

# Technical Manual

**HMK-080, HMC-080**

**Release2**



# **HWASUNG**

## **TICKET.KIOSK PRINTER**

### **CAUTION**



- Please do not disassemble / reorganize the product.
- Please do not the remove the paper jam during power on.
- Pleased do not exceed the standard power voltage.
- Please do not wash off the product.
- Please do not press / shock the product.
- Please do not put the product at the moist (humid) condition.



- Please contact us if there is any problem.
- Please power off once remove the paper jam.
- Please clear the air / open the disclosed place.
- Please set the product without damage enviornment.
- Please set the product at the stable place.
- Pleaes keep the requires as necessary as general electrics.

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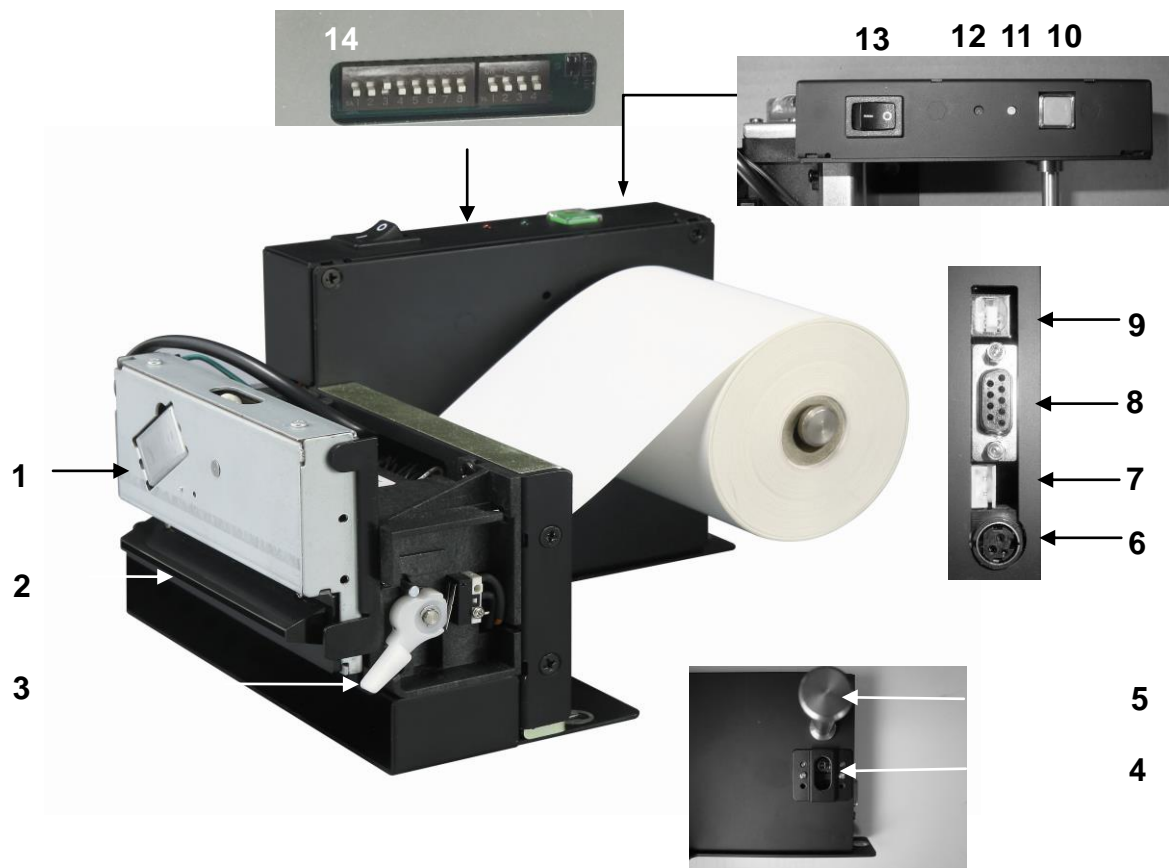
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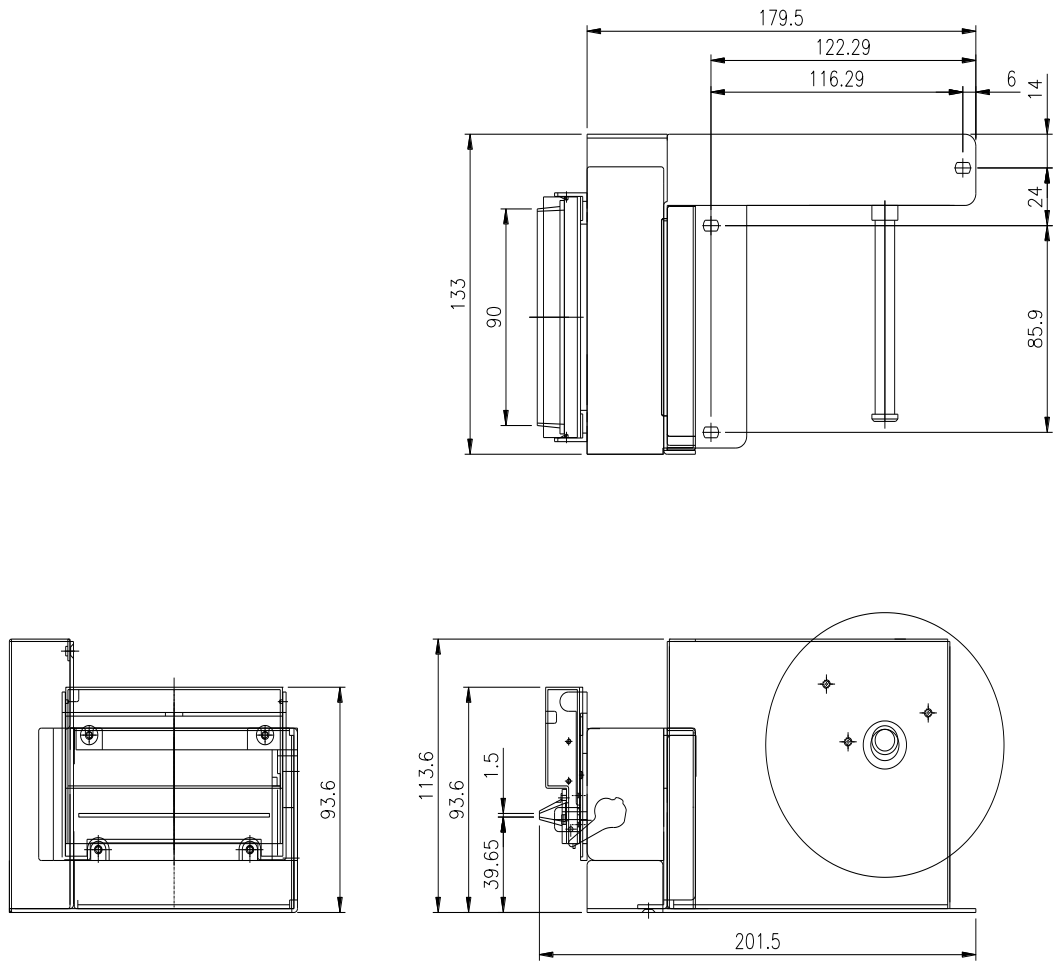
## 1. Printer features & External dimension

### 1-1) Name of each parts

- |                            |                                 |
|----------------------------|---------------------------------|
| 1. Auto cutter             | 8. Interface connector (RS232C) |
| 2. Paper guide             | 9. Interface connector (USB2.0) |
| 3. Headup lever            | 10. Feed button                 |
| 4. Near end sensor         | 11. Power LED(Green)            |
| 5. Paper holder            | 12. Error LED(Red).             |
| 6. Power connector (3 pin) | 13. POWER SWITCH                |
| 7. Power connector (2 pin) | 14. Dip switch 1, 2             |



1-2) Dimension

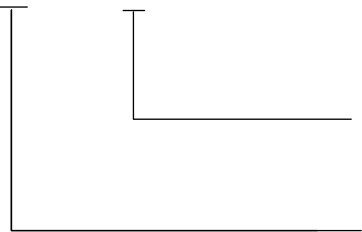


[ Standard type ]

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1-3) Model Number

HM□-080□

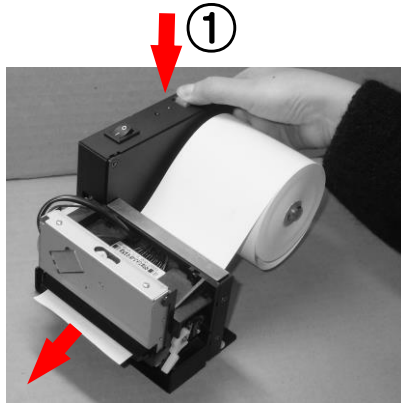


- ※ Interface  
S : Serial(RS-232C)  
U : USB

- ※ Frame  
K : Frame type.  
C : Board type.

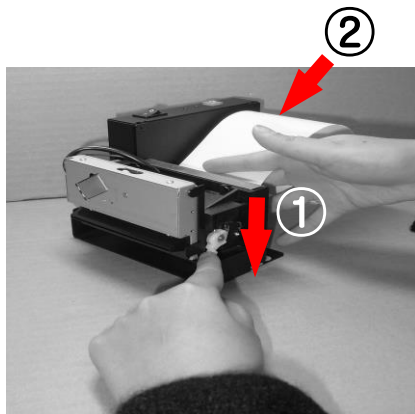
## 2. Operation

### 2-1) Setting a paper



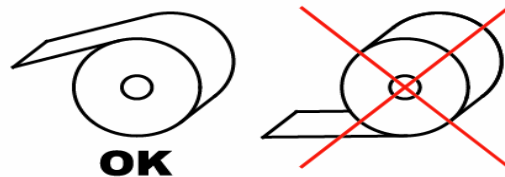
1. Please press down the feed button.

2. Please make sure the remains which the paper comes out.

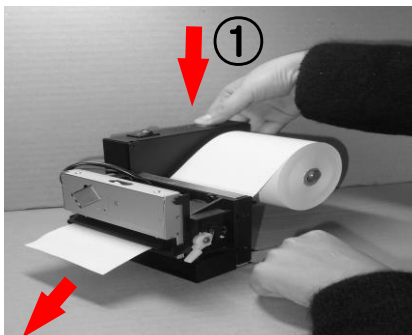


3. ① Please make sure if the head-up lever is down.

② Please insert the paper, and make sure if the auto loading is working, and the paper cuts.



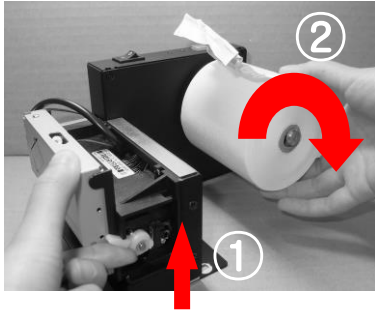
[Paper Direction]



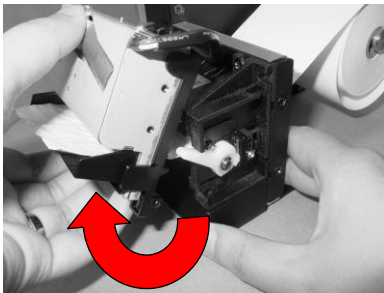
4. ① Please make sure if the head-up lever is down.

② Please insert the paper, and make sure if the auto loading is working, and the paper cuts.

## 2-2) Removing the paper jam



1. ① Please lift up the head-up lever.
- ② Please remove the paper with the direction as image.



2. Please follow the direction as image.



## 2-3) Self test

1. Please power on, once the feed button is being pressed down.

2. The following information will be printed.

```
*****
HMC-080 Control Board
Firmware   : R2.VerX .XX
Create     : 20XX/XX/XX
*****

Interface and Setting information
=====
Interface   : USB & RS-232C
Baud Rate   : 19200
Data Bit    : 8 Bit
Parity      : None
Stop Bit    : 1 or 2
=====

Peripheral & Setting Information
=====
USB Status  : B
```

- Model
- Firmware
- Create
- Interface
- Dip switch information
- Sample printing

Please refer to the Dip Switch Info at 2-7

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## 2-4) HEX Dump

1. Please switch 1 and 8 \*up at the dip switch, and power on. \*up : on  
It prints all data in hex character (16 antilogarithm), after [Hex Dump Mode] prints out.
2. It could know the printer status.
3. It will be useful for the application development.
  - It prints out if it receive twelve digits.
  - If it receives less than twelve digits, it will be printed if you press down feed button.
  - Control code ( 1F16 below) prints out as “.”.
  - 8016 more prints out as “^”.

[Printing sample]

16 antilogarithm	ASCII
[HEX DUMP MODE]	
41 42 43 44 45 46 47 47 49 4A 4B 4C	A B C D E F G H I J K L
30 31 32 33 34 35 36 37 38 39 1B 4A	0 1 2 3 4 5 6 7 8 9 . J
FF 1B 69	^ . i

## 2-5) Update (on Board)

Please conduct the updates, after refering the following steps.

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

2) Please check the connection between the printer and the data cable.

\* Please make sure about if it is the right cable.

\* If use USB cable, save the time to update the firmware

3) Please conduct the provided program , then set up the model and Interface port

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, till the update is complete.

4) The update will be complete, once the update indicates complete.

\* If the error LED keeps the light goes in and out, it's error.

Please stop the update program and make sure the cable and other connections.

Please return the process "1." and follow the step again.

5) After update, automatically the printer will be reset for using and use the printer.

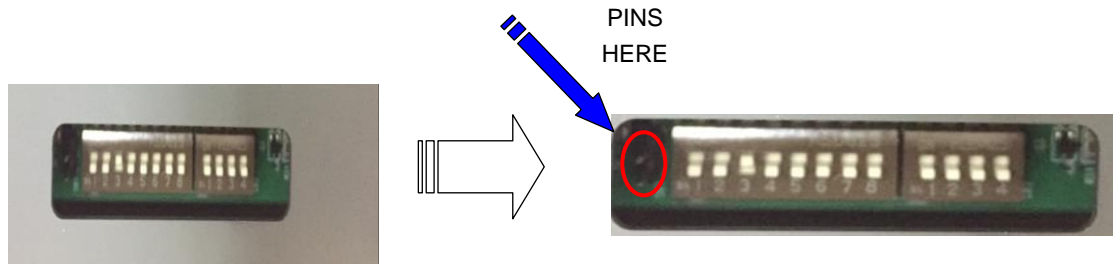
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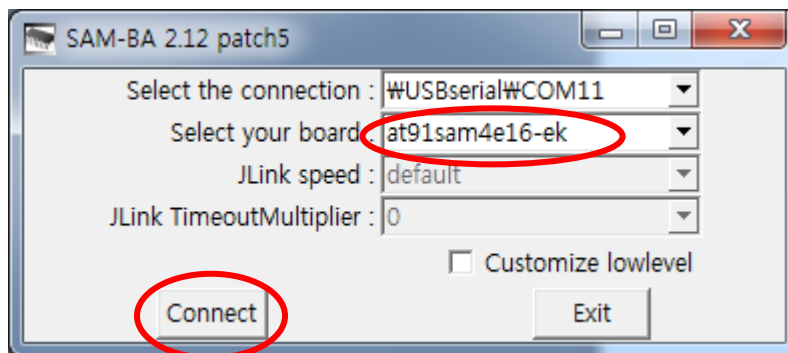
## 2-6) Rebooting Firmware

\* If the firmware was an error or damaged, not reset, please recover the firmware as following.

