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Re-Writable Thermal Printer with Mifare Contactless Card Reader/Writer

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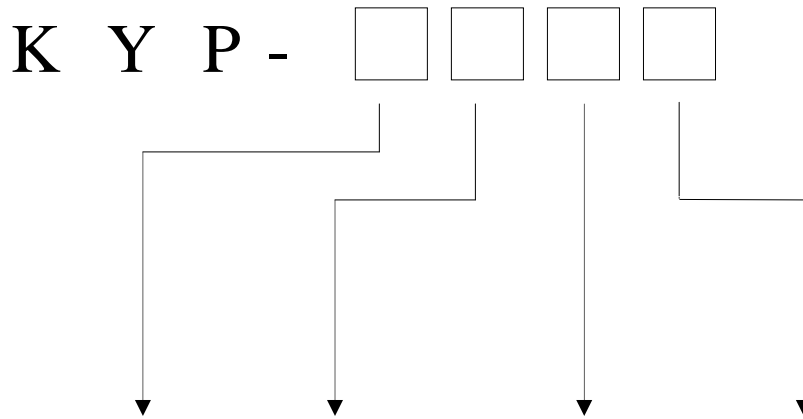
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REVISION HISTORY

No	DATE	DESCRIPTION	REV	PAGE
1	2008.09.2	First Edition	A	41
2	2008.12.22	Add the Font function.	B	43
3	2009.02.12	Add the Clean command	C	50

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MODEL NAME INFORMATION



Interface	Function	RF	Option1	Option2
RS232C	1:Re-Writable Thermal Printer Module	0 : Pinter only 1 : RF card read /write (Mifare)	0: Without bezel 1: Short bezel	0 : Capture - Rear Drop 1 : Capture- Solenoid and Rear Drop
	6:Re-Writable Thermal Printer Terminal	0 : - 1 : RF card read /write (Mifare)	0 : with Case	0 : -

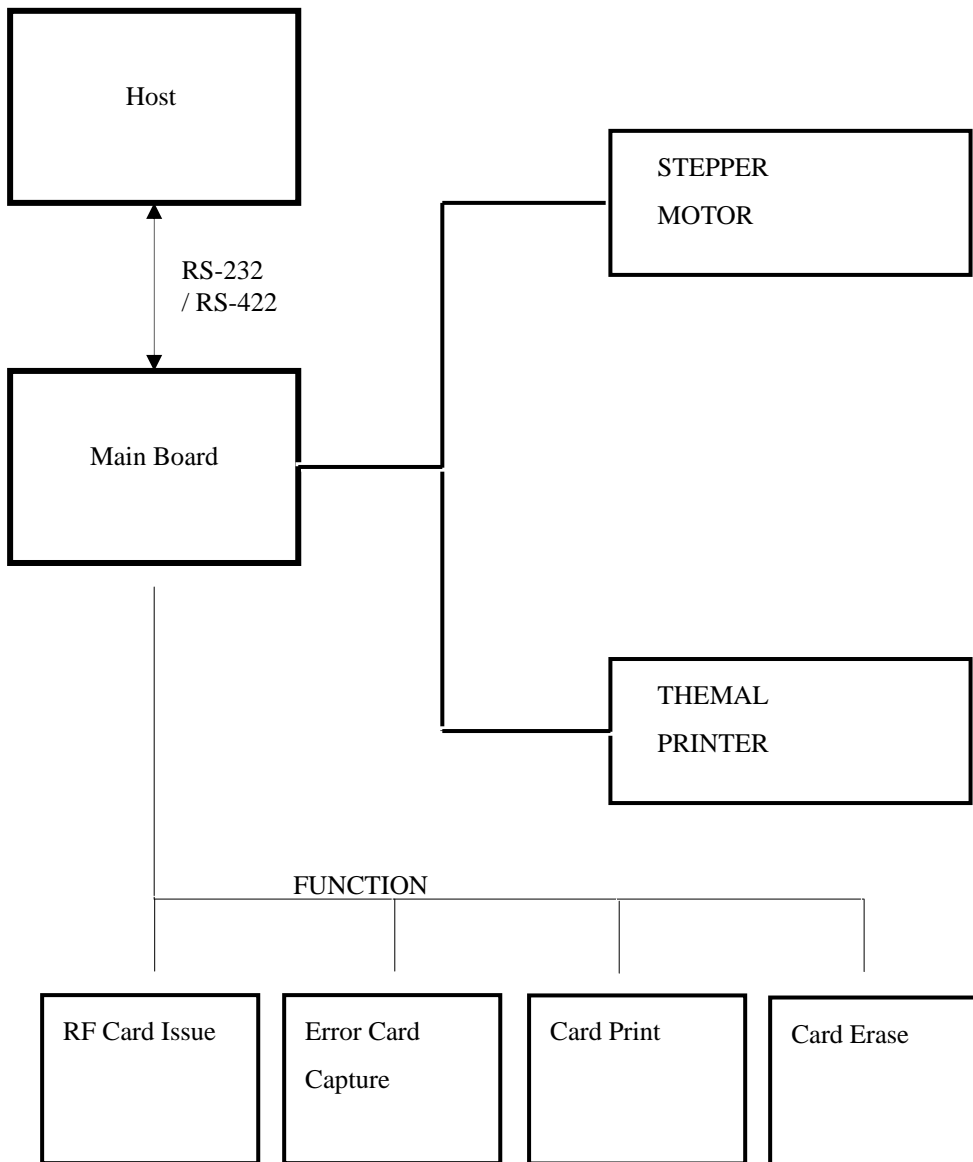
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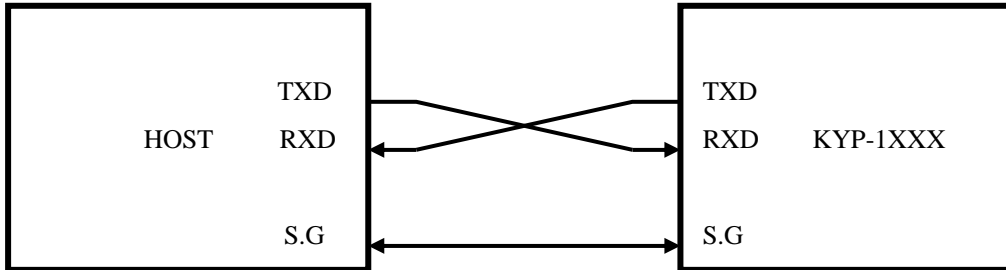
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SYSTEM BLOCK DIAGRAM



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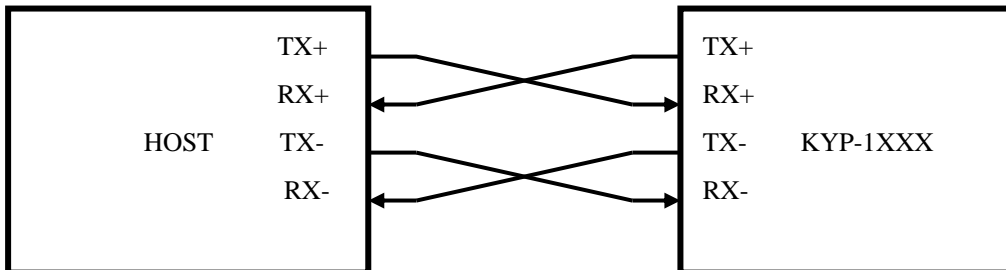
◆ *RS – 232 Connection*



CASE 1) Part Number : RED-9S-LNA(HIROSE)

Pin No	INDEX	Remark
2	RXD	Receive
3	TXD	Transmit
5	S.G	Signal Ground

◆ *RS422 Connection*



CASE 1) Part Number : RED-9S-LNA(HIROSE)

Pin No	INDEX	Remark
1	TX+	
4	RX+	
6	TX-	
8	RX-	

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SPECIFICATIONS

◆ *basic functions*

	Spec	Remark
Dimension		
Card Issue Speed		
Card Feeding Speed	300mm/Sec	
Character Print/Eraser Speed	40~50mm/s	
Card Material	PVC,PET	
Card Thickness	0.2~1.0mm	
Re/Write Type	Thermal Rewritable Film	
The Number of Rewrite	500times	
RFID Type	Mifare/13.56Mhz	
Life of Printer Head	Approximately 30 Km	

◆ *Power Consumption*

Steady state	:	Less than 70mA
Motor Starting or Reversing	:	Less than 1.8A
Character Print	:	Less than 1.2A
Card Erase	:	Less than 2A

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◆ *Environment Requirements*

Operating Locus : In door use only

Ambient Temperature

Storage : -10 °C to 60 °C(No functional error to be found in 12 hours after returning to normal environment)

Operating : 0 °C to 45° C (In 0° C to +5° C range)

Ambient Relative Humidity

Storage : 5% to 90% RH(No functional error to be found in 12 hours after returning to normal environment)

Operating : 20% to 85% RH(No Condensation)

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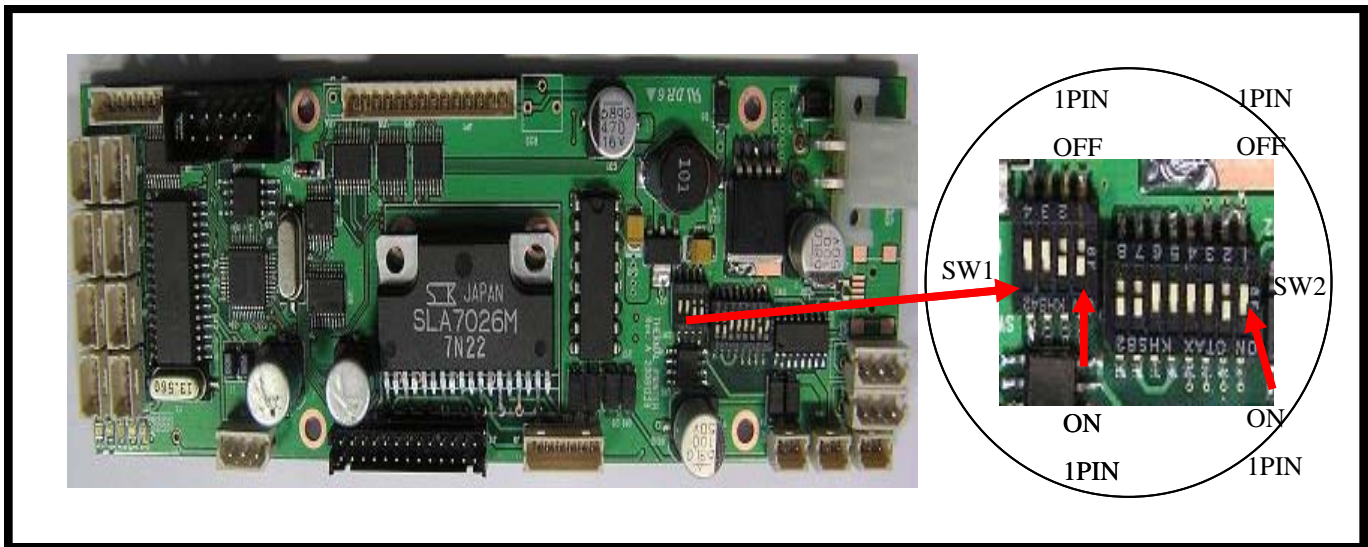
◆ *Controller Environment*

Communication

- : RS422 OR RS232C Interface
- : Baud Rate – 9600 BPS
 - 19200 BPS
 - 38400BPS(Default)
 - 57600BPS
- : 8Data bit, 1 Start bit, None Parity bit, 1 Stop Bit

DIP-Switch Setting

: To provide basic operation and function setting of terminal, DIP(Dual In type Package) switch in the main board has selection of main program and function of communication speed setting.



