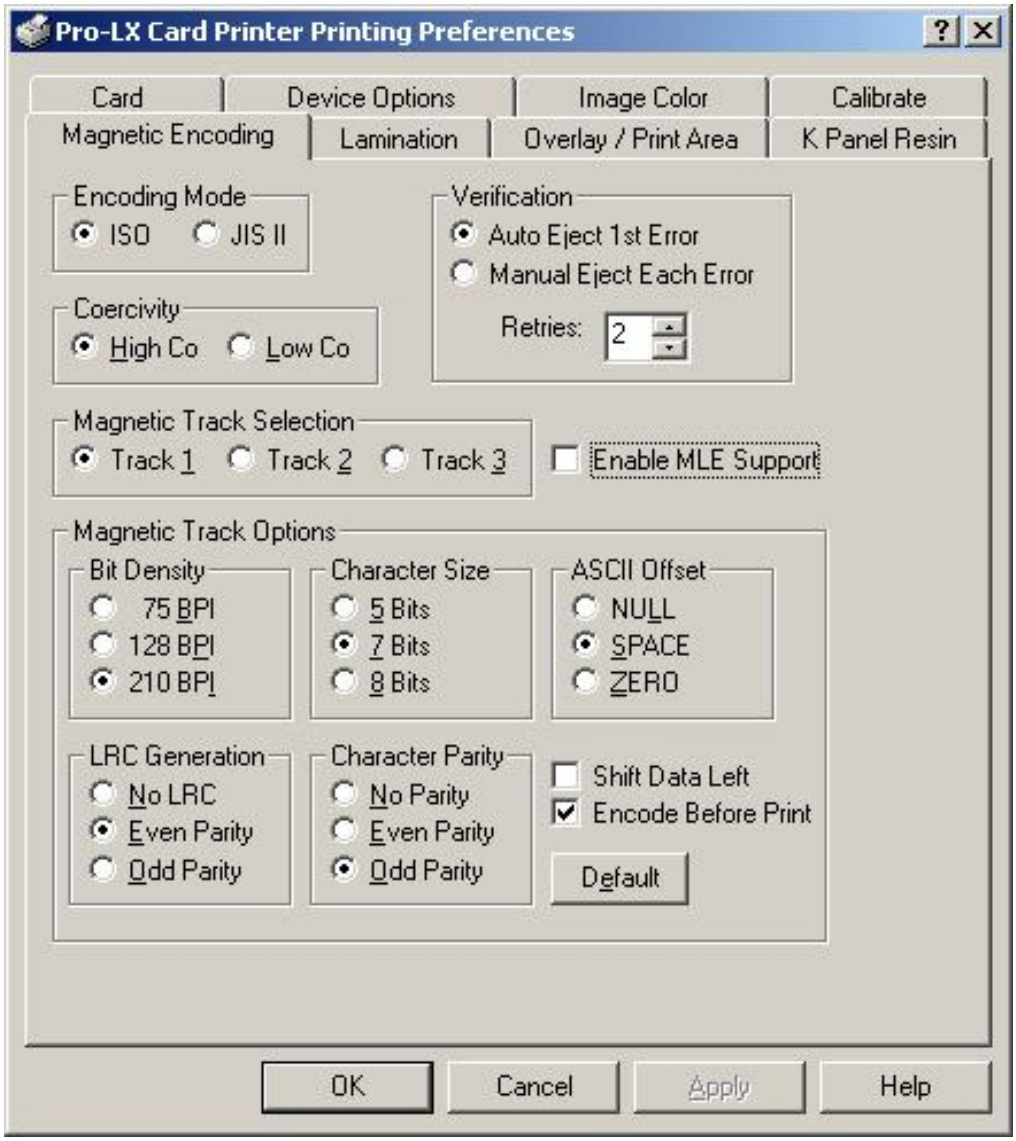


Using the Magnetic Encoding tab

Use this option only if the Printer has an optional Magnetic Stripe Encoding Module installed. This Section describes these options and the Printer's magnetic encoding process.

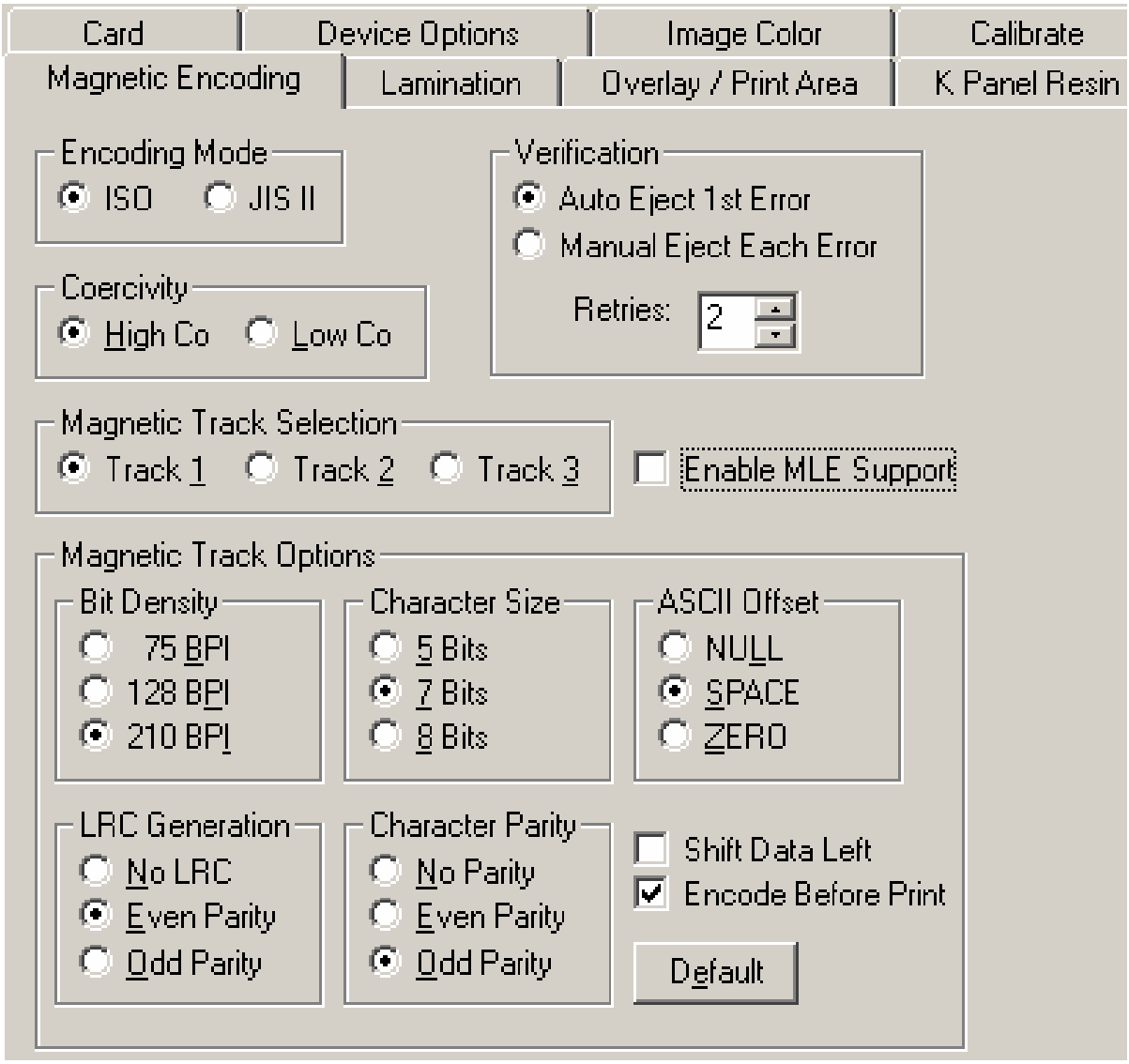
Step	Procedure
1	Select the Magnetic Encoding tab to display options for controlling the Magnetic Stripe encoding process.

Continued on the next page



Using the Magnetic Encoding tab (continued)

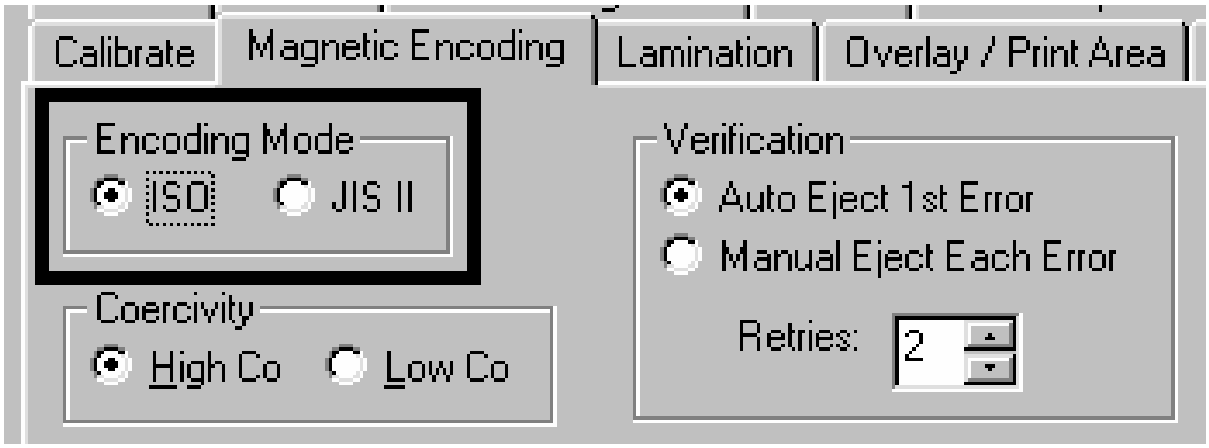
Step	Procedure
2	Adjust the following Magnetic Encoding options accordingly to change the ISO Standards for Tracks 1, 2 and 3.



Using the Encoding Mode option

Use the Encoding Mode option to specify the desired, magnetic encoding standard.

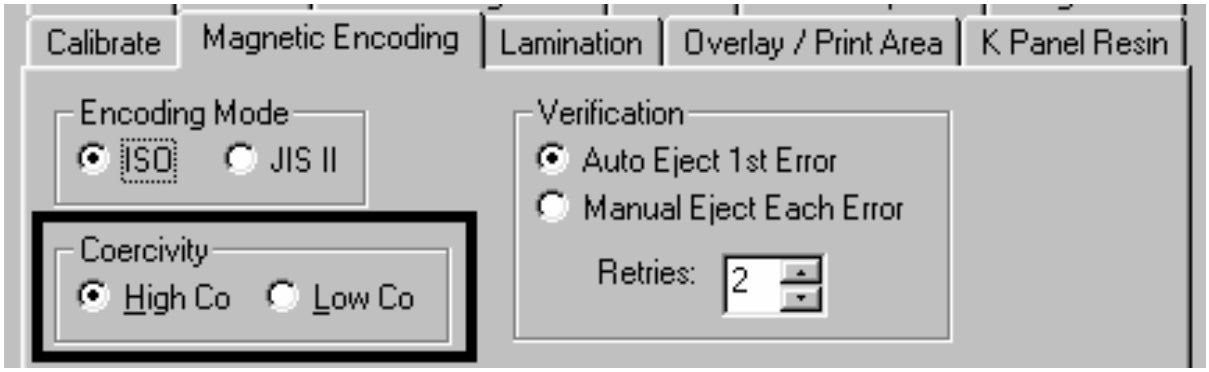
Step	Procedure
1	Select the **JIS II** mode provides encoding compatibility with the JIS C 6220 Type II cards commonly used in Japan. When the **JIS II** mode is selected, only Track 2 will be encoded. (**Note:** No encoding customization options are available with the JIS II mode.) **OR** Select the **ISO** option provides encoding capability for either high or low-coercivity cards on Tracks 1, 2 and 3. The **ISO** option is the industry's most standard mode of magnetic encoding.



Using the Coercivity option

Use the **Coercivity** option to select the type of Magnetic Stripe to encode.

Step	Procedure
1	Select High Co to set the Oersted level to 2750 **OR** Select Low Co to set the Oersted Level to 300.



Using the Magnetic Track Selection option

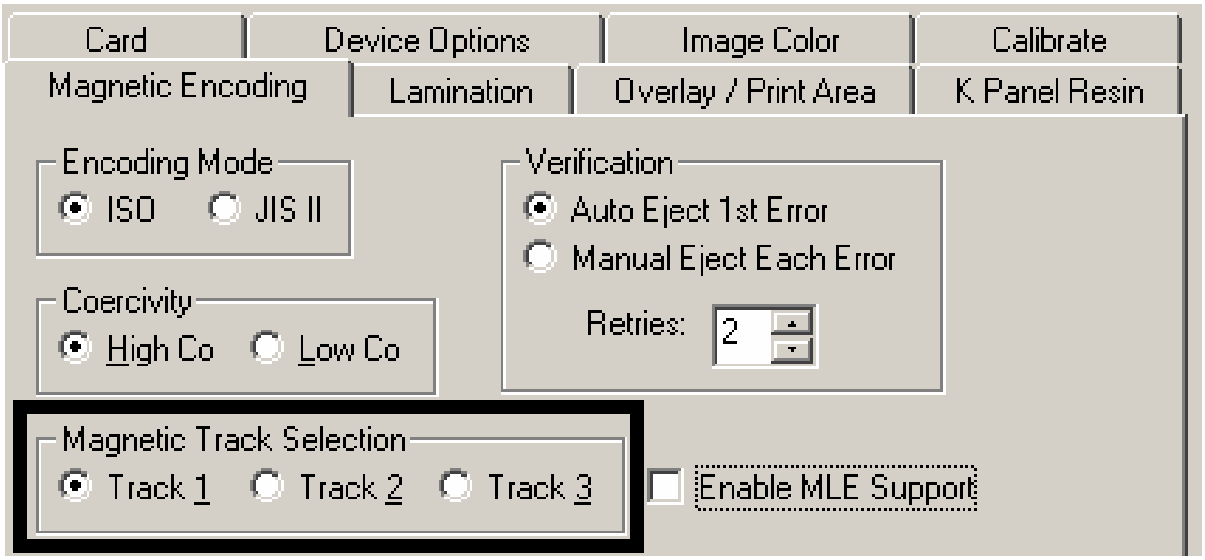
Use the **Magnetic Track Selection** option to specify which Track to configure through the Magnetic Track Options if the application requires customization of the standard ISO encoding process.

(**Note:** Although the default ISO Magnetic Track Options should be correct for almost all applications, these options can be customized if the application requires it.)

Continued on the next page

Using the Magnetic Track Selection (continued)

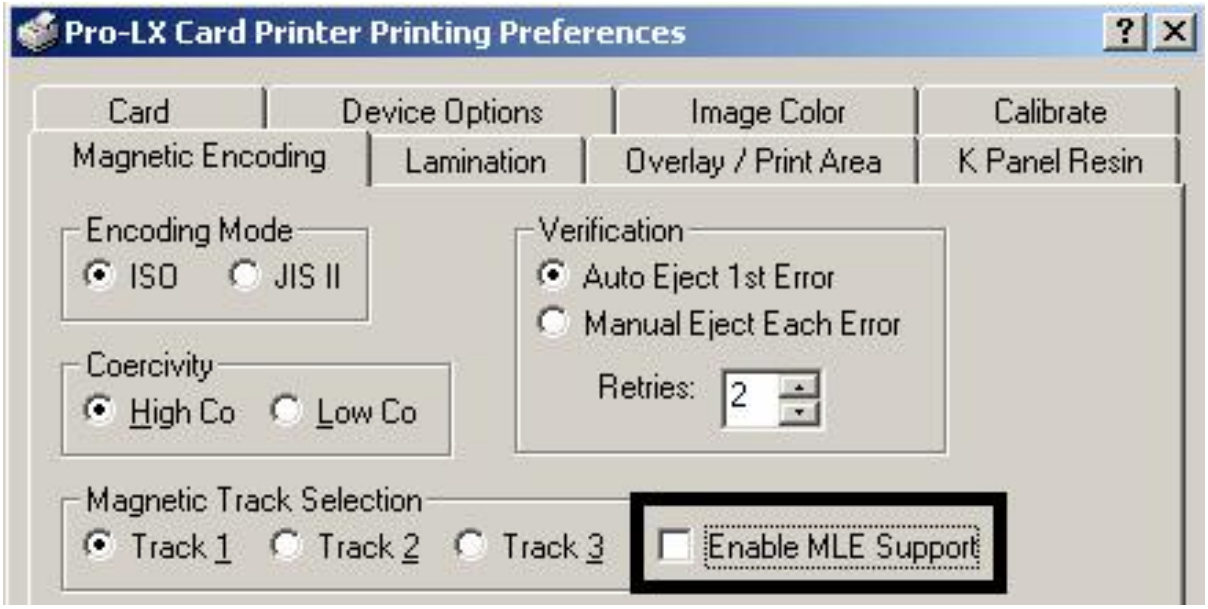
Step	Procedure
1	Select a Track selection to: a. Change all options separately for each of the three individual Tracks. b. Select the **Default** button for each of the separate Tracks to set these options back to the ISO Standard settings (once they have been changed). (**Important:** Please refer to the following for a description of all Magnetic Track Options.**)**
2	Use the **Magnetic Track Selections** to configure the way in which each of the three magnetic Tracks will encode. (**Note #1:** They do not designate which Tracks the Printer will encode (e.g., to encode only Track 2). This must be done through the specific software program.) (**Note #2:** Although the Printer Driver will remember the settings specified for each of the three Tracks, the Printer Driver will always default to displaying the options for Track 1 whenever the Printer Driver setup screen is first opened.)



Reviewing the Enable MLE Support checkbox

Multi-Language Extension (MLE) support in Windows XP can cause text strings to be broken up into fragments. This fragmentation of the text string prevents magnetic encoding.

Step	Procedure
1	Check this box to allow the Driver to process the fragmented text.



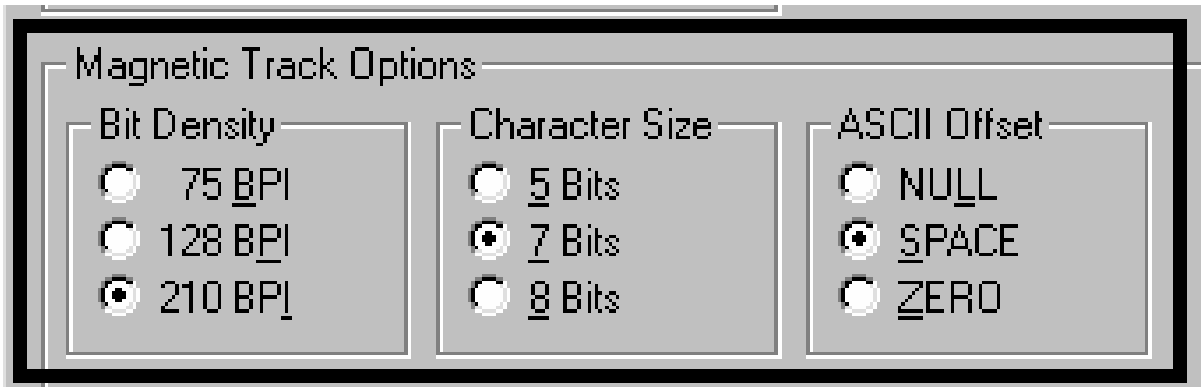
Using the Magnetic Track Options

Use the **Magnetic Track** options for these purposes:

- Customize the ISO encoded data format for each of the Magnetic Stripe's three Tracks.
- Customize each Track independently of the other two.
- Specify which of the three Tracks to customize by selecting one of the three Track options.)

(**Note #1:** After making the required selection, the Magnetic Track Options box displays the current set of customization options for the selected Track.)

(**Note #2:** For most applications, the default settings for these options do not need to be changed.)



Using the Bit Density radio buttons

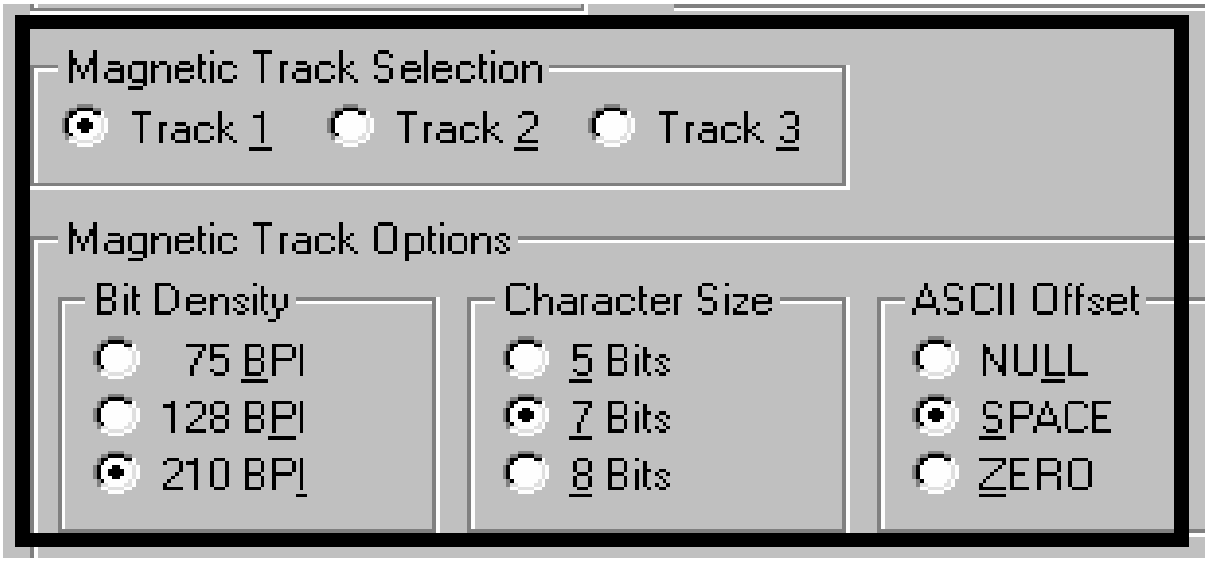
Use this option to customize the Bit Recording Density (Bits per Inch) used to encode the magnetic data on the currently selected Track. The default ISO Standard selections for this option are as follows:

Step	Procedure
1	Select 75 BPI to change the bits per inch to 75 BPI. **OR** Select 128 BPI to change the bits per inch to 128 BPI. **OR** Select 210 BPI to change the bits per inch to 210 BPI .

Using the Character Size radio buttons

Use this option to customize the Character Data Size (Bits per Character) used to encode the magnetic data on the currently selected Track. (**Note:** This character size includes the parity bit (if enabled).)

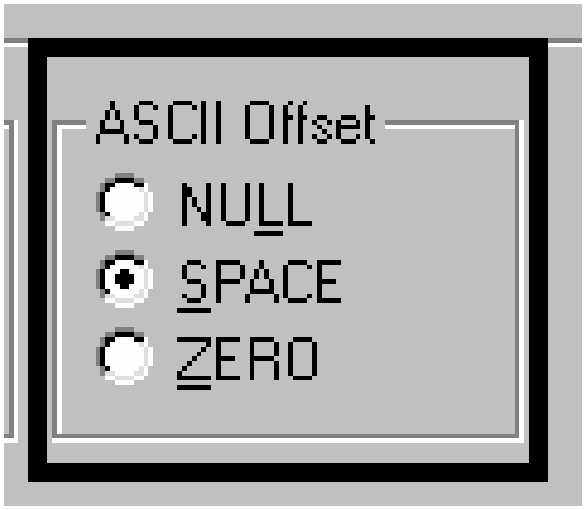
Step	Procedure
1	Select 5 Bits to change the bits per character to 5 BPC. **OR** Select 7 BPI to change the bits per character to 7 BPC. **OR** Select 8 BPI to change the bits per character to 8 BPC .



Using the ASCII Offset

Use this option to customize the Character ASCII Offset used to encode the magnetic data on the currently selected Track. (**Note:** This character offset value is subtracted from the ASCII value of each Magnetic Stripe data character prior to encoding on the Track.)

Step	Procedure
1	Select NULL to change the ASCII Offset to NULL. **OR** Select SPACE to change the ASCII Offset to SPACE. **OR** Select ZERO to change the ASCII Offset to ZERO.



Using the LRC Generation radio buttons

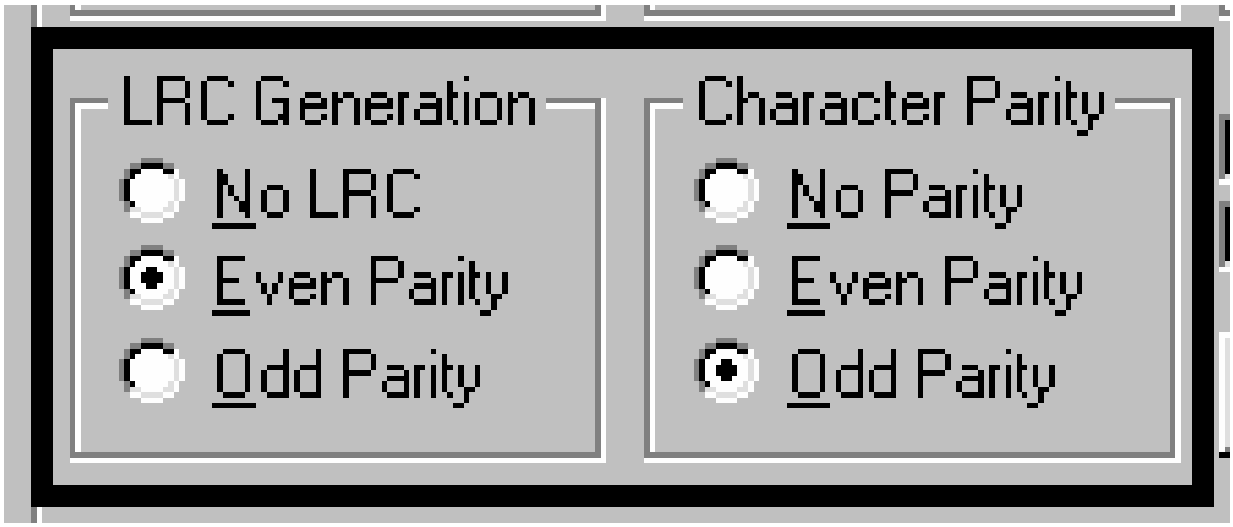
Use this option to customize the LRC Generation Mode (used to encode the magnetic data on the currently selected Track).

Step	Procedure
1	Select NO LRC to change the LRC Generation to none. **OR** Select Even Parity to change the LRC Generation to Even Parity. **OR** Select Odd Parity to change the LRC Generation to Odd Parity.

Using the Character Parity radio buttons

Use this option to customize the Character Data Parity (used to encode the magnetic data on the currently selected Track).

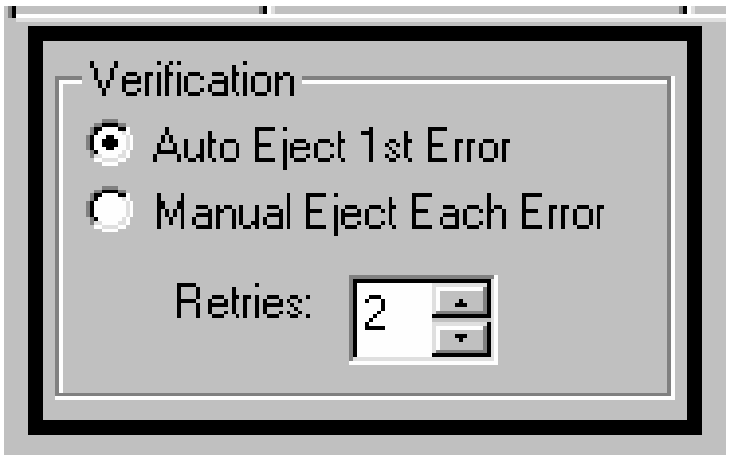
Step	Procedure
1	Select No Parity to change the Character Parity to none. **OR** Select Even Parity to change the Character Parity to Even Parity. **OR** Select Odd Parity to change the Character Parity to Odd Parity



Using the Verification radio buttons

Use this option to customize the encoding verification settings.

Step	Procedure
1	Select the **Auto Eject 1st Error** option to instruct the Printer to verify that all magnetic data has been correctly encoded on each card. (**Note:** The **Auto Eject** option is the most direct means of dealing with misverified cards; however, it may be undesirable when dealing with encoding errors.) For this reason, a **Manual Eject Each Error** option is also provided. • If the **Auto Eject 1st Error** option is selected, the Printer will automatically eject a card containing magnetic data that cannot be verified. (**Note:** Only the first misverified card will be automatically ejected.) • If a second consecutive card cannot be verified, the Printer will signal an error and go into a **Manual Eject Mode**. (**Note:** If the loaded cards have the wrong type of Magnetic Stripe, the Printer will not automatically feed and eject the entire card supply.) **OR** Select the **Manual Eject Each Error** option so that the Printer will signal an error communicating the magnetic data could not be verified. • **Unverified Magnetic Data:** When this occurs, press the **Pause/Resume** button to manually eject the misverified card. Whether auto ejecting or manually ejecting encoding errors, all misverified cards will always eject into the Rejection Card Hopper. • **Both options:** Specify the number of times the Printer must retry its verification pass. (**Note:** A range of 1 to 5 retries can be selected. This option is helpful since Magnetic Stripe verification can sometimes require more than a single pass.)



