Technical Manual

Model : HP-083E

CAUTION :

- Please do not disassemble / reorganize the product.
- Please do not the remove the paper jam during power on.
- Please do not exceed the standard power voltage.
- Please do not touch the product with your hands wet.
- Please do not press / shock the product.
- Please do not put the product at the moist (humid) condition.
- Please do not wash off the auto cutter, / thermal print head.
- Please do not touch the auto cutter, / thermal print head.

WARNING :

- Please contact us if there is any problem.
- Please power off the printer, once you remove the paper jam, and the foreign materials.
- Please clear the air / open the disclosed place.
- Please set the product without damage enviornment.
- Please set the product and the cable at the stable place.
- Pleaes keep the requires as necessary as general electrics.
- Pleaes use the power supply set provided.
- Pleaes power off the product, when the paper is changed.
 Otherwise, the auto cutter / the thermal print head could be operated incorrectly.

Content

1. Name of parts

1-1) Name

1) LED :
   POWER (Blue) : 1. It indicates the power is on.

   ERROR (Red) : 1. It indicates, when the printing is not available, when the paper detected.
                  2. It indicates, when the status is error (twinkle).
                     Notice : It doesn't indicate, when the status is normal.

   PAPER (Orange) : 1. It indicates, when the paper is ending, and not available.
                     Notice : It doesn't indicate, when the paper is set up normally.

   FEED : 1. It is a button to feed the paper.
          2. It is a button to conduct the self-test, when you power on during you press down this button.

2) Power switch :
   It is a switch to power on/ power off.
   UP: Power on, DOWN : Power off

3) Cover open lever :
   It is a lever to change the paper, and to open the cover.

Notice : When you press down the cover open lever, please do not open the cover if it is not open.
          Please look at the article of paper jam this manual.
          It is very important to prevent the product from the damage.

4) Cutter cover :
   It is to remove the paper jam. Please look at the article of paper jam.

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1-2) Connector :

It is to connect with the external device, such as cash drawer, melody.

RJ45(RS232)   DB9(RS232)   USB   Cash Drawer,   Power Connector
                                                    Melody Box Connector
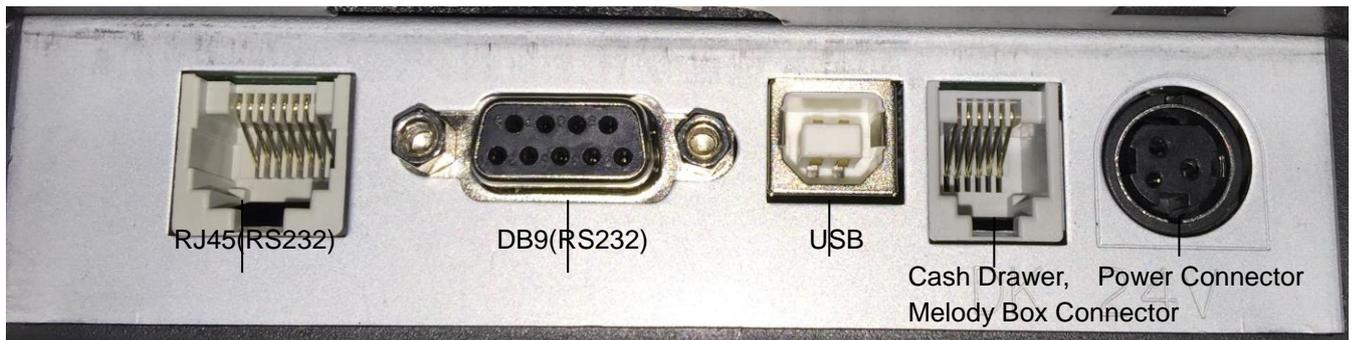
1) Power connector: connection with 24volt.
     Notice : Please use the power supply set we provide.

GND
24V
N.C

GND
24V
N.C

(Please see the indication)

O   **X**
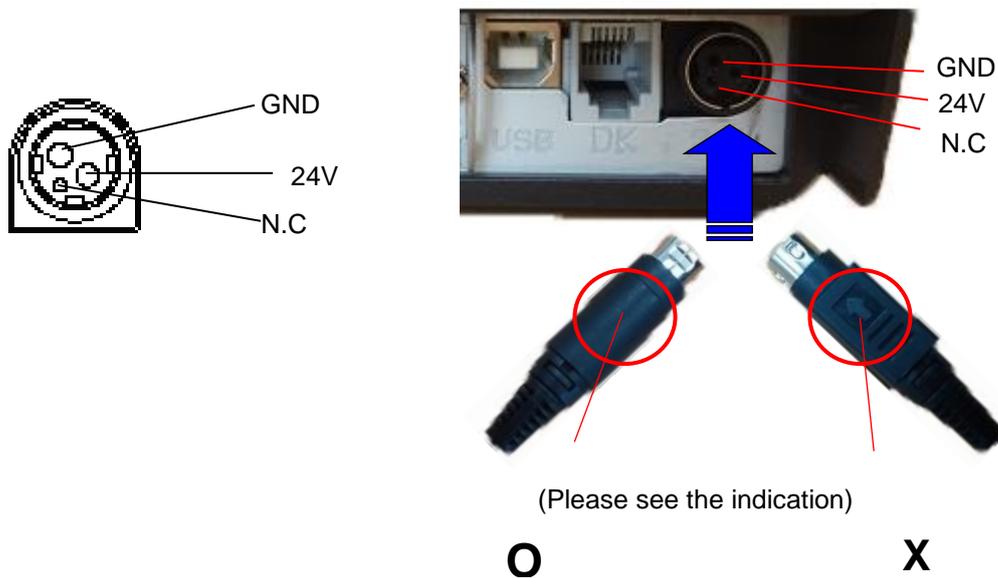
2) Cash drawer, Melody connector :
    It is to connect the cash drawer, and the melody connector.
    Notice : Please use the standard of connector.
    Please refer to the specification of the cash drawer / the melody at this manual.
    Notice : Please do not connect with the cable of Modem / Lan.
    It is very important to prevent the product from the damage.

3) Interface card :
    It is to connect the host with the *interface cable. *interface cable : data cable
    It can be Serial(RS232C), USB and RJ-45

    Do not connect RJ45 cable to LAN interface. the printer would be damaged

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◈ USB : USB2.0 Type B 4 pin Flug
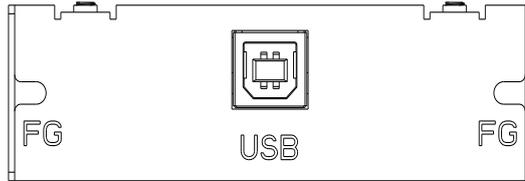
◈ Extensive Serial RJ-45 : DSUB- 9 pins RJ-45 6 pins receptacle
It is to extend the serial RJ-45.
It is to communicate with rs232c, when you use the RS232c cable 9 pins,
or the Lan cable 6 pins one to one.
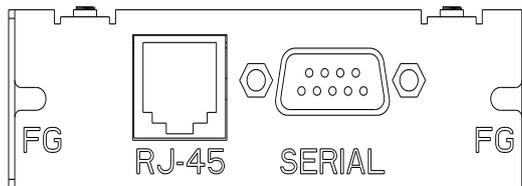
Notice：Please do not connect with the cable of Modem / Lan .
It is very important to prevent the product from the damage.

2.How to use

2-1) Paper set up

1) Please press down the cover open lever to open the cover.

Cover

Cover open lever
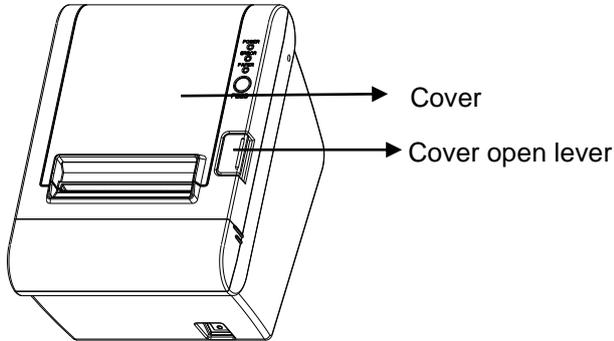
2) Please set up the paper as image below.
Notice : Please make sure the printing side of paper.

Printing side

Printing side

○   ✕
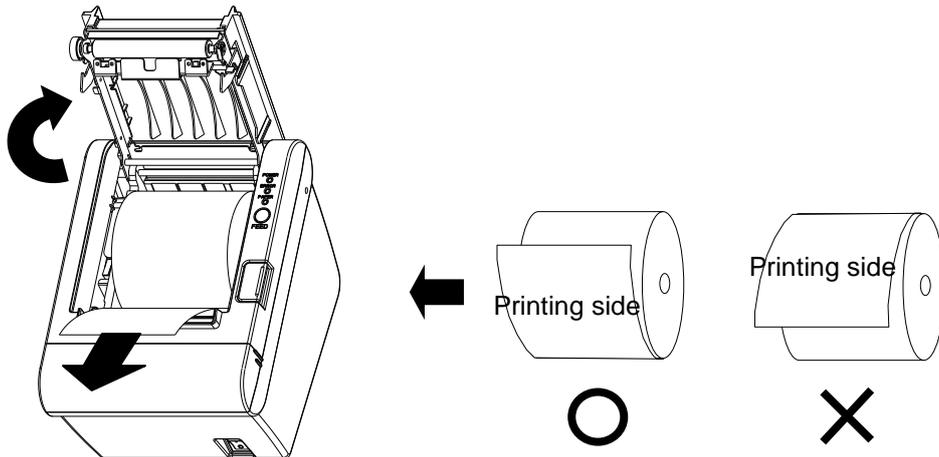
3) **Notice** : Please make sure the paper is out as image below, when you close the cover.
You can see the paper is printing and cut, when you close the cover, after you power on.
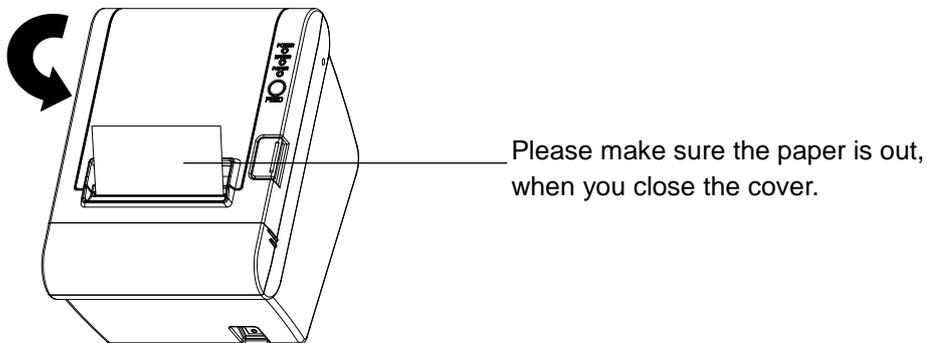
Please make sure the paper is out,
when you close the cover.

2-2) Paper jam :
Please follow the instruction as belows., when the paper jam occurred.

1) Please power off the pritner.

Notice :
Please power off the printer, once you remove the paper jam, and the foreign materials.
Pleaes power off the product, when you conduct this step.
Otherwise, the auto cutter / the thermal print head could be operated incorrectly.
The printer, and you will be damaged.

2) Please pull out the cutter cover to open as image below.

Cutter cover
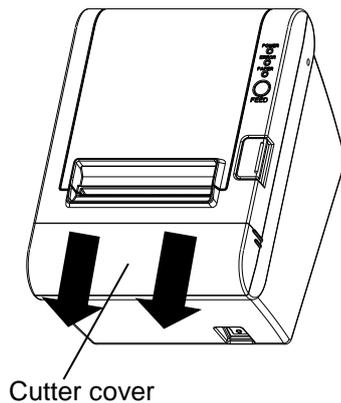
3) Please make sure the cutter is moving, when you turn the gear into one direction.
   You can turn the gear into any direction, such as from the lower and the upper,
   from the upper and the lower.

Notice : Please do not turn the gear any more,
when you see the cutter is not moving any more.
Please try to change the direction which you turn the gear.

Notice : Please turn the gear,
till you make sure you are able to press the cover open lever.
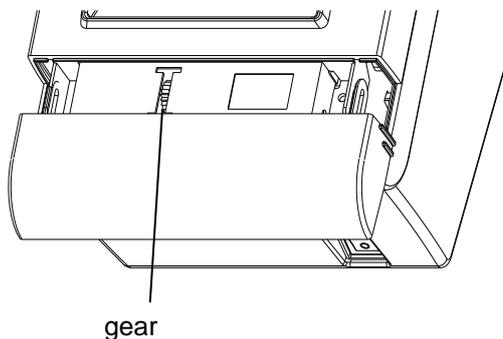
gear

4) If you can press the cover open lever, please open the cover, and remove the paper jam.
   Notice : Please make sure again you do not turn the gear any more,
            when you see the cutter is not moving any more.
            Please change the direction which you turn the gear.
            Please turn the gear, till you make sure you are able to press the cover open lever.

2-3) Self test :

Without the host, or the communication, it is to print the status of printing.
Please power on, once you press down the button of feed(1 Sec) then back.

Do not press the botten over 2 sec. it will be set up the mode.
So please press the botton under 2sec and be able to see the selftest.

It is printing the status of printing with the detail as belows.

◆ Model
◆ Firmware / Date
◆ Interface
◆ Dip switch

```
*******************************
HP-083E Control Board
Firmware  :  VerX .XX
Create    :  20XX/XX/XX
*******************************

Interface and Setting information
================================
Interface    :  USB & RS-232C
Baud Rate    :  9600
Data Bit     :  8 Bit
Parity       :  None
Stop Bit     :  1 or 2
Flow Control :  RTS_CTS(DTR_DSR)
================================
Peripheral & Setti
```

2-4) HEX Dump

2.4.1.Please use the printer utility Program to set up the HEX DUMP
2.4.2. Then it prints all data in hex character (16 antilogarithm).
2.4.3. You can see the status of receipt.
2.4.4. It will be useful for the appilcation you do.
.

◆ It prints the data, once it receives the data 10 digit.
◆ You can print the data less than 10 digit, when you press down the button of feed.
◆ It prints the control code ($1F_{16}$ below) as ".".
◆ It prints the data 80_{16} more as "^".

[Sample]

```
     16 antilogarithm              ASCII

[HEX DUMP MODE]
41 42 43 44 45 46 47 47 49 4A   ABCDEFGHIJ
30 31 32 33 34 35 36 37 38 39   0123456789
1B 4A FF                        .J^
```

2-5) On board update :

Notice : Please make you conduct the following instructions, when you get to know completely.

  1) Please turn on power switch off and on(Do not need to control Dip Switch.

  2) Please check the connection between the printer and the data cable.
     * You can save the time to set up, if you use USB Cable.

  3) Please conduct the given program, and Set up the model name with Interface port, then
    updating
    If the error LED is turned off and is lighted on slightly after 4 seconds,
    then the updated is being started.
     * Please do not switch off the printer power.

  4) The updated will be finished after the update indicates complete.
     * If the error LED keeps the light goes in and out, it's error.
     Please stop the update program and check the cable and others.
     Please return the process "1." and follow the step again.

  5) After updating completes, Automatically the printer will be ready to use
    As Reset.

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2-6) Communication setting

Set the printer function and communication condition between host by memory switch utility program.
※Note : Setting ereases all contents in memory switch, so code page and print optionshall be set again.

2-6-1) Manual setting

1) Turn the printer at initial setting mode.
※ Method to go initial setting mode
  [Press and hold FEED button and then turn on power pressing 2 or more seconds, then PE LED and
  ERROR LED blinks by turns and it is switched to initial setting mode (9600 BPS, PARITY NONE,
  HARDWARE HANDSHAKE).]
  In manual setting, considering of communication condition is not required.

2) After switched to initial setting mode, followings will be printed.

```
[Menu]
      1.Baud rate
      2.Parity
      3.Flow control
      4.Hex Dump Mode
      5.Print Density
      6.Auto Melody
      7.Cut Mode
      8.Auto Buzzer
      9.Print Speed
Select and then Enter...


Enter : Press the feed button once for
           more than 1second.
Select: Press the feed button many times
           less than 1second as menu number.
Exit   : Turn power off then on.
```

  Pressing FEED button for more than 1second, it is fixed(press enter), and less than 1 second, item is
  selected.
  For example, if you want to change the Auto Melody of #6 menu, press #6 less than 1 second, and press
  more than 1 second. To exit, turn off the power and turn on again.