-Operation Part

SW2 SET :Baud Rate Setting

Pin No. 1	Pin No. 2	Baud Rate	Note
ON	OFF	19200 BPS	
OFF	ON	38400 BPS	Default
ON	ON	57600 BPS	
OFF	OFF	115200 BPS	

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SW2 SET : Model Select

Pin No. 3	Pin No. 4	Model Select	Note
OFF	OFF	KYP-1000	
ON	OFF	KYP-6000	

SW2 SET : RS232 LEVEL

Pin No. 5	Pin No. 6	Pin No. 7	Pin No. 8	LEVEL	Note
ON	ON	OFF	OFF	5V	
OFF	OFF	ON	ON	12V	Default

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RF CARD PROCESS

The RF module supports most of RF cards conforming with the ISO14443-3 TypeA(MIFARE Card) with 8 Kbits memory.

◆ *Processing time* : Once Block

Command	Parameter	Time (mSec)		Note
		Type	Max	
Card Read	1 Block	100		Without card moving
Card Write	1 Block	150		Without card moving, With Verify
Card Decrement	1 Block	120		Without card moving With Verify
Card Increment	1 Block	120		Without Card moving With Verify

◆ *Operating Frequency*

Operating Frequency : 13.56 MHz

Data Transfer Baud : Baud rate 106Kbaud

◆ *Operating range of the Antenna*

Guar. Operating range : All distances in the range of 0 ... 50 mm from the antenna board.

Typical operating range : 0 ... 65 mm

◆ *Power Consumption*

Supply Voltage	Operating Voltage	Operating Current	
		Type	Max
+ 5 V	+5V +10% -5%	165mA	255mA

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COMMUNICATION INTERFACE

◆ *Communication Method*

Asynchronous, Half duplex.

Baud Rate : 9600 – 57600Bps , Default : 38400Bps

Start Bit : 1Bit

Data Length : 8Bit

Parity : None

Stop Bit : 1Bit

◆ *Communication Protocol Format*

1 Command Frame Format.

SOH	Null	Length	STX	CMD	DATA	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	N byte	1 byte	1 byte

2 Positive Response Frame Format

SOH	Null	Length	STX	CMD	GOOD	0x01	DATA	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	2 byte	1 byte	1 byte	1 byte	1 byte

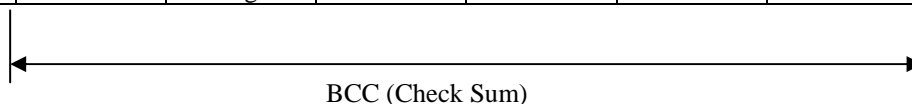
(N byte: variable length)

3 Negative Response Frame Format

SOH	Null	Length	STX	CMD	E-Code	0x00	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	2 byte	1 byte	1 byte	1 byte

4 BCC (Check Sum)

SOH	Null	Length	STX	CMD	DATA	ETX	BCC
-----	------	--------	-----	-----	------	-----	-----



Command Frame BCC = Null ^ Length ^ STX ^ CMD ^ DATA ^ ETX.

Positive Response BCC = Null ^ Length ^ STX ^ CMD ^ GOOD ^ 0x01 ^ DATA ^ ETX.

Negative Response BCC = Null ^ Length ^ STX ^ CMD ^ E-Code ^ ETX.

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5. Explanatory note of technical words

Name	Detail
Null	Reserved. Always 0x00.
Length	Data Length from the CMD to DATA.
CMD	Instruction Code (3 Bytes)
GOOD	Normal Execution : 0x0000 (2 Bytes)
E-Code	Command Failed: Refer to "Error Code" (2 Bytes)
BCC	Check Sum.

<Length>, <E-Code>

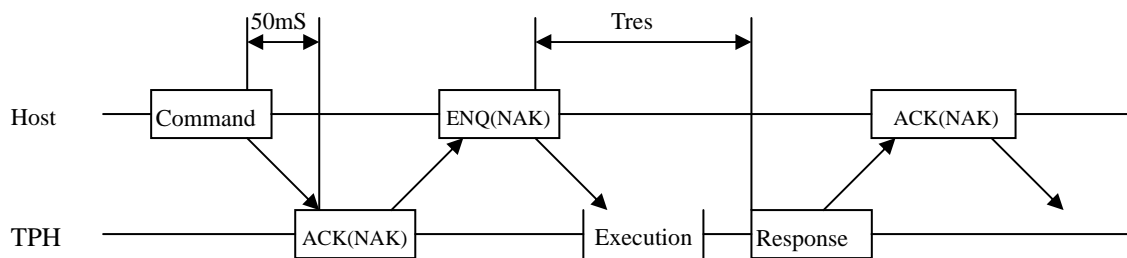
High Byte	Low Byte
-----------	----------

6. Control Characters

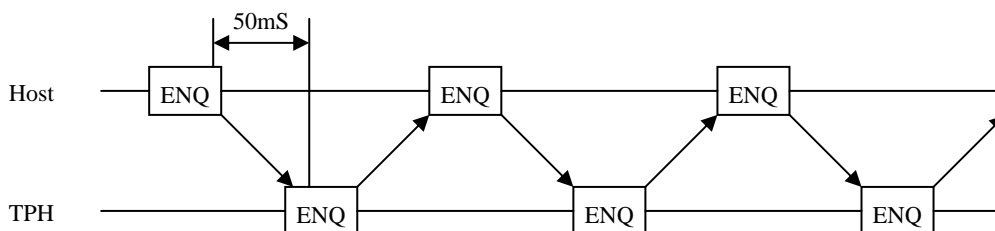
Name	Hex Value	Detail
SOH	0x01	Start of Header
STX	0x02	Start of Text
ETX	0x03	End of Text
ENQ	0x05	Enquiry
ACK	0x06	Positive Acknowledge
NAK	0x15	Negative Acknowledge
CAN	0x18	Cancel

7 COMMUNICATION SEQUENCE / TIMING

7.1 Command



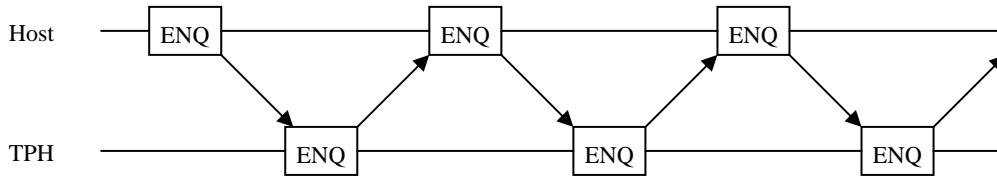
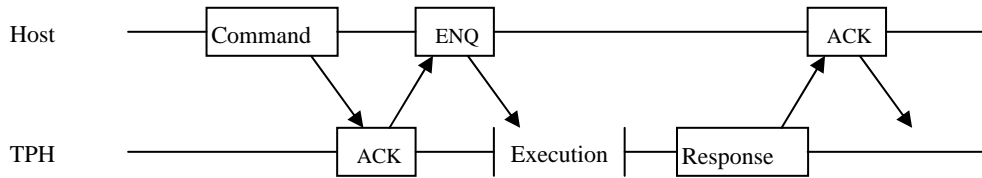
7.2 Inquiry



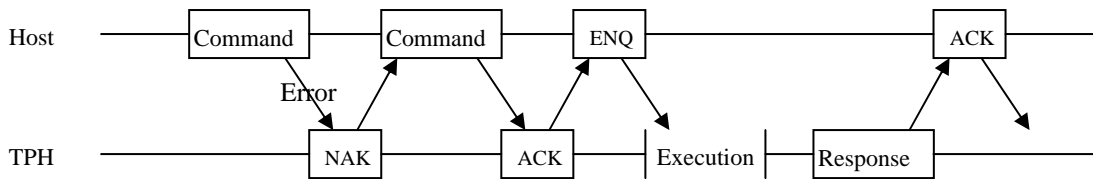
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7.3 Sequence

