



SR200 & SR300 Card Printer:

SDK Guide

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Revision History

June 2010	First release for SR200/SR300 printer and driver.
November 2010	Updates for driver that includes Windows 7, 64-bit, and current information for laminator interface.

Contents

Introduction.....	1
Overview.....	1
Control Libraries	1
Operating Environment.....	1
System Configuration.....	2
About the API	3
Command Structure	3
Card Position	3
Print Area.....	3
Printer Control Functions	4
Return Codes from Functions.....	4
Process Flow to Issue the Card.....	5
Scan Printer Functions	6
Scan Function.....	6
Printer Check Function	6
Printer Status Functions	7
Test Unit Ready Function	7
Read Position Function	7
Print on Retransfer Film functions	8
Image Out Function	8
Define LUT Function.....	11
Print Function.....	12
Functions for Moving and Discharging the Card	13
Card Load Function	13
Card Move Function	14
Retransfer to Card Functions	15
Retransfer Functions	15
Magnetic Stripe Encoding Functions	16
Writing Function (for JIS).....	16
Reading Function (for JIS).....	17
Writing Function (for ISO).....	17
Reading Function (for ISO).....	19
Smart Card (IC) Function	20
IC Control Function.....	20
Initializing the Printer Function	20
Rezero Function	20
Functions for Getting Information & Changing Settings	21
Inquiry Function	21
Mode Sense Function.....	22
Mode Select Function.....	32
Log Sense Function.....	43
Log Select Function	51
How to Encode with the Printer Driver	52
Inline Encoding	52

Encoding with ExtEscape()	54
Smart Card (IC) Programming	55
How to Override Driver Settings	57
Using ExtEscape() to Override a Setting	57
ExtEscape() Function	57
Change a Setting	57
Get the Current Setting	58
Programming Sample	59
cbParameter Values	61
Errors returned	62
Appendix A: API Error Codes	63
Error Format	63
Driver Errors (0x02xxxxxx)	64
Other Errors (0x09xxxxxx)	64
Appendix B: Magnetic Stripe Data	65
Appendix C: Card Printer Error Codes	68

Introduction

Overview

This document explains the application programming interface (API) for the SR200 & SR300 printer drivers.

Use the information to develop applications that use the SR200 printer or the SR300 printer. When you install the printer driver, the Printer Control DLL, required for the API (and printer driver), is also installed. You can use the printer driver and an existing application to print and encode. You can also use the Printer Control DLL directly without using the printer driver. This guide explains how to use Printer Control DLL, and how to do smart card and magnetic stripe encoding with printer driver.

Control Libraries

For the SR200/SR300 printer, the Printer Control DLL (PCP21CT.DLL) is part of the USB driver. The API for the SR200/SR300 described in this document can be used only with the USB driver and a USB connection.

The DLL is installed as part of driver installation.

Operating Environment

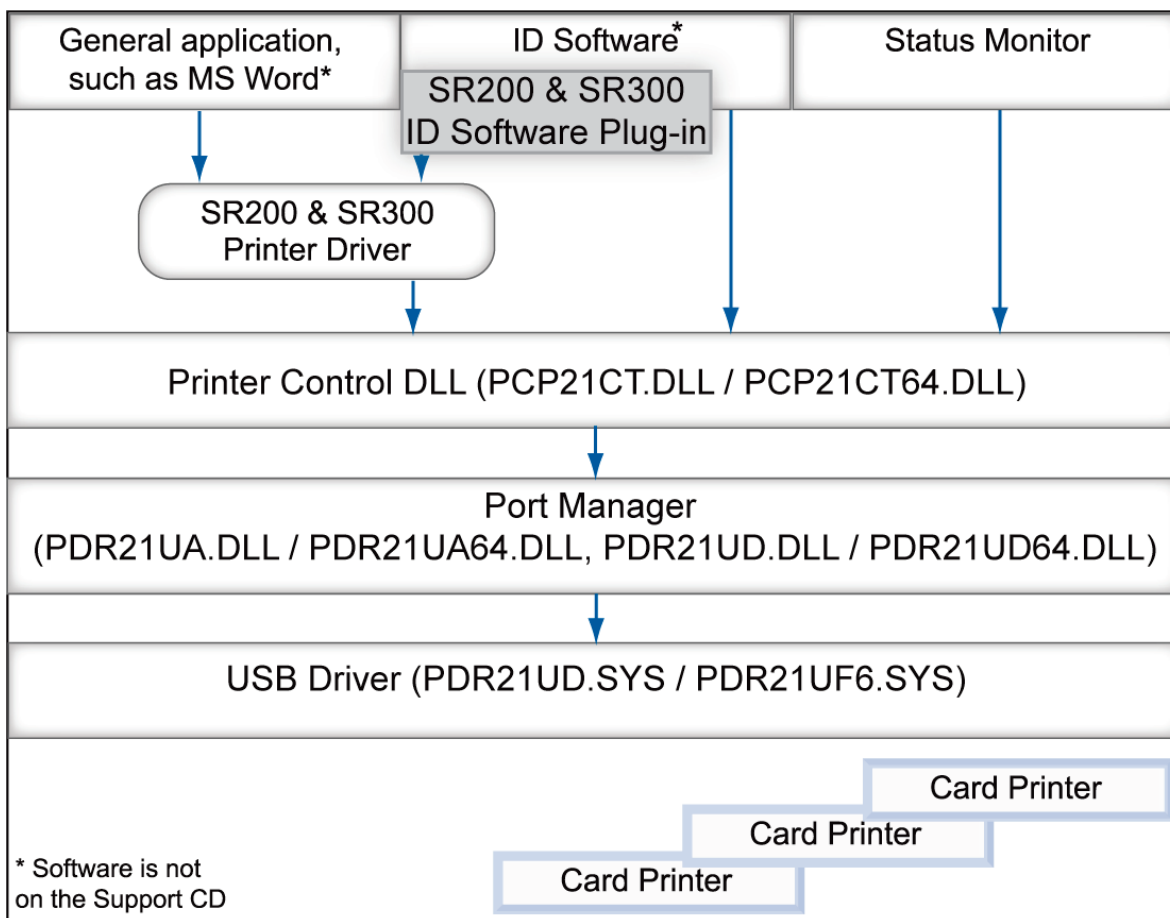
The following table shows the supported operating environment of the printer driver and API.

Item	Contents	Note
Operating System	Windows 7 (32-bit and 64-bit) Windows Vista (Service Pack 1 or later, 32 bit only) Windows 2000 Professional (Service Pack 4 or later, 32 bit) Windows XP Professional (Service Pack 2 or later, 32 bit only) Windows Server 2003 (R2 Service Pack 2 or later, 32 bit only)	
Peripheral	SR200 or SR300 Card Printer	Connect the card printer to the PC with a USB cable.

The API uses the C programming language.

System Configuration

The following diagram shows the software components and their relationships. Items with a gray background are not included with the SR200 or SR300 printer and Support CD. Software components with a white background are installed from the Support CD.



Tips for success

- Typically, the printer driver causes the printer to pick the card, and then encodes and prints. If a card is already in the printer, the printer driver processing is done to the card in the printer. By using the Printer Control DLL, you can perform processes such as smart card encoding before the printer driver's process.
- If you use both the Printer Control DLL and the printer driver, disable the Windows Spooler. The Printer Control DLL controls the card printer directly, and can cause conflicts with any printing data in the spooler.

About the API

This section provides background information about the printer driver API.

Command Structure

The structure of a command to the printer is according to the SCSI rule. A printer connected a PC is specified by both the Slot number and the ID of the printer. It makes it possible to control up to 10 printers. Most functions require both the Slot number and ID to specify the printer. The Slot number is a value decided by the system environment, and the ID is the unit number of the printer minus 1 (one).

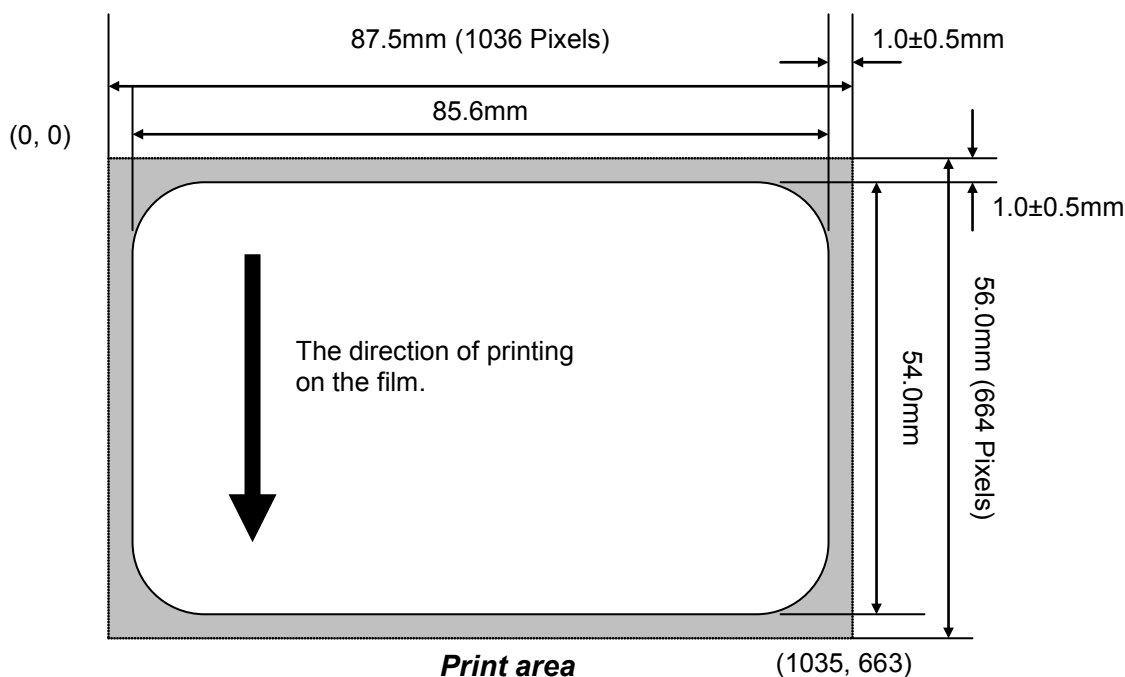
Card Position

The card must be in the correct position when you issue a printer command. If it is not, the command might fail. For example, the card must be at the retransfer position when you issue the Retransfer command, which retransfers the image from the INTM film to the card. You can use the Read Position command to identify the card position before issuing a command. The following table explains the card positions.

Card Position	Explanation
Retransfer Position	The position to start Retransfer
Contact IC encoder position	The position to do Contact IC encoding.
No-Contact IC encoder position	The position to do No-Contact IC encoding.
MAG encoder position	The position to do MAG encoding.

Print Area

The printer uses the Retransfer method, which prints on the retransfer (INTM) film and then the printer transfers the image to the card. The print area on the Retransfer film is larger than the actual print area on the card, as shown below.



Printer Control Functions

The Printer Control DLL (a Windows DLL) supports the printer control functions. The DLL is installed when the printer driver is installed.

Name	File Name	Explanation
Printer Control DLL	PCP21CT.DLL	SR200/SR300 CONTROL DLL for USB and 32-bit operating systems
	PCP21CT64>DLL	SR200/SR300 CONTROL DLL for USB and 64-bit operating systems

Return Codes from Functions

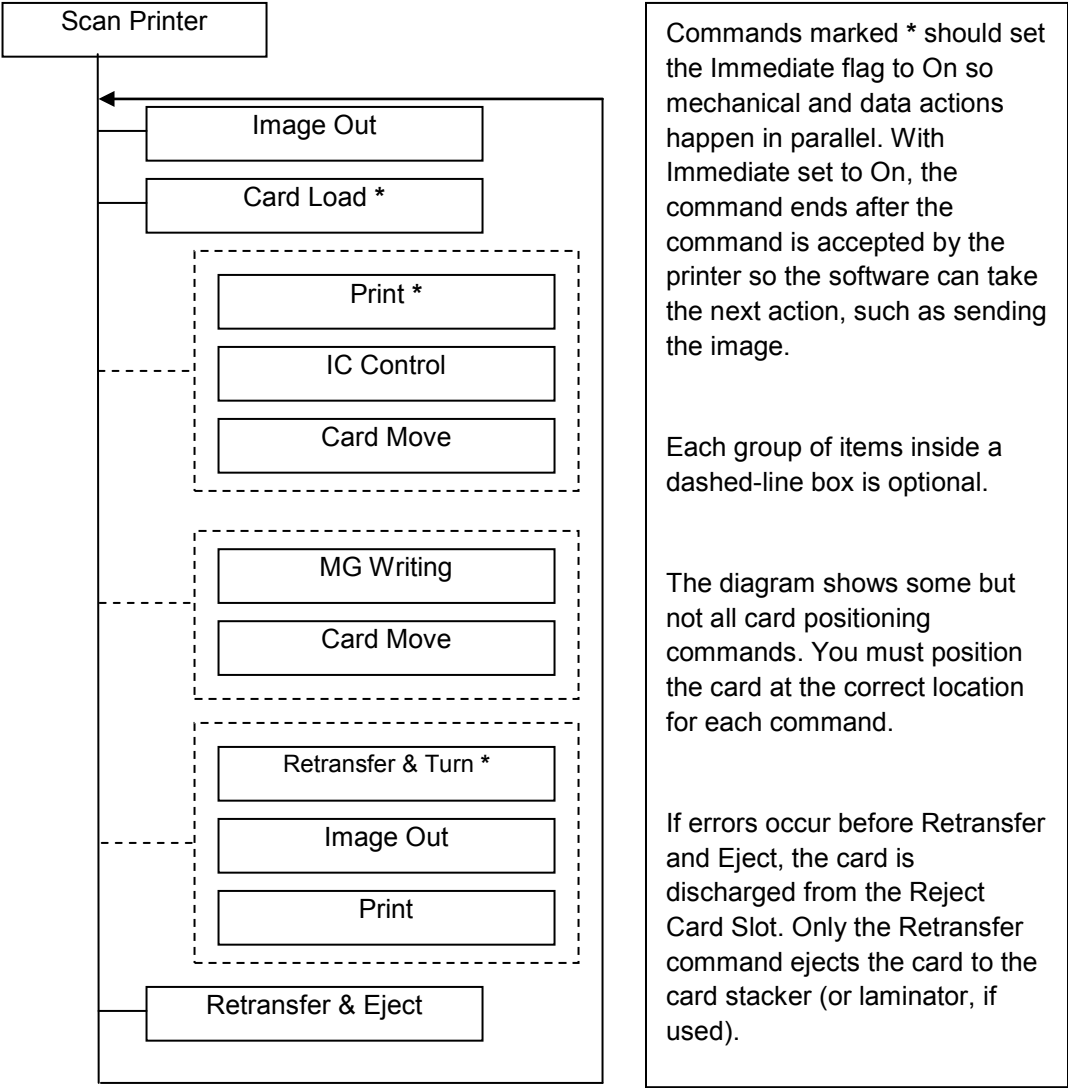
All functions can return the following:

- ◆ **0** Success.
- ◆ Positive value: The command could not be run but the condition will recover automatically. Retry after a little waiting. Possible values are:
 - 1(_BUSY)** The Port Manager did not send the command to the printer because of the printer's condition.
 - 2(_TARGET_BUSY1)** The Card Printer rejected the command because the printer is moving the card.
 - 3(_BUS_BUSY)** The Printer Control DLL rejected the command because the command issued by another process is being processed.
 - 4(_TARGET_BUSY2)** The Card Printer rejected the command because it is printing on the retransfer film.
 - 5(_TARGET_BUSY3)** The Card Printer rejected the command because of both _TARGET_BUSY1 and _TARGET_BUSY2.
- ◆ A negative value means an error occurred. See [Appendix A: API Error Codes](#) for details.