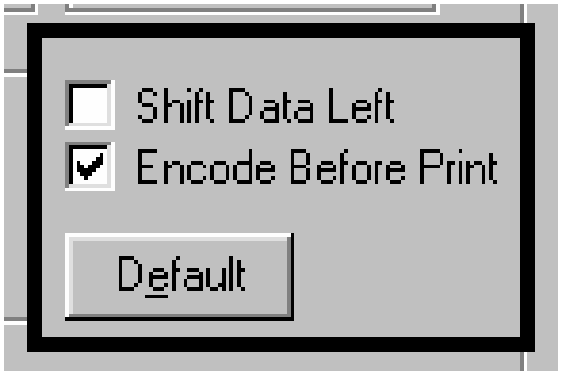
Using the Shift Data Left checkbox

Use this option to shift the recorded magnetic data to the left-hand side of the card's Magnetic Stripe.

OR

Use this option for situations that require cards to be readable with insert type readers that may not be able to read the right-hand side of the card.

Step	Procedure
1	Select the **Shift Data Left** option to apply to all Tracks.



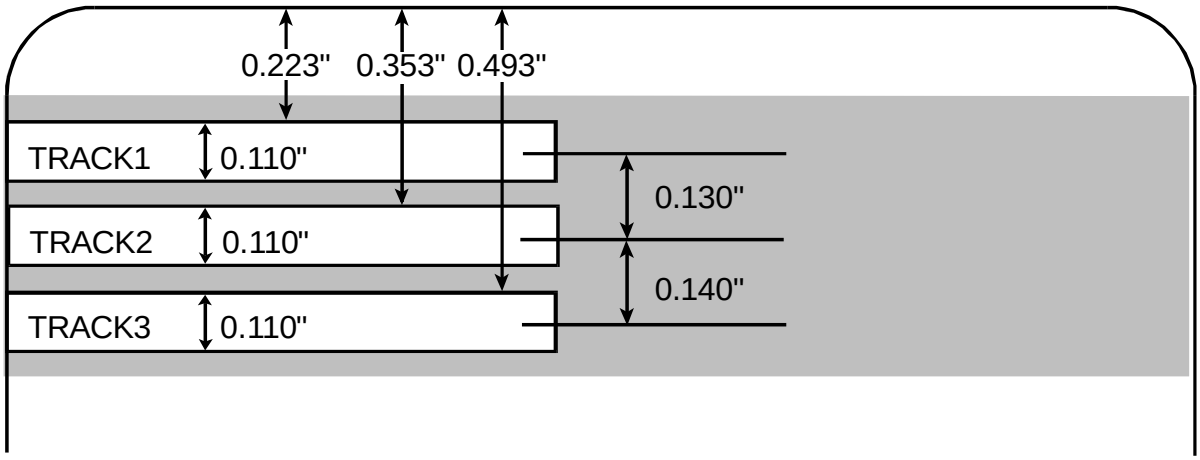
Using the Encode Before Print checkbox

Use the **Encode Before Print** option to instruct the Printer to encode the card first, before anything is printed.

Step	Procedure
1	Select this option to have the Printer encode the card before it is printed. **OR** Do not select this option and the Printer will encode the card after it has been printed. (**Note:** Encoding the card before printing takes a few seconds longer, but prevents wasting a printed card if the Magnetic Stripe is unable to be encoded.)

Reviewing ISO Track Locations

Review the magnetic encoding module, which encodes onto Tracks in accordance with an ISO 7811-2 Magnetic Stripe. (**Note:** Refer to the diagram (below) for Track locations.)



Sending Track Information

Magnetic Track data is sent in the form of text strings from the application software to the Printer Driver along with all of the other printable objects within the card design.

- **Magnetic Track Data added:** In order for the Printer Driver to differentiate between magnetic Track data and the rest of the printable objects, the magnetic Track data strings must be uniquely tagged or added.
- **Specific Characters added:** In other words, specific characters must be added to the magnetic Track data in order for the Printer Driver to know which data is to be encoded, which Tracks to encode, when the Track data stops and starts and so forth.
- **Manually or automatically added:** In some cases, these specific characters are automatically added to the string of Track data by customized ID software applications. In most cases, however, the User must manually add these characters to the string of magnetic Track data.

Entering Track Information

(**Note:** If these characters are not added to the Track data, the text intended for the magnetic Track will most likely appear as printed text on the card.)

Step	Procedure
1	To avoid this symptom, Track information must be entered as follows. When entering Track data, the "~" character is entered first, followed by the desired Track number (1, 2 or 3) used to encode the data. • The data to be encoded should then follow. (**Note:** The first character of this data string must be the Track's specific Start Sentinel (SS) and the last character must be the specific End Sentinel (ES).) • The characters or data in between the SS and ES can include all of the valid characters specific to each Track. (**Note:** The number of these characters is limited by each Track's maximum character capacity.)  **Caution:** When segmenting Track data, strictly use the appropriate Field Separator (FS).

Reviewing Tracks 1, 2 and 3 (in table format)

Review this table, which displays the SS, ES, FS and the valid characters defined for each Track.

	Start Sentinel	End Sentinel	Field Separator	Valid Characters	Maximum Number of Characters
Track 1	%	?	^	ASCII 32-95 (See the table below.)	78
Track 2	;	?	=	ASCII 48-63 (See the table below.)	39
Track 3	;	?	=	ASCII 48-63 (See the table below.)	106

Reviewing the Track Data Note

Review this Note, which displays how Track the data should be entered for Tracks 1, 2 and 3:

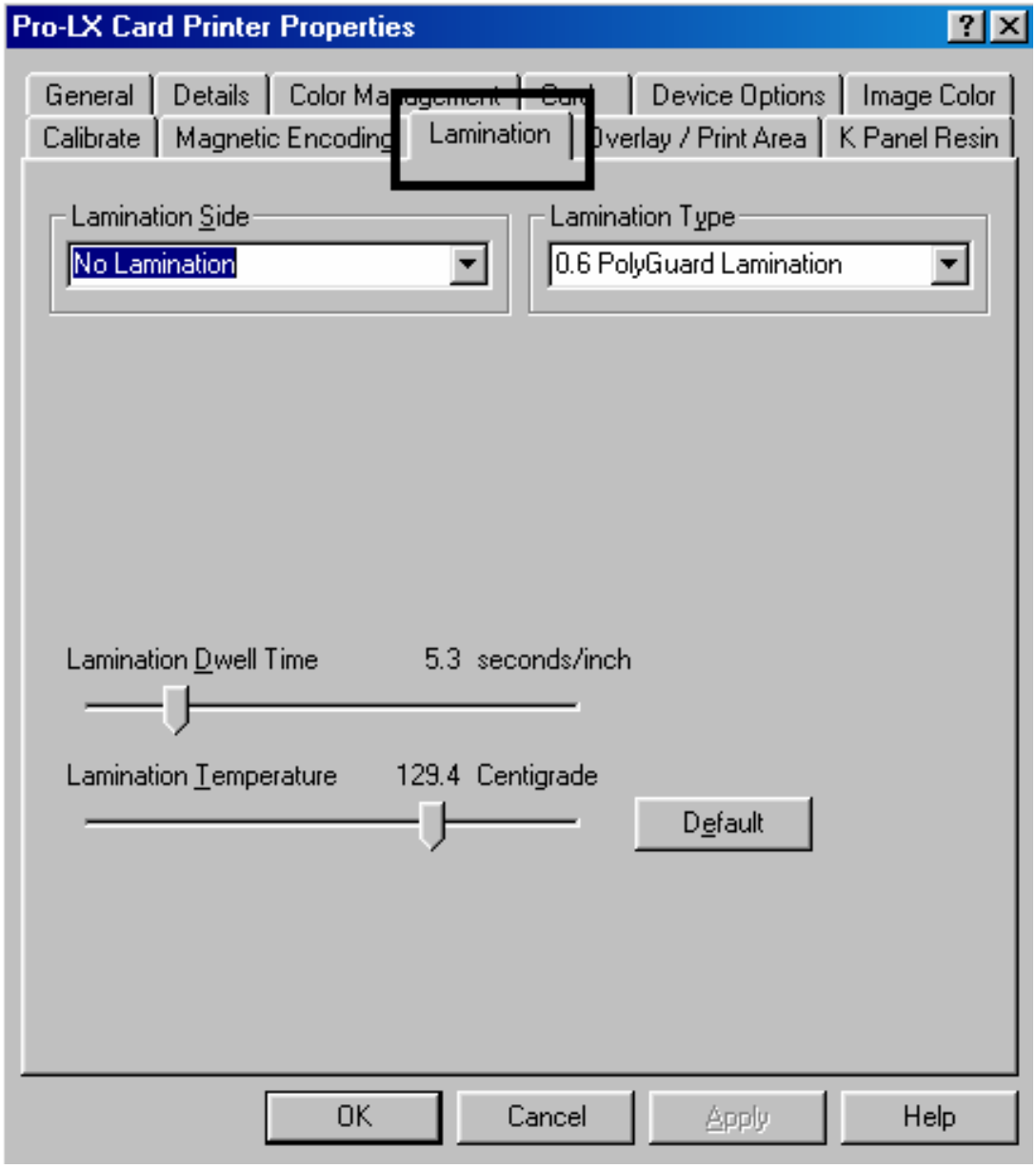
Track	Data Entry
Sending data to Track 1	**~1%JULIE ANDERSON^623-85-1253?**
Sending data to Track 2	**~2;0123456789?**
Sending data to Track 3	**~3;0123456789?**

Reviewing the ASCII Code and Character Table

ASCII Code	Character	ASCII Code	Character	ASCII Code	Character
32	space	56	8	80	P
33	!	57	9	81	Q
34	"	58	:	82	R
35	#	59	;	83	S
36	$	60	<	84	T
37	%	61	=	85	U
38	&	62	>	86	V
39	'	63	?	87	W
40	(	64	@	88	X
41	)	65	A	89	Y
42	*	66	B	90	Z
43	+	67	C	91	[
44	'	68	D	92	\
45	-	69	E	93	]
46	.	70	F	94	^
47	/	71	G	95	_
48	0	72	H		
49	1	73	I		
50	2	74	J		
51	3	75	K		
52	4	76	L		
53	5	77	M		
54	6	78	N		
55	7	79	O		

Using the Lamination tab

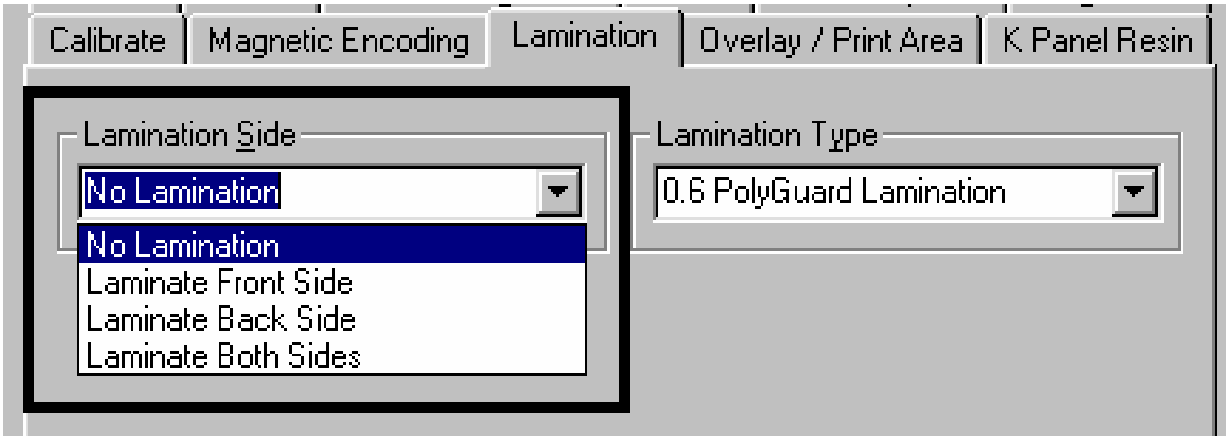
Use these options to control the Printer's lamination process.



Selecting from the Lamination Side dropdown menu

Use this option to customize what side(s) of the card the Printer is supposed to laminate.

Step	Procedure
1	Select the **No Lamination** option to avoid using the Printer's built-in laminator. **OR** Select **Laminate Front Side**, **Laminate Back Side** or **Laminate Both Sides** to specify the side(s) of the card to laminate.



Selecting from the Lamination Type dropdown menu

Use the Lamination Type dropdown menu to select the correct option.

Step	Procedure
1	Select the **PolyGuard Lamination** for either the 1.0 mil or 0.6 mil thick patch. (**Note:** These both offer equivalent protection but require different heat settings and lamination speeds.) **OR** Select the **PolyGuard Alternating Patch** option only if using PolyGuard material that has alternating patch configurations on the same roll (e.g., full patch on the front of the card and half patch on the back). **OR** Select the **Film Lamination** option to apply the film lamination to the printed card and then the card is ejected. **OR** Select the **Overlay then Film Lamination** option to apply the ribbon's clear overlay panel to the printed card first and then the film lamination is applied. (**Note:** This is a slightly slower way to apply the film lamination, but it provides higher film durability due to the added protection of the ribbon overlay.) **OR** Select the **Film Lamination then Overlay** option to apply the film lamination to the printed card first and then the ribbon's clear overlay panel is applied. (Note: (**Note:** This is the slowest method to apply the film lamination, but it provides maximum film durability due to the added protection of the ribbon overlay. Use this film lamination option when laminating with the film material.)  **Caution #1:** Select the **Overlay then Film Lamination** or **Film Lamination then Overlay** option and use a ribbon that provides a clear overlay panel. (**Note:** The ribbon types that do not provide an overlay panel or support overlay printing are the resin-only ribbons and the Full-Color YMCKK ribbon.) Avoid using these types of ribbons in conjunction with these Thermal Transfer Film options.  **Caution #2:** With any of these PolyGuard options, do not apply the ribbon overlay (O) when laminating with PolyGuard.

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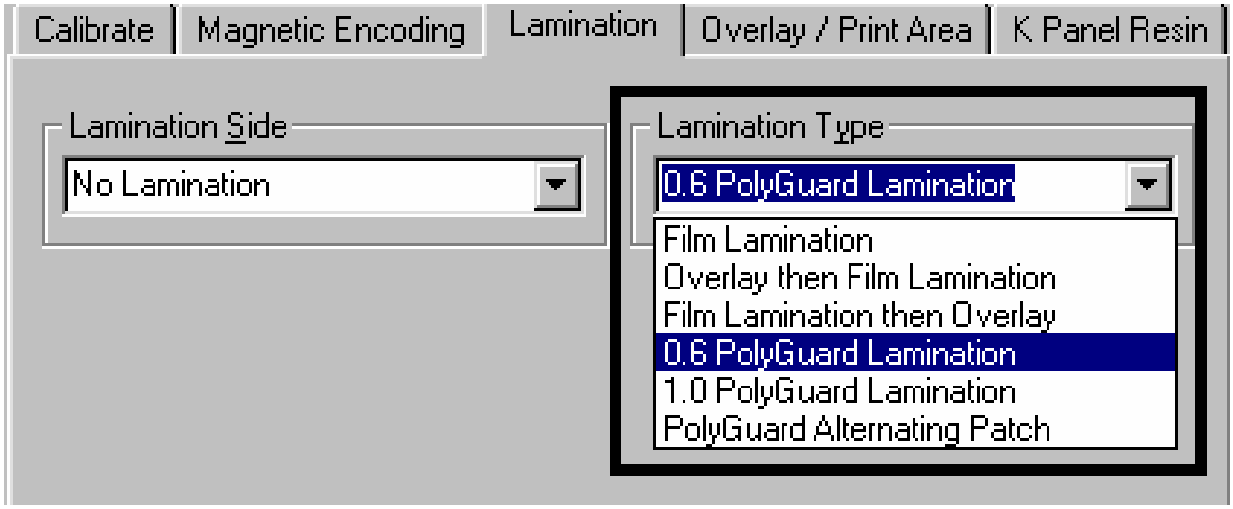
Selecting from Lamination Type dropdown menu (continued)

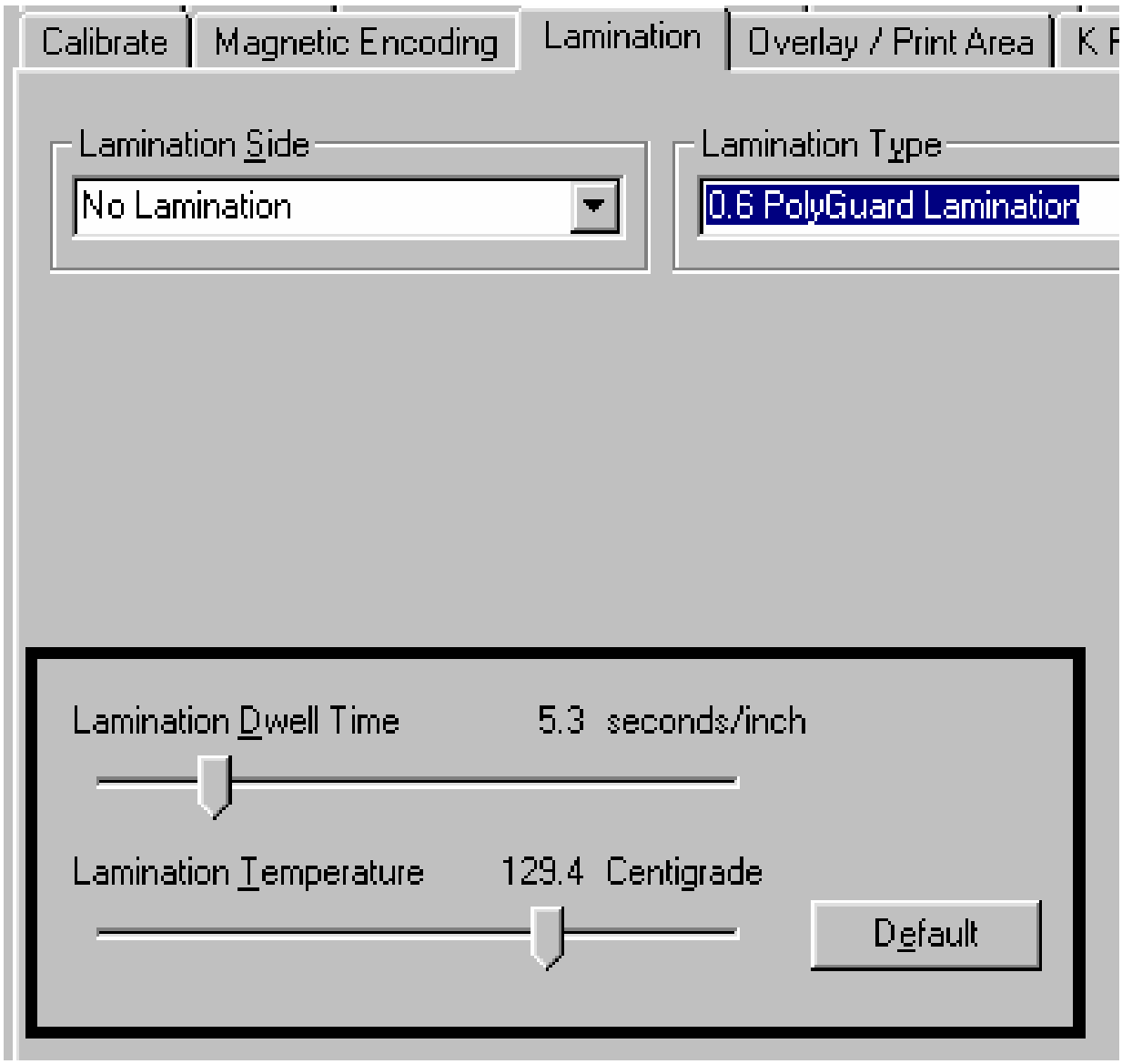
Refer to the previous procedure.



Selecting Lamination Dwell Time and Temperature

Use the Lamination window to control the **Lamination Dwell Time** or throughput speed of a card in seconds/inch as well as the **Lamination Temperature**.

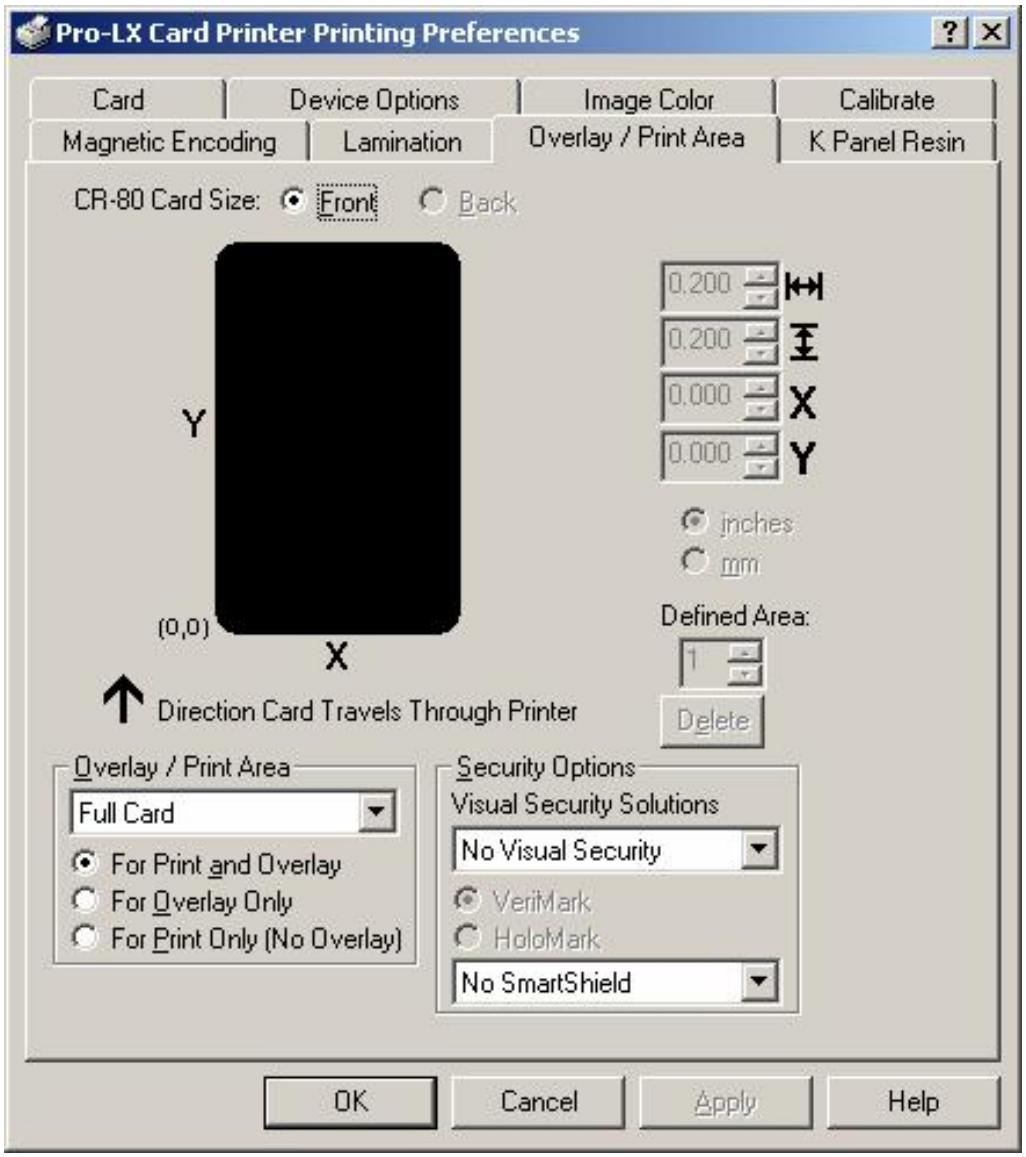
- **Preset Default Settings:** The default settings for the Lamination Dwell Time and Temperature are preset for manufacturer-recommended card stocks and overlaminate types.
- **Required Adjustments:** Some adjustment to these settings may be required if using other brands of these supplies.



Using the Overlay / Print Area tab

Use this option to control how the overlay (O) panel and/or the print area will appear on a card. (**Note:** This option is helpful if, for Note, to omit or block out the overlay or printing around a card's smart chip or Magnetic Stripe. By default, this option is set to print and overlay the entire card.)

Continued on the next page



Using the Overlay / Print Area dropdown menu

Step	Procedure
1	Select the **Full Card** option for the Printer to overlay and/or print the entire card. **OR** Select the **Defined Area(s)** option for the Printer to overlay and/or print only in the selected and defined area or areas. **OR** Select the **Undefined Area(s)** option for the Printer to overlay and/or print only in the space outside the selected and defined area. **OR** Select the **Omit Smart Chip Area** option for the Printer to overlay and/or print only in the space outside the standard location of a smart chip. **OR** Select the **Omit Mag Stripe Area** option for the Printer to overlay and/or print only in the space outside the standard location of an ISO Magnetic Stripe. **OR** Select the **Omit Signature Area** option for the Printer to overlay and/or print only in the space outside the standard location of a signature panel. (**Note:** In the card grid, black indicates the area in which the overlay and/or printing will be applied.)

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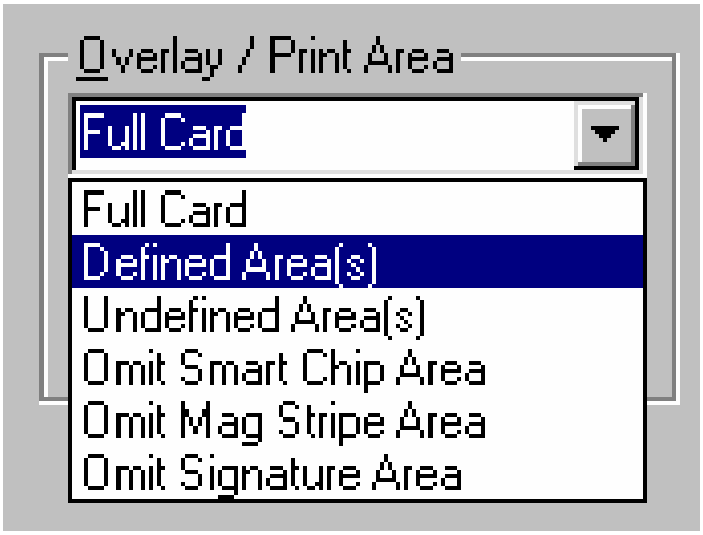

Using the Overlay / Print Area

Use these **Overlay / Print Area** options to control both the print and overlay together or control each individually.

Step	Procedure
1	Select **For Print and Overlay** for the defined area to apply to both the printing and overlay process. **OR** Select **For Overlay Only** for the defined area to apply only to the overlay process. (**Note:** In this mode, printing will still be allowed over the entire card and only the overlay will be affected.) **OR** Select **For Print Only (No Overlay)** for the defined area to apply only to the print process. (**Important:** In this mode, the overlay is completely disabled so it will not be applied.) **Caution:** An overlay or an overlaminate must protect dye-sublimation printing or it will quickly begin to wear or fade.