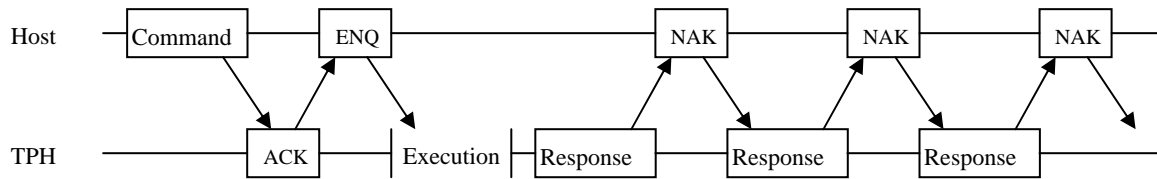
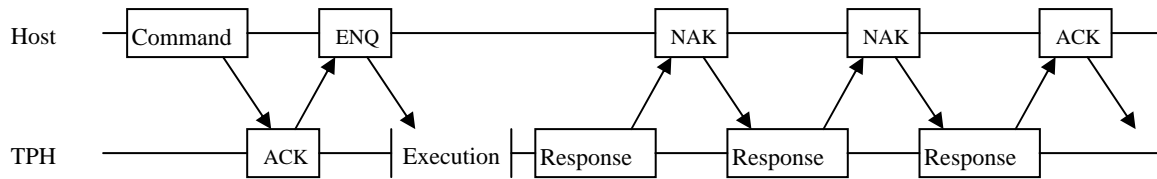
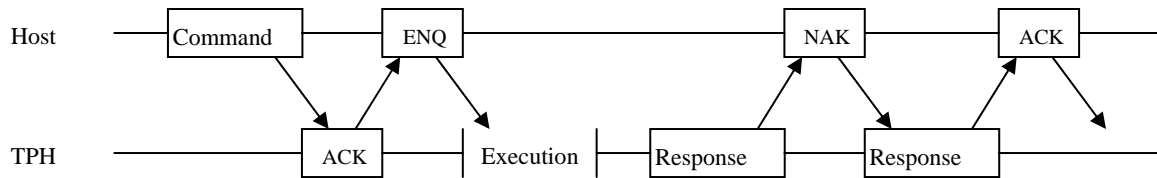
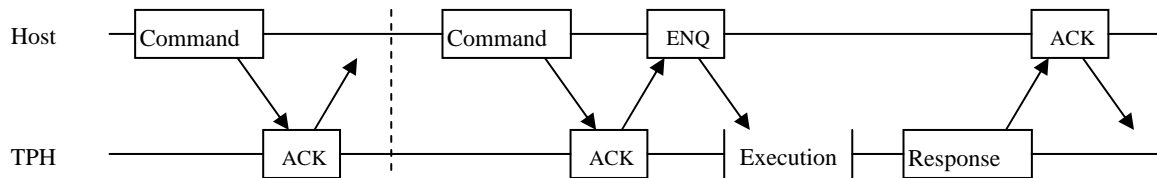
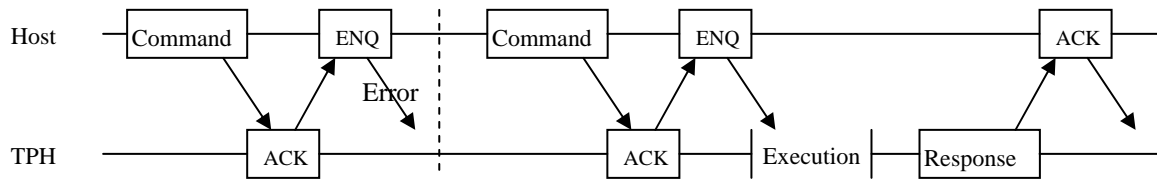
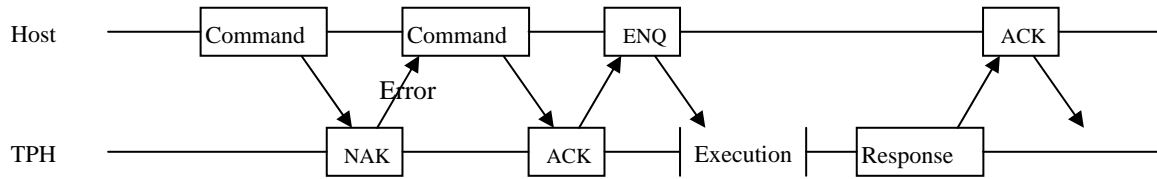
7.3.1 General



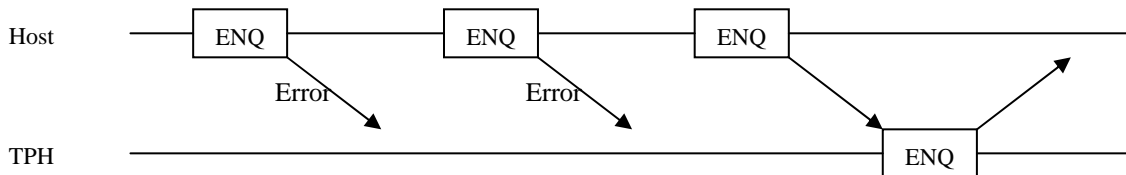
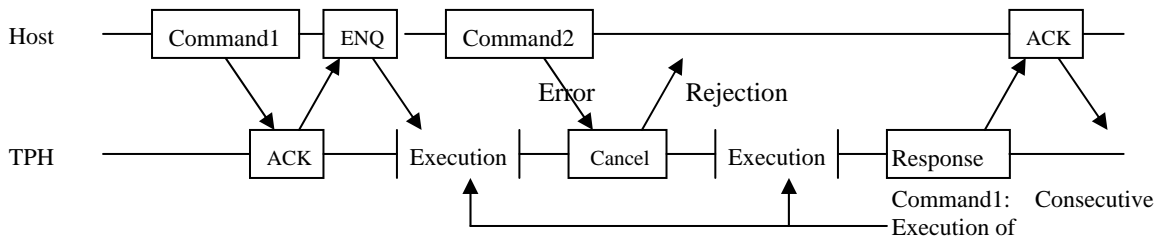
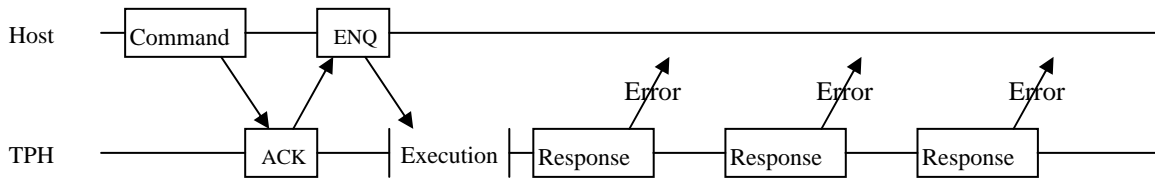
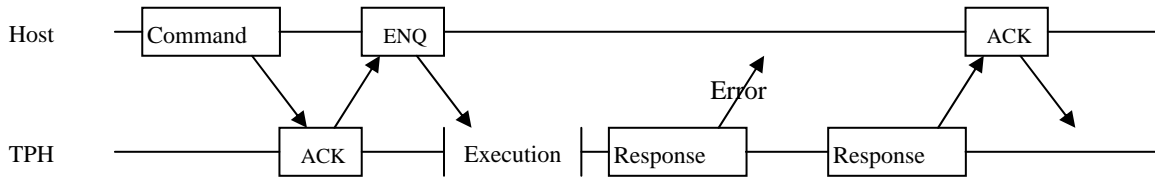
7.3.2 Event



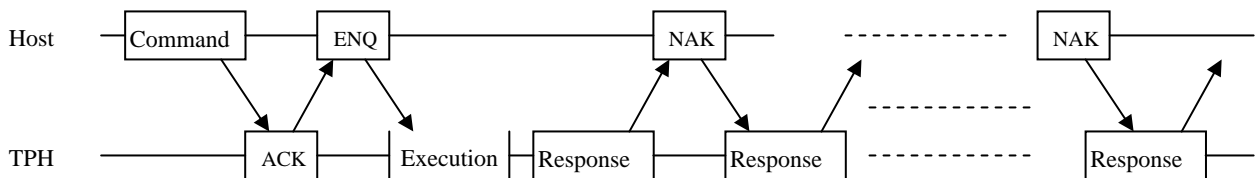
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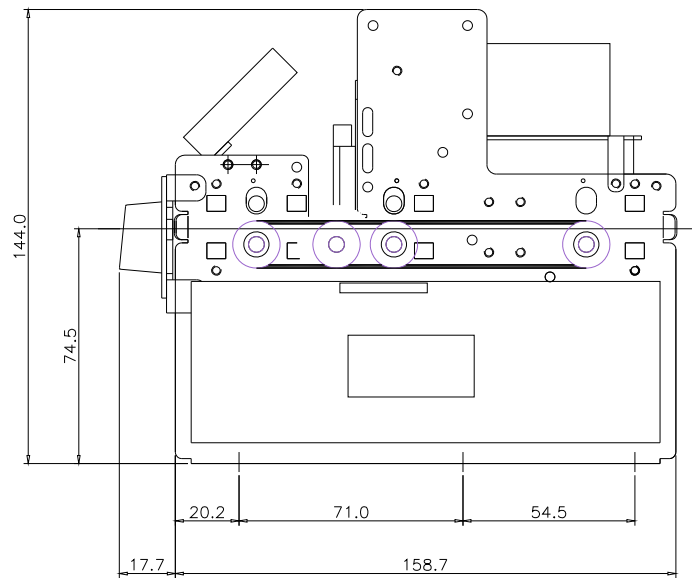
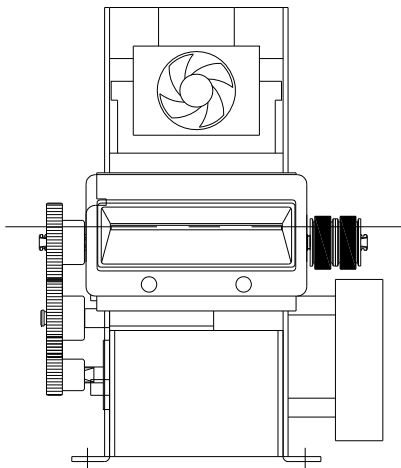
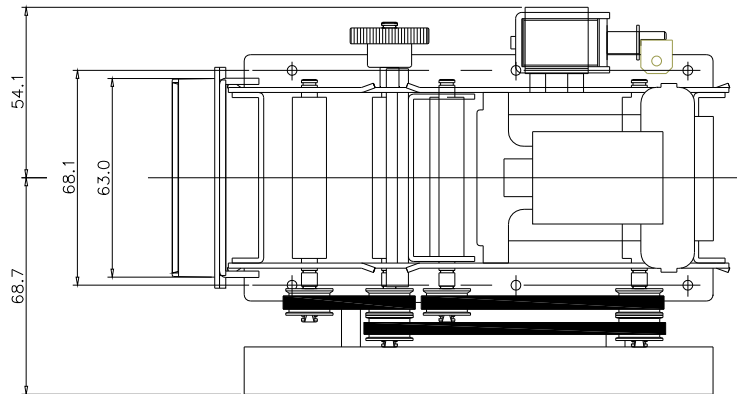
- When received the NAK packet consecutively.