There might be additional return codes from some functions, which are described with the function.

Process Flow to Issue the Card

First, use the **Scan Printer** function to obtain the Slot number and ID of the printer. When you have these values, you can use them to send commands to the printer. The following diagram shows the typical flow for card processing.



You can use a different order if needed by your card design.

Scan Printer Functions

The API includes the following

- ◆ Scan Function
- ◆ Printer Check Function

Scan Function

No.	Function Name	Explanation
1	int CXCMD_ScanPrinter (int *piSlot, int *piID)	Search for the first printer, and return the Slot number and ID. The result is set at piSlot and piID.
2	int CXCMD_ScanPrinterNext (int *piSlot, int *piID)	Search for additional SR200/SR300 printers, after the one specified by piSlot and piID. The result is set at piSlot and piID.

You do not need to retry these commands, even if they return a positive value. A valid value is set at piSlot and piID even if they return a positive value. See Return Codes from Functions for return values.

Printer Check Function

No.	Function Name	Explanation
1	BOOL CXCMD_CheckIfConnected (int *piSlot, int *piID)	Check whether the printer specified by the Slot number and ID is connected or not. It returns TRUE if it is connected and it returns FALSE if it is not. This is the safest way to confirm whether the printer is connected or not.

Printer Status Functions

You can use the following functions to retrieve printer status:

- ◆ Test Unit Ready Function
- ◆ Read Position Function

Test Unit Ready Function

No.	Function Name	Explanation
1	int CXCMD_TestUnitReady (int iSlot, int iID)	Check the printer condition by issuing Test Unit Ready command to the printer.

Read Position Function

No.	Function Name	Explanation
1	int CXCMD_ReadPosition (int iSlot, int iID, BYTE *pbyBuffer)	Retrieve the card position by issuing Read Position command to the printer. The data is set at pbyBuffer.

Data Format for the Read Position Function

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved					PU*	Reserved	
1	Reserved						Load Mode**	
From 2 to 6	Reserved							
7	Position***							

The following are possible values in the pbyBuffer data returned:

***PU** (Position Unknown) values can be:

- 0: A card is in the printer unit.
- 1: No card is in the printer unit.

The printer reports PU = 1 if cards are only in the card hopper. The printer generates a Check Condition if it is transporting the card.

****Load Mode** is the way to load the card, and can be:

- 0 From the card tray

*****Position** is the card position in the printer unit, and can be:

- 0 At Retransfer Position
- 1 At Contact IC Encoder
- 2 At No-Contact IC encoder
- 3 At MAG encoder
- Greater than 3 Reserved

Print on Retransfer Film functions

The API provides the following printing functions:

- ◆ Image Out Function
- ◆ Define LUT Function
- ◆ Print Function

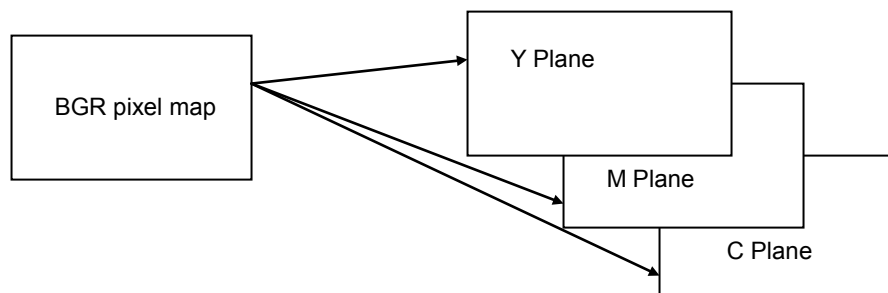
Image Out Function

No.	Function Name	Explanation
1	int CXCMD_ImageOut (int iSlot, int iID, BYTE * pbyPlane, int iLength, int iColor, int iBuffer)	<p>Transfers image data to the printer by using Image Out command.</p> <p>pbyPlane Image Data. The size of image data must be 1036 x 664 bytes.</p> <p>iLength Size of image data in bytes, which must be 1036 x 664.</p> <p>iColor Kind of image data.</p> <p>0 if image data is for K (black) ink. 1 if image data is for C (Cyan or blue) ink. 2 if image data is for M (Magenta) ink. 3 if image data is for Y (Yellow) ink. 4 if image data is for UV ink. 5 if image data is for Peel Off.</p> <p>iBuffer Image Data buffer number. The printer has two image buffers for all images. Specify:</p> <p>0 to use Buffer 0. 1 to use Buffer 1.</p>

How to Translate RGB to YMC Planes

The SR200 & SR300 printers support printing to YMC planes to print a colored image. If the source image is in RGB format, it must be transformed to Y, M and C planes. Normally, the formula to translate RGB to YMC is as follows.

$$Y = 255-B, M = 255-G, C = 255-R$$



About K Printing

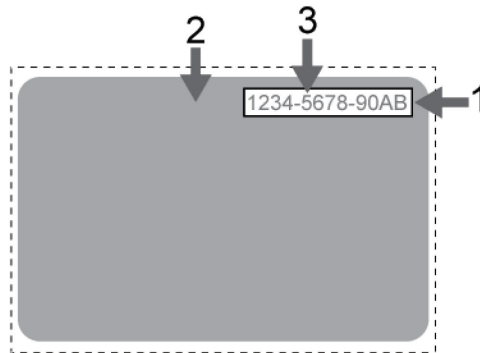
K ink is used for crisp, high-quality printing of black text. The data for K ink is Boolean (or 1 bit per pixel), where 0 stands for white or no printing, and 1 is black and is printed.

About UV Ink

UV ink becomes visible with ultraviolet rays. UV data is grayscale data, in the range of 0 to 255. 255 provides the maximum coverage.

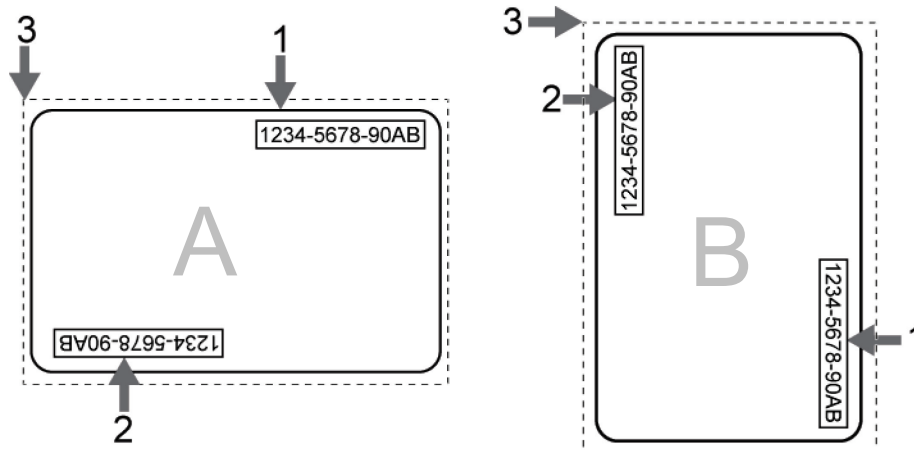
UV and YMCK inks cannot be transferred in the same area on the same retransfer panel. Two retransfer panels must be used to print the UV ink on top of the YMCK ink.

A single retransfer panel can be used to print UV and YMCK ink only if the area the UV ink will be printed on is not first printed with YMCK. An area of 2 pixels (1) is required between the K (2) and UV (3) printing. Be especially careful to maintain an unprinted border or 2 pixels of more between K printing and UV areas if using one panel.



When you use UV ink, the MAC address of the printer is always printed on the card using the UV Panel. For best results reading the MAC address, do not print YMCK on the MAC address block.

The location choices for printing the MAC address are Upper Right (1 in the illustration) and Lower Left (2), where 3 is the 0,0 point of the card image. The MAC Address block is 34 pixels high and 230 pixels long. The text is centered in these areas and is 18 pixels high and 200 pixels long.



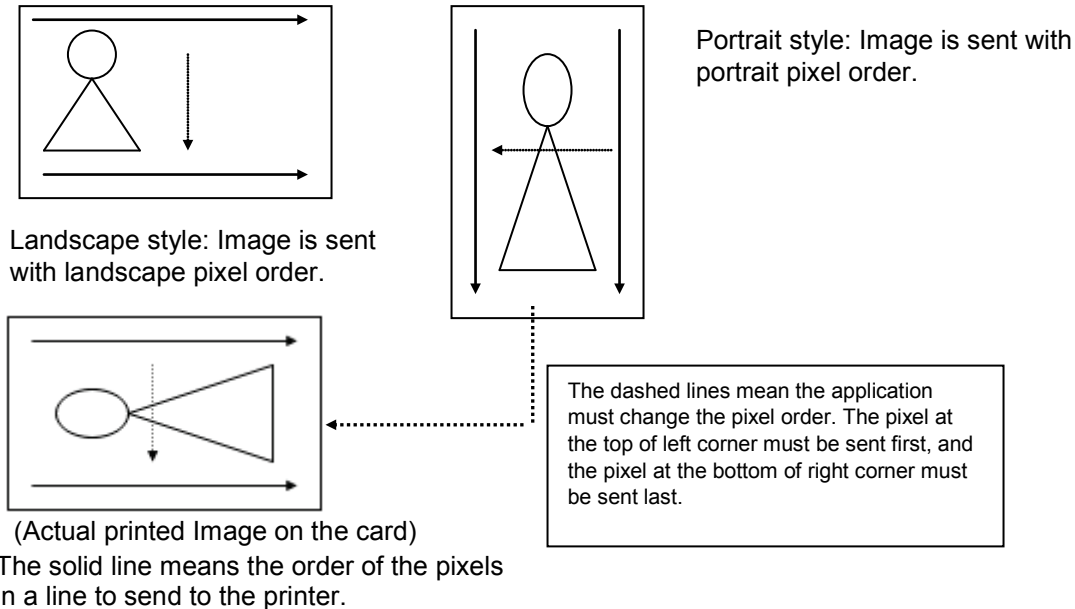
The card orientation—landscape (A in the illustration) or portrait (B)—affects where the MAC address block appears in the card design.

- ♦ **Landscape:** The upper right location starts at 764,18. The lower left location starts at 42,611.

- ◆ **Portrait:** The upper right location starts at 612,743. The lower left location starts at 19, 42.

About the Pixel Order for Images Sent to the Printer

Pixels must be sent to printer in Landscape order. If an image has portrait orientation, the application must change the pixel order to landscape when sending the data using the **ImageOut** function.



About the Peel Off Panel of the Ink Ribbon

The Peel Off panel of the YMCKPO Ink ribbon provides the ability to prevent printing on a magnetic stripe, signature panel, or other area on the card. Using driver settings for Special Ink 2 blocks printing and uses the peel-off panel to lift retransfer film. When using the API to print, you must perform print blocking and specify the peel-off area. The energy range for Peel Off is from 0 to 255, with a default of 230; a higher value has more power to peel off, but increases the possibility that the ink ribbon can fuse to the retransfer material.

The printer supports one peel-off area at the trailing edge of the card. If you need additional areas, contact your service provider for more information.

The quality of Peel Off depends on the shape, size and location of the peeled off area. In addition, the operating environment of the printer influences the quality of Peel Off. Use Peel Off after you confirm that Peel Off works well in your card design. Contact your dealer to learn more about Peel-off ribbon.

Define LUT Function

No.	Function Name	Explanation
1	int CXCMD_DefineLUT (int iSlot,int iID, int iColor, int iLength, BYTE *pbyBuffer)	<p>Change the look up table in the printer.</p> <p>iColor Each color has its own look up table. Possible values are 2 for C, 4 for M, 6 for Y. (0 for K is reserved for printer use.)</p> <p>iLength The length of LUT data in bytes. From 0 to 256.</p> <p>pbyBuffer LUT Data.</p>

About Look Up Tables (LUT)

A look up table is a method of adjusting RGB color values. The value X in the image data is replaced with LUT[X] value when it is printed.

