

Sublimation type Retransfer Card Printer CX-7650

Technical Document for Software Development

Revision 1.00

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<Revision Contents>

27.Sep.2024 Rev 1.00	The differences from CX-7600 are described with blue and bold characters .
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1. Overview

This document explains the printer software from the point of software development view. When you install the printer software, the Printer Control DLL is also installed. Although Printing and Encoding is done by using the printer driver normally, you can do them by using Printer Control DLL directly without using Printer Driver. This explains how to use Printer Control DLL, and the special usage of the printer driver such as IC and MAG encoding.

Note: In case of Network interface, the printer cannot control by the Printer Control DLL. The Printer Control DLL in this document is about USB interface.

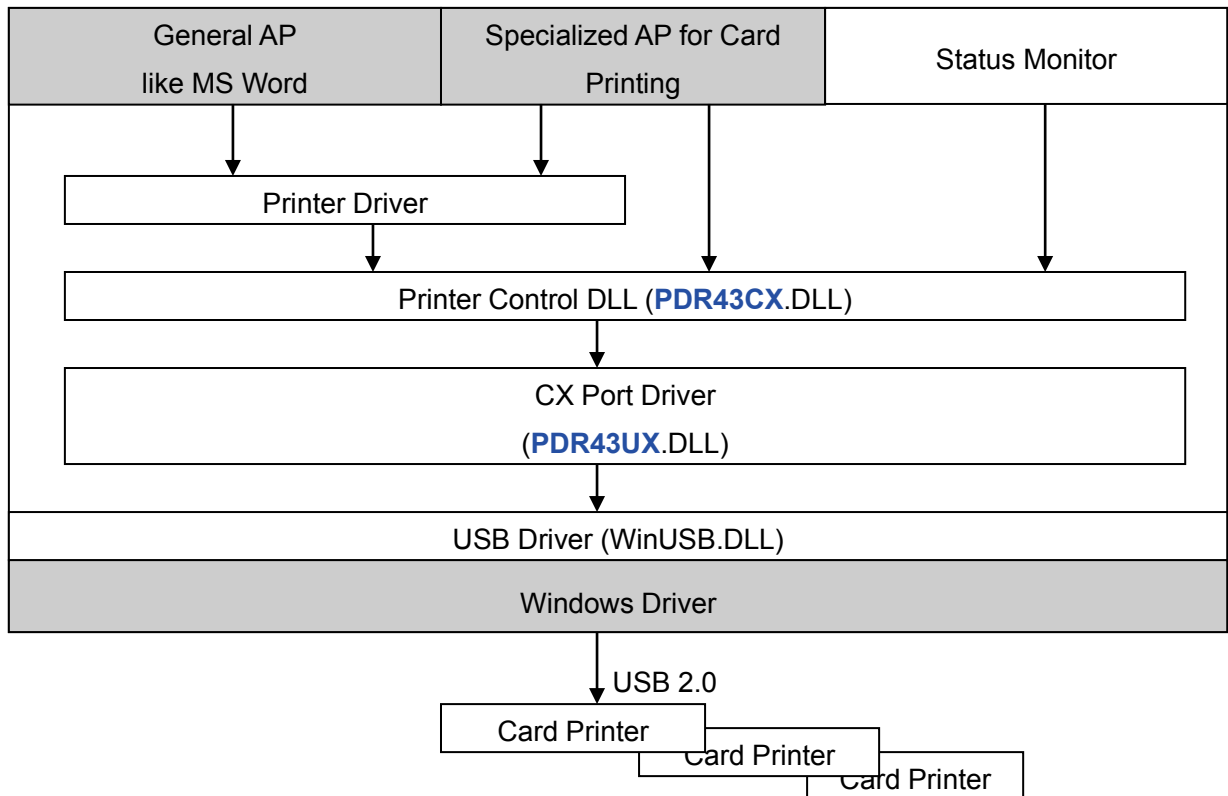
2. Operational Environment

Following table shows the operational environment of the software.

Item	Contents
OS	Windows 10 32bit / 64bit Windows 11
Peripheral	Card Printer connected PC via USB.

3. System Configuration on USB interface

Following figure shows the configuration of the printer software. The software surrounded by the white rectangle in the figure is the software which is installed from the CD-ROM of the printer. Many Application Software (hereinafter “AP”) use the printer driver.



Note: The file names are **the same for 32bit version and 64bit version.**

<Hint> Normally, Printer Driver loads the card, and encodes and prints. But when there is a card in the printer already, Printer Driver's processing is done to the card in the printer. By using this function, you can do pre-processing such as encoding by using Printer Control DLL before the Printer Driver's process.

Caution: If you use both Printer Control DLL and Printer Driver, Windows Spooling had better be disabled. If any printing data is pooled in Spooler, problem will happen as DLL controls Card Printer directly.

4. About Card Printer

4.1 Command Structure of the USB interface

The structure of the command to the printer is according to the SCSI rule. The printers being connected to a PC can be specified with the Slot number and the ID of the printer. This addressing makes it possible to control by 10 printers. Almost functions require both Slot number and ID to specify the printer. Slot number is a value decided by system environment, and ID is the value which is subtracted by 1 from Unit number of the printer.

4.2 Card Position

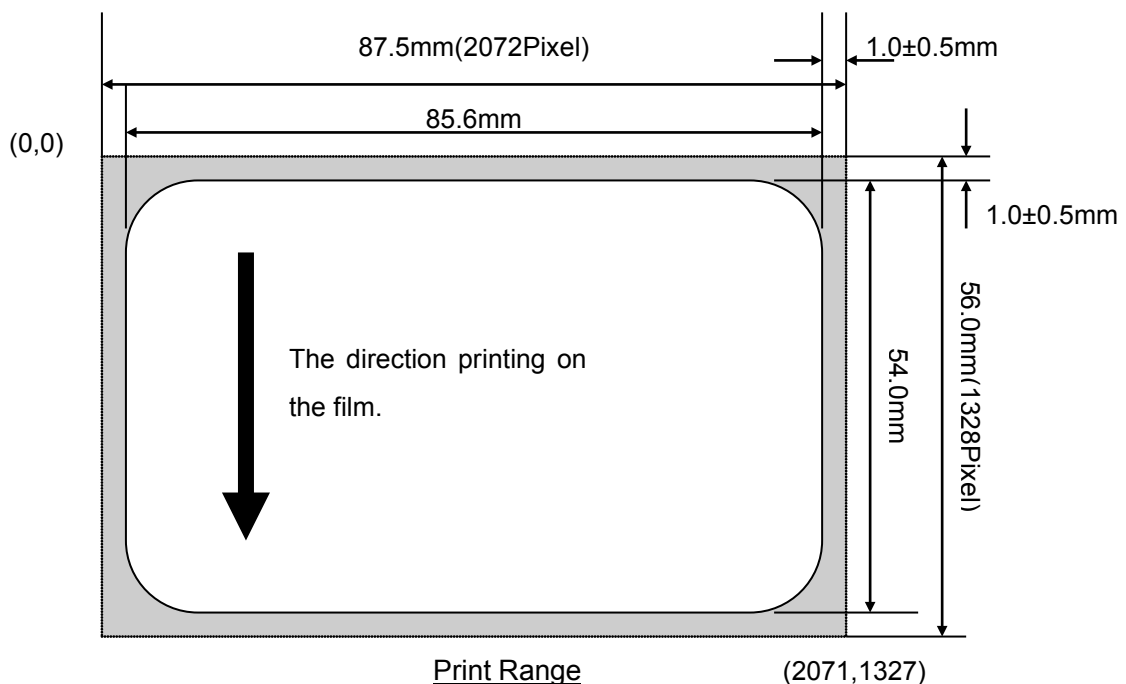
The printer command may fail if the card position is not proper for the command. For example, Retransfer command, which retransfers the image on the film to the card, will fail if the card is not positioned at Retransfer Position. Read Position command is prepared to know the card position.

Card Position in the Card Printer

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.

4.3 Print Range

The print range on Retransfer film is bigger than actual print range on the card. Following figure shows it.



5. Printer Control Function

5.1 Program Construction

They are functions in Printer Control DLL which is supplied as Windows DLL. They are installed when the printer driver is installed.

Name	OS	File Name
Printer Control DLL	32bit	PDR43CX.DLL
	64bit	PDR43CX.DLL

Note: Use the **PDR43CX.DLL** of 32bit version when you use 32bit application software on 64bit OS.

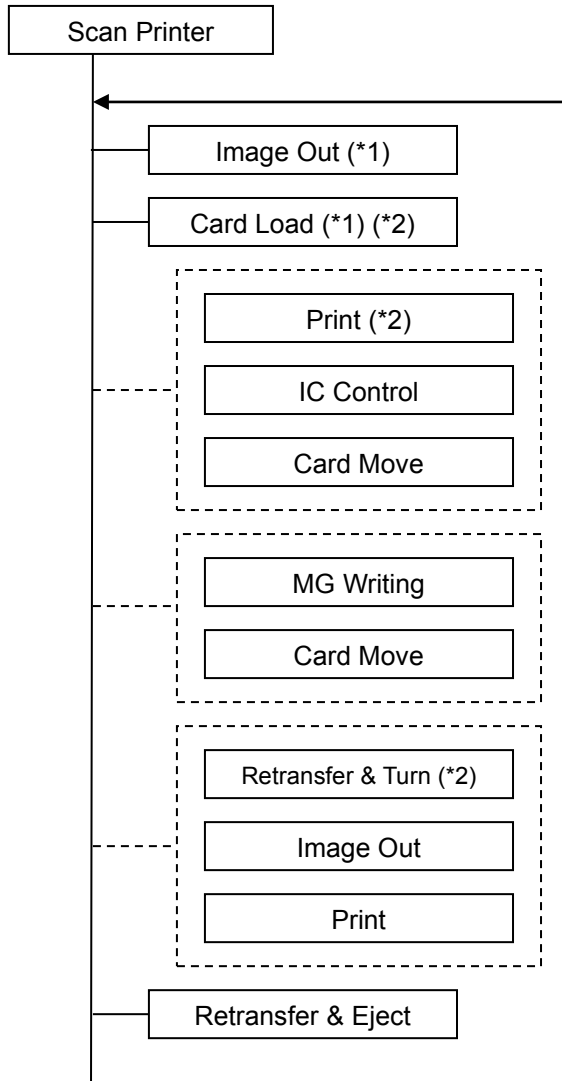
5.2 Basic rule of the return code from functions

The return code from all functions is according to following rules if there is no explicit description.

- ◆ 0 : It means success.
- ◆ Positive value: Command could not be executed but the condition will recover automatically. Retry after a little waiting.
 - 1(_BUSY) : CX Port Manager did not send command to the printer because of Printer's condition. This error never happens.
 - 2(_TARGET_BUSY1) : Card Printer rejected the command because it is on the way of moving the card.
 - 3(_BUS_BUSY) : Printer Control DLL rejected the command because the command issued by other process is on the way of processing.
 - 4(_TARGET_BUSY2) : Card Printer rejected the command because it is on the way of printing on the retransfer film.
 - 5(_TARGET_BUSY3) : Card Printer rejected the command because of both _TARGET_BUSY1 and _TARGET_BUSY2.
- ◆ Negative value : It means error. "Appendix Error Code Table" shows the detail.