3) Successively, select from printed items and confirm.

```
예) [Baud rate]
      -> 1.9600
         2.19200
         3.38400
         4.115200

      -> : Indicate current set status
      Select and then Enter...
```

Ex) In here, arrow((->) indicates current settings. To change, select item and enter. TO move to next menu with
  no change, just enter without selecting item.

4) Successively, you will know the change result from the printed items.
"It was changed successfully!"

This message means change was successful.

"The value is invalid, try again!"
This message is shown when selected item is invalid or when you move to other menu without item change.

5) Setting result can be confirmed by printing test page or by the location of arrow(->) after selecting menu item in initial setting mode..

2-6-2) Setting by communication
Set the printer function and communication conditions between host by memory switch utility program.
※Note : Setting ereases all contents in memory switch, so code page and print optionshall be set again.

1) Turn the printer at initial setting mode.
※ Method to go initial setting mode
[Press and hold FEED button and then turn on power pressing 2 or more seconds, then PE LED and
ERROR LED blinks by turns and it is switched to initial setting mode (9600 BPS, PARITY NONE, HARDWARE
HANDSHAKE).]
-> This process is skipped in setting with USB interface.

2) Run untility program, set port to be used in communication, and select 9600 for BaudRate setting, and
then press 'Communication Test' button. When communication is successful, Start transmit button is activated.
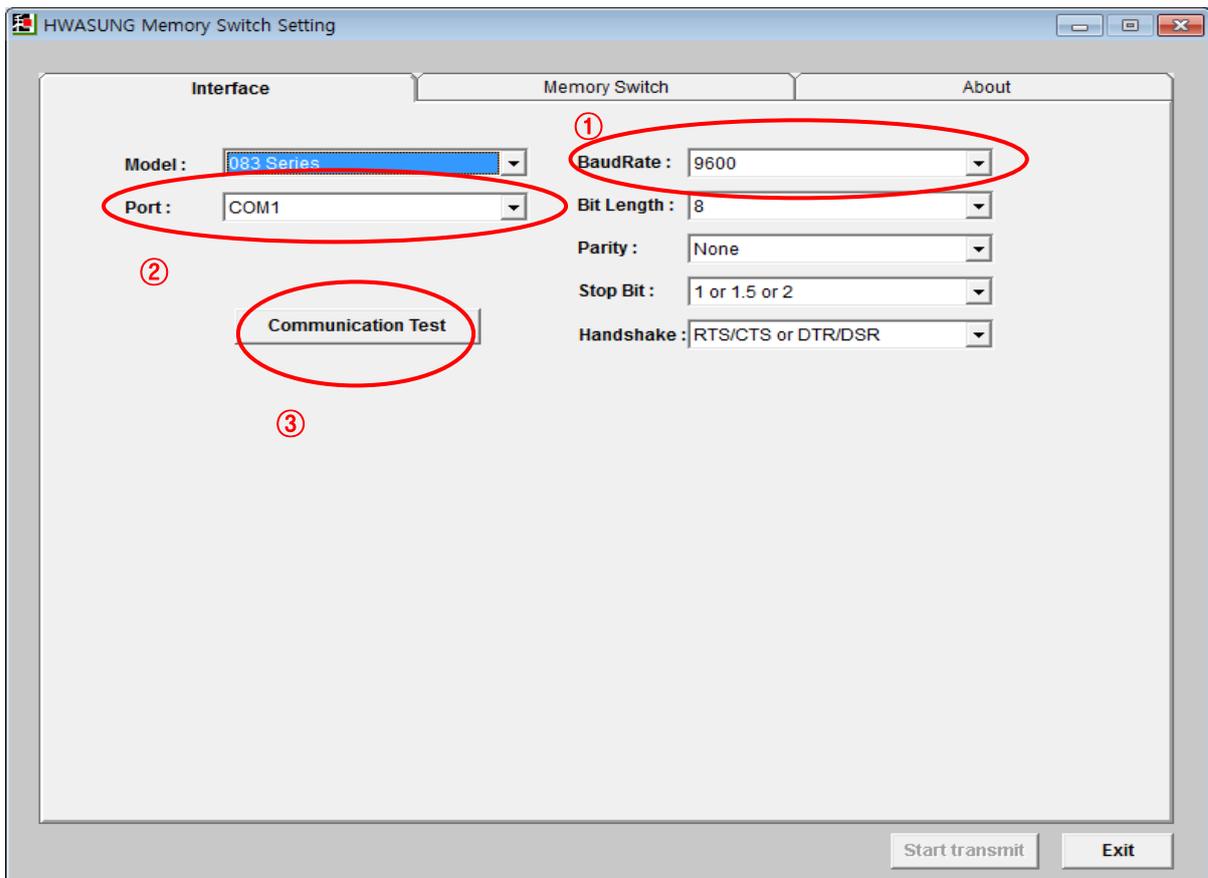
- > In setting by USB interface, select USB for Port setting.

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3) Press memory switch tap, and then press HP-083E in Special Model Option box.
    And then Form is appeared. In the Form select relevant items and then press 'Start transmit' button.
    After setting, turn off and on again power, it runs by the setting.
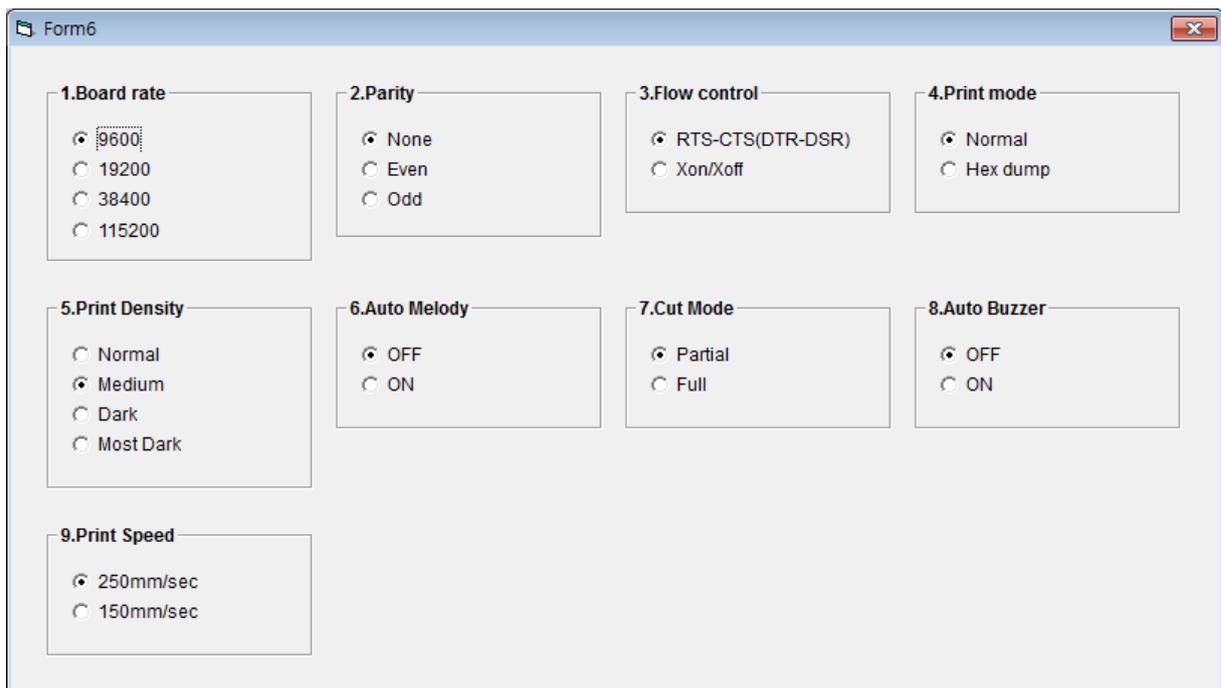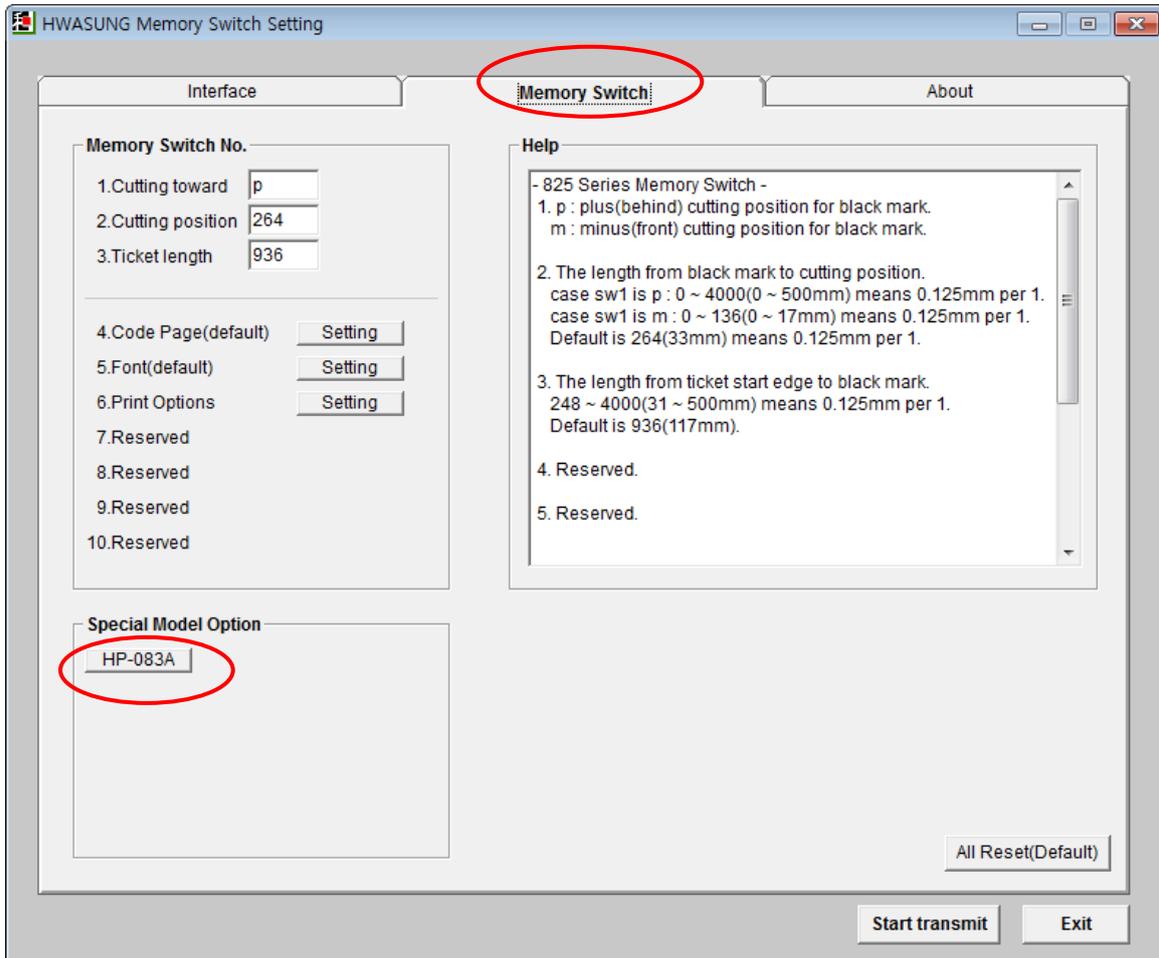
2-7) Memory Switch :

You can set up the memory by using internal non-volatile memory.

Notice : Please use the utility program provided for memory switch.
Notice : Even though you power off, the value will not be changed, till you change the value again.

Memory Switch	Value	Description
SW1	Reserved	
SW2	Reserved	
SW3	Reserved	
SW4	Code Page	
SW5	Font	
SW6	Print option	
SW7	Reserved	
SW8	Reserved	
SW9	Reserved	
SW10	Reserved	
SW12	RS-232C Transmission Condition and Print Function	
SW13	Print Function	

2-8) Recover firmware (Reboot)

You are able to recover the firmware, when the firmware / the boot were error as the following things.

   1) Please open the cover the dip switch, and check the jumper the pin header.

   2) Please connect the pin header (2.54mm) by using the jumper cap.

connection

Jumper cap

Pin header
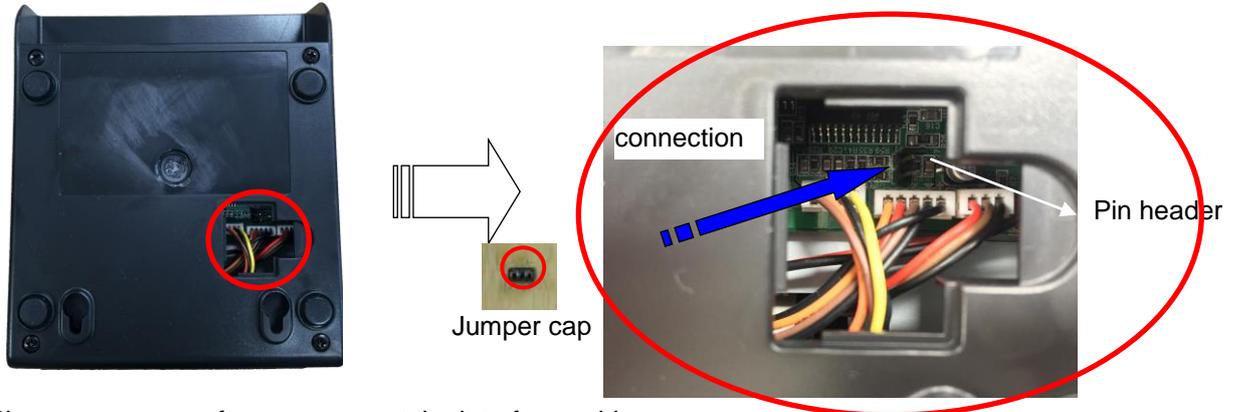
   3) Please power on, after you connect the interface cable.

   4) By using the booting program we provide,
      Please set up the interface port, and choose the mode 'at91sam4e16-ek' of Select your board,
      Please click the button 'Connect'.
      Notice : You are able to use the port RS232C, or the port USB only,
      However, please choose one of them. (You are able to save the time, if you use the port USB.)
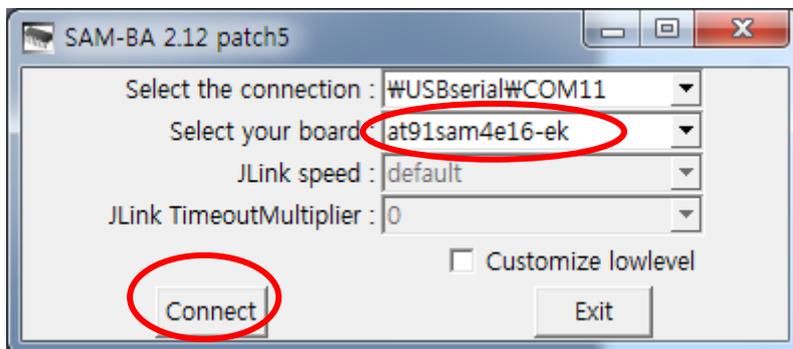
   5) Please dis-connect the jumper cap, after the booting program runs.
      Notice : The booting will not be available, if you don't disconnect the jumber cap,
      because the data is removed.

Dis-connection

Pin header

Jumper

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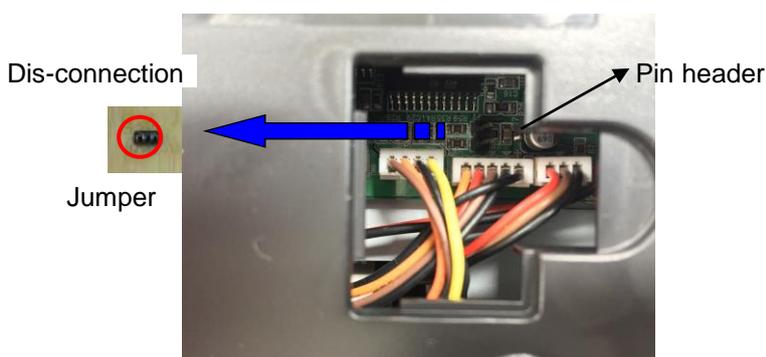
6) Please open the firmware file of the model you want, at the mode 'Send File Name',
   and click the button 'Send File' as the image below.

