

Technical Manual

HP-283



HWASUNG
POS.KIOSK PRINTER

※Safety Caution!



Caution : Please follow the direction in using the product as it may become the reason of malfunction, serious injury, or even death.

- Do not disassemble or modify the product.
- Do not remove jammed paper while power is turned on.
- Do not go over the specified voltage.
- Do not wash the product.
- Do not hit or cause an impact to the product.
- Do not store the product in the wet / humid place.



Caution : Please follow the direction in using the product as it may become the reason of malfunction, serious injury, or even death.

- Please contact us to take an action when product fails.
- Please power off during the removal of any matter.
- Please ventilate the air circulation in closed area.
- Please install the product away from the near interferences.
- Please install the wiring in a safe place.
- Please follow the directed terms of compliance in using the electrical product.

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1.Name of Part

1-1) Name



1) LED

◆POWER LED(Green): It indicates the power is on

◆ERROR LED(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 LED(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.

3) Cover open

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.



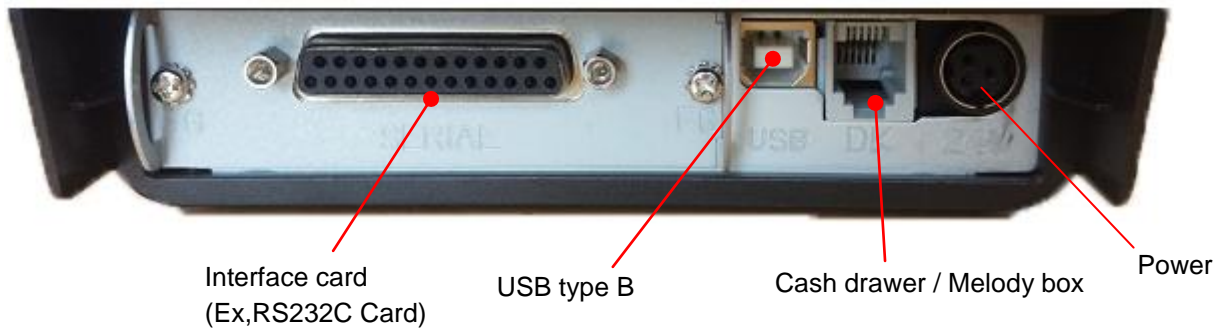
4) Cutter open (Front cover)

It is to remove the paper jam. Please look at the article of paper jam.

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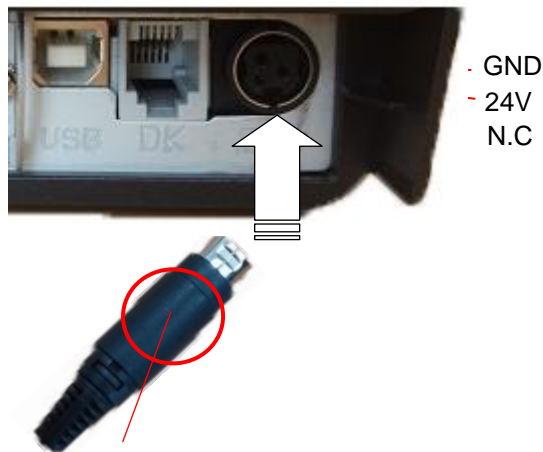
1-2) Connector

: It is to connect any device with the printer.



1) Power : It is to connect the external power 24Voltage. Please use the power supply we provide.

Notice : Please make sure about the direction of connector.



Notice: The sign 'arrow' should be downward to connect with the printer.



2) Cash drawer / Melody box : It is to connect the cash drawer / the melody box with the printer.

Notice : Please use the standard cash drawer.

Please read '4.Cash drawer / Melody box' at this manual.

Please do not connect with the cable of Modem / Lan.

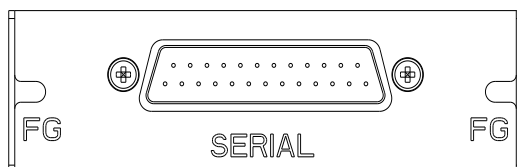
It is very important to prevent the product from the damage.



3) Interface card : It is to connect the interface cable with each hosts.

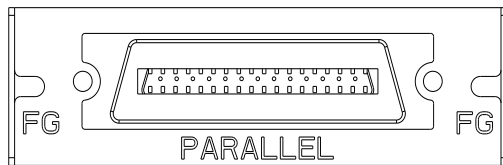
You are able to connect RS232C, PARALLEL, USB type B, Serial extension RJ-45, and Ethernet.

◆ RS232C : Connector DSUB25 pin Female.

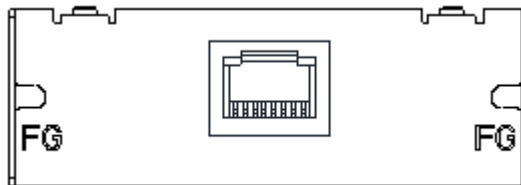


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- ◆ Parallel : IEEE-1284 type B 36pins Receptacle / Bi-directional interface card..



- ◆ Ethernet : LAN 8 pins

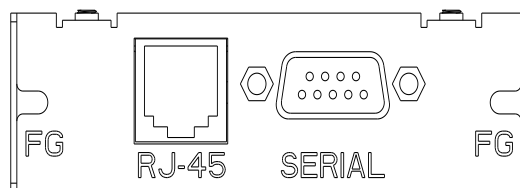


- ◆ Serial extension RJ-45 :

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

DSUB- 9 pins RJ-45 6 pins receptacle



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

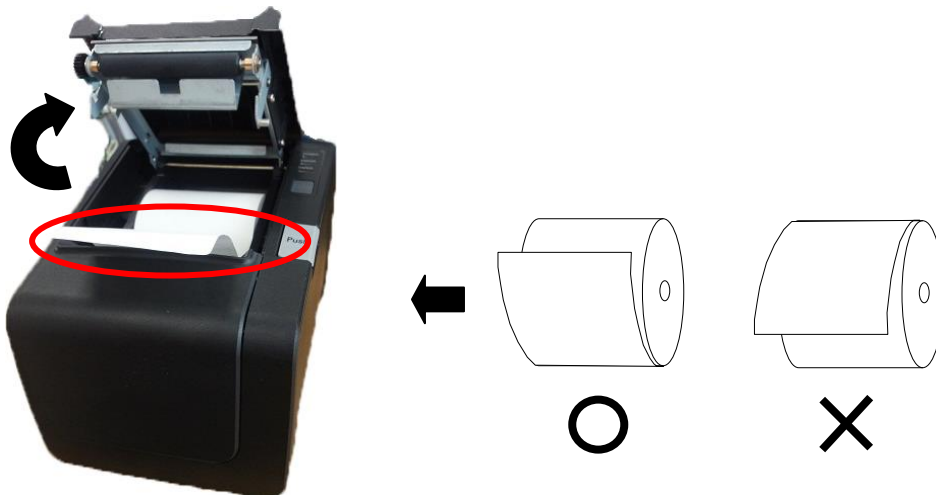
2-1) Paper set up

- 1) Please press the button (Cover open) as the image below, and open the cover.



- 2) Please make sure the paper direction as the images below.

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.



- 3) You can see the paper is printing and cut, when you close the cover, after you power on.



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2-2) Paper Jam.

Please follow the instruction as belows., when the paper jam occurred.

1) Please power off the printer.

Notice :

Please power off the printer, once you remove the paper jam, and the foreign materials.

Please 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.



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.



4) **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.

5) 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.



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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.

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

- ◆ Model
- ◆ Firmware / Date
- ◆ Interface
- ◆ Dip switch

2-4) HEX Dump

- 2.4.1. Please power on after the dip switch 8 (up) of 1.
- 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 application 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 (1F₁₆ below) as “.”
- ◆ It prints the data 80₁₆ 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 power off and on, after you do *up the eighth (8th) of Dip Switch 2.
Then the error LED (Red) will be lighted on, after the light goes on and off twice.
*up :on

- 2) Please connect the *data cable with the printer.
*data cable : interface cable (ex.serial cable, parallel cable, usb cable,etc.)



Notice : Please make sure you connect the cable of standard, or the cable provided.

- 3) Please conduct the update program we provide, after you set up the model / the port.
The update starts,when the error LED (Red) will be lighted on,after the light LED goes off 4 seconds.

Notice : Please do not power off, before the update is complete.



- 4) The update is completed, when you see the indication in the program.

- 5) After you complete the update, please power off and on,
after you do *down the eighth (8th) of Dip Switch 2.
*down :off

6. Then you can use the printer which is updated.

Notice : You have to stop updating, if the error LED (Red) continues flickering,
because it means error of update.



Please close the program you open.

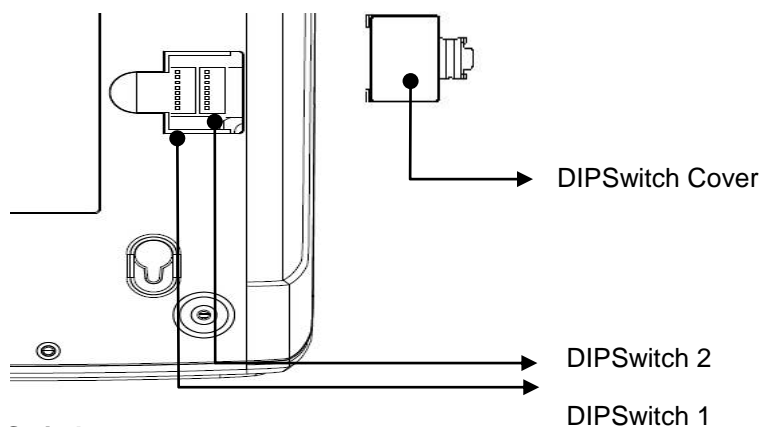
Please check the cable if it is correct.

Please go back to the instruction of step 1), and do it again.

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2-6) Dip Switch

Please adjust the DIP switch according to the environments you are using, such as host, and port.
You can see two switches, SW1, SW2, if you open the cover of DIP switch.



Dip Switch 1

SW1	Serial Baud rate	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	9,600	OFF	OFF						
	19,200	OFF	ON						
	38,400	ON	OFF						
	115,200	ON	ON						
	Serial Data Bit Length	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	7			ON					
	8			OFF					
	Serial Parity	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	None				OFF				
	Even				ON	OFF			
	Odd				ON	ON			
	Serial Stop bit	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	2 stop						ON		
	1 stop						OFF		
	Serial Flow control	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Software Xon/Xoff							ON	
	Hardware (RTS/CTS or DTR/DSR)							OFF	
	Print Mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Hexadecimal Mode								ON
	Normal Mode								OFF

Ethernet IP mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Dynamic IP mode	ON							
Static IP mode	OFF							

Ethernet Boot mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Factory mode		ON						
Default user mode		OFF						

Notice : You can read the details of Ethernet at this manual / 8. Ethernet.



Dip switch 2

SW2	Print Quality 1)	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Reserved	RSD							
	Reserved	RSD							
	Print Density 2)	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Normal		OFF	OFF					
	Medium		ON	OFF					
	Dark		OFF	ON					
	Reserve		ON	ON					
	External Auto Melody	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Play				ON				
	No play				OFF				
	Firmware Update	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
	Update								ON
	Print Mode								OFF

Cutting mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Partial cut					ON			
Full cut					OFF			

Buzzor of printing	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Play						ON		
No play						OFF		

Notice : The auto melody will be invalid, if the buzzer is on.



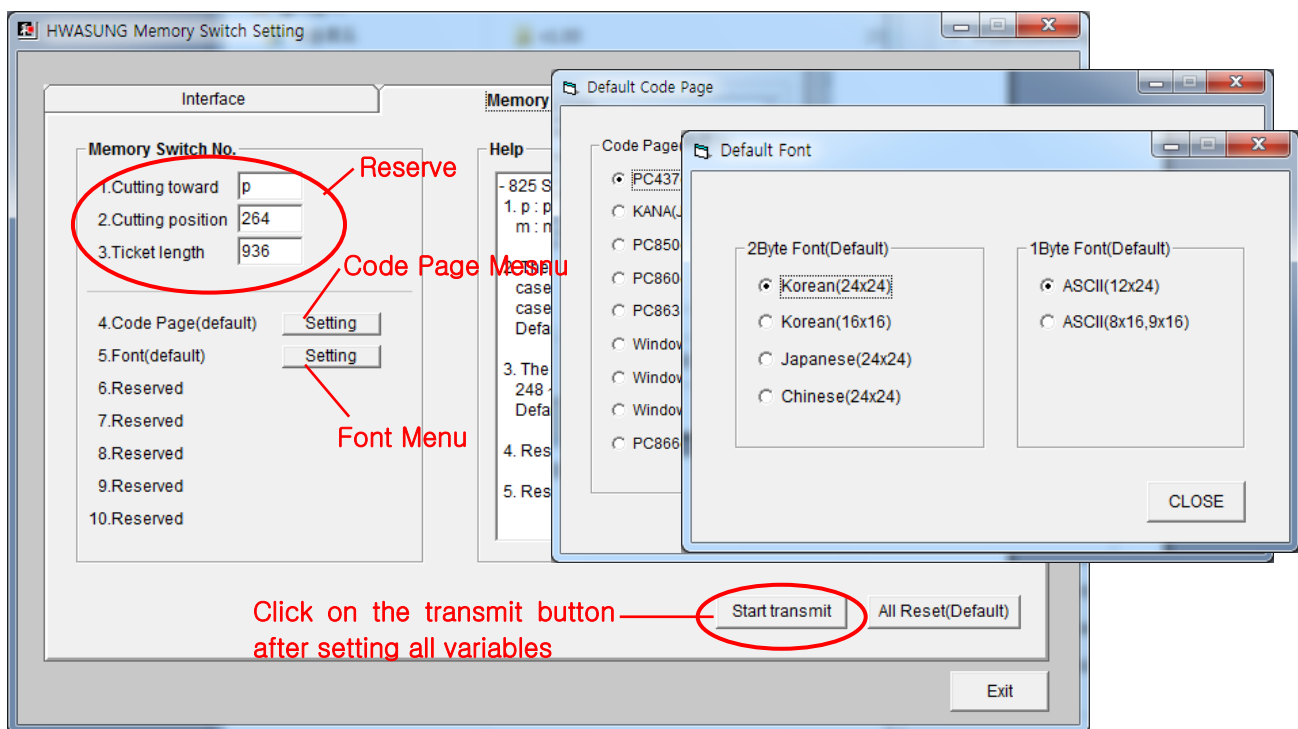
2-7) Memory Switch

Use non-volatile memory to set the function.

※Please use the provided 'Memory Switch Utility' for the setting.

※Once you've set the value, it will not reset even if you turn off the power so the value will maintain until you make the change.

Memory SW	Set Value	Description
SW1	p OR m	
SW2	0~1200 OR 0~136	
SW3	248 ~ 4000	
SW4	Basic Code Page	Setting one of the Code Page out of the option to be a default
SW5	Basic Font	2byte code will set the default from Korean (24x24), Korean (16x16), Japanese(24x24), Chinese(24x24). 1byte code will set the default from ASCII(12x24), ASCII(8x16,9x16).
SW6	Reserve	
SW7	Reserve	
SW8	Reserve	



1)SW1 :

- p(70₁₆) Setting : When executing cutting command (DC3 + "i"), move from the black mark point to the plus position up to the value set in SW2, then cut from that position.
- m(6D₁₆) Setting : When executing the cutting command (DC3 + "i", move up to the value set in SW2, then cut in that position.