5.3 Process flow to issue the card

Firstly, "Scan Printer" function should be used to know Slot number and ID of the printer. After that, you can control the printer with them. The printing method of the printer is Retransfer method, which prints on the retransfer film and retransfers the image on Retransfer film to the card.



Note

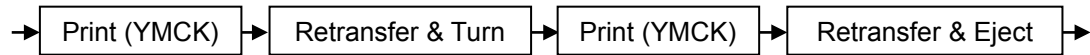
- 1) For the parallel processing of image data transferring and mechanical action, the command marked by *2 should be issued with setting Immediate Flag on. If Immediate flag is set, the command will end immediately after the command is accepted by the printer. So software can take next action such as image sending.
 - 2) The process surrounded by dashed line is optional procedure.
 - 3) It is required the card is located at proper position for the card processing command. The destination parameter of Card Move/Card Load must be considered to locate the card at proper position for the next card processing command.
 - 4) The card is discharged from the card outlet only by Retransfer command. The card is discharged from NG card outlet by other commands.
- *1 The order of Image Out and Card Load is arbitrary.

Sample of print sequence

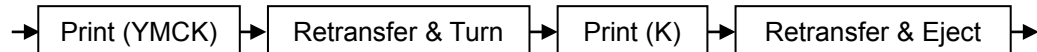
Single-sided YMCK Printing



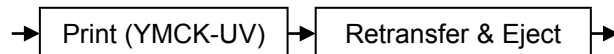
Double-sided YMCK Printing (Front: YMCK Back: YMCK)



Double-sided YMCK Printing (Front: YMCK Back: K)



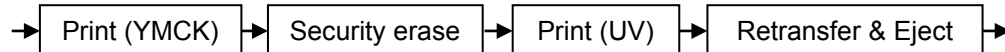
YMCK-UV Printing (1 panel)



YMCK-UV Printing (2 panels)

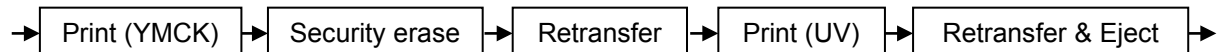


YMCK-UV Printing (1 panel) + Security erase



Note: This sequence is recommended.

YMCK-UV Printing (2 panels) + Security erase



YMCK-PO Printing



Note1: “Image Out” and “Card Load” are omitted.

Note2: “Security erase” needs special data.

Note3: The overcoat is performed automatically when commands are issued in the same print sequence as “Single-sided YMCK Printing” and “Double-sided YMCK Printing”. Overcoat settings can be set with `CXCMD_ModeSelect()`.

5.4 Scan Printer

5.4.1 Scan Printer Functions

No.	Function Name	Explanation
1	int CXCMD_ScanPrinter (int *piSlot, int *piID)	Search for the printer from the first, and return Slot number and ID. The result is set at piSlot and piID.
2	int CXCMD_ScanPrinterNext (int *piSlot, int *piID)	Search for the printer from the next of the printer specified by piSlot and piID. The result is set at piSlot and piID.

Note: It is not required to retry even if above functions return positive value. Valid value is set at piSlot and piID even if they return positive value.

5.4.2 Printer Check Function

No.	Function Name	Explanation
1	BOOL CXCMD_CheckIfConnected (int *piSlot, int *piID)	Check whether the printer specified by 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 more safety way than using other functions to confirm whether it is connected or not.

5.5 Getting Printer Status

5.5.1 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.

5.5.2 Read Position Function

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

1) Read Position Data format

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved					PU	Reserved	
1	Reserved							Load Mode
2-6	Reserved							
7	Position							

PU (Position Unknown)

0: The card is in the printer unit.

1: No card in the printer unit

Note: Printer reports PU = 1 even if any card is in the card hopper. Printer generates Check Condition if the card is being transported.

Position: Card position in the printer unit.

0: At Retransfer Position 1: At Contact IC Encoder 2: At No-Contact IC encoder

3: At MAG encoder

Load Mode: The way to load the card

0: From the card hopper

5.6 Print on Retransfer Film

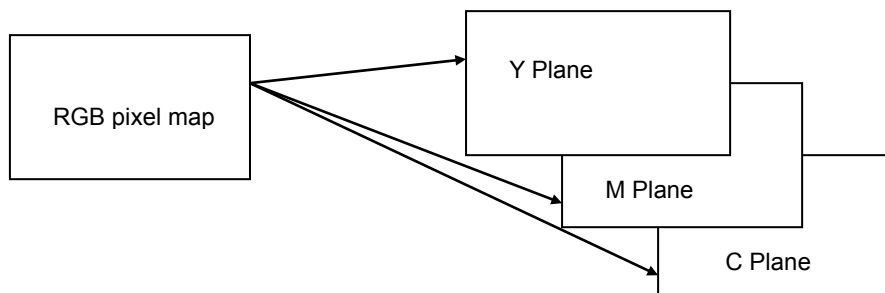
5.6.1 Image Out Function

No.	Function Name	Explanation
1	int CXCMD_ImageOut (int iSlot, int iID, BYTE * pbyPlane, int iLength, int iColor, int iBuffer)	Transfer image data to the printer by using Image Out command. ◆ pbyPlane: Image Data. The size of image data must be 2072 x 1328 bytes. ◆ iLength: Size of image data in byte. This must be 2072 x 1328. ◆ iColor: Kind of image data. 0 if image data is for K ink. 1 if image data is for C ink. 2 if image data is for M ink. 3 if image data is for Y ink. 4 if image data is for UV ink. 5 if image data is for PO ink. ◆ iBuffer: Image Data buffer number. Printer has two image buffers for all images. Image data is stored to the buffer specified here. 0 if Buffer 0. 1 if Buffer 1.

1) How to translate RGB to YMC planes

Only supports YMC plane to print colored image, RGB must be transformed to Y, M and C plane. Normally, the formula to translate RGB to YMC is as follows.

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



2) About K

Resin K ink (hereinafter “K ink”) is the ink specialized for black text printing. The data for K ink is Boolean, only the not zero part is printed with black color. It makes the quality of black text better.

3) About UV ink

UV ink is the ink which becomes visible with ultraviolet rays. The data for UV ink is gray scale data from 0 to 255, the greater value gives the more UV efficiency.

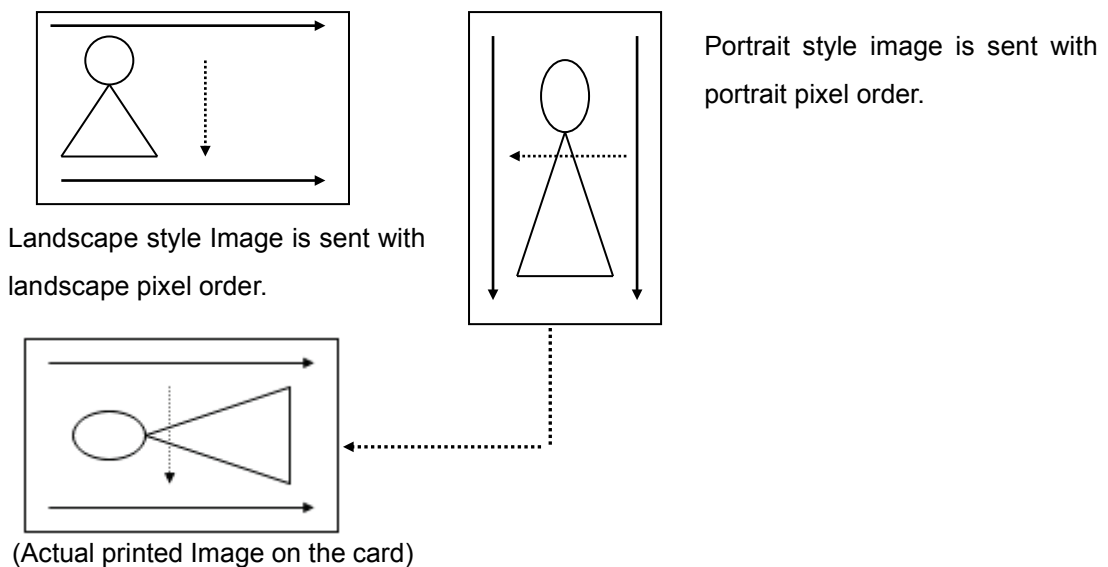
4) About PO(Peel-off)

Peel-off is used not to print any on magnetic stripe or sign panel. The data for Peel-off is from 0 to 255, the bigger value has the stronger power to peel off.

Note: Ability of Peel-off depends on the shape, size and location of the peeled off area. Furthermore operational environment of the printer gives some influence to the ability of Peel-off. Please use Peel-off after you confirm well that Peel-off works well.

5) About the order of the image sent to printer

The sending order of pixels to printer must be always Landscape order even if the image is created with portrait style. If the design is portrait style like right side of the following figure, pixel order must be adjusted by the application program.



- The solid line means the order of the pixels in a line to send to the printer.
- The dashed line means the order of the lines to send to the printer. The pixel at the top of left corner must be sent first, and the pixel at the bottom of right corner must be sent last.

5.6.2 LUT Setting Function

No.	Function Name	Explanation
1	int CXCMD_DefineLUT (int iSlot, int iID, int iColor, int iLength, BYTE *pbyBuffer)	Change LUT of the printer by using Print Format command. ◆ iColor: Each color has its own LUT. Specify the color here. 0 for K, 2 for C, 4 for M, 6 for Y ◆ iLength: The length of LUT data in byte. From 0 to 256. ◆ pbyBuffer: LUT Data.

Note: Don't specify K because it is used internally by the printer.

1) About LUT

LUT is 256 bytes length data and it is used to transform the color being printed. Printer has 4 LUTs for each color transformation.

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

The value X in image data is replaced with LUT[X] value when it is printed.

LUT Data configuration and the way to transform

Note: LUT data is set default value every when the printer is powered.

5.6.3 Print Function

No.	Function Name	Explanation
1	int CXCMD_Print (int iSlot, int iID, int iColor, int iBuffer, int ilmmed)	Print on Retransfer film by using Print command. ◆ iColor Bit0-3: Specify the color to print. Bit0: YMC Bit1: K Bit2: UV Bit3: PO Bit4-5: The location of the MAC address printed with UV. 0: None (Not printed) 1: Upper right corner 2: Lower left corner Note: Please refer “Appendix4” too. ◆ iBuffer: Specify Image buffer to print. 0: Buffer-0 1: Buffer-1 ◆ ilmmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes printing. 1: Reply immediately after printer accepts the command. Note: As printing UV on YMC ink decreases the quality of YMC, UV must be retransferred after the YMC was retransferred to the card when UV image and YMC image overlaps.
2	int CXCMD_SecurityPrint (int iSlot, int iID, int iColor, int iBuffer, int ilmmed)	Do Security Erase which conceals the text on the K ink and the retransfer film by printing again. It prints the K image in the image buffer on the retransfer film by using last used K ink. ◆ iColor: Specify the color to print. Only K(0x02) must be specified. Bit0: YMC Bit1: K Bit2: UV Bit3: PO ◆ iBuffer: Specify Image buffer to print. 0: Buffer-0 1: Buffer-1 ◆ ilmmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes printing. 1: Reply immediately after printer accepts the command. Note: Security Erase must be done after the ink is printed on the film and before it is not retransferred. This function is available only for the usage of YMCK ink, YMCK-UV ink and YMCK-K ink.