   Notice : Please do not change other parameters.
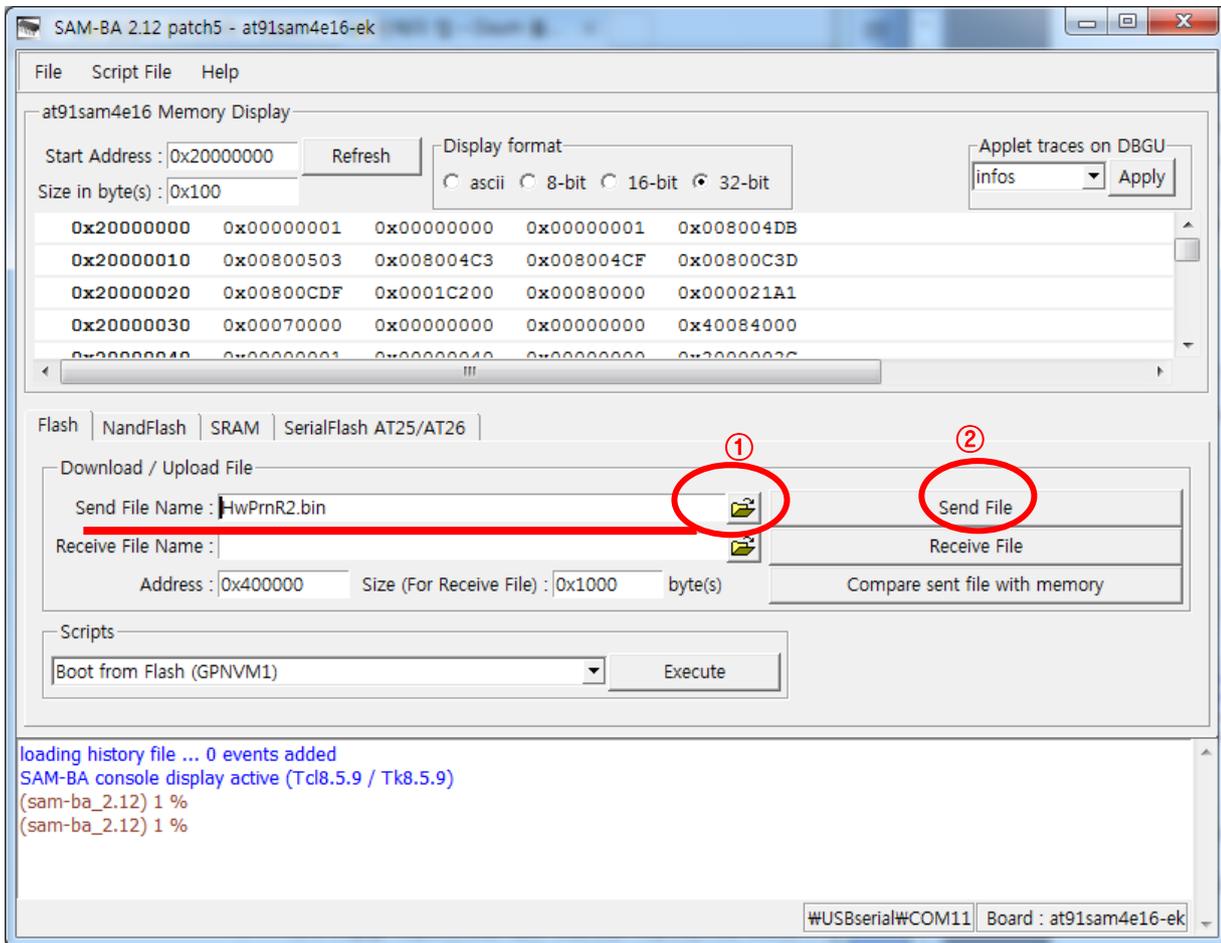
7) Please choose the button 'yes', after the transmission is complete as the image below.
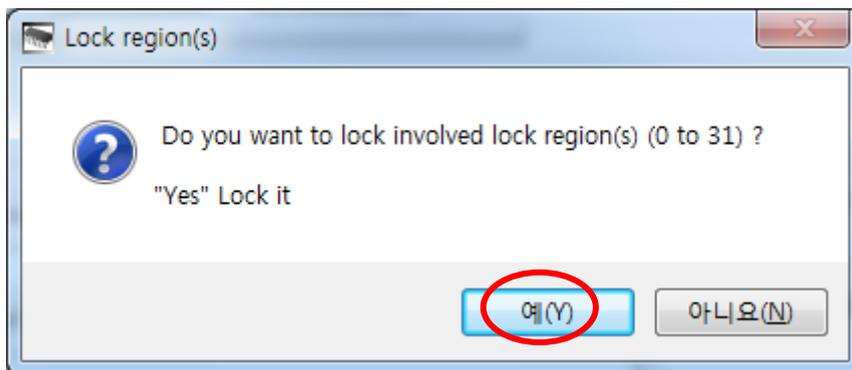
8) Please click 'Execute', after you make sure 'Boot from Flash(GPNVM1)' at the mode 'Scripts'.
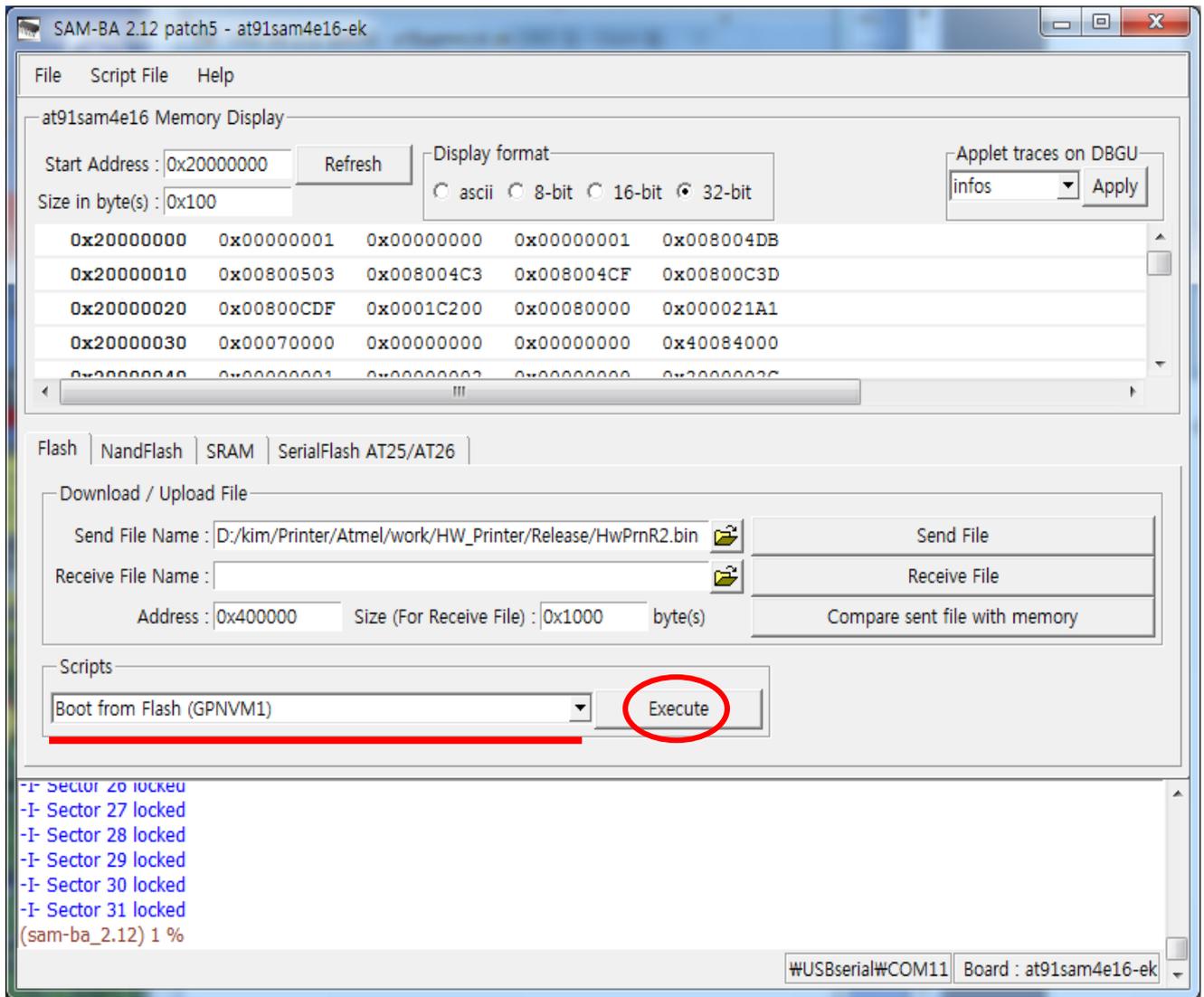
9) Please power off and on, to restart.

3.Specification

3-1) Printer

Printing	Direct thermal
Printing Speed	*1) 200mm/sec
Resolution	7 dots/mm,180DPI
Printing width	72.19mm, 512Dots/Line
Printing way	Line mode, Page mode
Character	Font A ASCII (12*24) 42 columns
	Font B ASCII (9*16) 56 columns
	Font C Korean (24*24) 21 columns
Paper	Width 79.50mm +-0.5mm
	Roll outside diameter MAX:80mm
	Thickness 0.07mm
Reliability	TPH 130km
	MCBF 60,000,000 lines
Barcode	EAN-8,EAN-13,CODE39,CODE93,CODE128,ITF, UPC-A,UPC-E,CODEBAR
2D barcode	QR, PDF417, Data Matrix
Emulation	ESC/POS command compatible / HWASUNG
Driver	Window(2000,2003,XP,7,Vista 32Bits,64Bits)
Interface	Serial(RS-232C / USB / RJ-45 (serial extension)
Power	24VDC 2.5A
Buffer	4 Kbytes
Cutting	Life 1,700,000 cuts / Guillotine / Full or Partial cut
Temperature	Operation 0'c~+40'C / Storage -20'c~+60'C
Humidity	40~80% RH
Dimension	143.00 (W)x 194.00(D) x136.00(H) mm

*1) The printing speed is subject to change with the transmission of data, and command.

3-2) Interface

3-2-1) RS-232C

1) Transmission	:	RS232C	
2) Hand shakes	:	Hardware (RTS/CTS or DTR/DSR)	
		Software (XON/XOFF)	
3) Baud rate	:	9600, 19200, 38400, 115200 bps	
4) Data bit length	:	7, 8 bits	
5) Parity	:	None, Odd, Even	
6) Stop bit	:	1 or 2	
7) Connector	:	DSUB-25(Female)	

8) Pin

No	Signal	IN/OUT	Remark
1	FG	-	Frame Ground
2	TxD	OUT	Transmit Data
3	RxD	IN	Receive Data
4	RTS	OUT	Printer Busy(same with DTR)
5	CTS	IN	Host Busy
7	GND	-	Signal Ground
20	DTR	OUT	Printer Busy
22	Power	OUT	*1) +5Volt or +3.3Volt
6,8-19,21,23-25	N.C	-	None Connection

*1) Option : JP1 short : +5Volt / JP2 short : +3.3Volt

Notice : Please do not short JP1 and JP2 at the same time (simultaneously).

9) Example

Printer			Host (PC)	
Pin	Signal		Pin	Signal
2	TxD	⟶	2	RxD
3	RxD	⟵	3	TxD
4	RTS	⟶	8	CTS
5	CTS	⟵	7	RTS
7	GND	—	5	GND
20	DTR	⟶	6	DSR

⋯⋯⋯ : It is connected inside the printer.

3-2-2) Serial extension RJ-45

1) Transmission: Same with the RS-232C

2) Pin

◆RJ-45 modular 8 pins

No	Singal	IN/OUT	Remark
1	N.C	-	None Connection
2	TxD	OUT	Transmit Data
3	RxD	IN	Receive Data
4	GND	-	Signal Ground
5	RTS	OUT	Printer Busy(the same with DTR)
6	CTS	IN	Host Busy
7	N.C	-	None Connection
8	Power	OUT	*1) +5Volt or +3.3Volt

```
┌─────────┐
│ |||||||| │
│ ╥╥╥╥ │
└─┘    └─┘
1           8
```
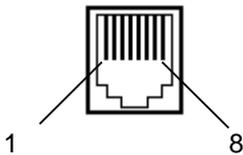
◆ DSUB 9 pins

No	Singal	IN/OUT	Remark
1	N.C	-	None Connection
2	TxD	OUT	Transmit Data
3	RxD	IN	Receive Data
4	N.C	-	None Connection
5	GND	-	Signal Ground
6	DTR	OUT	Printer Busy
7	CTS	IN	Host Busy
8	RTS	OUT	Printer Busy(Same with DTR)
9	Power	OUT	*1) +5Volt or +3.3Volt

*1) Option : JP1 short : +5Volt / JP2 short : +3.3Volt

Notice :   Please do not short JP1 and JP2 at the same time (simultaneously).

9) Example

◆RJ-45 modular 8 pins

Printer			Host (PC)	
Pin	Signal		Pin	Signal
2	TxD	→	2	RxD
3	RxD	←	3	TxD
5	RTS	→	8	CTS
6	CTS	←	7	RTS
4	GND	—	5	GND

◆DSUB-9 pins

Printer			Host (PC)	
Pin	Signal		Pin	Signal
2	TxD	→	2	RxD
3	RxD	←	3	TxD
8	RTS	● →	8	CTS
7	CTS	←	7	RTS
5	GND	—	5	GND
6	DTR	● →	6	DSR
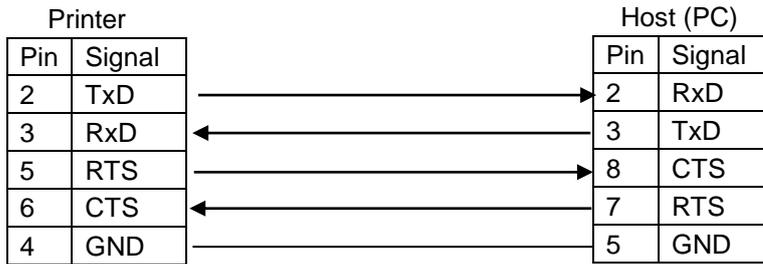
·············· : It is connected inside the printer.

3-2-3) USB

1) Standard   : USB 2.0 compatible, Full Speed(12Mb), High Speed(480Mb)
2) Connector   : Type B
3) Cable   : USB2.0 standard cable
4) Data   : Bulk IN, Bulk OUT
   ● Bulk IN   : End point 6,
   ● Bulk OUT   : End point 2
   ● Full Speed   : Max Packet Size 64 Byte(Bulk OUT),64 Byte(Bulk IN)
   ● High Speed   : Max Packet Size 512 Byte(Bulk OUT),512 Byte(Bulk IN)

Notice : The Full Speed, or the High Speed is set up automatically by communicating with host.

5) Pin

No	Signal	IN/OUT	Remark
1	VBus	-	
2	D-	IN/OUT	
3	D+	IN/OUT	
4	GND	-	Signal GND

4. Cash drawer / Melody

4-1) Cash drawer

1) Rating
- ◆ Output voltage : 24V
- ◆ Output current : 1A(Max)
- ◆ Resistance coil : More than 24 Ω

Notice : Please use the resistance coil of Solenoid more than 24Ω.
Please do not use the resistance coil less than 24Ω. It will damage the transistor.