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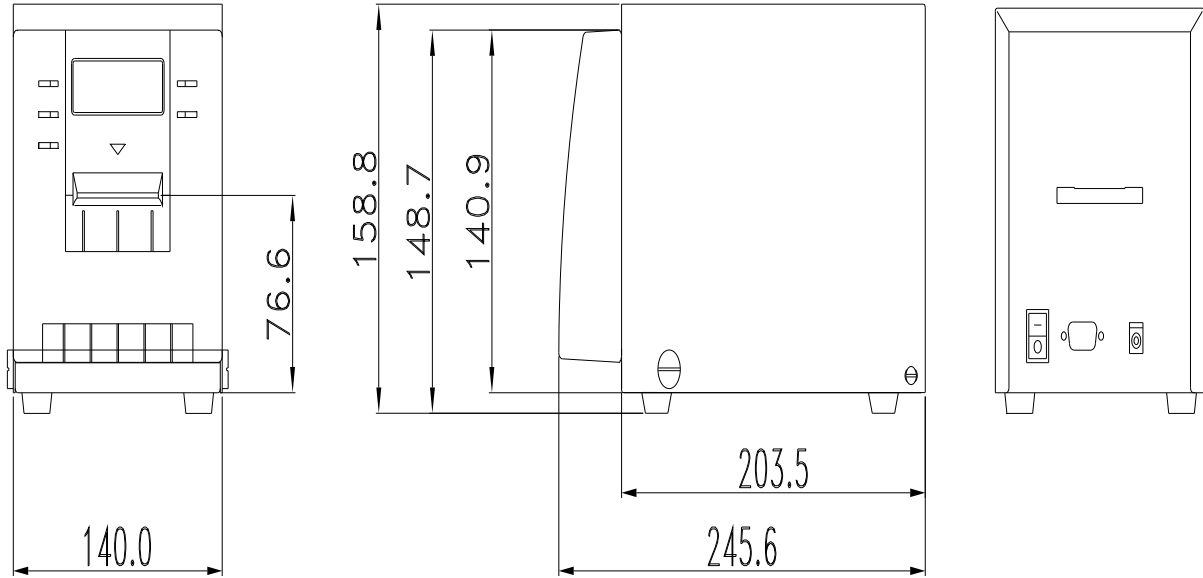
TECHNICAL DRAWING

<KYP-1000>



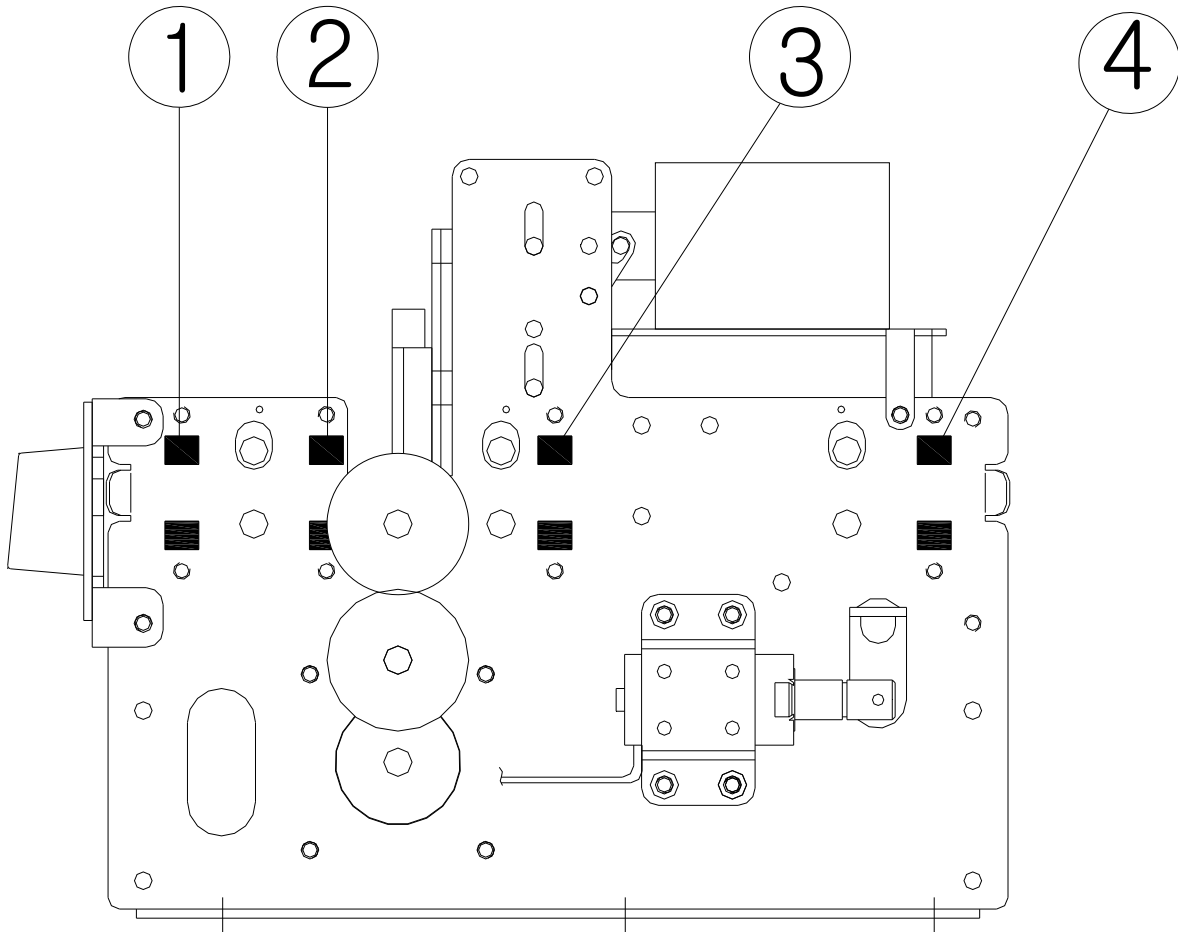
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<KYP-6000>



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< Feeder Part Sensor Position >



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COMMAND DETAIL

◆ *Command List*

	Item	Cm0	Cm1	Cm2	Detail	Note
COMMON	STATUS	'C'	'1'	'1'	Get Model	
		'C'	'1'	'2'	Get Firmware Version	
		'C'	'1'	'6'	Get Card Position	
	SETTING_1	'C'	'2'	'4'	Set Retry Count	
	MOVE	'C'	'3'	'2'	Card Stand By	
		'C'	'3'	'4'	Card Capture (solenoid use and KYP-1000 only)	
		'C'	'3'	'6'	Card Front Eject(Drop Mode)	
		'C'	'3'	'3'	Card Front Eject(Hold Mode)	
'C'		'3'	'A'	Card Rear Drop		
PRINTER	CARD PRINT	'P'	'1'	'0'	Card Print.	
		'P'	'1'	'1'	All of the Card Print.(test mode).	
	CARD ERASE	'P'	'2'	'0'	All of the Card Erase.	
		'P'	'2'	'1'	Partial of the Card Erase.	
	SETTING	'P'	'3'	'0'	Select Erase Line	
		'P'	'3'	'1'	Select Card Position	
RF CARD	RF CARD READ / WRITE	'R'	'3'	'1'	RF Card Read in Block Range	
		'R'	'3'	'2'	RF Card Write in Block Range	
		'R'	'3'	'6'	RF Card Read in Sector Range	
		'R'	'3'	'7'	RF Card Write in Sector Range	
	BALANCE	'R'	'4'	'1'	Balance Increment	
		'R'	'4'	'2'	Balance Decrement	
	SECRET KEY CHANGE	'R'	'5'	'1'	Change 'Secret Key' to other Key	
		'R'	'5'	'2'	Change 'Secret Key' to all the same Key value	
		'R'	'5'	'3'	Select 'Secret Key Index'	
		'R'	'5'	'4'	Change 'RF Card Secret Key' to other Key	
		'R'	'5'	'5'	Key Set and Change 'Secret Key' to other Key	
		'R'	'5'	'6'	Key Set and Change 'Secret Key' to all the same Key value	
	RF DETECT	'R'	'6'	'1'	Check RF card in antenna area	

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1 STATUS / SETTING

1.1 “C11” : It is to check out Model number of KYP-1XXX.

☞ Command Format

SOH	Null	Length	STX	“C11”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C11”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C11”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

Model No
30Byte (ASCII)

1.2 “C12” : It is to check out Firmware Version of KYP-1XXX

☞ Command Format

SOH	Null	Length	STX	“C12”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C12”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C12”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

Firmware Version
30Byte (ASCII)

1.3 “C16” : It is to check out current card position of KYP-1XXX

☞ Command Format

SOH	Null	Length	STX	“C16”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C16”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C16”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

Card Position
1Byte (Hex)

<Card Position> Refer to page 17.

Number	Code	Sensor
1	0x01	SEN1
2	0x02	SEN2
3	0x04	SEN3
4	0x08	SEN4
5	0x10	SEN5
6	0x20	SEN6
7	0x40	SEN7
8	0x80	SEN8

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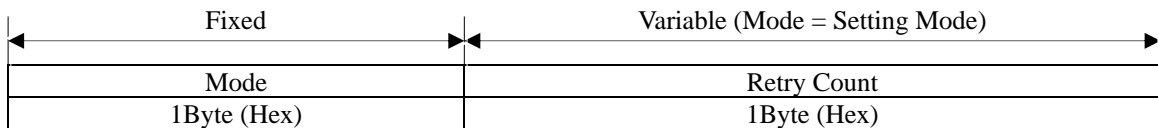
2 SETTING

2.1 “C24” : It is to set or to check ‘Retry Count’.

☞ Command Format

SOH	Null	Length	STX	“C24”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure



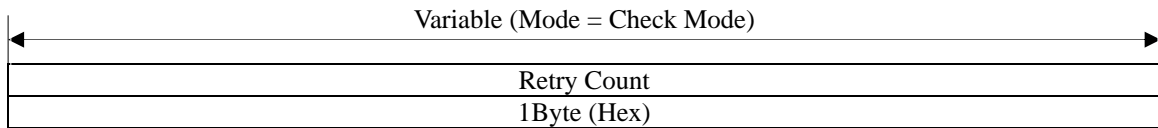
☞ Positive Response Format

SOH	Null	Length	STX	“C24”	GOOD	‘1’	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C24”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

☞ Response Data Structure



☞ Data Variable

<Mode>

Code	Mode	Detail
0x01	‘Setting Mode’	Set ‘Retry Count’
0x02	‘Check Mode’	Check ‘Retry Count’

<Retry Count>

Code	Setting	Detail	Note
0x00	NON	Do not retry	
0x01	Once	Execute the instruction again.	
0x02	Twice	Retry it twice	
0x03	Three times	Retry it three times	Default

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3 MOVE

3.1 “C32” : It is take card to Thermal Printer Module

☞ Command Format

SOH	Null	Length	STX	“C32”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Module
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“C32”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C32”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Data Variable

<Module>

Code	Setting	Detail
0x01	MSRW	Card transport to MSRW Module(don't use)
0x02	IC	Card transport to IC Module(don't use)
0x03	RF	Card transport to RF Module
0x04	FEEDER	Card transport to FEEDER Module(don't use)
0x05	PRINTER	Card transport to Printer Module.

- When the ‘C32’ Command(code:0x05,Setting:Printer) execute after the ‘P31’ command(Select the card position) execute

:Choose the line of the card using the ‘P31’ command(Select the card position) and then The card will move to the chosen position(Printer standby of ‘C32’ Command)

3.2 “C33” : It is to Feed out card to the front. (Hold)

☞ Command Format

SOH	Null	Length	STX	“C33”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C33”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C33”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

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3.3 “C34” : It takes card to Bin Box (Capture)

☞ Command Format

SOH	Null	Length	STX	“C34”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C34”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C34”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Details

This Command only can use the KYP-1000 series.