5.7 Moving & Discharging Card

5.7.1 Card Load Function

No.	Function Name	Explanation
1	int CXCMD_LoadCard (int iSlot, int iID, int iDest, int iFlip, int iFilmInit, int iImmed)	Load the card to the specified position by using Media Control command. The card is discharged from NG card outlet if NG card outlet is specified as Destination. ◆ iDest: Destination to move card. 0: Retransfer position 1: Contact IC encoder 2: No-contact IC encoder 3: MG encoder 4: NG Card outlet. Card is discharged from printer. ◆ iFlip: Specify whether turn over the card or not. 0: Not turn over 1: Turn over the card before arriving at the destination. ◆ iFilmInit: Specify whether Film position is adjusted or not. This setting is effective only when Destination is NG Card outlet. 0: Not adjusted. 1: Adjusted. ◆ iImmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes loading. 1: Reply immediately after printer accepts the command.

Note1: Film position must be adjusted by setting iFilmInit 1 if the part of retransfer film which is printed already is not used.

Note2: Error will be returned if CXCMD_LoadCard() is used when there is a card in the printer, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.7.2 Card Move Function

No.	Function Name	Explanation
1	int CXCMD_MoveCard (int iSlot, int iID, int iDest, int iFlip, int iFilmInit, int iImmed)	Move the card to the specified Destination by using Media Control command. The card is discharged from NG card outlet if NG card outlet is specified as Destination. ◆ iDest: Destination to move card. 0: Retransfer position 1: Contact IC encoder 2: No-contact IC encoder 3: MG encoder 4: NG Card outlet. Card is discharged from printer. ◆ iFlip: Specify whether turn over the card or not. 0: Not turn over 1: Turn over the card before arriving at the destination. ◆ iFilmInit: Specify whether Film position is adjusted or not. This setting is effective only when Destination is NG Card outlet. 0: Not adjusted. 1: Adjusted. ◆ iImmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes moving. 1: Reply immediately after printer accepts the command.

Note1: Film position must be adjusted by setting iFilmInit 1 if the part of retransfer film which is printed already is not used.

Note2: Error will be returned if CXCMD_MoveCard() is used when there is no card in the printer, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.8 Retransfer on the card

5.8.1 Retransfer Function

No.	Function Name	Explanation
1	int CXCMD_RetransferAndEject (int iSlot, int iID, int ilmmed)	Retransfer the image printed on the film to the card, and Discharge the card to the card outlet by using Media Control command. ◆ ilmmed: Specify immediate flag which decides when printer reply. 0: Reply after printer discharged the card. 1: Reply immediately after printer accepts the command.
2	int CXCMD_RetransferAndTurn (int iSlot, int iID, int ilmmed)	Retransfer the image printed on the film to the card, and Move the card to Retransfer Position after card is turned over by using Media Control command. ◆ ilmmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes retransfer and turning the card. 1: Reply immediately after printer accepts the command.
3	int CXCMD_Retransfer (int iSlot, int iID, int ilmmed)	Retransfer the image printed on the film to the card, and move the card to Retransfer Position by using Media Control Command. ◆ ilmmed: Specify immediate flag which decides when printer reply. 0: Reply after printer finishes retransfer and turning the card. 1: Reply immediately after printer accepts the command.

Note: Error will be returned if CXCMD_RetransferAndEject() and CXCMD_RetransferAndTurn() are used when the card is not located at Retransfer position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

Note: CXCMD_Retransfer() is added for UV. As the UV image gives a bad influence to the durability of the YMC ink if they are retransferred together, the UV image should be retransferred after YMCK have been retransferred.

5.9 Magnetic Encoding

5.9.1 Writing Function (For JIS)

No.	Function Name	Explanation
1	int CXCMD_WriteMagData (int iSlot, int iID, BYTE *pbyBuff, int iLength, int iMagFormat)	Write data to magnetic stripe by using Magnetic Data Write command. ◆ pbyBuff: Data to write. The code is ASCII character. ◆ iLength: Size of data in byte. ◆ iMagFormat: Specify kind of MG encoding. 0x07:JIS-2(7bits) 69 characters at most

Note: Error will be returned if CXCMD_WriteMagData() is used when the card is not located at MAG encoder position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.9.2 Reading Function (For JIS)

No.	Function Name	Explanation
1	int CXCMD_ReadMagData (int iSlot, int iID, BYTE *pbyBuff, int *piLength, int iMagFormat)	Read data from magnetic stripe by using Magnetic Data Read command. ◆ pbyBuff: Pointer to the memory which MG data is stored. Data is set with ASCII character. ◆ piLength: Size of data in byte is set. ◆ iMagFormat: Specify kind of MG encoding. 0x07:JIS-2(7bits) 69 characters maximum

Note: Error will be returned if CXCMD_ReadMagData() is used when the card is not located at MAG encoder position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.9.3 Writing Function (For ISO)

No.	Function Name	Explanation
1	<pre> 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) </pre>	Write data to the ISO MG stripe on the card by using ISO 3 Track Magnetic Data Write command. ◆ iTrack1MagFormat: Specify the format of Track1. 0x00: Not to write 0xa6: Write as ISO 6 unit code. Max 76 characters 0xa7: Write as ISO 7 unit code. Max 69 characters 0xa8: Write as ISO 6 unit code. Max 79 characters ◆ pbyTrack1Buff: Data to write to track 1. The data must be set with ASCII. ◆ iTrack1DataLength: Size of data in pbyTrack1Buff. ◆ iTrack2MagFormat: Specify the format of Track2. 0x00: Not to write 0xb4: Write as ISO 4 unit code. Max 37 characters ◆ pbyTrack2Buff: Data to write to track 2. The data must be set with ASCII. ◆ iTrack2DataLength: Size of data in pbyTrack2Buff. ◆ iTrack3MagFormat: Specify the format of Track3. 0x00: Not to write 0xc4: Write as ISO 4 unit code. Max 104 characters 0xc7: Write as ISO 7 unit code. Max 69 characters 0xc6: Write as ISO 6 unit code. Max 79 characters ◆ pbyTrack3Buff: Data to write to track 3. The data must be set with ASCII. ◆ iTrack3DataLength: Size of data in pbyTrack3Buff.

Note: Error will be returned if CXCMD_WriteISO3TrackMagData() is used when the card is not located at MAG encoder position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.9.4 Reading Function (For ISO)

No.	Function Name	Explanation
1	int CXCMD _ReadISO3TrackMagData (int iSlot, int iID, int iTrack1MagFormat, BYTE *pbyTrack1Buff, int *piTrack1DataLength, int iTrack2MagFormat, BYTE *pbyTrack2Buff, int *piTrack2DataLength, int iTrack3MagFormat, BYTE *pbyTrack3Buff, int *piTrack3DataLength) 	Read data from the ISO MG stripe on the card by using ISO 3 Track Magnetic Data Read command. ◆ iTrack1MagFormat: Specify the format of Track1. 0x00: Not to read 0xa6: Read as ISO 6 unit code. Max 76 characters 0xa7: Read as ISO 7 unit code. Max 69 characters 0xa8: Read as ISO 6 unit code. Max 79 characters ◆ pbyTrack1Buff: Data of track 1. The data is set in ASCII. ◆ iTrack1DataLength: Size of data in pbyTrack1Buff is set. ◆ iTrack2MagFormat: Specify the format of Track2. 0x00: Not to read 0xb4: Read as ISO 4 unit code. Max 37 characters ◆ pbyTrack2Buff: Data of track 2. The data is set in ASCII. ◆ iTrack2DataLength: Size of data in pbyTrack2Buff is set. ◆ iTrack3MagFormat: Specify the format of Track3. 0x00: Not to read 0xc4: Read as ISO 4 unit code. Max 104 characters 0xc7: Read as ISO 7 unit code. Max 69 characters 0xc6: Read as ISO 6 unit code. Max 79 characters ◆ pbyTrack3Buff: Data of track 3. The data is set in ASCII. ◆ iTrack3DataLength: Size of data in pbyTrack3Buff is set.

Note: Error will be returned if CXCMD_ReadISO3TrackMagData() is used when the card is not located at MAG encoder position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

5.10 IC Encoding

5.10.1 IC Control Function

No.	Function Name	Explanation
1	int CXCMD_ICControl (int iSlot, int iID, int iICType, int iAction)	Perform the procedure for IC encoding by using IC Control command. ◆ iICType: Type of IC encoding. 0: Contact IC encoding 1: No-Contact IC encoding ◆ iAction: Action of IC encoder. 0: Contact 1: Release

Note1: Error will be returned if CXCMD_ICControl() is used when the card is not located at the appropriate IC encoder position, and positive value will be returned if it is issued while the printer is on the way of moving card or retransfer. Retry with a little waiting if positive value is returned.

Note2: CXCMD_MoveCard() is rejected as error after CXCMD_ICControl() is issued with iAction=0. It is required to issue CXCMD_ICControl() with iAction=1 before moving card even if it is for No-Contact IC encoding.

5.11 Initializing Printer

5.11.1 Rezero Function

No.	Function Name	Explanation
1	int CXCMD_RezeroUnit (int iSlot, int iID, int iAction)	Initialize printer by using Rezero command. Printer discharges the card and adjusts both Retransfer position and Ink position. ◆ iAction: designate initialization 0x00: execute standard mechanical initialization. 0x01: release Power Save mode. No mechanical working. 0x1F: reboot the printer. Note: In the case that 0x1F is specified, reply immediately after printer accepts the command (before printer reboots).

5.12 Getting information and Changing setting

5.12.1 Inquiry Function

No.	Function Name	Explanation
1	int CXCMD_StandardInquiry (int iSlot, int iID, BYTE *pbyBuffer)	Get Inquiry Data from the printer by using Inquirycommand. ◆ pbyBuffer: Inquiry data is stored. 96 bytes or more memory is required.

1) Standard Inquiry Data format

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
8-15	Vendor Identification (ASCII)							
16-31	Product Identification (ASCII)							
32-39	Printer Firmware Version (ASCII)							
40	MG Option (Binary): None:0,ISO:1,JIS:2							
41	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							

Note: The version of the option unit which is not attached is filled with ‘?’.

5.12.2 Mode Sense Function

No.	Function Name	Explanation
1	int CXCMD_ModeSense (int iSlot, int iID, int iPC, int iPage, BYTE *pbyBuffer)	Get Mode Sense Data from printer by using Mode Sense command. ◆ iPC: Page Control. This must be 1. ◆ iPage: Choose one of following Mode Sense Data. 0x23: Ink Information Data 0x28: Print Unit Information Data 0x2a: Encode Unit Information Data 0x2C: Laminator Unit Information Data 0x2D: Network Information Data 0x18: Extra Print Unit Information Data 0x19: LCD Information Data ◆ pbyBuffer: Pointer to the memory to store Mode Sense Data. The size of memory must be; (4+40) bytes at least if Ink Information Data. (4+60) bytes at least if Print Unit Information Data. (4+10) bytes at least if Encode Unit Information Data. (4+24) bytes at least if Laminator Unit Information Data. (4+100) bytes at least if Network Information Data. (4+20) bytes at least if Extra Print Unit Information Data. (4+26) bytes at least if LCD Information Data.

Note: Mode Data Header is stored at the top of 4 bytes. Actual data is stored from 5th byte.