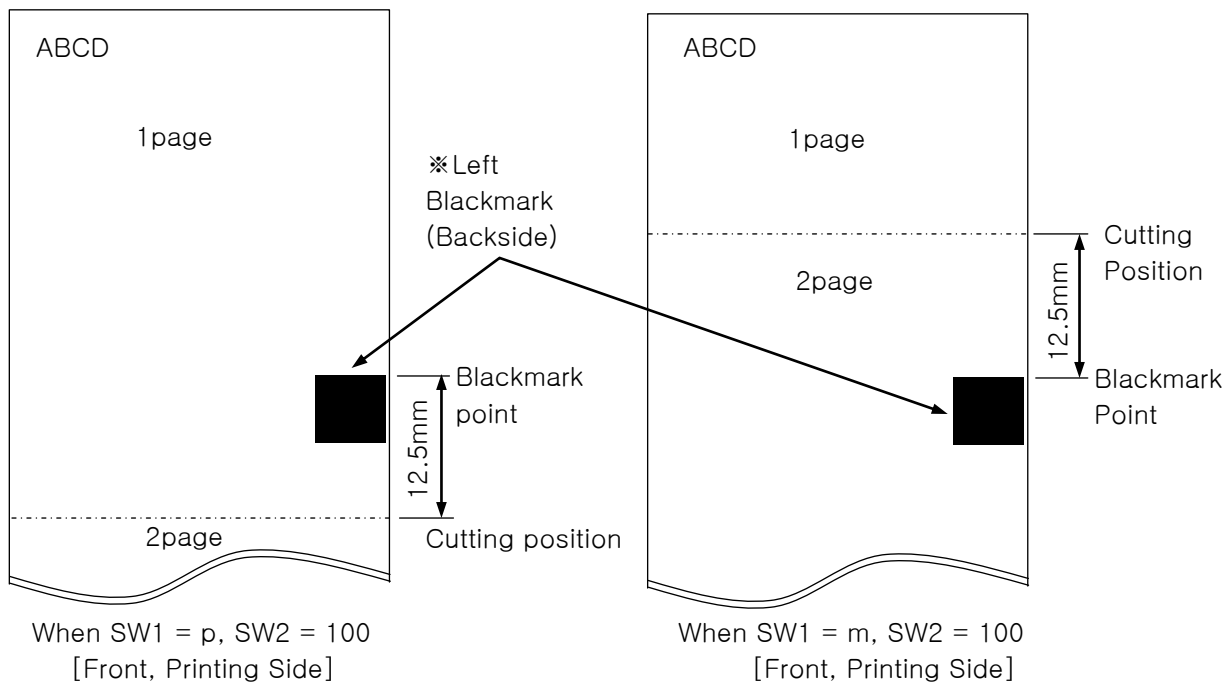
2)SW2 : Setting the distance from the black mark point to the cutting position

- When SW1 is @ p : You can set from 0~1200(0 ~ 150mm).
- When SW1 is @ m : You can set from 0~120(0 ~ 15mm).

※ Indicates 0.125mm per set value → ex) When set on 100 : $100 \times 0.125 = 12.5\text{mm}$

※ SW1 and SW2 are also used in Windows Driver to set the Cutting option to Black Mark Search (Full Cut). (Windows Driver : use DC3+"i" command)

ex)



3)SW3 : Sets the distance from the ticket start point to the black mark point.

When setting the Dip switch to First Page No Cut, it is used to set the initial position of the first piece of paper.

0~120(0 ~ 15mm : When cutting position is in front of blackmark) OR

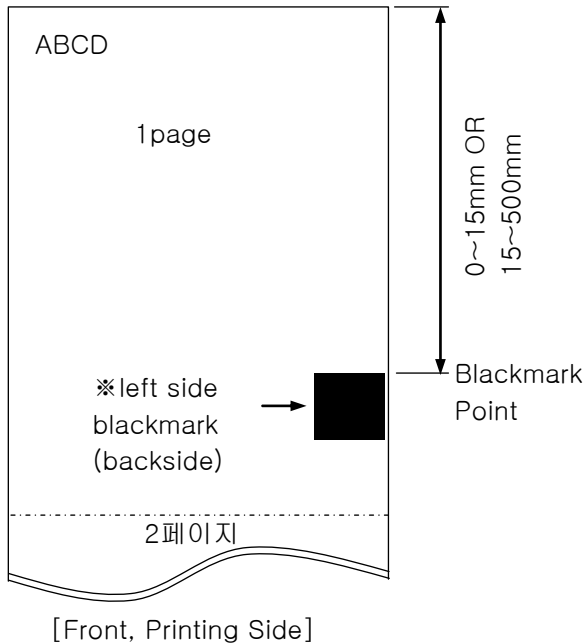
You can set up to 120~4000(15 ~ 500mm when cutting position is behind the blackmark)

※ Indicates 0.125mm per set value → ex) When setting it 300 : $300 \times 0.125 = 37.5\text{mm}$

※ The default setting is based on the blackmark on right side and set to 1048(131mm).

※ Please reference the ticket standards 7. for the detailed information.

ex)

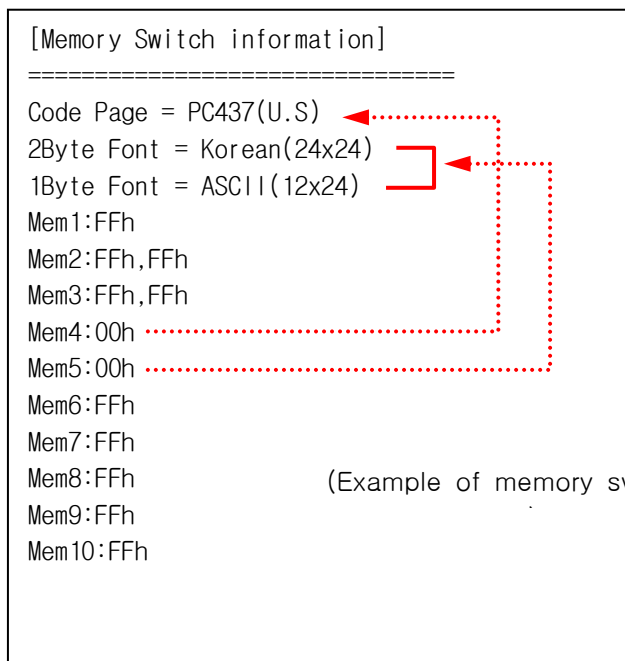


2)Memory Switch Modification Check

※ After adjusting the memory switch, check the modified details by running a self test.

When you turn on the power while holding down the FEED button, start self-test and stop printing.

Press the FEED button one more time to display the contents of the memory switch.



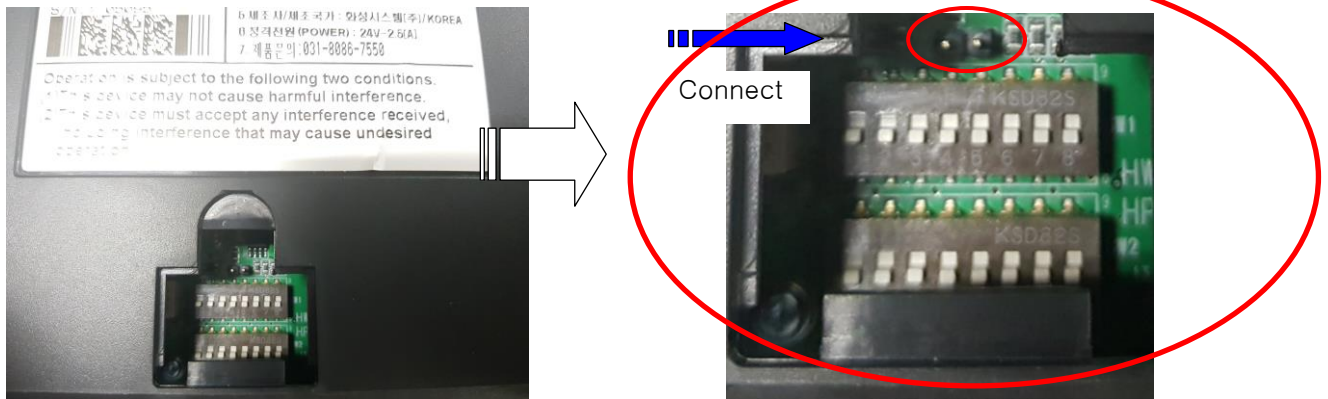
(Example of memory switch content checking)

Firmware Restoration (Boot Restoration)

You can use the restoration methods below when printer does not boot up due to the firmware corruption or update errors.

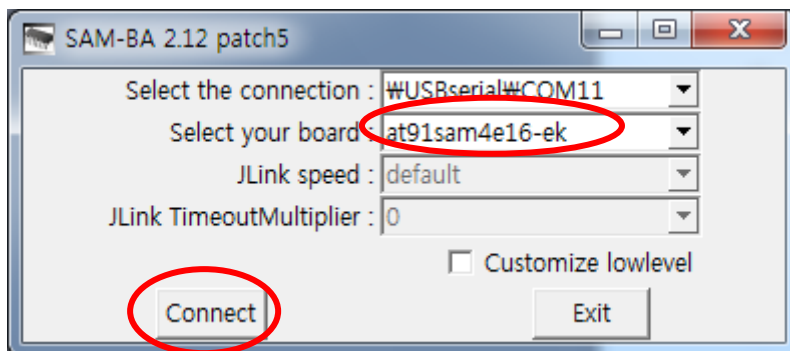
1) Check the jumper location next to the Dip Switch at the bottom.

2) Connect the two pins of JP2 using 2.5mm pin header.



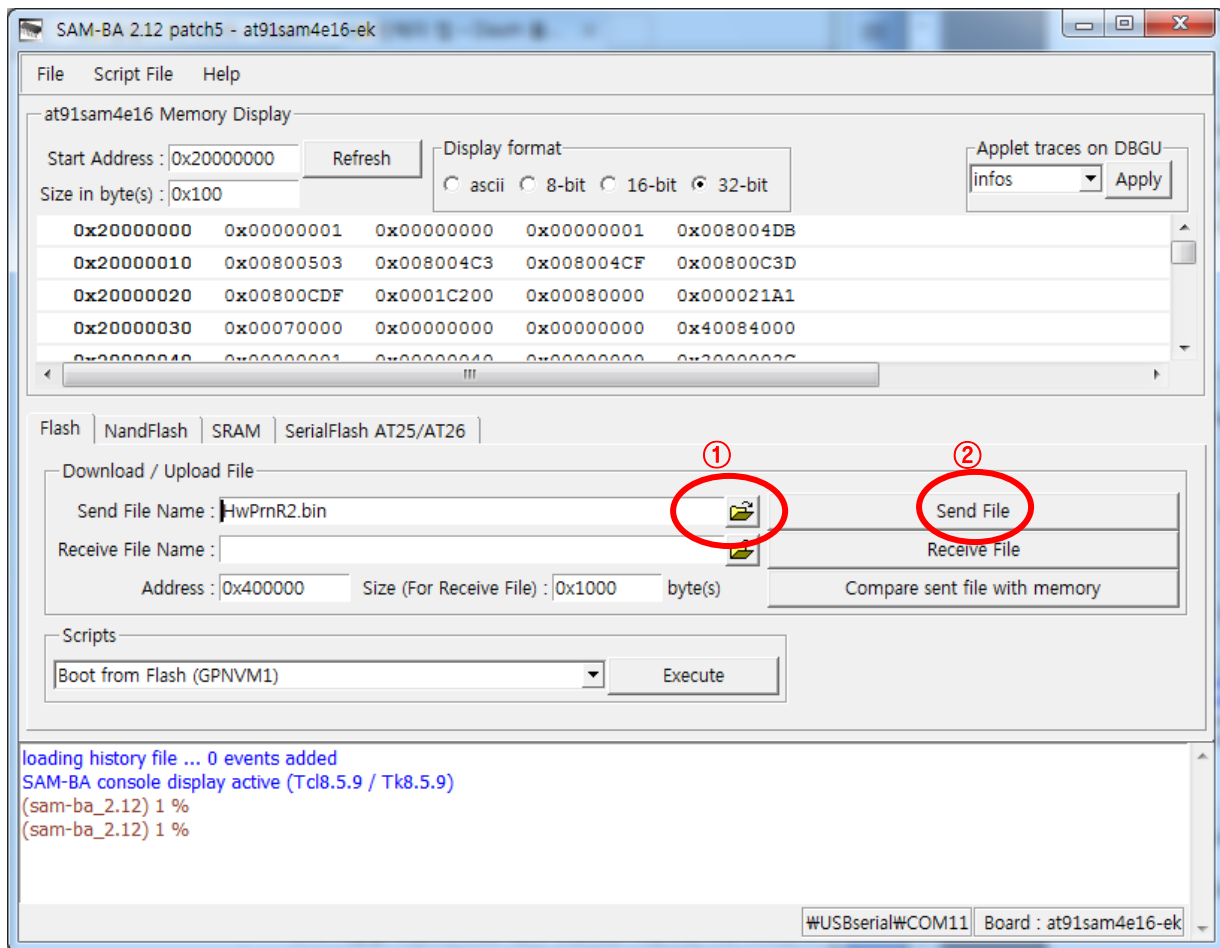
3) Turn on the power after connecting the data cable.

4) Set the ports on the provided booting program then select "at91sam4e16-ek" at the select your board prompt and click on the Connect Button. (Use only one data cable for connection) (You can reduce the load time if you use USB port)

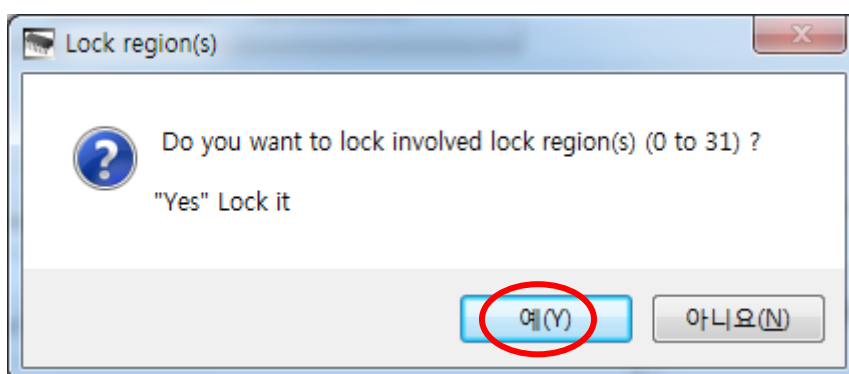


5) Please release the JP2 short after running the Booting Program.
(If you skip this process, the data will get wiped after the firmware restoration)

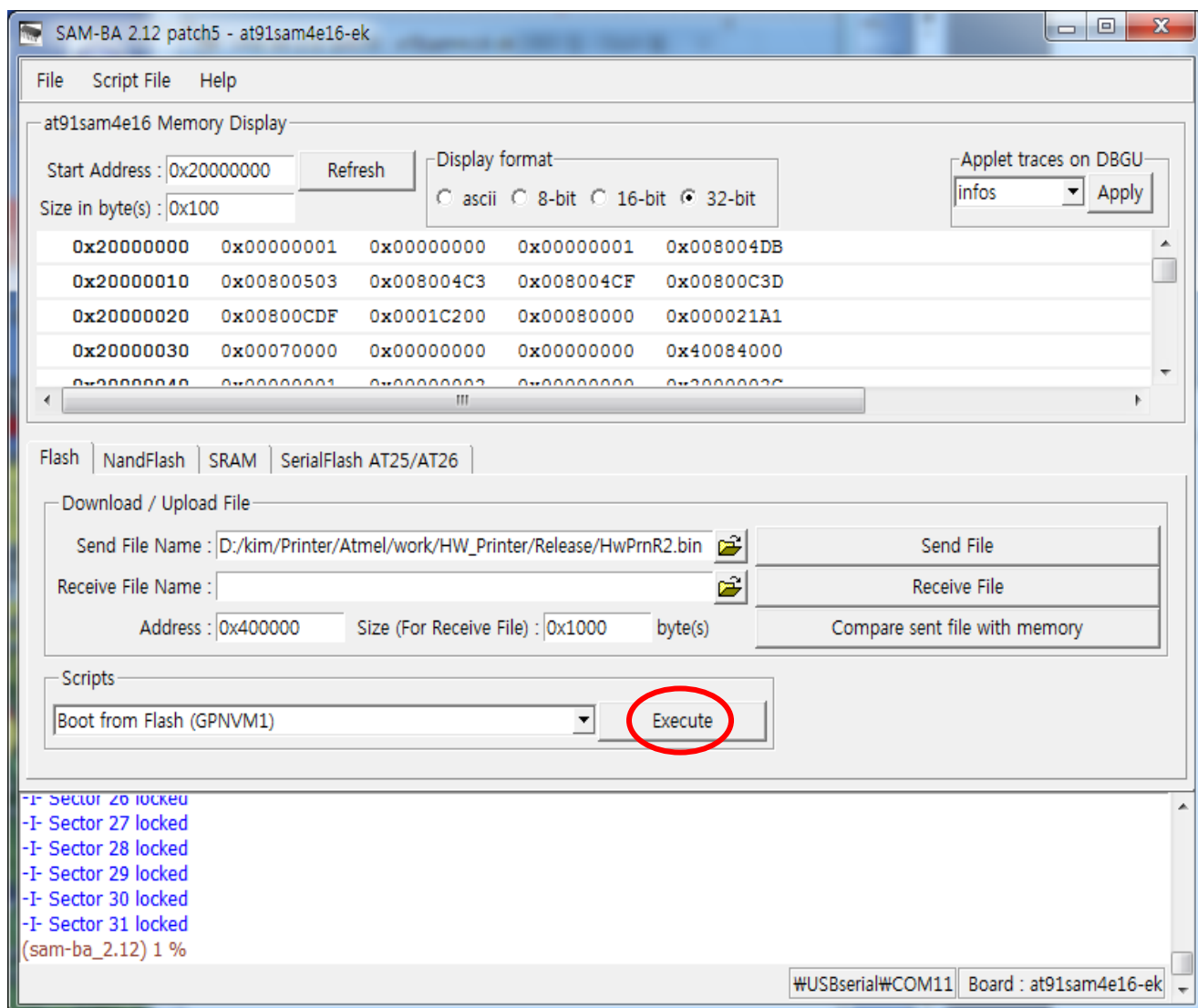
- 6) Click on "File open" icon next to Send File Name field, to select the target model's firmware and click on 'Send File' Button
(※ Caution : Do not modify other parameter's value)



- 7) There will be a prompt after the file transmit is complete, Click (YES) button on the prompt.