3.4 “C36” : It is to Feeder out of the unit.(Drop)

☞ Command Format

SOH	Null	Length	STX	“C36”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C36”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“C36”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

3.5 “C3A” : It is to Feed out of the unit to rear (Drop)

☞ Command Format

SOH	Null	Length	STX	“C3A”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“C3A”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

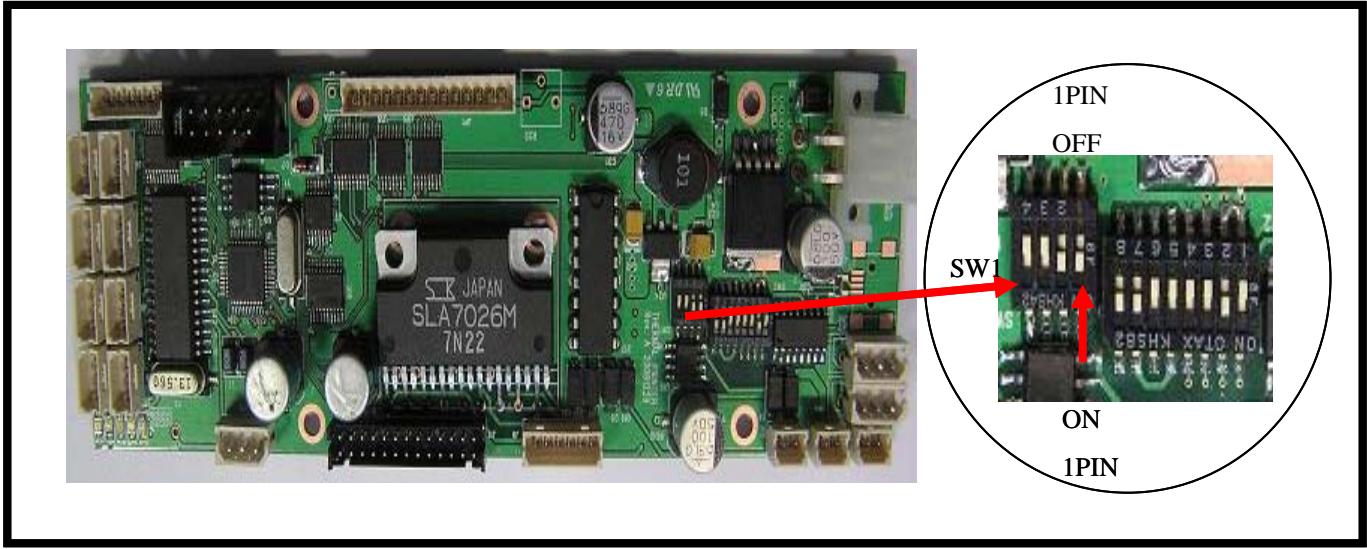
SOH	Null	Length	STX	“C3A”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

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◆ **THERMAL PRINT**

This section describes the commands that can use at the thermal print.

The data to be written ASCII code , the available character is as follows.



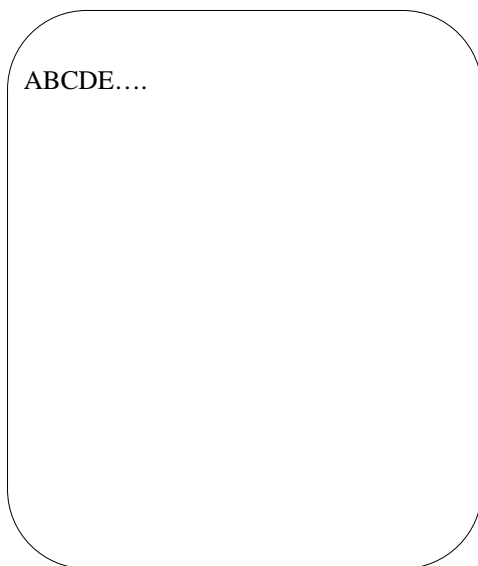
1.Setting the Font function.

1-1. SW1 SET : Card Space.

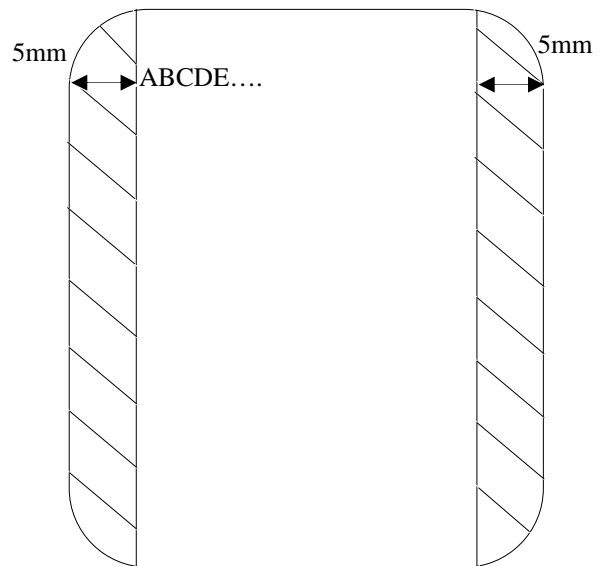
Pin No. 3	Card space	Note
OFF	Disable Card Space	Both the Card Left and Right side are not filled blank within 5mm.
ON	Enable Card Space	Both the Card Left and Right side are filled blank within 5mm.

***For optimized print & Erase quality, it is recommended to use the Card space function set to ON.**

-Disable Card Space



-Enable Card Space

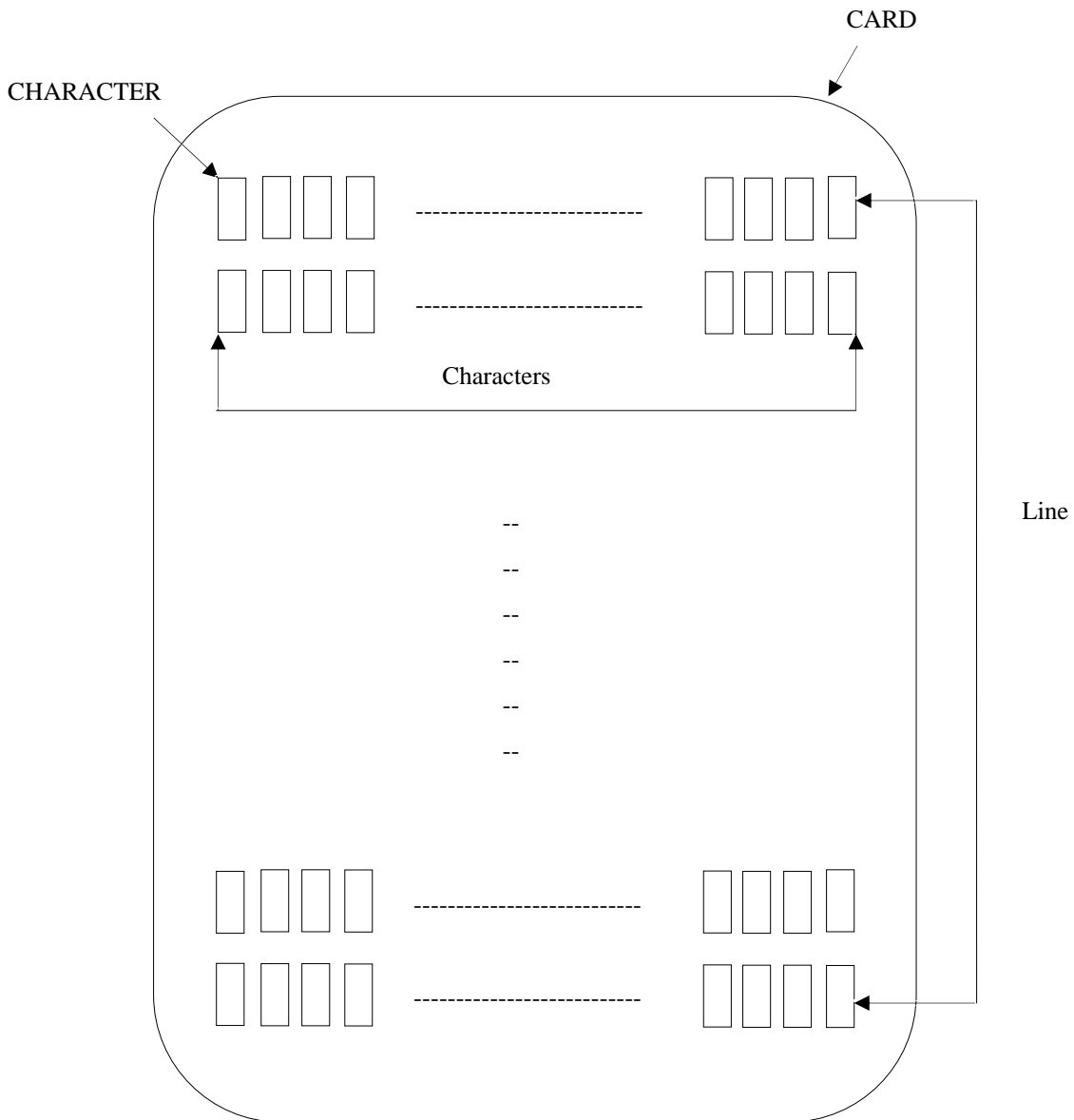


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1-2 SW1 SET : Font Size

Pin No. 1	Pin No. 2	Font Size	Note
OFF	OFF	-	
ON	OFF	32*32	
OFF	ON	48*24	Default
ON	ON	64*32	

Available Character Set	Font Size	Width Max Character		Length Max Line
		Card Space ON	Card Space OFF	
ASCII CODE 0x21(!) to 0x7E(~)	32 x 32	17 Character	19 Character	28 Line
	48 x 24	22 Character	26 Character	19 Line
	64 x 32	17 Character	19 Character	14 Line



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◆ *PRINT EXAMPLE*

Ex1) When the Font Size is 32x32 or 64x32 and Card Space Function Set to OFF

INPUT DATA : A~Z

CARD PRINT:



Ex2) When the Font Size is 32x32 or 64x32 and Card Space Function Set to ON

INPUT DATA : A~Z

CARD PRINT:

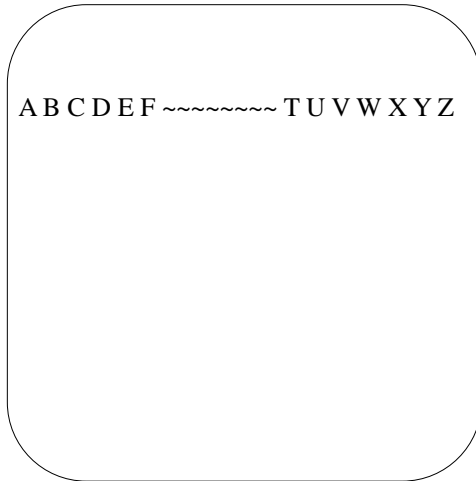


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Ex3) When the Font Size is 48x24 and Card Space Function Set to OFF