LUT data is 256 bytes in length, and transforms the color being printed. Look up table data in the printer is set to the default value whenever the printer is powered on.

The printer has 4 look up tables, one for each color transformation. The following table shows how LUT data transforms output.

Image Data from Host		Byte Position in LUT	Value of LUT		Color actually printed
0	→	0	0	→	0
1	→	1	2	→	2
2	→	2	5	→	5
:	:	:	:	:	:
253	→	253	255	→	255
254	→	254	255	→	255
255	→	255	255	→	255

Print Function

No.	Function Name	Explanation
1	int CXCMD_Print (int iSlot,int iID, int iColor, int iBuffer, int ilmmed)	<p>Print on Retransfer film.</p> <p>iColor Specify the color to print.</p> <p>Bit 0:YMC</p> <p>Bit 1: K</p> <p>Bit 2: UV</p> <p>Bit 3:PO</p> <p>Bit 4-5: The location of the MAC address printed with UV.</p> <p>1 Upper Right Corner</p> <p>2 Lower Left Corner</p> <p>iBuffer Image Data buffer number. The printer has two image buffers for all images. Specify:</p> <p>0 to use Buffer 0.</p> <p>1 to use Buffer 1.</p> <p>ilmmed The immediate flag specifies when the printer replies.</p> <p>0 Reply after printer finishes printing.</p> <p>1 Reply immediately after printer accepts the command.</p>
2	Int CXCMD_SecurityPrint (int iSlot,int iID, Int iColor, intiBuffer, int ilmmed)	<p>Print the Security Erase feature, which conceals the text on the K panel and the retransfer film by printing again from the K panel to the retransfer panel.</p> <p>iColor Specify the color to print. Only K is allowed.</p> <p>Bit 0:YMC (not supported)</p> <p>Bit 1: K</p> <p>Bit 2: UV (not supported)</p> <p>Bit 3:PO (not supported)</p> <p>iBuffer Image Data buffer number. The printer has two image buffers for all images. Specify:</p> <p>0 to use Buffer 0.</p> <p>1 to use Buffer 1.</p> <p>ilmmed The immediate flag specifies when the printer replies.</p> <p>0 Reply after printer finishes printing.</p> <p>1 Reply immediately after printer accepts the command.</p>

Tips for Success

- ◆ The peel-off panel prevents applying the retransfer film onto the card, used in areas such as the magnetic stripe. If using the Peel-off panel, block printing in the area where peel-off will be used.
- ◆ Print Security Erase after the YMCK image is printed on the retransfer film and after it has been transferred to the card by the heat roller. The security erase image is not transferred. This function is only available when using YMCK, YMCK-UV and YMCK-K ink.

Functions for Moving and Discharging the Card

The API provides the following functions to move and discharge the card:

- ◆ Card Load Function
- ◆ Card Move Function

Card Load Function

No.	Function Name	Explanation
1	int CXCMD_LoadCard (int iSlot, int iID, int iDest, int iFlip, int iFilmInit, int ilmmed)	<p>Pick a card and move it to the specified position.</p> <p>iDest Destination to move card.</p> <p>0 Retransfer position</p> <p>1 Contact IC encoder</p> <p>2 No-contact IC encoder</p> <p>3 MG encoder</p> <p>4 NG Card outlet. Discharges the card from NG card outlet (on the right side of the printer).</p> <p>iFlip Specify whether turn over the card.</p> <p>0 Do not turn the card over</p> <p>1 Turn over the card before arriving at the destination</p> <p>iFilmInit Specify whether to move the retransfer film. This setting is effective only when iDest is 4 (NG Card outlet).</p> <p>0 Not adjusted</p> <p>1 Adjusted</p> <p>ilmmed The immediate flag specifies when the printer replies.</p> <p>0 Reply after printer finishes printing.</p> <p>1 Reply immediately after printer accepts the command.</p>

Tips for success

- ◆ If the retransfer film is printed on but not used, set **iFilmInit** to 1 to move the printed area of the retransfer film.
- ◆ The printer returns an error if **CXCMD_LoadCard()** is used when there is a card in the printer.
- ◆ The printer returns a positive value if **CXCMD_LoadCard()** is issued while the printer is moving a card or the retransfer film. See Return Codes from Functions for return values.
- ◆ If the function returns a positive value, wait and retry the function.

Card Move Function

No.	Function Name	Explanation
1	int CXCMD_MoveCard (int iSlot, int iID, int iDest, int iFlip, int iFilmInit, int iImmed)	<p>Move a card (after it is picked) to the specified position.</p> <p>iDest Destination to move card.</p> <p>0 Retransfer position 1 Contact IC encoder 2 No-contact IC encoder 3 MG encoder 4 NG Card outlet. Discharges the card from NG card outlet (on the right side of the printer).</p> <p>iFlip Specify whether turn over the card.</p> <p>0 Do not turn the card over 1 Turn over the card before arriving at the destination</p> <p>iFilmInit Specify whether to move the retransfer film. This setting is effective only when iDest is 4 (NG Card outlet).</p> <p>0 Not adjusted 1 Adjusted</p> <p>iImmed The immediate flag specifies when the printer replies.</p> <p>0 Reply after printer finishes printing. 1 Reply immediately after printer accepts the command.</p>

Tips for success

- ◆ If the retransfer film is printed on but not used, set **iFilmInit** to **1** to move the printed area of the retransfer film.
- ◆ The driver returns an error if **CXCMD_LoadCard()** is used when there is no card in the printer.
- ◆ The driver returns a positive value if **CXCMD_LoadCard()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.

Retransfer to Card Functions

Retransfer Functions

No.	Function Name	Explanation
1	int CXCMD_RetransferAndEject (int iSlot, int iID, int ilmmed)	Retransfers the image from the film to the card, and then moves the card out through the card discharge slot (on the left side of the printer). ilmmed The immediate flag specifies when the printer replies. 0 Reply after printer finishes printing. 1 Reply immediately after printer accepts the command.
2	int CXCMD_RetransferAndTurn (int iSlot, int iID, int ilmmed)	Retransfers the image from the film to the card, turns the card over, and then moves the card to the retransfer position. ilmmed The immediate flag specifies when the printer replies. 0 Reply after printer finishes printing. 1 Reply immediately after printer accepts the command.
3	CXCMD_Retransfer (int iSlot, int iID, int ilmmed)	Retransfers the image from the film to the card, and then moves the card to the retransfer position (for transferring the UV image to the card). ilmmed The immediate flag specifies when the printer replies. 0 Reply after printer finishes printing. 1 Reply immediately after printer accepts the command.

Tips for success

- ◆ The driver returns an error if **CXCMD_RetransferAndEject()** or **CXCMD_RetransferAndTurn()** are used when the card is not in the retransfer position.
- ◆ The driver returns a positive value if **CXCMD_RetransferAndEject()** or **CXCMD_RetransferAndTurn()** are issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.

Magnetic Stripe Encoding Functions

The API provides the following functions for magnetic stripe encoding:

- ◆ Writing Function (for JIS)
- ◆ Reading Function (for JIS)
- ◆ Writing Functions (for ISO)
- ◆ Reading Function (for ISO)

Writing Function (for JIS)

No.	Function Name	Explanation
1	int CXCMD_WriteMagData (int iSlot, int iID, BYTE *pbyBuff, int iLength, int iMagFormat)	Writes data to the magnetic stripe on the card. pbyBuff Pointer to the data to write. Data must be ASCII characters. iLength Size of data in bytes. iMagFormat Specify the magnetic stripe encoding format. 0x07 JIS-2(7bits) 69 characters, maximum

Tips for success

- ◆ The driver returns an error if **CXCMD_WriteMagData()** is used when the card is not in the MG encoder position.
- ◆ The driver returns a positive value if **CXCMD_WriteMagData()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.
- ◆ See [Appendix B: Magnetic Stripe Data](#) for information about data for the format.

Reading Function (for JIS)

No.	Function Name	Explanation
1	int CXCMD_ReadMagData (int iSlot, int iID, BYTE *pbyBuff, int *piLength, int iMagFormat)	<p>Reads the data on the magnetic stripe on the card.</p> <p>pbyBuff Pointer to the memory location at which to store the data read from the card. Data must be ASCII characters.</p> <p>iLength Size of data in bytes.</p> <p>iMagFormat Specify the encoding format of the data to read.</p> <p>0x07 JIS-2(7bits) 69 characters, maximum</p>

Tips for success

- ◆ The printer returns an error if **CXCMD_ReadMagData()** is used when the card is not in the MG encoder position.
- ◆ The printer returns a positive value if **CXCMD_ReadMagData()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.
- ◆ See [Appendix B: Magnetic Stripe Data](#) for information about data for the format.

Writing Function (for ISO)

No.	Function Name	Explanation
1	int CXCMD_WriteISO3TrackMagData (int iSlot, int iID, int iTrack1MagFormat, BYTE *pbyTrack1Buff, int iTrack1DataLength, int iTrack2MagFormat, BYTE *pbyTrack2Buff, int iTrack2DataLength, int iTrack3MagFormat, BYTE *pbyTrack3Buff, int iTrack3DataLength,)	<p>Writes data to the 3-track (ISO) magnetic stripe on the card.</p> <p>iTrack1MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not write the track</p> <p>0xa6 ISO track 1 (6 bits) 76 characters, maximum</p> <p>0xa7 ISO track 1 (7 bits) 69 characters, maximum</p> <p>0xa8 ISO track 1 (6 bits) 79 characters, maximum</p> <p>pbyTrack1Buff Pointer to the data to write. Data must be ASCII characters.</p> <p>iTrack1DataLength Size of data in bytes in pbyTrack1Buff.</p> <p>iTrack2MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not write the track</p> <p>0xb4 ISO track 2 (4 bits) 37 characters, maximum</p>

No.	Function Name	Explanation
		<p>pbyTrack2Buff Pointer to the data to write. Data must be ASCII characters.</p> <p>iTrack2DataLength Size of data in bytes in pbyTrack2Buff.</p> <p>ITrack3MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not write the track</p> <p>0xc4 ISO track 3 (4 bits) 104 characters, maximum</p> <p>0xc6 ISO track 1 (6 bits) 79 characters, maximum</p> <p>0xc7 ISO track 3 (7 bits) 69 characters, maximum</p> <p>pbyTrack3Buff Pointer to the data to write. Data must be ASCII characters.</p> <p>iTrack3DataLength Size of data in bytes in pbyTrack3Buff.</p>

Tips for success

- ◆ The driver returns an error if **CXCMD_WriteISO3TrackMagData()** is used when the card is not in the MG encoder position.
- ◆ The driver returns a positive value if **CXCMD_WriteISO3TrackMagData()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.
- ◆ See [Appendix B: Magnetic Stripe Data](#) for information about data for each format.

Reading Function (for ISO)

No.	Function Name	Explanation
1	int CXCMD_ReadMagData (int iSlot, int iLD, int iTrack1MagFormat, BYTE *pbyTrack1Buff, int iTrack1DataLength, int iTrack2MagFormat, BYTE *pbyTrack2Buff, int iTrack2DataLength, int iTrack3MagFormat, BYTE *pbyTrack3Buff, int iTrack3DataLength,)	<p>Reads data from the 3-track (ISO) magnetic stripe on the card.</p> <p>iTrack1MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not read the track</p> <p>0xa6 ISO track 1 (6 bits) 76 characters, maximum</p> <p>0xa7 ISO track 1 (7 bits) 69 characters, maximum</p> <p>0xa8 ISO track 1 (6 bits) 79 characters, maximum</p> <p>pbyTrack1Buff Pointer to the data read. Data must be ASCII characters.</p> <p>iTrack1DataLength Size of data in bytes in pbyTrack1Buff.</p> <p>iTrack2MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not read the track</p> <p>0xb4 ISO track 2 (4 bits) 37 characters, maximum</p> <p>pbyTrack2Buff Pointer to the data read. Data must be ASCII characters.</p> <p>iTrack2DataLength Size of data in bytes in pbyTrack2Buff.</p> <p>iTrack3MagFormat Specify the magnetic stripe encoding format.</p> <p>0x00 Do not read the track</p> <p>0xc4 ISO track 3 (4 bits) 104 characters, maximum</p> <p>0xc6 ISO track 1 (6 bits) 79 characters, maximum</p> <p>0xc7 ISO track 3 (7 bits) 69 characters, maximum</p> <p>pbyTrack3Buff Pointer to the data read. Data must be ASCII characters.</p> <p>iTrack3DataLength Size of data in bytes in pbyTrack3Buff.</p>

Tips for success

- ◆ The driver returns an error if **CXCMD_ReadISO3TrackMagData()** is used when the card is not in the MG encoder position.
- ◆ The driver returns a positive value if **CXCMD_ReadISO3TrackMagData()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.
- ◆ See [Appendix B: Magnetic Stripe Data](#) for information about data for each format.

Smart Card (IC) Function

IC Control Function

No.	Function Name	Explanation
1	int CXCMD_ICControl (int iSlot,int iID, int iICType, int iAction)	<p>Perform smart card (IC) encoding.</p> <p>iICType Type of IC encoding.</p> <p>0 Contact IC encoding</p> <p>1 No-Contact IC encoding</p> <p>2 Security enclosure lock</p> <p>iAction Action of IC encoder or lock.</p> <p>0 Contact or lock</p> <p>1 Release or unlock</p>

Tips for success

- ◆ The printer returns an error if **CXCMD_ICControl()** is used when the card is not at the appropriate IC encoder position.
- ◆ The printer returns a positive value if **CXCMD_ICControl()** is issued while the printer is moving a card or the retransfer film. See [Return Codes from Functions](#) for return values.
- ◆ If the function returns a positive value, wait and retry the function.
- ◆ **CXCMD_ICControl()** must be issued with **iAction=1** before moving a card. The printer returns an error if **CXCMD_MoveCard()** is used after **CXCMD_ICControl()** is issued with **iAction=0**.
- ◆ If you use the printer driver, Datacard Software Plug-in for the SR200/SR300 printer, and smart card, the printer must be connected using a USB data cable. (Network connection is not supported for smart card.)