8) Under Scripts field, set the value to 'Boot from Flash(GPNVM1)' and then click on Execute.



9) Restart the printer by turning the power off and back on.

3. Specification

3-1) Printer

Printing	Direct Thermal
Printing Speed	*250mm/sec(Max)
Resolution	7dot/mm,180DPI
Printing width	72.19mm, 512Dots/Line
Printing way	Line mode, page mode.
Character	Font A ASCII (12x24) 42 columns.
	Font B ASCII (9x16) 56 columns.
	Font C Korean (24x24, character and Chinese characters).
	Font D Korean (16x16, character and "non" Chinese characters).
	Font E Japanese (24x24)
	Font F Chinese (24x24)
Paper	Width 79.50mm +-0.5mm
Paper dia.	80mm(Max)
Paper caliper	80micron
TPH life	130km (Printing duty 12.50%)
MCBF	60,000,000 lines
Barcode	EAN-8,EAN-13,CODE39,CODE93,ITF, UPC-A,UPC-E,CODE128
2D barcode	QR, PDF417, Data Matrix
Emulation	ESC/POS command compatible / HWASUNG
Driver	Windows(2000,2003,XP,Vista,7,8) 32Bit,64Bit
Interface	Serial/Parallel/USB/serial extension RJ-45 /Ethernet.
Power	24VDC 2.5A
Buffer	4K Bytes
Cutter	Life 1,700,000 cuts / Guillotine / Full or Partial
Temperature	Operation 0 ~ 40℃ / Storage -20 ~ +60℃
Humidity	40~80%RH
Size	151.00 (W)x 205.00(D) x134.00(H) mm

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

3-2) Interface

3-2-1) RS-232C

- 1) Data transmission : Serial
- 2) Hand shake : 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 bits : 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(the 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

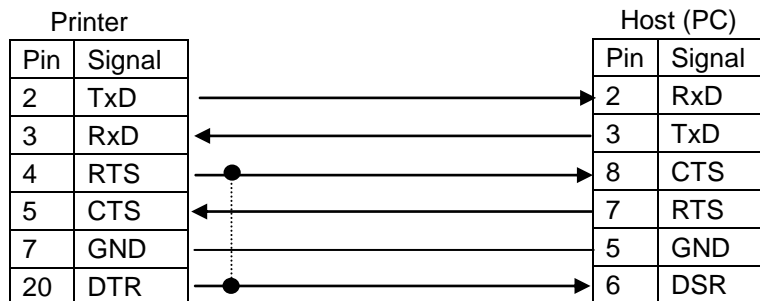
*1)Option : JP1 short : Provide +5 Volts

JP2 short : Provide +3.3 Volts

Notice : Do NOT short JP1 and JP2 at the same time.



9) Connection Example

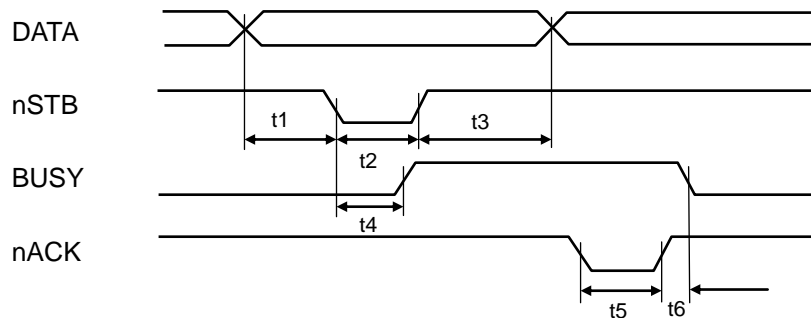


3-2-2) Parallel

- 1) Transmission : Parallel (IEEE-1284 Bi-directional compatibility)
- 2) Hand Shakes : STROBE,BUSY,ACK
- 3) Bi-direction : Nibble mode
- 4) Connector : IEEE-1284 B 36pin receptacle
- 5) Electrical character :

IN/OUT	Singal Mark	Standard		Condition
		min	MAX	
OUT	VOL	-	0.2V	IOL=0.1mA
	VOH	4.75	5.25	
	IOL	-	-32mA	VCC=5V
	IOH	-	32mA	
IN	VIL	-	0.8V	
	VIH	2.0V	-	
	IOL	-	-25mA	VCC=5V
	IOH	-	25mA	

6) Data Receipant Timing



Sign	Name	Standard	
		min	MAX
t1	Data setup time	0.75	-
t2	STROBE range	0.75	-
t3	Data hold time	0.75	-
t4	BUSY output delay time	-	0.75
t5	ACK range	0.5(Typ.)	0.5(Typ.)
t6	BUSY release time	0.5(Typ.)	0.5(Typ.)

7) Pin Arrangement

No	Signal		IN/OUT	Remark
	Compatible	Bi-direction		
1	nStrobe	HostClk	IN	Data Transmit Strobe
2	D0	D0	IN	DATA BIT 0
3	D1	D1	IN	DATA BIT 1
4	D2	D2	IN	DATA BIT 2
5	D3	D3	IN	DATA BIT 3
6	D4	D4	IN	DATA BIT 4
7	D5	D5	IN	DATA BIT 5
8	D6	D6	IN	DATA BIT 6
9	D7	D7	IN	DATA BIT 7
10	nAck	PtrClk	OUT	Printer Acknowledge
11	Busy	PtrBusy	OUT	Printer Busy
12	PError	AckDataReq	OUT	Printer Error
13	Select	Xflag	OUT	Printer Online
14	nAutoFd	HostBusy	IN	-
15,16	GND	GND	-	Signal Ground
17	FG	FG	-	Frame Ground
18	N.C	N.C	-	None Connection
19~30	GND	GND	-	Signal Ground
31	nInit	nInit	IN	Low Active Reset
32	nFault	nDataAvail	OUT	Printer Error
33~35	GND	GND	-	Signal Ground
36	nSelectIn	1284 Active	IN	-

3-2-3) USB

- 1)standard : USB 2.0 compatible, Full Speed(12Mb)
- 2)connector : Type B
- 3)cable : USB2.0 standard cable
- 4)data : Bulk IN, Bulk OUT
 - Bulk IN : End point 3,
 - Bulk OUT : End point 1
 - Full Speed : Max Packet Size 64 Byte(Bulk OUT),64 Byte(Bulk IN)

5) pin

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

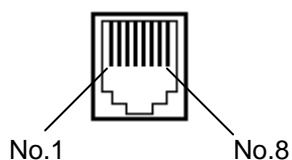
3-2-4) Serial extension RJ-45

1) Transmission: Same with the RS-232C

2) Pin Arrangement

◆ 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



◆ 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(the same with DTR)
9	Power	OUT	*1) +5Volt or +3.3Volt

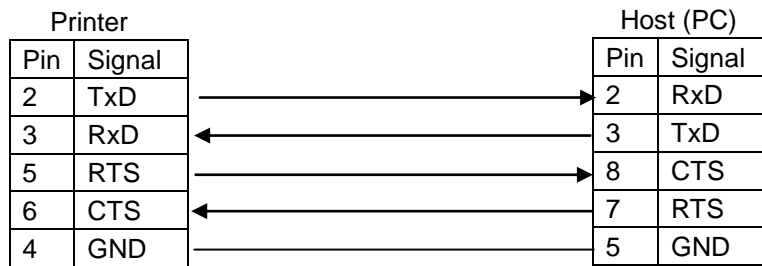
*1) Option : JP1 short : +5Volt / JP2 short : +3.3Volt

Notice : Do NOT short JP1 and JP2 at the same time.

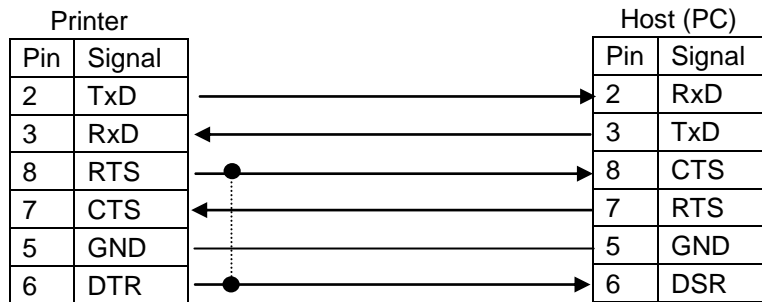


9) Example

◆RJ-45 modular 8pins



◆DSUB-9 pins



..... : It is connected inside the printer.

3-2-5) Ethernet

- 1) Protocol : TCP/IP
- 2) Standard : IEEE 802.3 10BASE-T 및 IEEE 802.3u 100BASE-TX
- 3) Connector : RB1-125BAG1A(UDE)
- 4) Pin

No	Singal	IN/OUT	Remark
1	TD+	OUT	Transmit Data+
2	TD-	OUT	Transmit Data-
3	TCT	OUT	
4	N.C	-	None Connection
5	N.C	-	None Connection
6	RCT	IN	
7	RD+	IN	Receive Data+
8	RD-	IN	Receive Data-

Notice : Refer to the 「8.Ethernet Settings」 for a detailed configuration.

3-2-6)WLAN(WiFi)

- 1) Standard : IEEE 802.11b/g/n
- 2) Frequency Band : 2.4GHz Single Band



4.Cash drawer / Melody box

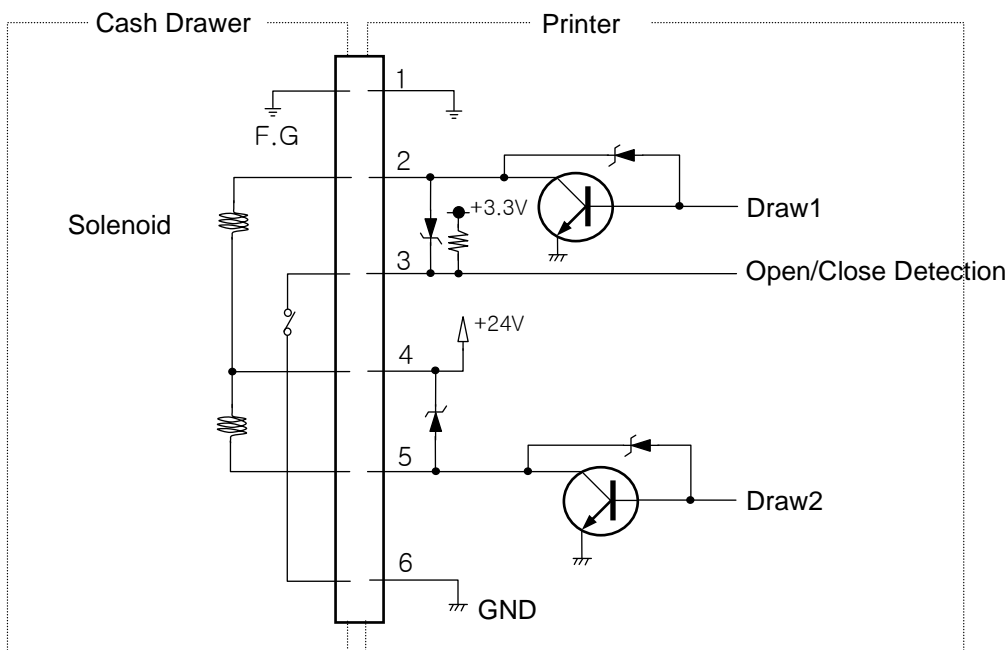
4-1) Cash drawer

1) Rating

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

Notice : Use Solenoid 24 Ω coil resistance or higher. The use of resistance less than 24 Ω may destroy the internal transistor.

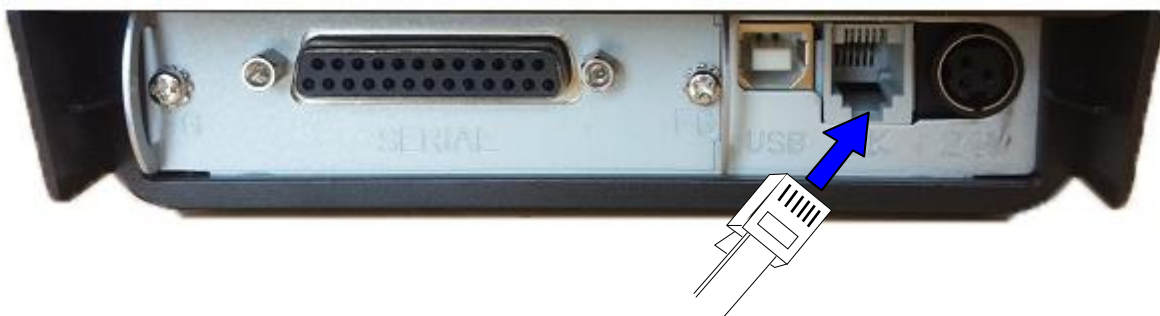
2) Circuit



Notice: You can use either one of pin 2, or pin 5.
The detection of Open / Close switch will set to invalid.

3) Connection:

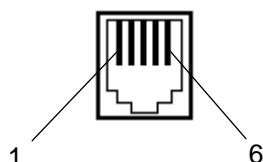
Please connect the cash drawer into the connector as below.



Notice: Do not connect modem or LAN device to the RJ-45 connector as it may potentially harm the printer.