INPUT DATA : A~Z

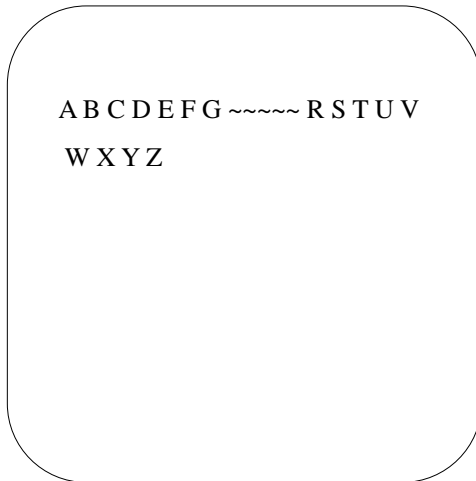
CARD PRINT:



Ex4) When the Font Size is 48x24 and Card Space Function Set to ON

INPUT DATA : A~Z

CARD PRINT:



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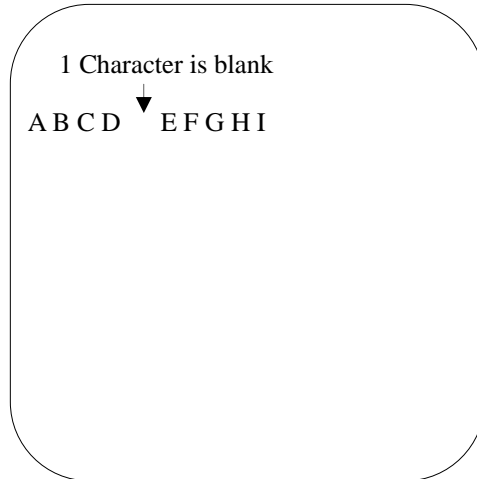
␣ (ASCII CODE 0x20) : 1character fills blank.

␣ (ASCII CODE 0x0D): Next Line moving.

Ex5)

INPUT DATA: ABCD␣EFGHI

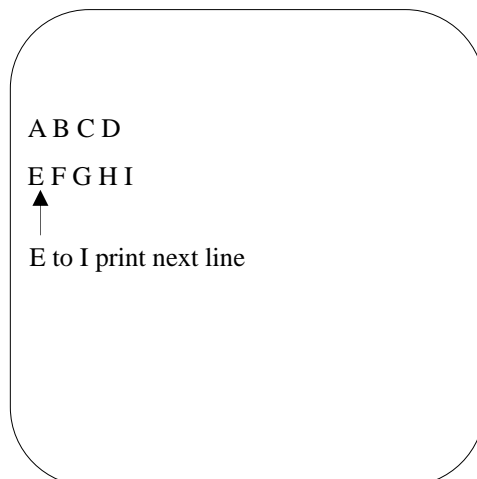
CARD PRINT:



Ex6)

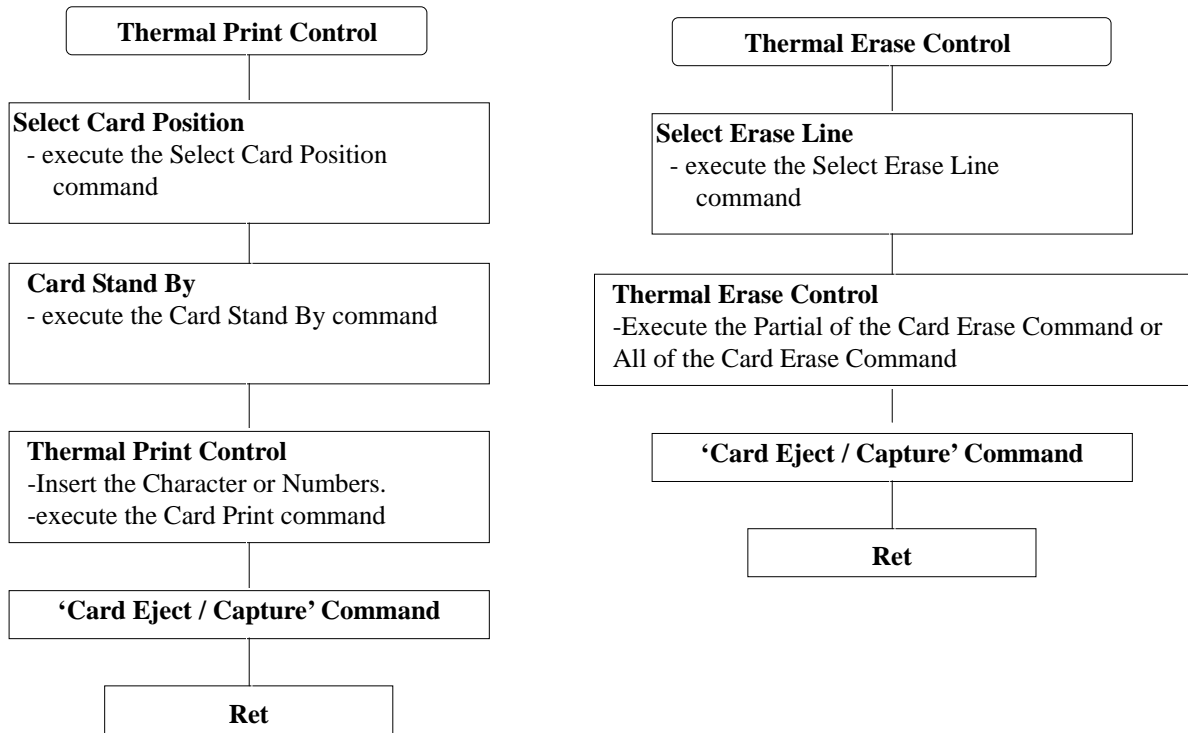
INPUT DATA: ABCD␣EFGHI

CARD PRINT:



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Basic Thermal Print Operations:



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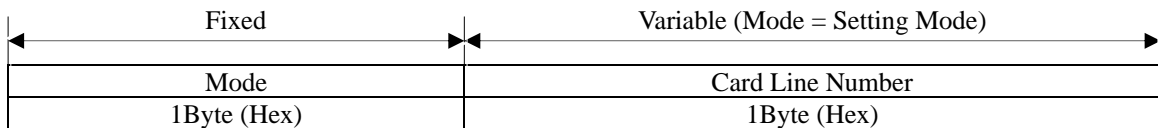
1. THERMAL PRINTER

1.1 “P31” : It is to select the card position.

Command Format

SOH	Null	Length	STX	“P31”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

Command Data Structure



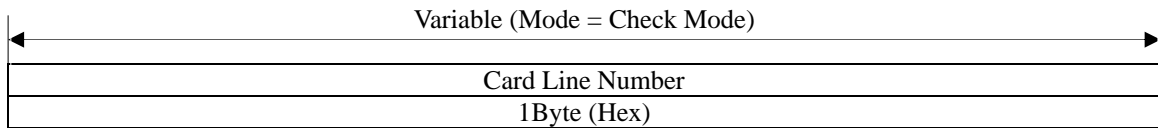
Positive Response Format

SOH	Null	Length	STX	“P31”	GOOD	‘1’	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	------	-----	-----

Negative Response Format

SOH	Null	Length	STX	“P31”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

Response Data Structure



-When the Font Size Set to 32x32.

Number of the Card Line is 1 to 28 LINE (0x00 to 0x1B)

-When the Font Size Set to 48x24.

Number of the Card Line is 1 to 19 LINE (0x00 to 0x12)

-When the Font Size Set to 64x32.

Number of the Card Line is 1 to 14 LINE (0x00 to 0x0D)

Data Variable

<Mode>

Code	Mode	Detail
0x00	‘Check Mode’	Check ‘Card Line Position’
0x01	‘Setting Mode’	Set ‘Card Line Position’

- When the ‘C32’Command(code:0x05,Setting:Printer) execute after the ‘P31’ command(Select the card position) execute

:Choose the line of the card using the ‘P31’ command(Select the card position) and then The card will move to the chosen position(Printer standby of ‘C32’Command)

- When the ‘P10’Command(Printer Standby) execute after the ‘P31’ command(Select the card position) execute

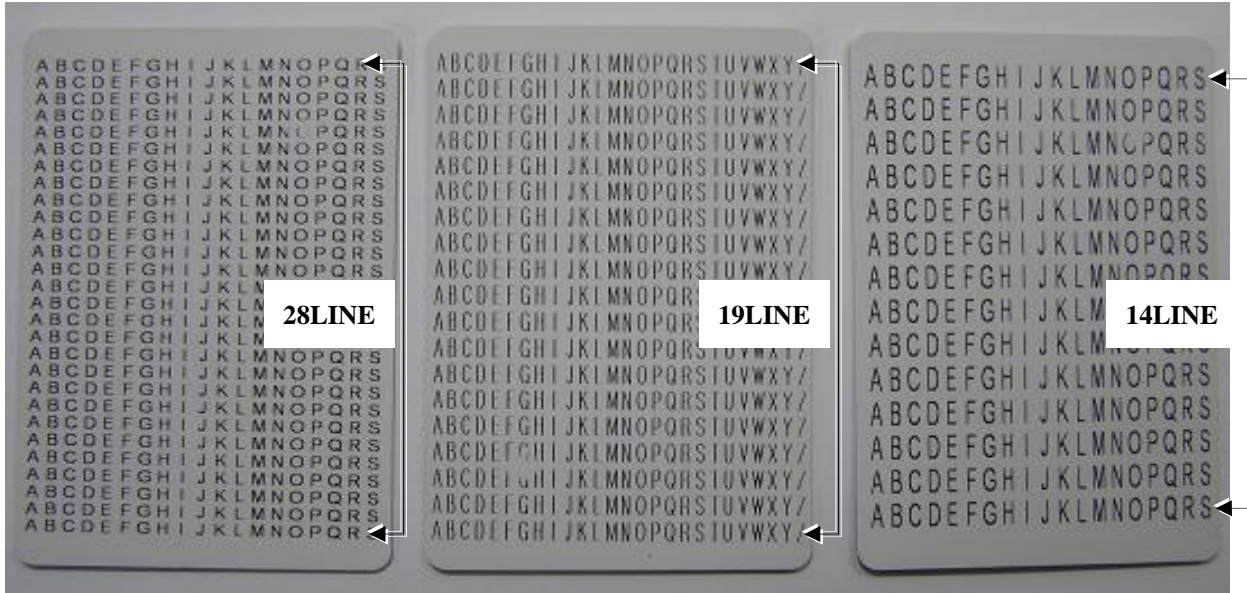
:Choose the line of the card using the ‘P31’ command(Select the card position) and then The card will move to the chosen position and start printing (‘P10’Command)

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Font: 32x32

48x24

64x32



- When the 'P10' Command(Printer Standby) execute after set to Line5(0x04) using the 'P31' command(Select the card position).