1) Mode Sense Data format

(1) Mode Sense Data Header

Bit Byte	7	6	5	4	3	2	1	0
0	Mode Sense Data Length							
1	Reserved							
2	Reserved	0	0	1	Reserved			
3	Reserved							

Mode Sense Data Length: It is the number that is subtracted by 1 from the size of Mode Sense Data in byte.

(2) Ink Information 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	Ink Quantity							
4	(MSB) Number of Set of Ink Panel (LSB)							
5								
6	Reserved							
7	Reserved							
8-39	Lot Number (ASCII) Only first 6 bytes are meaningful. The rest are filled with 0.							

Ink Code: Specifies the kind of the ink.

0x00: YMCK 0x01: Reserved 0x02: YMCK-PO 0x03: K
 0x04: YMCK-K 0x05: YMCK-UV
 0xFF: Unknown (Unable to communicate with TAG Reader Writer)
 0xFE: Unknown (Ink TAG is not found)
 0xFD: Unknown (Communication error happens between TAG)
 0xFC: Unknown (Invalid TAG data)

Ink Quantity: Usable ink quantity. From 0(None) to 50(Full).

Note: Ink Quantity is the same as one in Print Unit Information Data Page.

Number of Set of Ink Panel: The number of cards being printed by the ink normally.

Lot Number: The lot number of the ink. It is set by ASCII characters.

Note: Lot Number will be filled with zero if Ink Code is from 0xfc to 0xff.

(3) Print Unit Information 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 (0x3a)							
2-3	Reserved							
4	(MSB) Basic Resolution X (0x0258) (LSB)							
5								
6	(MSB) Basic Resolution Y (0x0258) (LSB)							
7								
8	HR Temperature Control							
9	Reserved							
10-11	Reserved							
12	(MSB) Card Size X (LSB)							
13								
14	(MSB) Card Size Y (LSB)							
15								
16	MG Peel Mode							
17	Reserved							
18	Reserved							
19	Reserved							
20	Film Code							
21	Reserved							
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 Front)
35	Velocity (Retransfer Back)
36	Heat Roller Temperature (Card Fix)
37	Velocity (Card Fix)
38	Reserved
39	Peel Wait Time Reserved
40	Reserved
41	Resin K (Black) Level
42	Resin K (Black) Mode
43	A0 (UV) Level
44	A1 (PO) Level
45	Buzzer Mode
46	Power Save Mode
47	Film Quantity
48	Ink Quantity
49	Card Quantity
50	YMC Level
51	Display Contrast LCD Back Light
52	Reserved (0xff)
53	Display Mode Reserved
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.

Basic Resolution Y: Vertical resolution in DPI.

HR Temperature Control:

When this is enabled, the printer decreases the heat roller temperature when the card is not printed for 30 minutes.

0: Disabled

1: Enabled

~~Peel Wait Time: Wait time in second before peel. From 0 to 15.~~

~~This setting becomes invalid.~~

Resin K (Black) Level: Resin K (Black) printing energy. From 0(Low) to 6(High).

Resin K (Black) Mode: Resin K (Black) printing mode. 0:Standard 1:Fine

A0 (UV) Level: UV ink printing energy. From 0(Low) to 6(High).

A1 (PO) Level: PO ink printing energy. From 0(Low) to 6(High).

Buzzer Mode: 0: On 1: Off

Power Save Mode: Power Save Mode enabled time 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. From 0(None) to 10(Full).

Ink Quantity: Usable ink quantity. From 0(None) to 50(Full).

Card Quantity: Card quantity in the card hopper.

0: Any 2: None

YMC Level: YMC printing energy. From 0(Low) to 6(High).

~~Display Contrast: LCD contrast.~~

~~LCD Back Light: LCD Brightness.~~

0: -3	1: -2	2: -2	3: 0
4: +1	5: +2	6: +3	7: +4 (Bright)

~~Display Mode: Contents in the LCD.~~

~~0: Counter 1: Laminator Status~~

~~Note) When the laminator is not connected, it shows the kind of Counter. When the connected laminator has malfunction, it shows the contents of the malfunction in the both setting.~~

Display Counter: The kind 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. From 0(+2:Fast) to 5(-3:Slow).

Velocity of the back side 2nd retransfer (UV):

The velocity for the 2nd retransfer of UV on 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

(4) Encode Unit Information Data (Page Code = 0x2a)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2a)					
1	Page Specific Parameter Length (0x08)							
2	ISO Mode							
3	JIS Mode							
4-6	Reserved							
7	Write Retry							
8	Reserved							
9	Reserved							

ISO Mode: Coercivity of ISO head.

0: Lo-Co (300Oe)

1: Hi-Co

JIS Mode: Coercivity of JIS head.

0: Lo-Co

1: Hi-Co (2750Oe)

Write Retry: The retry count of magnetic writing by one card. From 0 to 3.

(5) Laminator Unit Information Data Page (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							

Note: In "Film T Type" and "Film B Type", T(Top) means the lamination function on the top side of the

card. B(Bottom) means the lamination function on the bottom side of the card.

Laminate Mode: The way of lamination

0: Laminate 1: Pass through

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

0: Patch 1: Overlay

Film T Position = The position of lamination start ($\pm X$ direction) on the top side.

From 0(-7) to 14(+7)

Heat Roller T Temp: The heat roller temperature setting on the top side lamination.

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

Note)

If the temperature setting is over 180 centigrade, it becomes 180 centigrade.

Laminate Speed: The laminate speed setting.

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

Cassette: The provision of film cassette.

0: not provided	1: provided for the top side
2: provided for the bottom side	2: provided for the top and bottom side

Laminate Cooling Time: Laminate cooling time setting.

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

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

0: Off 1: On

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

0: Patch 1: Overlay

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

From 0(-7) to 14(+7)

Heat Roller B Temp: The heat roller temperature setting on the bottom side lamination.

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

Note)

If the temperature setting is over 180 centigrade, it becomes 180 centigrade.

(6) Network Information Data Page (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)							
2-5	(MSB) IPv4 Address (LSB)							
6-9	(MSB) IPv4 Sub Net Mask (LSB)							
10-13	(MSB) IPv4 Default Gateway Address (LSB)							
14	Session Timeout							
15	DHCP							
16	Host I/F							
17-26	Printer Name (ASCII)							
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							
63-99	Reserved							

IPv4 Address: IPv4 Address setting

IPv4 Sub Net Mask: IPv4 Sub Net Mask setting

IPv4 Default Gateway Address: IPv4 Default Gateway Address setting

Session Timeout:

This specifies the time out interval to detect the disconnection from the host on TCP print session.

0 is recommended.

0: Disabled 1: 10 minutes 2: 20 minutes 3: 30 minutes
4: 60 minutes

DHCP:

0: Enabled 1: Disabled

HOST I/F:

0: Ethernet I/F 1: USB I/F

Printer Name:

Logical name of the printer. The remainder is filled with 0 when the size of Printer name is less than 10.

IPSec Mode: 0: IPSec Function prohibit 1: IPSec Function work

Note) When IPSec Mode is not 0, IPSec does not work in the case that IPSec Type is 0.

IPSec Type: 0: No Certificate 1: Preshared 2: Certificate

IPv6 Subnet Prefix Length: IPv6 Subnet Prefix length setting

From 0 to 128.

IPv6 Address Configuration: IPv6 Address configuration setting

0: Auto 1: Manual

Note) In the case of Auto, IP Address set by manual is not effective.

IPv6 Default Gateway Address: IPv6 Default Gateway Address setting

IPv6 Address: IPv6 Address setting

(7) Extra Print Unit Information Data Page (Page Code = 0x18)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x18)					
1	Page Specific Parameter Length (0x12)							
2	Print Quality							
3	Reserved							
4	Reserved							
5	Reserved							
6	Overcoat Speed (Front)							
7	Overcoat Speed (Back)							
8	Card Material							
9	Reserved							
10	Left side Eject Speed							
11	Reserved							
12	Adjust IC Antenna Card X							
13-19	Reserved							

Print Quality: Print quality of the YMCK printing

0: Fine 1: Fast

Overcoat Speed (Front): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

Overcoat Speed (Back): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

Card Material: The kind of Card material.

0: PVC Standard 1: PET-G 2: HR-PET-G

Left side Eject Speed: From 7(-1: Slow) to 9(+1: Fast).

Adjust IC Antenna Card X: IC Antenna Card Position ($\pm X$ direction).

From 48(+2) to 52(-2). (in steps of approx. 1mm).

(8) LCD Information Data Page (Page Code = 0x19)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x19)					
1	Page Specific Parameter Length (0x18)							
2	Reserved							
3	Reserved							
4	Reserved							
5	LCD Language							
6	Reserved							
7	LCD Main Layout							
8	LCD Color (Ready)							
9	LCD Color (Busy)							
10	LCD Color (Error)							
11	LCD Menu Layout							
12	LCD Color (Menu1)							
13	Reserved							
14	Reserved							
15	LCD Color (Startup)							
16	LCD Icon Layout							
17-25	Reserved							

LCD Language: User-defined external font in the LCD.

0: System (displays text on the LCD using the printer unit's built-in font)

1: External (displays text on the LCD using a different font that was downloaded)

Note: Please refer to LCD SDK for other settings.

5.12.3 Mode Select Function

No.	Function Name	Explanation
1	int CXCMD_ModeSelect (int iSlot, int iID, int iSp, int iPage, BYTE *pbyData)	Change printer setting by using Mode Select command. ◆ iSp: Specify whether setting data is stored NVR(Non Volatile Memory) or not. Note: It should be set 0 always. In the case that the setting is not kept in the EEPROM, the setting will be changed by Print Information Data Page. The setting in other pages will be kept always in the EEPROM. ◆ iPage: Choose one of following Mode Select Data. 0x28: Print Unit Information Data 0x2a: Encode Unit Information Data 0x2C: Laminator Unit Information Data 0x2D: Network Information Data 0x2B: Print Information Data 0x18: Extra Print Unit Information Data 0x19: LCD Information Data 0x1B: Extra Print Information Data Note: The setting in this page is not kept in the EEPROM. ◆ 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. 10 bytes if Encode Unit Information Data. 24 bytes if Laminator Unit Information Data. 80 bytes if Network Information Data. 24 bytes if Print Information Data. 20 bytes if Extra Print Unit Information Data. 26 bytes if LCD Information Data. 20 bytes if Extra Print Information Data.

Notice:

- The data 0xff in the setting data has the following special meanings.
 - In the case of the setting is 0xff, this setting is not kept in the non volatile memory.
 - In the case of the setting is 0xff, the data in the non volatile memory is effective.
- In Mode Select Data, please set 0 at the position of "Reserved". In the case of 0xff clearly, please set 0xff.

1) Mode Select Data format

(1) Print Unit Information 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 Front)							
6	Velocity (Retransfer Back)							
7	Heat Roller Temperature (Card Fix)							
8	Velocity (Card Fix)							
9	Reserved (0xff)							
10	Peel Wait Time Reserved (0xff)							
11	MG Peel Mode							
12	Standby Mode							
13	Resin K (Black) Level							
14	Resin K (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 LCD Back Light							
25	Reserved (0xff)							
26	Display Mode Reserved (0xff)							
27	Display Counter							
28	Velocity of the front side 2nd retransfer (UV)							
29	Velocity of the back side 2nd retransfer (UV)							
30	Backside Cooling							

31	Reserved (0xff)
----	-----------------

The contents in this page are kept always in the EEPROM. In the case that the setting is 0xff, it works according to the setting kept in the printer EEPROM, the items are not changed. Film Code setting will be effective after the reset. Other printing function setting will be effective from the next printing.

