

Technical manual
(User Manual)

HMK-054

HMB-054

HMV-054

Release 2



HMK-054



HMB-054

Control board +

Mechanism combination



HMV-054

Vertical Type

HWASUNG

POS.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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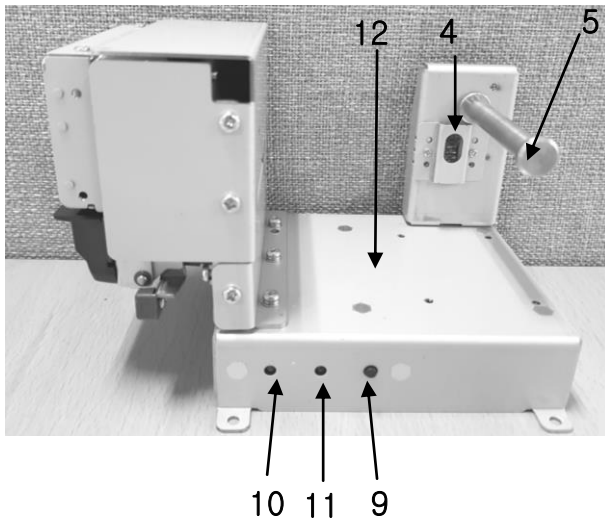
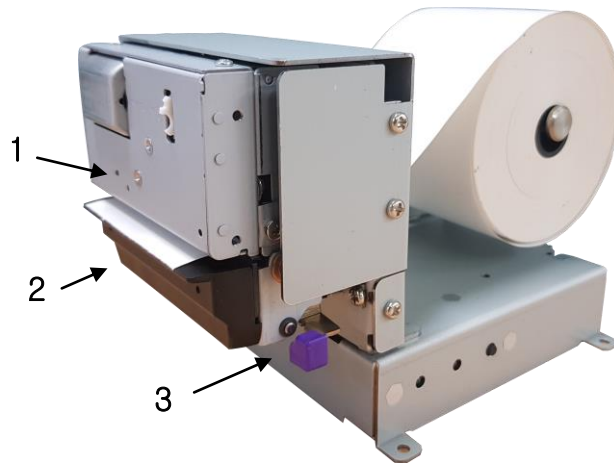
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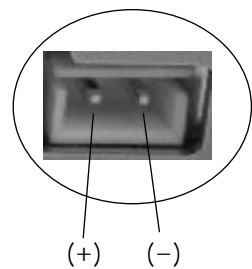
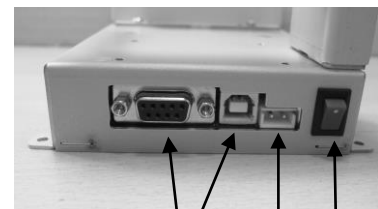
1. Printer features & External dimension

1-1) Name of each parts

- | | |
|------------------------|-------------------------|
| 1. Auto cutter | 8. Power switch |
| 2. Paper guide | 9. Feed button |
| 3. Head up lever | 10. Power LED(Green) |
| 4. Neae end sensor | 11. Error LED (Red) |
| 5. Paper shaft | 12. Dip swtich (Bottom) |
| 6. Power connector | |
| 7. Interface connector | |