Print data: A~Q

Font: 32x32

48x24

64x32



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1.2 “P10” : Move card to Stand-by position, and start printing .

If you ‘C32’(Print Standby)command had already executed, the Card is not moving.

☞ Command Format

SOH	Null	Length	STX	“P10”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

ASCII CODE 0x21(!) to 0x7E(~) (200Byte Max)

☞ Positive Response Format

SOH	Null	Length	STX	“P10”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P10”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

☞ Note

␣ (ASCII CODE 0x20) : 1character fills blank.

␣ (ASCII CODE 0x0D): Next Line moving.

1.3 “P11” : Move card to Stand-by position, and all of a card start printing (test mode).

☞ Command Format

SOH	Null	Length	STX	“P11”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“P11”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P11”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

Font: 32x32

48x24

64x32



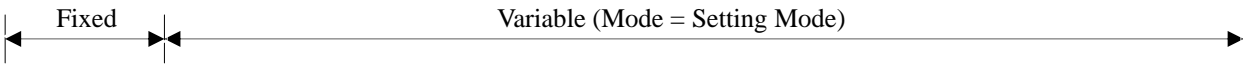
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1.4 “P30”: It is to select the Card Erase Line.

☞ Command Format

SOH	Null	Length	STX	“P30”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure



Mode	Card Line Number to erase			
1Byte (Hex)	D0 : 1Byte (Hex)	D1 : 1Byte (Hex)	D2 : 1Byte (Hex)	D3 : 1Byte (Hex)

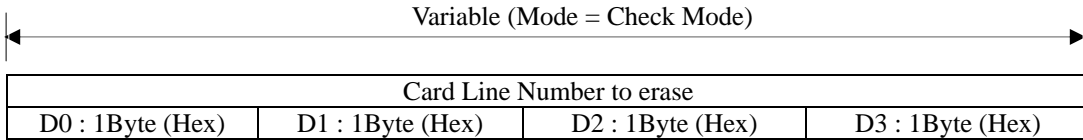
☞ Positive Response Format

SOH	Null	Length	STX	“P30”	GOOD	‘1’	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P30”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

☞ Response Data Structure



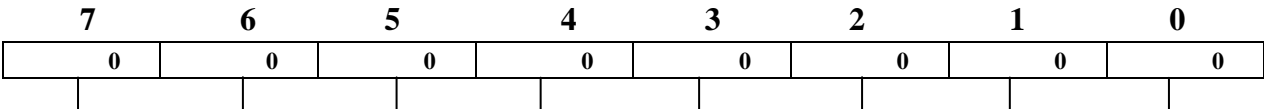
☞ Data Variable

<Mode>

Code	Mode	Detail
0x00	‘Check Mode’	Check ‘Card Line Position’
0x01	‘Setting Mode’	Set ‘Card Line Position’

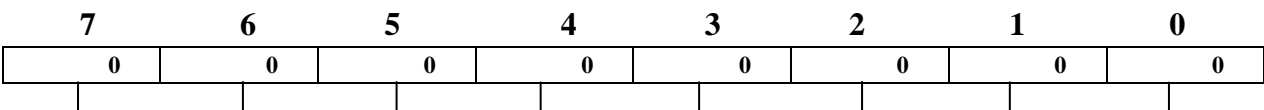
☞ Card Line Number to erase

D0:



1:set line1 1:set line2 1:set line3 1:set line4 1:set line5 1:set line6 1:set line7 1:set line8
0:clr line1 0:clr line2 0:clr line3 0:clr line4 0:clr line5 0:clr line6 0:clr line7 0:clr line8

D1:



1:set line9 1:set line10 1:set line11 1:set line12 1:set line13 1:set line14 1:set line15 1:set line16
0:clr line9 0:clr line10 0:clr line11 0:clr line12 0:clr line13 0:set line14 0:clr line15 0:clr line16

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D2:

7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0

1:set line17 1:set line18 1:set line19 1:set line20 1:set line21 1:set line22 1:set line23 1:set line24
0:clr line17 0:clr line18 0:clr line19 0:clr line20 0:clr line21 0:clr line22 0:clr line23 0:clr line24

D3:

7	6	5	4	3	2	1	0
0	0	0	0	X	X	X	X

1:set line25 1:set line26 1:set line27 1:set line28 Don't Care
0:clr line25 0:clr line26 0:clr line27 0:clr line28

- When the 'P21'Command(Erase printed card to Partial) execute after the 'P30' command(select the Card Erase Line) execute

:Choose the line of the card using the 'P30' command(Select the card Lines) and then the Printer will erase to the chosen lines ('P21'Command)

***For optimized Erase quality, it is recommended as below.**

1. If you want to erase LINE2, you should select **LINE1**,**LINE2** and **LINE3** using the 'P30' command.
2. If you want to erase LINE2 and LINE3, you should select **LINE1**,**LINE2** ,**LINE3** and **LINE4** using the 'P30' command.

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1.5 “P20” : Erase printed card

☞ Command Format

SOH	Null	Length	STX	“P20”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

0x00(1byte)

☞ Positive Response Format

SOH	Null	Length	STX	“P20”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P20”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

1.6 “P21” : Erase printed card to Partial

☞ Command Format

SOH	Null	Length	STX	“P20”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

0x00(1byte)

☞ Positive Response Format

SOH	Null	Length	STX	“P20”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P20”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

- When the ‘P21’Command(Erase printed card to Partial) execute after the ‘P30’ command(select the Card Erase Line) execute

:Choose the line of the card using the ‘P30’ command(Select the card Lines) and then the Printer will erase to the chosen lines (‘P21’Command)

***For optimized Erase quality, it is recommended as below.**

1. If you want to erase LINE2, you should select **LINE1**,**LINE2** and **LINE3** using the ‘P30’ command.
2. If you want to erase LINE2 and LINE3, you should select **LINE1**,**LINE2** ,**LINE3** and **LINE4** using the ‘P30’ command.

1.7 “P32” : It is to clean Thermal Printer Head.

☞ Command Format

SOH	Null	Length	STX	“P32”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“P32”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“P32”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

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◆ RF CARD

This section describes the commands that can use at the 'RF CARD'.

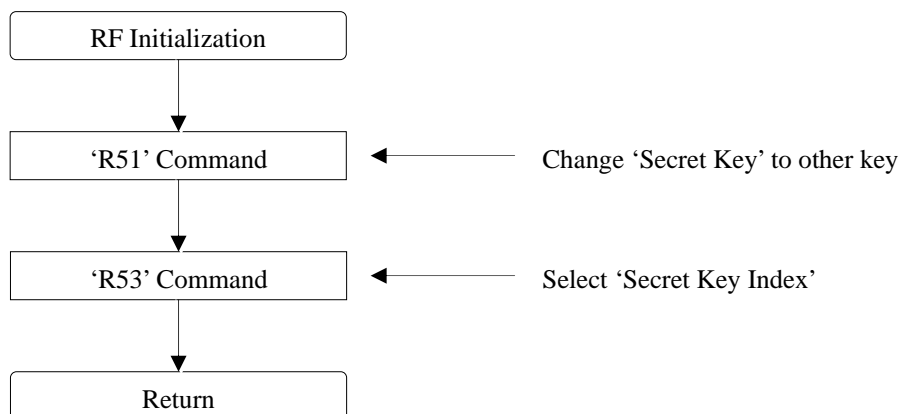
The RF Module of his model supports only the MIFARE card.

The applicable models of the KYP-1XXX Series is the CIM-560 the available commands are as follows.

Item	Cm0	Cm1	Cm2	Detail	Note
RF CARD READ / WRITE	'R'	'3'	'1'	RF Card Read in Block Range	
	'R'	'3'	'2'	RF Card Write in Block Range	Verify
	'R'	'3'	'6'	RF Card Read in Sector Range	
	'R'	'3'	'7'	RF Card Write in Sector Range	
BALANCE	'R'	'4'	'1'	Balance Increment	
	'R'	'4'	'2'	Balance Decrement	
SECRET KEY CHANGE	'R'	'5'	'1'	Change 'Secret Key' to other Key	
	'R'	'5'	'2'	Change 'Secret Key' to all the same Key value	
	'R'	'5'	'3'	Select 'Secret Key Index'	
	'R'	'5'	'4'	Change 'RF Card Secret Key' to other Key	
	'R'	'5'	'5'	Key Set and Change 'Secret Key' to other Key	
	'R'	'5'	'6'	Key Set and Change 'Secret Key' to all the same Key value	
RF DETECT	'R'	'6'	'1'	Check RF card in antenna area	

To use the RF card, you need to initialize at first.

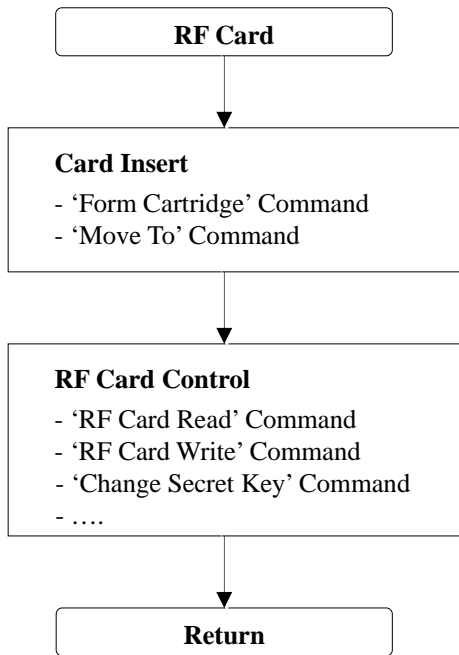
- Setting and updating of the secret key and secret key index.