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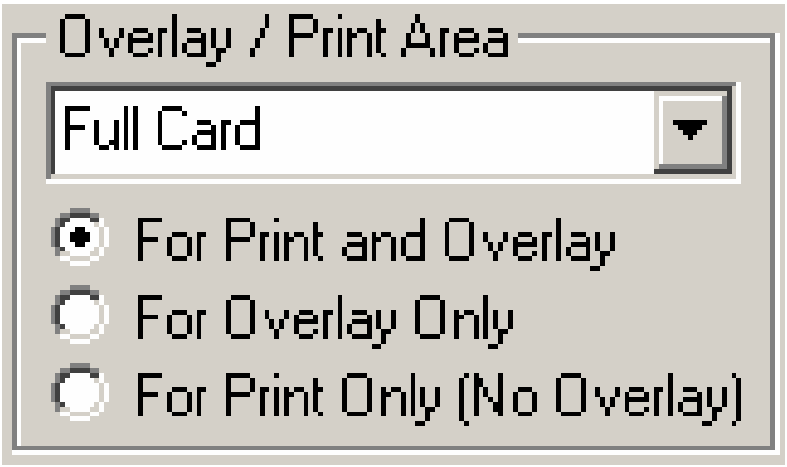
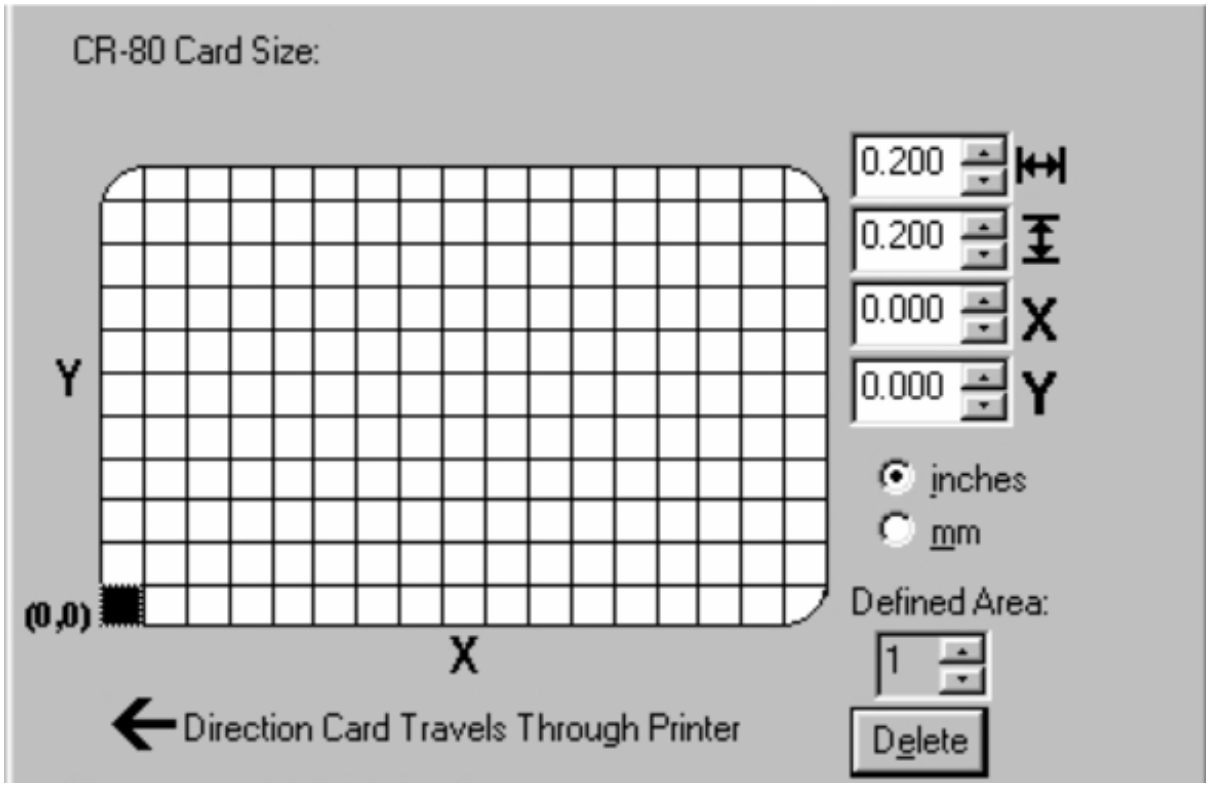


Using the Defined Area Option

Step	Procedure
1	Select the **Defined Area(s)** option to activate the card grid in the upper half of the window. It is through this card grid that up to five areas can be defined.

Continued on the next page



Using the Overlay / Print Area (continued)

Step	Procedure
2	When the card grid is first activated, a small black square will appear at its default size of .2" x .2" / 5mm x 5mm and at its default location in the lower left-hand corner (0,0). This square represents the first defined area. • Determine the area of the card needed to define for a signature panel with a different size and location than the driver's standard **Omit Signature Area** setting. (**Note:** This area is indicated by the dashed outline.) • Determine the area size by actually printing a card and looking at it in the same orientation as when it exits the Printer.
3	Measure the total size of the desired area and enter those dimensions into the dimension boxes. (**Note:** The minimum size an area is .2" x .2" / 5mm x 5mm.)

Continued on the next page

Using the Overlay / Print Area (continued)

Step	Procedure
4	Follow this procedure once the area is sized properly. a. Measure the location this desired area to be positioned on the card. b. Measure from the lower left corner of the card up and over to the lower left corner of for the defined area to begin and enter these values into the X and Y boxes. (**Note:** The card grid lines are spaced at .2 inch / 5mm intervals.)

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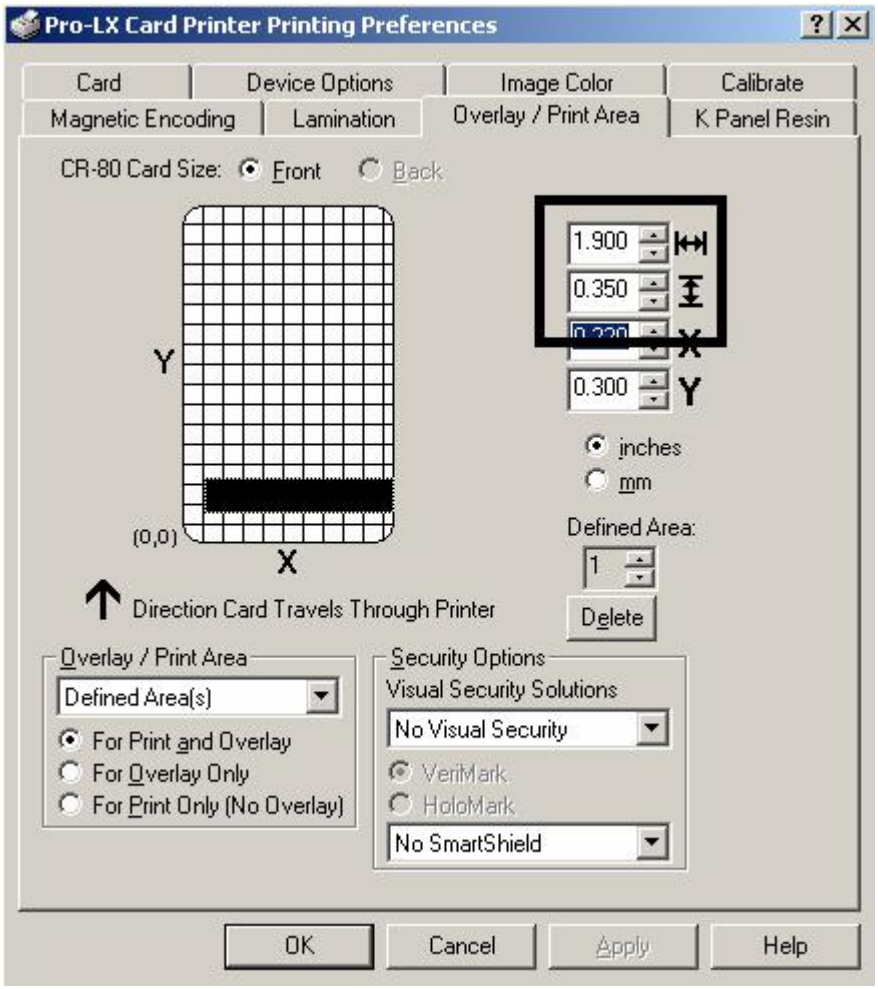


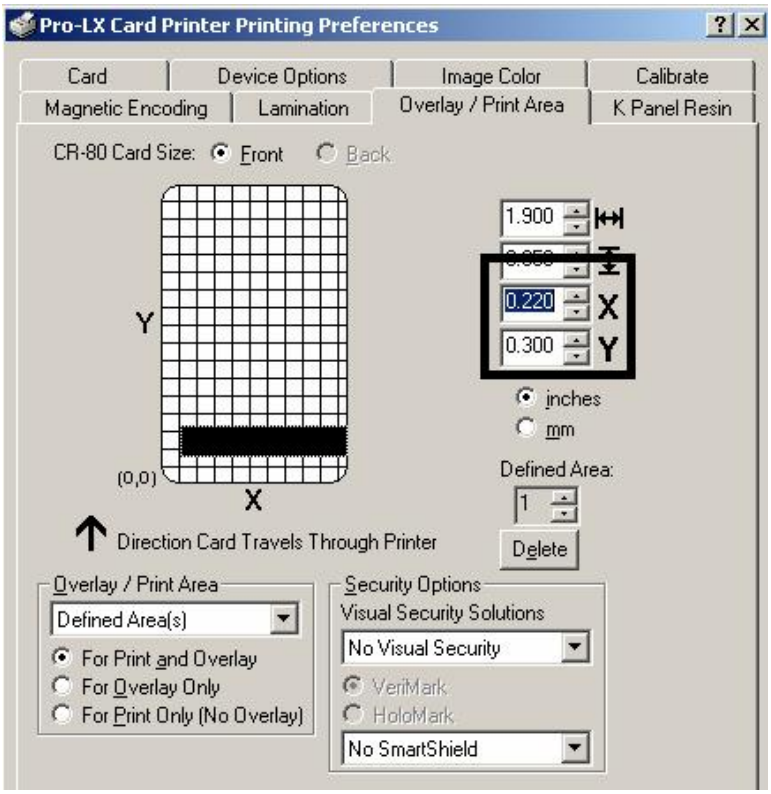
Using the Overlay / Print Area (continued)

Step	Procedure
5	a. Print the card design and observe how the image is oriented on the card as it ejects from the Printer. (**Note:** The location of a defined area is based on the card orientation as it exits the Printer.) b. Measure the defined area location based on the printed card. (**Note:** If selecting the **Rotate Front 180 Degrees** option, the image will appear upside down as it exits the Printer.) c. Position the defined area opposite to the measurement of the onscreen card design (which will appear rightside up).

Continued on the next page

Using the Overlay / Print Area (continued)

Step	Procedure
6	Use the Defined Area arrows to navigate back and forth from area to area. (**Note:** The active area will always be highlighted with a dotted outline.) a. Define another area by clicking on the Defined Area UP arrow. • Another .2" x .2" / 5mm x 5mm area will appear in the lower left-hand corner. (**Note:** This is the location in which all newly defined areas will first appear.) • Up to 5 areas can be defined; however, additional areas cannot be added until the most recently created area has been moved or sized. (**Note:** For this reason, size and position each area as it is created.) b. Define areas for both the Front and Back sides (as needed) if printing onto both sides of the card. c. Delete an area by using the Defined Area arrows to select the area and click on the **Delete** button. (**Note:** If all areas are deleted, the **K Panel Resin** options will automatically be deselected.)

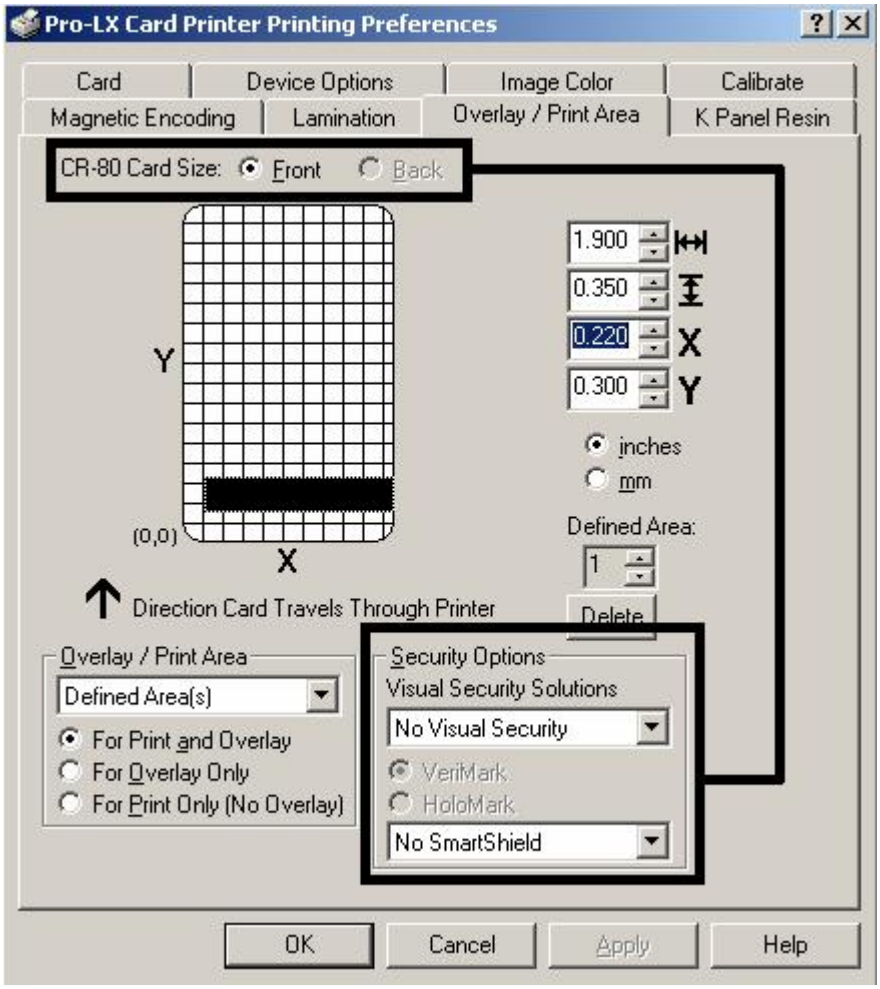


Using Security Options (Visual Security Solutions)

The Visual Security Solutions dropdown menu list will be used to enable and select which type of visual security will be used. The Visual Security dropdown list will be selectable only on the Front side (see below). Visual Security is not an option for the back side.

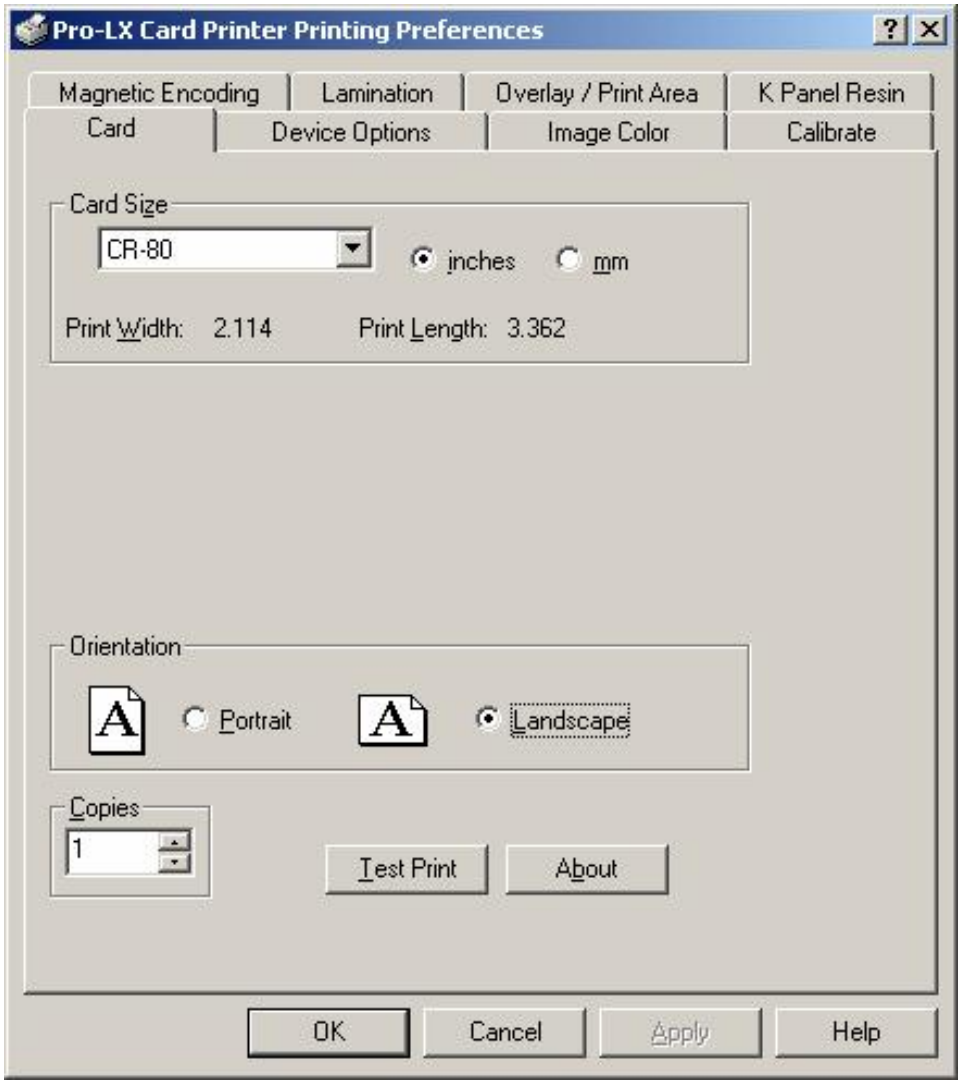
The following actions will occur when one of the Visual Security locations is selected.

- The Overlay / Print Area will be disabled.
- SmartShield will be disabled.
- The Foil Options become selectable.



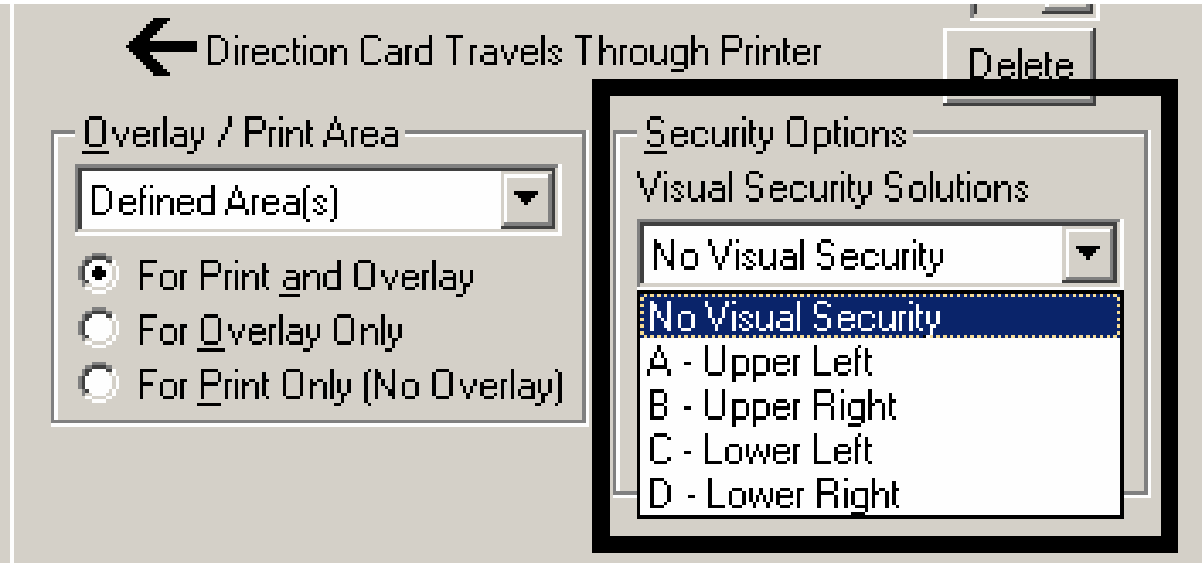
Selecting Orientation - Landscape under Card tab

Step	Procedure
1	Select the Landscape radio button (below) under Orientation under the Card Size tab to use the Visual Security Solutions (A to D), as shown in this window.



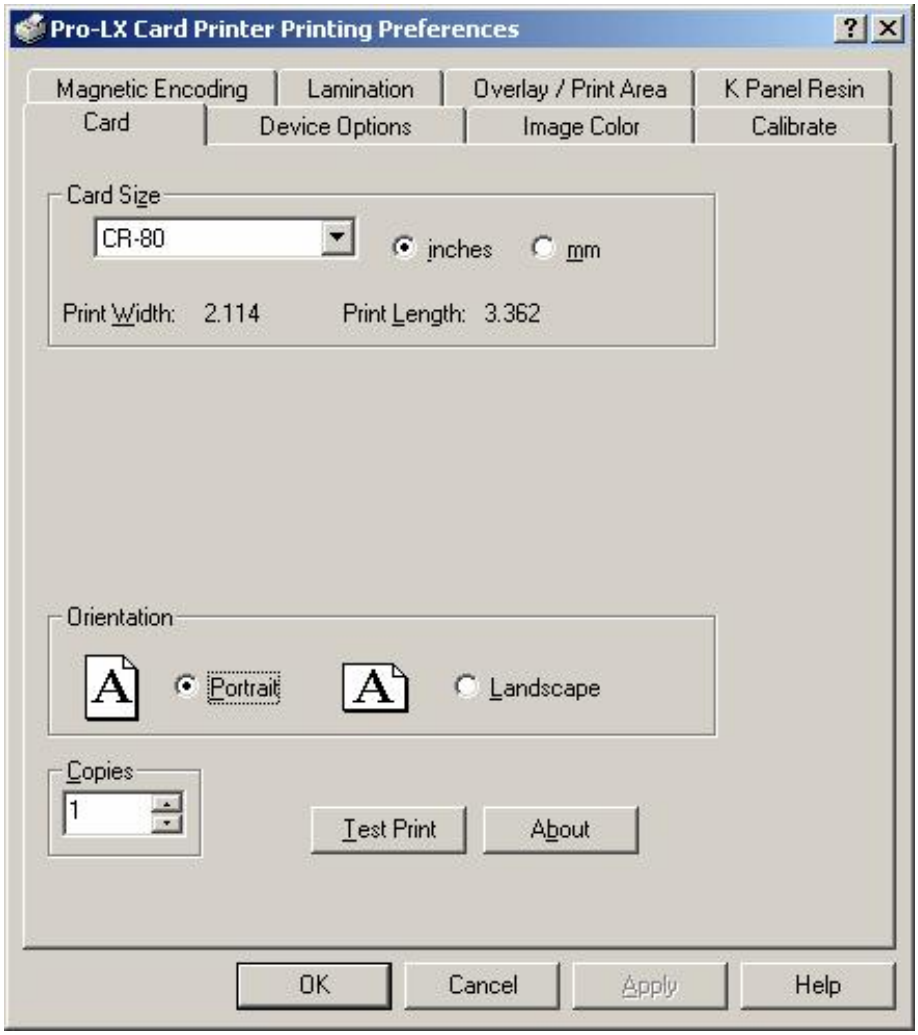
Selecting the Visual Security Solutions dropdown menu (A to D)

Step	Procedure
1	Click on the Visual Security Solutions dropdown menu (below) under the Landscape - Orientation (see above) to use the options shown in this display.



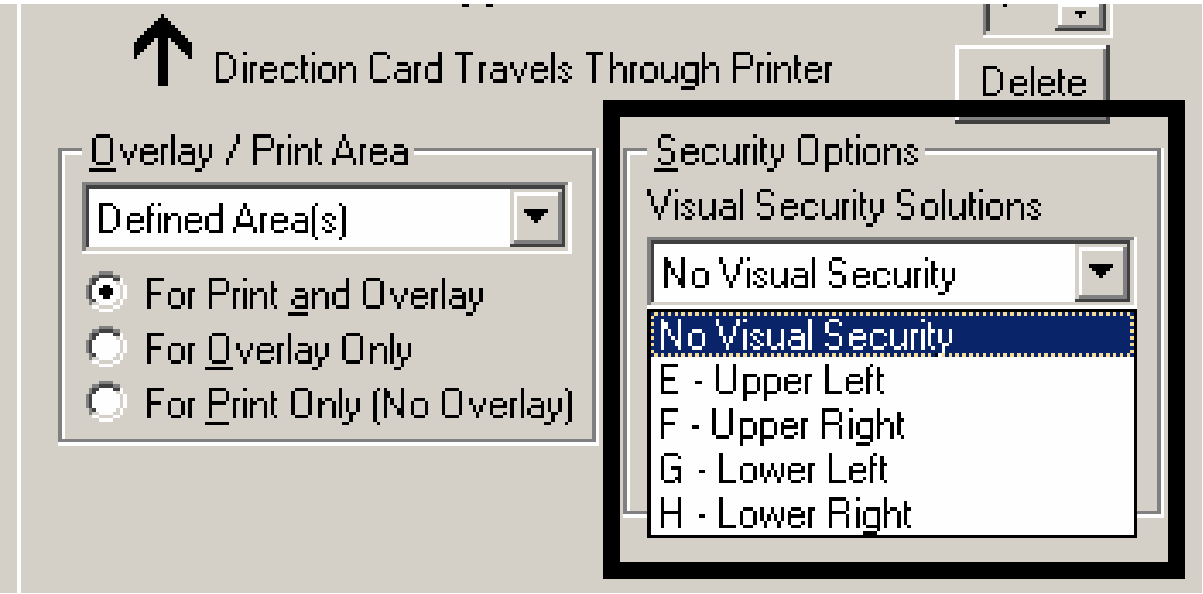
Selecting Orientation - Portfolio under Card tab

Step	Procedure
1	Select the Portrait radio button (below) under Orientation under the Card Size tab to use the Visual Security Solutions (E to H), as shown in this window.



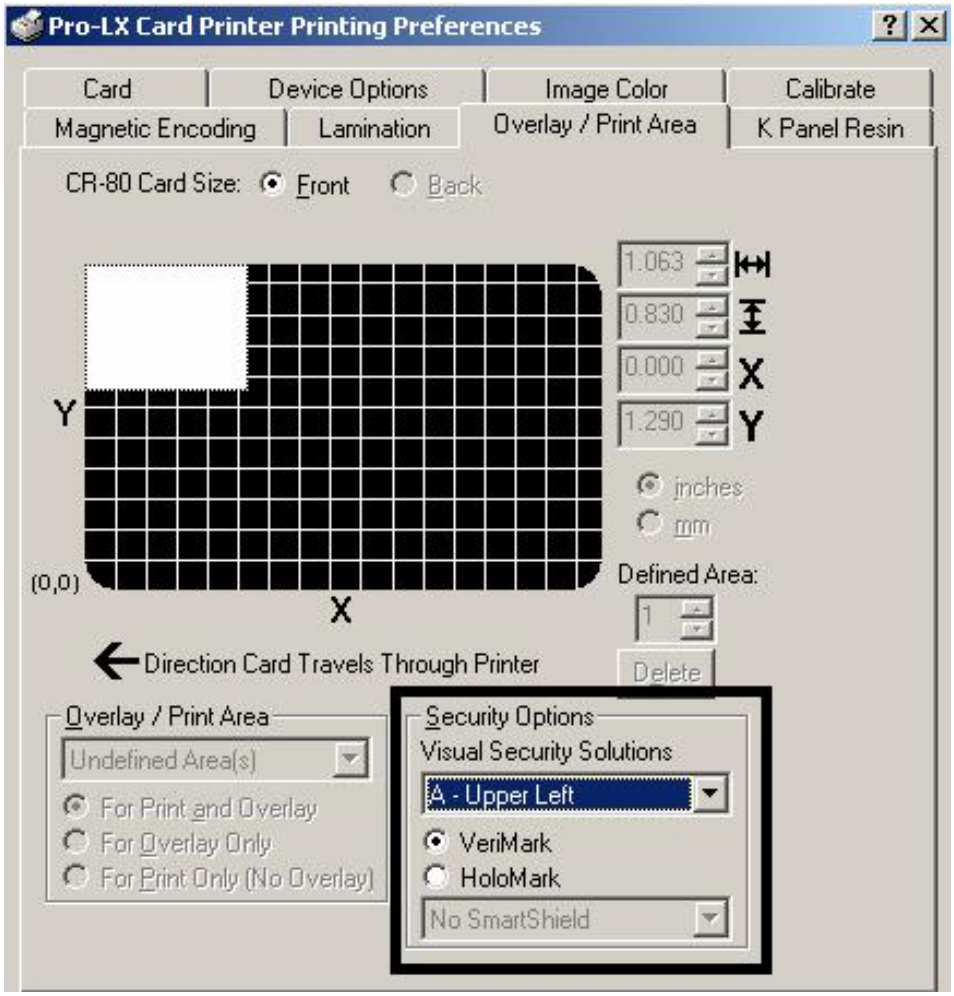
Selecting the Visual Security Solutions dropdown menu (E to H)

Step	Procedure
1	Click on the Visual Security Solutions dropdown menu under the Portrait - Orientation (see above) to use the options shown below.