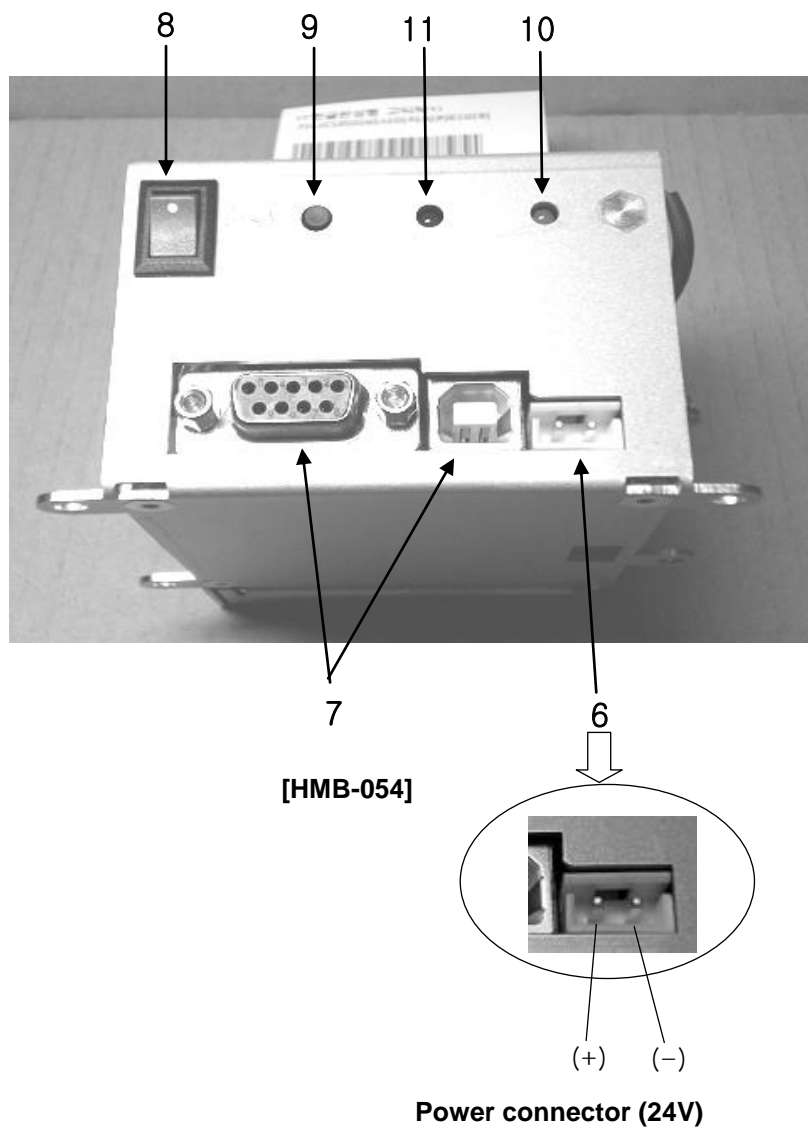


[HMK-054]



Power connector (24V)