Initializing the Printer Function

Rezero Function

No.	Function Name	Explanation
1	int CXCMD_RezeroUnit (int iSlot, int iID, init iAction)	<p>Initializes the printer. When it is initialized, the printer discharges the card, and moves both the Retransfer film and printing Ink to prepare for the next card. Initializing also ends sleep mode.</p> <p>iAction designate initialization</p> <p>0 Run standard mechanical initialization</p> <p>1 Release Power Save mode with no mechanical actions</p>

Functions for Getting Information & Changing Settings

The driver API provides the following functions:

- ◆ Inquiry Function
- ◆ Mode Sense Function
- ◆ Mode Select Function
- ◆ Log Sense Function
- ◆ Log Select Function

These functions query the printer to obtain data.

Inquiry Function

No.	Function Name	Explanation
1	int CXCMD_StandardInquiry (int iSlot, int iID, BYTE *pbyBuffer)	Get Inquiry data from the printer. PbyBuffer Pointer to the memory to store Inquiry data. 96 bytes or more of memory is required.

Bit Byte	7	6	5	4	3	2	1	0
0	Device Type (2: Printer)							
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	1	0
3	Reserved				0	0	1	0
4	Additional Length (0x5b)							
5-6	Reserved							
7	0	0	0	0	1	0	0	0
16-31	Product Identification (ASCII Characters)							
32-39	Printer Firmware Version (ASCII Characters)							
40	Mag Stripe Option (Binary): None:0,ISO:1,JIS:2							
41	External Smart Card (IC) Contact Option (Binary): None:0,ISO:1,JIS:2							
42	Contact IC R/W Option (Binary): None:0,Installed:1							
43	IC Antenna (Binary): None:0,Installed:1							
44	Turn Over Unit Option (Binary): None:0,Installed:1							
45	Bend Remedy Heat Roller Option (Binary): None:0,Installed:1							
46	Security Lock Option (Binary): None:0,Installed:1							
47	Laminator (Binary): None:0,Connected:1							
48-49	Reserved							
50-57	Laminator Version (ASCII): Laminator Firmware Version							
58-70	Thermal Head Information (ASCII): Thermal Head information							

71-78	Config Version (ASCII): Printer Configuration Version
79-86	Table Version (ASCII): Printer Table Version
87-95	Reserved

If an option unit is not installed, the function returns the string **????** as the firmware version.

Mode Sense Function

No.	Function Name	Explanation
1	int CXCMD_ModeSense (int iSlot, int iLD, Int iPC, int iPage, BYTE *pbyBuffer)	<p>Get Mode Sense data from the printer.</p> <p>iPage Choose one of following types of data.</p> <p>0x23 Ink data</p> <p>0x28 Print unit data</p> <p>0x2a Encode unit data</p> <p>0x2C Laminator unit data</p> <p>0x2D Network data</p> <p>pbyBuffer Pointer to the memory to store Mode Sense data.</p> <p>The size of memory must be at least:</p> <p>(4+40) bytes if you request Ink data</p> <p>(4+60) bytes if you request Print unit data</p> <p>(4+10) bytes if you request Encode unit data</p> <p>(4+24) bytes if you request Laminator unit data</p> <p>(4+100) bytes if you request Network data.</p>

The Mode Data Header is stored as the top 4 bytes. The actual data starts at the fifth (5) byte.

Mode Sense Data Header

<div>Bit</div> <div>Byte</div>	7	6	5	4	3	2	1	0
0	Mode Sense Data Length*							
1	Reserved							
2	Re- served	0	0	1	Reserved			
3	Reserved							

* The Mode Sense Data Length is the size of the Mode Sense Data (in bytes) minus 1.

Ink Data (Page Code = 23H)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x23)					
1	Page Specific Parameter Length (0x26)							
2	Ink Code							
3	Reserved							
4	(MSB) Number of Sets of Ink Panels (LSB)							
5								
6	Reserved							
7	Reserved							
8	Lot Number (ASCII) Only first 6 bytes are meaningful. The rest are filled with 0.							
39								

Ink Code Specifies the kind of the ink ribbon. Possible values are:

- | | |
|--|--------------------------------|
| 0x00 YMCK ink ribbon | 0x01 Reserved |
| 0x02 YMCK-PO ink ribbon | 0x03 K ink ribbon |
| 0x04 YMCKK ink ribbon | 0x05 YMCK-UV ink ribbon |
| 0xFF Unknown--Unable to communicate with RFID tag | |
| 0xFE Unknown—RFID tag not found | |
| 0xFD Unknown--Communication error with RFID tag | |
| 0xFC Unknown—RFID tag is not valid | |

Not all types of ink ribbon are supported by the printer.

Number of Sets of Ink Panels The number of cards being printed by the ink normally.

Lot Number The lot number of the ink ribbon, in ASCII character format. The **Lot Number** is zeros (0) if the **Ink Code** is from 0xFC to 0xFF.

Print Unit Data (Page Code=0x28)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (28H)					
1	Page Specific Parameter Length (0x3a)							
2~3	Reserved							
4	(MSB) Basic Resolution X (012CH) (LSB)							
5								
6	(MSB) Basic Resolution Y (012CH) (LSB)							
7								
8	HR Temperature Control							
10~11	Reserved							
12	(MSB) Card Size X (LSB)							
13								
14	(MSB) Card Size Y (LSB)							
15								
16	MG Peel Mode							
20	Film Code							
22	Card Code							
23	Standby Mode							
24	(MSB) Print Position X (LSB)							
25								
26	(MSB) Print Position Y (LSB)							
27								
28	(MSB) Print Size X (LSB)							
29								
30	(MSB) Print Size Y (LSB)							
31								
32	Reserved							
33	Heat Roller Temperature (Retransfer)							
34	Velocity (Retransfer)							
35	Velocity (Retransfer Back)							
36	Heat Roller Temperature (Card Fix)							
37	Velocity (Card Fix)							

<div>Bit</div> <div>Byte</div>	7	6	5	4	3	2	1	0
38	Reserved							
39	Peel Wait Time							
41	Resin Black Level							
42	Resin Black Mode							
43	A0 Level							
44	A1 Level							
45	Buzzer Mode							
46	Power Save Mode							
47	Film Quantity							
48	Ink Quantity							
49	Card Quantity							
50	YMC Level							
51	Display Contrast							
52	Reserved (0xff)							
53	Display Mode							
54	Display Counter							
55	Security Lock							
56	Velocity of the front side 2nd retransfer (UV)							
57	Velocity of the back side 2nd retransfer (UV)							
58	Backside Cooling							
59	Reserved (0xff)							

Basic Resolution X Horizontal resolution in DPI. Actual resolution is about 300.59 dpi.

Basic Resolution Y Vertical resolution in DPI. Actual resolution is about 300.59 dpi.

HR Temperature Control When temperature control is enabled, the printer lowers the heat roller temperature if no cards are printed for 30 minutes.

0 Disabled

1 Enabled

Card Size X Horizontal Card size at Basic Resolution X.

Card Size Y Vertical Card size at Basic Resolution Y.

0 Disabled **1** Enabled

0 Standard (1000 panels) **2** Standard (750 panels)

0 Standard (Print Range is 1036 x 664 pixels)

Standby Mode Specifies when the printer waits for the laminator to be ready. Use this setting only when a laminator is attached and you are printing both sides of the card.

0 Wait before retransferring the front side of the card

1 Wait before retransferring the back side of the card

Print Position X The location of the maximum printable area from left edge of the card, in the units of Basic Resolution X.

Print Position Y The location of the maximum printable area from top edge of the card, in the units of Basic Resolution Y.

Print Size X The width of the maximum printable area, in the units of Basic Resolution X.

Print Size Y The height of the maximum printable area, in the units of Basic Resolution Y.

Heat Roller Temperature for Retransfer The possible range is from 0 (Low) to 5 (High).

Velocity for front side Retransfer The possible range is from 0 (Fast) to 12 (Slow).

Velocity for back side Retransfer The possible range is from 0 (Fast) to 12 (Slow).

Heat Roller Temperature for Card Fix The possible range is from 0 (Low) to 5 (High).

Velocity for Card Fix The possible range is from 0 (Slow) to 4 (Fast).

Peel Wait Time Wait time in seconds before peel. Not used.

Resin Black Energy Level From 0 (Low) to 6 (High).

Resin Black Mode The possible values are:

0 Standard **1** Fine

A0 Energy Level The possible range is from 0 (Low) to 6 (High).

A1 Energy Level The possible range is from 0 (Low) to 6 (High).

Buzzer Mode

0 Buzzer is enabled **1** Buzzer is disabled

Power Save Mode The wait time to enable Power Save Mode, in minutes.

0 5(min)	1 10
2 15	3 20
4 25	5 30
6 45	7 60
8 Off	

Film Quantity Usable retransfer film quantity. The possible range is from **0** (None) to **10** (Full).

Ink Quantity Usable ink quantity. The possible range is from 0 (None) to 50 (Full).

Card Quantity The quantity of cards in the card tray.

0 None	2 Any
---------------	--------------

YMC Energy Level The possible range is from 0 (Low) to 6 (High).

Display Contrast LCD Contrast.

0 -3	1 -2
2 -2	3 0
4 +1	5 +2
6 +3	

Display Mode Contents in the LCD. When the laminator is not connected, it shows the Counter.

When the laminator has a problem, it shows the message for the problem.

0 Counter	1 Laminator Status
------------------	---------------------------

Display Counter The type of Counter in the LCD.

0 Total Counter	1 Head Counter
2 Free Counter	3 Cleaning Counter
4 Error Counter	

Security Lock The status of the security lock.

0 Unlocked	1 Locked
-------------------	-----------------

Velocity of the front side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV on the front side. The possible range is from 0 (+2: Fast) to 5 (-3: Slow).

Velocity of the back side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV onto the back side. From 0 (+2:Fast) to 5 (-3:Slow).

Backside Cooling Wait a little before the retransfer of the back side to decrease the card bending.

0 Off	1 On
--------------	-------------

Encode Unit Data (Page Code=0x2A)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (2AH)					
1	Page Specific Parameter Length (08H)							
2	ISO Mode							
3	JIS Mode							
4 to 6	Reserved							
7	Read Write Retry							
8	Reserved							
9	Reserved							

ISO Mode Coercivity of ISO MG encoder.

0 Lo-Co (300 Oe)

1 Hi-Co (2750 Oe)

JIS Mode Coercivity of JIS MG Encoder.

0 Lo-Co

1 Hi-Co (2750Oe)

Read Write Retry Retry count for reading and writing magnetic stripe data when the operation fails. Possible values are from 0 to 3.

Laminator Unit Data (Page Code=0x2C)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2c)					
1	Page Specific Parameter Length (0x16)							
2	Laminate Mode							
3	Film T Type*							
4	Film T Position							
5	Heat Roller T Temp							
6	Laminate Speed							
7	Cassette							
8	Laminate Cooling Time							
9	HR Control							
10-13	Reserved							
14	Film B Type*							
15	Film B Position							
16	Heat Roller B Temp							
17-23	Reserved							

*In "Film T Type" and "Film B Type", T (Top) references the lamination function on the top side of the card. B (Bottom) references the lamination function on the bottom side of the card.

Laminate Mode The type of lamination process used.

0 Laminate **1** Pass through

Film T Type The type of lamination film on the top side.

0 Patch **1** Overlay

NOTE: The LM300 laminator is designed to use same type of film in the top and bottom laminators. Using different types of film is not guaranteed.

Film T Position The position of lamination start (\pm X direction) on the top side. The possible range is from 0 (-7) to 14 (+7)

Heat Roller T Temp The heat roller temperature setting on the top side lamination. Values specified here correspond to the following temperatures (in degrees Centigrade).

0 90	1 95	2 100	3 105
4 110	5 115	6 120	7 125
8 130	9 135	10 140	11 145
12 150	13 155	14 160	15 165
16 170	17 175	18 180	

A laminator temperature over 180 degrees Centigrade is not used. A setting over 180 degrees (previously supported) results in a temperature of 180 degrees.

Laminate Speed The laminate speed setting. Values specified here correspond to the following speeds in millimeters per second (mm/sec).

0 3.0	1 3.5	2 4.0	3 4.5
4 5.0	5 5.5	6 6.0	7 6.5
8 7.0	9 7.5	10 8.0	11 8.5
12 9.0	13 9.5	14 10.0	15 10.5
16 11.0	17 11.5	18 12.0	

Cassette The provision of film cassette.

0 not provided **1** provided for the top side
2 provided for the bottom side **3** provided for the top and bottom side

Laminate Cooling Time Sets the length of cooling time in seconds.

0 0	1 5	2 7	3 10
4 15	5 20	6 30	

HR Control In the case of "On", the heat roller temperature falls to 180 centigrade when the laminator does not work for 30 minutes.

0 Off **1** On

Film B Type The type of the lamination film on the bottom side.

0 Patch

1 Overlay

NOTE: The LM300 laminator is designed to use same type of film in the top and bottom laminators. Using different types of film is not guaranteed.

Film B Position The position of lamination start (\pm X direction) on the bottom side.

The possible range is from 0 (-7) to 14 (+7)

Heat Roller B Temp Sets the heat roller temperature for applying the laminate to the card. Values specified here correspond to the following temperatures (in degrees Centigrade).

0 90	1 95	2 100	3 105
4 110	5 115	6 120	7 125
8 130	9 135	10 140	11 145
12 150	13 155	14 160	15 165
16 170	17 175	18 180	

A laminator temperature over 180 degrees Centigrade is not used. A setting over 180 degrees (previously supported) results in a temperature of 180 degrees.