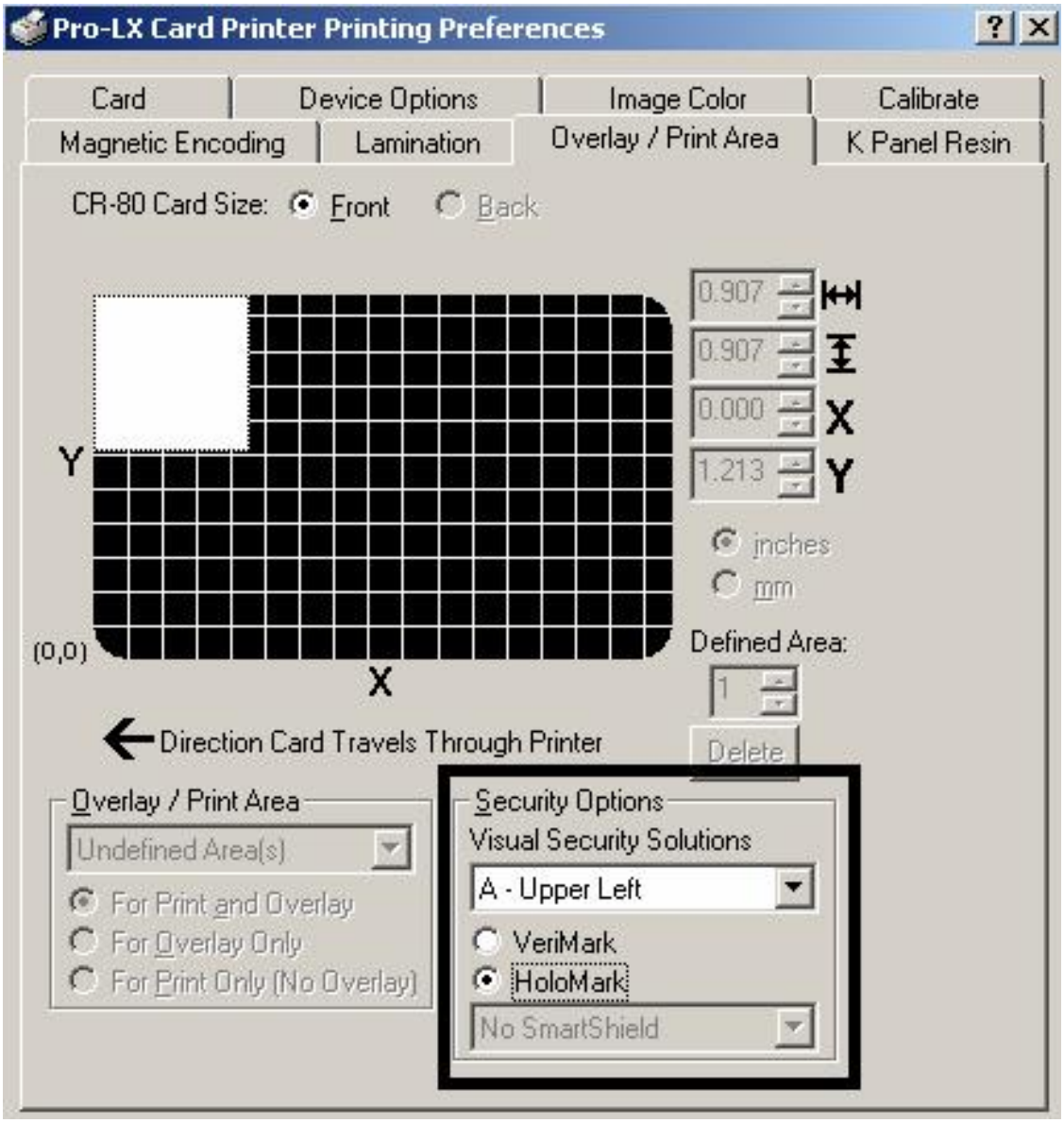
Selecting the VeriMark radio button

Step	Procedure
1	Click on either the **VeriMark** or **HoloMark** radio button, as shown below. The foil options are used to control the size of the exclusion area. (**Note:** When VeriMark is selected a rectangle-sized area is excluded, HoloMark uses a square sized area.)
2	Click on the **VeriMark** radio button (below) for the rectangle-sized area.



Selecting the HoloMark radio button

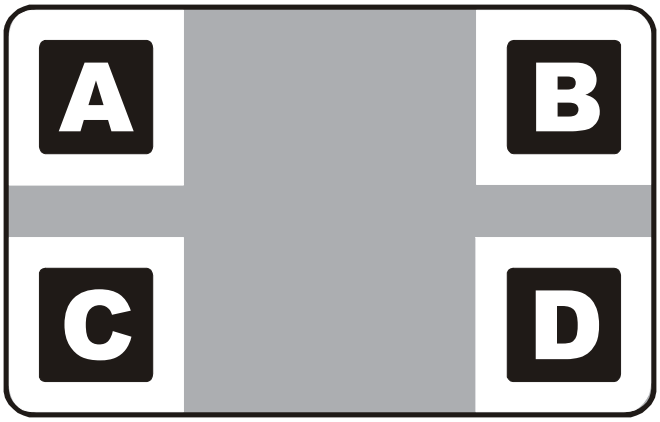
Step	Procedure
1	Click on the **HoloMark** radio button (below) for the squared-area size.



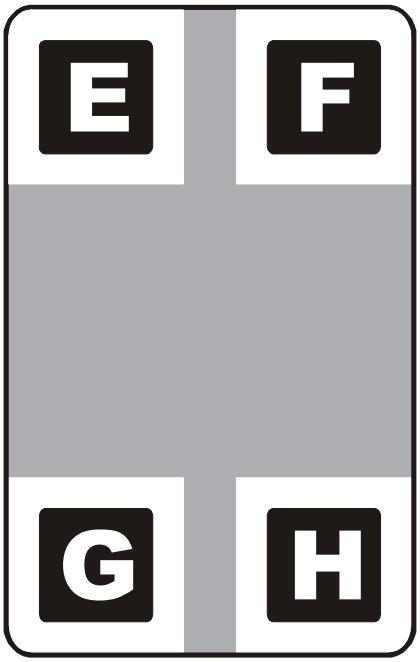
Reviewing the Custom VeriMark Card (Custom Graphic in a 2D foil)

The custom VeriMark image is stamped on blank, standard-sized cards. You can select one of eight positions (A to H), as shown in the Portrait and Landscape samples below.

Sample 1: VeriMark Card (Landscape - Orientation) - 4 positions (below)



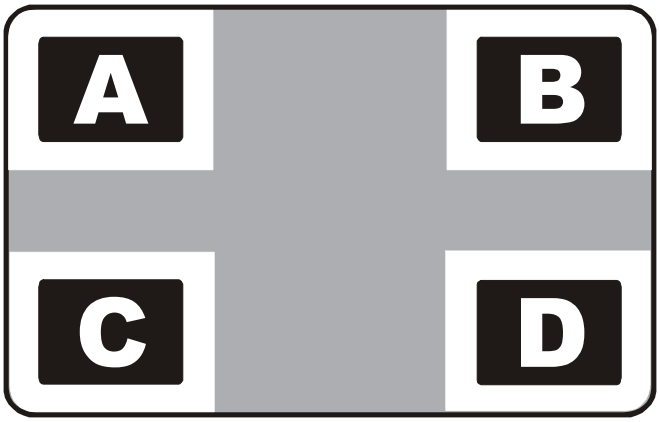
Sample 2: VeriMark Card (Portrait - Orientation) - 4 positions (below)



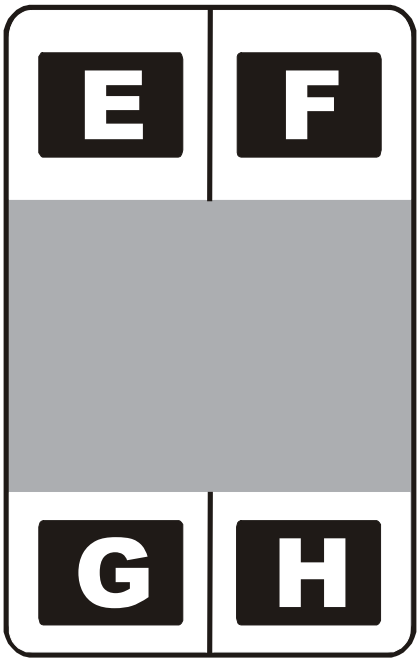
Reviewing the Custom HoloMark Card (Custom Graphic in a 2D foil)

The custom HoloMark image is stamped on blank, standard-sized cards. You can select one of eight positions (A to H), as shown in the Portrait and Landscape samples below.

Sample 1: HoloMark Card (Landscape - Orientation) - 4 positions (below)



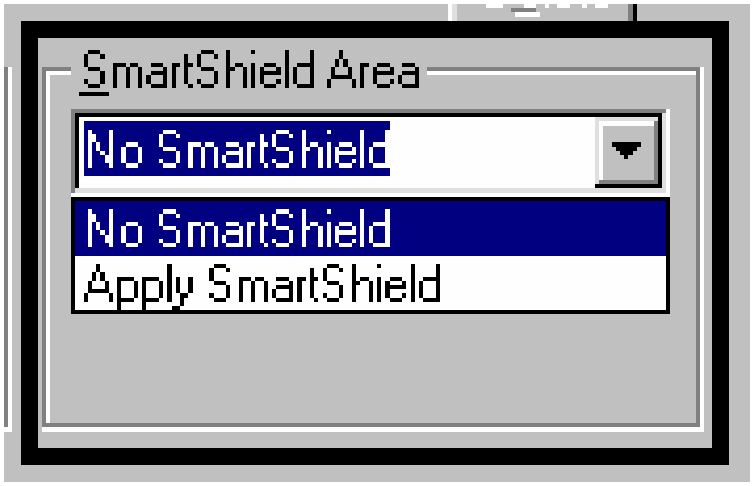
Sample 2: HoloMark Card (Portrait - Orientation) - 4 positions (below)



Using SmartShield Area dropdown menu

Use the SmartShield Area options, which apply only if using the Printer's optional SmartGuard Security Feature and the SmartShield option is enabled.

Step	Procedure
1	Select the **Apply SmartShield** option to print the custom SmartShield Security Image if using the Printer's optional SmartGuard Security Feature and the SmartShield option is enabled. (**Note:** Use the **Front** and **Back** options at the top of this tab to designate the side or sides of the card to print the SmartShield image.) **OR** Select **No SmartShield** if not using the SmartShield option or if not printing the SmartShield image even if it is encoded on the SmartGuard Access Card. (**Note #1:** This is a convenient way of turning the SmartShield Security Feature ON or OFF.) (**Note #2:** It is not possible to apply an overlay and a SmartShield image to the same side of a card.



Using the Image Color tab

Select the **Algebraic** color matching option and then use this option to control the **Contrast** and **Gamma** of the printed image, as well as the individual color balance of **Yellow**, **Magenta** and **Cyan**. (**Note:** In most cases, the default settings of these options will suffice.)

Step	Procedure
1	Control the overall darkness and lightness of the printed image by adjusting the **Dye-Sub Intensity** slide by clicking and dragging the slide's box or by clicking on the left and right arrows. • Move the slide to the left to cause less heat to be used in the printing process, thus generating a lighter print. • Move the slide to the right to cause more heat to be used, thus generating a darker print. (**Note:** This slide only affects those images printed with dye-sublimation ribbon panels (YMC).)
2	Control the amount of heat the Printer uses when printing with the resin black panel(s) of a full-color ribbon or when printing with a resin-only ribbon by adjusting the **Resin Heat** slide. • Move the slide to the left to cause less heat to be used in the printing process, causing resin images to be lighter or less saturated. • Move the slide to the right to cause more heat to be used, causing resin images to be darker or more saturated. (**Note:** This control can be helpful for fine-tuning the saturation of resin text and bar codes.)
3	Select the **Algebraic color matching** option to display and adjust (as needed) all control options. **OR** Select the **None or Monitor** option to display only the Dye-Sub Intensity and Resin Heat sliders.
4	Return all options to their factory settings by clicking on the **Default** button.

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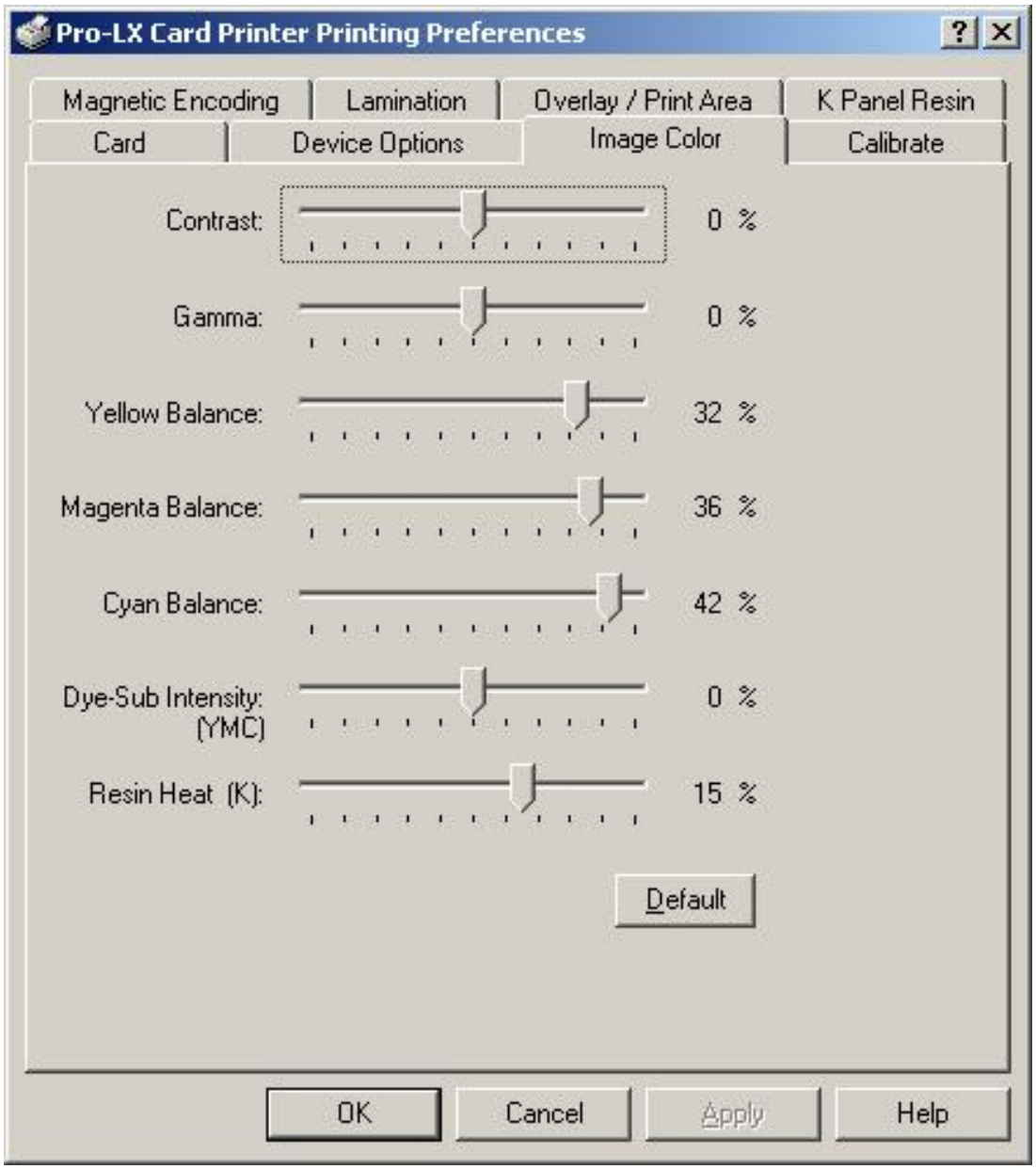
Image Color Tab (continued)

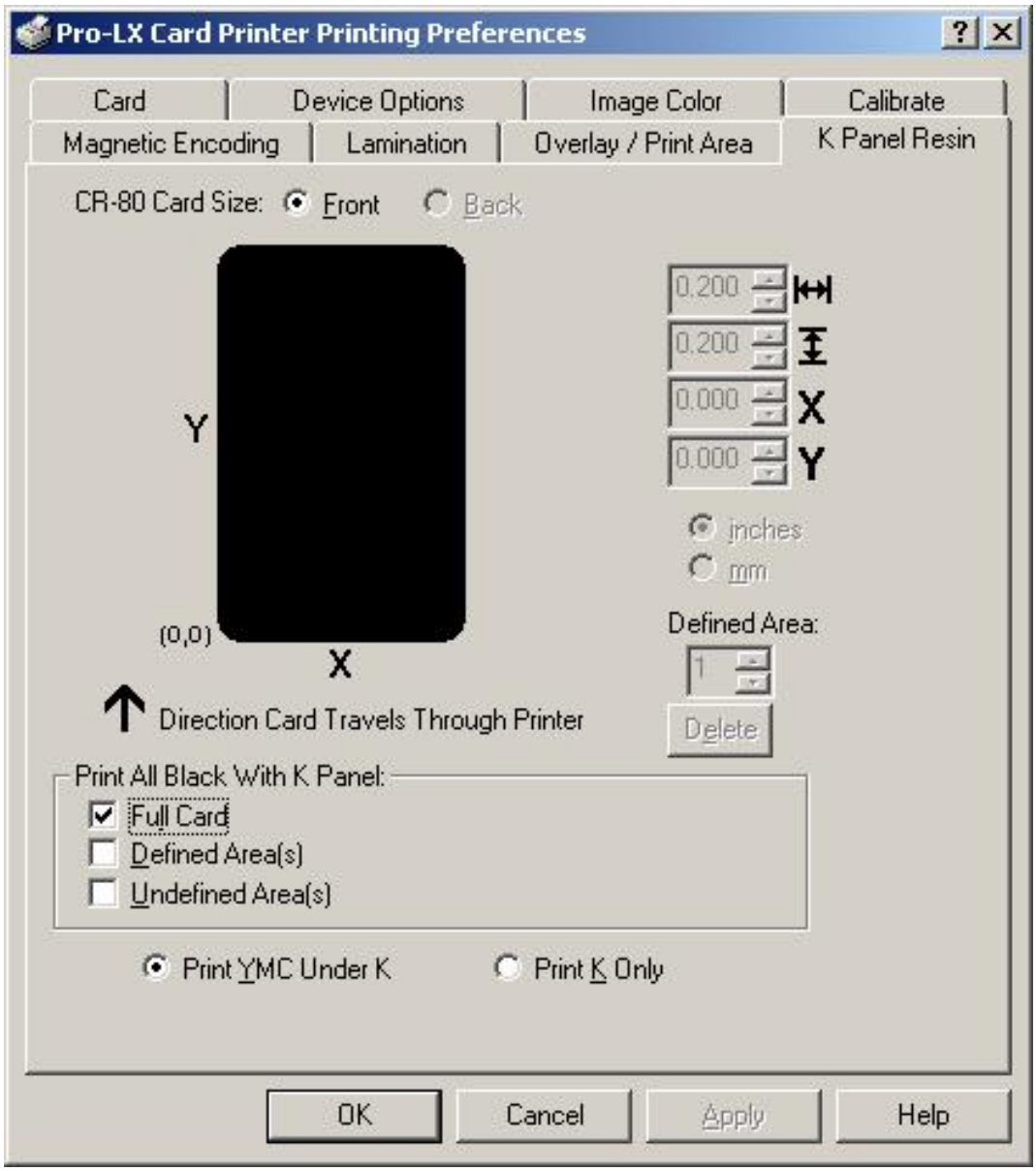
Refer to the previous procedure.



Using the K Panel Resin tab

Select the **K Panel Resin** option to control where the resin black (K) panel of a full-color ribbon is printed.

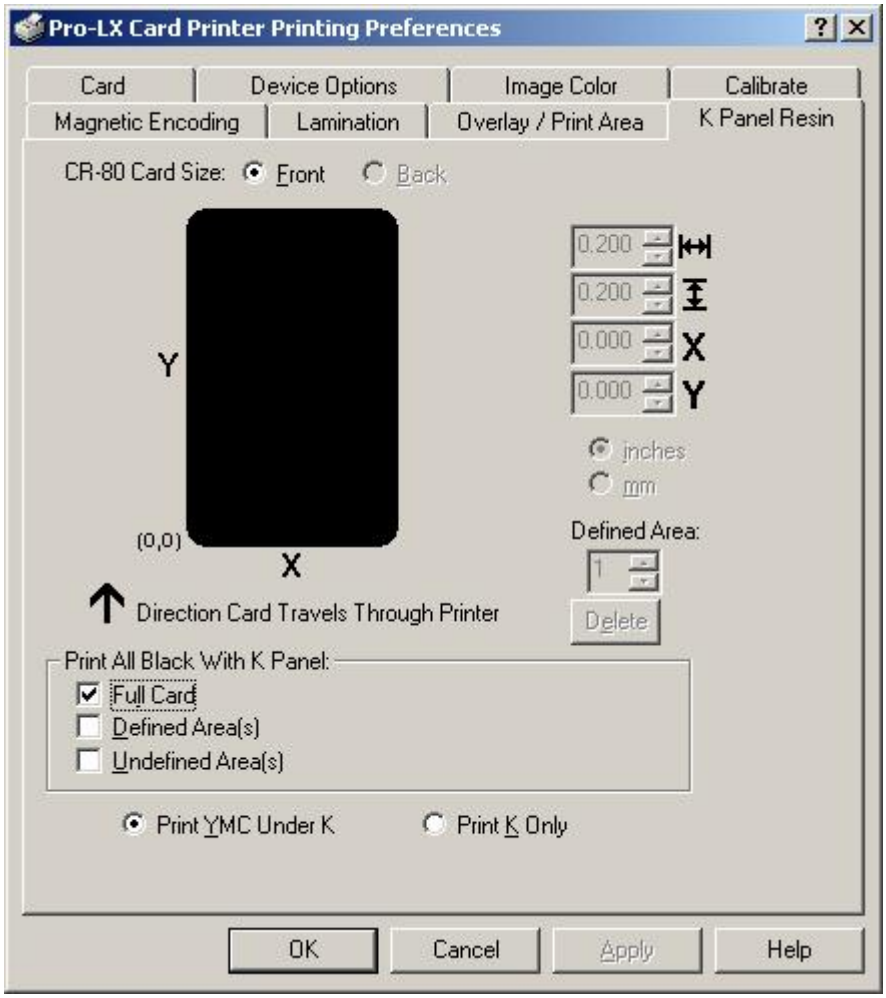
- If printing with a resin-only ribbon type or a ribbon type that does not have a K panel, all K Panel Resin options will be grayed out.
- Resin black text is desirable due to its sharp, saturated black coloring and resin black bar codes are often required to ensure readability when scanned.)



Selecting from the Print All Black With K Panel options

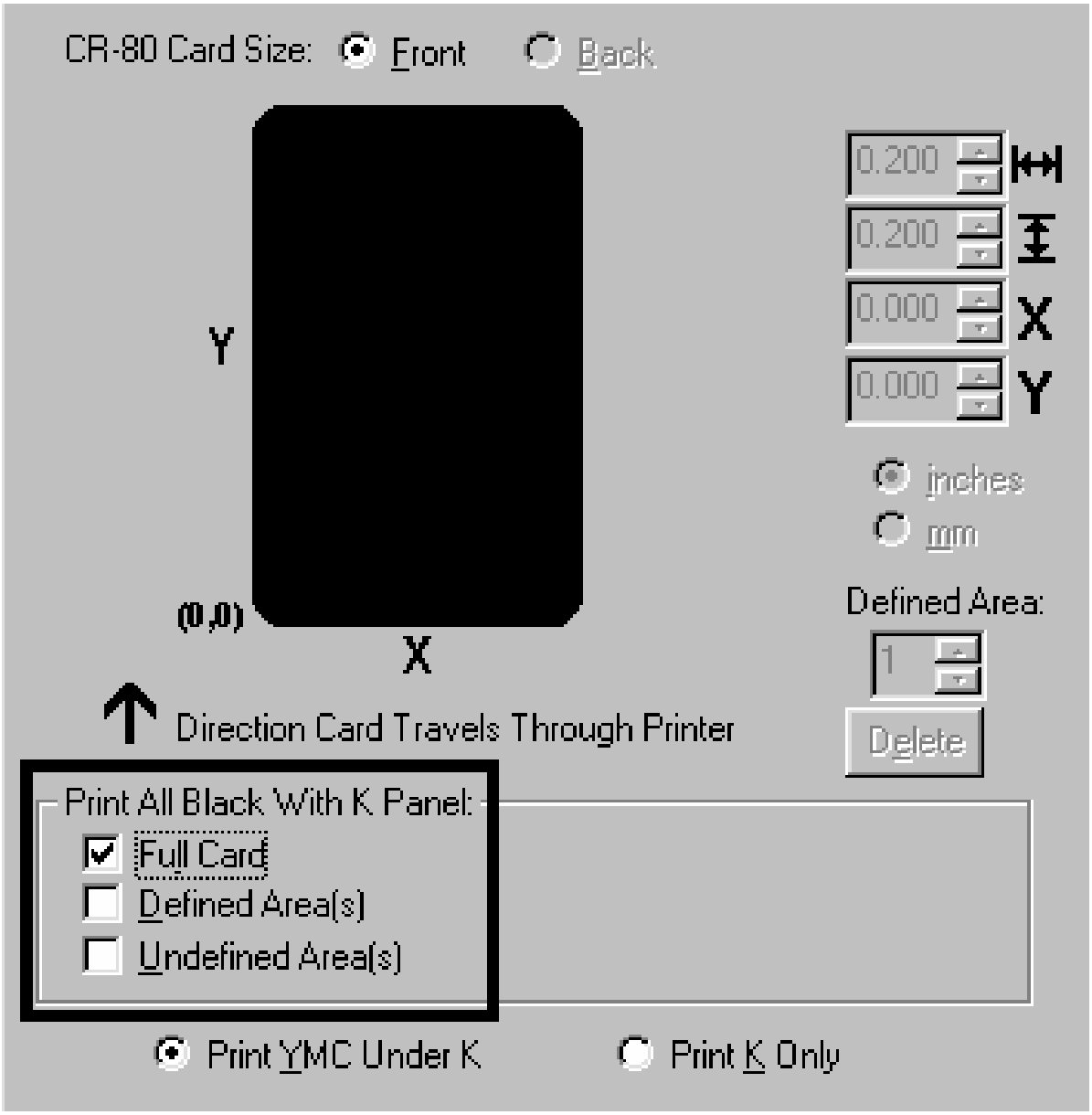
When none of the options within this window are selected, the Printer Driver will automatically print all TrueType black text and bar codes only with the Resin Black (K) Panel of the Print Ribbon.

Step	Procedure
1	Select one of the three options listed under **Print All Black With K Panel** if the black text or bar codes are not TrueType fonts and/or are not printing with the resin black panel. (**Note:** The Printer Driver will print areas of the image where it finds black coloring with the Print Ribbon's resin black (K) panel as specified by each of the following options. See the next page.)



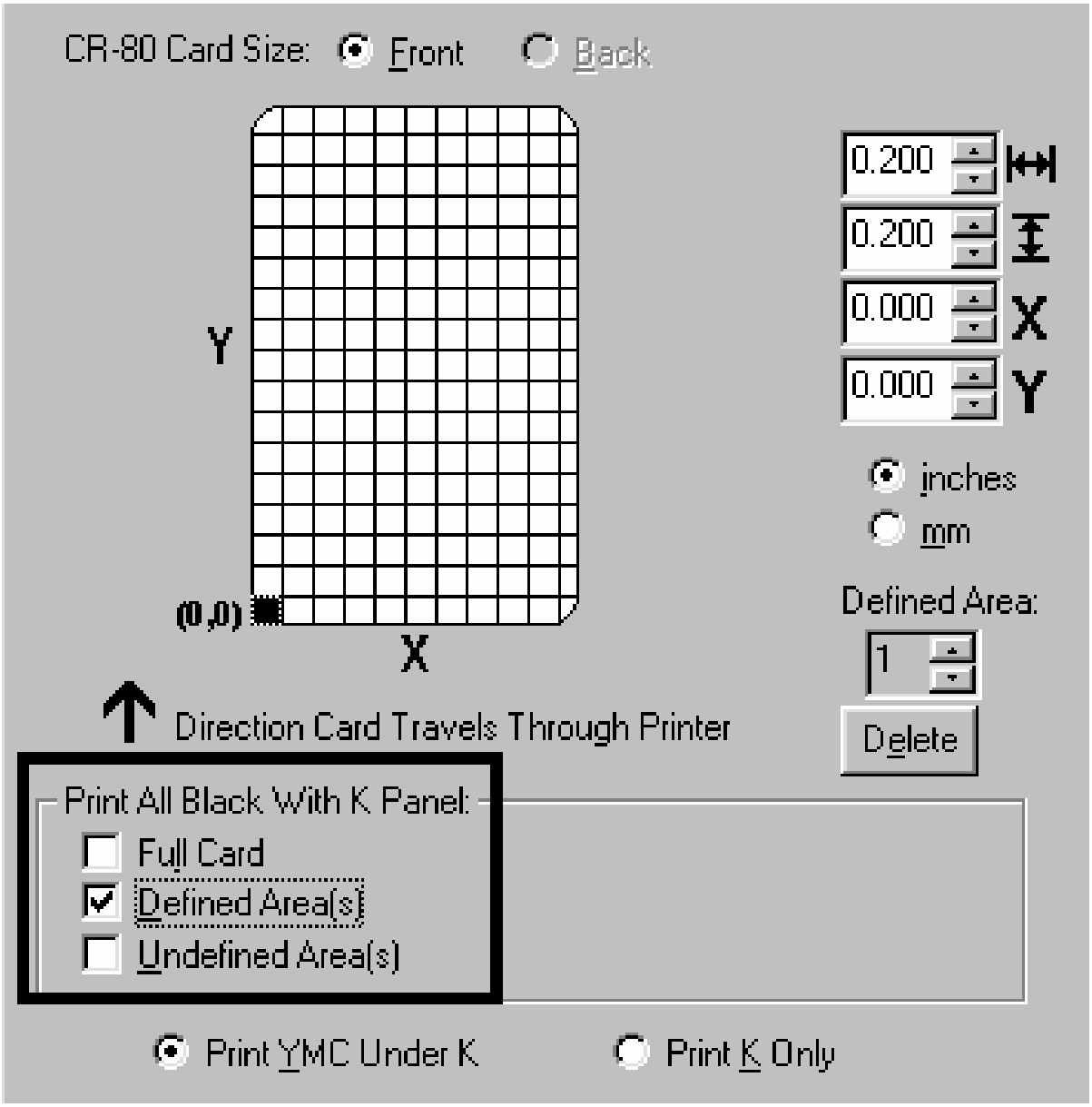
Selecting the Full Card option

Step	Procedure
1	Select the **Full Card** option for the Printer Driver to print the resin black (K) panel for all black found within all areas of the image.