2) Circuit
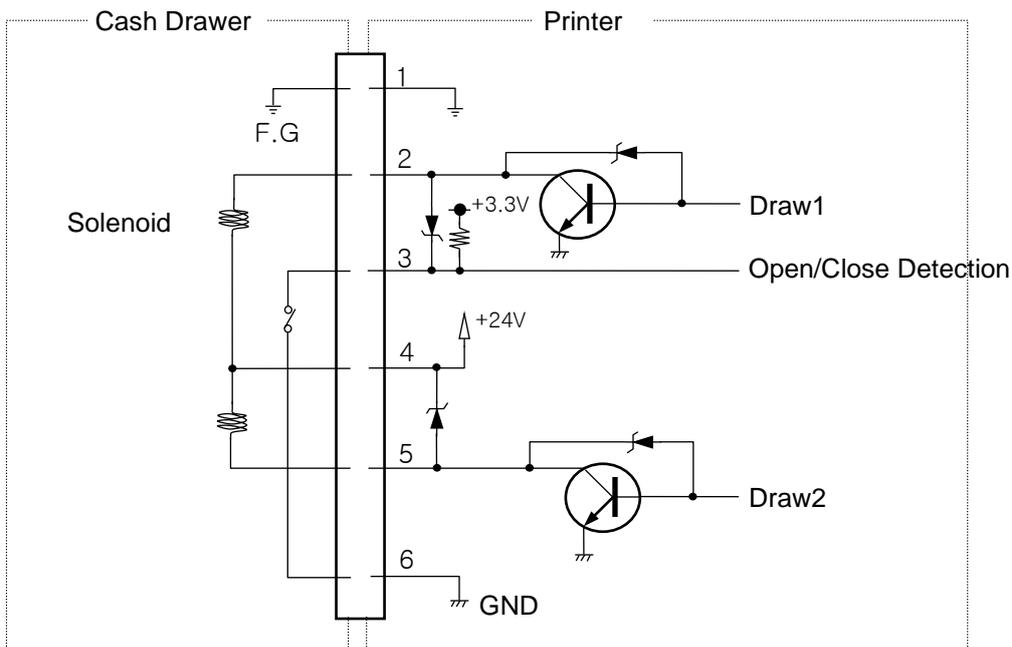
Notice : You can use one of pin 2, or pin 5.
The detection of Open / Close switch will be invalid.

3) Connection :
Please connect the cash drawer into the connector as below.
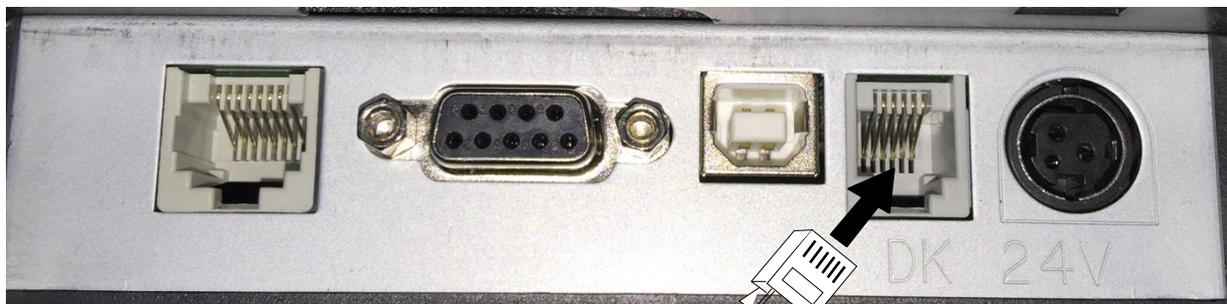
Notice : Please do not connect the model / the cable into the connector RJ45.
It could damage the printer.

4) Pin (RJ-45 modular 6 pins)

No	Signal	IN/OUT	Remark
1	FG	-	Frame Ground
2	Kick A	OUT	Operation Singal A
3	Open/Close	IN	Open/Close detection
4	+24V	-	+24 Volt
5	Kick B	OUT	Operation Singal B
6	GND	-	Signal Ground

1   6
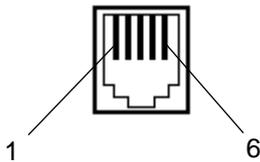
5) Operation :

If you use the command ESC + p + m + t1 + t2 command, or DLE + DC4 + 1 + kick No + t,
You can let the cash drawer operate as much as you fix the pulse of time.
Please look at the command list of this manual.

4-2) Melody : You can connect with the melody box.

1) Connection :

You can connect the melody into the the connector as image below.
Because the connector as image below is to use the melody and the cash drawer together.
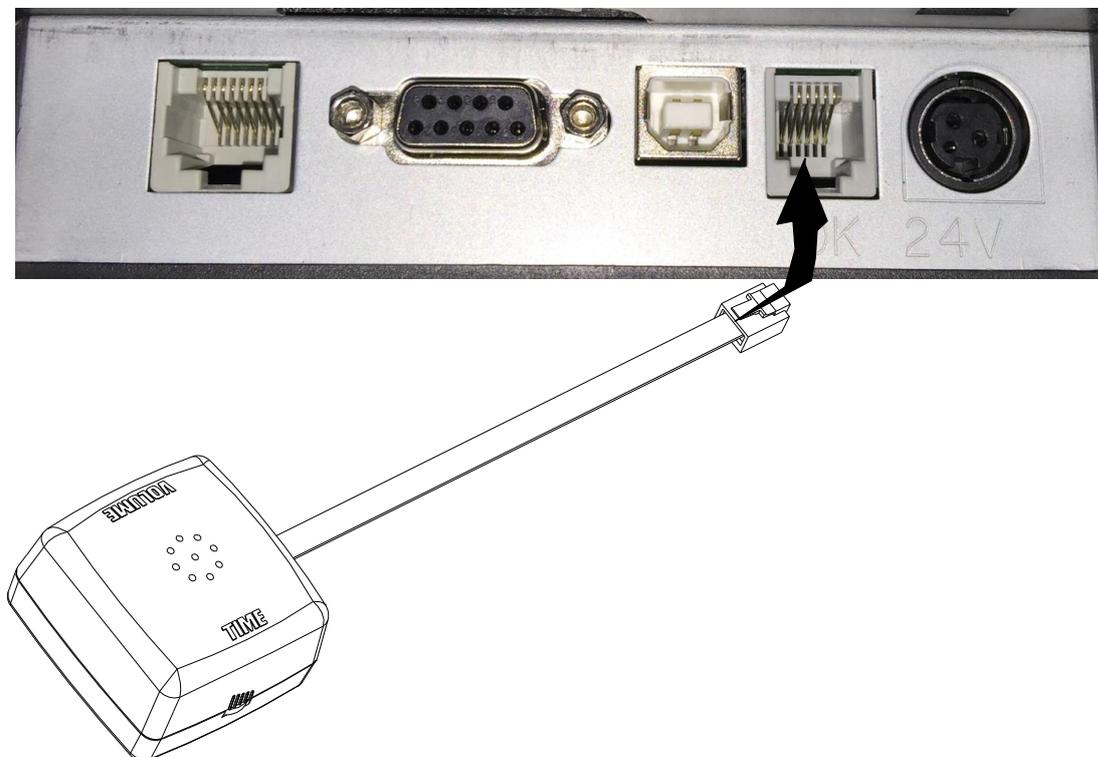
2) Pin

◈ At the side of Mainboard : The connector melody is used together the the connector cash drawer.
◈ At the side of Melody : It is connected with the printer, the cross cable.

No	Signal	IN/OUT	REMARK
1	GND	-	Signal Ground
2	Kick B	OUT	Operation B
3	+24V	-	+24 Volt
4	N.C	-	None Connection
5	N.C	-	None Connection
6	GND	-	Signal Ground

1   6
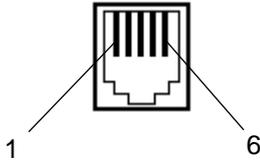
3) Play
◈Auto play : Refer to 2-6.

◈The play by the operation signal :
    It is the same signal with the command the cash drawer.
    With the command ESC + p + m + t1 + t2, or DLE + DC4 + 1 + kick No + t,
    It plays pulse at 5.

4) Volume
    You can control the melody time / the melody volume.
    You can control the melody time up to 25 seconds max.

5. Command

Command	Function	Page
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Command	Function	Page
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GS P	Pitch (Horizontal / Vertical)	55
GS *	Download Bit image definition	55
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SUB B	2D barcode	60
SUB z	Buzzer sound	61
SUB 1	Line 1 (Vertical, Horizontal)	61
SUB 2	Line 2 (Vertical, Horiztontal)	61
SUB W	Write (line data)	62
SUB C	Clear (line data)	62
SUB O	Line ON	62
SUB F	Line OFF	62
SUB P	Print line 1 dot line (Vertical, Horizontal)	62

CR

[Name]	Print and carriage return
[Format]	ASCII CR
	Hex 0Dh
	Decimal 13
[Range]	-
[Initial]	CR invalid.
[Description]	Same with LF. However, It will be only valid by command SUB+a+n.

LF

[Name]	Print and line feed
[Format]	ASCII LF
	Hex 0Ah
	Decimal 10
[Range]	-
[Description]	After printing the data, and it goes to return as much as it the fixed data.
[Caution]	The LF is ignored behind of CR

CAN

[Name]	Cancel the print data
[Format]	ASCII CAN
	Hex 18h
	Decimal 24
[Range]	-
[Description]	The data is deleted within the area of printing.

HT

[Name]	Horizontal tab
[Format]	ASCII HT
	Hex 09h
	Decimal 9
[Range]	-
[Description]	Moves the print position to the next tab poisition
[Caution]	The position of tab is fixed as ESC+'D'+n.

FF

[Name]	Print the page mode & Return to the standard mode
[Format]	ASCII FF
	Hex 0Ch
	Decimal 12
[Range]	-
[Description]	Print the data in the buffer and return to standard mode
[Caution]	Use the command ESC+FF , in order not to return the standard mode.
	The data is not deleted in the area of page.

[Name]	Extended graphic mode, and Korean mode		
[Format]	ASCII	SUB	x	n
	Hex	1A	78h	n
	Decimal	26	120	n

[Range]   0≤n≤1

[Initial]   n=0

[Description]   n=0 : Korean Mode, when the first code is A1h more, automatically transfer Korean in 2 bytes

n=1 : Extension Graphic Mode, Every code is setting in 1 byte

Extension Graphic font will be printed.

SUB+'p'+n

[Name]	Print the off-line a paper detection		
[Format]	ASCII	SUB	p	n
	Hex	1A	70h	n
	Decimal	26	112	n

[Range]   0≤n≤1

[Initial]   n=1

[Description]   n=0 : Detect the paper is not valid.

n=1 : Detect the paper is valid.

SUB+'b'+n

[Name]	Detect the black mark		
[Format]	ASCII	SUB	b	n
	Hex	1A	62h	n
	Decimal	26	98	n

[Range]   0≤n≤3

[Description]   n=0 : Feeding the flow direction till black mark is out.

n=1 : Feeding the flow direction till black mark is detected.

n=2 : Feeding the reverse direction till black mark is out.

n=3 : Feeding the reverse direction till black mark is detected.

[**Caution**]   The range of feeding is restricted within 30 centimeter.

When the range 30cm over is not detected, it detects the paper jam.

SUB+'R'+n

[Name]	Outline character (Tetragon)		
[Format]	ASCII	SUB	b	n
	Hex	1A	52h	n
	Decimal	26	82	n

[Range]   0≤n≤1

[Description]   n=0 : Cancel the outilne character (Tetragon).

n=1 : Set up the outline character (Tetragon).

[**Caution**]   The horizontal extension is valid as much as eight times.

The vertical extension is valid as much as two times.

[Name]	Speed		
[Format]	ASCII	SUB	s	n
	Hex	1A	73h	n
	Decimal	26	82	n
[Range]	1≤n≤14			
[Initial]	n=19			

[Descirpt]

n=1 : Printing Speed 70mm/s	n=11 : Printing Speed 170mm/s
n=2 : Printing Speed 80mm/s.	n=12 : Printing Speed 180mm/s
n=3 : Printing Speed 90mm/s	n=13 : Printing Speed 190mm/s
n=4 : Printing Speed 100mm/s	n=14 : Printing Speed 200mm/s
n=5 : Printing Speed 110mm/s	
n=6 : Printing Speed 120mm/s	
n=7 : Printing Speed 130mm/s	
n=8 : Printing Speed 140mm/s	
n=9 : Printing Speed 150mm/s	
n=10 : Printing Speed 160mm/s	

[**Caution**]   Please control the density, since that the low speed prints the density unclear.

[Name]	Horizontal tab position			
[Format]	ASCII	ESC	D	n1…nk NUL
	Hex	1B	44h	n1…nk 00
	Decimal	27	68	n1…nk 0
[Range]	1≤n≤255, 0≤k≤32			

[Description]   Set the horizontal tab position.

[**Caution**]   K means the whole tab a line.

From the line, or the left margin, it sets as much as the font width of FONT A (12 dots) x n.

[Name]	Spacing the character of ASCII.		
[Format]	ASCII	ESC	SP	n
	Hex	1B	20h	n
	Decimal	27	32	n
[Range]	0≤n≤127			
[Initial]	n=0			

[Description]   Set n x 0.141mm the right space of ASCII

[**Caution**]   The space of Korean sets FS+'S'+n.

[Name]   Font decoration
[Format]   ASCII   ESC   !   n
                Hex   1B   21h   n
                Decimal   27   33   n
[Range]   0≤n≤255
[Initial]   n=0
[Description]   It sets the font decoration in the same time.

Bit	Function	Hex	Decimal
0	0: Font 12x24, 24x24	00h	0
	1: Font 8x16, 16x16	01h	1
1	-	-	-
2	-	-	-
3	0: Cancel the highlight	00h	0
	1: Set the highlight	08h	8
4	0: Cancel the extension in Vertical	00h	0
	1: Set the extension in Vertical	10h	16
5	0: Cancel the extension in Horizontal	00h	0
	1: Set the extension in Horizontal	20h	32
6	-	-	-
7	0: Cancel the underline	00h	0
	1: Set the underline	80h	128

[Name]   Absolute position of printing
[Format]   ASCII   ESC $ nL   nH
                Hex   1B   24h   nL   nH
                Decimal   27   36   nL   nH
[Range]   0≤nL+nH×256≤65535, 0≤nL≤255, 0≤nH≤255
[Initial]   nL=0, nH=0
[Description]   Move the position from the space of left ending to (nL+nH×256)×0.141mm.
                Move the position into the space of left ending, if the area is over.