Network Data (Page Code=0x2D)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2d)					
1	Page Specific Parameter Length (0x62)							
2 to 5	(MSB) IP Address (Binary) (LSB)							
6 to 9	(MSB) Subnet Mask (Binary) (LSB)							
10 to 13	(MSB) Default Gateway (Binary) (LSB)							
14	Session Timeout							
15	DHCP							
16	Host I/F							
17 to 26	Printer Names (ASCII Characters)							
27	IPSec Mode							
28	IPSec Type							
29	IPv6 Subnet Prefix Length							
30	IPv6 Address Configuration							
31-46	IPv6 Default Gateway Address							

47-62	IPv6 Address
63-79	Reserved

Session Timeout The time interval to detect that the printer TCP session has been disconnected from the host PC. For best results, use 0.

- | | |
|---------------------|---------------------|
| 0 Disabled | 1 10 minutes |
| 2 20 minutes | 3 30 minutes |
| 4 60 minutes | |

DHCP Whether DHCP is enabled.

- | | |
|------------------|-------------------|
| 0 Enabled | 1 Disabled |
|------------------|-------------------|

Host I/F The type of connection (interface) between the printer and PC. This must always be 1 to use this programming interface.

- | | |
|-------------------|--------------|
| 0 Ethernet | 1 USB |
|-------------------|--------------|

Printer Name The logical name of the printer. The remainder of the field is filled with 0 when the printer name contains fewer than 10 characters.

IPSec Mode Whether IP Sec is enabled.

- | | |
|----------------------------------|-------------------------------|
| 0 IPSec Function prohibit | 1 IPSec Function work. |
|----------------------------------|-------------------------------|

When IPSec Mode is 1, IPSec Type must be set to 1 or 2.

IPSec Type The type of PC Sec – a Preshared key or a Certificate. A value of 0 means no IP security.

- | | |
|-------------------------|--------------------|
| 0 No Certificate | 1 Preshared |
| 2 Certificate | |

IPv6 Subnet Prefix Length IPv6 Subnet Prefix length setting.

The possible range is from 0 to 128

IPv6 Address Configuration IPv6 Address configuration setting

- | | |
|---------------|-----------------|
| 0 Auto | 1 Manual |
|---------------|-----------------|

When Auto is selected, a manually set IP Address is not effective.

IPv6 Default Gateway Address IPv6 Default Gateway Address setting.

IPv6 Address IPv6 Address setting.

Mode Select Function

No.	Function Name	Explanation
1	int CXCMD_ModeSelect (int iSlot, int iID, Int iSp, int iPage, BYTE *pbyData)	<p>Change printer settings by using Mode Select command.</p> <p>iSp Choose whether to save the setting in non-volatile memory. 0 Do not save This value must be 0. To change a setting, use the iPage parameter, below.</p> <p>iPage Choose one of following Mode Select Data types: 0x28 Print Unit Data (See page 3324) 0x2A Encode Unit Data (See page 36) 0x2C Laminator Unit Data (See page 37) 0x2D Network Data (See page 39) 0x2B Print Information Data (See page 41)</p> <p>pbyData Pointer to the memory. Mode Select Data must have been set. The size of memory must be: 32 bytes if Print Unit Information Data 23 bytes if Print Unit Data 10 bytes if Encode Unit Data 24 bytes for Laminator Unit Data 80 Bytes for Network Data 24 bytes if Print Information Data</p>

Tips for Success

- ◆ If the printer setting is changed by this command, send the **CXCMD_RezeroUnit** command or push the RESET button on the printer's front panel to initialize the printer and make the new values take effect.
- ◆ If you send a value of **0xFF**, the setting is not changed, and the printer uses the value currently stored in memory.
- ◆ The **Reserved** values in the Mode Select Data structure must be filled with zeros (0) for compatibility with future versions. (Use 0xFF for a reserved value only if that is the actual value.)
- ◆ The **iSp** value should be set at 0. When this setting is not stored in the EEPROM, it will be changed by the Print Information Data Page. The settings in other pages will always be kept in the EEPROM.
- ◆ The **iPage** setting is not kept in the EEPROM.

Print Unit Data (Page Code=0x28)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x28)					
1	Page Specific Parameter Length (0x1e)							
2	Reserved (0xff)							
3	Reserved (0xff)							
4	Heat Roller Temperature (Retransfer)							
5	Velocity (Retransfer)							
6	Velocity (Retransfer Back)							
7	Heat Roller Temperature (Card Fix)							
8	Velocity (Card Fix)							
9	Reserved (0xff)							
10	Peel Wait Time							
11	MG Peel Mode							
12	Standby Mode							
13	Resin Black Level							
14	Resin Black Mode							
15	A0 (UV) Level							
16	A1 (PO) Level							
17	Film Code							
18	HR Temperature Control							
19	Card Code							
20	Reserved (0xff)							
21	Buzzer Mode							
22	Power Save Mode							
23	YMC Level							
24	Display Contrast							
25	Reserved (0xff)							
26	Display Mode							
27	Display Counter							
28	Velocity of the front side 2nd retransfer (UV)							
29	Velocity of the back side 2nd retransfer (UV)							
30	Backside Cooling							

Bit Byte	7	6	5	4	3	2	1	0
31	Reserved (0xff)							

Tips for Success

- The contents of the Print Unit Data page are always kept in the EEPROM. If the setting is 0xff, it keeps the settings that are in the EEPROM. Other items are not changed.
- Film Code settings will be effective after the reset. Other printing function settings will be effective with the next card printed.

Heat Roller Temperature for Retransfer From 0 (Low) to 4 (High).

Velocity for the front side Retransfer From 0 (Fast) to 5 (Slow).

Velocity for the back side Retransfer From 0 (Fast) to 5 (Slow).

Heat Roller Temperature for Card Fix From 0 (Low) to 5 (High).

Velocity for Card Fix From 0 (Slow) to 4 (Fast).

Peel off Wait Time Wait time in seconds before peel. Not used.

MG Peel Mode When MG Peel is enabled, the retransfer film is peeled from the back side differently. The printer must have a mag stripe encoder and the card should use mag encoding if this setting is enabled.

0 Disabled

1 Enabled

Standby Mode Specifies when the printer waits for the laminator to be ready. Use this setting only when a laminator is attached and you are printing both sides of the card.

0 Wait before retransferring the front side of the card

1 Wait before retransferring the back side of the card

Resin Black Energy Level From 0 (Low) to 6 (High).

Resin Black Mode

0 Standard

1 Fine

A0 (UV) Energy Level: From 0 (Low) to 6 (High).

A1 (PO) Energy Level: From 0 (Low) to 6 (High).

Film Code The kind of retransfer film. Use **0** if the value for iSp is **0**.

0 Standard (1000 panels)

2 Standard (750 panels)

HR Temperature Control When temperature control is enabled, the printer lowers the heat roller temperature if no cards are printed for 30 minutes. Use **0** if the value for iSp is **0**.

0 Disabled

1 Enabled

Card Code The kind of card. Use **0** if the value for iSp is **0**.

0 Standard (Print area is 1036 x 664 pixels)

2 Thin card (Card thickness is 0.25mm)

Buzzer Mode: Use **0** if the value for iSp is **0**.

- | | |
|------------------------|-------------------------|
| 0 Enable Buzzer | 1 Disable Buzzer |
|------------------------|-------------------------|

Power Save Mode The wait time to enable Power Save Mode, in minutes. Use **0** if the value for iSp is **0**.

- | | | |
|------------------|-------------|--------------|
| 0 5 (min) | 1 10 | 2 15 |
| 3 20 | 4 25 | 5 30 |
| 6 45 | 7 60 | 8 Off |

YMC Level YMC Printing energy level setting. From 0 (Low) to 6 (High).

Display Contrast LCD Contrast.

- | | |
|-------------|-------------|
| 0 -3 | 1 -2 |
| 2 -2 | 3 0 |
| 4 +1 | 5 +2 |
| 6 +3 | |

Display Mode Contents in the LCD. When the laminator is not connected, it shows the Counter.

When the setting is 1 and the laminator has an error, the LCD shows the error information.

- | | |
|------------------|---------------------------|
| 0 Counter | 1 Laminator Status |
|------------------|---------------------------|

Display Counter The type of Counter in the LCD.

- | | |
|------------------------|---------------------------|
| 0 Total Counter | 1 Head Counter |
| 2 Free Counter | 3 Cleaning Counter |
| 4 Error Counter | |

Velocity of the front side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV on the front side. The possible range is from 0 (+2:Fast) to 5 (-3:Slow).

Velocity of the back side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV onto the back side. From 0 (+2:Fast) to 5 (-3:Slow).

Backside Cooling Wait a little before the retransfer of the back side to decrease the card bending.

- | | |
|--------------|-------------|
| 0 Off | 1 On |
|--------------|-------------|

ISO Mode ISO (3-track) magnetic stripe encoder coercivity setting:

JIS Mode Coercivity of JIS MG head.

Write Retry Retry count for reading and writing magnetic stripe data, when it fails. Possible values are from 0 to 3.

- ◆ If the printer does not have a magnetic stripe encoder, use **0** as the **ISO Mode** value.
- ◆ The contents of the Encode Unit Data page are always kept in the EEPROM. If a value is 0xff, it keeps the settings that are in the EEPROM. Other items are not changed.
- ◆ The settings will be effective with the next card printed.

Laminator Unit Data (Page Code=0x2C)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2c)					
1	Page Specific Parameter Length (0x16)							
2	Laminate Mode							
3	Film T Type							
4	Film T Position							
5	Heat Roller T Temp							
6	Laminate Speed							
7	Reserved (0xff)							
8	Laminate Cooling Time							
9	HR Control							
10-13	Reserved (0xff)							
14	Film B Type							
15	Film B Position							
16	Heat Roller B Temp							
17-23	Reserved (0xff)							

Tips for success

- ◆ Laminator settings are saved in the laminator EEPROM (memory).
- ◆ The printer ignores settings for a laminator that is not connected.
- ◆ If you set a value to 0xff, the current setting in the laminator is used.
- ◆ The T side is the top side of the card as it enters the laminator. The B side is the opposite side of the card.
- ◆ The Film T Type and Film B Type settings take effect after the laminator is reset. All other settings take effect with the next card.

Laminate Mode The type of lamination process used.

0 Laminate

1 Pass through

Film T Type The type of lamination film on the top side. Reset the laminator to make the new setting take effect.

0 Patch

1 Overlay

NOTE: The LM300 laminator is designed to use same type of film in the top and bottom laminators. Using different types of film is not guaranteed.

Film T Position The position of lamination start (\pm X direction) on the top side. The possible range is from 0 (-7) to 14 (+7).

Heat Roller T Temp The heat roller temperature for top-side lamination. Values specified here correspond to the following temperatures (degrees Centigrade).

0 90	1 95	2 100	3 105
4 110	5 115	6 120	7 125
8 130	9 135	10 140	11 145
12 150	13 155	14 160	15 165
16 170	17 175	18 180	

A laminator temperature over 180 degrees Centigrade is not used. A setting over 180 degrees (previously supported) results in a temperature of 180 degrees.

Laminate Speed The laminate speed setting. Values specified here correspond to the following speeds in millimeters per second (mm/sec).

0 3.0	1 3.5	2 4.0	3 4.5
4 5.0	5 5.5	6 6.0	7 6.5
8 7.0	9 7.5	10 8.0	11 8.5
12 9.0	13 9.5	14 10.0	15 10.5
16 11.0	17 11.5	18 12.0	

Laminate Cooling Time Sets the length of cooling time in seconds.

0 0	1 5	2 7	3 10
4 15	5 20	6 30	

HR Control In the case of "On", the heat roller temperature falls to 180 centigrade when the laminator does not work for 30 minutes.

0 Off	1 On
--------------	-------------

Film B Type The type of the lamination film on the bottom side. Reset the laminator to make the new setting take effect.

0 Patch	1 Overlay
----------------	------------------

NOTE: The LM300 laminator is designed to use same type of film in the top and bottom laminators. Using different types of film is not guaranteed.

Film B Position The position of lamination start (\pm X direction) on the bottom side.

The possible range is from 0 (-7) to 14 (+7)

Heat Roller B Temp The heat roller temperature for bottom-side lamination. Values specified here correspond to the following temperatures (degrees Centigrade).

0 90	1 95	2 100	3 105
4 110	5 115	6 120	7 125
8 130	9 135	10 140	11 145
12 150	13 155	14 160	15 165
16 170	17 175	18 180	

A laminator temperature over 180 degrees Centigrade is not used. A setting over 180 degrees (previously supported) results in a temperature of 180 degrees.

Network Data (Page Code=0x2D)

<div>Bit</div> <div>Byte</div>	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2d)					
1	Page Specific Parameter Length (0x4e)							
2 to 5	(MSB) IP Address (Binary) (LSB)							
6 to 9	(MSB) Subnet Mask (Binary) (LSB)							
10 to 13	(MSB) Default Gateway (Binary) (LSB)							
14	Session Timeout							
15	DHCP							
16	Host I/F							
17 to 26	Printer Name (ASCII Characters)							
27	IPSec Mode							
28	Reserved							
29	IPv6 Subnet Prefix Length (IPv6)							
30	IPv6 Address Configuration							
31 to 46	(MSB) IPv6 Default Gateway Address (LSB)							
47 to 62	(MSB) IPv6 Address (LSB)							
63 to 79	Reserved							

Tips for Success

- ◆ These settings are saved to printer EEPROM (memory).
- ◆ If you set a value to 0xff, the current setting in the printer is used.
- ◆ The Session Timeout and Printer Name settings become effective after they are set.
- ◆ The DHCP and Host I/F settings become effective after the printer is powered off and powered on.

Session Timeout The time interval to detect that the printer TCP session has been disconnected from the host PC. For best results, use 0.