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

Velocity (Retransfer Front): From 0(Fast) to 5(Slow).

Velocity (Retransfer Back): From 0(Fast) to 5(Slow).

Heat Roller Temperature (Card Fix): From 0(Low) to 5(High), **10(Off)**.

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

~~Peel Wait Time: Wait time in second before peel. From 0 to 15.~~

~~This setting becomes invalid. It does not give any influence to the printer.~~

MG Peel Mode: The way of peeling retransfer film on the back side of the card. It is the special arrangement for the card magnetic side. In the case that the card does not have magnetic stripe, do not set "On". Without magnetic encoder, it does not work.

0: Off 1: On

Standby Mode:

The printer waits for the laminator becoming ready. This is effective only when both side printing and the laminator are attached.

0: Wait after the front side retransferring.

1: Wait after the back side retransferring.

Resin K (Black) Level: Resin K (Black) printing energy. From 0(Low) to 6(High).

Resin K (Black) Mode: Resin K (Black) printing mode.

0: Standard 1: Fine

A0 (UV) Level: UV ink printing energy. From 0(Low) to 6(High).

A1 (PO) Level: PO ink printing energy. From 0(Low) to 6(High).

Film Code: The kind of retransfer film.

0: Standard (1000panels)

2: Standard (750panels)

HR Temperature Control:

When this is enabled, the printer decrease the heat roller temperature when the card is not printed for 30 minutes.

0: Disabled 1: Enabled

Card Code: The kind of Card.

0: Standard

2: Thin card (Card thickness is 0.25mm)

Buzzer Mode:

0: On 1: Off

Power Save Mode: Power Save Mode enabled time in minutes.

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

YMC Level: YMC printing energy. From 0(Low) to 6(High).

~~Display Contrast: LCD contrast.~~

~~LCD Back Light: LCD Brightness.~~

0: -3 1: -2 2: -1 3: 0
4: +1 5: +2 6: +3 7: +4 (Bright)

~~Display Mode: Contents in the LCD.~~

~~0: Counter 1: Laminator Status~~

~~Note) When the laminator is not connected, it shows the kind of Counter. When the connected laminator has malfunction, it shows the contents of the malfunction in the both setting.~~

Display Counter: The kind 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. From 0(+2:Fast) to 5(-3:Slow).

Velocity of the back side 2nd retransfer (UV):

The velocity for the 2nd retransfer of UV on 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

(2) Encode Unit Information Data (Page Code = 0x2a)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2A)					
1	Page Specific Parameter Length (0x08)							
2	ISO Mode							
3	JIS Mode							
4-6	Reserved (0xff)							
7	Write Retry							
8	Reserved (0xff)							
9	Reserved (0xff)							

The contents in this page are kept always in the EEPROM. In the case that the setting is 0xff, it works according to the setting kept in the printer EEPROM. The setting will be effective from the next printing.

ISO Mode: Coercivity ISO head.

0: Lo-Co (300Oe) 1: Hi-Co

JIS Mode: Coercivity of JIS head.

0: Lo-Co 1: Hi-Co (2750Oe)

Write Retry: The retry count of magnetic writing by one card.

From 0 to 3.

(3) Laminator Unit Information Data Page (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)							

T(Top) means the lamination function on the top of card and B(Bottom) means the lamination function on the bottom of card. In the case that the setting is 0xff, it works according to the setting kept in the laminator EEPROM. The settings in this page are kept in the laminator EEPROM. Film T Type and Film B Type setting will be effective after the laminator reset. Other laminate function setting will be effective from the next printing.

Laminate Mode: Laminate function setting.

0: Laminate 1: Pass through

Film T Type: Film Type on the top side of card.

0: Patch 1: Overlay

Film T Position: Move to the X direction of the laminate start on the top side of card.

From(0: -7) to (14: +7)

Heat Roller T Temp: Laminate Heat Roller temperature setting on the top side of card.

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

18: 180centigrade

Note)

If the temperature setting is over 180 centigrade, it becomes 180 centigrade.

Laminate Speed: Laminate speed setting.

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

Laminate Cooling Time: Laminate cooling time setting.

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

HR Control: In the case of effective, the heat roller temperature falls to 180 centigrade when it does not laminate in 30 minutes.

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

Film B Type: Laminate film type on the bottom of card setting.

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

Film B Position: Move to the X direction of the laminate film on the bottom of card.

From 0(-7) to 14(+7)

Heat Roller B Temp: Laminate heat roller temperature setting on the bottom of card.

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

Note)

If the temperature setting is over 180 centigrade, it becomes 180 centigrade.

(4) Network Information Data Page (Page Code = 0x2d)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x2d)					
1	Page Specific Parameter Length (0x4e)							
2-5	(MSB) IPv4 Address (LSB)							
6-9	(MSB) IPv4 Sub Net Mask (LSB)							
10-13	(MSB) IPv4 Default Gateway Address (LSB)							
14	Session Timeout							
15	DHCP							
16	Host I/F							
17-26	Printer Name (ASCII)							
27	IPSec Mode							
28	Reserved							
29	IPv6 Subnet Prefix Length (IPv6)							
30	IPv6 Address Configuration							
31-46	(MSB) IPv6 Default Gateway Address (LSB)							
47-62	(MSB) IPv6 Address- (LSB)							
63-79	Reserved							

The contents in this page are kept in the EEPROM. Except Printer Name and Session Timeout setting, the setting in this page will be effective after the power on. In the case that the setting is 0xff, it does not revive the setting in the EEPROM in this page, the effective setting will be kept as it is in the EEPROM.

IPv4 Address: IPv4 Address setting

IPv4 Sub Net Mask: IPv4 Sub Net Mask setting

IPv4 Default Gateway Address: IPv4 Default Gateway Address setting

Session Timeout:

This specifies the time out interval to detect the disconnection from the host on TCP print session.

0 is recommended. This becomes effective after it is set.

0: Disabled 1: 10 minutes 2: 20 minutes 3: 30 minutes 4: 60 minutes

DHCP:

0: Enabled 1: Disabled

HOST I/F:

0: Ethernet I/F 1: USB I/F

Printer Name:

Logical name of the printer. The remainder is filled with 0 when the size of Printer name is less than 10. This becomes effective after it is set.

IPSec Mode: 0: IPSec function prohibit 1: IPSec function work

Note) In the case that IPSec Type is 0(No Certificate), IPSec does not work.

IPv6 Subnet Prefix Length: IPv6 Subnet Prefix length setting.

From 0 to 128

IPv6 Address Configuration: IPv6 Address configuration setting.

0: Auto 1: Manual

Note) In the case of Auto, IPv6 Address(Manual) is not effective.

IPv6 Default Gateway Address: IPv6 Default Gateway Address setting.

IPv6 Address: IPv6 Address setting.

(5) Print Information Data Page (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 K (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 K (Black) Mode							
19	Velocity of the front side 2nd retransfer (UV)							
20	Velocity of the back side 2nd retransfer (UV)							
21	Backside Cooling							
22-23	Reserved (0xff)							

The settings in this page are not kept in the EEPROM. In the case of 0xff, the setting in the EEPROM is effective. The setting will be effective from the next printing.

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

Velocity (Retransfer Front): From 0(Fast) to 5(Slow).

Velocity (Retransfer Back): From 0(Fast) to 5(Slow).

Heat Roller Temperature (Card Fix): From 0(Low) to 5(High), **10(Off)**.

Velocity (Card Fix): From 0(Slow) to 4(Fast), ~~4(Off)~~

Peel Wait Time: Wait time in second before peel. From 0 to 15.

This setting becomes invalid. It does not give any influence to the printer.

MG Peel Mode: The way of peeling retransfer film on the back side of the card. It is the special arrangement for the card magnetic side. In the case that the card does not have magnetic stripe, do not set "On". Without magnetic encoder, it does not work.

0: Off 1: On

Standby Mode:

The printer waits for the laminator becoming ready. This is effective only when both side printing and the laminator are attached.

0: Wait after the front side retransferring.

1: Wait after the back side retransferring.

YMC Level: YMC printing energy. From 0(Low) to 6(High).

Resin K (Black) Level: Resin K (Black) printing energy. From 0(Low) to 6(High).

A0 (UV) Level: UV ink printing energy. From 0(Low) to 6(High).

A1 (PO) Level: PO ink printing energy. From 0(Low) to 6(High).

Laminate Mode: Laminate function.

0: Laminate 1: Pass through

ISO Mode: Coercivity of ISO head.

0: Lo-Co (300Oe) 1: Hi-Co

JIS Mode: Coercivity of JIS head.

0: Lo-Co 1: Hi-Co (2750Oe)

Write Retry: The retry count of magnetic writing by one card. From 0 to 3

Resin K (Black) Mode: Resin K (Black) printing 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. From 0(+2:Fast) to 5(-3:Slow).

Velocity of the back side 2nd retransfer (UV):

The velocity for the 2nd retransfer of UV on 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

(6) Extra Print Unit Information Data Page (Page Code = 0x18)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x18)					
1	Page Specific Parameter Length (0x12)							
2	Print Quality							
3	Reserved (0xff)							
4	Reserved (0xff)							
5	Reserved (0xff)							
6	Overcoat Speed (Front)							
7	Overcoat Speed (Back)							
8	Card Material							
9	Reserved (0xff)							
10	Left side Eject Speed							
11	Reserved (0xff)							
12	Adjust IC Antenna Card X							
13-19	Reserved (0xff)							

The contents in this page are kept always in the EEPROM. In the case that the setting is 0xff, it works according to the setting kept in the printer EEPROM, the items are not changed. The setting will be effective from the next printing.

Print Quality: Print quality of the YMCK printing

0: Fine 1: Fast

Overcoat Speed (Front): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

Overcoat Speed (Back): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

Card Material: The kind of Card material.

0: PVC Standard 1: PET-G 2: HR-PET-G

Left side Eject Speed: From 7(-1: Slow) to 9(+1: Fast).

Adjust IC Antenna Card X: IC Antenna Card Position ($\pm X$ direction).

From 48(+2) to 52(-2). (in steps of approx. 1mm).

(7) LCD Information Data Page (Page Code = 0x19)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x19)					
1	Page Specific Parameter Length (0x18)							
2	Reserved							
3	Reserved							
4	Reserved							
5	LCD Language							
6	Reserved							
7	LCD Main Layout							
8	LCD Color (Ready)							
9	LCD Color (Busy)							
10	LCD Color (Error)							
11	LCD Menu Layout							
12	LCD Color (Menu1)							
13	Reserved							
14	Reserved							
15	LCD Color (Startup)							
16	LCD Icon Layout							
17-25	Reserved							

The contents in this page are kept always in the EEPROM. In the case that the setting is 0xff, it works according to the setting kept in the printer EEPROM, the items are not changed.

LCD Language: User-defined external font in the LCD.

0: System (displays text on the LCD using the printer unit's built-in font)

1: External (displays text on the LCD using a different font that was downloaded)

Note: Please refer to LCD SDK for other settings.