RF Module Initialization

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Basic Operating Procedure of the RF card:



RF Card Basic Operating Procedures

Memory Architecture(map) of the RF card: 8Kbit

Sector	Block	Size	Detail	Note
Sector 0	Block 0	16Byte	RF Card Information	Can't use
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	
Sector 1	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	
Sector 2	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	
---	---	---	---	---
Sector 15	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	

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1 RF CARD READ / WRITE

1.1 “R31” : Read RF card data & Secret Key in block range

☞ Command Format

SOH	Null	Length	STX	“R31”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	Block
0x00 – 0x0f	0x00 – 0x03
1Byte (Hex)	1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R31”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R31”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

Sector	Block	Read Data												
1Byte (Hex)	1Byte (Hex)	16 Byte (Hex)												
<table border="1" style="margin-left: 100px;"> <tr> <td>D0</td> <td>D1</td> <td>D2</td> <td>---</td> <td>D14</td> <td>D15</td> </tr> <tr> <td>1Byte</td> <td>1Byte</td> <td>1Byte</td> <td>---</td> <td>1Byte</td> <td>1Byte</td> </tr> </table>			D0	D1	D2	---	D14	D15	1Byte	1Byte	1Byte	---	1Byte	1Byte
D0	D1	D2	---	D14	D15									
1Byte	1Byte	1Byte	---	1Byte	1Byte									

1.2 “R32” : Write RF card data in block range

☞ Command Format

SOH	Null	Length	STX	“R32”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	Block	Write Data												
0x00 – 0x0f	0x00 – 0x02	0x00 – 0xff												
1Byte (Hex)	1Byte (Hex)	16Byte (Hex)												
<table border="1" style="margin-left: 100px;"> <tr> <td>D0</td> <td>D1</td> <td>D2</td> <td>---</td> <td>D14</td> <td>D15</td> </tr> <tr> <td>1Byte</td> <td>1Byte</td> <td>1Byte</td> <td>---</td> <td>1Byte</td> <td>1Byte</td> </tr> </table>			D0	D1	D2	---	D14	D15	1Byte	1Byte	1Byte	---	1Byte	1Byte
D0	D1	D2	---	D14	D15									
1Byte	1Byte	1Byte	---	1Byte	1Byte									

☞ Positive Response Format

SOH	Null	Length	STX	“R32”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R32”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

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1.3 “R36” : Read RF card data in sector range

☞ Command Format

SOH	Null	Length	STX	“R36”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector
0x00 – 0x0f
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R36”	GOOD	0x01	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R36”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

0x00	Read Data (0)	0x01	Read Data (1)	0x02	Read Data (2)
1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

1.4 “R37” : Write RF card data in sector range (except Sector 0)

☞ Command Format

SOH	Null	Length	STX	“R37”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	Write Data
0x01 – 0x0f	0x00 – 0xff
1Byte (Hex)	51Byte (Hex)

0x00	Read Data (0)	0x01	Read Data (1)	0x02	Read Data (2)
1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

☞ Positive Response Format

SOH	Null	Length	STX	“R37”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R37”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

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2 BALANCE

2.1 “R41” : Increment the balance of card to the specified amount.

☞ Command Format

SOH	Null	Length	STX	“R41”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	Block	Index Value
0x00 – 0x0f	0x00 – 0x02	0x00000000 – 0xffffffff
1Byte (Hex)	1Byte (Hex)	4Byte (Hex)

V0	V1	V2	V3
0x00-0xff	0x00-0xff	0x00-0xff	0x00-0xff
1Byte(Hex, LSB)	1Byte(Hex)	1Byte(Hex)	1Byte(Hex, MSB)

☞ Positive Response Format

SOH	Null	Length	STX	“R41”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R41”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Note

The balance should be written in the Electronic Purse format in the card.

2.1 “R42” : Decrement the balance of card to the specified amount..

☞ Command Format

SOH	Null	Length	STX	“R42”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	Block	Index Value
0x00 – 0x0f	0x00 – 0x02	0x00000000 – 0xffffffff
1Byte (Hex)	1Byte (Hex)	4Byte (Hex)

V0	V1	V2	V3
0x00-0xff	0x00-0xff	0x00-0xff	0x00-0xff
1Byte(Hex, LSB)	1Byte(Hex)	1Byte(Hex)	1Byte(Hex, MSB)

☞ Positive Response Format

SOH	Null	Length	STX	“R42”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R42”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Note

The balance should be written in the Electronic Purse format in the card.

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3 SECRET KEY

3.1 “R51” : Change ‘Secret Key’ to a new key

☞ Command Format

SOH	Null	Length	STX	“R51”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Sector	KEY A	KEY B
0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff
1Byte (Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R51”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R51”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Note

KYP-1XXX Series ‘Secret Key’ Default – Key Set 0

KEY A : FFFFFFFFFF

KEY B : FFFFFFFFFF

3.2 “R52” : Change ‘Secret Key’ to all the same key value

☞ Command Format

SOH	Null	Length	STX	“R52”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

KEY A	KEY B
0x00 – 0xff	0x00 – 0xff
6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R52”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R52”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Note

KYP-1XXX Series ‘Secret Key’ Default – Key Set 0

KEY A : FFFFFFFFFF

KEY B : FFFFFFFFFF

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3.3 “R53” : Select ‘Secret Key Index’

Command Format

SOH	Null	Length	STX	“R53”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

Command Data Structure

Index
0x01 – 0x02
1Byte (Hex)

Positive Response Format

SOH	Null	Length	STX	“R53”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

Negative Response Format

SOH	Null	Length	STX	“R53”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

Data Variable

<Index>

Code	Setting	Detail
0x01	KEY A	Select ‘Secret Key A’
0x02	KEY B	Select ‘Secret Key B’

Note

KYP-1XXX Series ‘Secret Key Index’ Default

‘Secret Key Index ‘ : KEY A

3.4 “R54” : Change RF card ‘Secret Key’ to other key

Command Format

SOH	Null	Length	STX	“R54”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

Command Data Structure

- Command data structure without ‘Access Condition’

Sector	KEY A	KEY B
0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff
1Byte (Hex)	6Byte (Hex)	6Byte (Hex)

- Command data structure with ‘Access Condition’

Sector	KEY A	Access	KEY B
0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff	0x00 – 0xff
1Byte (Hex)	6Byte (Hex)	4Byte (Hex)	6Byte (Hex)

Positive Response Format

SOH	Null	Length	STX	“R54”	GOOD	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	-----	-----

Negative Response Format

SOH	Null	Length	STX	“R54”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

Warning

If you use this command incorrectly, it couldn’t be authenticated from the card.

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3.5 “R55” : Change ‘Secret Key’ to a new key from Key Set Number.

☞ Command Format

SOH	Null	Length	STX	“R55”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Key Set	Sector	KEY A	KEY B
0x00 – 0x02	0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff
1 Byte(Hex)	1Byte (Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R55”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R55”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

☞ Note

Key Set <Index>

Code	Detail
0x00	Key Set 0
0x01	Key Set 1
0x02	Key Set 2

3.6 “R56” : Change ‘Secret Key’ to all the same key value from Key Set Number.

☞ Command Format

SOH	Null	Length	STX	“R56”	DATA	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----

☞ Command Data Structure

Key Set	KEY A	KEY B
0x00 – 0x02	0x00 – 0xff	0x00 – 0xff
1 Byte(Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R56”	GOOD	‘1’	ETX	Bcc
-----	------	--------	-----	-------	------	-----	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R56”	E-Code	‘0’	ETX	Bcc
-----	------	--------	-----	-------	--------	-----	-----	-----

☞ Note

Key Set <Index>

Code	Detail
0x00	Key Set 0
0x01	Key Set 1
0x02	Key Set 2

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4 RF DETECT

4.1 “R61” : RF card detect in antenna area

☞ Command Format

SOH	Null	Length	STX	“R61”	ETX	Bcc
-----	------	--------	-----	-------	-----	-----

☞ Positive Response Format

SOH	Null	Length	STX	“R61”	GOOD	DATA	0x01	ETX	Bcc
-----	------	--------	-----	-------	------	------	------	-----	-----

☞ Negative Response Format

SOH	Null	Length	STX	“R61”	E-Code	0x00	ETX	Bcc
-----	------	--------	-----	-------	--------	------	-----	-----

☞ Response Data Structure

Serial Number
Hex Code
4Byte

☞ Note

If the RF card is detected, this command send the serial number to host. But, it doesn't authenticate the Secret Key of the RF card.

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ERROR DETAIL

<GOOD>

Code : 0x0000

Description: Normal Execution

Procedures: None

<NOT_DEFINE_COMMAND>

Code : 0x2001

Description : Using the command that does not defined in this model.

Action : Use the valid command in this model.

<NOT_USE_COMMAND>

Code : 0x2002

Description : Not available command in this model.

Action : Use the valid command in this model.

<COMM_FRAME_ERROR>

Code : 0x2003

Description : Sending the command that has the invalid communication frame.

Action : Check the data format and the corresponding module specification.

<CARD_JAM>

Code : 0x2004

Description : When the card is jammed.

Action : Remove the jammed card.

<NO_CARD>

Code : 0x2005

Description : No cards.

Action : Insert the card.

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<CARD_PRESENT>

Code : 0x2006

Description : When the card exists already in the terminal.

Action : Eject the card.

<BUSY>

Code : 0x2007

Description : When the terminal is running or busy.

Action : Wait until the previous operation is completed.

<TWO_CART_ERROR>

Code : 0x2009

Description : When more than one card is presented in the feeder part.

Action : Remove one card.

<DISPENSER_COMM_ERROR>

Code : 0x2101

Description : Dispenser communication error

Action : Check the communication line and reset the terminal.

<SOLENOID_ERROR>

Code : 0x2602

Description : Thermal Printer Solenoid open and close are wrong.

Action : Thermal Printer Solenoid open and close.

<RF_ERROR>

Code : 0x2300

Description : Unavailable RF module.

Action : Change the RF MODULE

<RF_COMM_ERROR>

Code : 0x2301

Description : Communication error at the RF Module.

Action : Check the connection socket

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<RF_AUTHEN_ERROR>

Code : 0x2302

Description : Authentication Error at the RF Module.

Action : Change the 'SECRET KEY'

<RF_WRITE_ERROR>

Code : 0x2303

Description : Error while the terminal writes at the RF Card.

Action : Be sure that the card exists in the detection range.

<RF_READ_ERROR>

Code : 0x2304

Description : Error while the terminal reads at the RF Card.

Action: Be sure that the card exists in the detection range.

<RF_DETECT_ERROR>

Error Code : 0x2305

Description : No RF Card.

Action : Insert the RF Card into the terminal.

<RF_AMOUNT_ERROR>

Error Code : 0x2306

Description : Error while the terminal increases(or decreases) the balance at the RF card.

Action : Tune the RF module.

<FLASH_ERROR>

Code : 0x2400

Description : Unavailable FLASH memory ic

Action : Change the FLASH memory ic

<PRINT_ERROR>

Code : 0x2600

Description : Unavailable PRINTER module.

Action : Change the PRINTER MODULE

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<ERASE_ERROR>

Code : 0x2601

Description : Unavailable PRINTER module.

Action : Change the PRINTER MODULE

<SHUTTER_OPEN_ERROR>

Code : 0x2602

Description : THERMAL SHUTTER OPEN ERROR.

Action : Check the Shutter Sensor or Motor.

<SHUTTER_CLOSE_ERROR>

Code : 0x2603

Description : THERMAL SHUTTER CLOSE ERROR.

Action : Check the Shutter Sensor or Motor.

<THERMAL_LINE_OVER_ERROR>

Code : 0x2604

Description : Too big the chosen value.

Action : Check the Font size or setting value.

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Precautions

1. Check the communication line

1) Communication Port, Baud, Parity, and Data Bit, etc.

1. Check if the card exists in stacker. Otherwise, it may not issue the card.