- | | |
|---------------------|---------------------|
| 0 Disabled | 1 10 minutes |
| 2 20 minutes | 3 30 minutes |
| 4 60 minutes | |

DHCP Whether DHCP is enabled.

0 Enabled

1 Disabled

Host I/F The type of connection (interface) between the printer and PC. This programming interface supports only USB connection.

0 Ethernet

1 USB

Printer Name The logical name of the printer. The remainder of the field is filled with 0 when the printer name contains fewer than 10 characters.

IPSec Mode Whether IP Sec is enabled.

0 IPSec Function prohibit

1 IPSec Function work.

When IPSec Mode is 1, IPSec Type must be set to 1 or 2.

IPSec Type The type of PC Sec – a Preshared key or a Certificate. A value of 0 means no IP security.

0 No Certificate

1 Preshared

2 Certificate

IPv6 Subnet Prefix Length IPv6 Subnet Prefix length setting.

The possible range is from 0 to 128

IPv6 Address Configuration IPv6 Address configuration setting.

0 Auto

1 Manual

When Auto is selected, a manually set IP Address is not effective.

IPv6 Default Gateway Address IPv6 Default Gateway Address setting.

IPv6 Address IPv6 Address setting.

Print Information Data (Page Code=0x2b)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2b)					
1	Page Specific Parameter Length (0x16)							
2	Heat Roller Temperature (Retransfer)							
3	Velocity (Retransfer Front)							
4	Velocity (Retransfer Back)							
5	Heat Roller Temperature (Card Fix)							
6	Velocity (Card Fix)							
7	Peel Wait Time							
8	MG Peel Mode							
9	Standby Mode							
10	YMC Level							
11	Resin Black Level							
12	A0 (UV) Level							
13	A1 (PO) Level							
14	Laminate Mode							
15	ISO Mode (for MG)							
16	JIS Mode (for MG)							
17	Write Retry (for MG)							
18	Resin Black Mode							
19	Velocity of the front side 2nd retransfer (UV)							
20	Velocity of the back side 2nd retransfer (UV)							
21	Backside Cooling							
22 to 23	Reserved (0xff)							

Tips for Success

- The contents of the Print Information Data page are kept in the printer EEPROM. If a setting is 0xff, it keeps the setting in the EEPROM. Other items are not changed.
- Settings will be effective with the next card printed.

Heat Roller Temperature for Retransfer From 0 (Low) to 4 (High).

Velocity for the front side Retransfer From 0 (Fast) to 5 (Slow).

Velocity for the back side Retransfer From 0 (Fast) to 5 (Slow).

Heat Roller Temperature for Card Fix From 0 (Low) to 5 (High).

Velocity for Card Fix From 0 (Slow) to 4 (Fast).

Peel off Wait Time Wait time in seconds before peel. Not used.

MG Peel Mode When MG Peel Mode is enabled, the retransfer film is peeled from the back side differently. The printer must have a mag stripe encoder and the card should use mag encoding if this setting is enabled.

0 Disabled

1 Enabled

Standby Mode Specifies when the printer waits for the laminator to be ready. Use this setting only when a laminator is attached and you are printing both sides of the card.

0 Wait before retransferring the front side of the card

1 Wait before retransferring the back side of the card

YMC Level YMC Printing energy level setting. From 0 (Low) to 6 (High).

Resin Black Energy Level From 0 (Low) to 6 (High).

A0 Energy Level: From 0 (Low) to 6 (High).

A1 Energy Level: From 0 (Low) to 6 (High).

Laminate Mode Laminate function setting.

0 Laminate

1 Pass Through

ISO Mode Coercivity of ISO head setting.

0 300Oe (Lo-Co)

1 2750Oe (Hi-Co)

JIS Mode Coercivity of JIS head setting.

0 650Oe (Lo-Co)

1 2750Oe (Hi-Co)

Write Retry Magnetic write retry setting, from 0 to 3 times.

Resin Black Mode

0 Standard

1 Fine

Velocity of the front side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV on the front side. The possible range is from 0 (+2:Fast) to 5 (-3:Slow).

Velocity of the back side 2nd retransfer (UV) The velocity for the 2nd retransfer of UV onto the back side. From 0 (+2:Fast) to 5 (-3:Slow).

Film Code The kind of retransfer film. Use **0** if the value for iSp is **0**.

0 Standard (1000 panels)

2 Standard (750 panels)

Backside Cooling Wait a little before the retransfer of the back side to decrease the card bending.

0 Off

1 On

Log Sense Function

No.	Function Name	Explanation
1	int CXCMD_ LogSense (int iSlot, int iID, int iPage, BYTE *pbyBuffer)	Get Log Sense Data from printer. iPage Choose Log Sense data. 0x38 Medium Quantity page 0x39 Miscellaneous page 0x3a Laminator Counter page pbyBuffer Pointer to the memory to store Log Sense Data. Use enough memory to store the Log Sense Data.

Log Sense Data Format (Medium Quantity Page: Page Code=0x38)

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved		Page Code (0x38)					
1	Reserved							
2	(MSB) Page Length (0x0030) (LSB)							
3								
4	(MSB) Parameter Code (0x0000) (LSB)							
5								
6	0	0	0	0	0	0	0	0
7	Parameter Length (0x04)							
8	(MSB) Total count (The number of printed cards.) (LSB)							
9								
10								
11								
12	(MSB) Parameter Code (0x0001) (LSB)							
13								
14	0	0	0	0	0	0	0	0
15	Parameter Length (0x04)							
16	(MSB) Free count (The number of printed cards. It can be reset to zero. The error count is reset when the Free Count is reset.) (LSB)							
17								
18								
19								

Bit Byte	7	6	5	4	3	2	1	0
20	(MSB) Parameter Code (0x0002) (LSB)							
21								
22	0	0	0	0	0	0	0	0
23	Parameter Length (0x04)							
24	(MSB) Head count (Number of panels printed. Each pass for a color adds 1 to this count.) (LSB)							
25								
26								
27								
28	(MSB) Parameter Code (0x0003) (LSB)							
29								
30	0	0	0	0	0	0	0	0
31	Parameter Length (0x0004)							
32	(MSB) Cleaning count (Number of cards printed since the last cleaning. It is reset to zero when Roller Cleaning is run .) (LSB)							
33								
34								
35								
36	(MSB) Parameter Code (0x0004) (LSB)							
37								
38	0x00							
39	Parameter Length (0x0004)							
40	(MSB) Error Count (The total number of error cards since last reset. This value is reset when the Free count is reset.) (LSB)							
41								
42								
43								
44 to 51	Reserved							

Tips for Success

- ◆ The error count is reset when the free count is reset.
- ◆ Successful Cards Loaded minus the Free Count equals the Error Count.
- ◆ Free Count is the number of cards which exit the left side of the printer without a jam after retransfer printing.
- ◆ Successful Cards Loaded does not count jams when picking a card.

Log Sense Data Format (Miscellaneous Page: Page Code=0x39)

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved		Page Code (0x39)					
1	Reserved							
2	(MSB) Page Length (0x0048) (LSB)							
3								
4	(MSB) Parameter Code (0000H) (LSB)							
5								
6	00H							
7	Parameter Length (0004H)							
8	(MSB) NG count The number of cards discharged to the NG or reject slot, since last reset. The response is always 0. (LSB)							
9								
10								
11								
12	(MSB) Parameter Code (0001H) (LSB)							
13								
14	00H							
15	Parameter Length (0004H)							
16	(MSB) Retransfer HR Power On Time This value in incremented by 1 for every 5 minutes the heat roller is powered. (LSB)							
17								
18								
19								
20	(MSB) Parameter Code (0002H) (LSB)							
21								
22	00H							
23	Parameter Length (0004H)							
24	(MSB) Remedy HR Power on Time: This value in incremented by 1 for every 5 minutes the heat roller is powered. (LSB)							
25								
26								
27								
28	(MSB) Parameter Code (0003H) (LSB)							
29								

<div>Bit</div> <div>Byte</div>	7	6	5	4	3	2	1	0
30	00H							
31	Parameter Length (0004H)							
32	Printer Status							
33	Printer Error Status (Sense Key)							
34	Printer Error Status (Additional Sense Code)							
35	Printer Error Status (Additional Sense Qualifier)							
36	(MSB) Parameter Code (0x0004) (LSB)							
37								
38	0x00							
39	Parameter Length (0x0004)							
40	(MSB) Unresetable Retransfer HR Power On Time (Unresetable Retransfer Heat Roller total power on time) (LSB)							
41								
42								
43								
44	(MSB) Parameter Code (0x0005) (LSB)							
45								
46	0x00							
47	Parameter Length (0x0004)							
48	(MSB) Unresetable Remedy HR Power On Time (Unresetable Bend Remedy Heat Roller total power on time) (LSB)							
49								
50								
51								
52	(MSB) Parameter Code (0x0006) (LSB)							
53								
54	0x00							
55	Parameter Length (0x0002)							
56	Laminator Status							
57	Laminator Error Status							
58 to 75	Reserved							

Printer Status Reports the current status of the printer, for display to the operator, which can be:

0 Ready	1 Initializing
3 Offline (such as in setting mode)	7 Preheating
51 Loading a card	52 Moving a card
53 MG Encoding	55 Card is at the contact IC unit
56 Card is at the contactless IC unit	57 Retransferring
61 Printing on retransfer film	62 Sleeping
63 Heating (The HR is heating to the normal temperature from HR Control Mode.)	
255 Any printer error (The error is returned in the Printer Error Status value.)	

The following are reported as Printer Status:

- Busy transporting
- Busy printing
- Busy transporting and printing
- Testing
- Cleaning
- In Setting mode
- In Transport mode

Printer Error Status When the Printer Status value is 255, this value contains the error. If this value is 0, the printer does not have an error.

Printer Error Status (Sense Key): Reports the sense key.

Printer Error Status (Additional Sense Code): Reports the additional sense code.

Printer Error Status (Additional Sense Qualifier): Reports the additional sense qualifier.

Laminator Status Reports the current status of the laminator, which can be:

0x00 Ready (Possible to laminate)	
0x01 Power Saving	0x02 Low temperature waiting mode
0x0f Download mode	0x10 Initializing
0x11 Preheating	0x12 Laminating
0x13 Cleaning	0x14 Sensor testing
0x15 Motor testing	0xfe Laminator is not connected
0xff Laminator has an error	

Laminator Error Status Reports the current laminator error. In the case that Laminator Status is not 255 (0xff), it reports 00.

- 0x50** Card jam (near the card entrance)
- 0x51** Card jam (in the printer)
- 0x52** Card jam (near the card exit)
- 0x53** Upper film out of supply

0x54: Lower film out of supply
0x55 Cannot detect upper film (No film or broken)
0x56 Cannot detect lower film (No film or broken)
0x57 Cannot detect upper film mark
0x58 Cannot detect lower film mark
0x59 Door open
0x5a No cassette
0x60 Thermostat not connected
0x61 Upper heat roller overheat
0x62: Lower heat roller overheat
0x63 Upper heater inside temperature overheat
0x64 Lower heater inside temperature overheat
0x65 Upper heater error
0x66 Lower heater error
0x67 Wire of upper heat roller thermistor is broken.
0x68 Wire of lower heat roller thermistor is broken.
0x6b Upper heat roller cumulative error
0x6c: Lower heat roller cumulative error
0x6d Over cool
0x6e Supply side encoder error of upper film
0x6f Supply side encoder error of lower film
0x70 Take up side encoder error of upper film
0x71 Take up side encoder error of lower film
0x7d Other errors

Laminator Counters Page (Page Code = 0x3A)

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved		Page Code (0x3a)					
1	Reserved							
2	(MSB) Page Length (0x0040) 							

Bit Byte	7	6	5	4	3	2	1	0
28	(MSB) Parameter Code (0x0003) (LSB)							
29								
30	0x00							
31	Parameter Length (0x0004)							
32	(MSB) Resetable Heat Roller B Power On Time (Total Power On Time for Bottom Heat Roller) (LSB)							
33								
34								
35								
36	(MSB) Parameter Code (0x0004) (LSB)							
37								
38	0x00							
39	Parameter Length (0x0004)							
40	(MSB) Unresetable Heat Roller T Power On Time (Top Unresetable Heat Roller Power On Time) (LSB)							
41								
42								
43								
44	(MSB) Parameter Code (0x0005) (LSB)							
45								
46	0x00							
47	Parameter Length (0x0004)							
48	(MSB) Unresetable Heat Roller B Power On Time (Bottom Unresetable Heat Roller Power On Time) (LSB)							
49								
50								
51								
52	(MSB) Parameter Code (0x0006) (LSB)							
53								
54	0x00							
55	Parameter Length (0x0002)							
56	(MSB) Heat Roller T Current Temperature (Current Temperature of Top Heat Roller) (LSB)							
57								

Bit Byte	7	6	5	4	3	2	1	0
58	(MSB) Parameter Code (0x0007) (LSB)							
59								
60	0x00							
61	Parameter Length (0x0002)							
62	(MSB) Heat Roller B Current Temperature (LSB)							
63								
64 to 75	Reserved							

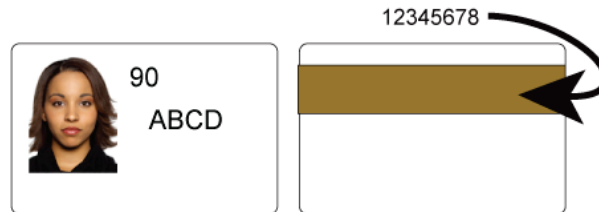
Log Select Function

No.	Function Name	Explanation
1	int CXCMD_ LogSelect (int iSlot, int iID Int iMod)	Reset both the Free Count and Error Count of the printer. Free Count is the accumulating counter of cards being printed. iMod must always be set to 0.