- 1) Check for the jumper which is beside Dip Switch on the bottom of printer
- 2) By using Pin Header(2.5mm), Connect between both of Pins



- 3) Connect the cable to printer, then turn on the power of printer
- 4) Using the provided Booting Program and setting the interface port.  
Then, Select board -> at91sam4e16-ek and click "Connect "  
(RS-232 and USBport Possible only, However, the cable is only one to connect)  
(If using the USB port, Save the time to set up)



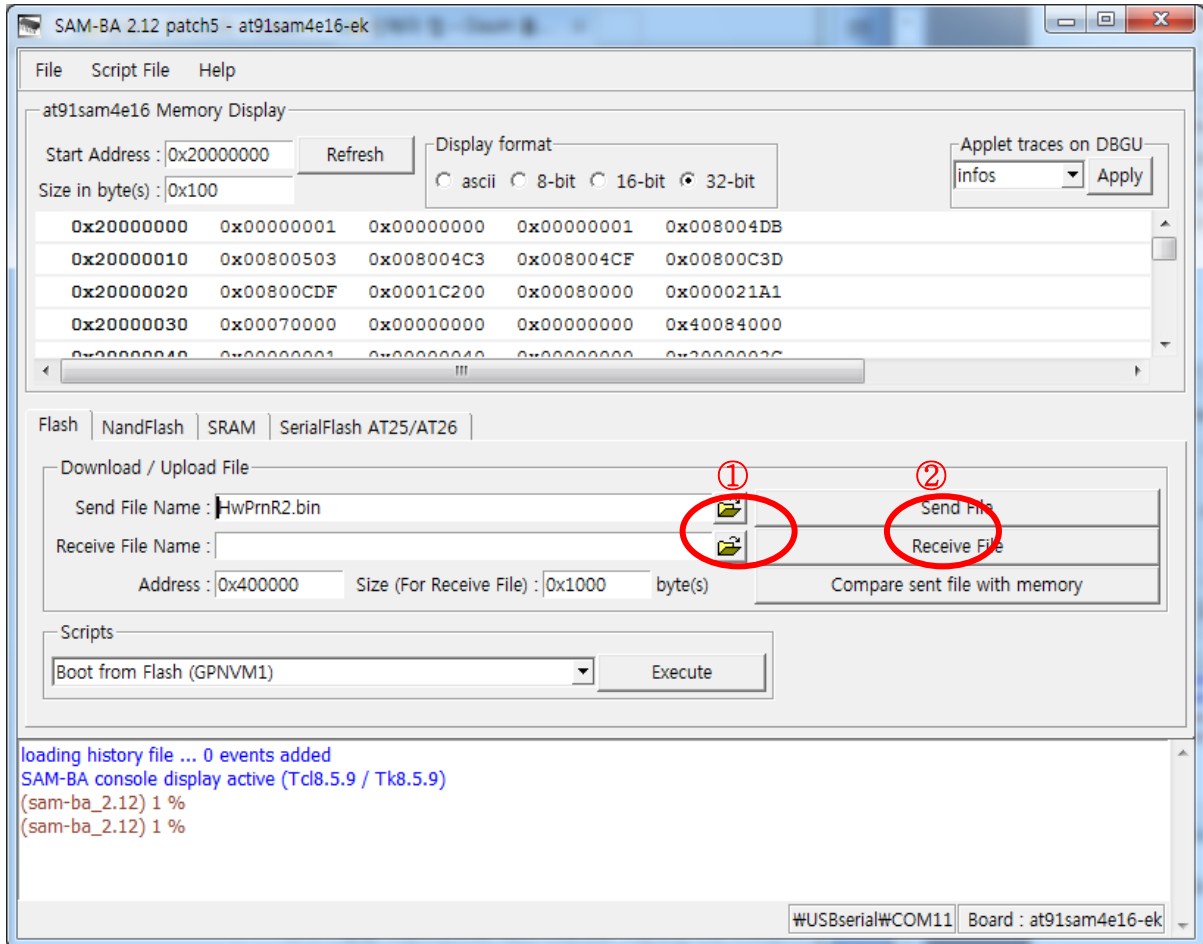
- 5) After rebooting, Please remove JP2(Jumper Pins)

\* If pass this step, it would not be rebooted after recover the firmware.

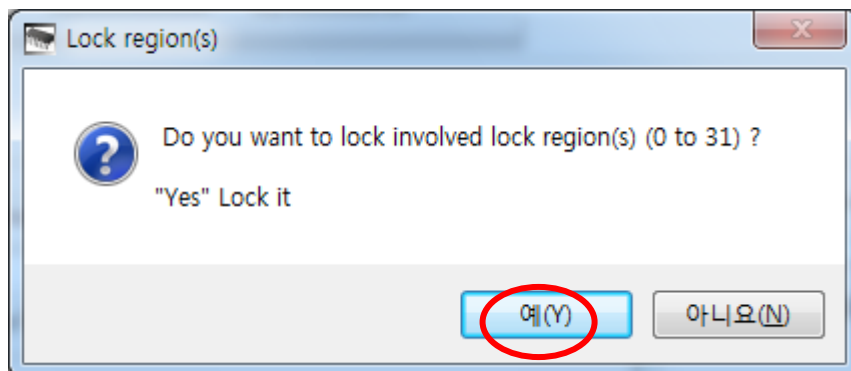
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- 6) Click the “ ICON “ in the Send file Name then after open the firmware file for Target model,  
Then, Click “Send File Button”

\*Notice : Do not revise the Parameter value.

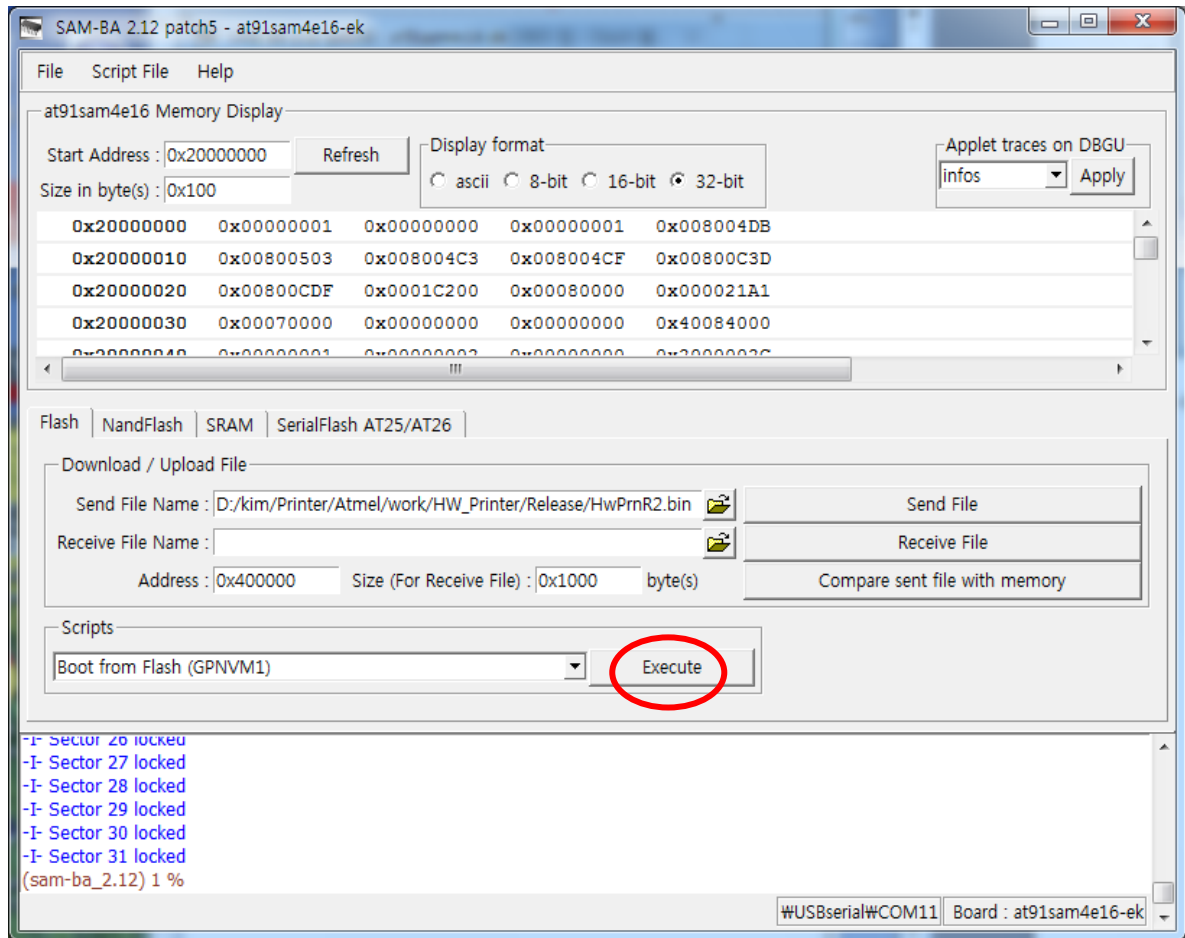


- 7) After the file is complete to transfer, Click “Yes “



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8) Click “Excute” button, after checking for stting up “Boot from Flash(GPNVM1) in Scripts.



9) To re-operate printer, Tune off and on

## 2-7) Dip Switch

Please control the dip switch between the printer & the host for the protocol condition.  
There are 1 and 2 of dip switch.

### 1) Dip Switch1

※RS-232C (Dip2 SW4)

A) SW 1,2,3 : Baud rate

SW1	SW2	SW3	Baud Rate(BPS)
OFF	OFF	OFF	1200
ON	OFF	OFF	2400
OFF	ON	OFF	4800
ON	ON	OFF	9600
OFF	OFF	ON	19200
ON	OFF	ON	38400
OFF	ON	ON	57600
ON	ON	ON	115200

B) SW 4 :

SW4	Reserve
ON	- -
OFF	- -

C) SW 5,6 : Parity

SW5	SW6	Parity
OFF	-	None
ON	OFF	Even
ON	ON	Odd

D) SW 7 :

SW7	Reserve
ON	Ticket Mode
OFF	Standard Mode

E) SW 8 : Print Mode

SW8	Print mode
ON	HEX DUMP
OFF	NORMAL

## 2) Dip Switch2

A) SW 1: Operation Mode

SW1	DLE Command
ON	DLE Command ON
OFF	DLE Command OFF

B) SW 2:

SW2	Black Mark Valid / Invalid	Remark
ON	Black Mark Valid	The first page will be positioned, after black mark detected.
OFF	Black Mark Invalid	The first page will not be positioned, after black mark is not detected.

※ If the valid sets up, please use the paper with black mark.  
If it is not the paper with black mark, the paper jam happens.

※ Please use the paper which is registered on the memory switch.  
Please take a note 2-8) about memory switch.

C) SW3:

SW3	First Page Mode	Remark
ON	First Page No Cut	The first page remains. It is to position at the first.
OFF	First Page Cut	The first page cut. It is to position at the first.

※ Please use the page which is registered on the memory switch.  
※ Please take a note the paper has to be the same with one which is registered on the memory switch.  
※ Please take a note the memory switch at 2-8).

D) SW4 : FACTORY MODE

SW8	Printer mode	Remark
ON	Firmware update Mode	Firmware update Mode
OFF	Print Mode	Standard Print Mode



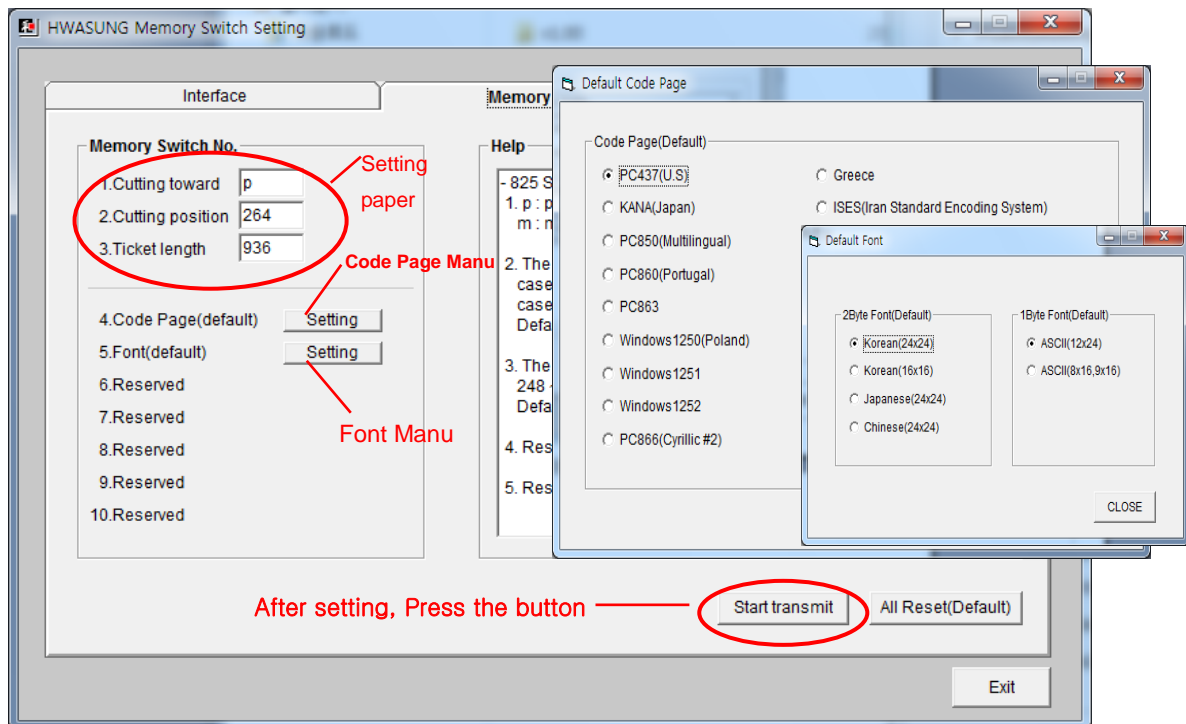
## 2-8) Memory Switch

Please set the function of internal memory.

※ Please use the provided program - 'memory switch setting utility program'.

※ The value is not deleted until the next value is changed, even though power off.

Memory SW	설정값	설 명
SW1	p or m	
SW2	0~1200 or 0~136	
SW3	248-4000	
SW4	Base Code Page	Setting one default value for each country
SW5	Base Font	Setting one of 1). 2byte codes : korean(24 x 24), korean(16 x 16), Japenes(24x24), Chinese(24x24). 2).1byte codes : ASCII(12x24), ASCII(8x16,9x16)
SW6	Reservation	
SW7	Reservation	
SW8	Reservation	



1) SW1 :

\* p(70<sub>16</sub>) : After command the cutting DC3 + "i", it will be cut from the black mark starting point to the value in the SW2 (plus) as the image below.

\* m(6D<sub>16</sub>) : After command the cutting DC3 + "i", it will be cut from the black mark starting point to the value in the SW2 (minus) as the image below.