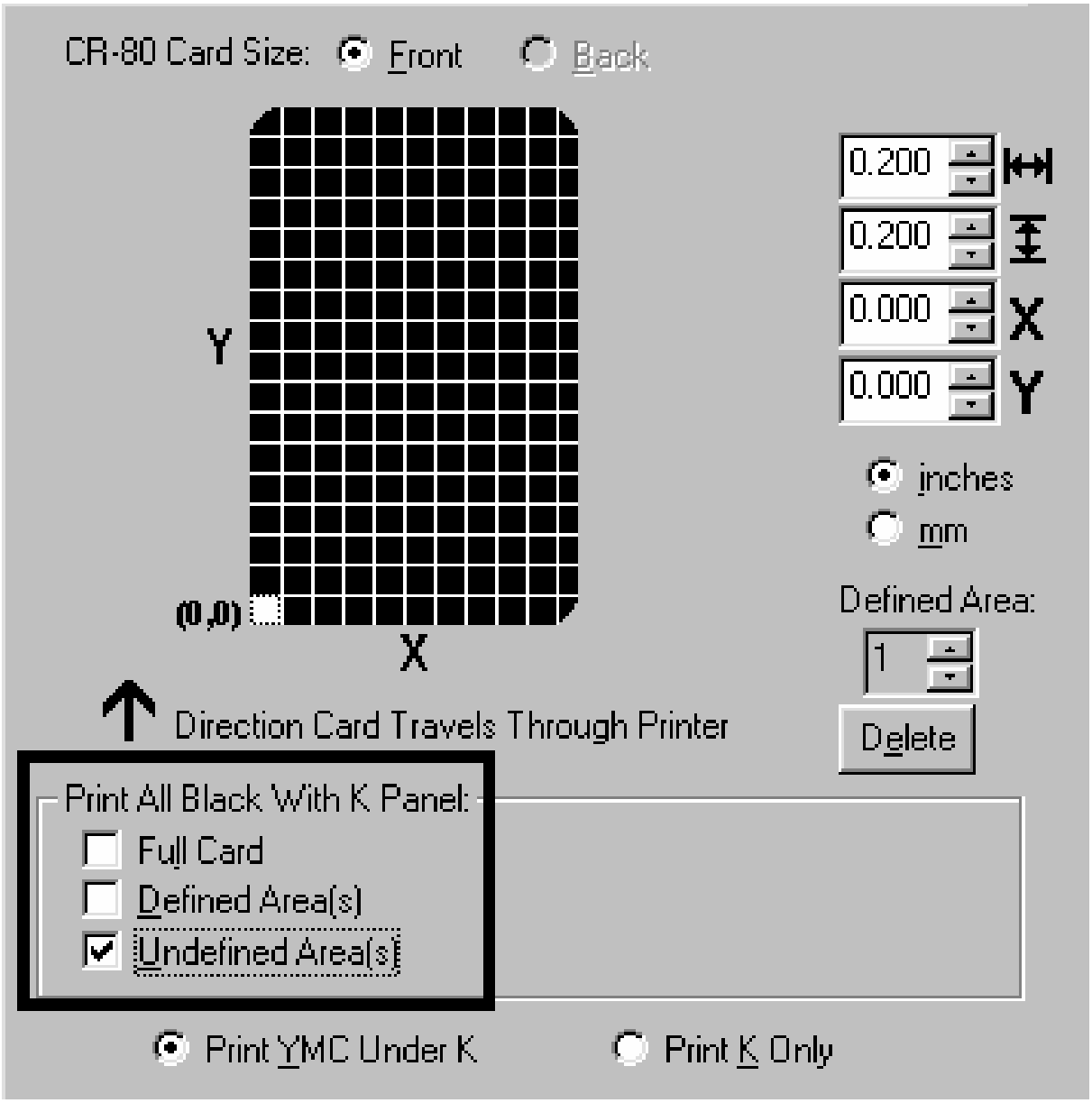
Selecting the Defined Area(s) option

Step	Procedure
1	Select the **Defined Area(s)** option for the Printer Driver to print the resin black (K) panel for all black found only in a desired and defined area or areas.



Selecting the Undefined Area(s) option

Step	Procedure
1	Select the **Undefined Area(s)** option for the Printer Driver to print the resin black (K) panel for all black found only in the space outside the defined areas. (**Note:** In the card grid, black indicates the area in which the resin black (K) panel will be printed.**)**



Using the Defined Area(s) function

To define an area, refer to the following steps:

Step	Procedure
1	Click on the **Defined Area(s)** check box. (**Note:** This will activate the card grid in the upper half of the window. It is through this card grid that up to five areas can be defined.) When the card grid is first activated, a small square will appear at its default size of .2" x .2" / 5mm x 5mm and at its default location in the lower left-hand corner (0,0). This square represents the first defined area.

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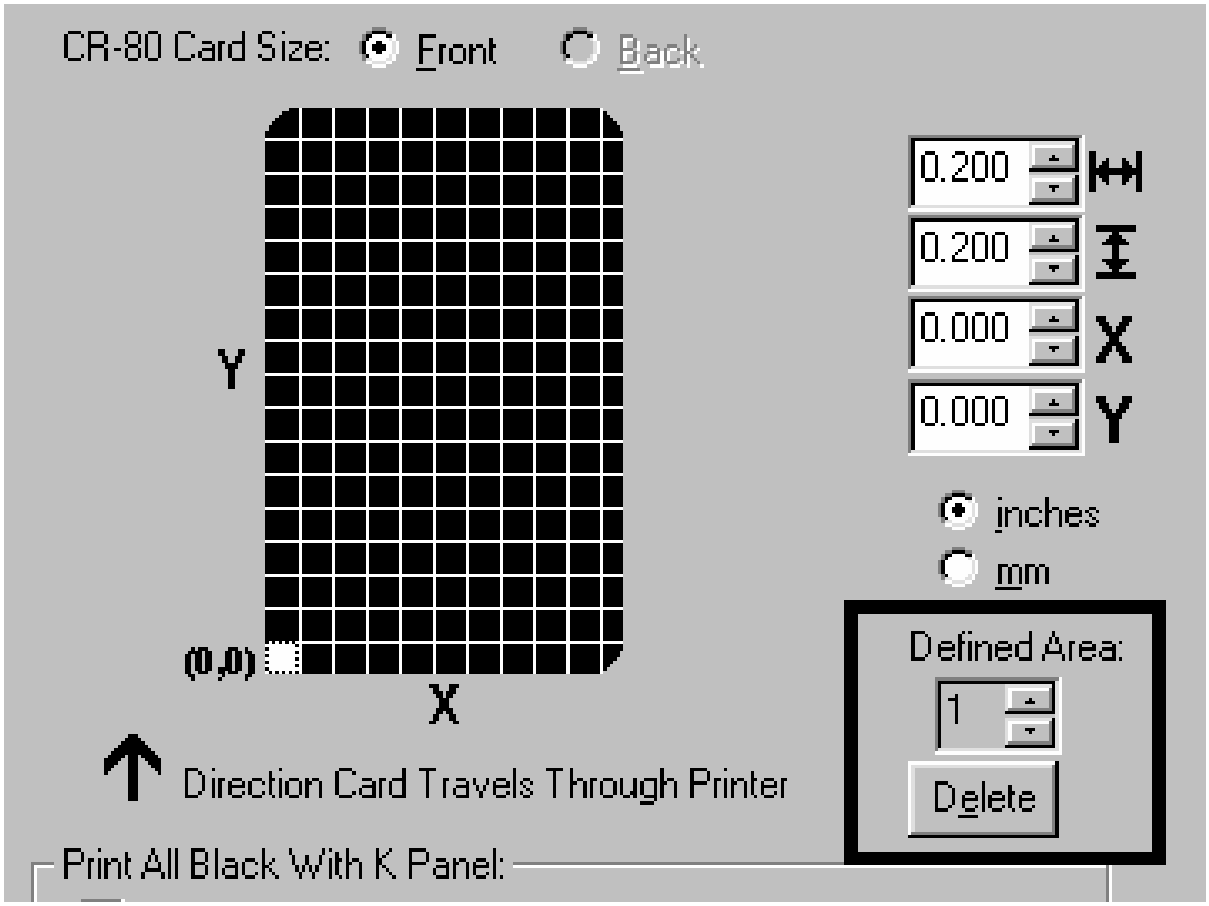
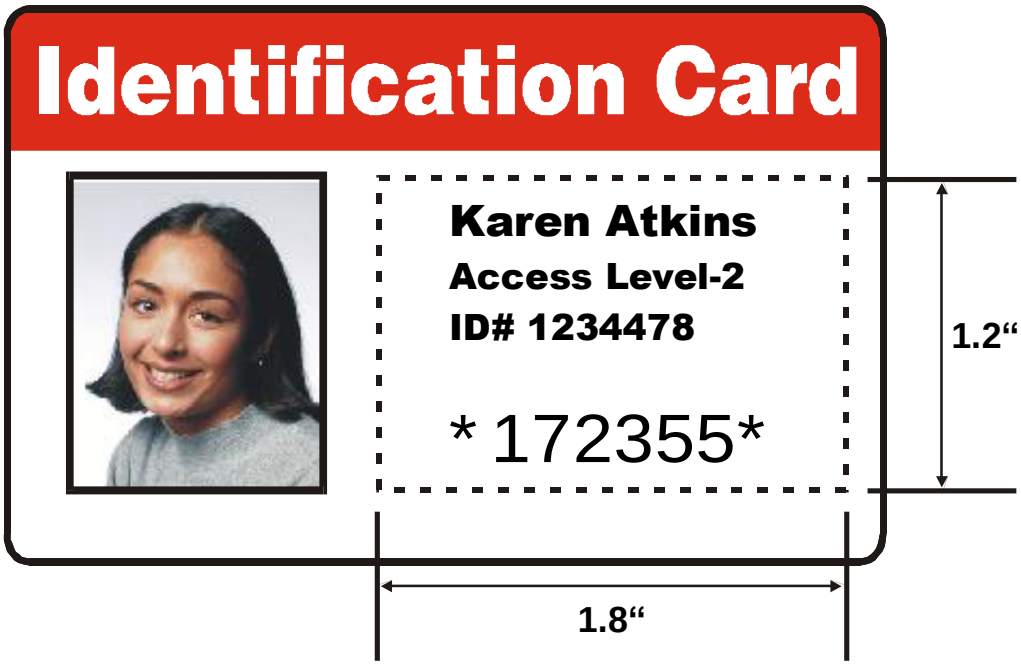


Using the Defined Area(s) function (continued)

Step	Procedure
2	a. Determine the area of the card necessary to define. In the sample (below), this area is indicated by the dashed outline. b. Determine the size of this area by actually printing a card and looking at it in the same orientation as when it exits the Printer.
3	Measure the total size for the area and enter those dimensions into the dimension boxes. (**Note:** The minimum size an area can be is .2" x .2" / 5mm x 5mm.)



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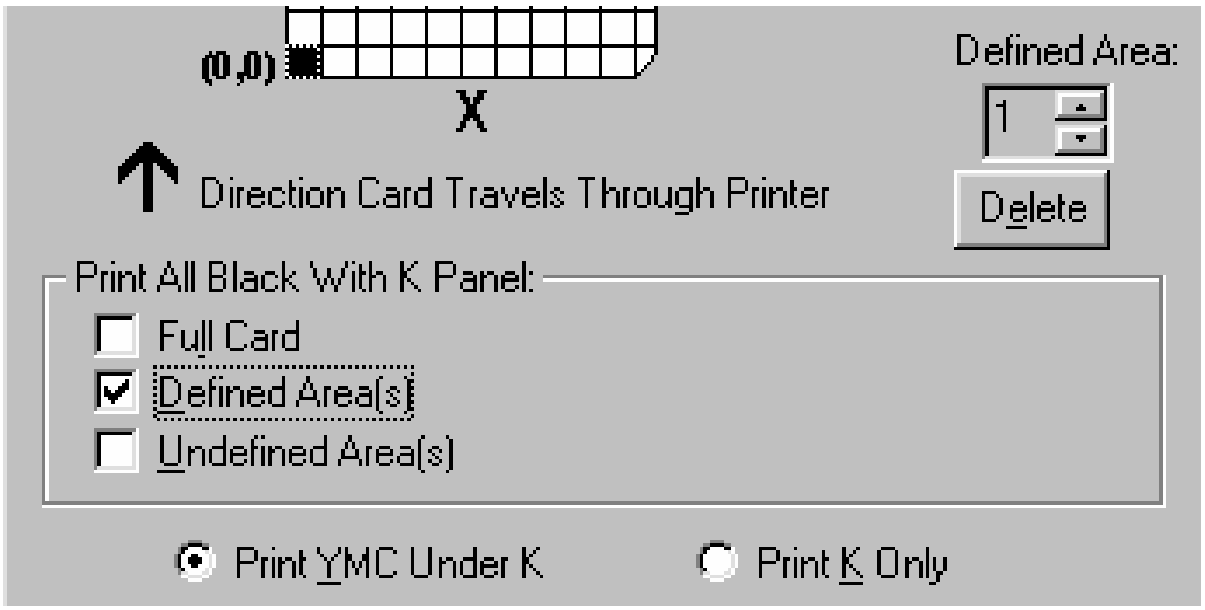
Using the Defined Area(s) function (continued)

Step	Procedure
4	Once the area is sized properly: • Measure the location for this area to be positioned on the card. • Measure from the lower left corner of the card up and over to the lower left corner for the defined area to begin and enter these values into the X and Y boxes. (**Note:** The card grid lines are spaced at .2 inch / 5mm intervals.)
5	a. Print the card design and note how the image is oriented on the card as it ejects from the Printer. (**Note:** The location of a defined area is based on the card orientation as it exits the Printer.) b. Measure the defined area location based on the printed card. (**Note:** If selecting the **Rotate Front 180 Degrees** option, the image will appear upside-down as it exits the Printer. In this case, position the defined area opposite to the measurement from the onscreen card design, which will appear right side up.)



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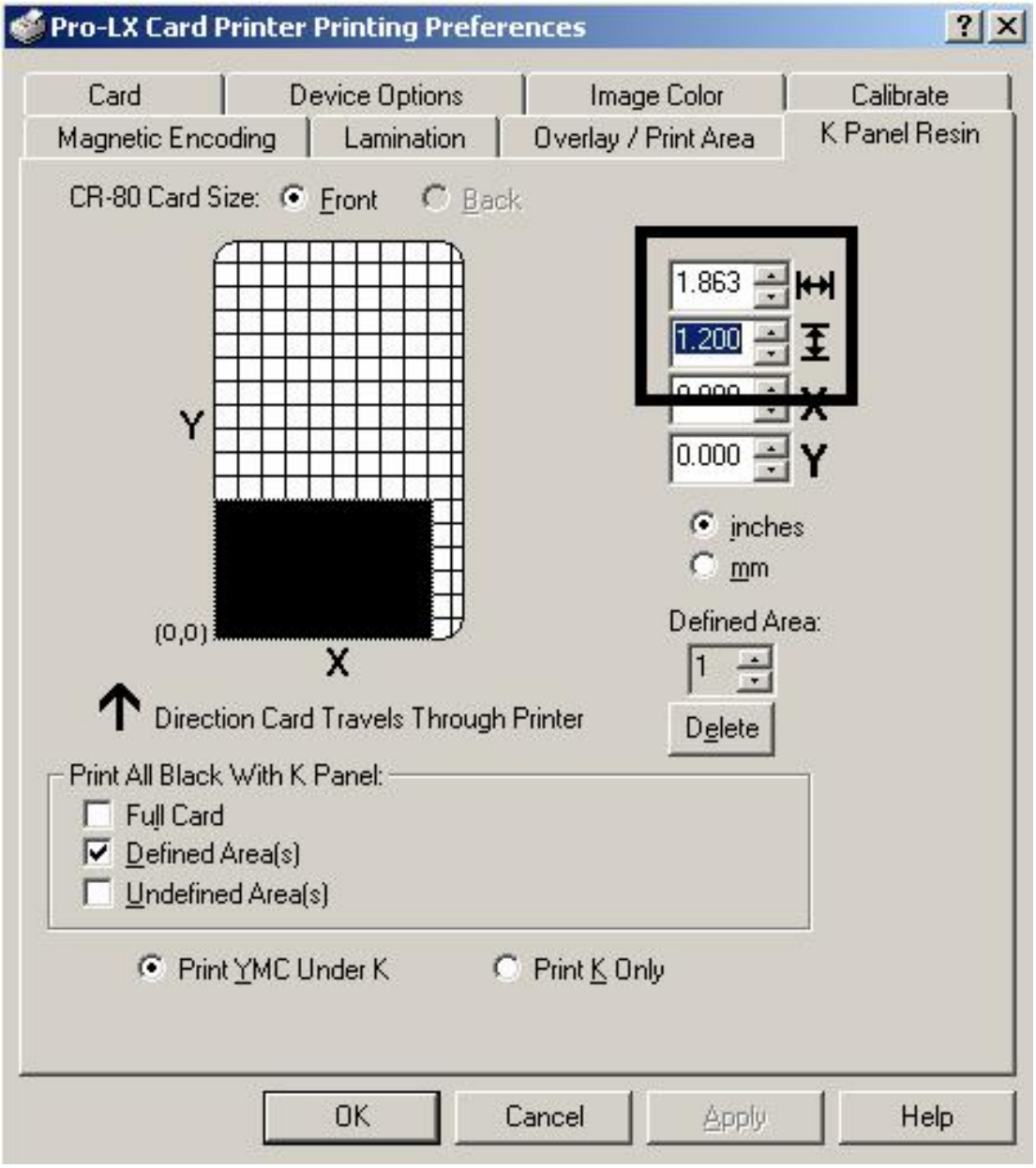
Using the Defined Area(s) function (continued)

Refer to the previous procedure.



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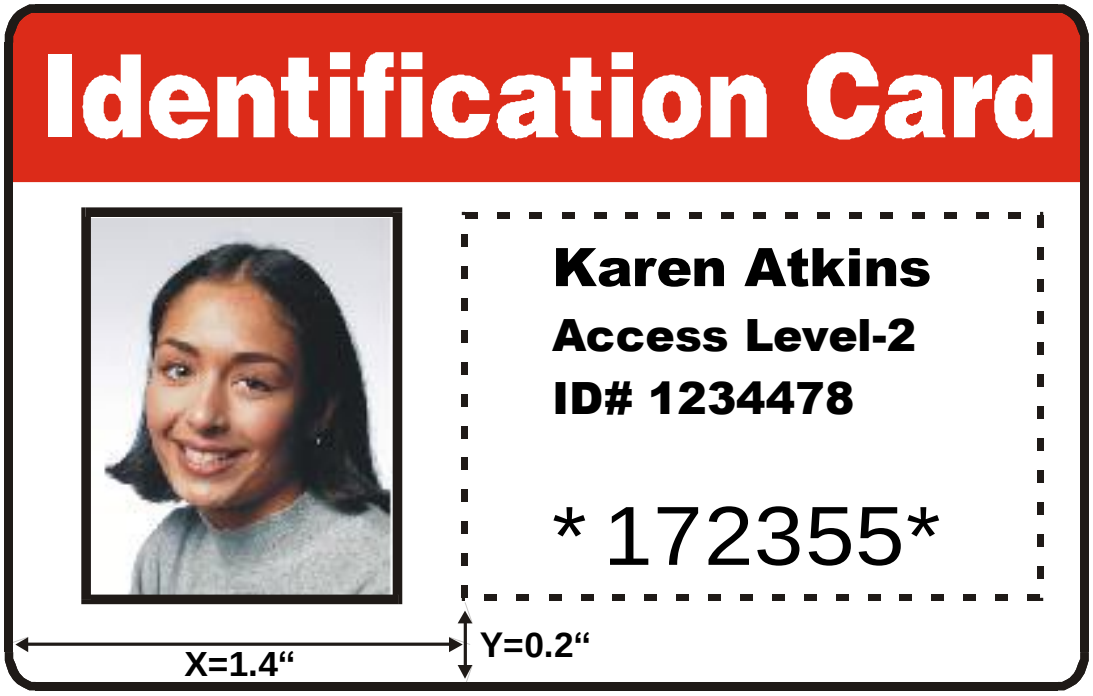
Using the Defined Area(s) function (continued)

Refer to the previous procedure.



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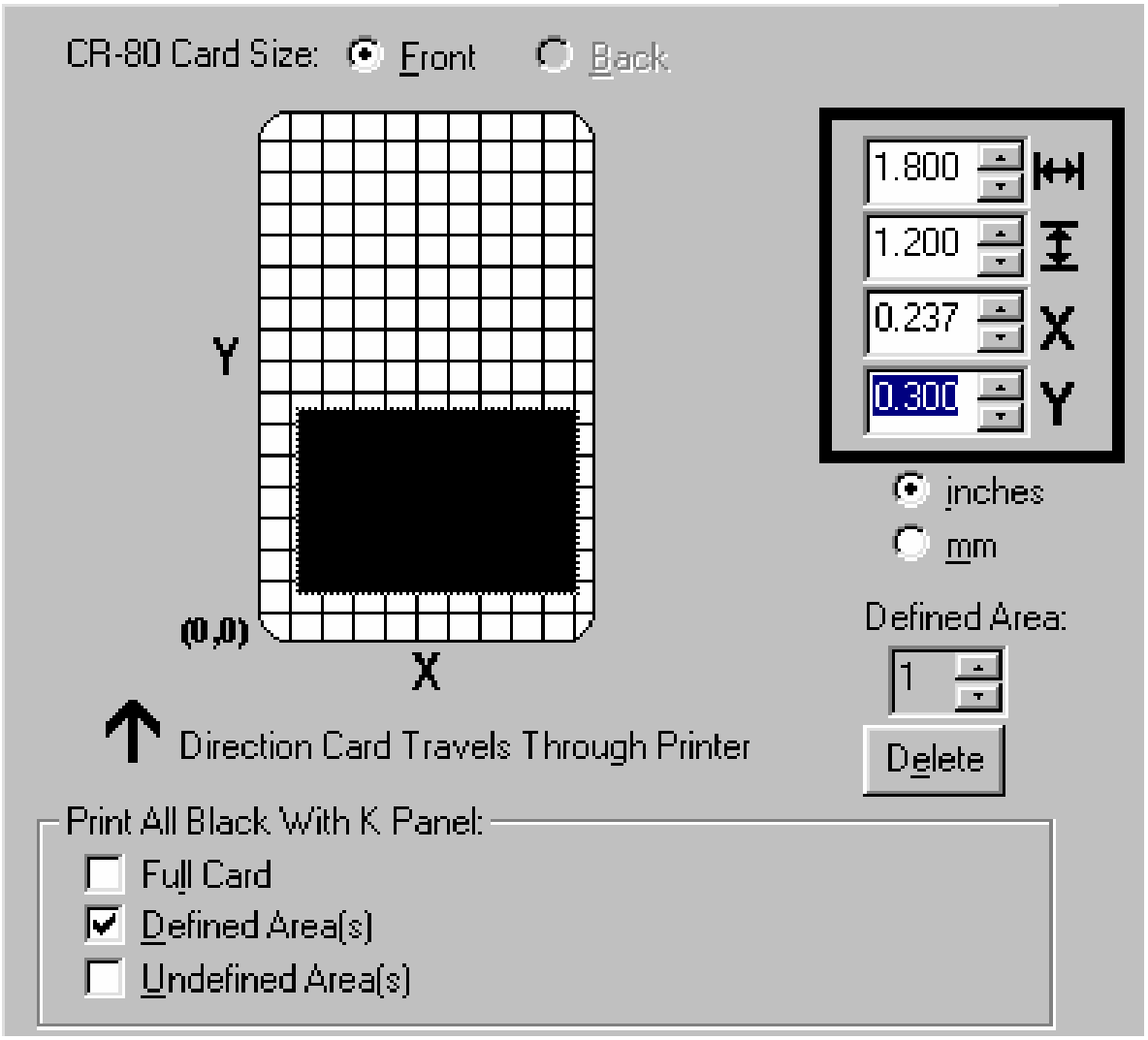
Using the Defined Area(s) function (continued)

Refer to the previous procedure.



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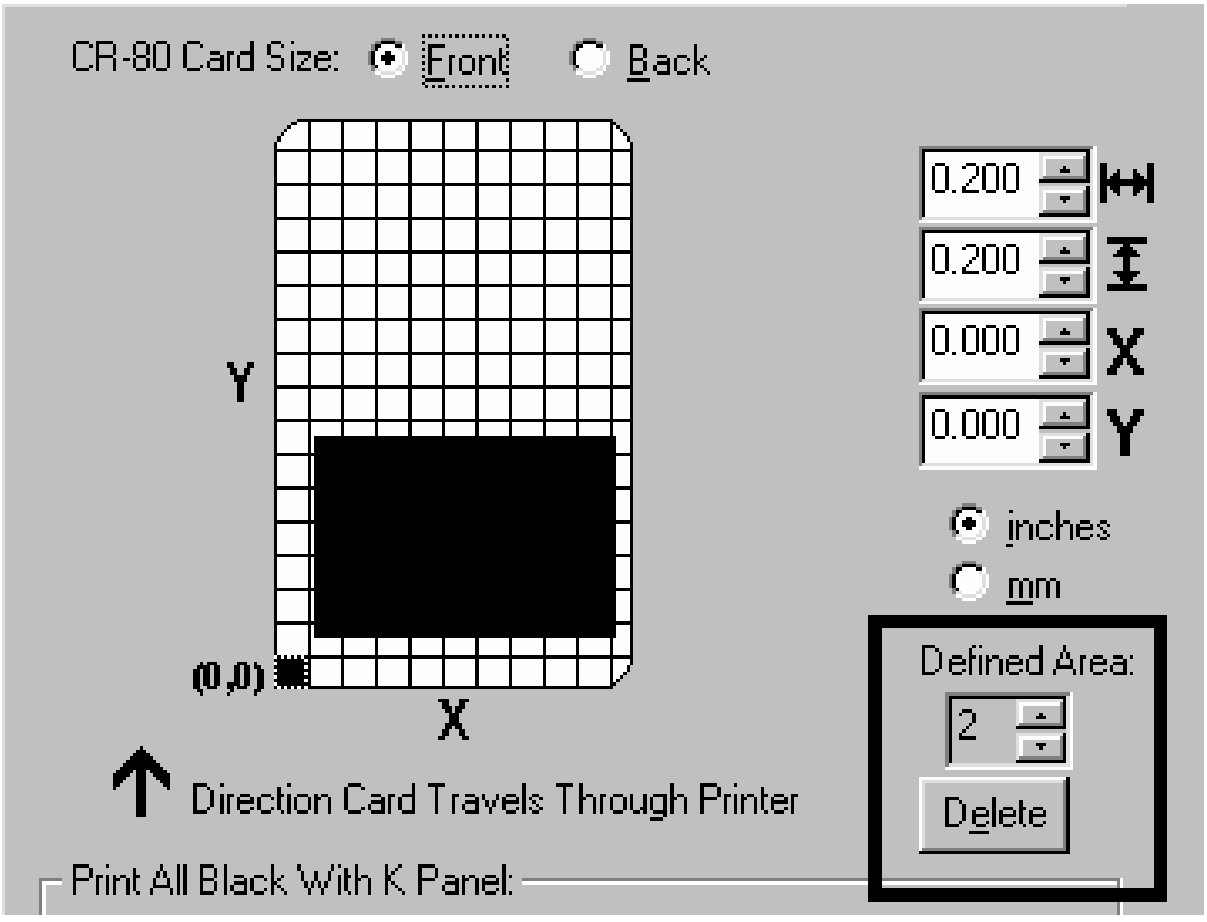
Using the Defined Area(s) function (continued)

Step	Procedure
6	Define another area by clicking on the **Defined Area** up arrow. (**Note:** Another .2" x .2" / 5mm x 5mm area will appear in the lower left-hand corner. This is the location in which all newly defined areas will first appear.)
7	a. Use the **Defined Area** arrows to navigate back and forth from area to area. (**Note:** The active area will always be highlighted with a dotted outline. Up to 5 areas can be defined.) b. Size and position each area as it is created because additional areas cannot be added until the most recently created area has been moved or sized.
8	Delete an area by using the Defined Area arrows to select the area and clicking on the **Delete** button. (**Note:** If all areas are deleted, the K Panel Resin options will automatically be deselected.)