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ESC+'*'+m+nL+nH+d1+…+dk

[Name]   Bit image (vertical)

[Format]   ASCII   ESC   *   m   nL   nH   d1…dk
              Hex   1B   2Ah   m   nL   nH   d1…dk
              Decimal   27   42   m   nL   nH   d1…dk

[Range]   m=0,1,32,33
              1≤nL+nH×256≤1023, 0≤nL≤255, 0≤nH≤3, 0≤d≤255

[Description] As much as dot fix nL+nHx256, It prints from bit data to graphic data in Mode m.

m	Mode	Vertical dots	Horizontal dots	Number of data(k)
0	8dots single density	8	256	nL+nH×256
1	8dots double density	8	512	nL+nH×256
32	24dots single density	24	256	(nL+nH×256)×3
33	24dots double density	24	512	(nL+nH×256)×3

•8dots mode

Single density   Double density

•24dots mode

D1 D2 D3 D4 D5 D6 D7 D8 D9   MSB   Once   Twice →   Once   Once →

                                        LSB

D1	D4	D7
D2	D5	D8
D3	D6	D9

Single Density   Double Density
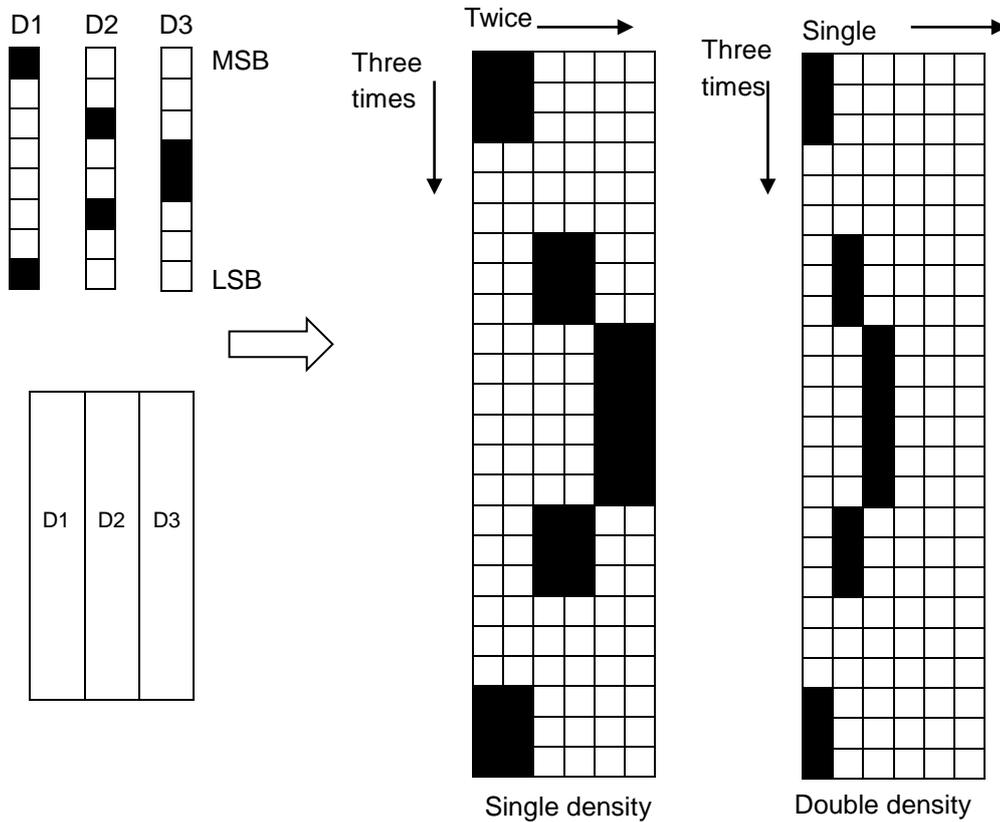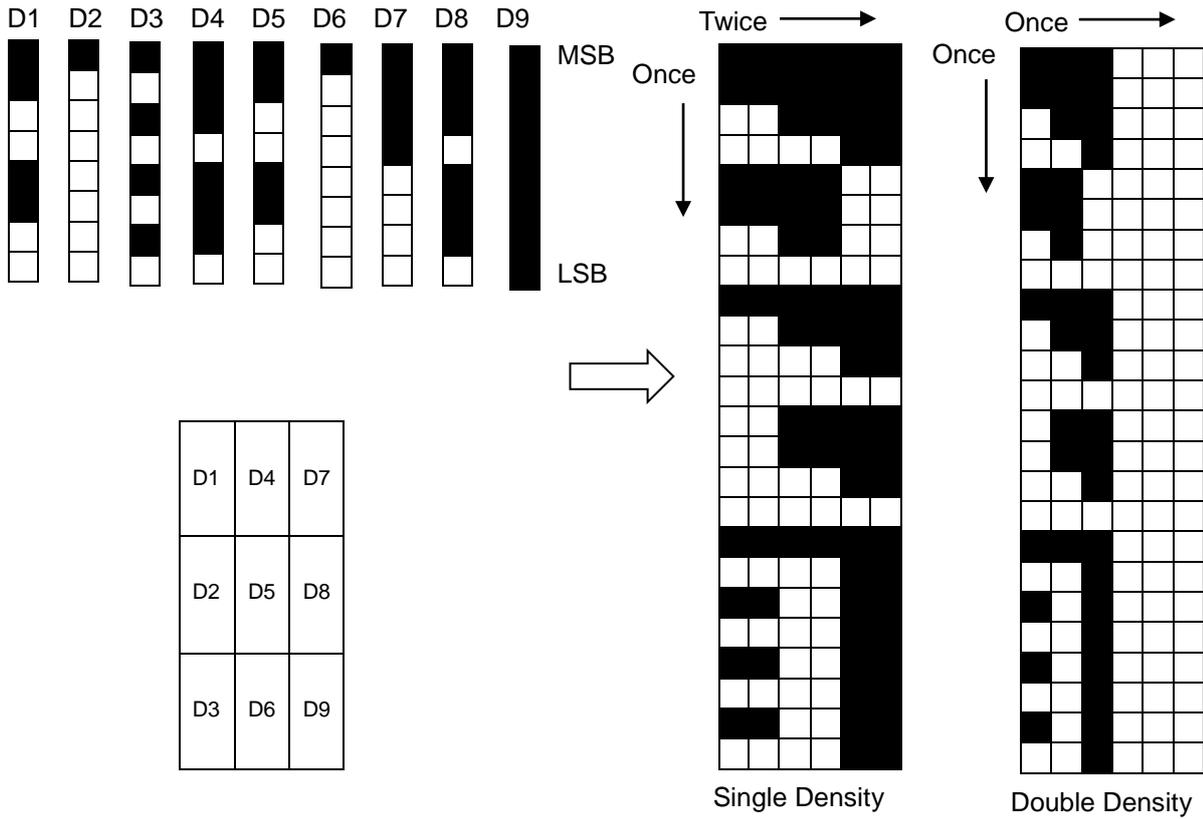
ESC+'-'+n

[Name]   Underline the character
[Format]   ASCII   ESC   -   n
                Hex   1B   2Dh   n
                Decimal   27   45   n
[Range]   0≤n≤7, 48≤n≤55,
[Initial]   n=0,
[Description]   Underline / Cancel.

n	Format
0, 48	Cancel
1, 49	Underline 1 dot
2, 50	Underline 2 dots
3, 51	Underline 3 dots
4, 52	Underline 4 dots
5, 53	Underline 5 dots
6, 54	Underline 6 dots
7, 55	Underline 7 dots

[Name]	Initial row pitch		
[Format]	ASCII	ESC	2
	Hex	1B	32h
	Decimal	27	50
[Initial]	Initial row pitch (30dots)		
[Description]	It sets 30dots the initial row pitch.		

[Name]	Row pitch			
[Format]	ASCII	ESC	3	n
	Hex	1B	33h	n
	Decimal	27	51	n
[Range]	0≤n≤255			
[Initial]	n=0			
[Description]	It sets n/2 the row pitch.			

[Name]	Printer reset		
[Format]	ASCII	ESC	@
	Hex	1B	40h
	Decimal	27	64
[Description]	Clear the buffer, and Initialize all parameter.		

[Name]	Emphasize			
[Format]	ASCII	ESC	E	n
	Hex	1B	45h	n
	Decimal	27	69	n
[Range]	0≤n≤255,			
[Initial]	n=0			
[Description]	The Bit zero (0) of n LSB (low rank), cancel the emphasize.			
	The Bit one (1) of n LSB (low rank), emphasize.			

[Name]	Double			
[Format]	ASCII	ESC	G	n
	Hex	1B	47h	n
	Decimal	27	71	n
[Range]	0≤n≤255,			
[Initial]	n=0			
[Description]	The Bit zero (0) of n LSB (low rank), cancel the double.			
	The Bit one (1) of n LSB (low rank), set the double.			

[Name]	Feed			
[Format]	ASCII	ESC	J	n
	Hex	1B	4Ah	n
	Decimal	27	74	n
[Range]	0≤n≤255			
[Description]	Feed n x 0.141mm, after the data printed in the buffer.			

[Name]	Font (ASCII)		
[Format]	ASCII	ESC	M	n
	Hex	1B	4Dh	n
	Decimal	27	77	n
[Range]	0≤n≤1		
[Initial]	n=0		
[Description]	Set the font		

n	Font
0	FONT A(12x24)
1	FONT B(9x16)

n			
Upper 4 bits (1 byte font)		Upper 4 bits (1 byte font)	
0000	0000	0000	0000
0001	0001	0001	0001
0010	0010	0010	0010
0011	0011	0011	0011

Notice : If you use the program 'memory switch setting utility' to set up the memory switch, you don't
need these commands above. You are able to choose one of these fonts above.
Please read the 'memory switch' at this manual.

[Name]	International character			
[Format]	ASCII	ESC	R	n
	Hex	1B	52h	n
	Decimal	27	82	n
[Range]	0≤n≤13			
[Initial]	n=13			
[Description]	The international character is following as :			

n	Country
0	United States
1	France
2	Germany
3	U.K
4	Denmark 1
5	Sweden
6	Italy
7	Spain 1
8	Japan
9	Norway
10	Denmark 2
11	Spain 2
12	Latin America
13	Korea

[Name]	Align the printing			
[Format]	ASCII	ESC	a	n
	Hex	1B	61h	n
	Decimal	27	97	n
[Range]	0≤n≤2, 48≤n≤50			
[Initial]	n=0			
[Description]	Align the position of printing			

n	Position	
0, 48	Left	
1, 49	Center	
2, 50		Right

[Name]	Printing and row FEED			
[Format]	ASCII	ESC	d	n
	Hex	1B	64h	n
	Decimal	27	100	n
[Range]	0≤n≤255			
[Description]	Print, and Feed n			

ESC+'{'+n

[Name]	180°rotation			
[Format]	ASCII	ESC	d	n
	Hex	1B	7Bh	n
	Decimal	27	123	n
[Range]	0≤n≤255			
[Initial]	n=0			
[Description]	The Bit zero (0) of n LSB (low rank), cancel the rotation (180 degree).			
	The Bit one (1) of n LSB (low rank), set the rotation (180 degree).			
[Caution]	The reference point should move from left to right.			

n low rank	Format
0	Cancel
1	Set

ESC+'i'

[Name]	Full cut		
[Format]	ASCII	ESC	i
	Hex	1B	69h
	Decimal	27	105
[Description]	Full cut		

ESC+'m'

[Name]	Partial cut		
[Format]	ASCII	ESC	i
	Hex	1B	6Dh
	Decimal	27	109
[Description]	Partial cut		

[Name]	International code page			
[Format]	ASCII	ESC	t	n
	Hex	1B	74h	n
	Decimal	27	116	n
[Range]	0≤n≤8			
[Initial]	n=0			
[Description]	The code page is refered with the following table.			
[Caution]	By the command FS +"."			
	Set 1 byte as valid, / Set 2 bytes as invalid.			

n	Code Page
0	PC437(US)
1	KANA(JAPAN)
2	PC850(Multilingual)
3	PC860(Portugal),
4	PC863(Canadian-French)
5	PC865(Nordic)
14	Windows1250(Poland)
15	Windows1251
16	Windows1252
17	PC866(Cyllic #2)
22	PC864(Arabic)

[Name]	Download character set			
[Format]	ASCII	ESC	%	n
	Hex	1B	25h	n
	Decimal	27	37	n
[Range]	0≤n≤255			
[Initial]	n=0			
[Description]	The Bit zero (0) of n LSB (low rank), cancel the download character set by ESC+&			
[Description]	The Bit one (1) of n LSB (low rank), set the download character set by ESC+&			

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ESC+'&'+y+c1+c2+[X1 d1….d(y x X1)]…[Xk d1…d(y x Xk)]

[Name]   Download character set (Definition / Register)

[Format]   ASCII   ESC   %   y c1 c2 X1 d1…d(y x X1)…Xk d1…d(y x Xk)
                Hex   1B   26h y c1 c2 X1 d1…d(y x X1)…Xk d1…d(y x Xk)
                Decimal   27   38 y c1 c2 X1 d1…d(y x X1)…Xk d1…d(y x Xk)

[Range]   y=3(FONT A(12x24)
                y=2(FONT B(9x16)
                $32 \leq c1 \leq c2 \leq 126$
                $0 \leq X \leq 12$ (FONT A(12x24))
                $0 \leq X \leq 9$ (FONT B(9x16))
                $0 \leq d \leq 255$
                k=c2-c1+1(the number of character)

[Description]   y is the number of byte of vertical.
                c1 is a code the start of definition.
                c2 is a code the finish of definition.
                x is a number of dots (horizontal).
                d is a pattern of definition.

ESC+'p'+n+t1+t2

[Name]   Cash drawer & Melody box
[Format]   ASCII   ESC   p   n   t1   t2
                Hex   1Bh   70h   n   t1   t2
                Decimal   27   112   n   t1   t2
[Range]   n=0,1,48,49, $0 \leq t1 \leq 255$, $0 \leq t2 \leq 255$
[Description]   According to n, you can set up ON of the cash drawer and the melody box
                for the time (t1 x 2ms), and set up OFF (t2 x 2ms).
                t1 :   (t1 x 2ms) operation for the time ON.
                t2 :   (t2 x 2ms) operation for the time OFF.

n	Function
0,48	Choose Cash drawer 1 (Connector 2)
1,49	Choose Cash drawer 2, or Melody box (Connector 5)

[**Caution**]   If it is t1 > t2 (ON > OFF), t2 extends as long as t1.
                To avoid heating the electric parts,
                it is recommended t1 operates shortly as you can.

                When the melody box operates, please choose the cash drawer 2.
                (connector 5, n=1 or 49).

ESC+'S'

[Name]	Standard mode / Clear the area of page
[Format]	ASCII ESC S
	Hex 1B 53h
	Decimal 27 83
[Description]	It changes to the standard mode, and clear the area of page.

ESC+'L'

[Name]	Page mode
[Format]	ASCII ESC L
	Hex 1B 4Ch
	Decimal 27 76
[Description]	It changes from standard mode to page mode.

[Name]	Page mode (Direction of printing)		
[Format]	ASCII	ESC	T	n

[Name]   Page mode (Direction of printing)
[Format]   ASCII   ESC   T   n
             Hex   1B   54h   n
             Decimal   27   84   n
[Range]   0≤n≤3
[Initial]   n=0
[Description]   Set up the direction of page mode.

•n=0 (Left→Right),

ABCD

Feeding

•n=1 (Lower→Upper),

ABCD

Feeding

•n=2(Right→Left),

ABCD

Feeding

•n=3(Upper→Lower),

ABCD

Feeding

[Name]	Page mode (Area of printing)									
[Format]	ASCII	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH
	Hex	1B	57h	xL	xH	yL	yH	dxL	dxH	dyL	dyH
	Decimal	27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH

[Range] $0 \le xL+(xH \times 256) \le 65535$ $(0 \le xL \le 255, 0 \le xL \le 255)$
            $0 \le yL+(yH \times 256) \le 65535$ $(0 \le yL \le 255, 0 \le yL \le 255)$
            $1 \le dxL+(dxH \times 256) \le 65535$ $(0 \le dxL \le 255, 0 \le dxL \le 255)$
            $1 \le dyL+(dyH \times 256) \le 65535$ $(0 \le dyL \le 255, 0 \le dyL \le 255)$

[Initial] $(xL+(xH \times 256))=0$ (0mm, xL=0, xH=0)
 $(yL+(yH \times 256))=0$ (0mm, yL=0, yH=0)
            $(dxL+(dxH \times 256))$Max=512 (72mm, dxL=00h, dxH=02h)
            $(dyL+(dyH \times 256))$Max=710 (100mm, dyL=C6h, dyH=02h)

[Description]   Set up the start point of printing area, and the size
                Start with Horizontal : $(xL+(xH \times 256))$ x 0.141mm
                Start with Vertical   : $(yL+(yH \times 256))$ x 0.141mm
                Size of Horizontal : $(dxL+(dxH \times 256))$ x 0.141mm
                Size of Vertical : $(dyL+(dyH \times 256))$ x 0.141mm

[**Caution**]   The maximum paper width is 72mm.
                The maximum paper length is 100mm.

                In case the vertical extension of character, and barcode, graphic data,
                If the height of printing is over against the reference point (24dots),
                please move the reference point (height of printing -24) by the command LF.