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

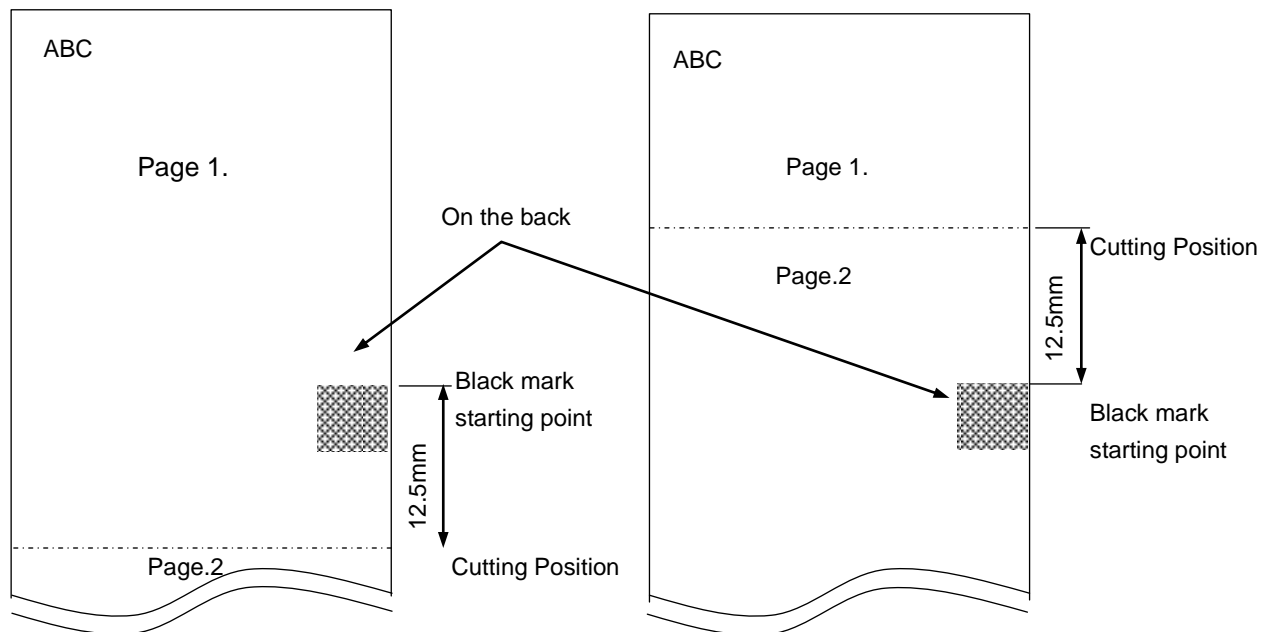
\* SW1 /p : You can set the value as 0~1200(0 ~ 150mm).

\* SW1/ m : You can set the value as 0~120(0 ~ 15mm).

※ A value point indicates 0.125mm ex) In case of 100,  $100 \times 0.125 = 12.5\text{mm}$

※ SW1,SW2 is used to set the cutting option (Black mark search as Full cut) at the Window Driver (Window driver : DC3 + "i")

Example)



Ex) SW1 = p, SW2 = 100,

Ex) SW1 = m, SW2 = 100,

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- 3) SW3 : It is to set up the distance from the starting point of Ticket to the point of black mark.  
 It is to set up the initial position of the first page,if the dip switch is the mode  
 'First page No cut'.  
 You can set up the range 0~120 or 120~4000.  
 0~120 should be 0~15mm, if the cutting position is the forepart of black mark.  
 12~4000 should be 15~500mm, if the cutting position is the rearpart of the black mark.

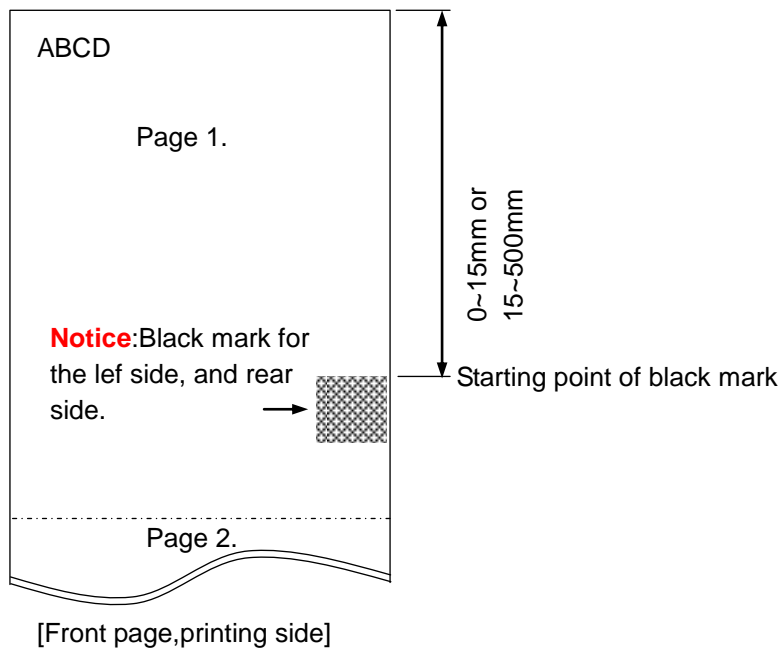
**Notice :** The value '1' means 0.125mm.

For example )  $300 \times 0.125\text{mm} = 37.5\text{mm}$

**Notice :** The factory mode is 1048(131mm), and is the black mark for the right side.

**Notice :** Please refer to 7.Ticket recommend.

Example)



- 2) Please make sure "Memory Switch" changed

\* After change "Memory Switch Value",

Please do self-test.

[Memory Switch information]

```

=====
Code Page = PC437(U.S)
2Byte Font = Korean(24x24)
1Byte Font = ASCII(12x24)
Mem1:FFh
Mem2:FFh,FFh
Mem3:FFh,FFh
Mem4:00h
Mem5:00h
Mem6:FFh
Mem7:FFh
Mem8:FFh
Mem9:FFh
  
```

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## 2-9) Internal Connector

1) CN10 : AC adapter Jack (AC00093-12-03,TECHWIN)

Pin	Descript	비 고
1	+24V	
2	GND	
3	N.C	

2) CN1 : DC connector (YAW396-02, Yeonho )      ↔      Housing : YH396-02

Pin	Descript	Remark
1	V+	+24
2	V-	GND

※ Alternative one : YH396-02,old Unlock type)


3) CN3 : Thermal Head Control Connector (20010WS-15,Yeonho:or S15B-PH-K-S, JST)

Pin	Descript	Remark
1	COM	+24V
2	COM	+24V
3	GND	
4	GND	
5	VDD	
6	TM	Thermistor
7	/STROBE1	Low Active
8	/STROBE2	Low Active
9	CLOCK	
10	/LATCH	Low Active
11	SI	
12	GND	
13	GND	
14	COM	+24V
15	COM	+24V

4) CN4 : Motor connector (GW200-06, Geoyoung : or 53014-0610, Molex)

Pin	Descript	Remark
1	A	φ1
2	B	φ2
3	+24V	It is used once Unipolar drive.
4	+24V	It is used once Unipolar drive.
5	/A	φ3
6	/B	φ4

5) CN5 : Please refer to the interface spec of RS-232C.

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6) CN6 : Auto cutter connector(GW250-04, Geoyoung : or 5267-04A, Molex)

Pin	Descript	Remark
1	CUT A	Drive signal (CUT_A)
2	CUT B	Drive signal (CUT_B)
3	SW	Detect switch
4	GND	Detect switch GND

7) CN7 : Sensor connector (GW200-05,Geoyoung : or 53014-0510, Molex)

Pin	Descript	Remark
1	GND	
2	GND	
3	VA	Sensor power (220Ω resistance)
4	Paper detect signal	
5	Headup detect signal	

8) CN8 : USB connector (Type B)

Pin	Descript	Remark
1	VBUS	VBus
2	D-	Data -
3	D+	Data +
4	GND	GND

9) SW2 : GW250-02,Geoyung or 5267-02A, Molex

Pin	Descript	Remark
1	+24V	Power switch input
2	+24V	Power switch output

### 3. General Specification

#### 3-1) Specification

- 1) Printing method : Direct thermal
- 2) Resolution : 8dot/mm, 203dpi, 1dot=0.125mm
- 3) Total dots a line : 640dot/line
- 4) Printing speed : 160mm/sec
- 5) Paper width : 60~81mm(Max)

#### 3-2) Power

- 1) Operation voltage

Drive	24V±10%	Motor, Head
Logic	5V±5%	Logic, paper sensor, Head up sensor

- 2) Current consumption

Average : 1.5A

Peak : 14A

#### 3-3) Paper loading capacity

- 1) 180 gf·cm above(if it's operated 1200pps)

#### 3-4) Font

- 1) Numerical value : FONT A(12 x 24) 95 fonts, FONT B(8 x 16)95 fonts
- 2) Extended Graphic : FONT A(12 x 24) 128 fonts, FONT B(8 x 16)95 fonts
- 3) International : 14types 37fonts  
(Korean,English,France,Germany,England,Denmark1,Swden,Italy,  
Spain1,Japan,Norway,Denmark2,Spain2,Latin America)
- 4) Korean : FONT C Korean (24x24, Symbols and Chines Characters)  
(Times New Roman, Gothic, Bodoni of one choice)  
: FONT D Japanese (24x24)  
: FONT E Chinese (24x24)

#### 3-5) Operation condition (temperature / Humid)

- 1) Temperature : 0 ~ 40℃
- 2) Humidity : 40 ~ 80%RH(in not dew condensation)

※ The conditions above can be subjected to change the print quality.

#### 3-6) Storage condition (temperature / Humid)

- 1) Temperature : -25 ~ 40℃
- 2) Humidity : 40 ~ 90%RH

#### 3-7) MCBF

- 1) Thermal head : 100Km (10million pulse)
- 2) Auto cutter : 1 million cuts

#### 3-8) Weight

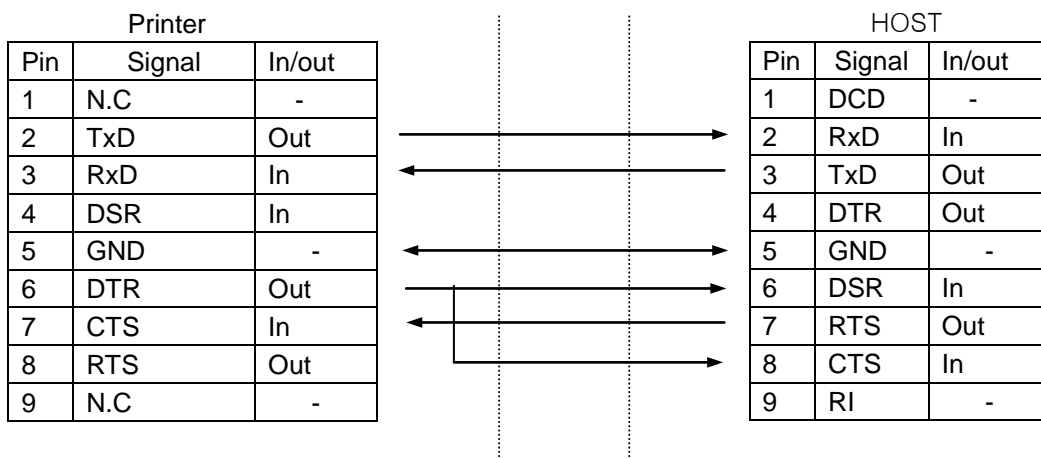
about 1.50kg (HMK-080)

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## 4.Interface Specification

### 4-1)RS-232C

- 1) Data transmission : Serial
- 2) Hand shake : Hardware (RTS/CTS or DTR/DSR )
- 3) Baud Rate : 2400, 4800, 9600, 19200, 38400, 57600, 115200, 921600 BPS
- 4) Data bit : 8bit
- 5) Parity : None, Odd, Even
- 6) Stop bit : 1 or 2bits
- 7) Connector : DSUB-9 Female
- 8) Cable : DSUB9(Male)-SUB9(Female) straight (1:1) Full cable.



### 4-2) USB

- 1) Specficiation : USB 2.0, Full Speed(12Mb) and High Speed(480Mb)
- 2) Connector : Type B
- 3) Cable : USB2.0 standard cable
- 4 )Data Way : 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)

※ Full Speed, High Speed sets automatically with Host communication.

## 5.Command

### 5-1) Command Directory

Command	Function	Page
CR	Print and carriage return	25
LF	Print and line feed	25
CAN	Cancel print data in page mode	25
HT	Horizontal tab	25
FF	Printing the page mode & return to standard mode	26
SUB x	Extended Graphic Mode	26
SUB p	Off line printing according to the paper detection	26
SUB b	Black mark detection	26
SUB R	Outline of character (Tetragon)	27
SUB s	Printing Speed	27
ESC D	Set horizontal tab positions	27
ESC SP	Set character right side spacing (ASCII)	27
ESC !	Set character	28
ESC \$	Select / Cancel user-defined character set	28
ESC *	Set bit image mode (vertical)	29
ESC -	Turn underline for ASCII	30
ESC 2	Set initial line spacing	31
ESC 3	Set line spacing using minimum units	31
ESC @	Printer reset (Initialize printer)	31
ESC E	Set emphasized mode	31
ESC G	Set double-strike mode	32
ESC J	FEED	32
ESC j	BACK FEED	32
ESC M	Select character font	32
ESC R	Select international character set	33
ESC a	Align position	33
ESC d	Printing & line feeding	34
ESC {	Print / cancel character printing in 180° turning	34
ESC i	Paper cutting	34
ESC m	Paper cutting	34
ESC S	Set Standard	34
ESC L	Set the pagemode in direction	35
ESC T	Set the pagemode in direction	35
ESC W	Set the printing area in page mode	36
ESC FF	Printing the page area	37
FS !	Set the printing all korean	37
FS &	Set the korean in extended graphic mode	37
FS .	Cancel the korean in extended graphic mode	38
FS -	Set the underline of Korean	38



FS S	Space Korean	38
FS W	Set the font size of Korean	39
FS q	Register Non Volatile logo(bit-image)	39
FS p	Print N/V logo print	40
GS !	Extension of character	40
GS (K (fn=49)	Printing density	41
GS (K (fn=97)	Operation in Low Power	41
GS B	Printing black in reverse	41
GS H	Barcode character	42
GS L	Left margin	42
GS V	Cutting paper	42
GS W	Set the printing area	43
GS h	Height of barcode	43
GS k	Printing of barcode	43
GS w	Extension / Reduction of barcode	44
GS r	Checking the status	45
GS a	Auto reply of status	45
DLE ENQ	Realtime buffer clear	46
DLE EOT	Realtime status check	46
GS v	Laster bit image (Horizontal)	47
SUB B	2D BARCORD	48
DC3 i	Cutting after it detects the black mark	48
SUB 1	Choice of rule 1	49
SUB 2	Choice of rule 2	49
SUB W	Writing the rule data	49
SUB C	Line CLEAR	49
SUB O	Line ON	49
SUB F	Line OFF	50
SUB P	Printing a dot of Rule	50
ESC t	International Code Page	50

## CR

[Name] Print and carriage return  
[Format] ASCII CR  
Hex 0Dh  
Decimal 13  
[Range] -  
[Descript] equal LF

## LF

[Name] Print and line feed  
[Format] ASCII LF  
Hex 0Ah  
Decimal 10  
[Range] -  
[Descript] ① STANDARD MODE:  
After printing the data and go to return according as the fixed data.  
② PAGE MODE:  
The fixed data can be only conduted, according as the fixed data.  
[Caution] The LF is ignored behind of CR

## CAN

[Name] Cancel print data in page mode  
[Format] ASCII CAN  
Hex 18h  
Decimal 24  
[Range] -  
[Descript] The print data will be deleted in print area.