(8) Extra Print Information Data Page (Page Code = 0x1B)

Bit Byte	7	6	5	4	3	2	1	0
0	0	0	Page Code (0x1B)					
1	Page Specific Parameter Length (0x12)							
2	Print Quality							
3	Reserved (0xff)							
4	Reserved (0xff)							
5	Reserved (0xff)							
6	Overcoat Speed (Front)							
7	Overcoat Speed (Back)							
8-19	Reserved (0xff)							

The settings in this page are not kept in the EEPROM. In the case of 0xff, the setting in the EEPROM is effective. The setting will be effective from the next printing.

Print Quality: Print quality of the YMCK printing

0: Fine 1: Fast

Overcoat Speed (Front): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

Overcoat Speed (Back): From 0(+2: Fast) to 5(-3: Slow), 10(Off).

5.12.4 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 by using Log Sense command. ◆ iPage: Choose Log Sense data. 0x38: Medium Quantity page 0x39: Miscellaneous page 0x3a: Laminator Counter Page ◆ pbyBuffer: Pointer to the memory being stored Log Sense Data. The size of memory must be enough size to store Log Sense Data.

(1) 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 successfully printed cards. It can be set to zero) (Refer Note1) (LSB)							
17								
18								
19								

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 printed colors)							(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 printed card. It is initialized to zero when Roller Cleaning is done)							(LSB)
33									
34									
35									
35									
36	(MSB)	Parameter Code (0x0004)							(LSB)
37									
38	0x00								
39	Parameter Length (0x0004)								
40	(MSB)	Error Count (The number of total resettable error card) (Refer Note1)							(LSB)
41									
42									
43									
44-51	Reserved								

Note1: Error Count is initialized when Free Count is initialized. And the relationship of Error Count and Free Count is following.

Error Count is Card load success count minus Free Count.

Free Count means the number of card which exit from left side of the printer without JAM after the retransfer printing, Card load success count does not count card supply JAM card.

(2) 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 Note: Respond 0 always (LSB)							
9								
10								
11								
12	(MSB)Parameter Code (0001H)(LSB)							
13								
14	00H							
15	Parameter Length (0004H)							
16	(MSB)Retransfer HR Power On Time. (It is accumulated by one on every 5 minutes during the heater 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 (It is accumulated by one on every 5 minutes during the heater is powered.) (LSB)							
25								
26								
27								
28	(MSB)Parameter Code (0003H)(LSB)							
29								
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) Unresettable Retransfer HR Power On Time (Unresettable 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) Unresettable Remedy HR Power On Time (Unresettable 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
58-75	Reserved

Printer Status: It reports the printer status.

- | | | |
|--|---|-----------------|
| 0: Ready (Ready to load the card) | 1: Initializing | |
| 3: Offline. Not ready by the setting mode or as like. | 4: Transport Mode | |
| 5: Cleaning Request | 7: Preheating | |
| 51: Loading the card. | 52: Moving the card. | 53: MG Encoding |
| 55: Card is at the contact IC encoder. | 56: Card is at the no-contact IC encoder. | |
| 57: Retransferring (Card is moved to Retransfer Origin) | | |
| 61: Printing on the retransfer film. | | |
| 62: Sleeping | | |
| 63: Heating (The status that HR is revived the normal temperature from HR Control Mode.) | | |

255: Any printer errors. Printer Error Status shows the contents of the error.

Note: This status is not rigid. This purpose is to make it possible for the software to show the printer status to the operator.

Printer Error Status:

This reports the contents of the printer error in case of (Printer Status =255). Otherwise, this reports 0.

Printer Error Status (Sense Key): Sense Key is reported.

Printer Error Status (Additional Sense Code) Additional Sense Code is reported.

Printer Error Status (Additional Sense Qualifier): Additional Sense Qualifier is reported.

Note: Some of error status are reported as Printer Status. They are;
Busy of Transporting, Busy of Printing, Busy of Transporting and Printing,
Preheating, Initializing, Testing or Cleaning, On Setting or Transport Mode,
Sleeping

Laminator Status: Report the laminator status.

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 malfunction.

Laminator Error Status: Report the laminator malfunction. In the case that Laminator Status is not 255, it reports 00.

0x50: Card JAM (near the card entrance) 0x51: Card JAM (in the printer)
 0x52: Card JAM (near the card exit)
 0x53: No remains of upper film 0x54: No remains of lower film
 0x55: Impossible to detect upper film (No film or broken)
 0x56: Impossible to detect lower film (No film or broken)
 0x57: Impossible to detect upper film mark.
 0x58: Impossible to detect lower film mark.
 0x59: Door open
 0x5a: No cassette
 0x60: Thermostat cut
 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 cum error 0x6c: Lower heat roller cum 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

(3) Laminator Counters Page (Page Code = 0x3A)

Respond the following laminator information.

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved		Page Code (0x3A)					
1	Reserved							
2	(MSB) Page Length (0x0040) (LSB)							
3								
4	(MSB) Parameter Code (0x0000) (LSB)							
5								
6	0x00							

7	Parameter Length (0x0004)	
8	(MSB)	Total Count (The number to total card issue. Unresettable.)
9		
10		
11		(LSB)
12	(MSB)	Parameter Code (0x0001)
13		(LSB)
14	0x00	
15	Parameter Length (0x0004)	
16	(MSB)	Cleaning Count (The number of total card issue. Resettable every roller cleaning)
17		
18		
19		(LSB)
20	(MSB)	Parameter Code (0x0002)
21		(LSB)
22	0x00	
23	Parameter Length (0x0004)	
24	(MSB)	Resettable Heat Roller T Power On Time (Resettable heat roller top total power on time)
25		
26		
27		(LSB)
28	(MSB)	Parameter Code (0x0003)
29		(LSB)
30	0x00	
31	Parameter Length (0x0004)	
32	(MSB)	Resettable Heat Roller B Power On Time (Resettable heat roller bottom total power on time)
33		
34		
35		(LSB)
36	(MSB)	Parameter Code (0x0004)
37		(LSB)
38	0x00	
39	Parameter Length (0x0004)	
40	(MSB)	Unresettable Heat Roller T Power On Time (Unresettable heat roller top total power on time)
41		
42		

43		(LSB)
44	(MSB)	Parameter Code (0x0005)
45		
46		(LSB)
46		0x00
47		Parameter Length (0x0004)
48	(MSB)	Unresettable Heat Roller B Power On Time (Unresettable heat roller bottom total power on time)
49		
50		
51		
52	(MSB)	Parameter Code (0x0006)
53		
54		(LSB)
54		0x00
55		Parameter Length (0x0002)
56	(MSB)	Heat Roller T Current Temperature (Heat Roller Top current temperature)
57		
58	(MSB)	Parameter Code (0x0007)
59		
60		(LSB)
60		0x00
61		Parameter Length (0x0002)
62	(MSB)	Heat Roller B Current Temperature (Heat Roller Bottom current temperature)
63		
64-75		(LSB)
64-75		Reserved

5.12.5 Log Select Function

No.	Function Name	Explanation
1	int CXCMD_LogSelect (int iSlot, int iID, int iMod)	Initialize both Free Counter and Error Counter of the printer. Note: Set 0 always at iMod.

6. How to encode with Printer Driver

The printer driver offers a function for encoding. Normally, It is not possible to pass the encode data to the printer driver. We offer two kinds of special way to it to the printer driver.

6.1 Inline Encoding

Encoding data can be passed to the printer driver as print data. A text proceeding by the predefined prefix is not printed but encoded. Set the method of inline encoding in the “Inline type” of the Printer Driver. The default encoding is encoded without the ISO Magnetic encoding. If the text is regarded as the encoding data, both prefix and the text will be not printed.

6.1.1 Default Encoding

Adding a prefix (tilde(~), ?, or numeric characters) at the beginning of a text enables the string to be recognized as encoding data.

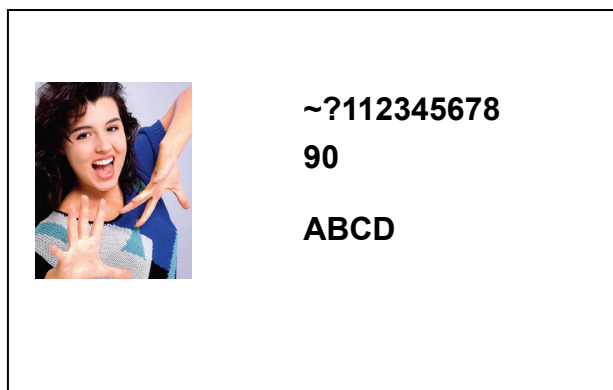
Prefix	Max Length	Code	Text after prefix
~?0	69	7 unit	Text is processed as the data for JIS-2 MG encoding.
~?1	76	6 unit	Text is processed as the data for ISO track1 MG encoding
~?2	37	4 unit	Text is processed as the data for ISO track2 MG encoding
~?3	104	4 unit	Text is processed as the data for ISO track3 MG encoding
~?4	32760	8 unit	Text is processed as the data for the contact IC encoding
~?5	32760	8 unit	Text is processed as the data for the non-contact IC encoding
~?6	69	7 unit	Text is processed as the data for ISO track1 MG encoding
~?7	69	7 unit	Text is processed as the data for ISO track3 MG encoding
~?8	79	6 unit	Text is processed as the data for ISO track1 MG encoding.
~?9	79	6 unit	Text is processed as the data for ISO track3 MG encoding.

*Column “Max Length” shows the maximum number of encoding characters.

Note:

- Encoding setting of the printer driver property sheet must be enabled.
- Inline encoding data must be set on the first printed page.
- The prefix and text must be successive, and their font and size must be same.
- Effective code for MG encoding is shown at “Appendix: ASCII Code Table and Magnetic Data”.
- In JIS-2 encoding, JIS Katakana characters are transformed to ASCII characters by inserting SI / SO control code by the printer driver.
- In case of both Contact IC encoding and Non-Contact IC encoding, the data being passed to IC Encode DLL(See 6.3) is ASCII single byte code. If other characters than ASCII are described, the value being passed to Encode DLL will not be guaranteed.

Following figure is an example for ISO MAG Track1 encoding. If following picture is printed, “12345678” will be encoded and “~?112345678” will be not printed.



6.1.2 Type B Encoding

Adding a prefix (tilde(~), numeric characters or start sentinel) at the beginning of a text enables the string to be recognized as encoding data.

Prefix	Code	Text after prefix	Last character
~1	6 unit	Text is processed as the data for ISO track1 MG encoding	End Sentinel
Start Sentinel	7 unit		
~2	4 unit	Text is processed as the data for ISO track2 MG encoding	End Sentinel
Start Sentinel			
~3	4 unit	Text is processed as the data for ISO track3 MG encoding	End Sentinel
Start	6 unit		
Sentinel	7 unit		

Note:

- Encoding setting of the printer driver property sheet must be enabled.
- Inline encoding data must be set on the first printed page.
- The prefix and text must be successive, and their font and size must be same.
- The start sentinel determines the unit code. The end sentinel is needed at the last of character string. Effective code for MG encoding is shown at "Appendix: ASCII Code Table and Magnetic Data".

6.1.3 Type C Encoding

Adding a prefix (tilde(~), numeric characters or “=”) at the beginning of a text enables the string to be recognized as encoding data.