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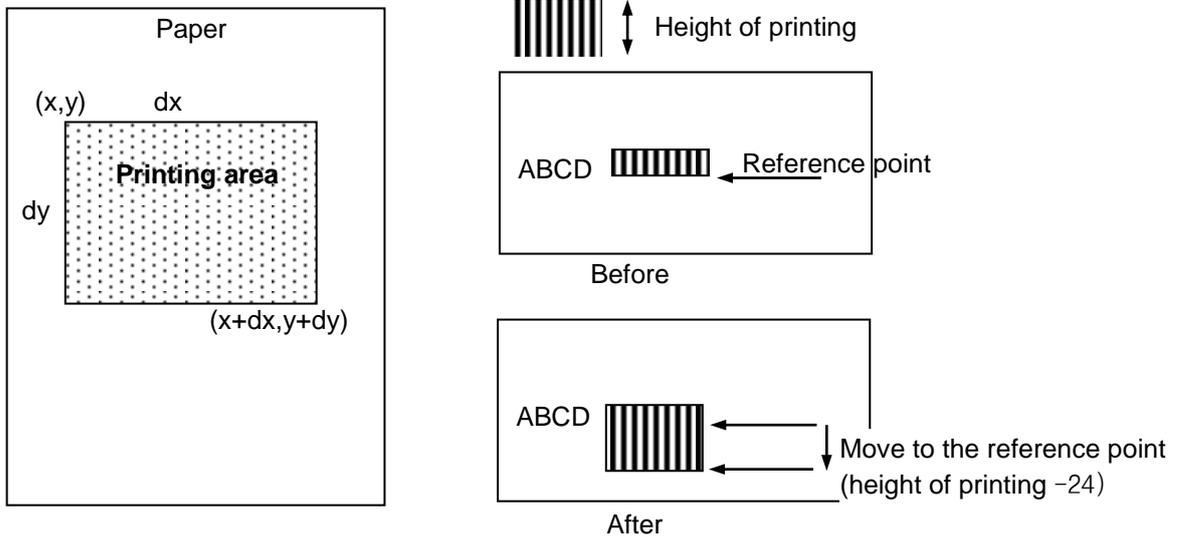
[Name]	Printing of page area		
[Format]	ASCII	ESC	FF
	Hex	1Bh	0Ch
	Decimal	27	12
[Description]	Edit the printing of page area the receipt of data.		
	Print the page area in the same time.		

[**Caution**]   Please use the command ESC+S to clear,because the data remains at the page area.

FS+'!'+n

[Name]	Korean font decoration			
[Format]	ASCII	FS	!	n
	Hex	1C	21h	n
	Decimal	28	33	n
[Range]	0≤n≤255			
[Initial]	n=0			
[Description]	Korean font decoration in the same time.			
[**Caution**]	It is limited Korean font only.			

Bit	Format	Hex	Decimal
0	-	00h	0
1	-	00h	0
2	Cancel Horizontal extension	00h	0
	Set Horizontal extension	04h	4
3	Cancel Vertical extension	00h	0
	Set Vertical extension	08h	8
4	-	00h	0
5	-	00h	0
6	-	00h	0
7	Cancel the underline	00h	0
	Set the underline	80h	128

FS+'&'

[Name]	Korean mode of extended graphic mode set up (2Bytes)	
[Format]	ASCII	FS	&
	Hex	1C	26h
	Decimal	28	38
[Description]	Set up the Koran mode (2Byte).	
[**Caution**]	It is necessary for Korean, when it is the extended graphic mode to set up.	
	Korean mode is automatically recognized, it is not necessary to set up.	
	Please refer to the command SUB+'x'+n.	

[Name]	Korean mode of extended graphic mode cancel (2Bytes)
[Format]	ASCII FS .
	Hex 1C 2Eh
	Decimal 28 46
[Description]	Cancel the Korean mode (2Bytes).

[**Caution**]   It is necessary for Korean, when it is the extended graphic mode to cancel.
Korean mode is automatically recognized, it is not necessary to set up.
Please refer to the command SUB+'x'+n.

[Name]	Underline Korean
[Format]	ASCII FS - n
	Hex 1C 2Dh n
	Decimal 28 45 n
[Range]	0≤n≤7, 48≤n≤55
[Initial]	n=0
[Description]	Underline Korean

n	Format
0, 48	Cancel the underline Korean.
1, 49	Underline 1 dot Korean.
2, 50	Underline 2 dots Korean.
3, 51	Underline 3 dots Korean.
4, 52	Underline 4 dots Korean.
5, 53	Underline 5 dots Korean.
6, 54	Underline 6 dots Korean.
7, 55	Underline 7 dots Korean.

|	
[Name]	Space Korean
[Format]	ASCII FS S n1 n2
	Hex 1C 53h n1 n2
	Decimal 28 83 n1 n2
[Range]	0≤n1≤255, 0≤n2≤255
[Initial]	n=0
[Description]	Set up the space of Korean.
	Set up the left space of Korean n1 x 0.141mm.
	Set up the right space of Korean n2 x0.141mm.

[Name]	Size Korean			
[Format]	ASCII	FS	W	n
	Hex	1C	57h	n
	Decimal	28	87	n
[Range]	0≤n1≤255			
[Initial]	n=0			
[Descripion]	Size twice horizontal, Size twice vertical.			

The Bit zero (0) of n LSB (low rank), size twice horizontal, size twice vertical to cancel.
The Bit one (1) of n LSB (low rank), size twice horizontal, size twice vertical to set up.

FS+'q'+n+(xL+xH+yL+yH+d1…dk)1……+(xL+xH+yL+yH+d1…dk)n

[Name]	Register Non Volatile logo (bit image)			
[Format]	ASCII	FS	q	n (xL xH yL yH d1..dk)1…(xL xH yL yH d1..dk)n
	Hex	1C	71h	n (xL xH yL yH d1..dk)1…(xL xH yL yH d1..dk)n
	Decimal	28	113	n (xL xH yL yH d1..dk)1…(xL xH yL yH d1..dk)n

[Range]
1≤n≤255
$0 \le xL+xH \times 256 \le 65535$ ($0 \le xL \le 255$, $0 \le xH \le 255$),number of horizontal byte
$0 \le yL+yH \times 256 \le 65535$ ($0 \le yL \le 255$, $0 \le yH \le 255$),number of vertical byte
$0 \le d \le 255$
$k=(xL+xH \times 256) \times (yL+yH \times 256) \times 8$
You can register the capacity up to 64kbytes.)

[Description]
It registers the logo (bit image) at the non volatile memory.
n is a total number of NV logo.
xL,xH means $(xL+xH \times 256) \times 8$ of horizontal dots.
yL,yH means $(xL+xH \times 256) \times 8$ of vertical dots.
k means the number of bit for one NV logo.

[**Caution**]
You can register the kinds of NV logo as much as you don't exceed the capacity (64kbytes).
However, you have to register again, after you remove all of registers you already had.
You can register / remove 100,000 cycles, however, we don't recommend it is very often,
because of memory damage.
Notice : You can register the logo very easy, if you use the program we provide.

<Register image >

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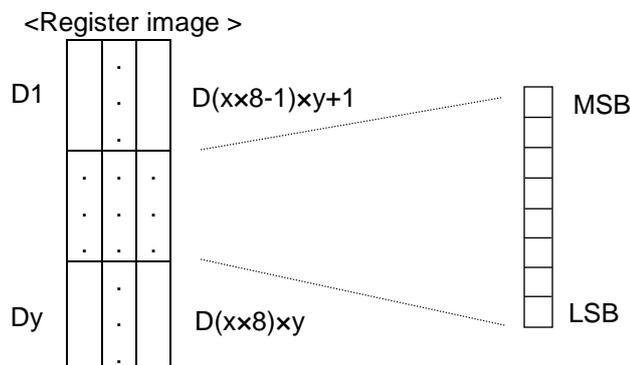
FS+'p'+n+m

[Name]	Non Volatile logo printer			
[Format]	ASCII	FS	p	n	m

[Format]	ASCII	FS	p	n	m
	Hex	1C	70h	n	m
	Decimal	28	112	n	m

[Range]   1≤n≤255, 0≤m≤3, 48≤m≤51
[Initial]   n=0
[Description]   'n' means it is a logo you have registered in 'n'.
                        m means it prints you have registered the mode of 'm'.

m	Printing mode
0, 48	STANDARD
1, 49	Horizontal extension
2, 50	Vertical extension
3, 51	Horizontal/ Vertical extension in the same time

GS+'!'+n

[Name]	Extension of character			
[Format]	ASCII	GS	!	n
	Hex	1D	21h	n
	Decimal	29	33	n

[Rnage]   0≤n1≤255   (The portion of horizontal / vertical is limited 8 maximum.)
[Initial]   n=0
[Description]   It sets the portion of extension.
[**Caution**]   Calculate the numbers of two as belows, if the horizontal, and the vertical is extended in the same time. ex) horiziontal 3 times, vertical 3 times : n=32+2=34

Bit	Function
0-3	Set the extension in vertical.
4-7	Set the extension in horizontal.

	Horizontal				Vertical	
n(Hex)	n(Decimal)	Portion		n(Hex)	n(DecimaL)	Portion
00h	0	Once		00h	0	Once
10h	16	Twice		01h	1	Twice
20h	32	Three		02h	2	Three
30h	48	Four		03h	3	Four
40h	64	Five		04h	4	Five
50h	80	Six		05h	5	Six
60h	96	Seven		06h	6	Seven
70h	112	Eight		07h	7	Eight

GS+'('+'K'+pL+pH+fn+m (fn=49)

[Name]	Density of printing						
[Format]	ASCII	GS	(	K	pL	pH	fn	m
	Hex	1D	28h	4Bh	pL	pH	fn	m
	Decimal	29	40	75	pL	pH	fn	m
[Range]	pL=2, pH=0, fn=49							
	0≤m≤5, 251≤m≤255							
[Initial]	m=0							
[Description]	It sets the density of printing.							

m	Density	m	Density
-	-	0	Standard
251	Level –5	1	Level +1
252	Level –4	2	Level +2
253	Level –3	3	Level +3
254	Level –2	4	Level +4
255	Level –1	5	Level +5

GS+'B'+n

[Name]	Reverse printing in black / white		
[Format]	ASCII	GS	B	n
	Hex	1D	42h	n
	Decimal	29	66	n
[Range]	0≤n≤255			
[Initial]	n=0			
[Description]	Reverse printing in black / white.			
	The Bit zero (0) of n LSB (low rank), It is a standard.			
	The Bit one (1) of n LSB (low rank), It is a reverse printing in black / white.			

GS+'H'+n

[Name]	Barcode (Printing at the barcode)		
[Format]	ASCII	GS	H	n
	Hex	1D	48h	n
	Decimal	29	72	n
[Range]	0≤n≤3, 48≤n≤51			
[Initial]	n=0			
[Description]	It prints at the position of barcodes.			

n	Printing at the barcode
0, 48	No printing
1, 49	It prints at the barcode above.
2, 50	It prints at the barcode below.
3, 51	It prints at the barcode both above and below.

[Name]	Font of Barcode HRI
[Format]	ASCII GS f n
	Hex 1D 66h n
	Decimal 29 102 n
[Range]	0≤n≤1, 48≤n≤49
[Initial]	n=0
[Description]	It provides the font of barcode HRI.

n	Font
0,48	FONT A (12x24)
1,49	FONT B (9x16)

[Name]	Left space
[Format]	ASCII GS L nL nH
	Hex 1D 4Ch nL nH
	Decimal 29 76 nL nH
[Range]	0≤nL≤255, 0≤nH≤255
[Initial]	nL+nH×256 = 0 (nL=0, nH=0)
[Description]	The left space sets up (nL+nH×256)×0.141mm.

[Name]	Cutting (Full / Partial)
[Format]	ASCII GS V m
	Hex 1D 56h m
	Decimal 29 86 m
[Range]	0≤m≤1
[Initial]	m=0
[Description]	It cuts full, or partial.

m	Function
0, 48	Full
1, 49	Partial

[Name]	Cutting (Full / Partial)
[Format]	ASCII GS V m n
	Hex 1D 56h m n
	Decimal 29 86 m n
[Range]	0≤m≤1
[Initial]	m=0
[Description]	It cuts the paper n x pitch.

m	Function
65	It cuts full the paper n x pitch by the command GS+P+n1+n2.
66	It cuts partial the paper n x pitch by the command GS+P+n1+n2.

[**Caution**]   Please set up the pitch by the command GS+P+n1+n2.
   The factory pitch is 360 DPI(0.07mm).

[Name]	Area of printing
[Format]	ASCII GS W nL nH
	Hex 1D 57h nL nH
	Decimal 29 87 nL nH
[Range]	0≤nL≤255, 0≤nH≤255
[Initial]	nL+nH×256 = 512(72mm)
[Description]	The area of printing sets up (nL+nH×256)×0.141mm from the left space.

Printing area

Left Margin   Printing area width
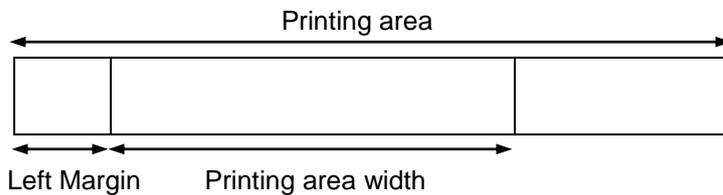
[Name]	Barcode (Height)
[Format]	ASCII GS h n
	Hex 1D 68h n
	Decimal 29 104 n
[Range]	1≤n≤255
[Initial]	n=162 (22.8mm)
[Description]	It sets up the height of barcode n×0.141mm.

[Name]	Barcode (printing)

[Format]

	ASCII	GS	k	m	d1…dn	NUL
	Hex	1D	6Bh	m	d1…dn	00h
	Decimal	29	107	m	d1…dn	0

[Range]   0≤m≤8, n, Please look at the table of d.

[Description]   It prints the barcode.

[**Caution**]   It knows the end of barcode by NULL.

m	Barcode	n (number of barcode)	d (barcode data)
0	UPCA	n=11 (check digit is automatically added.)	48≤d≤57
1	UPC-E	n=7 (check digit is automatically added.)	48≤d≤57
2	EAN13	n=12 (check digit is automatically added.)	48≤d≤57
3	EAN8	n=7 (check digit is automatically added.)	48≤d≤57
4	CODE39	1≤n (Start & Stop characteres is automatically added.)	48≤d≤57, 65≤d≤90 d=32,36,37,43,45,46,47
5	ITF(I of 2/5)	1≤n (even number)	48≤d≤57
6	CODABAR	1≤n	48≤d≤57, 65≤d≤68 d=36,43,45,46,47,58
7	CODE93	1≤n	0≤d≤127
8	CODE128	2≤n≤255(Check digit , Stop character Is automatically added)	0≤d≤127

[**Caution**]   To know CODE128, Please start with character as below.

CODE128	Character	Example
CODE A	g	"gABCD"
CODE B	h	"hABCD"
CODE C	i	"iABCD"

If it is CODE C, the data should be an even number.

If it is an odd number, 0 (zero) will be added.

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GS+'k'+m+n+d1…dn

[Name]   Barcode Printing
[Format]   ASCII   GS   k   m   n   d1…dn NUL
                Hex   1D   6Bh   m   n   d1…dn 00h
                Decimal   29   107   m   n   d1…dn 0
[Range]   65≤m≤73,   n is the number of barcode.
                           d is dependent on the barcode as the table below.
[Description]   It prints the barcode.

m	Barcode	n (number of barcode)	d (barcode data)
65	UPCA	n=11 (check digit is automatically added.)	48≤d≤57
66	UPC-E	n=7 (check digit is automatically added.)	48≤d≤57
67	EAN13	n=12 (check digit is automatically added.)	48≤d≤57
68	EAN8	n=7 (check digit is automatically added.)	48≤d≤57
69	CODE39	1≤n (Start & Stop characteres is automatically added.)	48≤d≤57, 65≤d≤90 d=32,36,37,43,45,46,47
70	ITF(I of 2/5)	1≤n (Even number only)	48≤d≤57
71	CODABAR	1≤n	48≤d≤57, 65≤d≤68 d=36,43,45,46,47,58
72	CODE93	1≤n	0≤d≤127
73	CODE128	2≤n≤255 (Check digit , Stop character Is automatically added)	0≤d≤127

[**Caution**]   To know CODE128, Please start with character as below.

CODE128	Start with Character	Example
CODE A	g or {A	"gABCD" or "{AABCD"
CODE B	h or {B	"hABCD" or "{BABCD"
CODE C	i or {C	"iABCD" or "{CABCD"

If it is CODE C, the data should be an even number.
If it is an odd number, 0 (zero) will be added.