## HT

[Name] Horizontal tab  
[Format] ASCII HT  
Hex 09h  
Decimal 9  
[Range] -  
[Descript] Moves the print position to the next tab poission  
[Caution] Horizontal tab position are to set in ESC+'D'+n..

**FF**

[Name]	Print and return to standard mode in page mode	
[Format]	ASCII	FF
	Hex	0Ch
	Decimal	12
[Range]	-	
[Descript]	Print the data in the print buffer and returns to standard mode	
[Caution]	Use ESC+FF once standard mode not to return	

**SUB+'x'+n**

[Name]	Extension Graphic Mode, Korean Mode			
[Format]	ASCII	SUB	x	n
	Hex	1A	78h	n
	Decimal	26	120	n
[Range]	0≤n≤1			
[Initial Value]	n=0			
[Descript]	n=0 : Korean Mode, 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]	Off line printing according to the paper detection			
[Format]	ASCII	SUB	p	n
	Hex	1A	70h	n
	Decimal	26	112	n
[Range]	0≤n≤1			
[Initial Value]	n=1			
[Descript]	n=0 : Not transition to offline once paper empty (data communication available)			
	n=1 : Transition to offline once paper empty (data communication not available)			

**SUB+'b'+n**

[Name]	Black mark detection			
[Format]	ASCII	SUB	b	n
	Hex	1A	62h	n
	Decimal	26	98	n
[Range]	0≤n≤3			
[Descript]	n=0 : the feeding in easy flow direction till black mark is out			
	n=1 : the feeding in easy flow direction till black mark is detected			
	n=2 : the feeding in reverse direction till black mark is out			
	n=3 : the feeding in reverse directoin till black mark is detected			
[Caution]	the feeding range is restricted in 30Cm			
	Once the detection distance is over in 30Cm, it could be jammed			

**SUB+'R'+n**

[Name]	Set the character outline			
[Format]	ASCII	SUB	b	n
	Hex	1A	52h	n
	Decimal	26	82	n
[Range]	0≤n≤1			
[Descript]	n=0 : cancel outline (border) of character in tetragon			
	n=1 : Set outline (border) of character in tetragon			
[Caution]	the horizontal extension is valid as extended as eight times			
	the vertical extension is valid as extended as two times			

**SUB+'s'+n**


[Name]	Set the printing speed			
[Format]	ASCII	SUB	s	n
	Hex	1A	73h	n
	Decimal	26	82	n
[Range]	1≤n≤10			
[Initial]	n=10			
[Descript]	n=1 : speed 70mm/s printing.		n=6 : speed 120mm/s printing.	
	n=2 : speed 80mm/s printing.		n=7 : speed 130mm/s printing.	
	n=3 : speed 90mm/s printing.		n=8 : speed 140mm/s printing.	
	n=4 : speed 100mm/s printing.		n=9 : speed 150mm/s printing.	
	n=5 : speed 110mm/s printing.		n=10 : speed 160mm/s printing.	
[Caution]	Please control density, if it is low.			

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

[Name]	Set the horizontal 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				
[Descript]	Set the horizontal tab position				
[Caution]	n : Indicating the figures from the start position of line to set position				
	K : indicating the total tabs per line				

**ESC+SP+n**

[Name]	Set the space amount on the right of ASCII character			
[Format]	ASCII	ESC	SP	n
	Hex	1B	20h	n
	Decimal	27	32	n
[Range]	0≤n≤255			
[Initial Value]	n=0			
[Descript]	Set in n x 0.125mm the space amount on the right of ASCII character			
[Caution]	Set the Korean space in FS+'S'+n			

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**ESC+'!' +n**

[Name] Set character all at once

[Format] ASCII ESC ! n  
Hex 1B 21h n  
Decimal 27 33 n

[Range]  $0 \leq n \leq 255$

[Initial Value]  $n=0$

[Descript] Set font & character in the same time

[Caution] If it's Korean, the Font / the Stress is valid only.

Bit	Format	Hex	Decimal
0	0: Font 12x24, 24x24	00h	0
	1: Font 8x16, 16x16	01h	1
1	-	-	-
2	-	-	-
3	0: Cancel the stress	00h	0
	1: Set the stress	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] Set absolute poosition

[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 Value]  $nL=0$ ,  $nH=0$

[Descript] Move the printing position from left ending space to  $(nL + nH \times 256) \times 0.125\text{mm}$   
Move the printing position in left ending once printing position is over

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

[Name] Set the bitmap image

[Format] ASCII           ESC       \*       m       nL       nH       d1...dk

Hex           1B       2Ah       m       nL       nH       d1...dk

Decimal       27       42       m       nL       nH       d1...dk

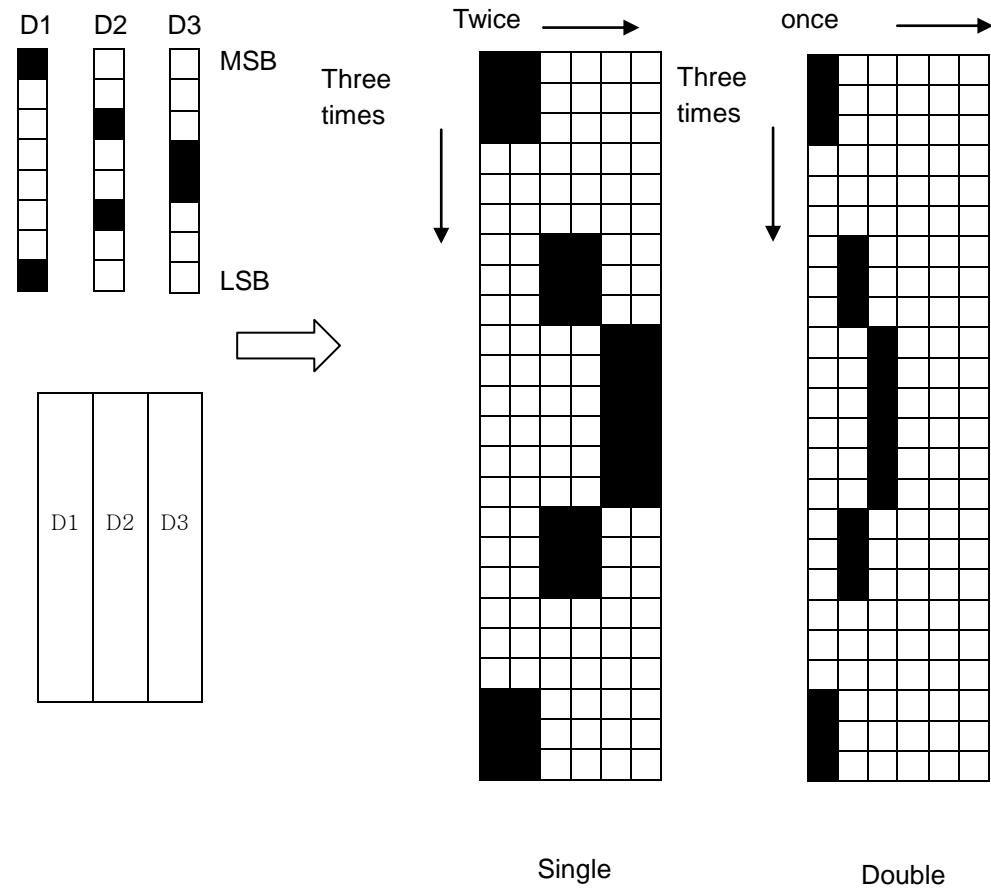
[Range] m=0,1,32,33

1≤nL+nH×256≤1023, 0≤nL≤255, 0≤nH≤3, 0≤d≤255

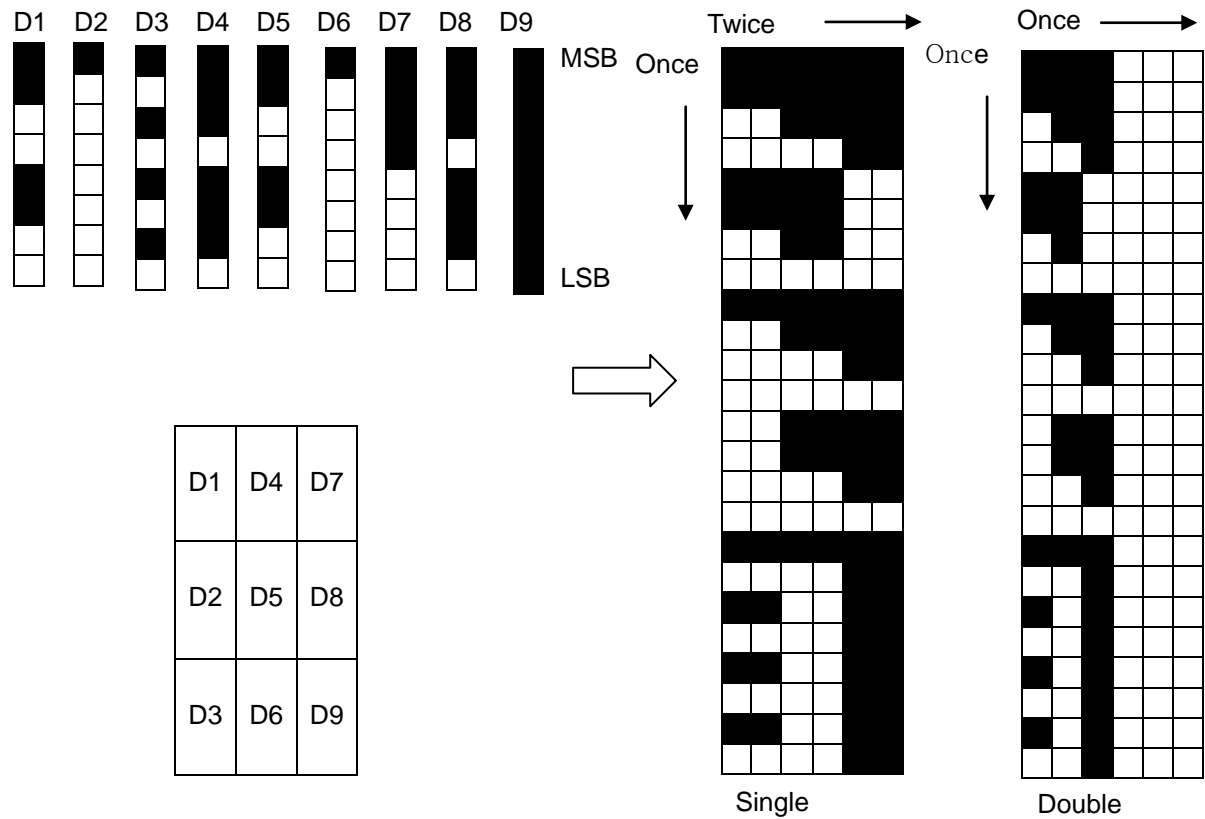
[Descrpt] Due to fixing nL+nHx256, Printing from bit data to graphic data in Mode m

m	Mode	Dots in vertical	Dots in horizontal	Data (k)
0	8dots Single Density	8	224	nL+nH×256
1	8dots Double Density	8	448	nL+nH×256
32	24dots Single Density	24	224	(nL+nH×256)×3
33	24dots Double Density	24	448	(nL+nH×256)×3

•8 dots Mode



•24 dots Mode



ESC+<sup>1</sup>+<sup>2</sup>+n

[Name]	Set / Cancel underline			
[Format]	ASCII	ESC	-	n
	Hex	1B	2Dh	n
	Decimal	27	45	n
[Range]	0≤n≤255,			
[Initial Value]	n=0,			
[Descript]	Set / Cancel underline			

n	Function
0	Cancel underline
1	Set underline in thick 0.125mm
2	Set underline in thick 0.25mm
3	Set underline in thick 0.375mm
4	Set underline in thick 0.5mm
5	Set underline in thick 0.625mm
6	Set underline in thick 0.75mm
7	Set underline in thick 0.875mm

## ESC+'2'

[Name]	Set the interval of initial line		
[Format]	ASCII	ESC	2
	Hex	1B	32h
	Decimal	27	50
[Range]	0≤n≤255,		
[Initial Value]	n=0		
[Descript]	Set the interval of initial value in 4mm		

## ESC+'3'+n

[Name]	Set the interval of line			
[Format]	ASCII	ESC	3	n
	Hex	1B	33h	n
	Decimal	27	51	n
[Range]	0≤n≤255,			
[Initial Value]	n=0			
[Descript]	Set the interval of line in n x 0.125mm			

## ESC+'@'

[Name]	Rest printer		
[Format]	ASCII	ESC	@
	Hex	1B	40h
	Decimal	27	64
[Range]	0≤n≤255,		
[Descript]	Clear buffer & Initialize all parameter		

## ESC+'E'+n

[Name]	Set the font in thick			
[Format]	ASCII	ESC	E	n
	Hex	1B	45h	n
	Decimal	27	69	n
[Range]	0≤n≤255,			
[Initial Value]	n=0			
[Descript]	n=0, cancel the font in thick			
	n=1, set the font in thick			



## ESC+'G'+n

[Name]	Set the printing double for font thickness			
[Format]	ASCII	ESC	G	n
	Hex	1B	47h	n
	Decimal	27	71	n
[Range]	0≤n≤255,			
[Initial Value]	n=0			
[Descript]	n=0, cancel the printing twice for font thickness			
	n=1, set the printing twice for font thickness			

## ESC+'J'+n

[Name]	Feeding			
[Format]	ASCII	ESC	J	n
	Hex	1B	4Ah	n
	Decimal	27	74	n
[Range]	0≤n≤255			
[Descript]	Printing the data inner buffer, feeding in n x 0.125mm			

## ESC+'j'+n

[Name]	Back Feeding			
[Format]	ASCII	ESC	j	n
	Hex	1B	6Ah	n
	Decimal	27	106	n
[Range]	0≤n≤255			
[Descript]	Printing the data inner buffer and back feeding in n x 0.125mm			

## ESC+'M'+n

[Name]	Select font			
[Format]	ASCII	ESC	M	n
	Hex	1B	4Dh	n
	Decimal	27	77	n
[Range]	0≤n≤2			
[Initial Value]	n=0			
[Descript]	Select printer font			

n	Font
0	12x24(ASCII), 24x24(Korean)
1	8x16(ASCII)

**ESC+'R'+n**

[Name] Select the International character  
 [Format] ASCII ESC R n  
 Hex 1B 52h n  
 Decimal 27 82 n  
 [Range]  $0 \leq n \leq 13$   
 [Initial Value]  $n=13$   
 [Descrpt] Select the international character asf:-

n	Country Name
0	USA
1	France
2	Germany
3	England
4	Denmark1
5	Sweden
6	Italian
7	Spain1
8	Japanese
9	Norway
10	Denmark2
11	Spain2
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]  $0 \leq n \leq 2$   
 [Initial Value]  $n=0$   
 [Descrpt] Align the printing position

n	Printing Position
0	Left
1	Middle
2	Right

## ESC+'d'+n

[Name]	Printing and feeding 'n' line			
[Format]	ASCII	ESC	d	n
	Hex	1B	64h	n
	Decimal	27	100	n
[Range]	0≤n≤255			
[Descript]	Printing the data & feeding 'n' line			