Prefix	Max Length	Code	Text after prefix
~1=	76	6 unit	Text is processed as the data for ISO track1 MG encoding
~2=	37	4 unit	Text is processed as the data for ISO track2 MG encoding
~3=	104	4 unit	Text is processed as the data for ISO track3 MG encoding

*Column “Max Length” shows the maximum number of encoding characters.

Note:

- Encoding setting of the printer driver property sheet must be enabled.
- Inline encoding data must be set on the first printed page.
- The prefix and text must be successive, and their font and size must be same.
- Effective code for MG encoding is shown at “Appendix: ASCII Code Table and Magnetic Data”.

6.2 Encoding by using ExtEscape()

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

(1) Parameter to ExtEscape() function

```
int ExtEscape (  
    HDC      hdc,           // Handle to the device context.  
    Int       nEscape,       // Escape ID.  
    int       cbInput,       // Size of encoding data.  
    LPCSTR    lpzInData,     // Encoding data.  
    int       cbOutput,      // Unused.  
    LPSTR     lpzOutData    // Unused.  
);
```

List of Escape ID

No	Escape ID	Explanation
1	9010	Non-contact IC encoding.
2	9011	Contact IC encoding.
3	9020	JIS Magnetic encoding(7Unit, Max 69 characters)
4	9021	ISO Track1 Magnetic encoding (6Unit, Max 76 characters)
5	9022	ISO Track2 Magnetic encoding (4Unit, Max 37 characters)
6	9023	ISO Track3 Magnetic encoding (4Unit, Max 104 characters)
7	9024	ISO Track1 Magnetic encoding (7Unit, Max 69 characters)
8	9025	ISO Track3 Magnetic encoding (7Unit, Max 69 characters)
9	9026	ISO Track1 Magnetic encoding (6Unit, Max 79 characters)
10	9027	ISO Track3 Magnetic encoding (6Unit, Max 79 characters)

(2) Return Code from ExtEscape() function

It'll return greater than zero if the function is successful. It means not the result of encoding but the result of sending encoding data.

Note:

- ExtEscape() must be used between StartPage() and EndPage(). And if both sides are printed, ExtEscape() must be done at the 1st printing side.
- Encode setting of the printer driver property sheet must be enabled.

6.3 How to make IC Encoding program

The printer driver does not offer the actual IC encoding function. When IC Encoding data is passed to the printer driver, it calls IC Encode DLL after making the printer ready for IC Encoding. If you would like to do IC encoding, you must make IC Encode DLL and locate it in the system32 folder.

(1) File name of IC Encode DLL

PDR43IC0.DLL : For Non-contact IC encoding in case of USB interface.

PDR43IC1.DLL : For Contact IC encoding in case of USB interface.

PDR44IC0.DLL : For Non-contact IC encoding in case of Network interface.

PDR44IC1.DLL : For Contact IC encoding in case of Network interface.

(2) Function Prototype of IC Encode DLL

```
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 bit0 to bit7: ID From bit8 to bit15: Slot number	Connection information to the printer.
lpiErrorCode	This is not used.	
lpPrinterName	Printer Name in ASCII. It can be set with the printer operation or CXCMD_ModeSelect().	
lpzInData	Encoding data passed by Inline Encoding or ExtEscape().	
cbInput	Size of encoding data in byte.	

(3) Return Code from IC Encode DLL

It must return zero when the function ends successfully, and must return a negative value when an error happens. Printer Driver will discharge the card when a negative value is returned from DLL after the confirmation is done with the error dialog.

Note:

The processing of the printer driver to the return code from IC Encode DLL is changed as follows. This is applied to the printer driver version 3.0.0.9 and the later.

0: Success. The printer driver continues printing.

0x1001: Fail. The printer driver does not display an error dialog. It discharges the card and retries on a new card.

0x1002: Fail. The printer driver does not display an error dialog. It discharges the card and cancels the current Print Job.

Negative, and other positive value than above: The printer driver displays an error dialog, and does further processing according to the operator's choice.

7. How to change the driver setting

The setting of the printer driver can be referred and changed by using ExtEscape() function.

7.1 How to use ExtEscape()

```
int ExtEscape (  
    HDC      hdc,           // Handle to the device context.  
    Int      nEscape,       // Escape ID.  
    int      cbParameter,   // Size of the parameter data.  
    LPCSTR   lpzParameter,  // Pointer to the parameter data.  
    int      cbResult,      // Size of the result area.  
    LPSTR    lpzResult     // Pointer to the result area.  
);
```

- nEscape : Set 9100 for this purpose.
- cbParameter : Set the length of Parameter in byte.
- lpzParameter : Pointer to the Parameter memory.
- cbResult : Set the length of Result memory in byte.
- lpzResult : Pointer to the Result memory.

Note:

- ExtEscape() must be used after StartDoc() and before StartPage().

7.2 Change the setting

1) Format of the parameter

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

*1: Refer to "7.5 About the parameter".

*2: Data length in byte.

2) Format of the result

(1) In case of success

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

(2) In case of error

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

*1: Refer to "7.6 About the error code".

7.3 Get the current setting

1) Format of the parameter

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

*1: Refer to "7.5 About the parameter".

2) Format of the result

(1) In case of success

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

*1: Refer to "7.5 About the parameter".

*2: Data length in byte.

(2) In case of error

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

*1: Refer to “7.6 About the error code”.

7.4 Programming sample

1) Change the setting of “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()
;
}
```

2) Refer to the setting of “Number of copies”.

```
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()
    ;
}
```

7.5 About the parameter

Note: All value 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	Not turn the card.
				0x00000001	Turn the card before discharging(Not available)
				0x00000002	Turn the card after loading.
				0x00000003	Turn the card after loading and turn the card before discharging. (Not available)
Print Print on both sides Print the back side first	R/W	0x0201	0x0004	0x00000000	Not print
				0x00000010	Single side printing.
				0x00000020	Both side printing. Print front side fast.
				0x00000021	Both side printing. Print back side fast.
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.

Item Name	ATR	ID	Size	Data	Explanation
Using of 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.
Using of Resin K ink [Back side]	R/W	0x0205	0x0004	0x00000010	Print black text of back side with K ink.
				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	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	Not rotate the image of back side.
				0x00000001	Make the back side image upside down.
Magnetic encoding	R/W	0x0301	0x0004	0x00000000	Disable MG encoding.
				0x00000010	Enable MG encoding.
				0x00000011	Turn the card after MG encoding.
Non-contact/Contact IC encoding	R/W	0x0302	0x0004	0x00000000	Disable 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.

Item Name	ATR	ID	Size	Data	Explanation
Printer Interface Information	R	0x0901	0x0005		If the interface is unknown; 1st byte: 0x00 From 2nd byte to 5th byte: Unpredictable Note: In the case of followings, Unknown happens. 1) Printer driver is not connected to the port directly. 2) Printer Pool is enabled, and multiple ports are specified. 3) The setting of the port is invalid.
					If the interface is USB; 1st byte: 0x01 2nd byte: Slot number 3rd byte: ID 4th byte: Unpredictable
					If the interface is network; 1st byte: 0x02 From 2nd byte to 5th byte: IP address Ex) If IP address is 192.168.0.1; 2nd byte: 192 3rd byte: 168 4th byte: 0 5th byte: 1 Note: In the case that the setting of the Port Monitor is either "No Selection" or "No Device", IP address is filled with 0.

7.6 About the error code

Note: All value is set with Big Endian.

No	Error code A	Error code B	Explanation
1	0x0901	0x0000	Invalid parameter was passed.
2	0x0902	*	Length of data area is not enough. Required length for the data is returned at Error code B.

<Appendix 1 Error Code Table>

The configuration of error is shown in the table below. The error code in the table is transformed to positive by the calculation “ (-1) * (Error code)”. Detail of printer error code is shown in “Appendix Card Printer Error Code table”.

Error Code(HEXA)				Explanation
Bit31-24	Bit23-16	Bit15-8	Bit7-0	
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 of CX Port Manager. XXX means the contents of error.
0x02	01	XXX		Error of CX Port Manager: XXX is an Invalid SRB status value from Manager.
0x02	02	XXX		Error of CX Port Manager: XXX is an Invalid HA status value from Manager.
0x02	03	XXX		Error of CX Port Manager: XXX is an Invalid Target status value from Manager.
0x09	XXX			Other Error. XXX means the contents of error.

A) Driver Error (0x02xxxxxx)

Bit31-24 (0x02)	Bit23-16	Bit15-0	Explanation
0x02	00	1	Not enough memory.
0x02	00	2	CX Port Manager is busy, and command cannot be accepted.
0x02	00	3	Command was aborted.
0x02	00	4	Time out.
0x02	00	5	No SCSI card.
0x02	00	6	CX Port Manager can not work. This means that the DLL of CX Port Manager could not be loaded.
0x02	01	XXXX	XXX is an Invalid SRB status value from CX Port Manager.
0x02	02	XXXX	XXX is an Invalid HA status value from CX Port Manager.
0x02	03	XXXX	XXX is an Invalid Target status value from CX Port Manager.

B) Others(0x09xxxxxx)

Bit31-24 (0x09)	Bit23-0	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 2 Magnetic Data Code>

4 unit 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	?

Note: Special code

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

Default encoding must not use End Code as MG Encoding data.

Type B encoding must not use Start Code and End Code as MG Encoding data.

Type C encoding must not use Separate Code as MG Encoding 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	_	

Note: Special code

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

Default encoding must not use End Code as MG Encoding data.

Type B encoding must not use Start Code and End Code as MG Encoding data.

Type C encoding must not use Code for hardware control (=) as MG Encoding data.

7 unit code													
					b7	0	0	0	0	1	1	1	1
					b6	0	0	1	1	0	0	1	1
					b5	0	1	0	1	0	1	0	1
b4	b3	b2	b1			0	1	2	3	4	5	6	7
0	0	0	0	0				0	@	P	`	p	
0	0	0	1	1				!	1	A	Q	a	q
0	0	1	0	2				“	2	B	R	b	r
0	0	1	1	3				#	3	C	S	c	s
0	1	0	0	4				\$	4	D	T	d	t
0	1	0	1	5				%	5	E	U	e	u
0	1	1	0	6				&	6	F	V	f	v
0	1	1	1	7				‘	7	G	W	g	w
1	0	0	0	8				(	8	H	X	h	x
1	0	0	1	9				)	9	I	Y	l	y
1	0	1	0	A				*	:	J	Z	j	z
1	0	1	1	B				+	;	K	[	k	{
1	1	0	0	C				,	<	L	\	l	
1	1	0	1	D				-	=	M	]	m	}
1	1	1	0	E				.	>	N	^	n	~
1	1	1	1	F				/	?	O	_	o	DEL

Note: Special code

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

Start Code and End Code must not be used as MG Encoding data.

Type C encoding must not use Code for hardware control (=) as MG Encoding data.