[Name]	Barcode (Extension / Reduction)		
[Format]	ASCII	GS	w	n
	Hex	1D	77h	n
	Decimal	29	119	n
[Range]	1≤n≤4		
[Initial]	n=2		
[Description]	It sets up the barcode the horizontal size.		

n	Multi level barcode Module width	2 level barcode	
		Narrow	Wide
1	2 dots	1 dot	3 dots
2	3 dots	2 dots	5 dots
3	4 dots	3 dots	8 dots
4	5 dots	4 dots	10 dots

* Multi Level barcode : UPCA, UPC-E, EAN13, EAN8, CODE93, CODE128
* 2 level barcode : CODE39, ITF, CODABAR

[Name]	Status check			
[Format]	ASCII	GS	r	n
	Hex	1D	72h	n
	Decimal	29	114	n
[Range]	n=1,2,49,50			
[Description]	It transmits the status check.			
[**Caution**]	You can't use this command, when it is offline.			
	You can't use this command, when the buffer is full.			
	Please use the command the real time (DLE+EOT+n).			
	Please use the command if the interface is rs232c only.			
	Please refer to the table below about the status of parallel, and the usb.			

<RS232C,2 bytes>

n=1 or 49

bit	Status	Hex	Decimal
0	0 : Paper enough	00h	0
	1 : Paper necessary	01h	
1	0 : Paper enough	00h	0
	1 : Paper necessary	02h	2
2	0 : Paper remain	00h	0
	1 : Paper empty	04h	4
3	0 : Paper remain	00h	0
	1 : Paper empty	08h	8
4	Reserved	00h	0
5	Reserved	00h	0
6	Reserved	00h	0
7	Reserved	00h	0

n=2 or 50

bit	Status	Hex	Decimal
0	0 : cash drawer switch LOW	00h	0
	1 : cash drawer switch HIGH	01h	1
1	Reserved	00h	0
2	Reserved	00h	0
3	Reserved	00h	0
4	Reserved	00h	0
5	Reserved	00h	0
6	Reserved	00h	0
7	Reserved	00h	0

< USB, 1 byte>

bit	Status	Hex	Decimal
0	0 : Paper remain	00h	0
	1 : Paper empty	01h	1
1	0 : Cover close	00h	0
	1 : Cover open	02h	2
2	0 (not use)	00h	0
3	0 : Paper enough	00h	0
	1 : Paper necessary	08h	8
4	0 (not use)	00h	0
5	0 : No cutter error	00h	0
	1 : Cutter error	20h	32
6	0 (not use)	00h	0
7	0 (not use)	00h	0

[Name]	Status check (Auto reply)
[Format]	ASCII GS a n
	Hex 1D 61h n
	Decimal 29 97 n
[Range]	0≤n≤2, 48≤n≤50,
[Initial]	n=0 or 48, The auto reply of status check is not set up, when we provide.

[Description]   It sets up the status check automatically.

It transmits 4 bytes automatically, when you do the status check, and the status is changed.

[**Caution**]   Please use the command if the interface is rs232c only.

Please refer to the table below about the status of parallel, and the usb.

n	Function
0,48	Cancel
1,49	Set up
2,50	Set up

<RS232C, 4 bytes>

① First byte

Bit	Status	Hex	Decimal
0	Fixed	00h	0
1	Fixed	00h	0
2	0 : Cash drawer 3th pin = LOW	00h	0
	1 : Cash drawer 3th pin = HIGH	04h	4
3	0 : Online	00h	0
	1 : Offline	08h	8
4	Fixed	10h	16
5	0 : Cover close	00h	0
	1 : Cover open	20h	32
6	Fixed	00h	0
7	Fixed	00h	0

② Second byte

Bit	Status	Hex	Decimal
0	0 : Online	00h	0
	1 : Offline	01h	1
1	Fixed	00h	0
2	0 : No error	00h	0
	1 : Error	04h	4
3	0 : No error (Auto cutter)	00h	0
	1 : Error (Auto cutter)	08h	8
4	Fixed	00h	0
5	0 : No error	00h	0
	1 : Error	20h	32
6	0 : No error	00h	0
	1 : Error	40h	64
7	Fixed	00h	0

③ Third byte

Bit	Status	Hex	Decimal
0	0 : Paper enough	00h	0
	1 : Paper necessary	01h	1
1	0 : Paper enough	00h	0
	1 : Paper necessary	02h	2
2	0 : Paper remain	00h	0
	1 : Paper empty	04h	4
3	0 : Paper remain	00h	0
	1 : Paper empty	08h	8
4	Fixed	00h	0
5	Fixed	00h	0
6	Fixed	00h	0
7	Fixed	00h	0

④ Fourth byte

Bit	Status	Hex	Decimal
0	Reserved	01h	1
1	Reserved	02h	2
2	Reserved	04h	4
3	Reserved	08h	8
4	Fixed	00h	0
5	Fixed	00h	0
6	Fixed	00h	0
7	Fixed	00h	0

< USB 1 byte>

Bit	Status	Hex	Decimal
0	0 : Paper remain	00h	0
	1 : Paper empty	01h	1
1	0 : Cover close	00h	0
	1 : Cover open	02h	2
2	0 (Not use)	00h	0
3	0 : Paper enough	00h	0
	1 : Paper necessary	08h	8
4	0 (Not use)	00h	0
5	0 : No Cutter error	00h	0
	1 : Cutter error	20h	32
6	0 (Not use)	00h	0
7	0 (Not use)	00h	0

GS+'P'+n1+n2

[Name]	Pitch (Horizontal / Vertical)				
[Format]	ASCII	GS	P	n1	n2
	Hex	1D	50h	n1	n2
	Decimal	29	80	n1	n2
[Range]	n1=180 DPI,1≤n2≤255				
[Initial]	n1=180 DPI ,n2=360 DPI				
[Description]	n1= Horizontal pitch (180 DPI fix)				

n2= Vertical pitch

One pitch of vertical sets up 25.4/n2 mm.

Ex) n2=180 DPI, 1 pitch = 25.4/180=0.141mm

n2=360 DPI, 1 pitch = 25.4/360=0.07mm

GS+'*'+x+y+d1…….dk

[Name]	Download bit image definition			
[Format]	ASCII	GS	*	x	y
	Hex	1D	2Ah	x	y
	Decimal	29	42	x	y
[Range]	1≤x≤255, 1≤y≤48,k = x x y x 8			
[Description]	x=The number of Horizontal byte			

y=The number of Vertical byte

k=The number of total data

Bit image registers to RAM of user. (Please refer to the command GS+/+m.)

[Caution]	The data will be deleted, when the power is off and on.

The data will be deleted, when it is reset.

You have to register again the data.

GS+'/'+m

[Name]	Download bit image printing		
[Format]	ASCII	GS	/	m
	Hex	1D	2Fh	m
	Decimal	29	47	m
[Range]	0≤m≤3 or 48≤m≤51		
[Description]	Please print the mode m, after you download the big image which you have		

registered the command GS+*+x+y+d1..아

m	Printing mode
0, 48	STANDARD
1, 49	Horizontal extension
2, 50	Vertical extension
3, 51	Horizontal and Vertical extension at the same time.

[Name]	Buffer clear (real time)			
[Format]	ASCII	DLE	ENQ	n
	Hex	10h	05h	n
	Decimal	16	5	n

[Range]　　　　n=2

[Description]　It clears each buffers of the real time.

[**Caution**]　Please use the command if the interface is rs232c only.
Please be careful, because it can operate same, when the command
is received with the data. (ex. Bit image data).

DLE+DC4+fn+n+t

[Name]	Cash drawer & Melody box by real time.				
[Format]	ASCII	DLE	DC4	fn	n	t
	Hex	10h	14h	fn	n	t
	Decimal	16	20	fn	n	t

[Range]　　　　fn=1, n=0,1, 0≤t≤255,

[Description]　According to n, you can set up ON of the cash drawer for the time (t x 2ms).
t (t x 2ms) operation ON

n	Function
0	Choose Cash drawer 1 (Connector 2)
1	Choose Cash drawer 2, or Melody box (Connector 5)

[**Caution**]　To avoid heating the electric parts,
it is recommended t operates shortly as you can.

When the melody box operates, please choose the cash drawer 2.
(connector 5, n=1 or 49).

This command is different with ESC+'p'+n+t1+t2, because it prints by the *real time*,
as soon as this command is conducted.

[Name]	Status transmission			
[Format]	ASCII	DLE	EOT	n
	Hex	10h	04h	n
	Decimal	16	4	n

[Range]　　　　1≤n≤4

[Description]　It transmits 1 byte of n the real time.

[Caution]　　　Please use the command if the interface is rs232c only.

Please be careful, because it can operate same, when the command

is received with the data. (ex. Bit image data).

<RS232C, 4 bytes>

①n=1,

Bit	Status	Hex	Decimal
0	Fix	00h	0
1	Fix	02h	2
2	0 : Cash drawer 3th pin = LOW	00h	0
	1 : Cash drawer 3th pin = HIGH	04h	4
3	0 : Online	00h	0
	1 : Offline	08h	8
4	FIX	10h	16
5	0 : Online	00h	0
	1 : Offline	20h	32
6	Fix	00h	0
7	Fix	00h	0

②n=2,

Bit	Status	Hex	Decimal
0	Fix	00h	0
1	Fix	02h	2
2	0 : Cover close	00h	0
	1 : Cover open	04h	4
3	Fix	00h	0
4	Fix	10h	16
5	0 : Paper remain	00h	0
	1 : Paper empty	20h	32
6	0 : No erro	00h	0
	1 : Error	40h	64
7	Fix	00h	0

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③ n=3,

Bit	Status	Hex	Decimal
0	Fix	00h	0
1	Fix	02h	2
2	0 : No error	00h	0
	1 : Error	04h	4
3	0 : No error (Auto cutter)	00h	0
	1 : Error (Auto cutter)	08h	8
4	Fix	10h	16
5	0 : No error	00h	0
	1 : Error	20h	32
6	0 : No error	00h	0
	1 : Error	40h	64
7	Fix	00h	0

④ n=4,

Bit	Status	Hex	Decimal
0	Fix	00h	0
1	Fix	02h	2
2	0 : Paper enough	00h	0
	1 : Paper necessary	04h	4
3	0 : Paper enough	00h	0
	1 : Paper necessary	08h	8
4	Fix	10h	16
5	0 : Paper remain	00h	0
	1 : Paper empty	20h	32
6	0 : Paper remain	00h	0
	1 : Paper empty	40h	64
7	Fix	00h	0

[Name]	Laster bit image

[Format]

	ASCII	GS	v	0	m	xL	xH	yL	yH	d1..dk
	Hex	1D	76h	30h	m	xL	xH	yL	yH	d1..dk
	Decimal	28	118	48	m	xL	xH	yL	yH	d1..dk

[Range]   0≤m≤3 or 48≤m≤51,

1≤(xL+(xH x 256))≤89   (0≤xL≤89, xH=0)

1≤(yL+(yH x 256))≤436   (0≤yL≤255, 0≤yH≤1)

0≤d≤255 (yL+(yH x 256))

k (Number of data) = (xL+(xH x 256)) x (yL+(yH x 256))

[Description]   It prints the laster bit image the mode m.

xL,xH indicates the number of data the horizontal.

yL,yH indicates the number of dot line the vertical.

d indicates the data the laster bit image.

m	mode	Extension
0, 48	Normal	One time
1, 49	Horizontal	Double
2, 50	Vertical	Double
3, 51	Horizontal, Vertical	Horizontal double Vertical double

Ex) Image

xL+(xH×256) = 32 bytes,

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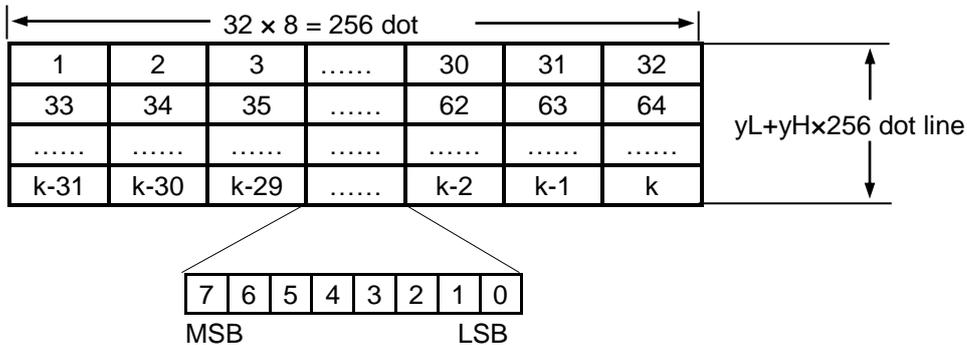
SUB+'B'+n1+n2+n3+d1……dk

[Name]   2D barcode
[Format]   ASCII   SUB   B   n1   n2   n3   d1…………dk
                Hex   1A   42h   n1   n2   n3   d1…………dk
                Decimal   26   66   n1   n2   n3   d1…………dk
[Range]   Please refer to the following table.
[Description]   Please use the size of barcodes.

n1 : 2D barcode
n2 : Number of data barcode
n3 : Size of barcode
d1… dk : Barcode

n1	2D barcode
1	PDF417
2	QR code
3	DataMatrix

1) PDF417

n2	Number
	1 < n2 ≤ 255

n3	Size
3	Horizontal row 3
4	Horizontal row 4
5	Horizontal row 5
6	Horizontal row 6
7	Horizontal row 7
8	Horizontal row 8
9	Horizontal row 9

2) QR code

n2	Number
n3=1	1 < n2 ≤ 17
n3=3	1 < n2 ≤ 53
n3=5	1 < n2 ≤ 106
n3=9	1 < n2 ≤ 230

n3	Size
1	Version 1
3	Version 3
5	Version 5
9	Version 9

The vertical size PDF417 sets up automatically.

3) Data Matrix

n2	Remark	Number
n3=20	ASCII	1 < n2 ≤ 22
	Number	1 < n2 ≤ 44
	Extension graphic	1 < n2 ≤ 11
n3=24	ASCII	1 < n2 ≤ 36
	Number	1 < n2 ≤ 72
	Extension graphic	1 < n2 ≤ 18
n3=36	ASCII	1 < n2 ≤ 86
	Number	1 < n2 ≤ 172
	Extension graphic	1 < n2 ≤ 43
n3=44	ASCII	1 < n2 ≤ 144
	Number	1 < n2 ≤ 255
	Extension graphic	1 < n2 ≤ 72

n3	Size
20	20 x 20
24	24 x 24
36	36 x 36
44	44 x 44

※ ASCII : It is the sign and the alphabet under than the code value 127 (The number 0-9 is not included.)
Number : It is the number of the code value from 48 to 57 (0-9).
Extension Graphic letter : It is the extension graphic letter more than the code value 128.

※ When you print the things such as ASCII, number, extension graphic letter,
the number of data you can print, n2, is calculated as the formulation above

SUB+'z'+n

[Name]   Buzzer sound
[Format]   ASCII   SUB   z   n
              Hex   1A   7Ah   n
              Decimal   26   122   n
[Range]   0≤n≤255
[Description] n=0, Invalid .
              n=1, Valid.

SUB+'1'

[Name]   Line 1 (Vertical, Horizontal)
[Format]   ASCII   SUB   1
              Hex   1A   31h
              Decimal   26   49
[Description] Line of Vertical Horizontal.

SUB+'2'

[Name]   Line 2 (Vertical,Horizontal)
[Format]   ASCII   SUB   1
              Hex   1A   32h
              Decimal   26   50
[Description] Line of Vertical Horizontal

SUB+'W'+nL+nH+kL+kH

[Name]	Write (line data)						
[Format]	ASCII	SUB	W	nL	nH	kL	kH
	Hex	1A	57h	nL	nH	kL	kH
	Decimal	26	87	nL	nH	kL	kH
[Range]	0≤nL+(nH×256)≤512、 (0≤nL≤255, 0≤nH≤3)						
	0≤kL+(kH×256)≤512、 (0≤kL≤255, 0≤kH≤3)						
[Description]	It writes 1 from nL+nH×256 to kL+kH×256.						
[**Caution**]	It is not deleted, till you power off, or you clear the command.						

SUB+'C'

[Name]	Clear (line data)		
[Format]	ASCII	SUB	C
	Hex	1A	43h
	Decimal	26	67
[Description]	It clears all of line zero (0).		
[**Caution**]	Please use this command to write the line again.		
	Please use the command line ON/ line OFF to write line 1 to speed up the progress.		