How to Encode with the Printer Driver

Encoding includes magnetic stripe encoding and smart card (IC) encoding. The printer driver provides two methods for encoding data. They are:

- ◆ Inline Encoding
- ◆ Encoding with ExtEscape()



Inline Encoding

Encoding data can be passed to the printer driver along with data to print, when the data to encode is marked with a prefix code.

The following table shows the prefixes and their meaning.

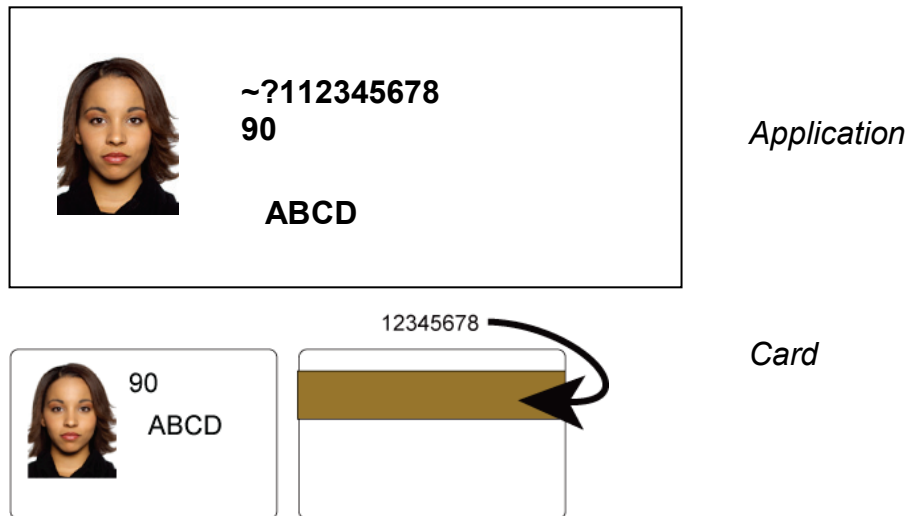
Prefix Code	Max Length*	Description	Text after prefix
~?0	69	7 unit (JIS)	Process the following text as data for JIS-2 Magnetic stripe encoding.
~?1	76	6 unit (IATA)	Process the following text as data for ISO track1 (International Air Transport Association-IATA) Magnetic stripe encoding.
~?2	37	4 unit (ABA)	Process the following text as data for ISO track2 (American Banking Association-ABA) Magnetic stripe encoding.
~?3	104	4 unit (TTS)	Process the following text as data for ISO track3 (Thrift Third Shift-TTS) Magnetic stripe encoding.
~?4	32760	8 unit (ASCII)	Process the following text as data for contact smart card (IC) encoding
~?5	32760	8 unit(ASCII)	Process the following text as data for non-contact smart card (IC) encoding
~?6	69	7 unit (IATA)	Process the following text as data for ISO track1 (International Air Transport Association-IATA) Magnetic stripe encoding.
~?7	69	7 unit (TTS)	Process the following text as data for ISO track3 (Thrift Third Shift-TTS) Magnetic stripe encoding.
~?8	79	6 unit	Process the following text as American Association of Motor Vehicle Administrators (AAMVA) data for track1 Magnetic stripe encoding.
~?9	79	6 unit	Process the following text as American Association of Motor Vehicle Administrators (AAMVA) data for track3 Magnetic stripe encoding.

***Max Length** shows the maximum number of characters to encode using that method and format.

Tips for success:

- ◆ The Printer Driver Printing Preferences setting for encoding must be enabled.
- ◆ The prefix and text must be successive (with no characters or spaces between) and they must be formatted with the same font.
- ◆ The data to encode must be on the first page of the card.
- ◆ Characters supported by magnetic stripe formats are shown in [Appendix B: Magnetic Stripe Data](#).
- ◆ In JIS-2 encoding, JIS Katakana characters are transformed to ASCII characters by the printer driver, which inserts SI / SO (shift-in/shift-out) control codes.
- ◆ If the requirements for encoding are met, both the prefix and the text will be removed from data to print. The data will be encoded only.
- ◆ For both Contact IC encoding and Non-Contact IC encoding, the data being passed to the IC Encode DLL (see [Smart Card \(IC\) Programming](#)) and must be ASCII single byte data. Using other characters can give unpredictable results.

The following example shows ISO MAG Track1 encoding. If the following card is sent to print, the photo, “90” and “ABCD” are printed as shown. “12345678” is encoded and “~?112345678” is not printed.



Encoding with ExtEscape()

You can pass the encoding data to the printer driver by using the **ExtEscape()** function of WIN32 API.

ExtEscape() Function

```
int ExtEscape (
    HDC hdc,           // handle to the device context.
    Int nEscape,        // Escape ID
    int cbInput,        // size of encoding data
    LPCSTR lpszInData, // encoding data
    int cbOutput,       // unused.
    LPSTR lpszOutData  // unused.
);
```

No	Escape ID	Explanation
1	9010	Non-contact IC encoding.
2	9011	Contact IC encoding.
3	9020	Magnetic encoding [JIS, 7-bit, 69 characters max]
4	9021	Magnetic encoding [ISO 1st track-IATA, 6 bit, 76 characters max]
5	9022	Magnetic encoding [ISO 2nd track-ABA, 4 bit, 37 characters max]
6	9023	Magnetic encoding [ISO 3rd track-TTS, 4 bit, 104 characters max]
7	9024	Magnetic encoding [JIS on Track 1, 7 bit, 69 characters max]
8	9025	Magnetic encoding [JIS on Track 3, 7 bit, 69 characters max]
9	9026	Magnetic encoding [ISO on Track 1, 6 bit, 79 characters max (AAMVA)]
10	9027	Magnetic encoding [ISO on Track 3, 6 bit, 79 characters max (AAMVA)]

Return Code from ExtEscape() Function

The function returns a value greater than zero if the function is successful. This value means the data was sent successfully. It does not mean the data was encoded.

Tips for success

- ◆ **ExtEscape()** must be called between **StartPage()** and **EndPage()**. If both sides of the card are printed, **ExtEscape()** must on page 1 (the first side).
- ◆ The Printing Preferences setting for encoding must be enabled.

Smart Card (IC) Programming

The driver does not offer the actual IC encoding function. When IC encoding data is passed to the printer driver, it calls an IC Encode DLL after telling the printer to position the card for IC encoding.

To encode or program a smart card (IC), create an IC Encode DLL and locate it in the System32 folder.

Use one of the following names for the DLL you create:

- ◆ PDR21IC0.DLL for Non-contact IC encoding using a USB connection[†]
- ◆ PDR21IC1.DLL for Contact IC encoding using a USB connection[†]
- ◆ PDR22IC0.DLL for Non-contact IC encoding using the printer internal Network connection[†]
- ◆ PDR22IC1.DLL for Contact IC encoding using the printer internal Network connection[†]

[†] Installed with the Datacard Software SR200/SR300 Printer Plug-in.

Sample IC Encode Functionality

```
int stdcall Encode (
    LPINT      lpiPrinterAdr    // pointer to the printer address
    LPINT      lpiErrorCode    // pointer to the error code (not used)
    LPSTR      lpPrinterName   // Pointer to the printer name
    LPCSTR     lpzInData,       // encoding data
    int        cbInput,        // size of encoding data
);
```

Parameter	USB Interface	Network Interface
lpiPrinterAdr	ID of the printer: From bit 0 to bit 7 – ID From bit 8 to bit 15 – Slot number	Connection information to the printer.
lpiErrorCode	Not used.	
lpPrinterName	Printer name in ASCII characters. It can be set using the Printer LCD panel or the CXCMD_ModeSelect() function.	
lpzInData,	Encoding data passed by inline encoding or by Windows ExtEscape() function.	
cbInput,	Size of encoding data in bytes.	

Return Codes from IC Encode DLL

The DLL must return the following:

- 0 Zero, when the function ends successfully.
- 0x1001 Fail. The printer driver does not display an error. It discharges the card and picks a new card to retry the job.
- 0x1002 Fail. The printer driver does not display an error. It discharges the card and cancels the current print job.

Negative, or value different from those listed here

The printer driver displays an error. After the operator responds, any additional processing is based on the operator's response.

Tips for success

- ◆ If you encode or program smart cards, the PC can have only one instance (copy) of the printer driver installed.
- ◆ When debugging applications on Windows Vista, pop-ups are blocked. Use another operating system or different debugging method.

How to Override Driver Settings

You can override settings in the printer driver using the Win32 **ExtEscape()** function.

Tips for success

- ◆ You must call **ExtEscape()** function after **StartDoc()** and before **StartPage()** when you change settings.
- ◆ The modified setting is in effect until the printer handle is removed by **DeleteDC()**.

Using *ExtEscape()* to Override a Setting

You can pass settings to the printer driver by using the **ExtEscape()** function of the WIN32 API.

ExtEscape() Function

```
int ExtEscape (
    HDC hdc,                // handle to the device context.
    Int nEscape,            // Escape ID
    int cbParameter,        // size of the parameter data
    LPCSTR lpszParameter,  // pointer to the parameter data
    int cbResult,           // size of the result area
    LPSTR lpszResult       // pointer to the result area
);
```

Where:

- ◆ **nEscape** Use 9100 for the escape ID.
- ◆ **cbParameter** Set the length of the Parameter in bytes.
- ◆ **lpszParameter** Pointer to the Parameter memory.
- ◆ **cbResult** Set the length of Result memory in bytes.
- ◆ **lpszResult** Pointer to the Result memory.

Change a Setting

cbParameter

Name	Command Code	ID	Size	Data (New value)
Length in bytes	1	2	2	n
Value	'S'(0x53)	1*	2*	1*

1* [See cbParameter Values page 61](#)

2* Data length in bytes.

cbResult when successful

Name	Error Code	Reserved
Length in byte	1	4
Value	0x00	Not defined

cbResult when not successful

Name	Error Code	Error Code-A	Error Code-B
Length in byte	1	2	2
Value	0x00	1*	1*

1* See [Errors returned on page 62](#).

Get the Current Setting*cbParameter*

Name	Command Code	ID
Length in byte	1	2
Value	'G'(0x47)	1*

1* See [cbParameter Values on page 61](#).

cbResult when successful

Name	Error Code	ID	Size	Data (Current value)
Length in byte	1	2	2	n
Value	0x00	1*	2*	1*

1* See [cbParameter Values on page 61](#).

2* Data length in bytes.

cbResult when not successful

Name	Error Code	Error Code-A	Error Code-B
Length in byte	1	2	2
Value	0xff	1*	1*

1* See [Errors returned on page 62](#).

Programming Sample

Change the “Number of copies” to 100

```
int          escape_id;
unsigned short id, size;
unsigned long data;
unsigned char in[9], out[5];
int          ret;
unsigned short error_code;

escape_id = 9100; id = 257; size = 4; data = 100;
in[0]      = 'S';
in[1]      = (unsigned char)((id >> 8) & 0xFF);
in[2]      = (unsigned char)(id);
in[3]      = (unsigned char)((size >> 8) & 0xFF);
in[4]      = (unsigned char)(size);
in[5]      = (unsigned char)((data >> 24) & 0xFF);
in[6]      = (unsigned char)((data >> 16) & 0xFF);
in[7]      = (unsigned char)((data >> 8) & 0xFF);
in[8]      = (unsigned char)(data);

ret = ExtEscape ( hDC, escape_id, sizeof(in), (const char*)in, sizeof(out),
                 (char*)out );
if (ret > 0) {      // Succeed in calling ExtEscape()
if (out[0] == 0x00) {      // Succeed
    ;
} else {              // Error happens in the driver
// Get error code
    error_code = (unsigned short)((unsigned short)out[1] << 8 | out[2]);
}
} else {              //Fail in the ExtEscape()
    ;
}
```

Refer to the “Number of copies” setting

```
int      escape_id;
unsigned short id, size;
unsigned long data;
unsigned char in[3], out[9];
int      ret;
unsigned short error_code;

escape_id = 9100; id = 257;

in[0]     = 'G';
in[1]     = (unsigned char)((id >> 8) & 0xFF);
in[2]     = (unsigned char)(id);

ret = ExtEscape ( hDC, escape_id, sizeof(in), (const char*)in, sizeof(out),
                 (char*)out );
if (ret > 0) {      // Succeed in calling ExtEscape()
if (out[0] == 0x00) {      // Succeed
    size = (unsigned short)((unsigned short)out[3] << 8 | out[4]);
    data = (unsigned long)((unsigned long)out[5] << 24 | (unsigned long)out[6]
                          << 16 |
    (unsigned long)out[7] << 8 | out[8]);
} else {            // Error happens in the driver
// Get error code
    error_code = (unsigned short)((unsigned short)out[1] << 8 | out[2]);
}
} else {            //Fail in the ExtEscape()
    ;
}
```


cbParameter Values

All values must be set with Big Endian.

Item Name	ATR	ID	Size	Data	Explanation
Number of copies	R/W	0x0101	0x0004	0x00000001 ~ 0x000003E7	The value must be from 1 to 999.
Card Load/Eject settings	R/W	0x0103	0x0004	0x00000000	Do not turn the card.
				0x00000001	Turn the card before discharging
				0x00000002	Turn the card after loading.
				0x00000003	Turn the card after loading and turn the card before discharging.
Print Print on both sides Print the back side first	R/W	0x0201	0x0004	0x00000000	Do not print.
				0x00000010	Single side printing.
				0x00000020	Print on both sides. Print front side first.
				0x00000021	Print on both sides. Print back side first.
Print mode [Front side]	R/W	0x0202	0x0004	0x00000001	Use YMC ink for front side printing.
				0x00000002	Use K ink for front side printing.
				0x00000003	Use YMCK ink for front side printing.
				0x00000011	Use YMC+UV ink for front side printing.
				0x00000012	Use K+UV ink for front side printing.
				0x00000013	Use YMCK+UV ink for front side printing.
Print mode [Back side]	R/W	0x0203	0x0004	0x00000001	Use YMC ink for back side printing.
				0x00000002	Use K ink for back side printing.
				0x00000003	Use YMCK ink for back side printing.
				0x00000011	Use YMC+UV ink for back side printing.
				0x00000012	Use K+UV ink for back side printing.
				0x00000013	Use YMCK+UV ink for back side printing.
Use Resin K ink [Front side]	R/W	0x0204	0x0004	0x00000010	Print black text of front side with K ink.
				0x00000011	Print black text of front side with K and print its background with YMC.
				0x00000020	Print black color of front side with K ink.
				0x00000021	Print black color of front side with K and print its background with YMC.
				0x00000040	Use page split function.
Use Resin K ink [Back side]	R/W	0x0205	0x0004	0x00000010	Print black text of back side with K ink.