4) Pin Arrangement (RJ-12 or RJ-25 modular 6pins)

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



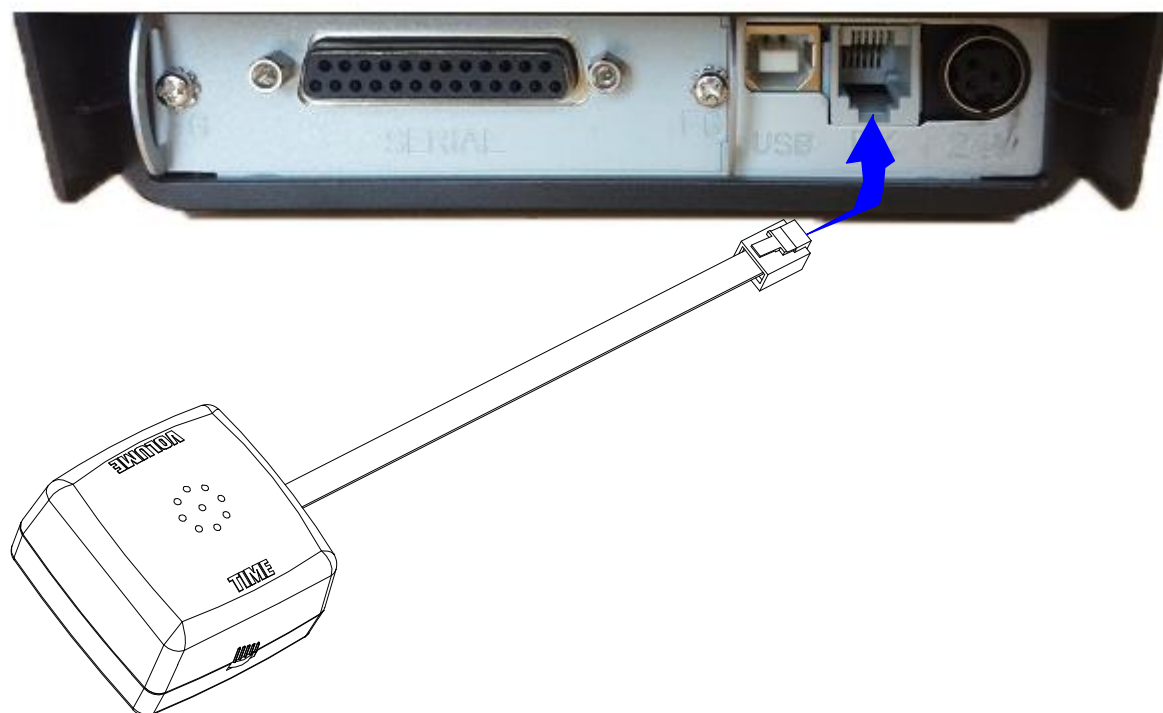
5) Operation :

If you use the command ESC + p + m + t1 + t2 command, or DLE + DC4 + 1 + kick No + t, You can operate the designated numbered cash drawer to output a set amount of pulse rate. Refer to the Command Configuration for the detailed information.

4-2) Melody : You can connect an optional melody box for the use.

1) Connection :

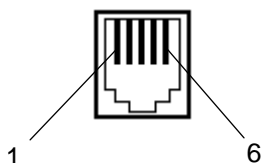
The access connector is used altogether with the cash drawer access connector.



2) Pin Arrangement

- ◆ For Mainboard: Used altogether with the cash drawer, so it's identical.
- ◆ For Melody Box: Connects to the printer's main body using 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



3) Play

- ◆ Auto play: The melody will automatically play if you place the Dip SW number 2 and 4 to ON position.
- ◆ The play by the operational signal:
Same with the cash drawers, pulse print using ESC + p + m + t1 + t2 command or DLE + DC4 + 1 + kick No + t command to play the melody.

Notice : Place the Dip SW number 2 and 4 to OFF position for this case.



4) Volume

You can control the play duration and the loudness through volume.
You can manipulate the play duration from minimum 1 second to maximum 25 seconds.

5. Command

Command	Function	Page
CR	Print and carriage return	28
LF	Print and line feed	28
CAN	Cancel the print data	28
HT	Horizontal tab	28
FF	Print the page mode / return to the standard mode	29
SUB x	Extended graphic mode / Korean mode	29
SUB p	Print the off line a paper detection	29
SUB b	Detect the black mark	29
SUB R	Outline Character (Tetragon)	30
SUB s	Speed	30
ESC D	Horizontal tab position	31
ESC SP	Spacing the character of ASCII	31
ESC !	Font decoration	31
ESC \$	Absolute position of printing	32
ESC *	Bit image (vertical)	32
ESC -	Underline the character of ASCII	33
ESC 2	Initial row pitch	34
ESC 3	Row pitch	34
ESC @	Printer reset	34
ESC E	Emphasize	34
ESC G	Double	35
ESC J	FEED	35
ESC M	Font (ASCII)	35
ESC R	International character	36
ESC a	Align the printing	36
ESC d	Printing and row FEED	37
ESC {	180° rotation	37
ESC i	Full cut	37
ESC m	Partical cut	37
ESC t	Code page (International)	38
ESC %	Download character set	38
ESC &	Download character set (Definition / Register)	39
ESC p	Cash drawer & Melody box	39
ESC S	Standard mode / Clear the area of page	40
ESC L	Page mode	40
ESC T	Page mode (Direction of printing)	41
ESC W	Page mode (Area of printing)	42
ESC FF	Printing of page area	43
FS !	Korean font decoration	44
FS &	Korean extended graphic mode (set up)	44
FS .	Korean extended graphic mode (cancel)	44
FS -	Underline Korean	45
FS S	Space Korean	45
FS W	Size Korean	45

Command	Function	Page
FS q	Register Non Volatile logo (bit image)	46
FS p	Non Volatile logo print	46
GS !	Extension of character	47
GS (K (fn=49)	Density of printing	47
GS B	Reverse printing in black / white	48
GS H	Barcode	48
GS f	Font of Barcode	48
GS L	Left space	49
GS V	Cutting (Full / Partial)	49
GS W	Area of printing	50
GS h	Barcode (Height)	50
GS k	Barcode (Printing)	51
GS w	Barcode (Extension / Reduction)	53
GS r	Status check	54
GS a	Status check (Auto reply)	56
GS P	Pitch (Horizontal / Vertical)	58
GS *	Download Bit image definition	58
GS /	Download Bit image printing	58
DLE ENQ	Buffer clear (real time)	59
DLE DC4	Cash drawer & Melody box by real time.	59
DLE EOT	Status transmission (real time)	60
GS v	Laster bit image (Horizontal)	62
SUB B	2D barcode	63
SUB z	Buzzer sound	64
SUB 1	Line 1 (Vertical, Horizontal)	65
SUB 2	Line 2 (Vertical, Horiztontal)	65
SUB W	Write (line data)	65
SUB C	Clear (line data)	65
SUB O	Line ON	65
SUB F	Line OFF	66
SUB P	Print line 1 dot line (Vertical, Horizontal)	66

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 poosition	
[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.		

SUB+'x'+n

[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 outline 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.

SUB+'s'+n

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

ESC+'D'+n1...nk+NUL

[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.

ESC+SP+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.

ESC+'!' +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

ESC+'\$'+nL+nH

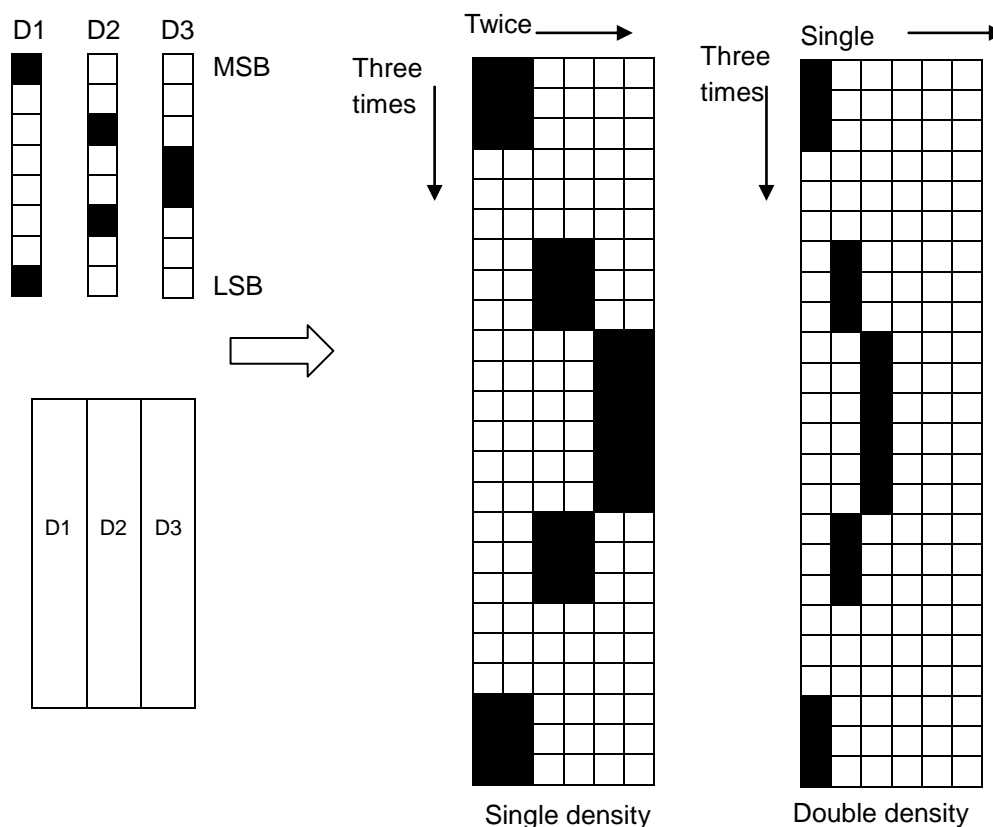
[Name]	Absolute position of printing				
[Format]	ASCII	ESC	\$	nL	nH
	Hex	1B	24h	nL	nH
	Decimal	27	36	nL	nH
[Range]	$0 \leq nL + nH \times 256 \leq 65535$, $0 \leq nL \leq 255$, $0 \leq nH \leq 255$				
[Initial]	nL=0, nH=0				
[Description]	Move the position from the space of left ending to $(nL + nH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

ESC+'*' +m+nL+nH+d1+...+dk

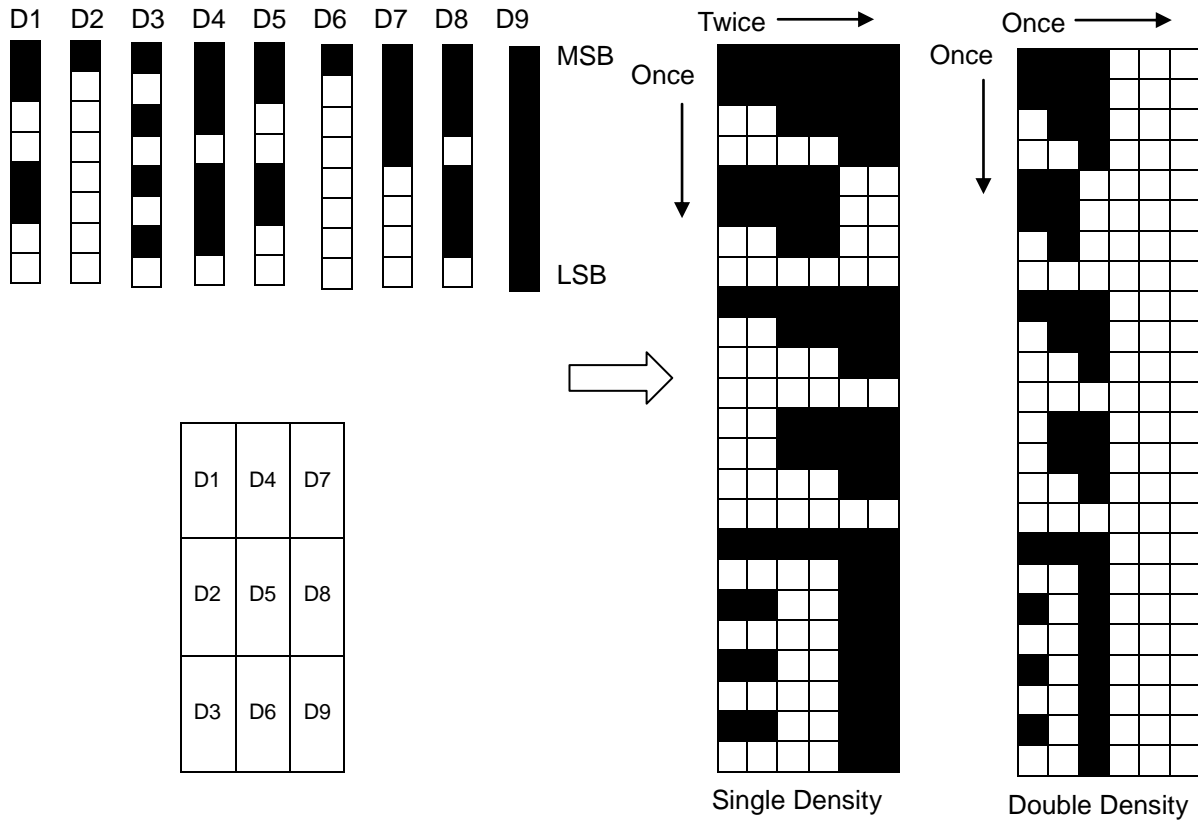
[Name]	Bit image (vertical)						
[Format]	ASCII	ESC	*	m	nL	nH	d1...dk
	Hex	1B	2Ah	m	nL	nH	d1...dk
	Decimal	27	42	m	nL	nH	d1...dk
[Range]	m=0,1,32,33 $1 \leq nL + nH \times 256 \leq 1023$, $0 \leq nL \leq 255$, $0 \leq nH \leq 3$, $0 \leq d \leq 255$						
[Description]	As much as dot fix $nL + nH \times 256$, 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	$nL + nH \times 256$
1	8dots double density	8	512	$nL + nH \times 256$
32	24dots single density	24	256	$(nL + nH \times 256) \times 3$
33	24dots double density	24	512	$(nL + nH \times 256) \times 3$

•8dots mode



•24dots mode



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] Underline the character
 [Format] ASCII ESC - n
 Hex 1B 2Dh n
 Decimal 27 45 n
 [Range] $0 \leq n \leq 7, 48 \leq n \leq 55,$
 [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

ESC+'2'

[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.

ESC+'3'+n

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

ESC+'@'

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

ESC+'E'+n

[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.

ESC+'G'+n

[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.

ESC+'J'+n

[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.

ESC+'M'+n

[Name] ASCII font selection.
 [Format] ASCII ESC M n
 Hex 1B 4Dh n
 Decimal 27 77 n
 [Range] 0≤n≤1
 [Initial] n=0
 [Description] Select the printer font.

n			
Upper 4 bits (1 byte font)		Lower 4 bits (ASCII, 1 byte font)	
0000	Korean 24x24 Godic	0000	12x24
0001	Korean 16x16 Dodeum	0001	8x16(9x16)
0010	Japapnese 24x24 Myungjo	0010	Reserved.
0011	Chinese 24x24 Godic	0011	Reserved.

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.

ESC+'R'+n

[Name]	International character			
[Format]	ASCII	ESC	R	n
	Hex	1B	52h	n
	Decimal	27	82	n
[Range]	$0 \leq n \leq 13$			
[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

ESC+'a'+n

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

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

ESC+'d'+n

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

ESC+'{' +n

[Name]	180°rotation			
[Format]	ASCII	ESC	d	n
	Hex	1B	7Bh	n
	Decimal	27	123	n
[Range]	$0 \leq n \leq 255$			
[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		

ESC+'t'+n

[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 referred 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(Cyilic #2)

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

ESC+'%' +n

[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+&			

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≤c1≤c2≤126
0≤X≤12 (FONT A(12x24))
0≤X≤9 (FONT B(9x16))
0≤d≤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≤t1≤255, 0≤t2≤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.		