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1-2) Model Number

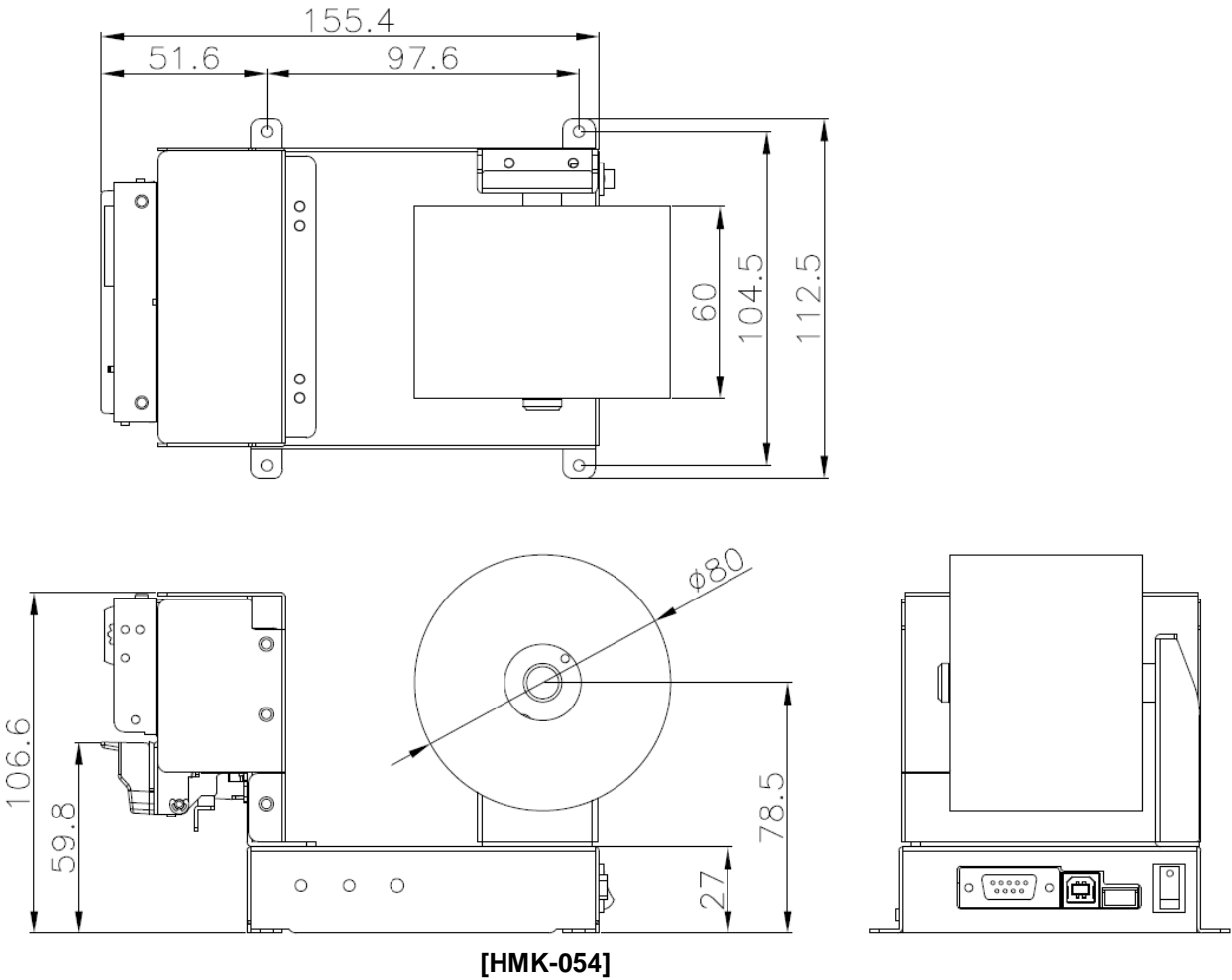
HM□-054

※ Model

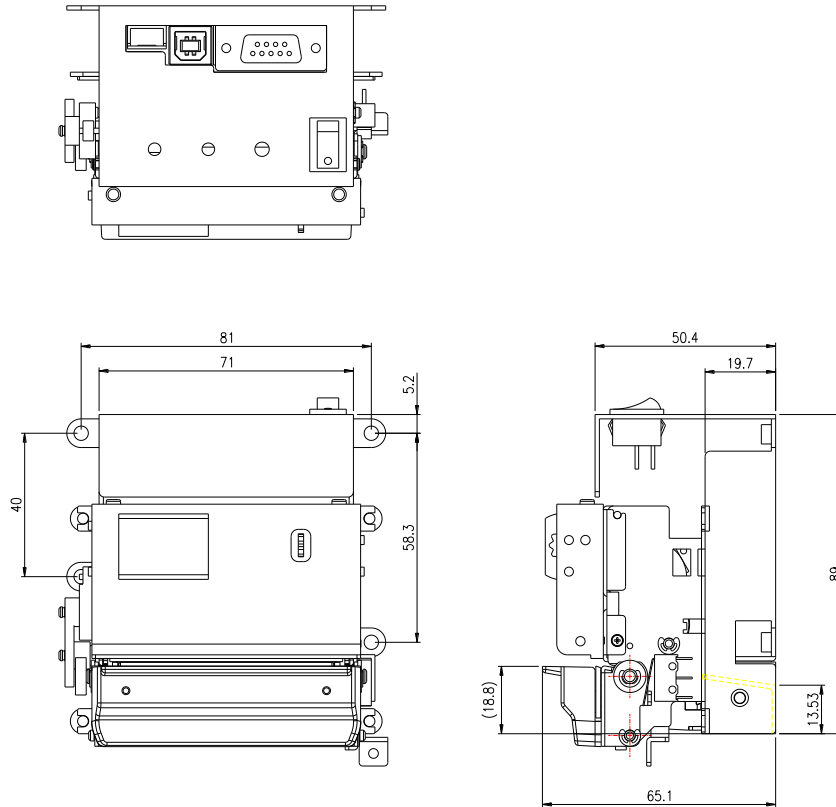
- K : Kiosk type (KIOSK)
- B : Control board + Mechanism combination
- V : Vertical Type
- C : Control board Type

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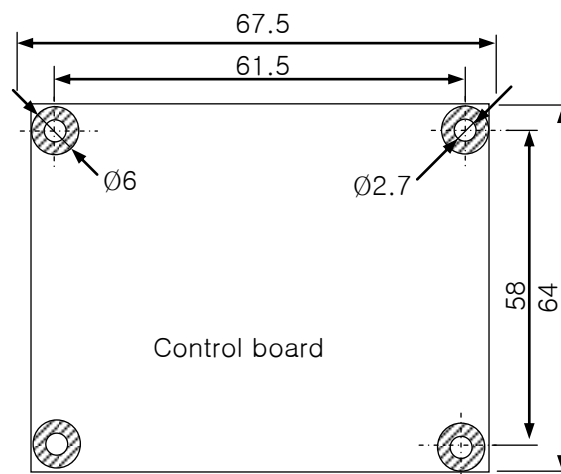
1-3) Dimension