Item Name	ATR	ID	Size	Data	Explanation
				0x00000011	Print black text of back side with K and print its background with YMC.
				0x00000020	Print black color of back side with K ink.
				0x00000021	Print black color of back side with K and print its background with YMC.
				0x00000040	Use page split function.
Rotate by 180 [Front side]	R/W	0x0206	0x0004	0x00000000	Do not rotate the image of front side.
				0x00000001	Make the front side image upside down
Rotate by 180 [Back side]	R/W	0x0207	0x0004	0x00000000	Do not rotate the image of back side.
				0x00000001	Make the back side image upside down
Magnetic encoding	R/W	0x0301	0x0004	0x00000000	Disable magnetic stripe encoding.
				0x00000010	Enable magnetic stripe encoding.
				0x00000011	Turn the card after magnetic stripe encoding
Non-contact/Contact IC encoding	R/W	0x0302	0x0004	0x00000000	Disable smart card (IC) encoding.
				0x00000010	Enable Contact IC encoding.
				0x00000011	Turn the card after Contact IC encoding.
				0x00000020	Enable No-Contact IC encoding.
				0x00000021	Turn the card after No-Contact IC encoding.
				0x00000030	Enable both Contact and No-Contact IC encoding.
				0x00000031	Turn the card after both Contact and No-Contact IC encoding.

Errors returned

The driver can return the following when you use the **ExtEscape()** function. All values are set with Big Endian.

No	Error code A	Error code B	Explanation
1	0x0901	0x0000	Invalid parameter was passed.
2	0x0902	*	The Data Length specified was not large enough. The required length is returned at error code B.

Appendix A: API Error Codes

This appendix lists errors returned by the printer driver API. It includes:

- ◆ Error Format
- ◆ Driver Errors (0x02xxxxxx)
- ◆ Other Errors (0x09xxxxxx)

Error Format

This section shows the format of errors that the API returns.

The error code in the table is transformed to positive by the calculation:

$n = (-1) * (\text{Error code})$

For details about errors returned by the printer, see [Appendix C: Card Printer Error Codes](#).

Error Code (HEX)				Explanation
Bit 31-24	Bit 23-16	Bit 15-8	Bit 7-0	
0x01	Sense Key	ASC	ASCQ	Error code from Card Printer: From bit 0 to bit 23 is an error code sent from the printer.
0x02	00	XXX		Error from the Port Manager. XXX is the error code.
0x02	01	XXX		Error from the Port Manager: XXX is an Invalid SRB status value from the Port Manager.
0x02	02	XXX		Error from the Port Manager: XXX is an Invalid HA status value from the Port Manager.
0x02	03	XXX		Error from the Port Manager: XXX is an Invalid Target status value from the Port Manager.
0x09	XXX			Other Error. XXX is the error code.

Driver Errors (0x02xxxxxx)

Bit 31-24 (0x02)	Bit 23-16	Bit 15-0	Explanation
0x02	00	1	Not enough memory
0x02	00	2	The Port Manager is busy, and the command cannot be accepted.
0x02	00	3	Command was aborted.
0x02	00	4	Time out.
0x02	00	5	No SCSI card.
0x02	00	6	The Port Manager DLL could not be loaded. This error is generated by the Printer Control DLL.
0x02	01	XXXX	XXX is an Invalid SRB status value from the Port Manager.
0x02	02	XXXX	XXX is an Invalid HA status value from the Port Manager.
0x02	03	XXXX	XXX is an Invalid Target status value from the Port Manager.

Other Errors (0x09xxxxxx)

Bit 31-24 (0x09)	Bit 23-0	Explanation
0x09	1	Invalid parameter, such as NULL pointer.
0x09	2	No printer is found.
0x09	3	Not enough memory
0x09	4	File Operation Error: fail to read file, or file content is wrong.
0x09	5	Content of the DC is invalid: fail to get image from DC.

Appendix B: Magnetic Stripe Data

This section contains:

- ◆ 4-bit data
- ◆ Codes for 4-unit (bit) data
- ◆ 6-bit data
- ◆ Codes for 6-unit data
- ◆ 7-bit data
- ◆ Codes for 7-unit data

4-bit data

4 unit (bit) code					
b4	b3	b2	b1		
0	0	0	0	0	0
0	0	0	1	1	1
0	0	1	0	2	2
0	0	1	1	3	3
0	1	0	0	4	4
0	1	0	1	5	5
0	1	1	0	6	6
0	1	1	1	7	7
1	0	0	0	8	8
1	0	0	1	9	9
1	0	1	0	A	:
1	0	1	1	B	;
1	1	0	0	C	<
1	1	0	1	D	=
1	1	1	0	E	>
1	1	1	1	F	?

Codes for 4-unit (bit) data

No.	Meaning	Character
1	Start Code	;
2	End Code	?
3	Separate Code	=
4	Code for hardware control	: < >

Do not use the End Code as magnetic stripe data.

6-bit data

6 unit code									
						0	0	1	1
						0	1	0	1
b4	b3	b2	b1			0	1	2	3
0	0	0	0	0			0	@	P
0	0	0	1	1	!	1	A	Q	
0	0	1	0	2	“	2	B	R	
0	0	1	1	3	#	3	C	S	
0	1	0	0	4	\$	4	D	T	
0	1	0	1	5	%	5	E	U	
0	1	1	0	6	&	6	F	V	
0	1	1	1	7	‘	7	G	W	
1	0	0	0	8	(	8	H	X	
1	0	0	1	9	)	9	I	Y	
1	0	1	0	A	*	:	J	Z	
1	0	1	1	B	+	;	K	[
1	1	0	0	C	,	<	L	\	
1	1	0	1	D	-	=	M]	
1	1	1	0	E	.	>	N	^	
1	1	1	1	F	/	?	O	_	

Codes for 6-unit data

No.	Meaning	Character
1	Start Code (Sentinel)	%
2	End Code (Sentinel)	?
3	Separate Code	^
4	Code for hardware control	! " & ' * + , : ; < = > @ [\] _

Do not use the End Code as magnetic stripe data.

7-bit data

7 unit code												
					b7	0	0	0	0	1	1	1
					b6	0	0	1	1	0	0	1
					b5	0	1	0	1	0	1	0
b4	b3	b2	b1			0	1	2	3	4	5	6
0	0	0	0	0					0	@	P	`
0	0	0	1	1					!	1	A	Q
0	0	1	0	2					"	2	B	R
0	0	1	1	3					#	3	C	S
0	1	0	0	4					\$	4	D	T
0	1	0	1	5					%	5	E	U
0	1	1	0	6					&	6	F	V
0	1	1	1	7					'	7	G	W
1	0	0	0	8					(	8	H	X
1	0	0	1	9					)	9	I	Y
1	0	1	0	A					*	:	J	Z
1	0	1	1	B					+	;	K	[
1	1	0	0	C					,	<	L	\
1	1	0	1	D					-	=	M]
1	1	1	0	E					.	>	N	^
1	1	1	1	F					/	?	O	_
												DEL

Codes for 7-unit data

No.	Meaning	Character
1	Start Code	0x7f (DEL)
2	End Code	0x7f (DEL)
3	Separate Code	^
4	Code for hardware control	! " & ' * + , : ; < = > @ [\] _

Do not use the Start Code and End Code as magnetic stripe data.

Appendix C: Card Printer Error Codes

No.	Error Code			Name	Contents
	SK	ASC	ASQ		
1	02	D0	00	No card	There is no card, or the card hopper tray is not closed.
2	02	D1	00	Door Open	Printer door is open or cleaning roller is not attached.
3	02	D3	00	Busy Transporting	Busy transporting the card or retransferring the image. This error is not returned from API functions, which return a positive value for BUSY.
4	02	D4	00	Busy Printing	Busy printing. This error is not returned from API functions, which return a positive value for BUSY.
5	02	D5	00	Busy Transporting and Printing	Busy Transporting and Printing. This error is not returned from API functions, which return a positive value for BUSY.
8	02	DA	00	Preheating	Printer is preheating.
9	02	DB	00	Initializing	Printer is initializing.
10	02	DC	00	Testing or Cleaning	Printer is performing an Off-line Test or a cleaning cycle.
11	02	DD	00	On Setting or Transport Mode	Printer is in the setting mode or transporting mode.
12	02	DE	00	Not Ready for Download	Firmware download cannot be done as printer is not in Download mode.
13	02	FD	00	Sleeping	Printer is in the power save mode. To exit Power Save mode, initialize the printer by pressing the RESET and then the ENTER button. You can also send the REZERO command.
14	02	FE	00	Password Error	Password certification is not done.

No.	Error Code			Name	Content
	SK	ASC	ASQ		
15	03	90	00	Jam(Hopper)	The card does not arrive at the card supply sensor within a predefined time.
16	03	91	00	Jam(TurnOver)	The card does not arrive at the sensor inside the turnover unit within a predefined time.
17	03	92	00	Jam(MG)	The card does not arrive at the card edge sensor within a predefined time after leaving the turnover unit. Also in case of magnetic encoding, when the card is not detected by the start position sensor of the MG unit.
18	03	93	00	Jam(Transfer)	The card does not arrive at the card outlet sensor within a predefined time after leaving the card edge sensor.
19	03	94	00	Jam(Discharge)	The card stops at the card outlet sensor.
22	03	A1	00	Media Search	Mark on the retransfer film could not be detected.
23	03	AD	00	MG Write Error	A write error occurred in the magnetic stripe module.
24	03	AE	00	MG Read Error	A read error occurred in the magnetic stripe module.
25	03	B0	00	Ink Error	Invalid Ink is installed.
26	03	B1	00	Ink Search	The index mark on the ink ribbon could not be detected, or the ink ribbon is broken.
28	04	44	00	Hardware	Time out was detected by the printer firmware.
30	04	AB	00	MG Mechanical	A mechanical error occurred in the magnetic stripe unit.

No.	Error Code			Name	Content
	SK	ASC	ASQ		
31	04	AC	00	MG Hardware	A hardware error occurred in the magnetic stripe unit.
36	04	BF	00	EXT2. Communicate	A communication error occurred during the laminator firmware update.
38	04	C1	00	Heater Cam	The heater cam is out of order.
39	04	D8	00	Hardware	Circuit trouble was detected at initialization or writing error to the laminator memory fails during the firmware update. For example, the power supply unit is not delivering the needed level of power.
40	04	F0	00	TR Overheat	The temperature of the retransfer roller is too hot.
41	04	F1	00	TR Broken	The retransfer roller is out of order.
42	04	F2	00	TR Sensor Broken	The retransfer roller thermister is out of order.
43	04	F3	00	RR Overheat	The temperature of the bend remedy roller is too hot.
44	04	F4	00	RR Broken	The bend remedy roller is out of order.
45	04	F5	00	RR Sensor Broken	The bend remedy roller thermistor is out of order.
46	04	F6	00	Overcool	The temperature in the printer is too cool.
47	04	F8	00	Head Overheat	The temperature of the thermal head is too hot.
49	05	1A	00	Parameter List Length Error	The content of the command is not valid. Parameter list length value in CDB or Page Data is not valid.

No.	Error Code			Name	Contents
	SK	ASC	ASQ		
50	05	20	00	Invalid Command Operation Code	The content of the command is not valid. Operation Code in CDB is not valid.
51	05	24	00	Illegal Field in CDB	The content of the command is not valid. The data in CDB is not valid.
53	05	26	00	Invalid Field in Parameter List	The content of the command is not valid. The data in Page Data is not valid.
54	05	27	00	Invalid Color Code in CDB	The ink specified is not valid.
55	05	2A	00	Command Sequence Error	The command is issued out of order. For example, the Load Card command is issued when a card is in the printer.
56	05	2B	00	MG Data Error	Magnetic stripe data from the PC does not meet requirements.
57	05	2C	00	IC Encoder not installed	The printer does not have a smart card (IC) unit but that function was requested for the card.
58	05	2D	00	MG Encoder not installed	The printer does not have a magnetic stripe unit but that function was requested for the card.
59	05	FB	00	Invalid Download Data	Data download from the PC is not valid.
60	06	28	00	Medium Changed	The printer was initialized by pressing the RESET button.
61	06	29	00	Power On or Bus Device Reset Occurred	The printer was initialized by turning on the printer power.
62	42	A2	00	Media Run Out	The end of the retransfer film is detected.
63	42	B2	00	Ink Run Out	The end of the ink ribbon is detected.
64	04	C2	00	HR Overheat	The temperature of the bend remedy heat roller or retransfer heat roller.
65	03	A8	00	MG Write Error in Self Test	MG writing error happens in MG Self Test.
66	05	2E	00	Option Not Installed	The command could not be executed as the turn over unit is not attached.
67	05	21	00	Security Key is already set	New security key could not be registered as the key is already set.
68	05	23	00	Security key is not set	Security key is not registered.
69	05	22	00	Invalid Security Key	Security key is invalid.
70	04	C3	00	Detect Power Interrupt	24V electric power was interrupted.
71	03	95	00	Jam(Retransfer)	Card JAM error happens during retransfer.