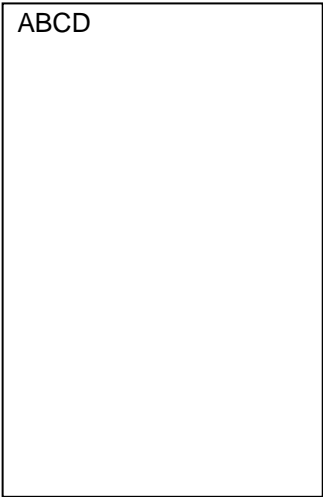
ESC+'L'

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

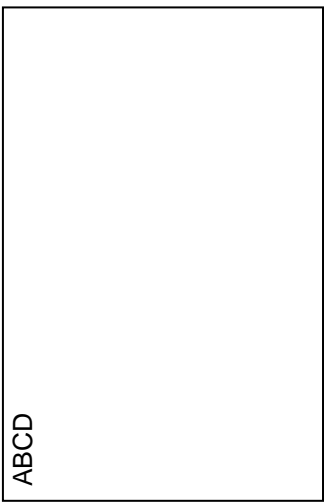
ESC+'T'+n

[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.			

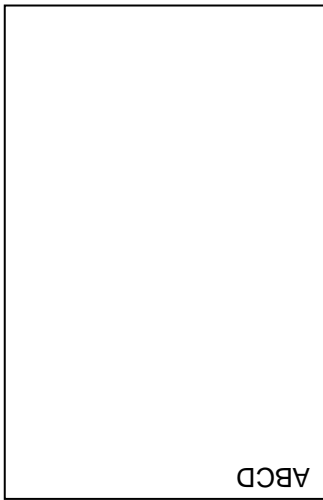
•n=0 (Left→Right),



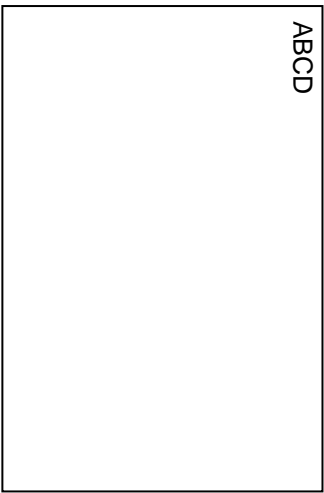
•n=1 (Lower→Upper),



•n=2(Right→Left),



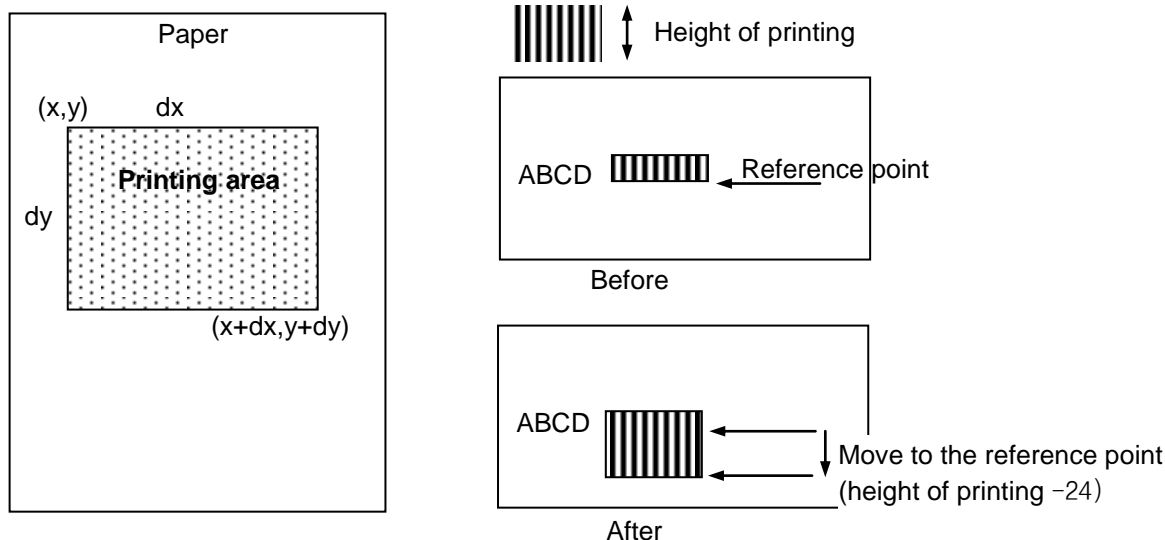
•n=3(Upper→Lower),



ESC+'W'+xL+xH+yL+yH+dxL+dxH+dyL+dyH

[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]	$0 \leq xL + (xH \times 256) \leq 65535$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 255$)										
	$0 \leq yL + (yH \times 256) \leq 65535$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 255$)										
	$1 \leq dxL + (dxH \times 256) \leq 65535$ ($0 \leq dxL \leq 255$, $0 \leq dxH \leq 255$)										
	$1 \leq dyL + (dyH \times 256) \leq 65535$ ($0 \leq dyL \leq 255$, $0 \leq dyH \leq 255$)										
[Initial]	$(xL + (xH \times 256)) = 0$ (0mm, xL=0, xH=0)										
	$(yL + (yH \times 256)) = 0$ (0mm, yL=0, yH=0)										
	$(dxL + (dxH \times 256)) \text{Max} = 512$ (72mm, dxL=00h, dxH=02h)										
	$(dyL + (dyH \times 256)) \text{Max} = 710$ (100mm, dyL=C6h, dyH=02h)										
[Description]	Set up the start point of printing area, and the size Start with Horizontal : $(xL + (xH \times 256)) \times 0.141\text{mm}$ Start with Vertical : $(yL + (yH \times 256)) \times 0.141\text{mm}$ Size of Horizontal : $(dxL + (dxH \times 256)) \times 0.141\text{mm}$ Size of Vertical : $(dyL + (dyH \times 256)) \times 0.141\text{mm}$										
[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.



ESC+FF

[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] $0 \leq n \leq 255$
 [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 Korean 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.

FS+'.'

[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.

FS+'-' +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.

FS+'S'+n1+n2

[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.				

FS+'W'+n

[Name]	Size Korean			
[Format]	ASCII	FS	W	n
	Hex	1C	57h	n
	Decimal	28	87	n
[Range]	0≤n1≤255			
[Initial]	n=0			
[Description]	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)

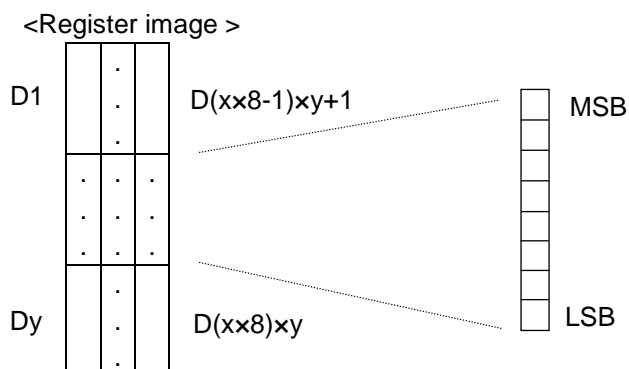
[Format] ASCII FS q n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n
Hex 1C 71h n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n
Decimal 28 113 n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n

[Range] $1 \leq n \leq 255$
 $0 \leq xL + xH \times 256 \leq 65535$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 255$), number of horizontal byte
 $0 \leq yL + yH \times 256 \leq 65535$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 255$), number of vertical byte
 $0 \leq d \leq 255$
 $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$
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 $(yL + yH \times 256) \times 8$ 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.



FS+'p'+n+m

[Name] Non Volatile logo printer

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

[Range] $1 \leq n \leq 255$, $0 \leq m \leq 3$, $48 \leq m \leq 51$

[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
[Range]	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) horizontal 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		
n(Hex)	n(Decimal)	Portion
00h	0	Once
10h	16	Twice
20h	32	Three
30h	48	Four
40h	64	Five
50h	80	Six
60h	96	Seven
70h	112	Eight

Vertical		
n(Hex)	n(DecimaL)	Portion
00h	0	Once
01h	1	Twice
02h	2	Three
03h	3	Four
04h	4	Five
05h	5	Six
06h	6	Seven
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]	$0 \leq n \leq 255$			
[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]	$0 \leq n \leq 3, 48 \leq n \leq 51$			
[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.

GS+'f'+n

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

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

GS+'L'+nL+nH

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

GS+'V'+m

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

m	Function
0, 48	Full
1, 49	Partial

GS+'V'+m+n

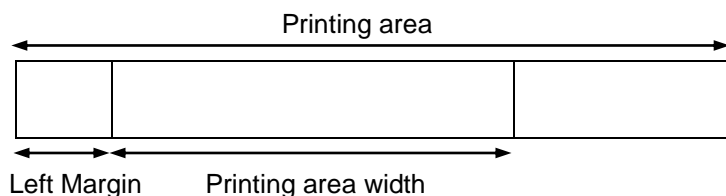
[Name]	Cutting (Full / Partial)				
[Format]	ASCII	GS	V	m	n
	Hex	1D	56h	m	n
	Decimal	29	86	m	n
[Range]	$0 \leq m \leq 1$				
[Initial]	$m=0$				
[Description]	It cuts the paper $n \times$ pitch.				

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

GS+'W'+nL+nH

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



GS+'h'+n

[Name]	Barcode (Height)			
[Format]	ASCII	GS	h	n
	Hex	1D	68h	n
	Decimal	29	104	n
[Range]	$1 \leq n \leq 255$			
[Initial]	$n = 162 (22.8\text{mm})$			
[Description]	It sets up the height of barcode $n \times 0.141\text{mm}$.			

GS+'k'+m+d1...dn+NUL

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

[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.

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

[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]	$1 \leq n \leq 4$			
[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 : UPC-E, EAN13, EAN8

* 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

<Parallel & 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

<Parallel & 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..dk			

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

DLE+ENQ+n

[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.

DLE+EOT+n

[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

③ n=3,

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

④ n=4,

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

<Parallel and USB 1 byte>

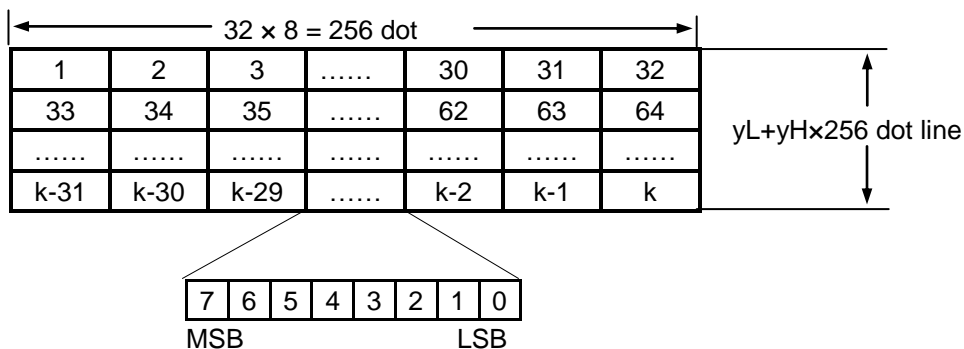
Bit	Status	Hex	Decimal
0	0 : Paper remain 1 : Paper empty	00h 01h	0 1
1	0 : Cover close 1 : Cover open	00h 02h	0 2
2	0 (Not use)	00h	0
3	0 : Paper enough 1 : Paper necessary	00h 08h	0 8
4	0 (Not use)	00h	0
5	0 : No cutter error 1 : Cutter error	00h 20h	0 32
6	0 (Not use)	00h	0
7	0 (Not use)	00h	0

[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]	$0 \leq m \leq 3$ or $48 \leq m \leq 51$,									
	$1 \leq (xL + (xH \times 256)) \leq 89$ ($0 \leq xL \leq 89$, $xH = 0$)									
	$1 \leq (yL + (yH \times 256)) \leq 436$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 1$)									
	$0 \leq d \leq 255$ ($yL + (yH \times 256)$)									
[Description]	k (Number of data) = $(xL + (xH \times 256)) \times (yL + (yH \times 256))$									
	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

$xL + (xH \times 256) = 32$ bytes,



[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
	$1 < n2 \leq 255$

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

The vertical size PDF417 sets up automatically.

2) QR code

n2	Number
n3=1	$1 < n2 \leq 17$
n3=3	$1 < n2 \leq 53$
n3=5	$1 < n2 \leq 106$
n3=9	$1 < n2 \leq 230$

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

3) Data Matrix

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

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]	$0 \leq n \leq 255$			
[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]	$0 \leq nL + (nH \times 256) \leq 512$, ($0 \leq nL \leq 255$, $0 \leq nH \leq 3$)						
	$0 \leq kL + (kH \times 256) \leq 512$, ($0 \leq kL \leq 255$, $0 \leq kH \leq 3$)						
[Description]	It writes 1 from $nL + nH \times 256$ to $kL + kH \times 256$.						
[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'

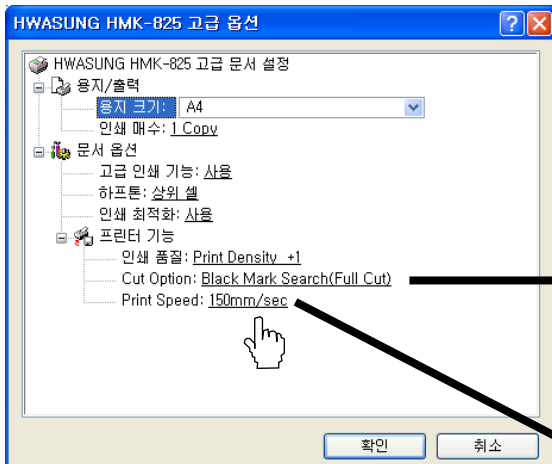
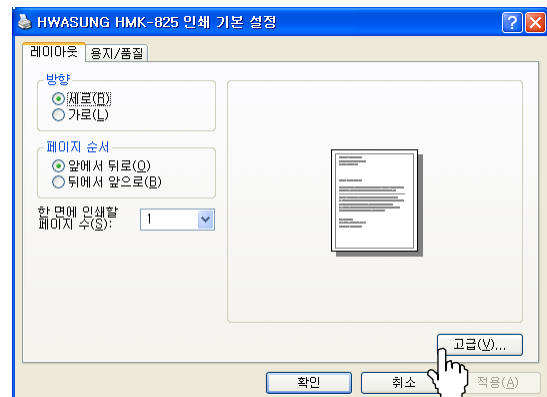
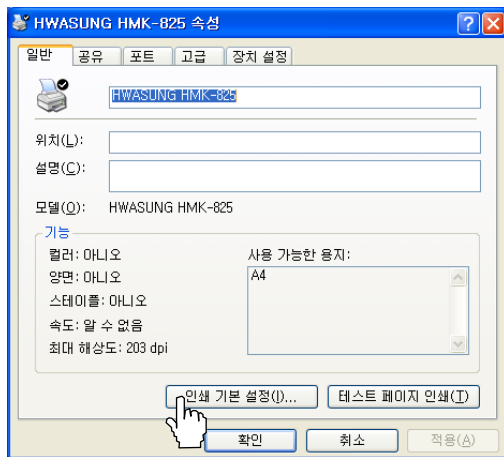
[Name]	Print line 1 dot line (Vertical,Horizontal)		
[Format]	ASCII	SUB	P
	Hex	1A	50h
	Decimal	26	80
[Description]	It prints line 1 dot line.		

[**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.

4. Windows Driver

4-1) Printer Configuration Settings

- 1) Please open the screen of printer / fax, and click the basic setting (I) of the general tap.
- 2) Please click Advanced Tab(V).
- 3) Please refer to the following images, and set up each details. You can select on each dropdown list to set the Density, Cutting Option, and Print Speed Setting.