## ESC+'{' +n

[Name]	Turning 180°			
[Format]	ASCII	ESC	d	n
	Hex	1B	7Bh	n
	Decimal	27	123	n
[Range]	0≤n≤255			
[Initial Value]	n=0			
[Descript]	Set the reverse image			
[Caution]	Move the standard from the left to the right			

n	Function
0	Cancel 180°
1	Set 180°

## ESC+'i'

[Name]	Full Cutting		
[Format]	ASCII	ESC	i
	Hex	1B	69h
	Decimal	27	105
[Descript]	Cutting the paper completely		

## ESC+'m'

[Name]	Partial Cutting		
[Format]	ASCII	ESC	i
	Hex	1B	6Dh
	Decimal	27	109
[Descript]	Cutting the paper partially		

## ESC+'S'

[Name]	Set the Standard mode		
[Format]	ASCII	ESC	S
	Hex	1B	53h
	Decimal	27	83
[Descript]	Switches from page mode to standard mode		

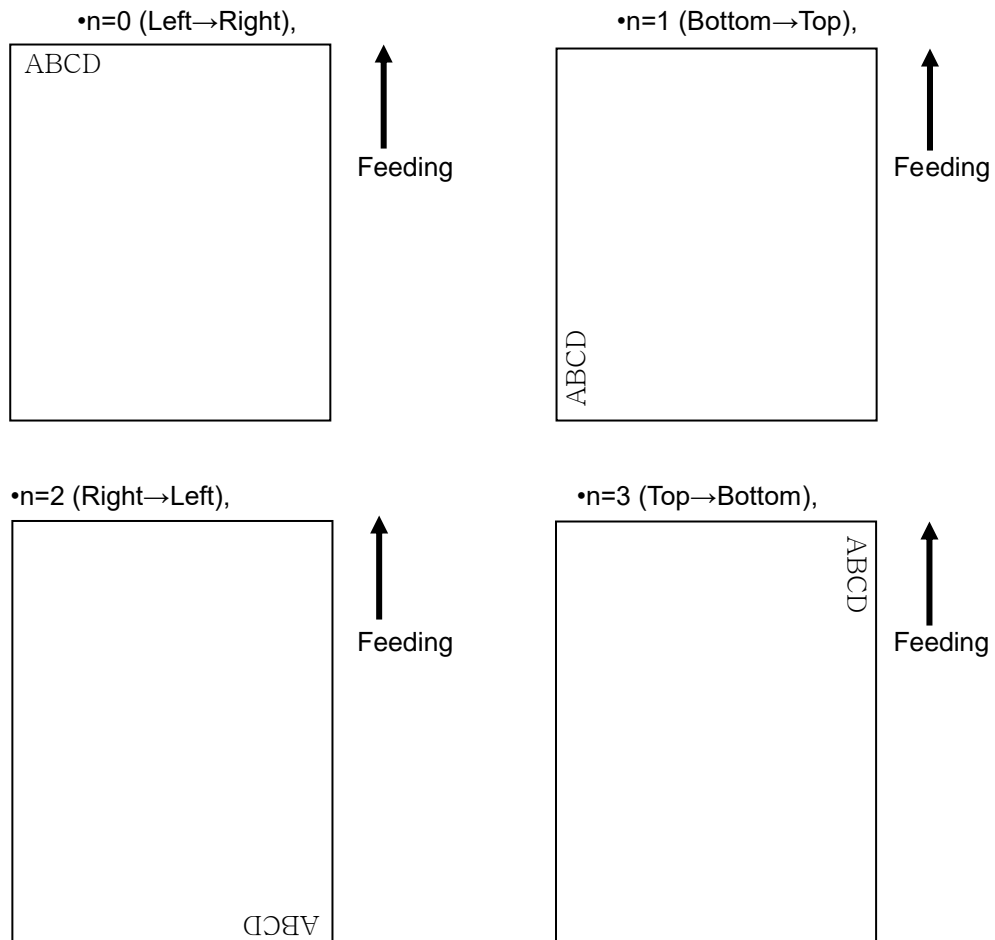
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## ESC+'L'

[Name]	Select page mode		
[Format]	ASCII	ESC	L
	Hex	1B	4Ch
	Decimal	27	76
[Range]	$0 \leq n \leq 255$		
[Initial Value]	$n=0$		
[Descript]	Switches from standard mode to page mode.		


## ESC+'T'+n

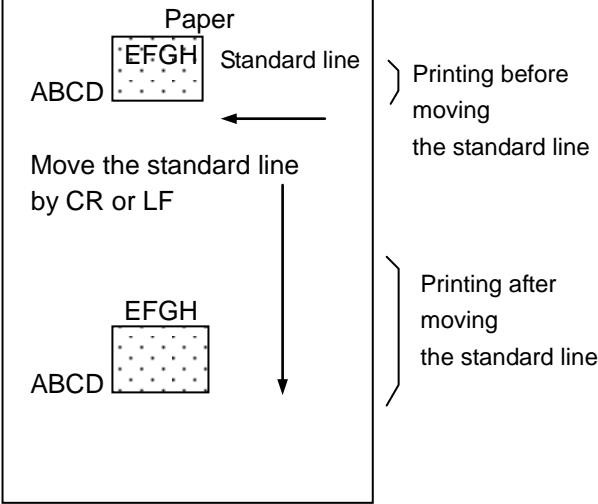
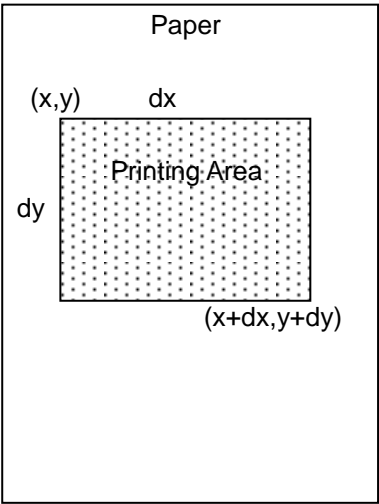
[Name]	Select print direction in page mode			
[Format]	ASCII	ESC	T	n
	Hex	1B	54h	n
	Decimal	27	84	n
[Range]	$0 \leq n \leq 3$			
[Initial Value]	$n=0$			
[Descript]	Select the print direction & start position in page mode			



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

[Name]	Set printing area in page mode											
[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≤xL+xH×256≤65535 (0≤xL≤255, 0≤xH≤255)											
	0≤yL+yH×256≤65535 (0≤yL≤255, 0≤yH≤255)											
	1≤dxL+dxH×256≤65535 (0≤dxL≤255, 0≤dxH≤255)											
	1≤dyL+dyH×256≤65535 (0≤dyL≤255, 0≤dyH≤255)											
[Initial Value]	(xL+xH×256)=0 (0mm, xL=0, xH=0)											
	(yL+yH×256)=0 (0mm, yL=0, yH=0)											
	(dxL+dxH×256)=448 (56mm, dxL=C0h, dxH=01h)											
	(dyL+dyH×256)=1200 (150mm, dyL=B0h, dyH=04h)											
[Descript]	Set printing area & starting point											
	Horizontal starting point : (xL+xH×256) × 0.125mm											
	Vertical starting point : (yL+yH×256) × 0.125mm											
	Horizontal size : (dxL+dxH×256) × 0.125mm											
[Caution]	Vertical size : (dyL+dyH×256) × 0.125mm											
	The maximum page width is available 56mm											
	The maximum page length is available 150mm											
	Barcode & graphic data is executed as per standard line, If the size exceed the standard line, move the standardline by CR or LF.											

 : Barcode or Graphic



## ESC+FF

[Name] Printing the page area  
[Format] ASCII ESC FF  
Hex 1Bh 0Ch  
Decimal 27 12  
[Range] Please edit the received data at the page area.  
The page area will be printed all at once, when you use this command.  
[Descript] The page area remains. Please use the command ESC+S,  
If you want all clear.

## FS+'!' +n

[Name] Set the printing mode in Korean  
[Format] ASCII FS ! n  
Hex 1C 21h n  
Decimal 28 33 n  
[Range]  $0 \leq n \leq 255$   
[Initial Value] n=0  
[Descript] Set the printing mode in Korean  
[Caution] Only valid in Koean

Bit	Function	Hex	Decimal
0	-	00h	0
1	-	00h	0
2	Cancel the horizontal extension	00h	0
	Set the horizontal extension	04h	4
3	Cancel the vertical extension	00h	0
	Set the 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] Set to print Korean mode (2bytes Mode)  
[Format] ASCII FS &  
Hex 1C 26h  
Decimal 28 38  
[Descript] Set to print Korean mode (2bytes Mode)  
[Caution] Set to print Korean mode in extended graphic mode  
Appointment is not required in Korean mode, due to auto detection  
(Ref.SUB+'x'+n command)

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**FS+'.'**

[Name] Cancel Korean mode (2Bytes mode)  
 [Format] ASCII FS .  
 Hex 1C 2Eh  
 Decimal 28 46  
 [Descript] Cancel Korean mode (2Bytes mode)  
 [Caution] In case of cancel 2 bytes mode in extended graphic mode  
 Appointment is not required due to auto detection in Korean mode  
 (Ref.SUB+'x'+n command)

**FS+'-' +n**

[Name] Set the underline of Korean  
 [Format] ASCII FS - n  
 Hex 1C 2Dh n  
 Decimal 28 45 n  
 [Range]  $0 \leq n \leq 2$   
 [Initial Value] n=0  
 [Descript] Set the underline of Korean

n	Function
0	Cancel the underline of Korean
1	Set the thickness of underline in 0.125mm
2	Set the thickness of underline in 0.25mm

**FS+'S'+n1+n2**

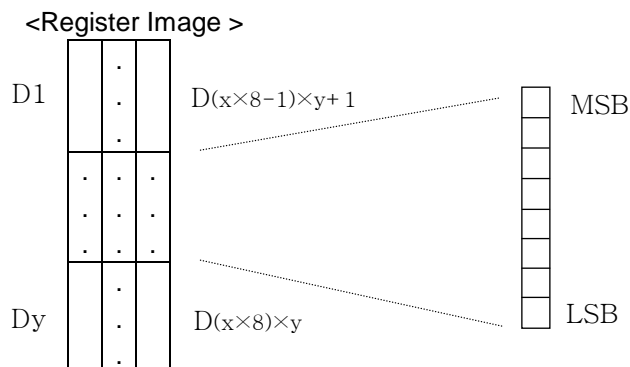
[Name] Set the space between Korean characters  
 [Format] ASCII FS S n1 n2  
 Hex 1C 53h n1 n2  
 Decimal 28 83 n1 n2  
 [Range]  $0 \leq n1 \leq 255, 0 \leq n2 \leq 255$   
 [Initial Value] n=0  
 [Descript] Set the space between Korean characters  
 Set the left space in  $n1 \times 0.125\text{mm}$   
 Set the right space in  $n2 \times 0.125\text{mm}$

## FS+'W'+n

[Name]	Set the font size in Korean			
[Format]	ASCII	FS	W	n
	Hex	1C	57h	n
	Decimal	28	87	n
[Range]	$0 \leq n \leq 255$			
[Initial Value]	n=0			
[Descript]	Set the Korean font size twice (HorizontalxVertical) in Korean			
	n=0, Cancel the font size two times			
	n=1, Set the font size two times			

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

[[Name]	Register logo (bitmap image) non volatilization			
[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]	$1 \leq n \leq 255$			
	$0 \leq xL + xH \times 256 \leq 65535$ ( $0 \leq xL \leq 255$ , $0 \leq xH \leq 255$ )			
	$0 \leq yL + yH \times 256 \leq 65535$ ( $0 \leq yL \leq 255$ , $0 \leq yH \leq 255$ )			
	$0 \leq d \leq 255$			
	$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$			
	Capable register : 64kbytes			
[Descript.]	Register the logo non-volatilization			
	n : Total unit of N/V logo			
	xL,xH : Set the horizontal dot in $(xL + xH \times 256) \times 8$			
	yL,yH : Set the vertical dot in $(xL + xH \times 256) \times 8$			
	k : Bitmap image of a N/V logo			
[Caution]	Register various as much as NV's capa.			
	Required to delete all if (it is) registered again.			
	Renewable registration / deletion at 100000 cycles,			
	It's not recommended frequent registration / deletion, due to memory damage			





**FS+'p'+n+m**

[Name] Printing N/ V logo  
 [Format] ASCII FS p n m  
 Hex 1C 70h n m  
 Decimal 28 112 n m  
 [Range]  $1 \leq n \leq 255, 0 \leq m \leq 3$   
 [Initial Value]  $n=0$   
 [Descript.] m : printing the registered N/V in 'm' mode  
 n : indicating the registered logo in the 'n'.

m	Printing mode
0	Standard
1	Horizontal extension
2	Vertical extension
3	Horizontal,vertical extension in the same time

**GS+'!' +n**

[Name] Set the proportion of character extension  
 [Format] ASCII GS ! n  
 Hex 1D 21h n  
 Decimal 29 33 n  
 [Range]  $0 \leq n \leq 255$  (horizontal / vertical portions is restricted maxim value 8)  
 [Initial Value]  $n=0$   
 [Descript.] Set the proportion of character extension  
 [Caution] Calculate the numeric value if vertical & horizontal is extended in the same time  
 ex.) x3 (Horizontal Rate), x3(Vertical Rate) :  $n=32+2=34$

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

**Extension in Horizontal**

n(Hex)	n(Decimal)	Rate
00h	0	x1
10h	16	x2
20h	32	x3
30h	48	x4
40h	64	x5
50h	80	x6
60h	96	x7
70h	112	X8

**Extension in Vertical**

n(Hex)	n(DecimaL)	Rate
00h	0	x1
01h	1	x2
02h	2	x3
03h	3	x4
04h	4	x5
05h	5	x6
06h	6	x7
07h	7	X8

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

[Name] Set the printing density

[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 Value] m=0

[Descript] Set the printing density

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+'('+'K'+pL+pH+fn+m (fn=97)**

[Name] Operating thermal head partially

[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=97  
0≤m≤2

[Initial Value] m=0

[Descript] Set the operation of partial thermal head

[Caution] This function will be effective once the power capacity is short.  
The Second division of electric current (ampere) will be half than the first division.

m	Partial operation
0	Initial setting (first division)
1	First Division
2	Second Division

**GS+'B'+n**

[Name] Reverse printing in black

[Format] ASCII GS B n  
Hex 1D 42h n  
Decimal 29 66 n

[Range] 0≤n≤255

[Initial Value] n=0

[Descript] Reverse printing in black  
n=0, standard printing  
n=1, reverse printing in black

**GS+'H'+n**

[Name] Select the printing position of HRI characters (Barcode)

[Format] ASCII GS H n  
Hex 1D 48h n  
Decimal 29 72 n

[Range]  $0 \leq n \leq 3$

[Initial Value]  $n=0$

[Descript] Select the printing positions of numerical value & characters

n	Printing Position
0	Non printing
1	Above the barcode
2	Below the barcode
3	Both above & below barcode

**GS+'L'+nL+nH**

[Name] Select the left margin

[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 Value]  $nL+nH \times 256 = 0$  ( $nL=0, nH=0$ )

[Descript] The left margin is set in  $(nL+nH \times 256) \times 0.125\text{mm}$ .