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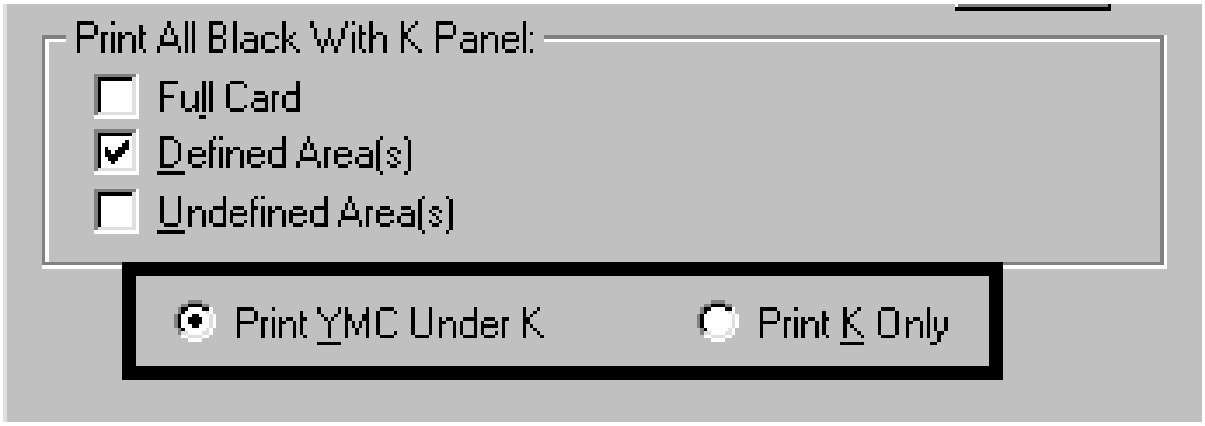
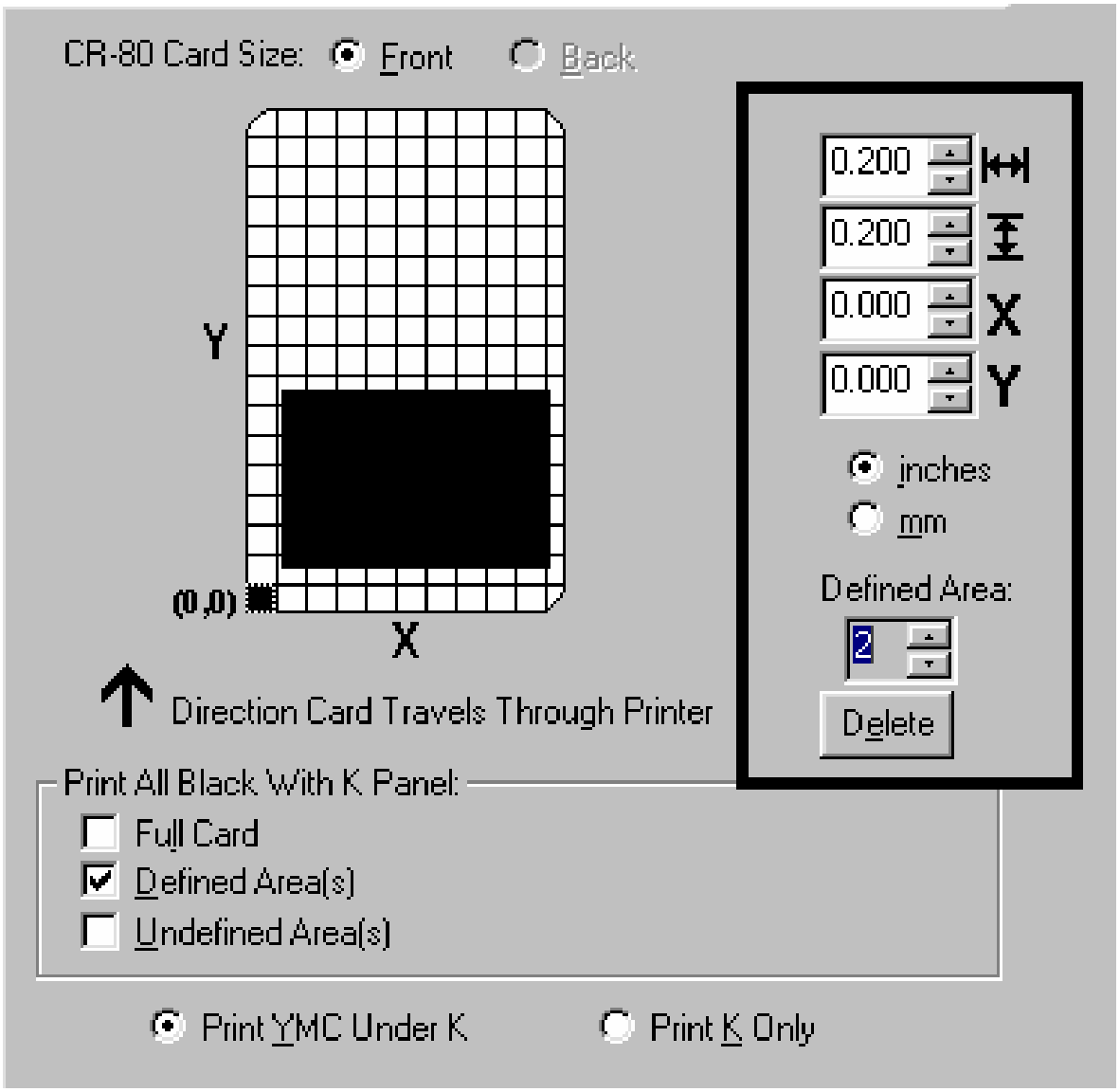
Using the Defined Area(s) function (continued)

Step	Procedure
9	a. Select between the **Print YMC Under K** and **Print K Only** options. (**Note:** When the **Print YMC Under K** option is selected, all black in the designated areas will print with the Yellow (Y), Magenta (M) and Cyan (C) ribbon panels directly beneath the resin black (K) panel.) b. Select this option if printing resin black text or bar codes onto a colored background to provide a more gradual transition between the two.
10	Select the **Print K Only** option if printing resin black onto a white background to maximize the sharpness of printed text and bar codes. (**Note:** When this option is selected, all black in the designated areas will print only with the resin black (K) panel.)



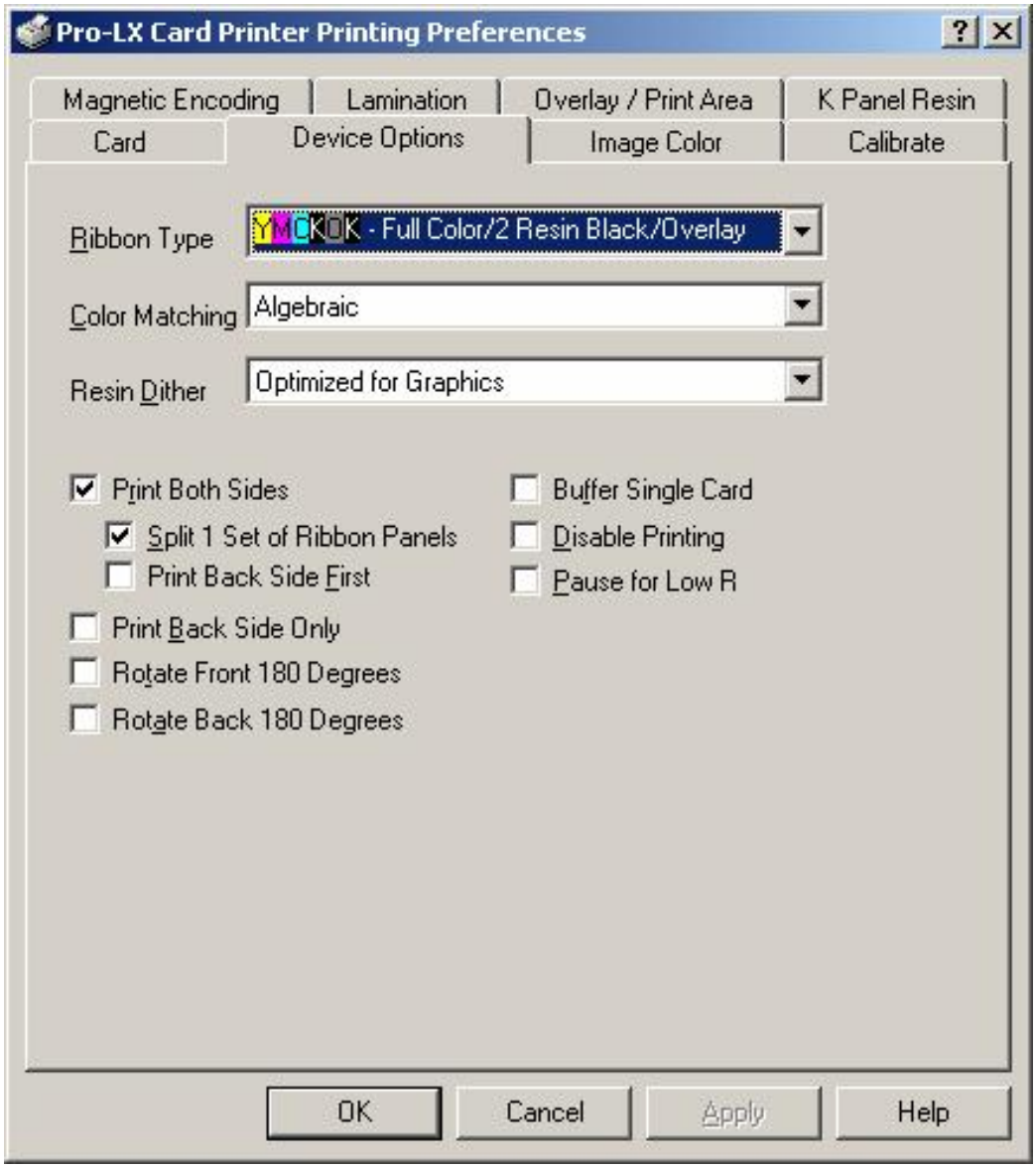
Using the Defined Area(s) function (continued)

Refer to the previous procedure.



Using the Device Options tab

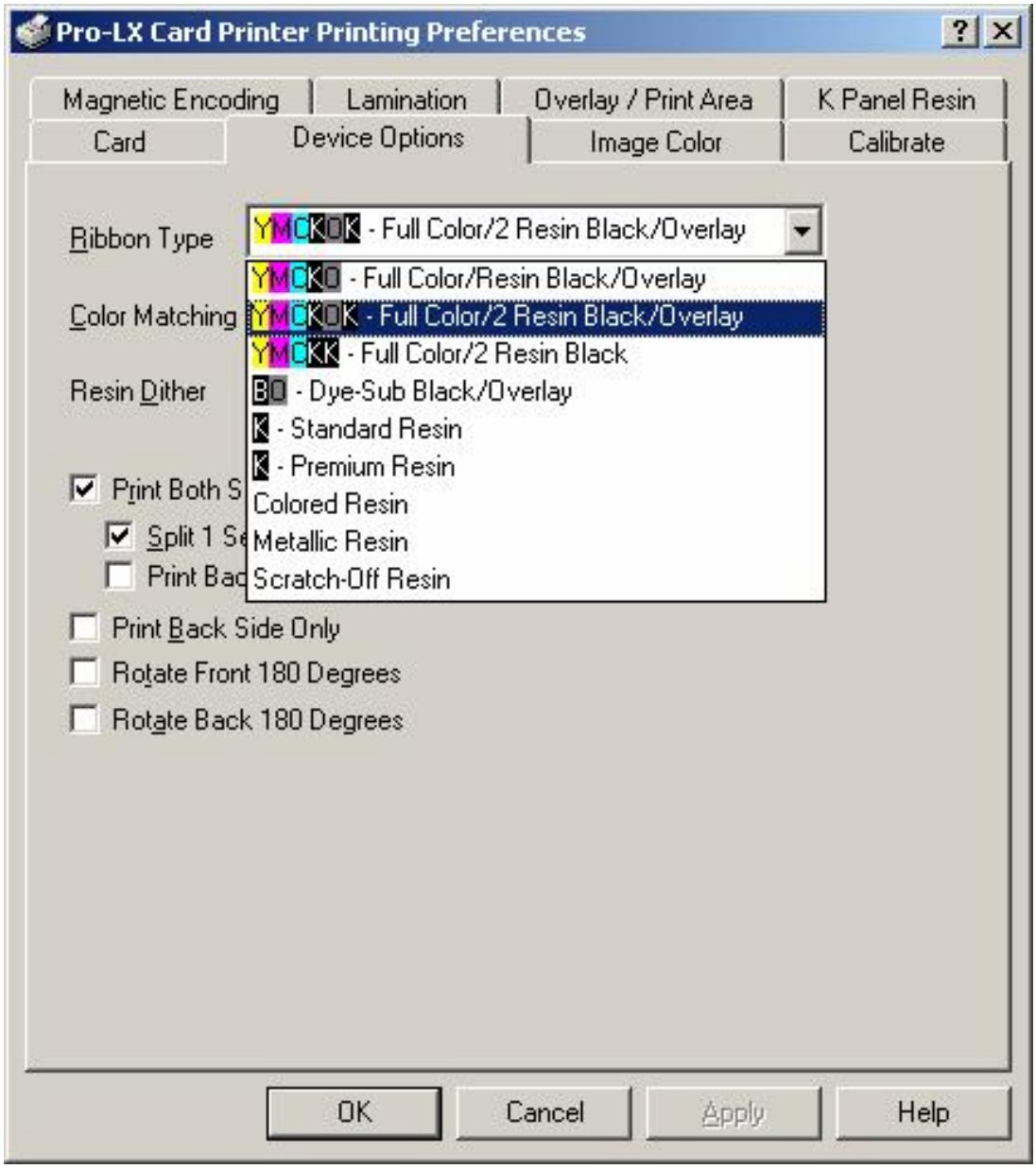
Use the Device Options tab to select options that control the Printer's functions.



Selecting the Ribbon Type

Use the Ribbon Type dropdown menu to select the correct ribbon type.

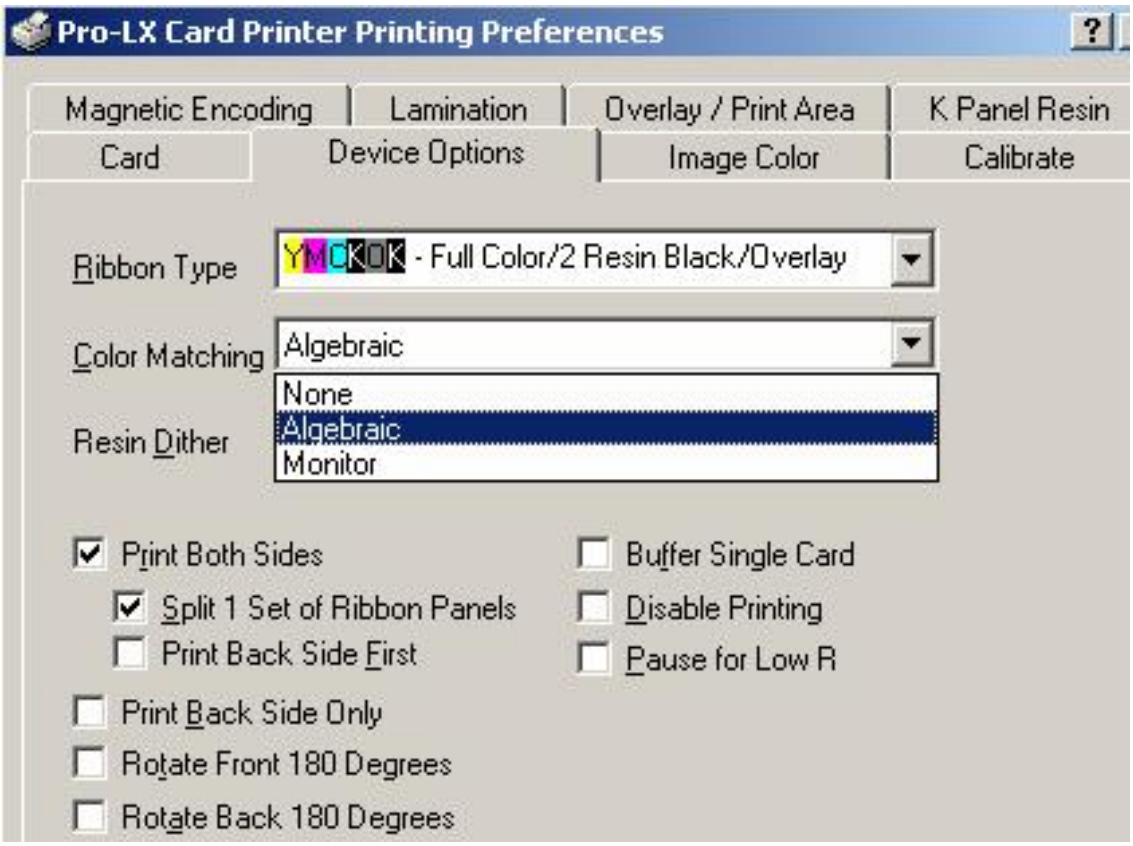
Step	Procedure
1	Select the appropriate **Ribbon Type** option for the type of Print Ribbon in use.



Selecting from the Color Matching options

Use the **Color Matchings** options to meet or fit the requirements of the current print job.

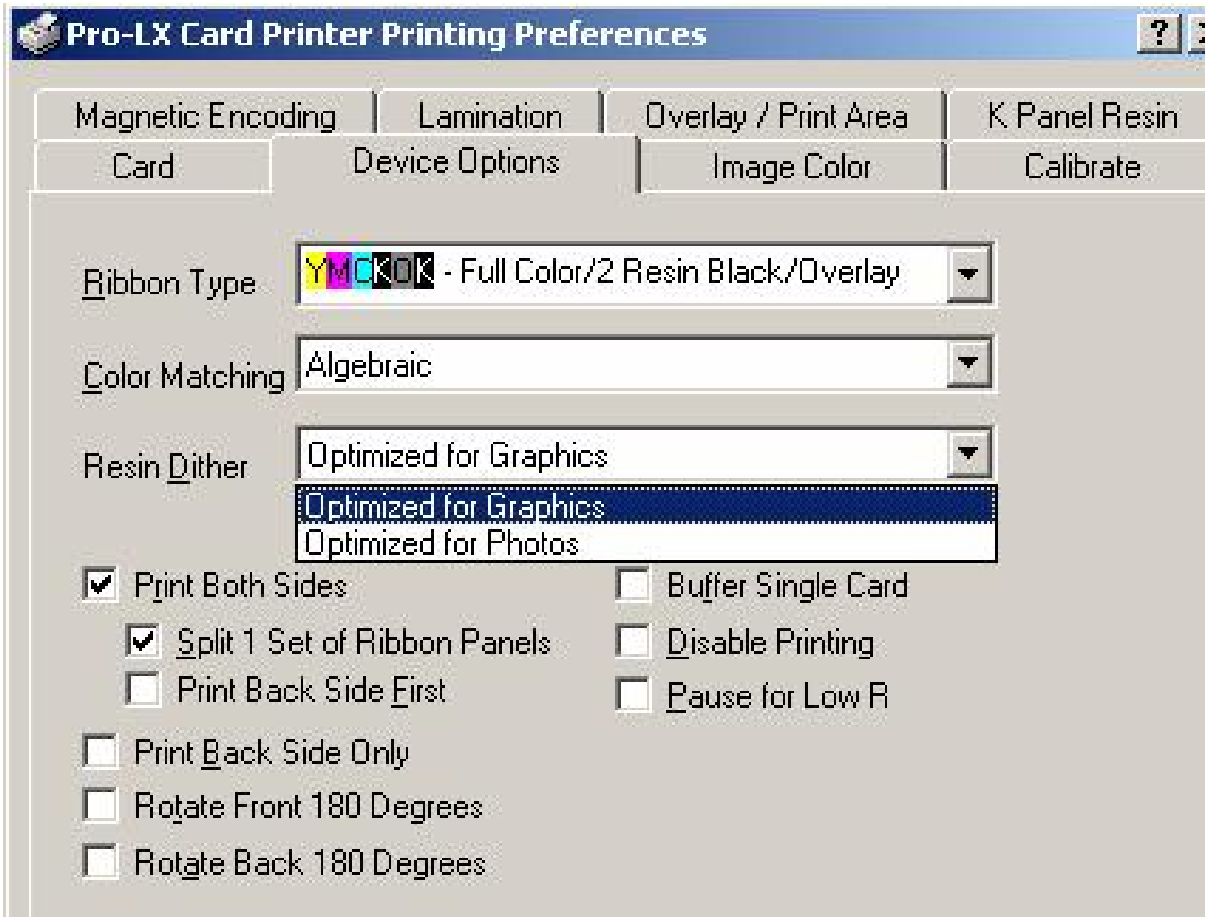
Step	Procedure
1	Select **None** for print speed rather than print color, • If the color is already correcting the image for printing. **OR** • If some other third party color matching software is in use. **OR** Select **Algebraic** for the Printer Driver to make very simple, yet fast, color balance adjustments. **OR** Select **Monitor** for the Printer Driver to make complex color corrections similar to the Algebraic option but through a more complex color matching algorithm.



Selecting from the Resin Dither dropdown menu

Use the Resin Dither options according to the type of image being printing. (**Note:** This option only effects objects printed with a resin-only Print Ribbon or those objects printed on the back side of a card with the resin black panel of a YMCKO, YMCKOK or YMCKK Print Ribbon.)

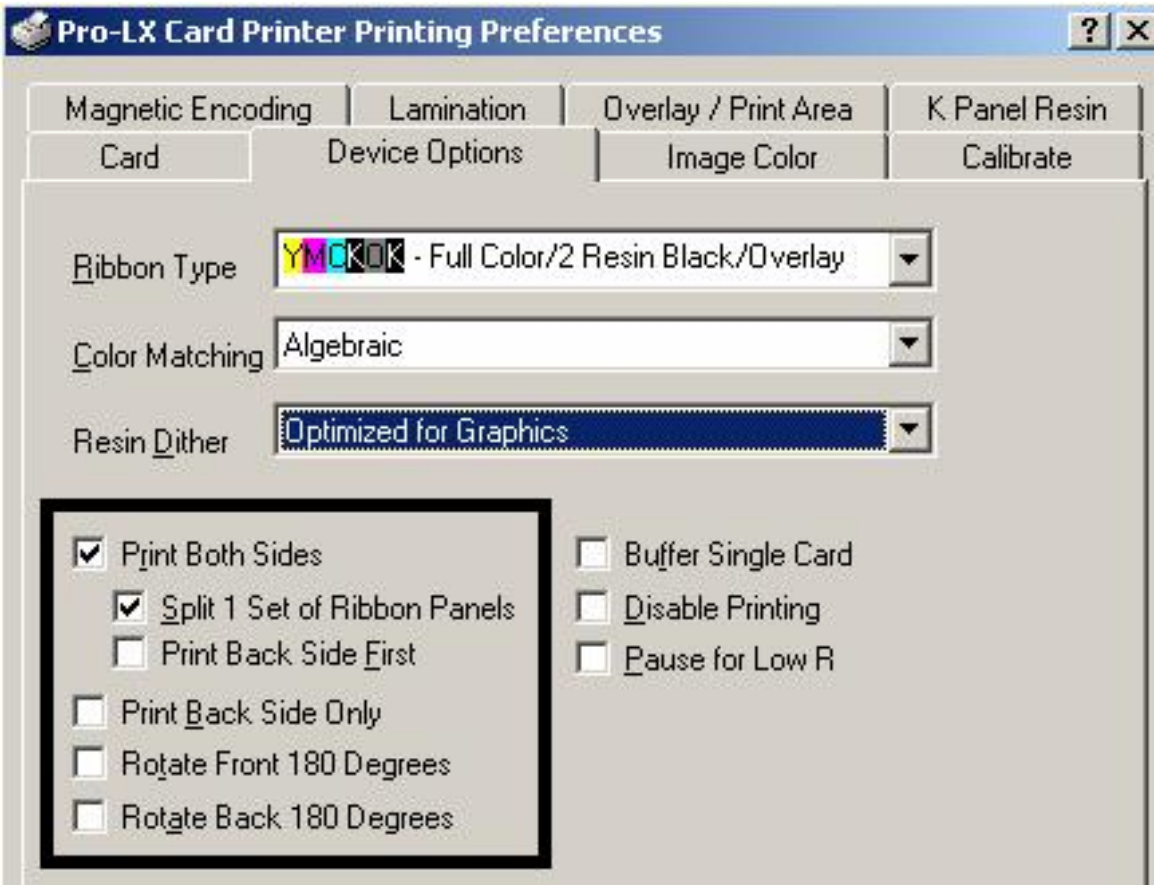
Step	Procedure
1	Select the Optimized for Graphics option. **OR** Select the Optimized for Photos option.



Selecting the Print Both Sides checkbox

Use this option to automatically print on both the front and backside of a card.

Step	Procedure
1	a. Select this option in conjunction with any application program that supports a multiple page document. (**Note:** In other words, the program must be able to send down two or more separate pages to be printed within the same document.) b. Print a full-color ID format on the front of the card and monochrome text or bar codes on the back by creating the full-color front side of the card (on page 1) of the document and the monochrome backside (on page 2). (**Note:** The Printer Driver will always place all odd numbered pages on the front side of the card and all even numbered pages on the backside.)



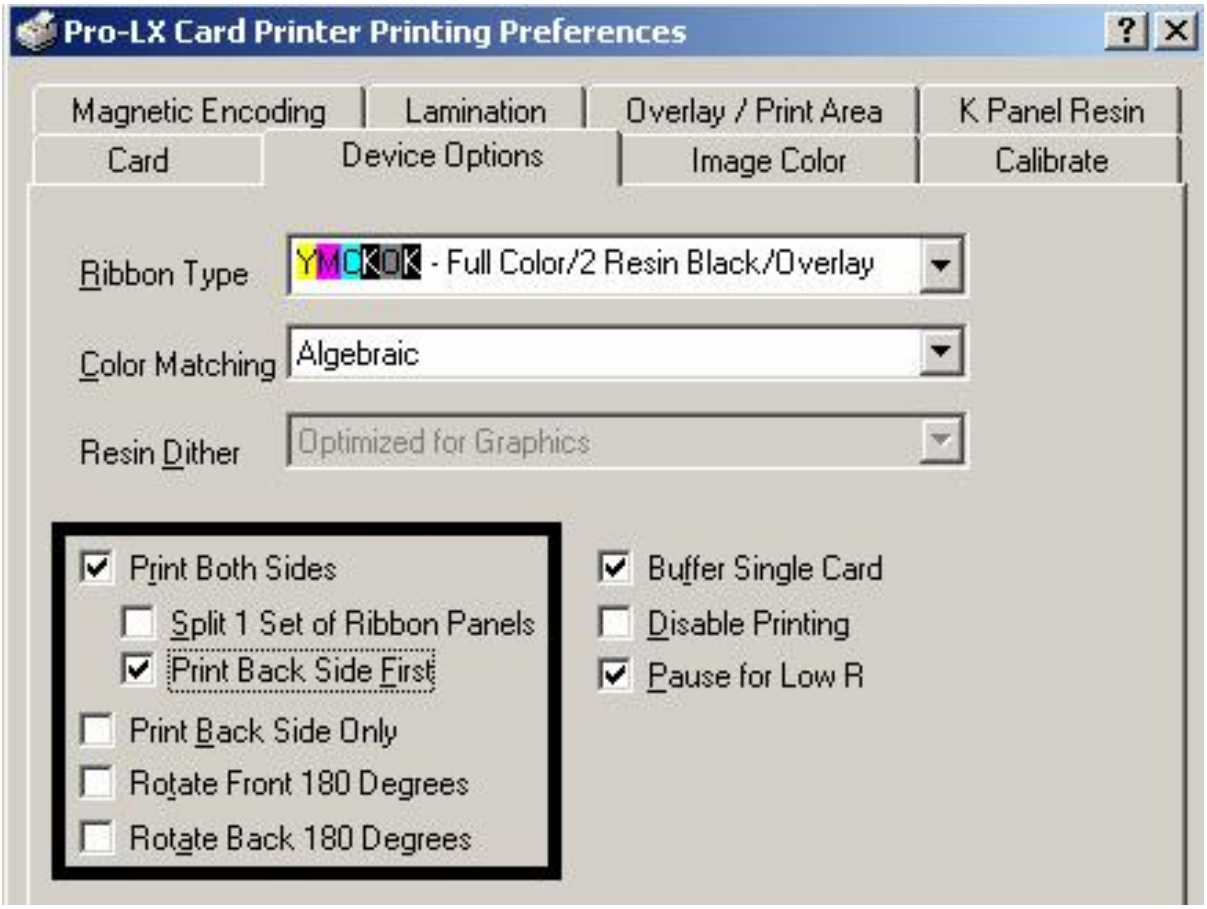
Selecting the Split 1 Set of Ribbon Panels checkbox

Use this option to automatically print full-color on the front of a card and resin black on the back of a card using any of the Full-Color YMC+K Print Ribbon types.

Step	Procedure
1	Select this option to use the most economical means of printing a dual-sided card since a single set of ribbon panels is essentially split to print both the front and back sides of a card. • If using a YMCKO ribbon type, the front of the card is printed with the ribbon's YMCO panels and the back is printed with the K panel. • If using a YMCKOK ribbon type, the front of the card is printed with the YMCKO panels and the back is printed with the second K panel. • If using a YMCKK ribbon type, the front of the card is printed with the YMCK panels and the back is printed with the second K panel. (**Note #1:** This option is automatically enabled when the either the YMCKOK or YMCKK ribbon type is selected.) (**Note #2:** The Print Both Sides option is automatically enabled when this option is selected.)

Using the Print Back Side First option

Step	Procedure
1	Select this option if you need to print the first page of a two-page document on the backside of the card. The second page of the document will be printed on the front side of the card.