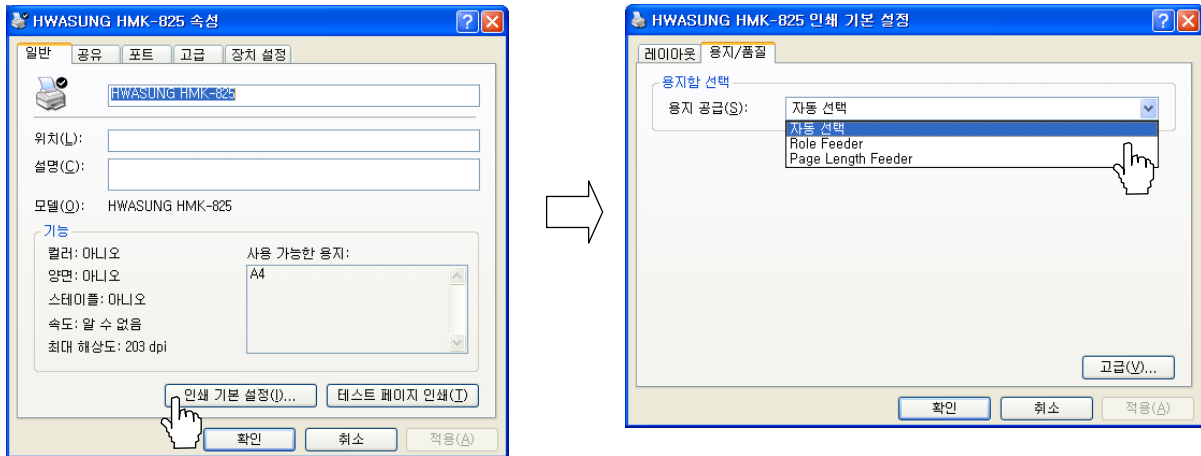
No Cut : No Cut, just Print.
 Full Cut : Full Cut after print.
 Partial Cut : Partial Cut after print.
 Black Mark Search(Full Cut) :
 The cutting position from the black mark will be set by the memory switch.

※All printed materials would be different depending on the print data size due to printing in graphic, so by fixing the setting to the below set may provide a smoother quality.
 Print Width 60mm: Set the speed to 150mm.
 80mm: Set the speed to 130mm.

4-2) Paper Feed Setting

Please set the form feeding after printing.

- 1) Open the Printer and Fax folder, then click on the Basic Setting (I) under General tab.
- 2) Please click the paper /quality tab, and select from the Paper Feed dropdown list.



- 3) Auto Select / Role Feeder : : After printing, the form feeding is not conducted any more regardless of the paper length. This setting is used when the printed material length is irregular. As you can see from the example below, the feeding will not happen even if you set the margin through the Visual Basic, so you'd have to set the FontSize smaller and print "." to set the cutting position through Dummy Form Feeding.

Example)

'----- Example Dummy form feeding to cutting position -----'

```
Printer.Print " " & vbCrLf
```

```
Printer.Print " " & vbCrLf
```

```
Printer.Print " " & vbCrLf
```

```
Printer.FontSize = 2
```

```
Printer.Print "." ' dummy print for form feeding
```

```
Printer.EndDoc
```

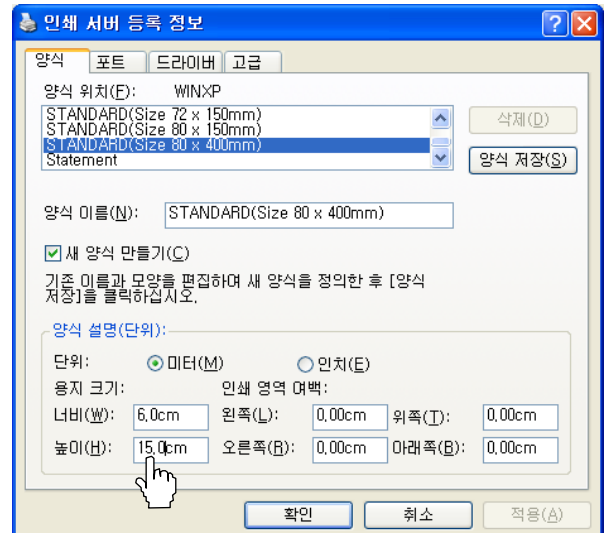
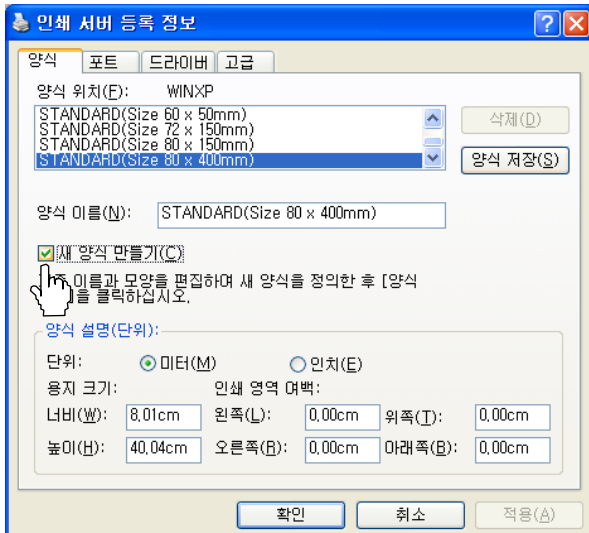
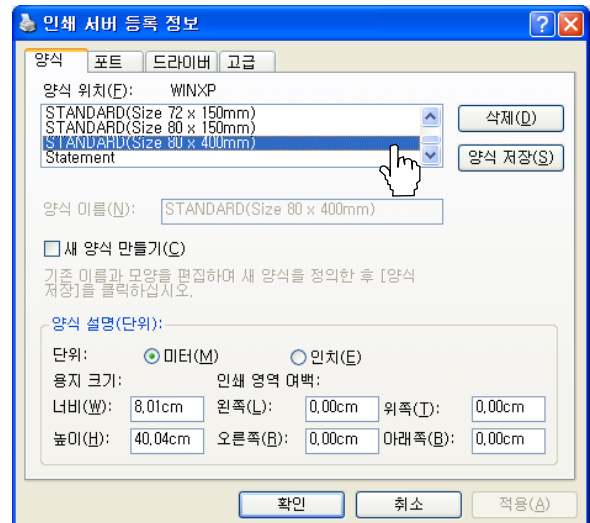
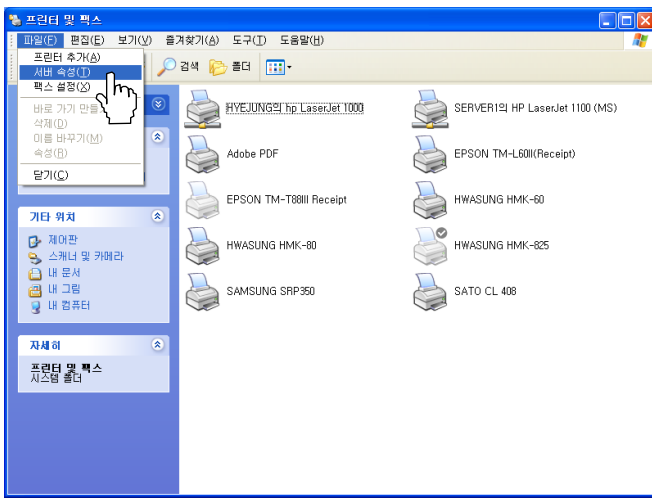
- 4) page length Feeder : After print, execute form feeding up to the set page length. Set when the printed materials are fixed to a certain length.

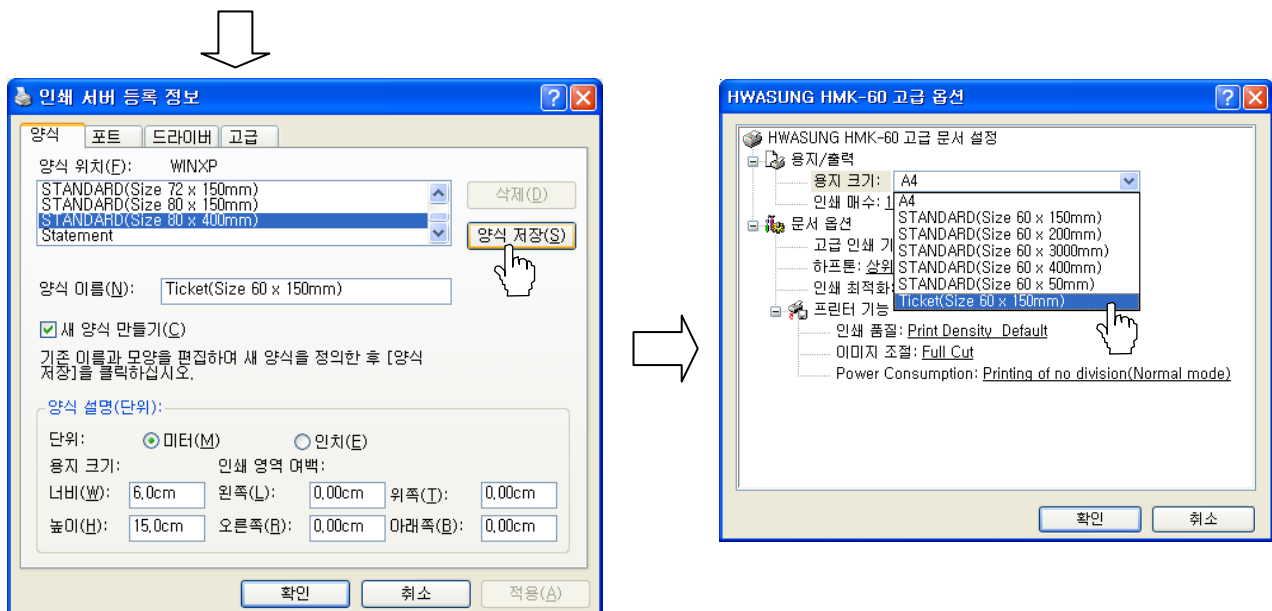
4-3) New Paper Settings

You can use the custom user paper size.

Below is the example of making 60mm x 150mm sized paper.

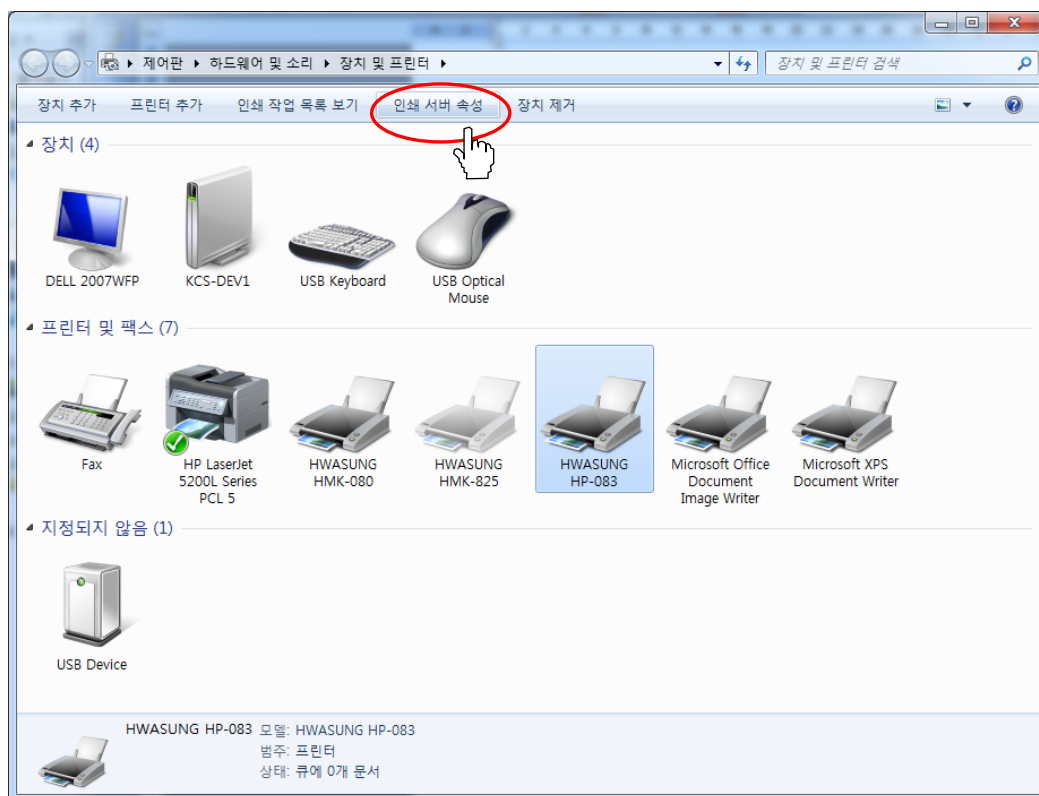
- 1) Open the Printer and Fax Screen, then click on the server property under File Menu.
- 2) Select the STANDARD(Size 80 x 400mm) from Form Location.
- 3) Check the "Create New Form" box.
- 4) Click the paper size field and input 6.0cm (W), 15.0cm(H).
Make sure to make no changes in the print area margin.
- 5) Save the form after creating a custom name for the size. (i.e, Ticket(Size 60 x 150mm)).
- 6) Go to Basic Print Setting -> Advance then Select the newly created Ticket(Size 60 x 150mm)





※ Following images are the examples for the Windows XP Operating System.

※ Select the button highlight in Red, and set it up the same ways as Windows 7, or Windows 8.



※ Windows7 example

6. USB (User Interface)

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).

6-1) DLL Interface

Place the HwaUSB.DLL into the System32 folder or SysWow64 folder depending on your Operating System's bit version.

6-1-1) DLL (Funtions)

1)long UsbOpen(LPCTSTR SelPrinter);

Open the USB port to Printer Model "HMK-081".

- Parameters:
SelPrinter : Printer Model Name
- Return :
Open Normal: 0
Open Error: -3(negative)

2)long PrintStr(LPCTSTR data);

Prints String.

- Parameters:
data : String datas
- Return :
Print Normal : 1
Print Error : 0

※ 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);

Prints 1 byte of data. When printing big data spool, use the following PrintPacket Value to increase the transfer Speed.

- Parameters:
data : 1 byte data (0~255)
- Return :
Print Normal : 1
Print Error : 0

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4) long NewRealRead(void);

Reads 1 byte of print status data using USB port.

- Parameters:
None
- Return :
Read Normal : Print Status Value
Read Error : -1 (Negative)

5) long PrintPacket(unsigned char *PacketBuf, unsigned long PacketLength);

The sending data buffer outputs a USB port for the specified data length.

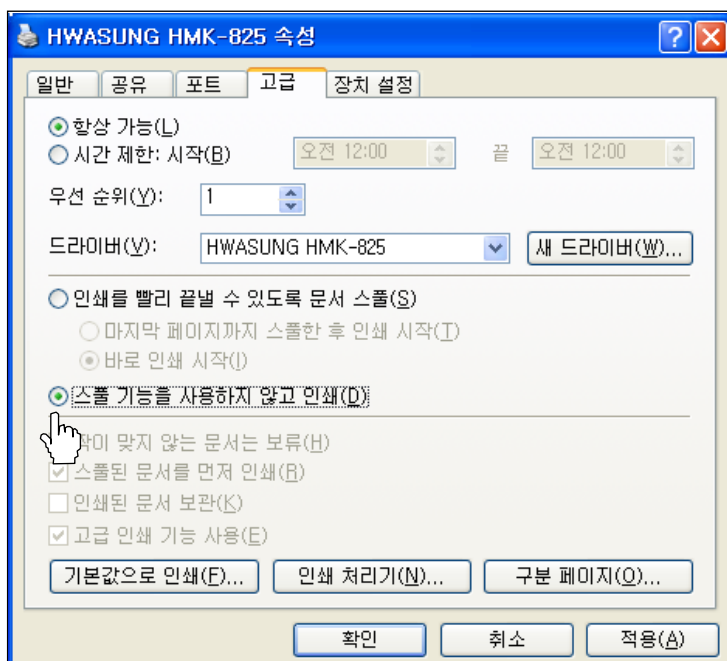
- Parameters:
PacketBuf : TransmitDataBuffer Pointer
PacketLength : Transmit data length (not to exceed up to 64 bytes)
- Return :
Normal Output : 1
Output Error : 0

※ Do not use functions other than those listed above as they are for debug.

※ For more information, download the sample program from our website.