**GS+'V'+m**

[Name] Select cut mode and cut paper

[Format] ASCII GS V m  
Hex 1D 56h m  
Decimal 29 86 m

[Range]  $0 \leq m \leq 1$

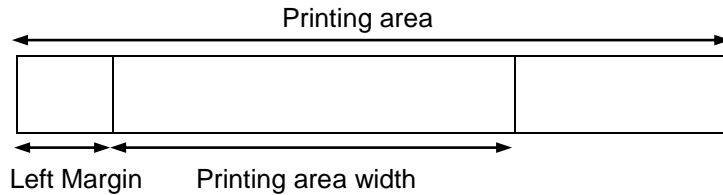
[Initial Value]  $m=0$

[Descript] Select a mode for cutting paper

m	Function
0	Full Cutting
1	Partial Cutting

**GS+'W'+nL+nH**

[Name] Set printing area width  
 [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 Value]  $nL + nH \times 256 = 448$  (56mm, nL=0, nH=0)  
 [Descript] Set printing area width from the left margin in  $(nL + nH \times 256) \times 0.125\text{mm}$

**GS+'h'+n**

[Name] Select barcode height  
 [Format] ASCII GS h n  
 Hex 1D 68h n  
 Decimal 29 104 n  
 [Range]  $1 \leq n \leq 255$   
 [Initial Value]  $n = 162$  (20.25mm)  
 [Descript] Select barcode height by  $n \times 0.125\text{mm}$

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

[Name] Print barcode  
 [Format] ASCII GS k m d1...dn NUL  
 Hex 1D 6Bh m d1...dn 00h  
 Decimal 29 107 m d1...dn 0  
 [Range]  $1 \leq m \leq 7$ , n & d depend on barcode system used  
 [Descript] Refer the table as below

m	Barcode system	n (Barcode data numbers)	d (barcode data )
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)	$1 \leq n$ (Only 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	CODE128	$2 \leq n \leq 255$ (Check digit , Stop character Is automatically added)	$0 \leq d \leq 127$

**[Caution]** In CODE128, set additional “{” in 2bytes when the special character as below.

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Special character	Barcode data		
	ASCII	Hex	Decimal
SHIFT	{S	7Bh, 53h	123, 83
CODE A	{A	7Bh, 41h	123, 65
CODE B	{B	7Bh, 42h	123, 66
CODE C	{C	7Bh, 43h	123, 67
FNC1	{1	7Bh, 31h	123, 49
FNC2	{2	7Bh, 32h	123, 50
FNC3	{3	7Bh, 33h	123, 51
FNC4	{4	7Bh, 34h	123, 52
"{"	{{	7Bh, 7Bh	123, 123

**Notice** : Also, you have to add the following initial code, when you start CODE A, CODE B, CODE C. It is to recognize CODE128.

CODE128	Initial character	Example of barcode
CODE A	g	"gABCD"
CODE B	h	"hABCD"
CODE C	i	"iABCD"

**GS+'w'+n**

[Name]	Set the horizontal size of barcode			
[Format]	ASCII	GS	w	n
	Hex	1D	77h	n
	Decimal	29	119	n
[Range]	1≤n≤4			
[Initial Value]	n=2			
[Descript.]	Set the horizontal size of barcode			

n	Module width	Two level barcode	
		Narrow	Wide
1	0.25mm	0.125mm	0.375mm
2	0.375mm	0.25mm	0.625mm
3	0.5mm	0.375mm	1mm
4	0.625mm	0.5mm	1.25mm

\* Multi Level barcode : UPC-E, EAN13, EAN8

\* 2 level barcode : CODE39, ITF, CODABAR

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## GS+'r'+n

[Name]	Transmit status			
[Format]	ASCII	GS	r	n
	Hex	1D	72h	n
	Decimal	29	114	n
[Range]	n=1			
[Descript]	Transmit current status of printer			
[Caution]	The status is not ready till the printer is offline,			
	If the receiver buffer is full at the printer offline, this command is not able to receive, and is not able to respond to the status.			
	Therefore we recommend the real time command (DLE+EOT).			

## GS+'a'+n

[Name]	Enable / Disable automatic status back (ASB)			
[Format]	ASCII	GS	a	n
	Hex	1D	61h	n
	Decimal	29	97	n
[Range]	0≤n≤1			
[Initial Value]	n=1			
[Descript]	Enable / Disable ASB			
	If the status is changed after checking the printer status,			
	the status is automatically executed.			
	This command is executed to enable or disable.			

n	Function
0	Disable automatic status back
1	Enable automatic status back

<Status transmission data >

Bit	Satus	Hex	Decimal
0	0 : Paper	00h	0
	1 : No paper	01h	1
1	0 : Printer head down	00h	0
	1 : Printer head up	02h	2
2	0 : Paper w/o jamm	00h	0
	1 : Paper with jamm	04h	4
3	0 : Paper adequate	00h	0
	1 : Paper Near End	08h	8
4	0 : Print complete	00h	0
	1 : Print or Feeding	10h	16
5	0 : Cutter no- error (jamm)	00h	0
	1 : Cutter error (jamm)	20h	32
6	0	00h	0
7	0	00h	0

※ the status of bit 4 will be effective when the realtime command DLE + EOT + n,  
The others are fixed '0'.

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**DLE+ENQ+n**

[Name] Realtime buffer clear, or reset.

[Format]

ASCII	DLE	ENQ	n
Hex	10h	05h	n
Decimal	16	5	n

[Range] n = 2, 3

[Descript]

n = 2 : The realtime will clear each buffer of the printer, as soon as this command is conducted.

n=3 : The realtime will reset the printer, as soon as this command is conducted. The command ESC+@ will be reset.

However, it doesn't work at the paper jam, cutting jam, has to reset compulsory.

[Caution]

If the offline is valid, and the printer receive the data same with this command, The printer will be working the same with this comand. (Bit image, Data.)

**DLE+EOT+n**

[Name] Realtime status transmission

[Format]

ASCII	DLE	EOT	n
Hex	10h	04h	n
Decimal	16	4	n

[Range] n=2

[Descript]

The printer transmits is the current data.

Each status item is represented by one-byte data

[Caution]

Pls refer the status as below.

If the command is received same data, it could be same operation (Bit image data, etc)

## &lt;Status transmission data &gt;

Bit	Satus	Hex	Decimal
0	0 : Paper	00h	0
	1 : No paper	01h	1
1	0 : Printer head down	00h	0
	1 : Printer head up	02h	2
2	0 : Paper w/o jamm	00h	0
	1 : Paper with jamm	04h	4
3	0 : Paper adequate	00h	0
	1 : Paper Near End	08h	8
4	0 : Print complete	00h	0
	1 : Print or Feeding	10h	16
5	0 : Cutter no- error (jamm)	00h	0
	1 : Cutter error (jamm)	20h	32
6	0 : Not available	00h	0
7	0 : Paper invalid at sub sensor	00h	0
	1 : Paper valid at sub sensor	80h	128

GS+'v'+0'+m+xL+xH+yL+yH+d1+...+dk

[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  $48 \leq m \leq 51$ ,  
 $1 \leq (xL + xH \times 256) \leq 150$  ( $0 \leq xL \leq 150$ ,  $xH = 0$ )  
 $1 \leq (yL + yH \times 256) \leq 436$  ( $0 \leq yL \leq 255$ ,  $0 \leq yH \leq 1$ )  
 $0 \leq d \leq 255$  ( $yL + yH \times 256$ )  
 $K$  (All data) =  $(xL + xH \times 256) \times (yL + yH \times 256)$

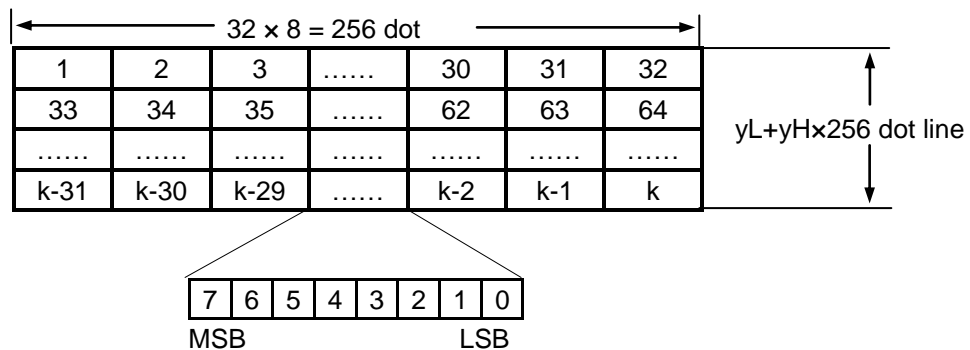
[Descript] The laster bit image will be recognized in mode m.  
xL,xH appoint the data (byte) of horizontal at image data.  
yL,yH appoint the dta (dot line) of vertical at image data.

\* d is a data for laster bit.

m	Mode	Expansion
0, 48	Normal	X1
1, 49	Horizontal expansion	X2
2, 50	Vertical expansion	X2
3, 51	Horizontal, Vertical expansion	X2 (Horizontal & Vertical)

Ex) Expansion image

$xL + xH \times 256 = 32$  byte,





**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 the table below.						
[Descript]	Please choose the barcode by the data of barcode.						

n1 : two dimension of barcode  
n2 : the number of data of barcode  
n3 : size of barcode  
d1... dk : the data of barcode

n1	Barcode
1	PDF417
2	QR code

## 1) PDF417

n2	Number of data
	$1 < n2 \leq 255$

n3	Size of data
3	Horizontal 3
4	Horizontal 4
5	Horizontal 5
6	Horizontal 6
7	Horizontal 7
8	Horizontal 8
9	Horizontal 9

## 2) QR code


n2	Number of data
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 of data
1	Version 1
3	Version 3
5	Version 5
9	Version 9

※ Vertical is set automatically.

**DC3+'i'**

[Name]	Cutting after it detects the black mark.		
[Format]	ASCII	DC3	i
	Hex	13	69h
	Decimal	19	105
[Descript]	- The value is not deleted until the next value is changed, even though power off.		
	If you register the information at SW1,SW2, the black mark detects automatically, Then it cuts the registered points.		
	- Please use the provided program - 'Memory switch setting utility program'.		
	- Please refer the 2-7)Memory switch.		

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## SUB+'1'

[Name] Choise of Line 1  
[Format] ASCII SUB 1  
Hex 1A 31h  
Decimal 26 49  
[Descript] Choose the Line 1 of two Lines (Line 1 or Line 2).

## SUB+'2'

[Name] Choise of Line 2  
[Format] ASCII SUB 1  
Hex 1A 32h  
Decimal 26 50  
[Descript] Choose the Line 2 of two Lines (Line 1 or Line 2).

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

[Name] Writing the 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]  $0 \leq nL + nH \times 256 \leq 448$ , ( $0 \leq nL \leq 255$ ,  $0 \leq nH \leq 3$ )  
 $0 \leq kL + kH \times 256 \leq 448$ , ( $0 \leq kL \leq 255$ ,  $0 \leq kH \leq 3$ )  
[Descript] It writes 1 from nL+nHx256 to kL+kHx256.  
[Caution] If the range is exceed, the data will be ignored.  
If the writing is set up, the data is not erased, until you do power off or you receive the command (the rule clear).

## SUB+'C'

[Name] Line CLEAR  
[Format] ASCII SUB C  
Hex 1A 43h  
Decimal 26 67  
[Descript] It clears all of data (as) zero you choosed.  
[Caution] Please use this command, once you do rewrite the rule data.  
If you need to speed up the processing, you use the command on/off.

## SUB+'O'

[Name] Line ON  
[Format] ASCII SUB O  
Hex 1A 4Fh  
Decimal 26 79  
[Descript] Once you set up the command, the rull will be printing with the character or font.

**SUB+'F'**

[Name] Rule OFF

[Format] ASCII SUB O  
 Hex 1A 46h  
 Decimal 26 70

[Descript] Once you set up the command, the rule will be preserved.

**SUB+'P'**

[Name] Printing a dot of Rule 1.

[Format] ASCII SUB P  
 Hex 1A 50h  
 Decimal 26 80

[Descript] It's printing a dot of rule 1.

[Caution] Please do not use this command if you print the character or the graphic.  
 Please use the Rule ON if you print the character or the graphic.  
 Please use this command if you print the rule between row and row at the space.

**ESC+'t'+n**

[Name] Code Page (International language)

[Format] ASCII ESC t n  
 Hex 1B 74h n  
 Decimal 27 116 n

[Range]  $0 \leq n \leq 8$

[Initial] n=0

[Descript] Please refer to the code page below.

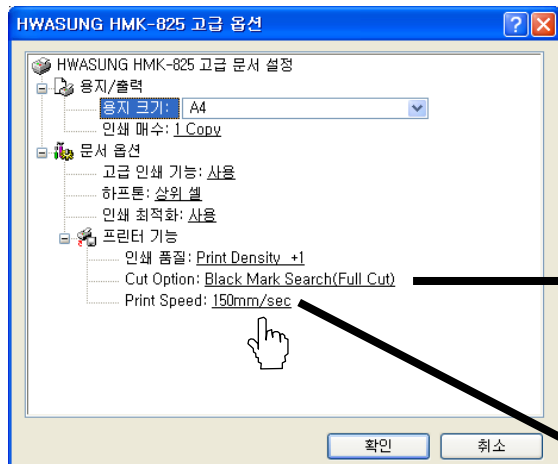
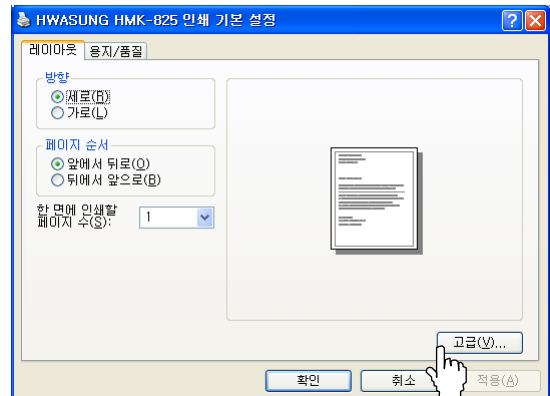
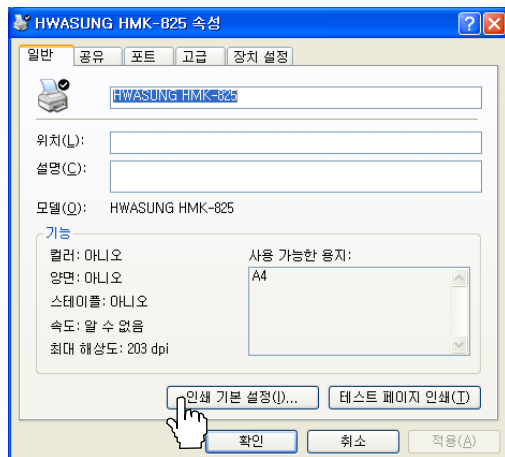
n	Code Page	n	Code Page
0	PC437(USA)	6	PC850(Multilingual)
1	KANA(JAPAN)	7	PC860(Portuguese)
2	Greece	8	WPC1252
3	WPC1251	9	Iran System Encoding Standard
4	PC866(Cylic #2,Russian)	10	PC857(Turkish)
5	Windows1250(Poland)	11	PC864(ARABIC)

**[Caution]** 1 byte will be valid, if it's SUB + x, or FS+.”  
 2 bytes will NOT be valid.

## 6. Widows Driver

### 6-1) Set up the function.

- 1) Please open the screen of printer / fax, and click the basic setting (I) of the general tap.
- 2) Please click (V).
- 3) Please refer to the following images, and set up each details.