Selecting the Print Back Side Only checkbox

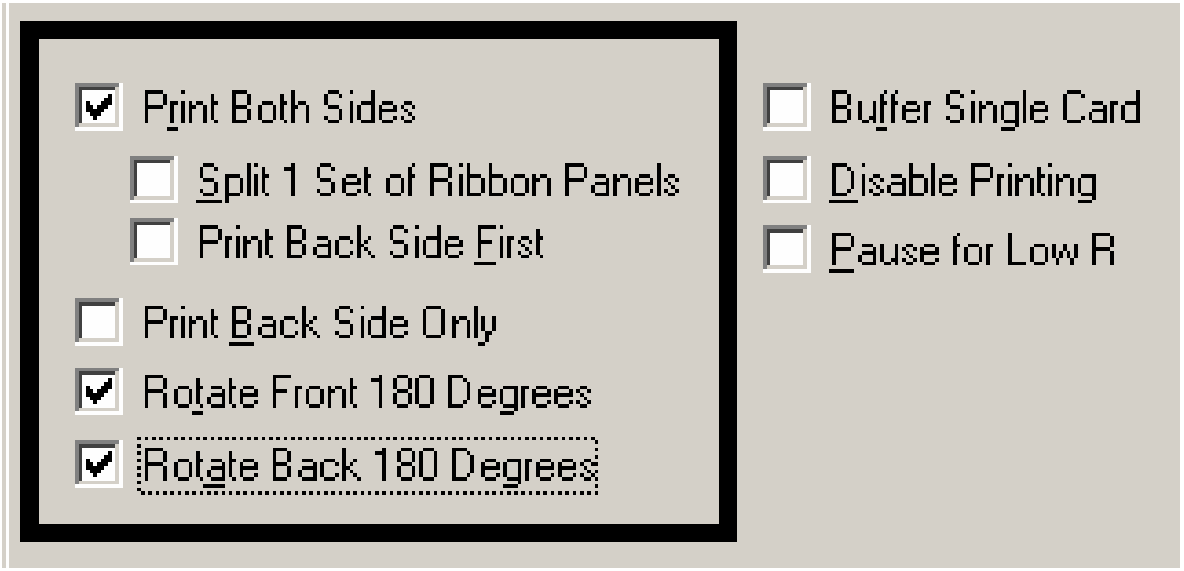
Select this option to conveniently print the backside of preprinted cards, which also must have their Magnetic Stripe or smart card chip encoded.

Selecting the Rotate Front 180 Degrees checkbox

Select this option to change the position of the printed image in relation to the set location of a card's Magnetic Stripe or smart chip.

Selecting the Rotate Back 180 Degrees checkbox

Select this option to change the position of the printed image in relation to the set location of a card's Magnetic Stripe or smart chip.



Selecting the Buffer Single Card checkbox

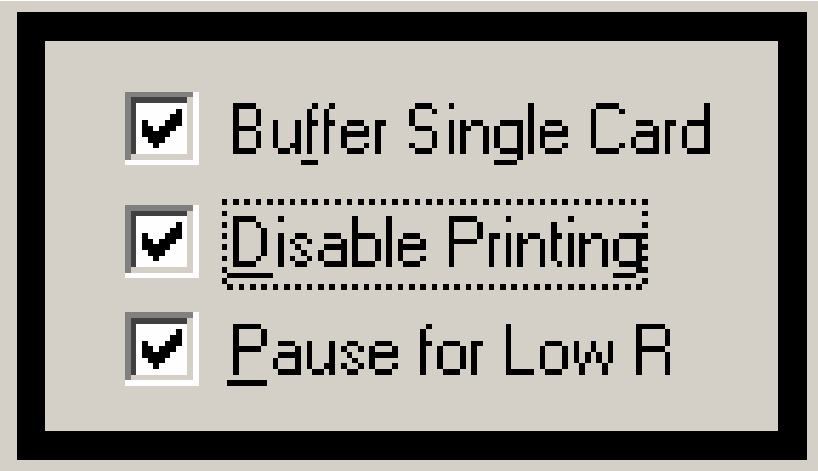
Use this option to force the Printer's memory to buffer or hold, only one print job at a time.

Step	Procedure
1	Select this option only to print to multiple Printers sharing print jobs over a network. (**Note:** In this case, this option ensures all print evenly shared by all Printers. Normally, when this option is not selected, the Printer's memory will buffer as many print jobs as it can until the Printer's memory is full. This is ideal for most applications where Printers are not networked together.)

Selecting the Disable Printing checkbox

Use this option to disable the printing capabilities of the Printer and still allow the Printer to encode cards.

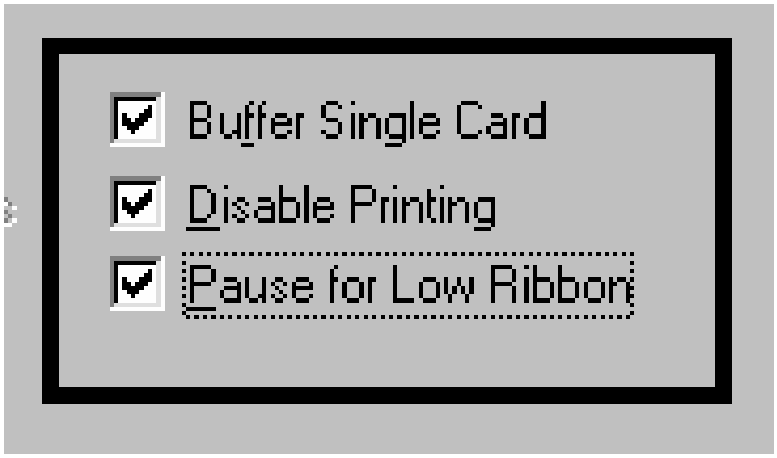
Step	Procedure
1	Select this option: • To encode or re-encode preprinted cards without wasting additional time, effort or printing supplies. • To ensure that all encoding instructions will be sent according to how they are configured within the software (even though all print data will not be sent to the Printer).



Selecting the Pause for Low Ribbon checkbox

Use this option to generate a definitive warning when the Print Ribbon is running low. (**Note:** When this option is selected, the Printer will "beep", pause and the Ready LED will flash when approximately 10 to 20 prints remain on the Print Ribbon.)

Step	Procedure
1	Replace the ribbon and press the **Pause/Resume** button to continue printing with a new ribbon.\ **OR** Leave the existing ribbon in the Printer and press the **Pause/Resume** button. • Once the **Pause/Resume** button is pressed, the Printer will continue printing until the end of the ribbon, but will beep once before each print job. • It will not be necessary to press the **Pause/Resume** button again to continue printing once it has been pressed initially during a batch print.) • The Printer will still beep once before each print job when approximately 10 to 20 prints remain on the Print Ribbon; however, the Printer will not pause. Instead, it will continue printing until the end of the ribbon, without User intervention.



Using the Card tab

Selecting the Card Size

Use this dropdown menu to select the standard, credit card size CR-80 cards. (**Note:** The dimensions of the total print area for this card size appear in the Print Width and Print Length boxes.)

Step	Procedure
1	Click on the **inches** or **mm** option to choose the desired unit of measurement. (**Note:** When designing a card format, always set the card size or page size within the card design program to the exact dimensions of a CR-80 card.)

Selecting the Orientation

Use the **Orientation** option to select either **Portrait** or **Landscape**.

Step	Procedure
1	Select **Portrait** to cause the card to print in a vertical orientation. **OR** Select **Landscape** to cause the card to print in a horizontal orientation. (**Note:** An icon illustrating a printed card helps represent the difference between the two.)

Determining the number of Copies

Use the up or down arrows to indicate copies required.

Step	Procedure
1	Specify the number of copies to be printed by clicking on the up or down arrows.

Clicking on the Test Print button

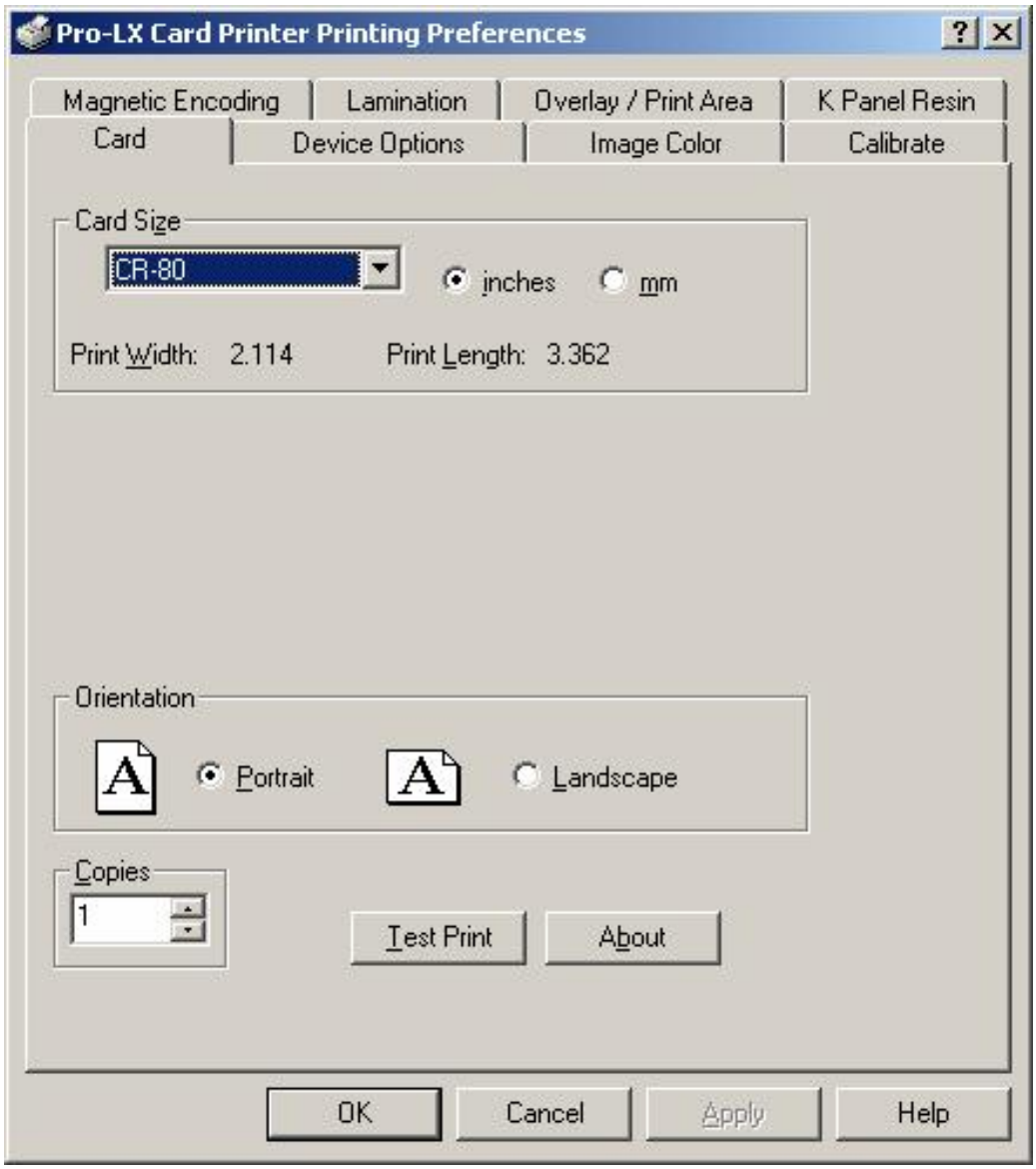
Use this option to send a simple self-test print to the Printer.

Step	Procedure
1	Install a full-color Print Ribbon as a requirement. Use this test print procedure to ensure that the computer is effectively communicating with the Printer and that the Printer is functioning properly.

Clicking on the About button

Click the **About** button to open a dialog box containing the copyright and version information about this Printer Driver software.

Step	Procedure
1	Review the information in the dialog box (as needed).



Section 4: Cleaning

This Section deals with the Printer's internal and external maintenance in regards to the unit's cleaning and general upkeep. (**Note:** The Printer should be cleaned on a regular basis to insure that the Printer consistently produces high quality output.)

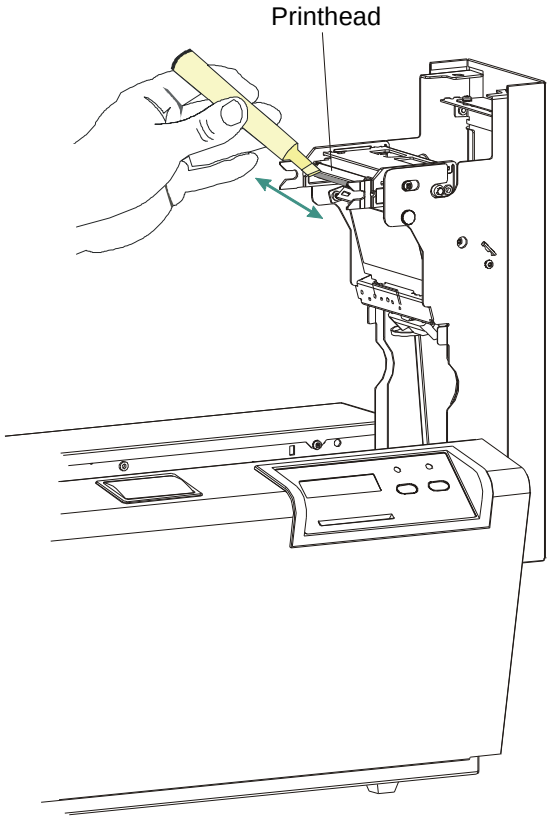
 **Danger:** Be sure to disconnect the Printer's power cord whenever performing any type of maintenance procedure unless otherwise directed.

Cleaning the Printhead

Perform this procedure approximately **every 1,000 prints** or as needed, depending on the cleanliness of the card stock and the environment in which the Printer is located. Perform this procedure (as needed) if a streak on the card appears where color was not transferred.

Caution: Never use a sharp tool or a metal object of any kind to clean the Printhead!

Step	Procedure
1	Open the Printer's Print Top Cover.
2	Using a **Printhead Cleaning Pen** from the Printer Cleaning Kit, firmly wipe back and forth across the surface of the Printhead.
3	Once the Printhead is completely dry, close the Printer. If a streak persists, repeat this process or call for technical assistance.



Cleaning the Card Feed Rollers

The Card Feed Rollers move the card throughout the print process.

Caution: Clean these Rollers to prevent card jams and card contamination and to provide better print quality and extended Printhead life.

Step	Procedure
1	a. Ensure consistent Printer operation by cleaning these Rollers approximately every 1,500 prints or as needed depending on the cleanliness of the card stock and the environment in which the Printer is located. b. Clean if the Rollers appear dirty or if the cards start showing speckles or debris on the printed surface. c. Refer to Steps 2 to 5 (in this procedure) to clean all these Rollers through a single, easy process:
2	a. Open the Printer's Top Covers and remove all card, Print Ribbon and over laminate from the Printer. b. Leave the Printer power ON and the Top Covers open throughout this procedure. (**Note:** The Card Cleaning Cartridge can also remain within the Printer during this cleaning process.)
3	Get a **Cleaning Card** from the Printer Cleaning Kit and remove its adhesive backing paper.

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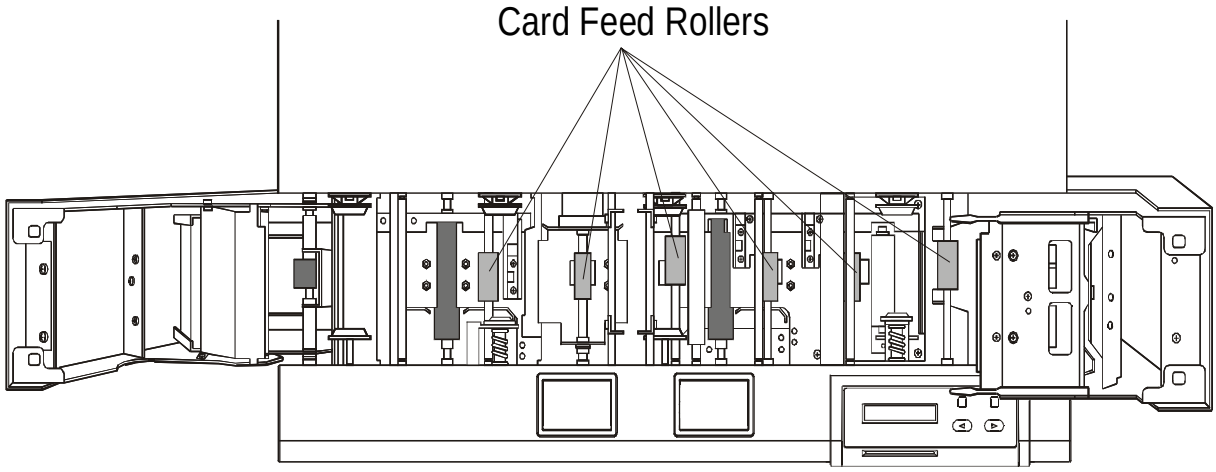

Cleaning the Card Feed Rollers (continued)

Step	Procedure
4	a. Insert the Cleaning Card into the Card Hopper, above the Card Input Tray, as normally done with any other type of card. b. Be sure, however, that the shortest non-adhesive end of the Cleaning Card enters the Printer first and that the sticky side is facing UPWARD.  **Caution:** If the card is inserted with the sticky side facing downward, it will stick to the Card Input Tray and will not feed.
5	Once the Cleaning Card is properly inserted into the Card Hopper, hold down the **On/Cancel** button and push the Cleaning Card into the Printer until the second gray feed roller grabs and begins feeding the card.
6	a. Continue to hold down the **On/Cancel** button until the Cleaning Card has fed completely through the Printer. b. Repeat this cleaning procedure as needed. c. After the cleaning procedure is finished, re-install media, close the Printer's Top Covers and turn the Printer power **OFF** and **ON** to reset the Printer.
7	Be sure to use either clear tape or masking tape. (**Note:** If the cleaning kit is not available, adhesive tape is also an effective method for removing lint and debris from the Rollers.)  **Caution:** Do not use duct or strapping tape. These adhesives leave a gummy residue behind.
8	a. Open the lid and use the **Pause/Resume** and **On/Cancel** buttons to rotate the main feed Rollers, while applying the tape. b. Alternatively, use 99% pure alcohol wipe. Do not use these wipes for every cleaning because this could eventually deplete the tact from the roller's rubber. (**Warning:** Do not use alcohol to clean the Cleaning Roller Assembly.)

Replacing the Cleaning Tape

The Card Cleaning Cartridge removes dust particles from the top and bottom of a blank card as it feeds into the Printer. It accomplishes this through two (2) Cleaning Rollers that are in turn, continually cleaned by a replaceable Card Cleaning Tape.

Caution: Replace this tape to help prevent card contamination for higher quality output.

Step	Procedure
1	a. Replace the Card Cleaning Tape should be replaced approximately **every 1,500 prints** or as needed depending on the cleanliness of the card stock and the environment in which the Printer is located. b. Replace this tape if the cards start showing speckles or debris on the printed surface.
2	Open the Printer's Print Top Cover and remove the Print Ribbon.
3	Pull the Cleaning Cartridge out of the Printer.

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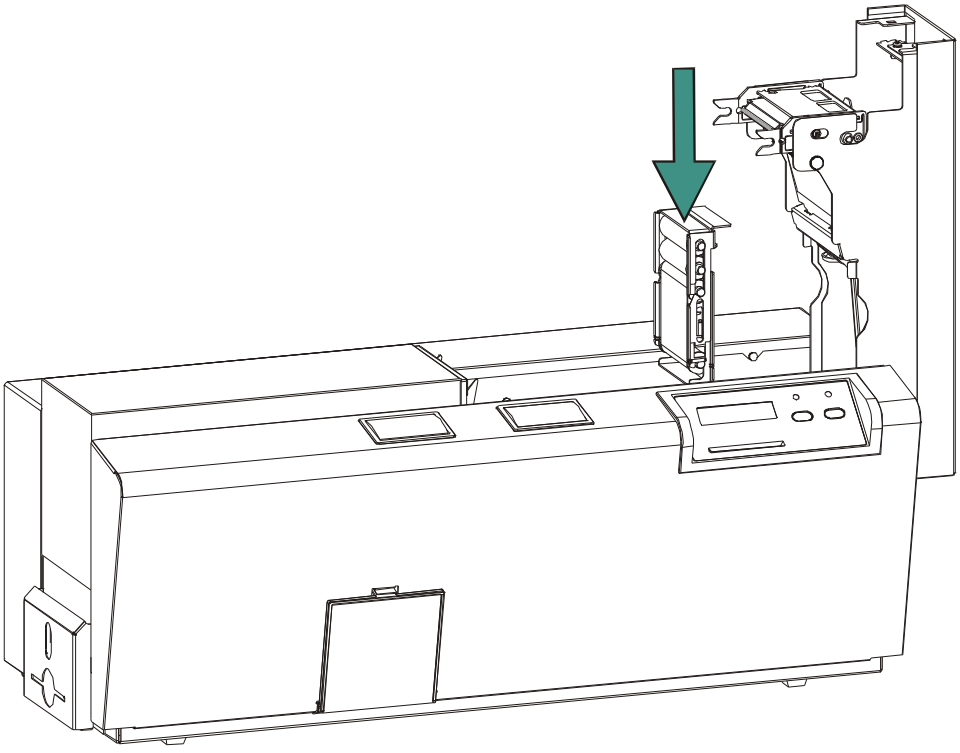
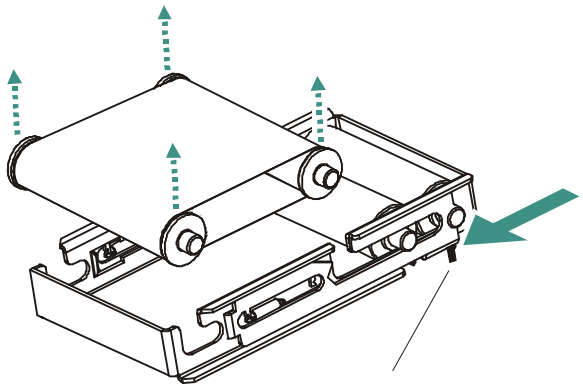


Replacing the Cleaning Tape (continued)

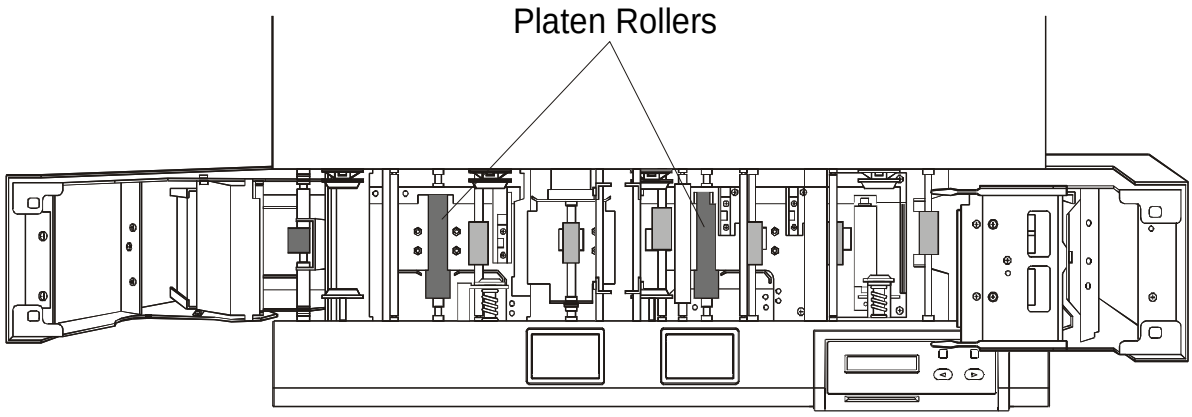
Step	Procedure
4	Push the spring-loaded Release Tab in and lift the used cleaning tape and the two (2) Tape Rollers out of the Cartridge, as shown below. (**Note:** The permanent Cleaning Rollers should stay within the Cartridge.)
5	Insert the two (2) Tape Rollers into the new Cleaning Tape loop.
6	a. Push in the spring-loaded Release Tab and place the Tape Rollers and the new tape back into the cartridge. b. Be sure to orient the new tape loop so that it extends over the end of the cartridge.
7	Pull on the Tape Loop's Tab to remove the backing from the tape.
8	a. Insert the Cleaning Cartridge back into the Printer as shown. b. Be sure to insert the cartridge with the Release Tab toward the input end of the Printer. **Caution:** If the cartridge is not inserted properly, the Printer will not feed cards.



Cleaning the Platen Rollers

Clean the Printer's Platen Rollers approximately **every 1,500 prints** or as needed depending on the cleanliness of the card stock and the environment in which the Printer is located.

Step	Procedure
1	Clean if the Rollers appear dirty or if the cards start showing speckles or debris on the printed surface. See Steps 2 to 6 (below).
2	Leave the power ON and open the Printer's Top Covers.
3	Remove the Print Ribbon and overlaminate.
4	Locate the Platen Rollers.
5	a. Use a Cleaning Pad from the Printer Cleaning Kit to wipe the Rollers clean. b. Press the **On/Cancel** button and the **Pause/Resume** button to move the Rollers back and forth while cleaning.
6	After the Rollers are clean and completely dry, replace the printing supplies and close the Printer.



Cleaning the Printer's Exterior

The Printer has a durable casing that should retain its luster and appearance for many years.

Steps	Procedures
1	Clean it only with a Cleaning Pad from the Printer Cleaning Kit.  **Caution:** Do not use cleaning solvents of any kind or spray the cabinet with a cleaner.

Cleaning the Printer's Interior

The Printer may generate dust and other particles inside the Printer. These particles are attracted to the Print Ribbon or blank card by static produced during printing and can contaminate the printed card causing spots or speckles to appear.

Periodically, use the following procedure to remove dust and other contaminants:

Steps	Procedures
1	Open the Printer's Top Covers.
2	Remove the Print Ribbon and overlaminate from the Printer.
3	Use a **Cleaning Pad** from the Printer Cleaning Kit to wipe out all visible areas inside the Printer. Remove any debris that may be inside.  **Caution:** Be extremely careful not to let any alcohol drip inside the Printer.
4	Re-install the printing supplies and close the Printer.

Cleaning the Magnetic Encoder

Clean the Magnetic Encoder approximately **every 1,500 prints** or as needed depending on the cleanliness of the card stock and the environment in which the Printer is located.

Step	Procedure
1	Remove the ribbon, cards and Cleaning Roller Assembly from the Printer.
2	Insert the felt card into the card Hopper. • Alcohol-moistened, felt cleaning cards designed for use in credit card/Magnetic Stripe readers are excellent for cleaning the card path, Rollers and magnetic encoder. • Occasional use of these cards is recommended for cleaning the encoder when the reliability of card encoding is suspect.) From the software application, execute a print job that includes information for magnetic encoding. • The card will be passed through the encoder twice in an attempt to write data and to verify. • The Printer will be unable to read any data and will eject the card from the Printer.
3	Press the **On/Cancel** button twice to reset the Printer.

Section 5: Packing the Pro-LX Card Printer

The purpose of this section to provide the User with a specific packing procedure for the Pro-LX Card Printer.

Follow this instruction to pack the Card Printer for transport.

Step	Procedure
1	Clean the inside of the Printer with deionized air. Wipe it down with a lint-free cloth.
2	Clean the Printhead with a Printhead pen.
3	Pack the Printer in the original carton and packing materials.
4	Be sure to enclose any necessary paperwork, test cards, etc.

Section 6: Board Level Diagnostics

The purpose of this section to provide the User with specific Board Level Diagnostic procedures for Board Errors and Sensor Testing for the Pro-LX Card Printer.

Board Errors

Resolving the EE Memory Error

Symptom: An EE Memory Error is displayed on the LCD display.

Step	Procedure
1	Reboot the Printer.
2	If the problem persists, the Main Print Board will need to be replaced. See Replacing the Main Board procedure in Section 5, page **Error! Bookmark not defined.**.
3	As an alternative to replacing the Main Print Board, the chip U16 (080196) may be replaced. (**Note:** Fargo recommends that only a qualified electronics technician perform this procedure.)

Resolving the EE Checksum Error

Symptom: An EE Checksum Error is displayed on the LCD display.

Step	Procedure
1	Reboot the Printer.
2	If the problem persists, the Main Print Board will need to be replaced. See Replacing the Main Board procedure in Section 5, page **Error! Bookmark not defined.**.
3	As an alternative to replacing the Main Print Board, the chip U16 (080196) may be replaced. (**Note:** Fargo recommends that only a qualified electronics technician perform this procedure.)

Resolving the DRAM Memory Error

Symptom: A DRAM Memory Error is displayed on the LCD display.

Step	Procedure
1	Reboot the Printer.
2	If the problem persists, remove the rear cover and ensure that the SIMM (080016) is seated properly.
3	If the memory module is not seated properly, remove the board and reinstall.
4	If the installation appears correct and the error persists, the SIMM (080016) on the Main Print Board will need to be replaced.

Sensor Testing

Step	Procedure
1	Check the voltage to determine if a Sensor is working.
2	a. Test the voltage of each Sensor using ground (GRD = Chassis) to the correct pin on each connector. See the Sensor Location and Voltages table on the next page. b. Block a Slot Sensor with a card. c. Cover a Reflective Sensor with a card.

Reviewing the Sensor Location and Voltages

Use this table as a reference tool for Board Level Diagnostics.