SUB+'O'

[Name]	Line ON		
[Format]	ASCII	SUB	O
	Hex	1A	4Fh
	Decimal	26	79
[Description]	The line data is valid ON. The line prints together, when you print the character.		

SUB+'F'

[Name]	Line OFF		
[Format]	ASCII	SUB	F
	Hex	1A	46h
	Decimal	26	70
[Description]	The line is valid OFF. The line data is preserved.		

SUB+'P'

[Name]	Print line 1 dot line (Vertical,Horizontal)		
[Format]	ASCII	SUB	P
	Hex	1A	50h
	Decimal	26	80
[Description]	It prints line 1 dot line.		

［**Caution**］ Please do not use this command, when you print any character,or any graphic.
Please use the command Line ON.
Please use this command, when you print the line at the space.

6-1) Printer

1) Please open the screen of printer / fax, and click the basic setting (I) of the general tap.
2) Please click the button (V).
3) Please set up the density, and the form feed, the cutting option, the speed of printing,
and the buzz the melody box.
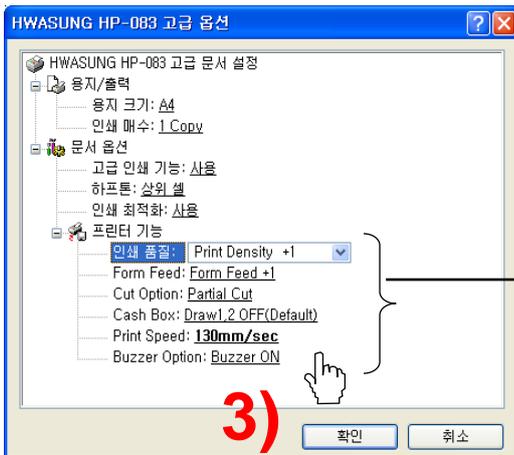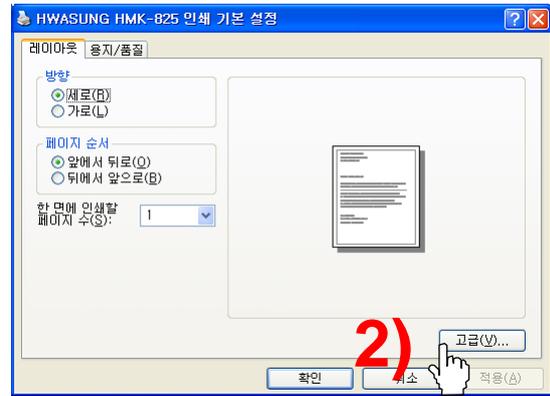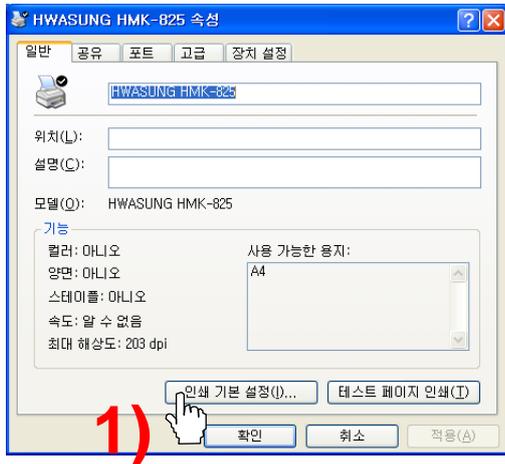
1. Print density (Standard +1)

2. Form feed (Standard +1)
  2.1. Form feed 0 : It doesn't feed the form.
  2.2. Form feed +1~+5 : It feeds the form each +1.

3. Cash box, and Melody box set up.

4. Printing Speed

5. Buzzer option set up (Valid / Invalid)

6-2) Paper

Please select the form feeding, after you print.

1) Please click (I) as below.
2) Please select the options you want at the tab.

2-1) Automatic and Role Feeder : After it prints,it doesn't conduct the form feeding,
regardless of the paper length.
We recommend this option,if the paper length is not regular.

2-2) Page Length Feeder : After it prints,
it conducts the form feeding as much as you fix the paper length.
We recommend this option,if the paper length is regular.

6-3) New paper

You can make the size of paper you need.
Please refer to the example how to set up the size of paper 60mm x 150mm.

1) Please open the screen of printer & fax,and click the server on file / menu.
2) Please choose the STANDARD(Size 80 x 400mm) as image.
3) Please tick 'new documentation (C)' as image.
4) Please type the width 6.0 cm / the height 15.0 cm as image.
[Caution] Please do not change the space area of printing.
5) Please click the 'form install' to install, after you name the register (ex.Ticket (Size 60 x 150mm))
6)Please click the tap 'advanced' and set the paper Ticket(Size 60 x 150mm) as image below.

5)

6)
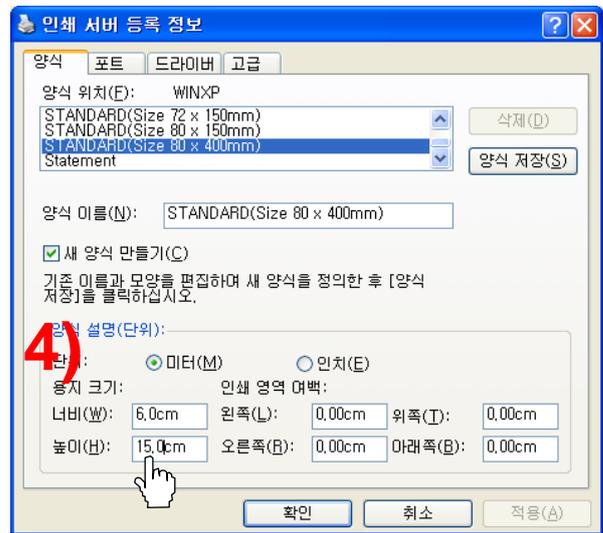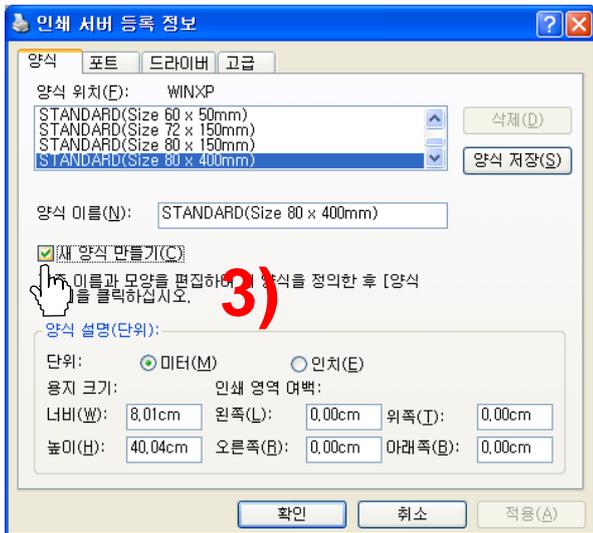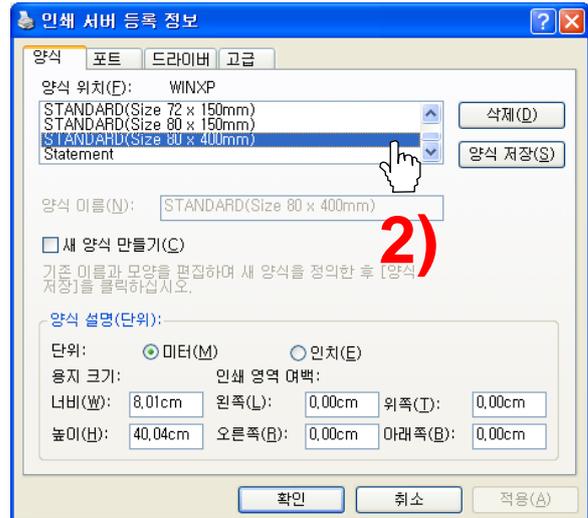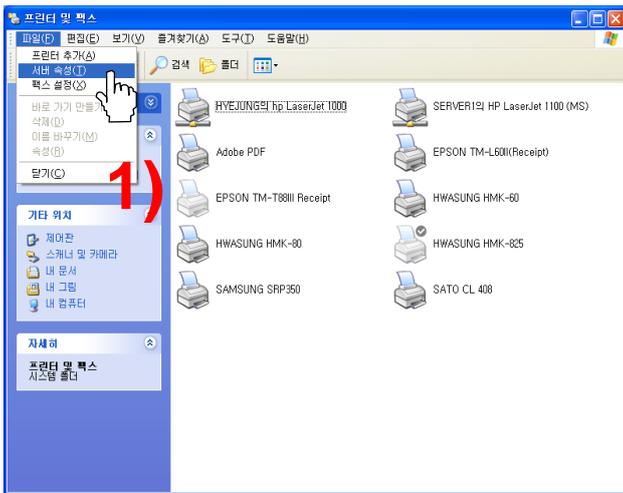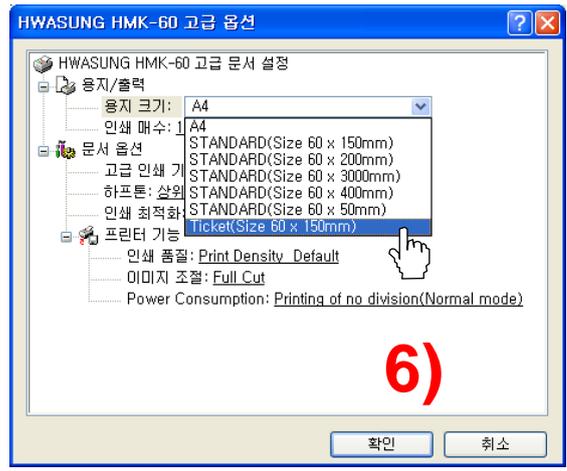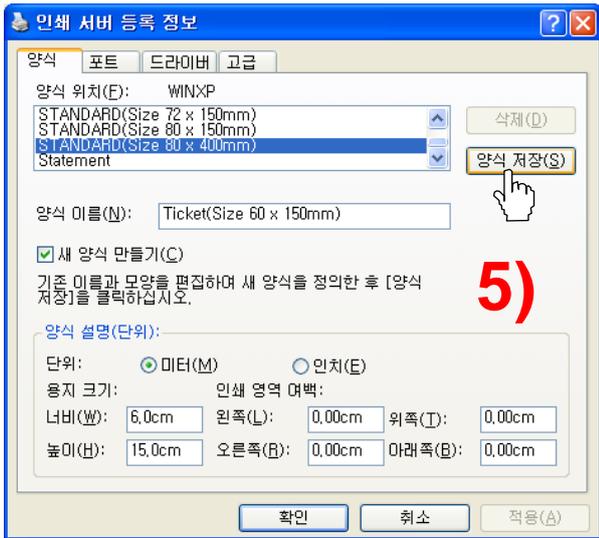
Without using the Windows driver, you are able to check the printer status, and transmit / receive the data, by using USB Interface DLL (HwaUSB.DLL) and OCX driver (HwaUSB.OCX).

7-1) DLL Interface
Please add the file HwaUSB.DLL at the folder System 32, or the folder SysWow64.

7-1-1)DLL function (Funtions)
1) long UsbOpen(LPCTSTR SelPrinter);

Please open the port USB by the printer Model "HP-083E".

- Parameters:
   SelPrinter : Printer Model Name
- Return :
   Open normal : 0
   Open error : -3(minus)

2) long PrintStr(LPCTSTR data);
It prints the character line.

- Parameters:
   data : String datas
- Return :
   Print normal : 1
   Print error : 0

Notice : To prevent the loss of data for the print timeout ,
Please use the function 'NewRealRead' to check the status,and go to the next step, when it's normal.

3) long PrintCmd(unsigned char data);
It prints the data one (1) byte.
Please use the 'PrintPackage function' as below, if there are a lot of datas to print.
Then you are able to increase the speed of the transmission.

- Parameters:
   data :   one (1) byte data (0~255)
- Return :
   Print normal : 1
   Print error : 0

4)long NewRealRead(void);
 It reads the printer status data as one (1) byte by the port USB.

- ■ Parameters:
   None
- ■ Return :
   Read normal : Printer status value.
   Read error   : -1(minus)

5)long PrintPacket(unsigned char *PacketBuf,unsigned long PacketLength);
It prints the data by the port USB, as much as the data at the transmission data buffer .

- ■ Parameters:
   PacketBuf : Transmission data buffer pointer.
   PacketLength : Transmissiong data length
**Notice** : Please do not exceed more than 64 bytes max.

- ■ Return :
   Print normal : 1
   Print error   : 0
Notice   Please do not use any function we don't provide, due to the debug usage.
Notice   Please ask the sample program for more details.

7-2) DLL notice

If you use Windows driver together, when you use OCX driver,
the data of Windows driver, and the data of OCX driver can not be delivered properly.
Please do not use the spool to print.
Please refer the following image.
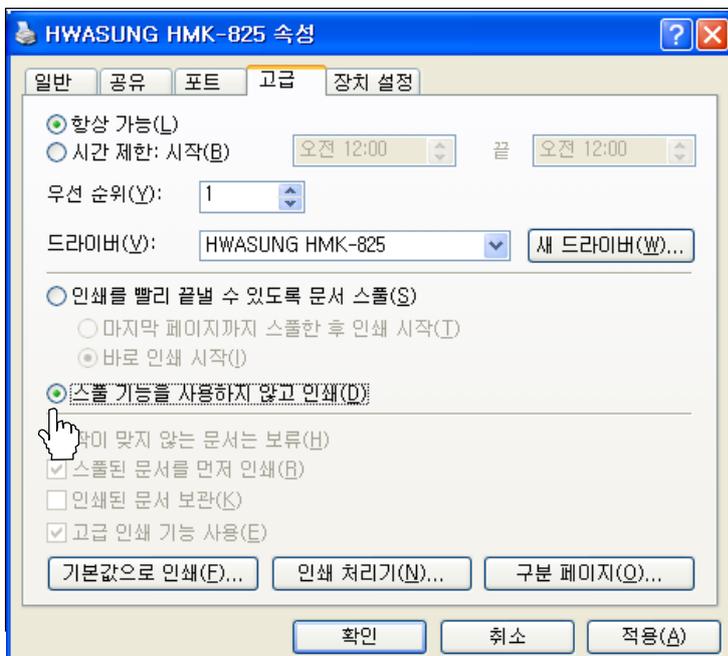
7. OCX driver (USB)

You can check the printer status, and transfer / receive the data without Windows driver, since that we provide the USB interface OCX driver (HwasUSB.OCX).

7-1) How to use with Visual Basic.
Please refer to the following instructions how to use with *Visual Basic*.
[Caution] The image as below is Korean, please contact us more details, if you can't.

[Caution] Please contact us for the sample program.

7-2) OCX function (Functions)

1) long HwaUSB1.Open (LPCTSTR SelPrinter);
   Please open USB port by Printer Model ("HP-083E").

   - Parameters :
     SelPrinter : Printer Model Name
   - Return :
     Open normal : 0
     Open error   : -3 (minus)

2) void HwaUSB1.Close (void);
   Please close USB port by Printer Model ("HMK-825").

   - Parameters :
     None
   - Return :
     None

3) long HwaUSB1.PrintStr (LPCTSTR data);
   It prints the character line.

   - Parameters :
     Data : String datas
   - Return :
     Printing normal : 1
     Printing error   : 0

   ［**Caution**］
   To prevent the loss of data for the timeout of output,
   Please use the function 'RealRead' to check the status,and go to the next step, when it's normal.

4) long HwaUSB1.PrintCmd(unsigned char data);
        It prints the data one (1) byte.

   - Parameters :
     Data : 1 byte data (0~255)
   - Return :
     Printing normal : 1
     Printing error   : 0

5) long HwaUSB1.NewRealRead(void);
        It reads the printer status as data one (1) bye by the port USB.

   - Parameters :
     None
   - Return :
     Reading normal : The value of printer status
     Reading error   : -1 (minus)

   ［**Caution**］ Please do not use the function we don't provide, because it causes the function damage.
              Please contact us for the sample program.

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7-3) OCX driver notice

Notice : If you use Windows driver together, when you use OCX driver,
the data of Windows driver, and the data of OCX driver can not be delivered properly.
Please do not use the spool to print.

1) Please tick the option as image below.

* Reference for revision

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