<Appendix 3 Card Printer Error Code Table>

No.	Error Code			Name	Contents
	SK	ASC	ASQ		
1	02	D0	00	No card	There is no card, or the card hopper is detached.
2	02	D1	00	Door Open	Printer door is opened, or cleaning unit is detached.
3	02	D3	00	Busy of Transporting	Busy because of transporting card or encoding. Note: This error is not returned from functions. Control Function returns positive value as BUSY.
4	02	D4	00	Busy of Printing	Busy because of printing. Note: This error is not returned from functions. Control Function returns positive value as BUSY.
5	02	D5	00	Busy of Transporting and Printing	Busy because of both “Busy of Transporting” and “Busy of Transporting and Printing”, or on the way of retransfer. Note: This error is not returned from functions. Control Function returns positive value as BUSY.
6	02	D7	00	It fails to change to Transport mode	The retransfer film is loaded.
7	02	D9	00	It fails to start cleaning	The following causes are possible. • The retransfer film is installed. • The card hopper is installed. • The temperature of the retransfer heating roller is too hot.
8	02	DA	00	Preheating	Printer is on the way of preheating.
9	02	DB	00	Initializing	Printer is on the way of initializing.
10	02	DC	00	Testing or Cleaning	Printer is on the way of Off-line Test or cleaning.
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. Note: To exit this, initializing printer, which is pressing ENTER button after RESET button or sending REZERO command, is required.
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 the card supply sensor within a predefined time.
16	03	91	00	Jam(TurnOver)	The card does not arrive the sensor inside the turnover unit within a predefined time.
17	03	93	00	Jam(Transfer)	The card does not arrive the card outlet sensor within a predefined time after leaving the card edge sensor.
18	03	94	00	Jam(Discharge)	The card stops at the card outlet sensor.
19	03	95	00	Jam(Retransfer)	Card JAM error happens during retransfer.
20	03	A1	00	Media Search	Mark on the retransfer film could not be detected.
21	03	AD	00	MG Write Error	Writing error to the magnetic stripe happens.
22	03	AE	00	MG Read Error	Reading error from the magnetic stripe happens.
23	03	B0	00	Ink Error	Invalid ink is attached.
24	03	B1	00	Ink Search	Mark on the ink ribbon could not be detected, or ink is broken.

No.	Error Code			Name	Content
	SK	ASC	ASQ		
25	04	44	00	Hardware (Printing)	Time out was detected by the printer firmware.
26	04	AB	00	MG Mechanical	Mechanical error happens in the MG unit.
27	04	AC	00	MG Hardware	Hardware error happens in the MG unit.
28	04	BF	00	EXT2. Communicate	Communication error happens during updating laminator firmware.
29	04	C1	00	Cam Error	A heating roller operation error has occurred.
30	04	C2	00	HR Overheat	The temperature of the bend remedy heat roller or retransfer heat roller.
31	04	C3	00	Detect Power Interrupt	24V electric power was interrupted.
32	04	D8	00	Hardware (Initializing)	Circuit trouble was detected at the initialization, or writing error to the laminator memory fails during updating laminator firmware.
33	04	F0	00	TR Overheat	The temperature of retransfer heating roller is too hot.
34	04	F1	00	TR Heater	Retransfer heating roller is out of order.
35	04	F2	00	TR Thermister	Thermistor of retransfer heating roller is out of order.
36	04	F3	00	RR Overheat	The temperature of bend remedy heating roller is too hot.
37	04	F4	00	RR Heater	Bend remedy heating roller is out of order.
38	04	F5	00	RR Thermister	Thermistor of bend remedy heating roller is out of order.
39	04	F6	00	Overcool	The temperature in the printer is too cool.
40	04	F8	00	Head Overheat	The temperature of the thermal head is too hot.

No.	Error Code			Name	Contents
	SK	ASC	ASQ		
41	05	1A	00	Parameter List Length Error	The content of command is invalid. Parameter list length value in CDB or Page Data is invalid.
42	05	20	00	Invalid Command Operation Code	The content of command is invalid. Operation Code in CDB is invalid.
43	05	21	00	Security Key is already set	New security key could not be registered as the key is already set.
44	05	22	00	Invalid Security Key	Security key is invalid.
45	05	23	00	Security key is not set	Security key is not registered.
46	05	24	00	Illegal Field in CDB	The content of command is invalid. The data in CDB is invalid.
47	05	26	00	Invalid Field in Parameter List	The content of command is invalid. The data in Page Data is invalid.
48	05	27	00	Invalid Color Code in CDB	Invalid ink is specified.
49	05	2A	00	Command Sequence Error	The command is issued in bad order. Ex. Load Card is done when the card is in the printer.
50	05	2B	00	MG Data Error	MG data from the host computer is invalid.
51	05	2C	00	IC Encoder not installed	There is no specified IC Encoder.
52	05	2D	00	MG Encoder not installed	There is no specified MG Encoder.
53	05	2E	00	Option Not Installed	The command could not be executed as the turn over unit is not attached.
54	05	FB	00	Invalid Download Data	Download data from the host computer is invalid.
55	06	28	00	Medium Changed	Printer was initialized by pressing RESET button.
56	06	29	00	Power On or Bus Device Reset Occurred	Printer was initialized by turning on the printer power.
57	42	A2	00	Media Run Out	End of retransfer film is detected.
58	42	B2	00	Ink Run Out	End of ink ribbon is detected.

<Appendix 4 The location of the MAC address printed with UV>

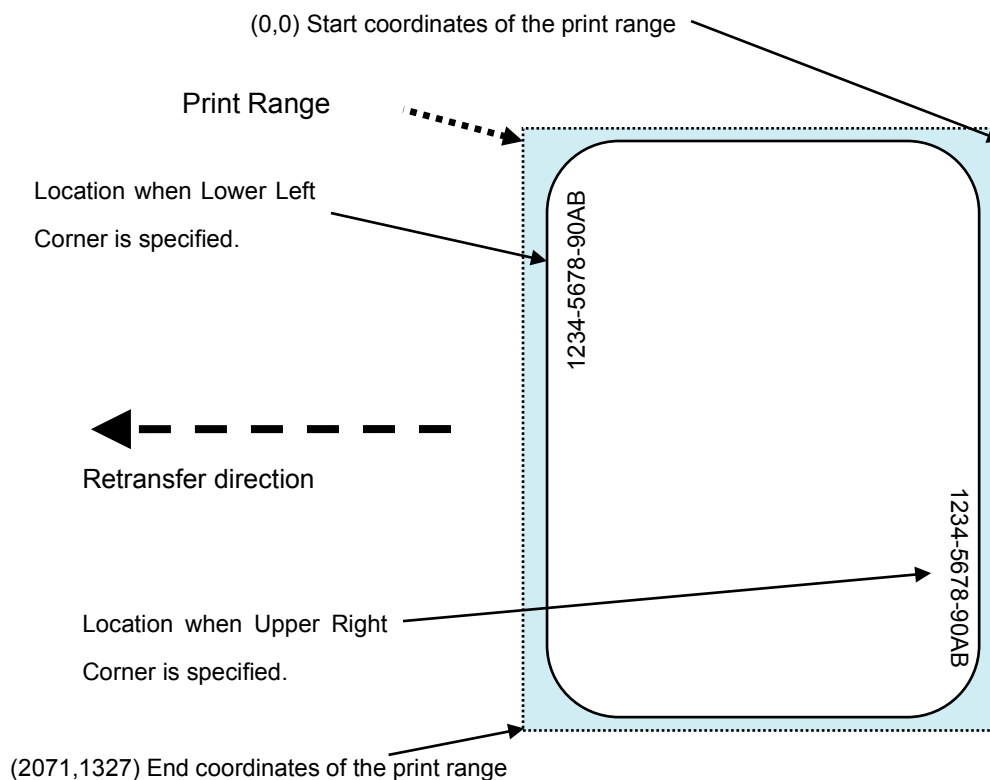
Printing UV on YMC directly makes it difficult to retransfer the YMC ink to the card. In case of the UV image and the YMC image overlapping, you must use 2 patches of the retransfer film so as not to happen this problem. After printing the YMC image on the retransfer film and retransferring it to the card, the UV image should be printed on the new patch of the retransfer film and be retransferred to the card.

Printing UV on K directly, the film and the ink may stick when the UV ink is printed on the YMC image printed on the film. So as not to happen this problem, please use the next patch of the film for UV, or replace the UV image with zero the place where the UV image and the K image overlap. And 4 pixels are required between K and UV image.

The card printer ~~prints always~~ can print its MAC address at the corner of the card with UV ~~every~~ when the UV ink is printed. So it is important to care about the place where the MAC address is printed when you don't use the printer driver.

1) The location where the MAC address is printed

The location can be specified by the command of the printer, one is at the upper right corner of the card and another is at the lower left corner. In case of the location at the lower corner, the font is printed upside down. So when you rotate the card by 180 degree, the same characters are printed at the same location.



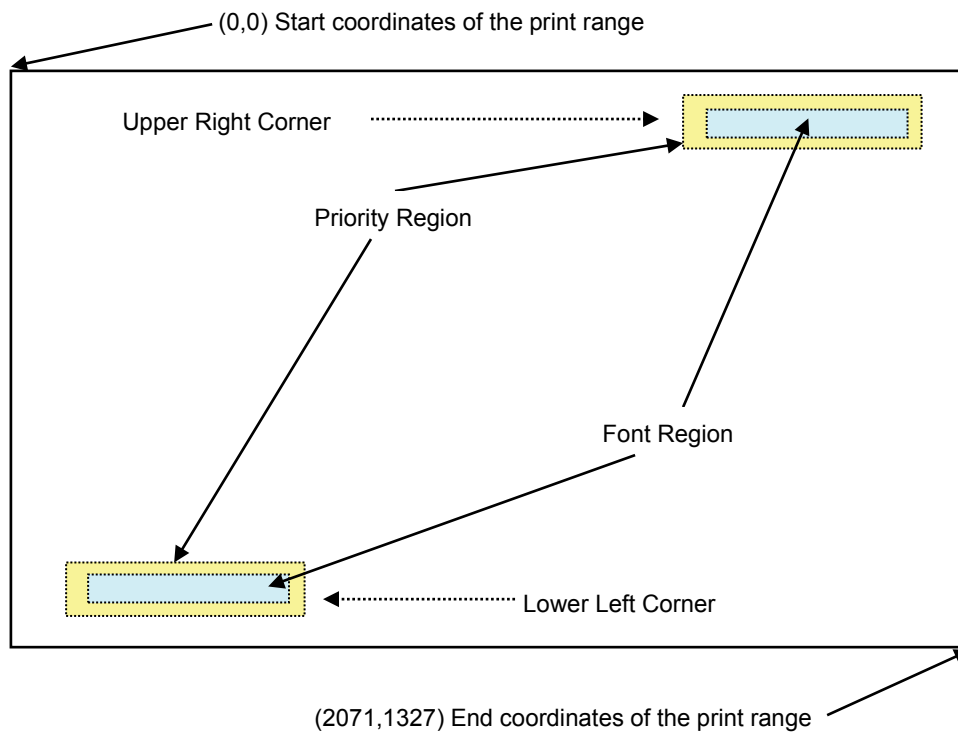
2) More about the location

(1) Structure of the font

Height	36 pixels.(Approx.1.5mm).
Width	32 pixels including 4 white pixels on both sides (Approx. 1.4mm)

(2) Priority Region on the print range

We define two regions for MAC address printing. One is Font Region and another is Priority Region. MAC address is printed at Font Region. So the UV image in Font Region is replaced with MAC Address. Priority Region is a recommended region where YMCK image should not be printed. If they are overlapped, the UV image had better be printed on the film after the YMCK image is retransferred.



		Upper Right Corner	Lower Left Corner
Priority Region	Width	460 pixels	
	Height	68 pixels	
	X	1528	84
	Y	36	1222