7-2) DLL notice

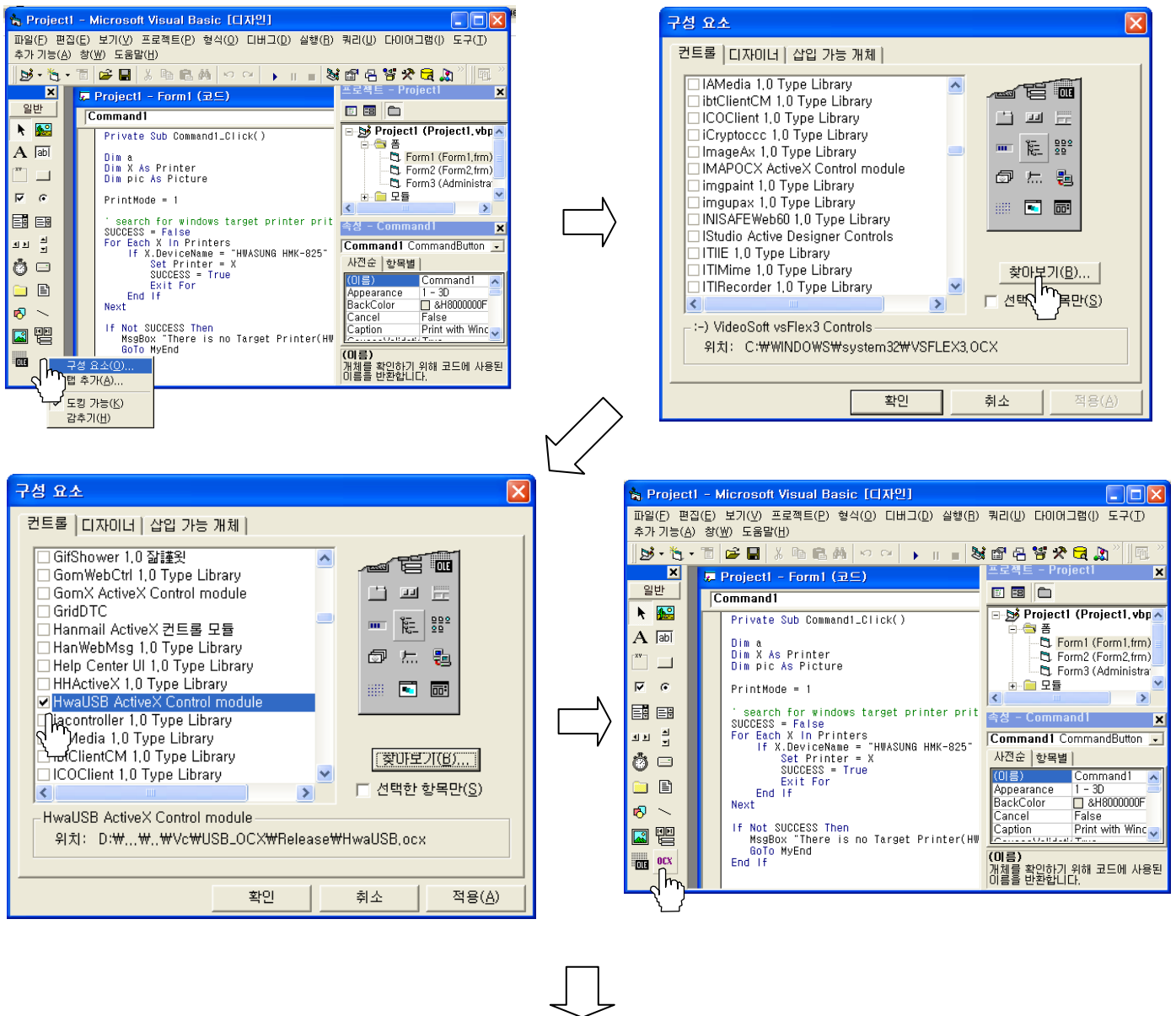
If you use Windows driver together, when you use OCX driver,
the data of Windows driver, and the data of OCX driver can not be delivered properly.
Please do not use the spool to print.
Please refer the following image.

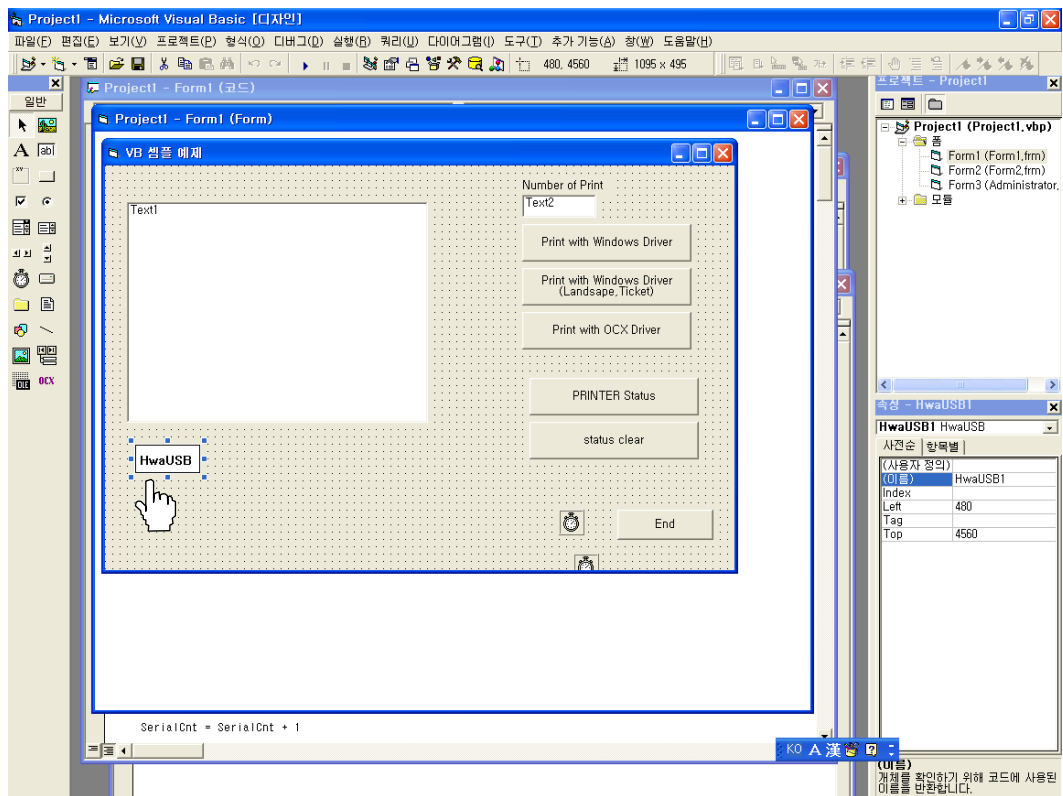


7-3) OCX driver

Notice : We recommend DLL, better than OCX driver.
From now on, the upgrade will be made for DLL only.

Please see the following instructions of the ocx driver, how to use at the program Visual Basic.
The image as below is Korean, please contact us more details, if you can't.





Notice : Please contact us for the sample program.

7-3-1) OCX function (Functions)

1) long HwaUSB1.Open(LPCTSTR SelPrinter);

Please open the port USB by the printer model HP-283, or the printer model HP-083.

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

2) void HwaUSB1.Close(void);

Please close the port USB by the printer model.

- Parameters:
None
- Return :
None

3) long HwaUSB1.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 '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 : one(1) byte data (0~255)
- Return :
Print normal : 1
Print error : 0

5) long HwaUSB1.NewRealRead(void);

It reads the printer status as data one (1) byte by the port USB.

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

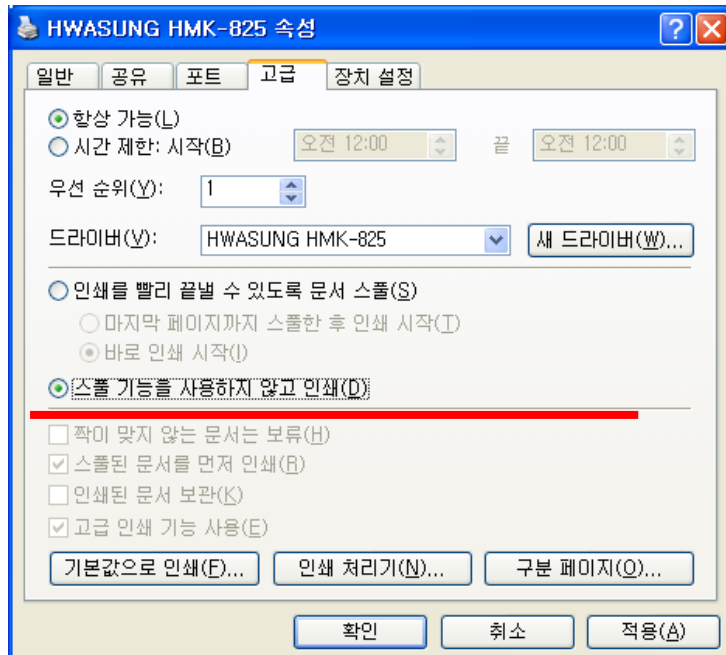
Notice Please do not use any function we don't provide, due to the debug usage.

Notice Please ask the sample program for more details.

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7-3) OCX driver notice

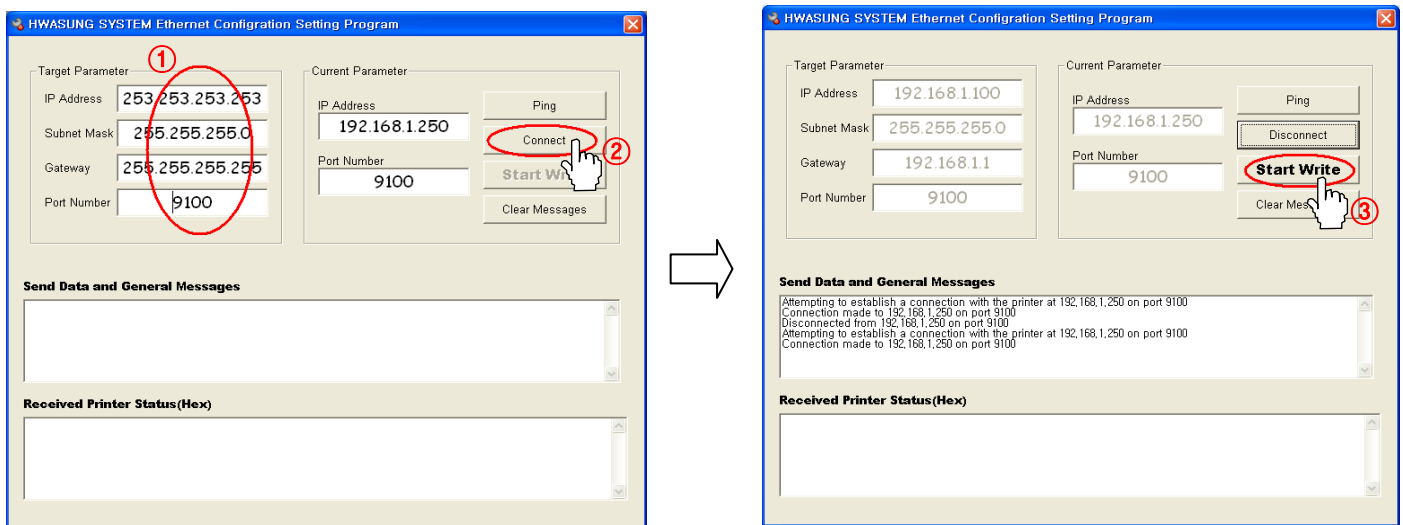
Notice: If you use Windows driver with OCX driver, the data of Windows driver, and the data of OCX driver will conflict with each other. Go to the printer's property and click on the "Do no use spool to print" as shown on the image below to avoid the problem.



8. Ethernet

8-1) If it is Static IP Mode,

- 1) Connect the network cable to the printer.
- 2) Configure the Dip SW1 number 1 to OFF (Static IP Mode) number 2 to ON (Boot into Default Value) prior to power ON. It will boot up to the factory setting IP address: 192.168.1.250 port number: 9100.
- 3) Run the IP Configuration Utility Program.
- 4) Set the desired communication parameter into the Target Parameter and click on Connect button.
- 5) After a successful connection, there will be a message of confirmation and the "Start Write" button will become active.
- 6) Click on the 'Start Write' button.
- 7) There will be a notification of Transmission Complete, and the sent communication parameter will be stored in the printer's non-volatile memory.

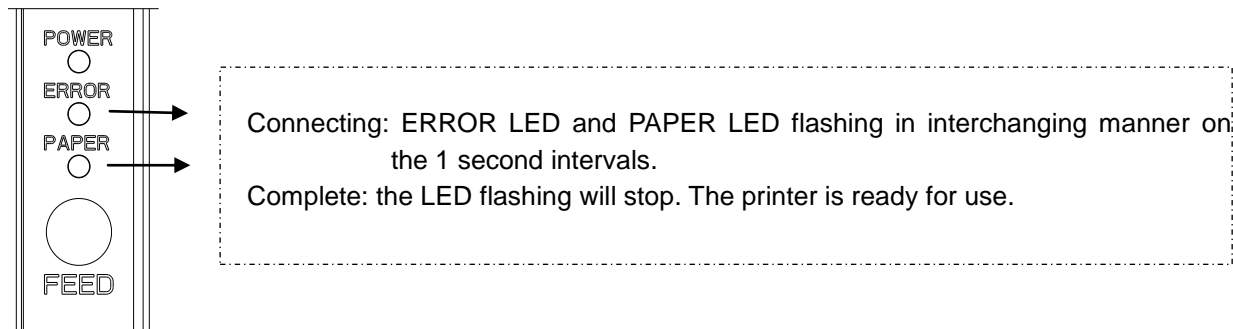


- 8) Turn off the Printer's power.
- 9) Configure the Dip SW1 number 2 to OFF position (Boot into User Value) and turn on the printer while pressing down on the FEED button. The self-test print will run and the User Parameter Value will be printed.
- 10) Verify the configured User Value, and the printer will boot into User Value when it reboots. You can use this User Value with the application in use.

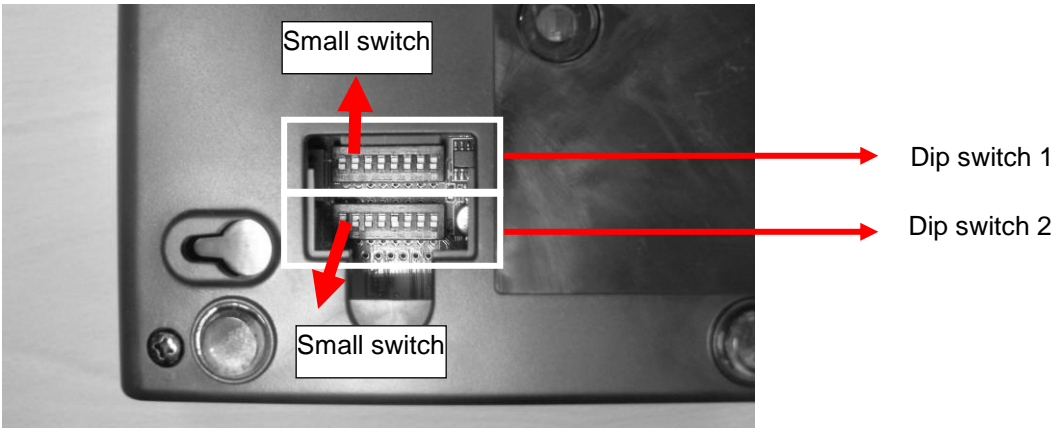
Caution) In case of factory setting IP address colliding with the Network's IP address, you cannot change the configuration value, so you'd have to connect the printer directly to PC to avoid the IP address collision for settings, or you'd have to boot into DHCP mode and obtain an IP address automatically then reconfigure. (Refer to the 'In case of using DHCP Mode')

8-2) In case of using Dynamic IP DHCP Mode,

- 1) Connect the network cable to the printer.
- 2) Configure the Dip SW1 number 1 to ON (Dynamic IP DHCP Mode) number 2 to OFF (Boot into User Value) prior to power ON. Printer's ERROR LED and PAPER LED will flash in interchanging manner on the 1 second intervals, and it will start the Protocol communication exchange with the Host. .
- 3) When the connection is successful, LED will stop blinking.
- 4) Power OFF the printer.
- 5) Turn on the printer while pressing down on the FEED button to start the self-test print. On the print, there will be a parameter value which you've automatically obtained from the Dynamic IP DHCP Mode. You can use this Value with the application in use.