- \* No Cut : No cutting & Printing.
- \* Full Cut : Full cutting after printing.
- \* Partial Cut : Partial cutting after printing.
- \* Black Mark Search (Full Cut) :  
The cutting position from the black mark will be set by the memory switch.

※ The quality of printing will be different, because it prints out as graphic.  
So pls try to print out as below.

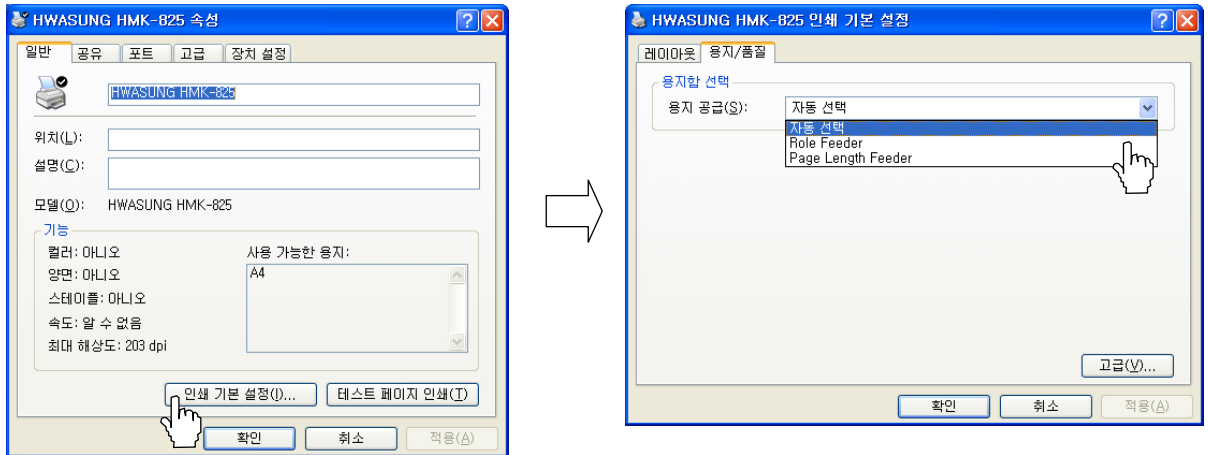
Printing width : 60mm -> Speed 150mm  
80mm -> Speed 130mm

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## 6-2) Set up the paper feeding

Please set the form feeding after printing.

- 1) Please click the basic setting (I) of the general tap.
- 2) Please click the tap of paper /quality, and drop down paper providing.



- 3) Auto & Role Feeder : After printing, the form feeding is not conducted any more.

Please set up if the printing length is not regular.

You can't conduct the feeding, even you set up the space at the program Visual Basic.

We recommend you make the font size smaller, such as ".", and make the position the cutting.

Example)

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

```
Printer.Print " " & vbLf
```

```
Printer.Print " " & vbLf
```

```
Printer.Print " " & vbLf
```

```
Printer.FontSize = 2
```

```
Printer.Print "."
```

```
Printer.EndDoc
```

' dummy print for form feeding

- 4) Page length Feeder : After printing, The form feeding will be conducted as long as the length is fixed. It is mostly used when the regular length is printed.

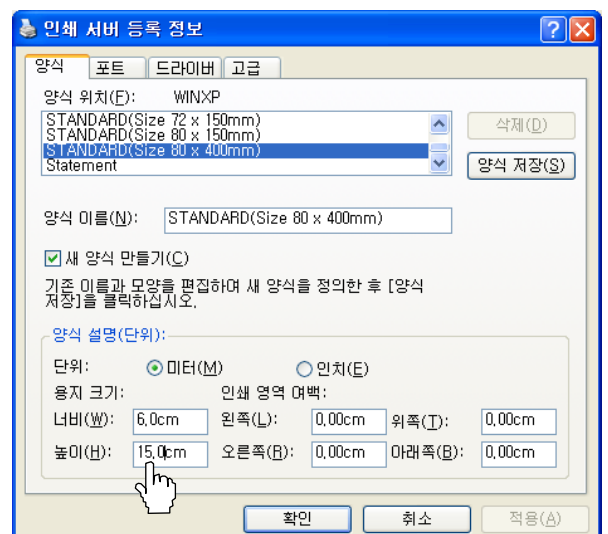
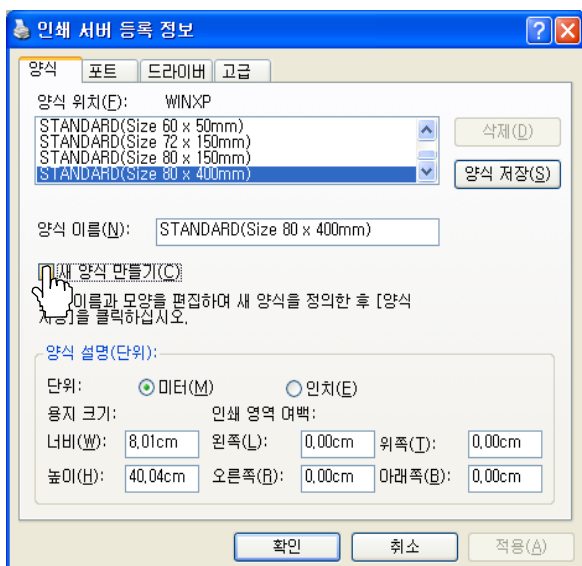
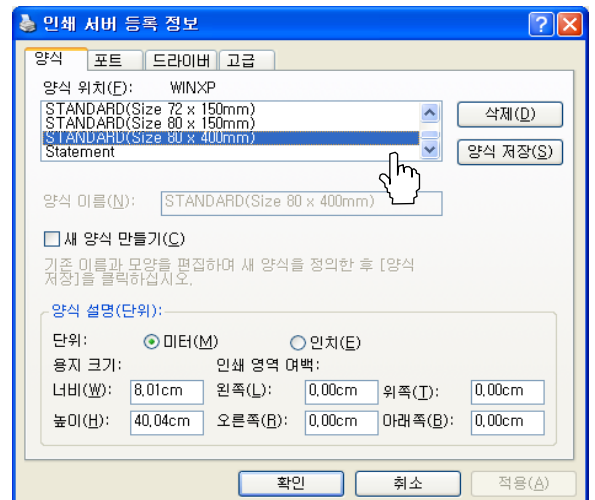
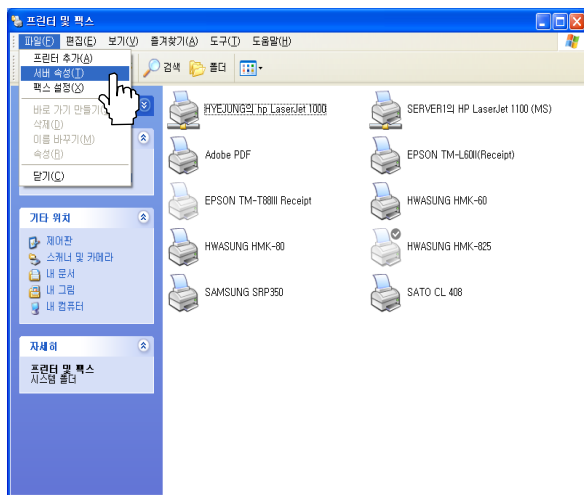
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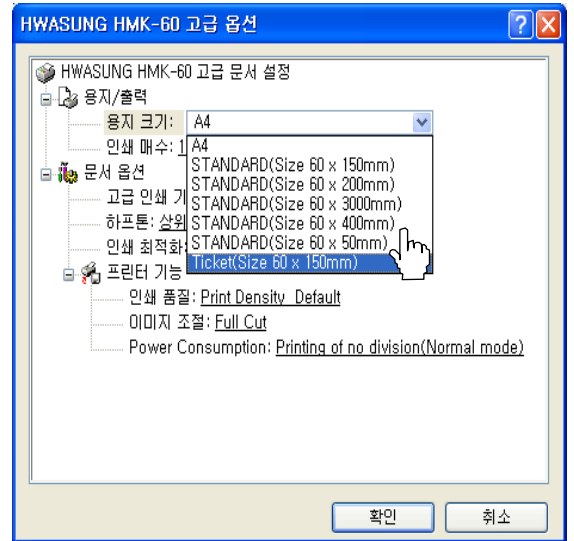
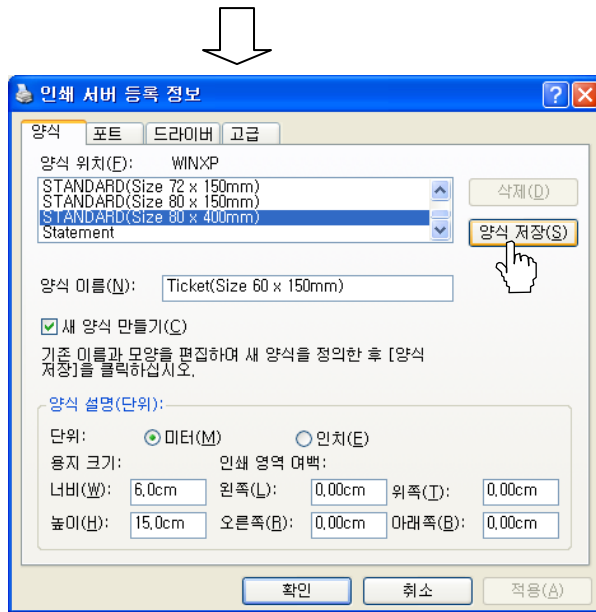
### 6-3) Set up the new length of paper size

You can make the size of paper you need.

Please refer the example of 60mm x 150mm as below.

- 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.
- 5) Please click the 'form install' Ticket (Size 60 x 150mm) as image.
- 6) Please click the tap 'advanced' and set the paper Ticket(Size 60 x 150mm).

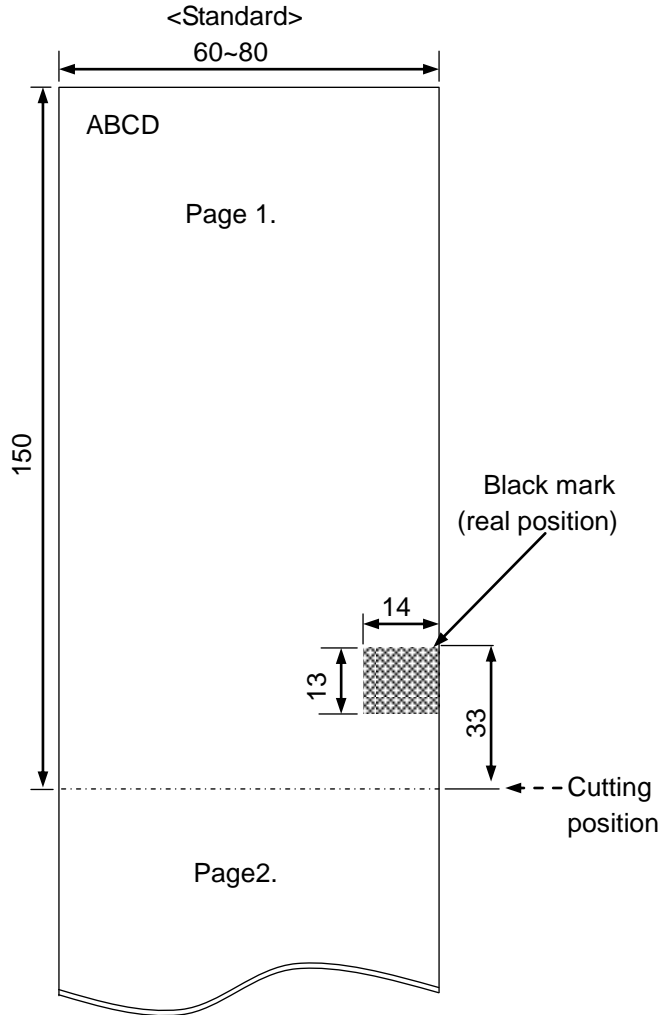




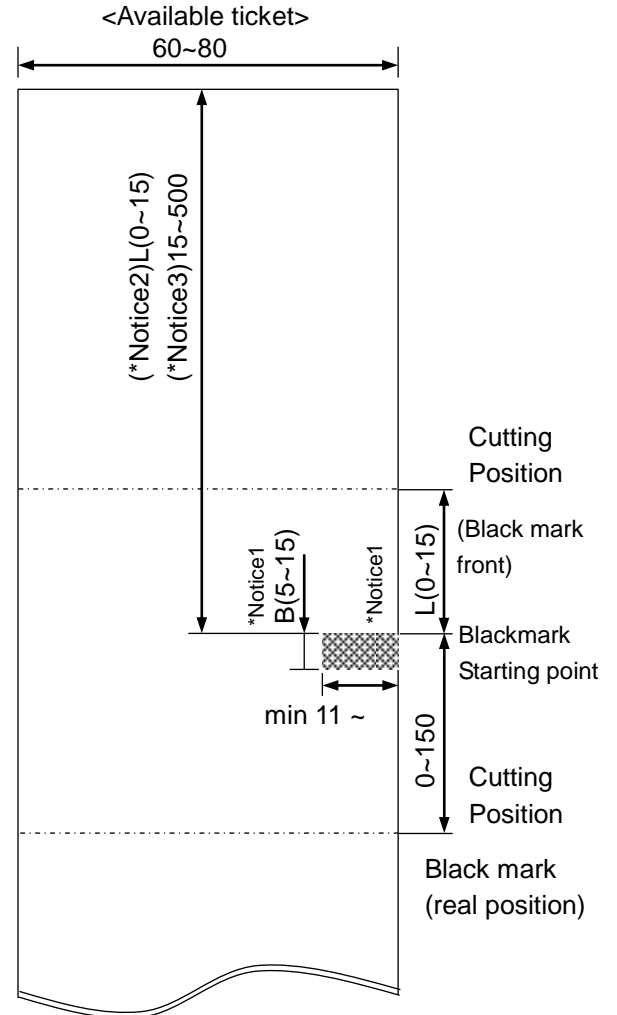
## 7. Ticket recommend

[Unit:mm]

7-1) It is the case the black mark is on the left.



[Front side,Printing side]



[Front side,Printing side]

[\*Notice1]

B : Height Blackmark,

L : Forepart cutting position blackmark

$L+B < 15$

It should range  $L < 15 - B$ .

[\*Notice2]

Forepart cutting position blackmark

\*It is the same condition with Notice 1.