Sensor	Location	Pin	Low Range VDC	High Range VDC
Print Ribbon ID	J33	3	Present .02	Not present .70
Lam Ribbon ID	J2 on Encoder Board	3	Present .02	Not present .70
Print Headlift	J3	3	Unblocked 2.2	Blocked 5
Lam Roller Lift	J4	3	Unblocked 2.2	Blocked 5
Print Cover Sensor	J11	2	Unblocked 2.2	Blocked 5
Lam Cover Sensor	J12	2	Unblocked 2.2	Blocked 5
Print Ribbon Encoder Sensor	J13	4	Unblocked .17 -.9	Blocked 5
Lamination Ribbon Encoder Sensor	J3 on Encoder Board	4	Unblocked .17 -.9	Blocked 5
Card Detection Sensor	J4	4	Unblocked .17 -.9	Blocked 5
Print TOF Sensor	J6	4	Unblocked .17 -.9	Blocked 5
Lamination TOF Sensor	J7	4	Unblocked .17 -.9	Blocked 5
Flipper Home Sensor	J8	4	Covered .17 -.9	Uncovered 3.8-3.5
Encoder TOF Sensor	J31	4	Covered .17 -.9	Uncovered 3.8-3.5

Reviewing the Motor Voltages (when active)

Use this table as a reference tool for Board Level Diagnostics.

Motor	Location	Pin	VDC
Print Drive Stepper	J22	4	5
Lamination Drive Stepper	J24	4	5
Print Headlift	J27	1	17.0
Lamination Roller Lift	J29	4	23.00
Card Feed	J28	4	20
Ribbon Drive	J25	2	5
Lamination Drive	J26	2	5

Section 7: Fargo Technical Support

The purpose of this section to provide the User with an efficient, step-by-step procedure to be used when contacting Fargo Technical Support as needed for the Pro-LX Card Printer.

Contacting Fargo Technical Support

Step	Procedure
1	Read the suggested Sections of the service manual in order to troubleshoot a Pro-LX Printer. As needed, contact the Fargo Technical Support Group by phone at (952) 941-0050 or by fax at (952) 941-1852 for additional, technical assistance. **OR** Contact Fargo Technical Support via the Web: http://www.fargo.com/tech_support/contact_tech_support.asp
2	Position a phone near the Printer and Computer so Fargo technicians can help to help troubleshoot the Printer(s).
3	Please have a self-test and a sample card ready when calling Fargo Technical Support.

Reading the Serial Numbers on a Fargo printer

The purpose of this section is to provide updated instructions for reading serial numbers on a Fargo printer.

Finding out when a Fargo Card Printer was manufactured

You can determine when your card printer was manufactured by reading directly from the serial number (affixed to your card printer).

1. **Year Built:** The first two digits in the serial number indicate the year that the printer was manufactured.
2. **Week Built:** The second two digits indicate the week.
3. **Numeric Order:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Reviewing Example No. 1: Serial Number 80453289

1. **80453289:** The first two digits in the serial number indicate the year the printer was built (e.g., the digits 80 indicate the year 1998).
2. **80453289:** The third and fourth digits in the serial number indicate the week the printer was built (e.g., the digits 45 indicate week 45 of that year).
3. **80453289:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Reviewing Example No. 2: Serial Number A1280224

1. **A1280224:** The first two digits in the serial number indicate the year the printer was built (e.g., the letter and digit A1 indicate the year 2001).
2. **A1280224:** The third and fourth digits in the serial number indicate the week the printer was built (e.g., the digits 28 indicate week 28 of that year).
3. **A1280224:** The last four digits indicate the sequence number for the numeric order in which the printers were built.

Section 8: Reviewing the Spare Parts List

Pro-LX ID Card Printer
Recommended Spare Parts List
Effective Date: April 2004
For current pricing see http://www.fargopartner.com/support_services/

Glossary of Terms

Term	Definition
24-bit color	A color depth for an image that uses 8 bits for each color (red, blue, green) combining the possible 256 shades to provide a color depth of 16.7 million colors.
AC - Alternating Current	An electrical current that reverses its direction at regular intervals (typically 50 - 60 times a second).
Access Card	The card for the SmartGuard security system. A cared with embedded electronics that can be removed from the Printer, locking the Printer and preventing unauthorized use.
Adhesion	The firm attachment of a material to the card surface, confirmed by using the Tape Test -pulling an applied piece of adhesive tape (Scotch 600 or equivelent) off the card at 1 sec/in to see if any material is pulled off by the tape.
Algebraic	A type of color matching that takes the colors value of pixels and applies them to an algebraic equation to adjust the levels of hue, saturation and brightness.
ANSI (American National Standards Institute)	The United States Representative to ISO, providing standardization for U.S. Manufactures prior or in addition, to acceptance by ISO.
AS400	An IBM operating system running on a main frame. DTC500 Fargo Printers are built with fonts saved in the Printer memory so users of AS400 can write escape codes and print from the Printer.
ASCII (American Standard Code for Information Interchange)	A standard for processing information in computer processors. An 8-bit character set of 255 decimal numbers, each assigned to numbers, letters, punctuation and special characters.
AT	Refers to an IBM standard in early computing with regard to the chipset and function of the parallel port, set up in the BIOS.
B (Black)	Black Dye-Sublimation panels are distinguished from the black panel using resin by the use of B for dye-sublimation black. K denotes resin black.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Barcodes	A series of alternating black and white stripes, of varying widths (each character denoted by a set number and width of black stripes) that allows characters to be optically read by a computer.
Batch print	A file sent down from the computer that contains commands to print a number of cards, sequentially.
Battery Back-up	A power supply that can keep AC electronic equipment running for a short time when power is interrupted, allowing enough time for the user to save data and close the machine properly.
Bi-directional	A communication standard that allows two way data transfer between PC and Printer.
BIOS (Basic Input/Output System)	The part of the operating system in a computer that handles communication between the PC mainboard and its peripherals. Typically residing in chip-based, non-volatile memory.
Bit	An abbreviation for binary digital. Each bit is an element of information that can have two states: off and on.
Bit map	A graphic produced by an array of pixel elements with the color hue, brightness and saturation information stored in bits. The more bits, the more values and thus the greater variety. 1 bit color is black and white, 8-bit color produces 256 shades of gray and 24-bit color can produce 16.7 million colors.
Board	A term used for the circuit board, a hard mylar plate made of many layers, that holds the electronic circuit elements and wire traces.
Boot-up	A series of operations that the Printer runs through when power is first applied including a series of initializing, status testing and a diagnostics program to ensure a ready state.
Buffer	A block of memory, in the Printer or PC, that holds print files until the processor is ready to print them.
Cable	A set of conductors wrapped together and often concealed within insulation, used for signal transfer from one device to another, with connectors on either end that allows the cable to be removed.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Cache	A type of memory buffer to store data temporarily, used to hold information that is most often exchanged between controller and peripheral, to expedite data transfer.
Calibrating	A procedure to adjust an electro-mechanical device so that it operates within established parameters.
Cleaning Roller	High tack Rollers positioned just after the input Hopper to lift debris off the card as it rolls over it. A clean card surface improves print quality.
CD (Compact Disc)	A 4.75 inch (12 cm) optical disk that stores data, written too and read from using a laser.
DMA (Direct Memory Access)	Channels designated within the Windows operating environment that are used for dedicated high-speed communication between the PC and the Printer port.
Centronics	A parallel communications interface that has become the standard for connections to Printers, designed by the Centronics Corp.
Coercivity	The property of a Magnetic Stripe that indicates the amount of force needed before magnetic saturation, measured in Oersted (Oe).
Color matching	The process of adjusting color hue, saturation and brightness, to duplicate a desired color. An algorithm within the driver, which adjusts the color balance and provides output with the desired color, automates this process.
Compressed air	Air stored in a tank or produced by an aerosol can, delivered by through nozzle at a high speed. Used in the Printer to blow out debris.
Contrast	The degree of difference in luminance of two areas.
Control panel	The panel on the Printer from which the user can control Printer functions. The Printer is usually composed of the control buttons and an LED or LCD display.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
CR-79	A card dimension standard of 2.0625" L X 3.3125" W (+/-0.002" W, +/-0.005" L) or 52.400 X 84.150 mm.
CR-80	A card dimension standard of 2.125" X 3.370" (+/-0.002" W, +/-0.005" L) or 53.975 X 85.598 mm.
CR-90	A card dimension standard of 2.375" X 3.625" (+/-0.002" W, +/-0.005" L) or 60.325 X 92.075 mm.
CR-100	A card dimension standard of 2.625" X 3.875" (+/-0.002" W, +/-0.005" L) or 66.675 X 98.425 mm.
Cursor	The marker in the LCD Display Window that indicates the active selection.
Darkness	A reference to color saturation.
DB-9	A 9 pin, D-shaped connector, typically used in serial port interfaces.
DC motor	A motor that works on DC with continuous motion.
DC (Direct Current)	Electronic flow that is unidirectional, flowing from the positive (+) to negative (-) of a power source.
Default	A setting or parameter that comes preset from the factory in driver or firmware. Performance parameters may be customized in the driver, but can be reset to the factory values usually through the push of the default button. The default values for the firmware are usually denoted on a label attached to the Printer.
Defrag	Abbreviation for defragmenting. The process of reformatting data on a hard drive so that it uses space more efficiently.
DIP switches (Dual In-line Package Switches)	A small array of mechanical switches installed on the board that can be configured to change Printer operations including providing a variety of self-tests.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Direct-to-Card (DTC) Printing	The Direct-to-Card printing process prints digital images directly onto any plastic card with a smooth, clean, glossy PVC surface.
Dither	A system of distributing dots to control the hue, brightness and/or saturation. In monochrome printing, this controls the brightness. In color printing, dithering can supply a larger color gamut than non-dithering. In the driver, dither modes can be selected to provide better image quality depending on the type of image to be printed.
Dongle	A peripheral that attaches to a port to act as a key for an installed application. The PC is able to run that application only when the dongle is installed. Typically, it works as a pass-through device and is connected in serial to the parallel cable.
Dot	The smallest unit of an image that the Printer is able to produce. The smaller the dot, see dot pitch, the sharper the image.
Dot pitch	A measurement of image sharpness denoting the width of the dots that make up a pixel. The smaller the pitch, the sharper the image.
Download	The transfer of a data file from one device to the other over a network or cable, typically from the Internet to a PC.
DPI (Dot Per Inch)	A measurement of the Printer resolution indicating how many dots a Printer can produce in a linear inch.
DRAM (Dynamic Random Access Memory)	A microchip based volatile memory storage device. The Printer uses this to buffer a print job, transferred from the PC, until the Printer controller is able to process the packet.
Driver	Software utility installed in Windows, that interfaces an application to rasterize image data and include command codes so the Printer can process the file.
Duplex Printing	Printing on the front and the back of the card.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Dwell Time	The speed at which the card moves across the lam roller, measured in seconds/inch (sec/in). This may be adjusted in the driver to ensure adhesion and card flatness.
Dye Migration	The diffusion of dye out of the card surface and into another receptive surface, such as a vinyl pouch card holder, resulting in a faded image.
Dye-Sublimation	Also called dye diffusion/thermal transfer, it is the process of heating a dye suspended in a cellulous substrate until the dye can flow, diffusing into the dye receptive surface of the card or InTM. This produces the image in the surface of the card.
E-card	An abbreviation for electronic card. A generic term used to reference any card with built-in electronic devices such as smart cards or prox cards.
E-card Docking Station	The device in the Printer that accepts smart cards with an ISO smart card contact station. This allows the user to write to the smart card chip with a standard RS-232 interface in the back of the Printer or with the optional built-in encoder.
Edge-to-Edge	Refers to the maximum printable area on a card resulting in printed cards with virtually no border.
ECP Mode (Enhanced Capabilities Port Mode)	A type of parallel port mode, developed by Microsoft, to increase the port throughput and improve performance.
EE Memory	An abbreviation for EEPROM.
EEPROM (Electrically Erasable Programmable Read Only Memory)	A microchip based non-volatile memory storage device that can be rewritten in the field. The chip can hold new values as the Printer adapts its operational parameters.
Encoder (smart card)	An electro-mechanical interface to transfer data from the PC to a chip or Magnetic Stripe built into the card.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Encoder (wheel)	An electromechanical device, attached to a shaft that detects the change in rotational position, incremented to count ticks per revolution. The Printer's encoder wheel both detects motion and measures the amount of rotation in the movement of the ribbon.
Engine	A generic term for a collection of systems and mechanisms that is dedicated to executing a specific function. A Printer that also laminates would have both a print engine and a lamination engine.
EOF (End Of Form)	The trailing edge of the card, detected to indicate when the Printer should stop printing.
EPP (Enhanced Parallel Port)	A type of parallel port mode, developed by Intel, to increase the port throughput.
EPROM (Electronically Programmable Read Only Memory)	A microchip based non-volatile memory storage device that can not be rewritten in the field. Firmware for many Fargo Printers is stored on these chips and so a change of the chip is necessary for an upgrade.
Escape sequence	A string or control character that indicates to the processor that what follows is a command and not data.
ESD (ElectroStatic Discharge)	The discharge of static electricity (high voltage, low current) that can damage electronic devices.
Ethernet	A system of networking a series of computers for the sharing of data or peripherals.
Film	A thin flexible transparent sheet used to carry dye-impregnated material or resin to be transferred to the card.
Firmware	The instruction set, stored in chip memory, inside the Printer that controls functional and operational data. Some models require a chip change for updates; some firmware can be changed by reprogramming from the PC.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Flash Memory	A microchip based non-volatile memory device that holds its data when power is removed. This allows for field reprogramming of the Printer commands, such as Printer firmware upgrades, without the necessity of changing chips.
Font	A character set similar in style and form. Fonts can be graphical or mathematical constructs, represented by a series of dots or an assembly of curves and lines.
FPGA (Field Programmable Gate Array)	A microchip with configurable logic circuits installed that is programmed to act as the Printer's central processor.
Full bleed	Printing that covers the entire card surface.
Gamma	The degree of contrast of an image or the display of a monitor determined by the slope of a characteristic curve relating optical density to relative log exposure.
Glossy / Matte	A smooth polished surface in comparison to a rougher matte surface. Fargo matte cards have a surface index (Ra) of approximately 65 microinches while glossy have a Ra = 3.
Glossy PVC	A card made of PVC with a smooth polished surface (Surface roughness of approximately 0 - 10 micro-inches). This is required for direct to card dye-sublimation printing.
Graphical Device Interface (GDI)	A Windows standard for protocol between drivers and applications and the Windows interface. An application uses a driver to rasterize the data in the format necessary for the Printer but also for the Windows interface to execute the print commands.
Gray Scale	A graduation through the various brightness levels from white to black.
Halftoning	A process in monochrome printing that simulates continuous tone by using changes to the distribution of single dots. Increasing the number of dots in a given area increases the darkness even though the individual dots stay the same size.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Hard Drive	A high capacity storage device in a PC consisting of non-removable magnetically encodable platters.
Hardware	Physical components of a system such as the Printer, the PC, the power supply.
HDP (High Definition Printing™)	The High-Definition Printing process prints full-color images onto clear HDP transfer film (InTM). The HDP film is then fused to the card through heat and pressure via a heated roller. The Printhead is capable of 256 shades with a sharper print and better color match.
Head	Abbreviation for Printhead.
Heat sink	A device used to dissipate heat into the ambient.
Heat Seal	A resinous film transferred by the Printhead onto the back of an HDP intermediate transfer film to facilitate adhesion.
HiCo (High Coercivity)	The coercivity value of magnetic media between 2500 - 4000 Oe (ISO 7811-6). Fargo's High Coercivity encodes at 2750 Oe.
HTML (HyperText Markup Language)	A standard protocol used to format text files for use in a browser or on the Internet.
HTTP (HyperText Transfer Protocol)	A standard protocol by which computers can transfer data, compatible through multiple platforms.
IC (Integrated Circuit)	An electronic device that contains many individual circuits interconnected and placed within a discrete package.
ID (Identification)	An abbreviation for identification.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
IEEE 1284 (Institute of Electrical and Electronics Engineers 1284)	A standard method of signaling for a bi-directional parallel interface on personal computers. To ensure proper Printer communications and image output, Fargo recommends a parallel interface cable that complies with this specification.
Image	A collection of pictures or graphical elements that compose the visual features on a card. Also refers to the digital representation.
Input	Any data or material being transferred to the Printer.
Input Hopper	The area of the Printer that stores the blank cards, ready to print.
Intermediate Transfer Media (InTM)	A thin flexible material coated with a resin material into which the dye is transferred from the ribbon by the Printhead. The film is then transferred to the card surface by the hot lamination roller.
ISO	For the Greek, "iso", meaning same. Used to represent data from the International Organization for Standardization.
JIS II (Japanese Industrial Standard)	The standard for encoding to a Magnetic Stripe provided by the Japan Standards Association. The single Track is as wide as ISO Tracks 1 and 2 combined and in the same approximate location as those Tracks but on the front of the card. The coercivity level is 600 Oe.
K Panel	An area of a multicolored ribbon (e.g., YMCK) that contains black resin for transfer to the card surface. Also used in reference to the application of preference to items printed on the card - those using the black panel in lieu of a process (YMC) black.
Lamination	The application of a film or resinous substance, fused by heat and pressure, to the surface of a card.
LAN (Local Area Network)	An array of several computers connected through a series of data transfer cables for the sharing of data and peripherals.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Landscape	A document layout that is viewed with the document's long axis in a horizontal orientation.
LCD (Liquid Crystal Display)	A device that contains a liquid crystal between two pieces of polarized film through which reflected or ambient light can pass. When a current is applied, the liquid's polarity changes and blocks the passage of the light resulting in an opaque area of the display. The areas are arrayed to form characters.
LED (Light Emitting Diode)	A semiconductor that emits light when a current is applied.
Media	A generic reference to anything onto which the Printer can transfer an image including cards, ribbon and film.
LoCo (Low Coercivity)	The coercivity value of magnetic media between 250 - 600 Oe (ISO 7811-2). Fargo's Low Coercivity encodes at 300 Oe.
LPT Port (Line Printer Port)	The system abbreviation for a PC's parallel Printer port.
Mag encoding	The process of orienting successive magnetic bits to produce a serial data string.
Mag stripe	An area of the card with an applied or impregnated ferrous material that may hold encoded data through a series of prescribed polarity changes.
Mag Track	An area of a magnetic strip running the length of the card, with a given width and position, constitutes a Track. This is the area dedicated to one data string, restricted to specific rules of format. ISO Standards specify three magnetic Tracks on the back of a card. The JIS standard specifies one Track on the front.
Mag Verify	A process to confirm proper magnetic encoding. After encoding, the information is read off back and compared to the intended string.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
MB (Megabyte)	A unit of storage that equals 1,048,576 bytes.
Memory	A generic term for any device that stores digital information using magnetic media or digital chip storage device.
Menu	A descriptive list of headings above nested functions that aid navigation to a specific operation. These are found in computer applications, with the heading at the top of a subset of like functions. They are also on the Printer LCD control panel.
Monochrome	An image composed of a single color.
Network	A series of computers connected by data transfer cable for communication and sharing of functions and peripherals.
Oersted (Oe)	The unit of magnetic field strength named after Dutch scientist Hans Christian Oersted who found the science of electromagnetism.
Offset	The prescribed distance between a reference point and the target point. The offset in card printing may refer to the position of the image relative to the leading edge or the distance of the start of magnetic encoding from the leading edge of the card.
O-Ring	A rubber ring used as a belt in several media driving applications.
OS (Operating System)	The instructions installed on the computer hard drive that run the computer's operations and applications. The driver used for any given OS will differ from other platforms. The correct version driver must be loaded for the Printer to interface with the OS and the application to print.
Output	Any product of the Printer including card image, encoded data and lamination.
Output Hopper	The portion of the Printer that accepts the completed cards.
Overlay	A resin-like substance that is transferred by the Printhead to the card surface over a printed dye image to prevent image fading, increase abrasion durability and prevent dye migration.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Oversized Cards	Oversized cards are used for more efficient visual identification and are available in many non-standard sizes. The most popular sizes are CR-90 (3.63" x 2.37"/92mm x 60mm) and CR-100 (3.88" x 2.63"/98.5mm x 67mm).
Overlaminate	Protective clear or holographic material to increase security and durability applied over the printed surface with a hot roller.
Parallel	A method of data transfer in which serial data is divided into sections and sent simultaneously down parallel wires to speed transfer rate.
Parallel port	A communication socket on a device that allows for parallel data transfer.
PC (Personal Computer)	A stand-alone, programmable, electronic device that can store, retrieve and process data consisting of a CPU, mouse, keyboard and monitor.
PCB (Printed Circuit Board)	A solid, multi-layered plate on which electronic elements are attached, either through the board or on the surface.
Peel	The removal of a film or ribbon from a card surface (at a perpendicular angle) to ensure proper transfer, then separation, from the card surface.
Peel-Off	A bar on the lamination section that holds the film at the correct position and provides proper peel angle.
Peripheral	Any device that is attached externally to a PC. These often share the same data cable or port as a Printer and may be the source of communication problems.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Pinch roller	A free spinning (non-driven) roller that presses the card against the drive roller, on the opposite side, to ensure an adequate normal force for proper traction.
Pixel	Short for picture element. The smallest element of a graphic.
Platen	The hard rubber roller that drives the media through the Printer, providing support to the backside of the media during printing or laminating.
PET	Abbreviation for polyester terephthalate, often called polyester. Sheets of PET are laminated with sheets of PVC to produce thermal acceptance composite cards.
Port	A communication interface, serial or parallel, used for the transference of data.
PolyGuard Overlaminate	A 1-mil or .6-mil thick polyester material that enhances card security and durability applied over the printed surface with a hot roller. Available as clear or with embedded holographic-type security images.
Portrait	A document layout that is viewed with the document's long axis in a vertical orientation.
Potentiometer	An electronic resistor with a variable resistance value that can be mechanically set.
Print Driver	A software utility that serves as an interface between the Printer and the Windows GDI (Graphical Device Interface), making the Printer's functions available through the software application. It also provides the format information for the rasterizing of the print file including any necessary escape or function commands.
Print Job	A file of one or more cards for the Printer to print, including image data and Printer functions, transmitted through the parallel interface and at times stored temporarily in the print buffer and spooler.
Print Server	A device used to connect and control a Printer on a network.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Printhead	The device on a Printer that produces the image on the media.
PVC	Abbreviation for polyvinyl chloride, often called vinyl. PVC is the component of the 0.002" thick clear, dye receptive film on the surface of the identification card and is the primary component of the identification card cores.
Queue	A sequence of files or sets of data, awaiting transmission or processing.
Proximity (“Prox”) Card	Proximity cards allow access and Tracking utilizing contactless technology, usually by communicating through a built-in antenna.
Prox Card Encoder	The Fargo prox card encoder uses an HID ProxPoint® Plus reader mounted on the e-card docking station inside the Printer/encoder. The ProxPoint is a "read only" device producing a Wiegand signal that is converted to RS-232 using a Cypress Computer Systems CVT-2232. Application programs can read information from HID prox cards via a RS-232 signal through a dedicated DB-9 port on the outside of the Printer labeled "Prox."
RAM (Random Access Memory)	A storage device for digital information to be held temporarily, to facilitate processing.
Rasterize	The process of converting the elements of a graphic into a bitmap to be printed.
Reboot	Cycling the power to the Printer so that it resets and reinitializes.
Registration	The quality of the alignment of the separate primary-color images: YMCK.
Resident Font	A set of characters loaded into the Printer memory that can be programmed to print those characters on the card without rasterizing the image.
Resin	A semi-solid material.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Resolution	The number of individual pixels in a graphic, taken over a given length, used to indicate the sharpness of the picture and the level of detail. The number of elements in the Printhead determines Fargo Printer resolution.
RFI (Radio Frequency Interference)	Electromagnetic waves radiated by poorly shielded cables or electronic devices that interferes with the operation or data transfer of another device.
RGB (Red/Green/Blue)	The three primary colors of the luminance or additive, model. Combinations of these three colors can produce practically all the colors of the spectrum that humans can detect. Computer monitors operate on an RGB model.
Ribbon	The dye impregnated film that is used for color printing.
Ribbon cable	Parallel wires held flat in a row by plastic insulation.
RibbonTraq	A Fargo Electronics method of placing bar code-like marks on the transition area between color panels. These marks are arranged for detection by a Reflective Sensor array for the identification of ribbon type and the ribbon position.
RMA number (Return Merchandise Authorization number)	A number, acquired from Fargo Support, which authorizes the return of merchandise for repair or credit.
Roller	Elements of the Printer used for the transport of media consisting of a rotating steel shaft (for ribbon) or a rotating steel shaft with a rubber cylinder installed at the shaft midpoint (for moving cards).
RS-232	An interface standard, established in 1969 by the Electronic Industries Association, regarding the connecting of computer peripherals.
Saturation	A measure of the degree of color, from gray, with the same brightness.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Self-test	A pre-determined print file used to confirm Printer operation typically sent from the driver or stored in the Printer's memory.
Sensor	An electro-mechanical/electro-optical device used to indicate a change in state in the Printer such as when a card reaches a certain location.
Serial communications	The transfer of data, one bit at a time and in sequential order, using a single wire.
Serial interface	A sub D 9 pin input/output port on the Printer, used for serial communication with the PC for AS400 operating systems or for e card encoding.
SIMM (Single In-Line Memory Module)	An array of memory chips, attached to a printed circuit board that installs in a slot on the main board.
Simplex	Single-sided printing.
SmartGuard	An application from Fargo Electronics that allows users to prevent access to the Printer through the use of a personally encoded smart card.
SmartGuard™	SmartGuard is a Printer security option that uses a custom access card and a built-in reader to restrict Printer access. Only a valid access card can enable the Printer to print cards.
SmartShield™	This option allows the Printer to print custom, security images on the card that reflect under a black or UV light source.
Smart Card	Smart cards have an embedded computer circuit that contains either a memory chip or a microprocessor chip. There are several types of smart cards: Memory, Contact, Contactless, Hybrid (Twin), Combi (Dual Interface), Proximity and Vicinity.
Software	Instructions saved in computer memory that directs the computer to perform certain tasks and functions.
Spooler	A computer application that allows the spooling of print jobs.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Spooling	Rather than moving a print job directly to the Printer, the job is written to the disk so that the user can access the application faster while Windows takes care of printing in the background.
SS (Start Sentinel)	The character denoting the end of a magnetic data string.
Stacker	The device that moves the finished cards onto the output column ordering them First In, First Out.
Stepper motor	A motor whose shaft turns in discrete steps, rather than continuously.
String	A sequence of characters that form a line of data.
Surface mount	A method of mounting circuit elements onto the surface of a circuit board, attached at solder pads, rather than through holes in the board.
Surge Protector	An electronic device, placed in serial to the Printer's power supply, that prevents damage to the Printer from electronic surges and electrical current that is outside of the normal parameters.
Switch box	An electromechanical device to which a user may connect several peripheral devices to the parallel port simultaneously, yet using the selector switch to designate the active port.
TAC	Thermal Acceptance Composite cards. Card stock produced by laminating sheets of PVC with sheets of PET for better thermal distortion resistance. Ultra III cards.
Temp file	A temporary file, generated automatically by Windows, to store the information for an active document. Windows should delete these files when the application is closed.
Test-print	A file stored in or generated through windows that is sent to the Printer to test basic functionality.
Thermistor	An electronic resistor on the Printhead with a resistance value that varies in proportion to the heat to which it is exposed.

Continued on the next page

Glossary of Terms (continued)

Term	Definition
Thermocouple	A device for measuring temperature using a junction of two wires of dissimilar metals that produce a voltage when heated that varies proportionally with the temperature.
Thin Film Overlaminate	A 0.25-mil thick resin material that enhances card security and durability applied over the printed surface with a hot roller. Available as clear or with embedded holographic-type security images.
Through-hole	A method of mounting circuit elements with the leads passing through holes in the circuit board and soldered on the opposite side.
Timeout	An interruption of a print job that occurs when a function is not completed in the time allotted by the operating system.
TOF (Top of Form)	The leading edge of the card, as it travels through the Printer.
Track	The area on a mag stripe designated to contain the magnetic data string.
Troubleshooting	The process of investigating and determining the cause of a problem.
TrueType (TT)	A font format that produces each character using a mathematical equation, rather than a graphical representation, resulting in a much sharper, cleaner image.
UltraCard	The Fargo brand of card stock recommended for use in Fargo Printers, with the necessary glossy surface and composed of PVC.
UltraCard III	The Fargo brand of card stock, recommended for use in Fargo Printers that laminate, with the necessary glossy surface and composed of PVC and PET to prevent heat distortion.
Update	The process of installing a new revision of software or firmware to implement new changes to the Printer's command codes and procedures.
UPS (Un-interruptible Power Supply)	An AC power supply, typically powered by batteries, which provides temporary power to the PC or Printer during an interruption of the supply voltage.

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Glossary of Terms (continued)

Term	Definition
USB (Universal Serial Bus)	A 1.5M/sec (12Mbit/sec) serial communication interface that can support 127 separate devices consisting of 4 wires: power, ground, data in and data out.
Virtual Memory	A technique used by Windows when chip memory is exhausted, in which data is written to the hard to hold data temporarily and support Window's operations.
Wrinkle	The appearance in the card image of wavy or arched lines, either colored or clear, caused by improper film or ribbon tension.
YMC	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C).
YMCK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K).
YMCKH	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Heat Seal (H).
YMCKK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Black (K) (the second K is for backside, black only printing).
YMCKO	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Overlay (O).
YMCKOK	The designation of colored ribbon by the panels of color in the order in which they are printed: Yellow (Y), Magenta (M), Cyan (C), Black (K), Overlay (O), Black (K) (used for backside, black only printing).

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