Caution) When booting into Dynamic IP DHCP Mode, the communication parameter that you've obtained automatically may change on each use, so you need to pay attention for the change. Only use this mode when there's a conflict with network IP address during the configuration of communication parameter with Static IP, and when communicating with the application we recommend you to use static IP.



9. Wi-Fi setting

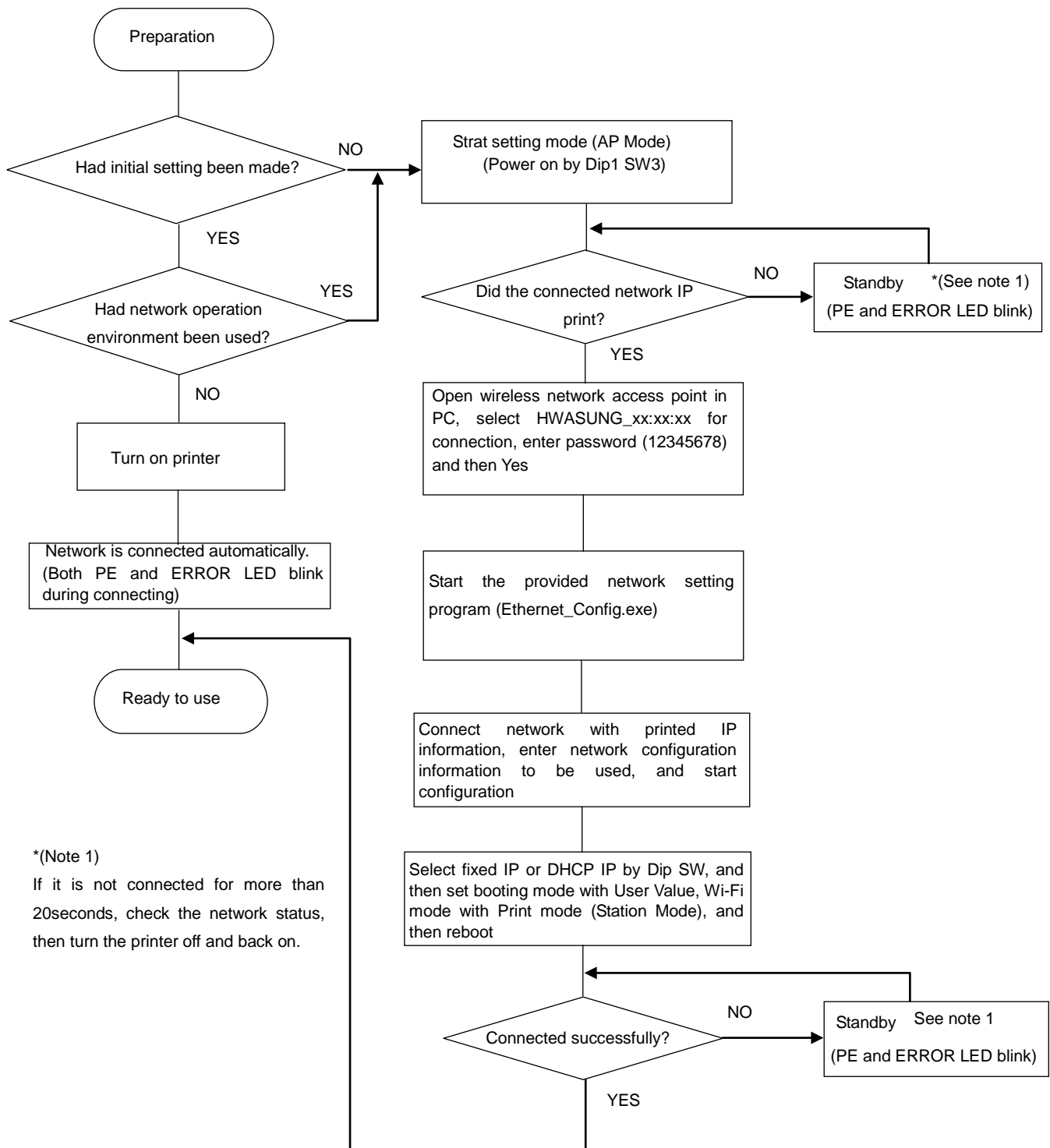
9-1) Initial setting

Initial setting is required before using the Wi-Fi interface.

The necessary process for using the Wi-Fi interface is expressed in the flow chart below.

The advantage of this printer that it is easy and simple to configure the Wi-Fi settings and use it right away.

(※When using WiFi, there will be 1 row of blank printed in case of Socket Open and Socket Close.)



*(Note 1)

If it is not connected for more than 20seconds, check the network status, then turn the printer off and back on.

- 1) Boot in setting Mode: Place the Dip SW1 number 3 to ON position and power ON the printer.
- 2) When connected on setting mode, available IP and gateway addresses are printed.
(Printing example when succesful connection is made in setting mode)

[Link up Events]

IP Addr : 192.168.12.101

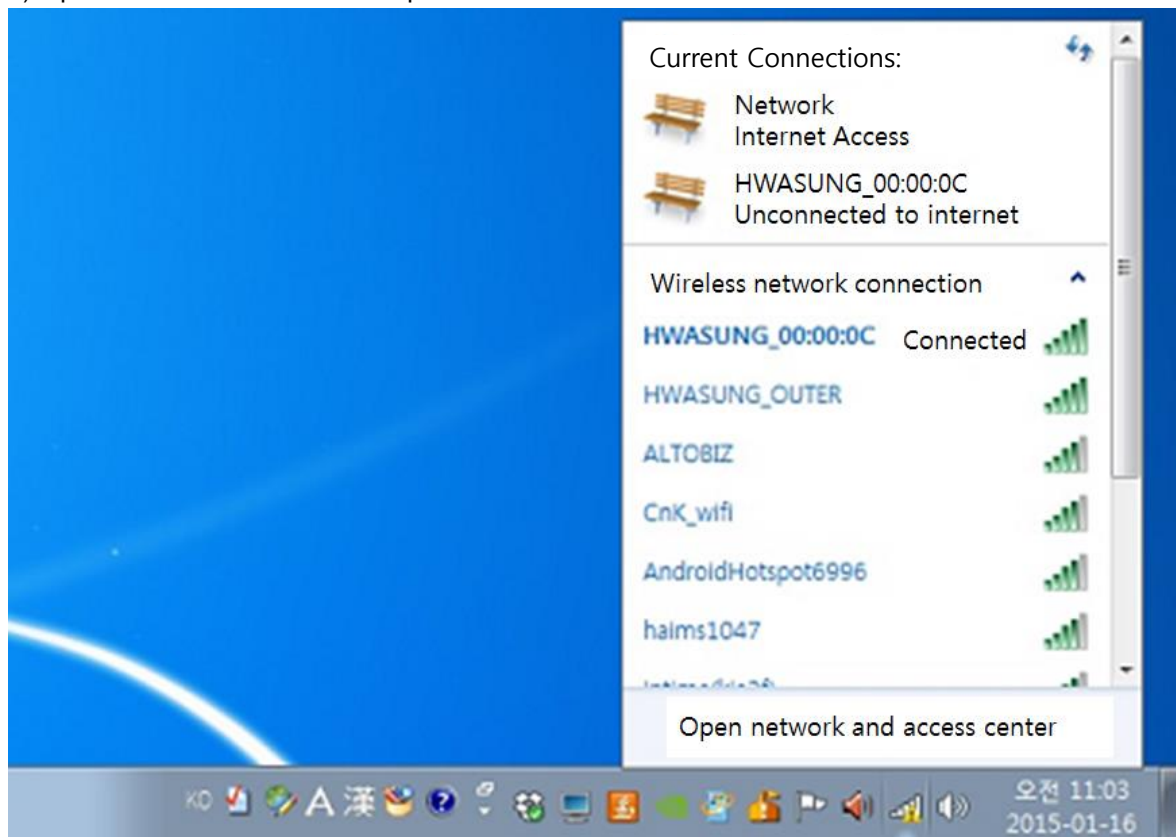
Gateway : 192,168.12.1

[OK]

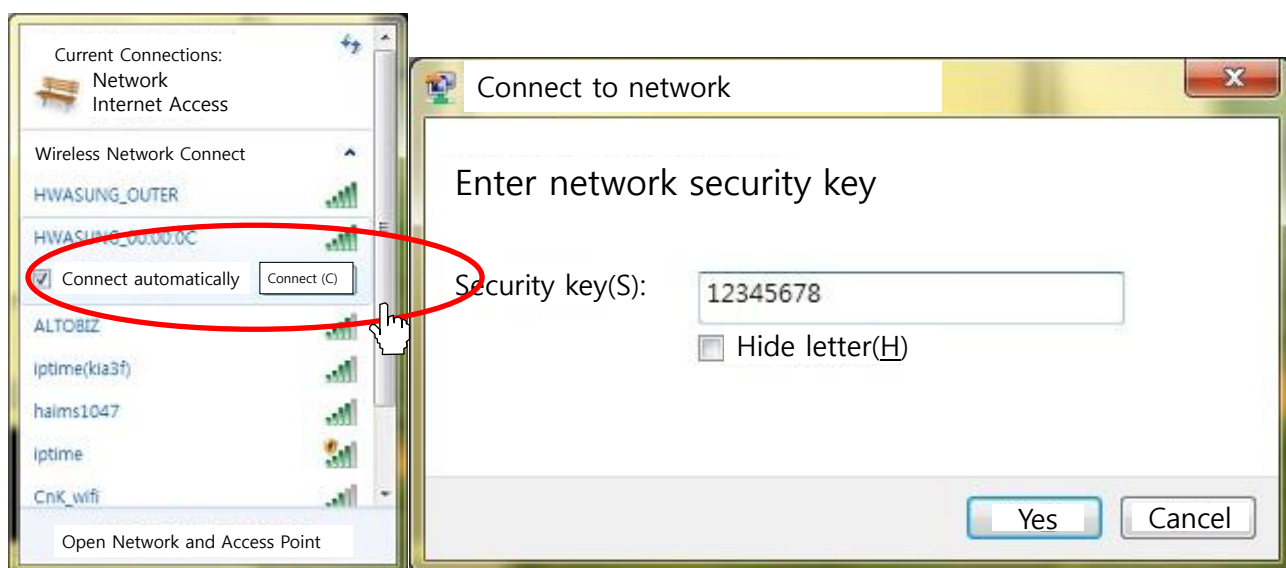
Temporary IP address to be used for network

Temporary IP address to be used for network setting

- 3) Open wireless network access point in PC.

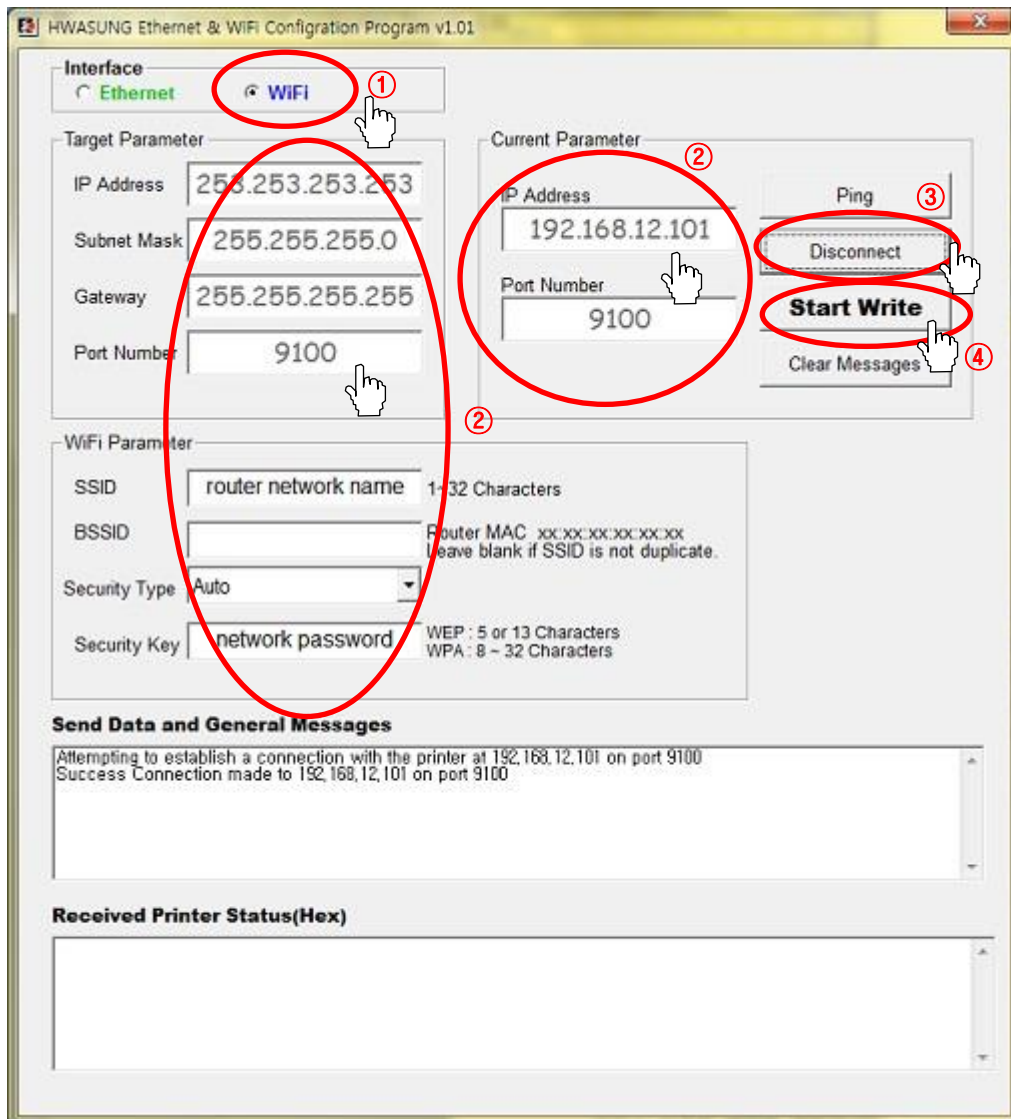


- 4) Select HWASUNG_XX:XX:XX, and then press connect (XX is the MAC value of printers and are different by each set).



- 5) Enter 12345678 when asked for security key and press 'Yes'.

- 6) Run IP Configuration setting utility program (Ethernet_config.exe).
- 7) Select Wi-Fi for interface, enter IP address printed above the Current Parameter box. Enter network configuration value which will be used in the work station to the Target Parameter box, Designate the name and password of AP in Wi-Fi Parameter box and then click Connect button.
- 8) After a successful connection, there will be a message of confirmation and the “Start Write” button will become active. Click on the ‘Start Write’ button.
- 9) Place the Dip SW1 number 3 to OFF position (Print Mode).
- 10) Select the Network IP type (Static IP or DHCP IP) using Dip SW as well as the booting mode (User Value Mode) and WiFi Mode to Print Mode then turn the printer off and back on.



※ If there is same AP name within the network environment to be used, enter MAC address of AP to be connected in **BSSID** box, or if not, leave blank.

※ When trying to connect to a network, s ERROR LED and PAPER LED will flash in interchanging manner on the 1 second intervals.

If such blinking lasts for more than 20 seconds, check network state, turn off printer and then turn on again.

11) Self-testing printing prints set network configuration values.

12) In Window Application, printing is available referring to this network configuration values.

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*** Spec revision**

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