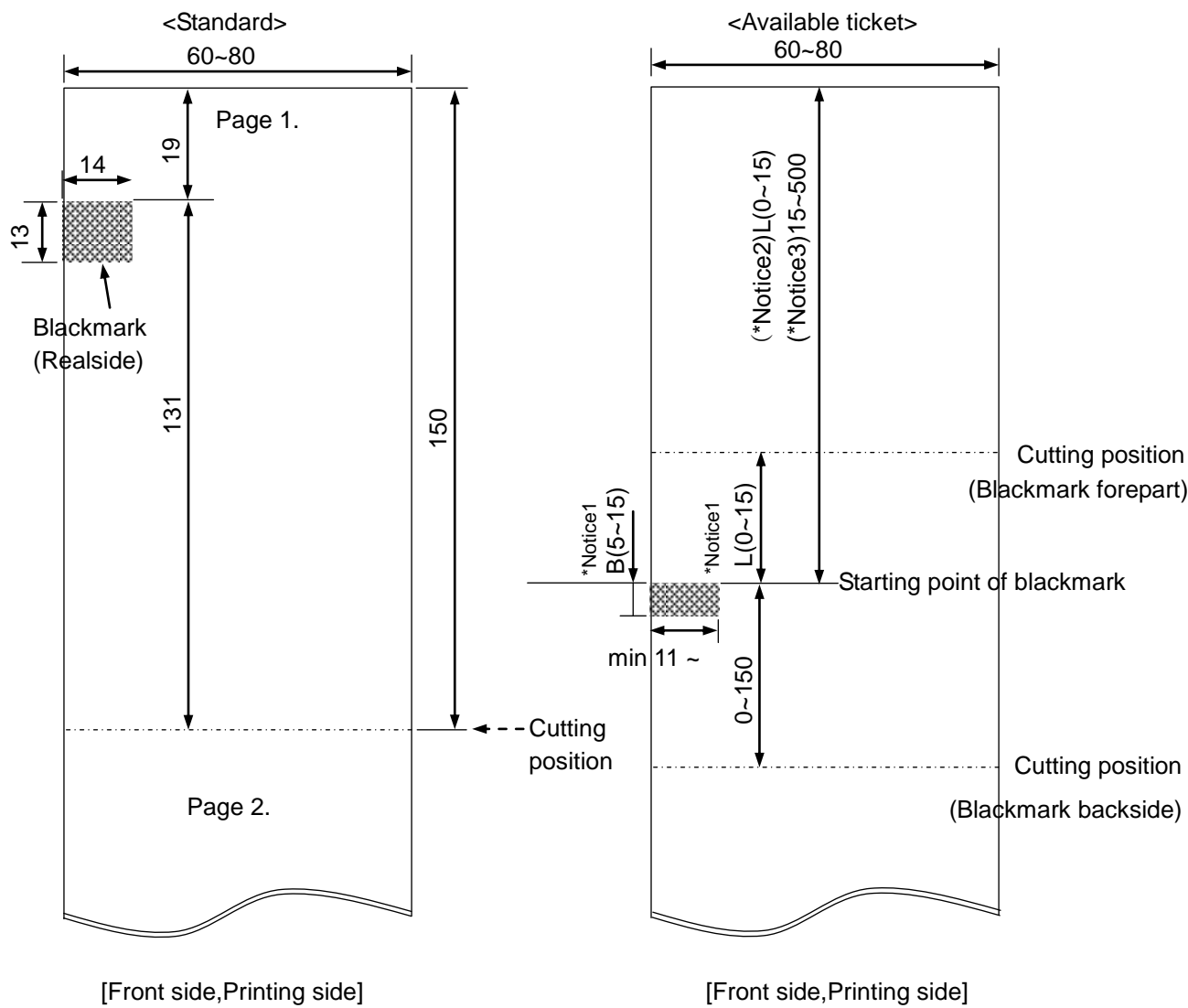
[\*Notice3]

It is the case if the cutting position is behind of blackmark.

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7-2) It is the case the black mark is on the right.



[\*Notice1]  
B : Height Blackmark,  
L : Forepart cutting position blackmark  
 $L+B < 15$   
It should range  $L < 15 - B$ .

[\*Notice2]  
Forepart cutting position blackmark  
\*It is the same condition with Notice 1.

[\*Notice3]  
It is the case if the cutting position is behind of blackmark.

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## 8. 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).

### 8-1) DLL Interface

Please add the file HwaUSB.DLL at the folder System 32, or the folder SysWow64.

#### 8-1-1) DLL function.

1) long `UsbOpen(LPCTSTR SelPrinter);`

Please open the port USB by the printer Model "HMK-080"

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

2) long `PrintStr(LPCTSTR data);`

It prints the string.

- 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

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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 : Transmisiong 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.

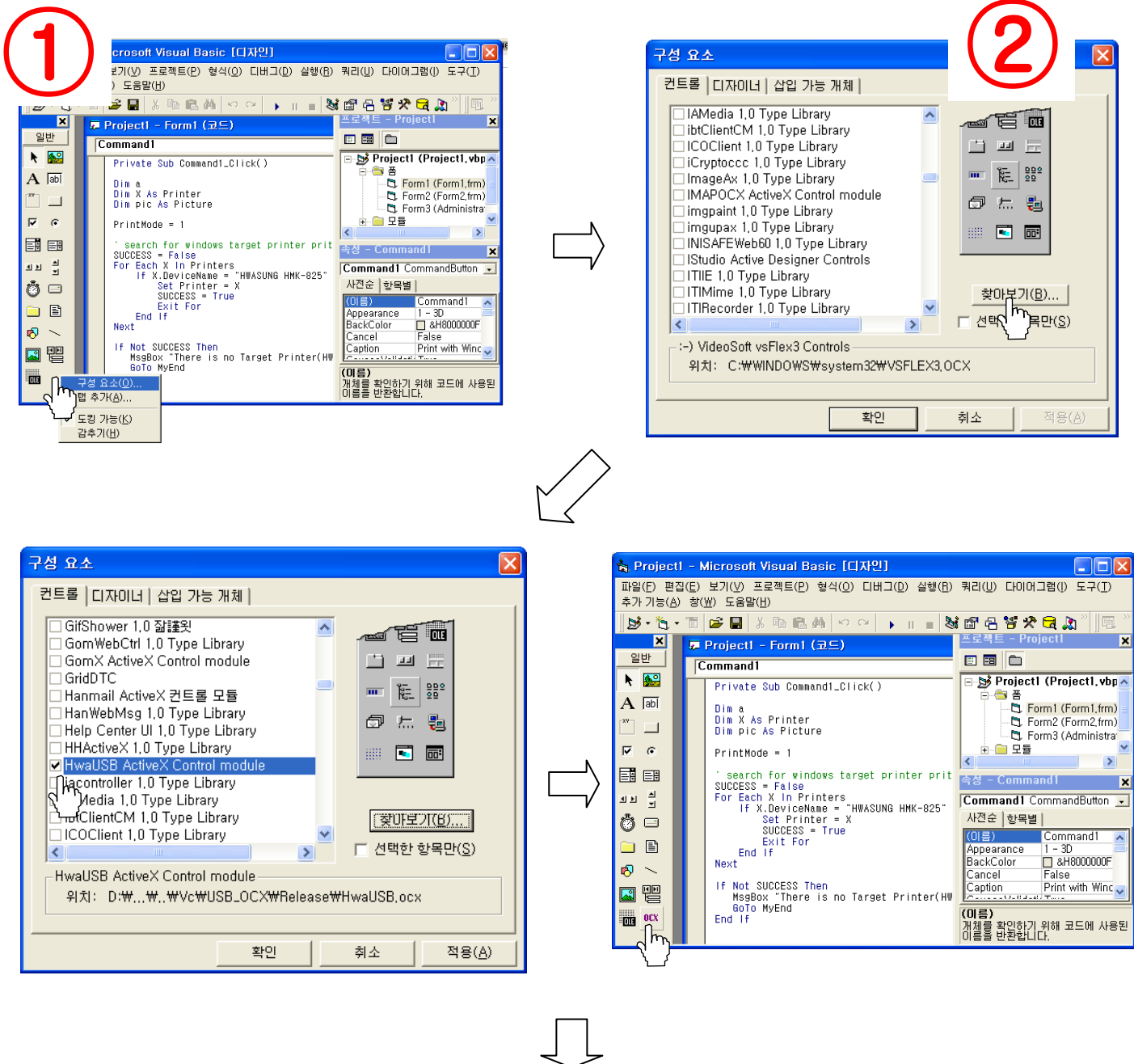
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## 9. OCX Driver

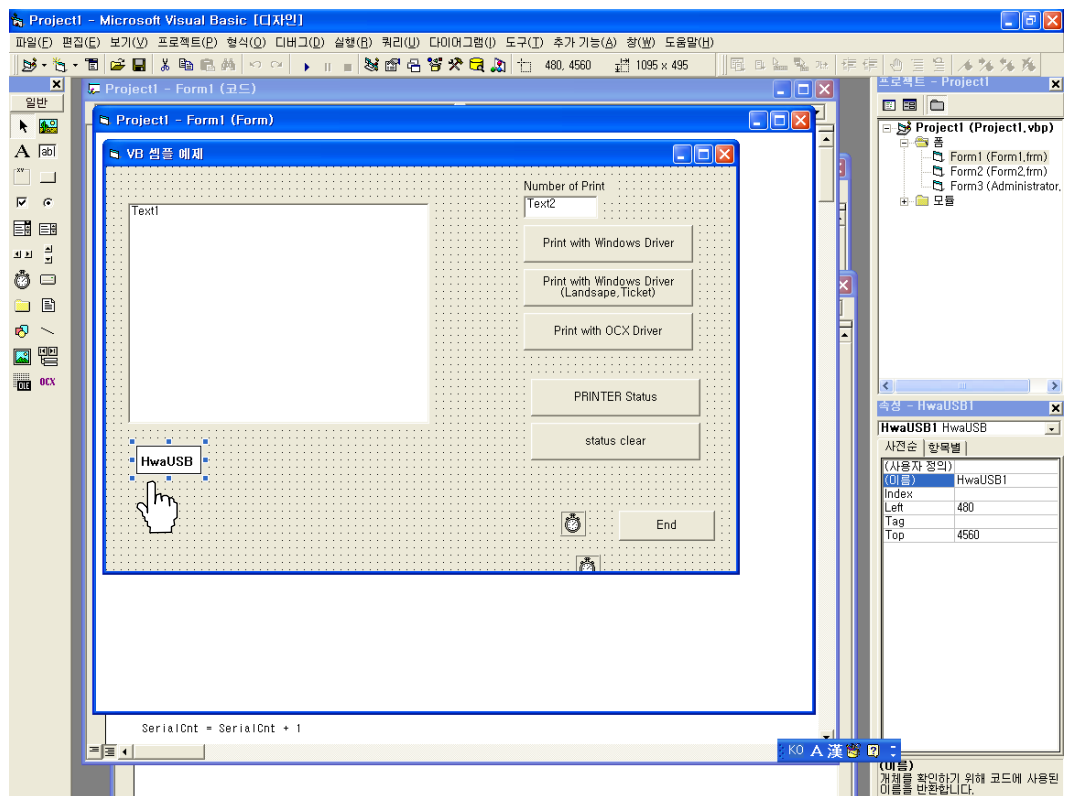
We recommend you to use DLL Diver then OCX Driver(Because when we update, we will use DLL Diver from now on)

### 9-1) How to use

Please follow the image steps of visual basic as below.



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Please ask the person in charge about the sample program.

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## 9-2) Functions

1) long HwaUSB1.Open(LPCTSTR SelPrinter);

Please open USB port as Printer Model("HMK-080").

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

2) void HwaUSB1.Close(void);

Please close USB port by the way of which you open Printer Model.

- Parameters:  
None
- Return :  
None

3) long HwaUSB1.PrintStr(LPCTSTR data);

It prints the string.

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

※ In order to prevent the data loss by the printing timeout,  
Please check the printer status by the RealRed function, and print out.

4) long HwaUSB1.PrintCmd(unsigned char data);

It prints the data 1 byte. It is to use for the printer control command.

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


5) long HwaUSB1.RealRead(void);

It reads the data of printer status as 1 byte of USB port.

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

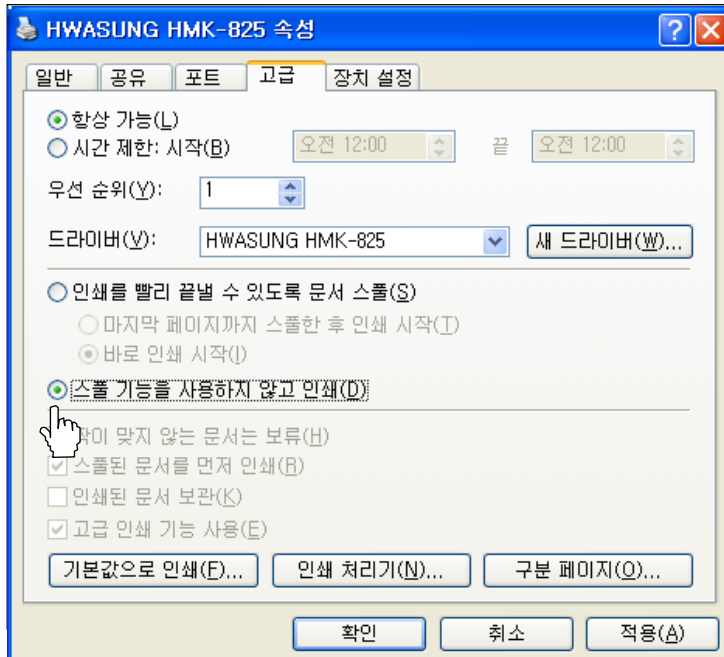
**Notice** Please do not use any function we don't provide, due to the debug usage.

**Notice** Please ask the sample program for more details.

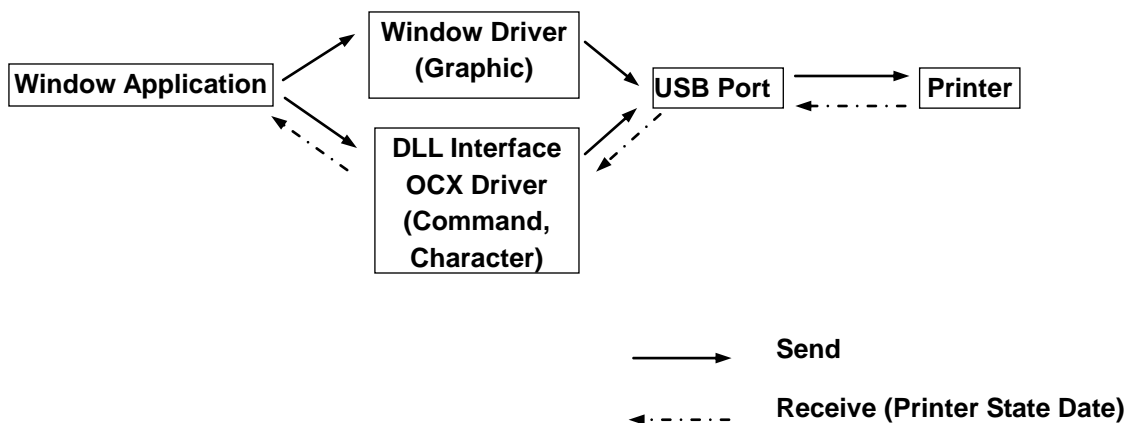
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### 9-3) Caution for using USB Interface

If you use the USB interface and windows drivers together, the data will not be printed in regular sequence. So please release the spool, when you want to use the USB interface and window driver together. If you release the spool, the data receipt is only made by USB Interface.



※ The Data diagram of window application.



## 10. Revision reference

It is a page for the technician to know what is the revision updated.  
This page is written in Korea or English

[illegible]