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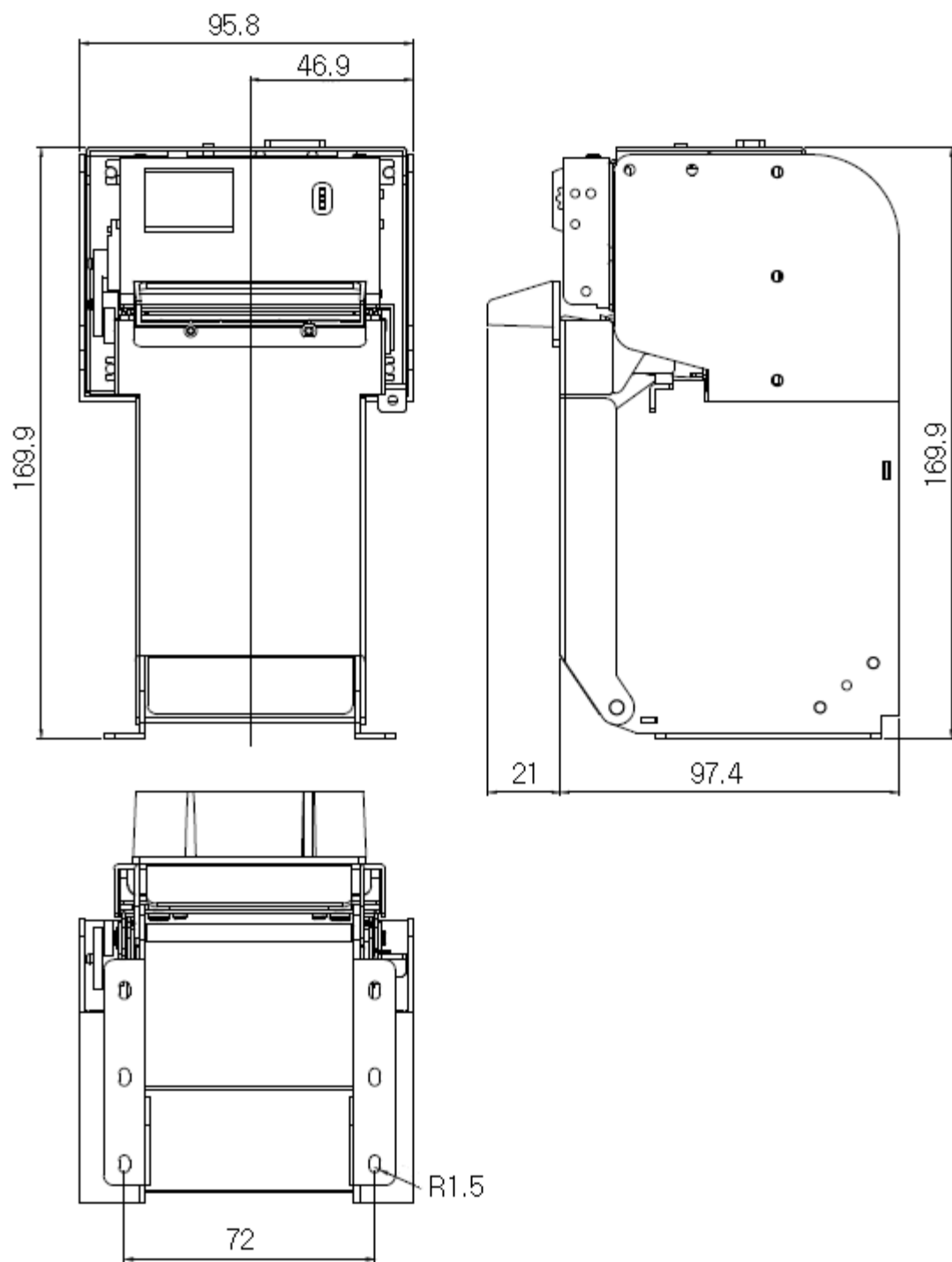


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[HMC-054]

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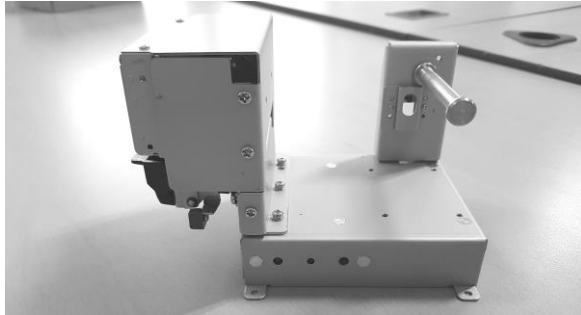


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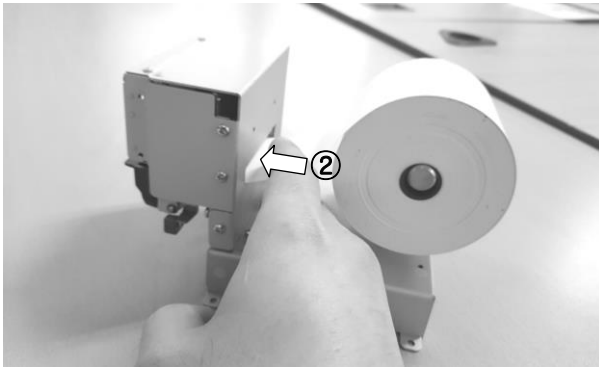
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2. Operation

2-1) Setting a paper : Auto Loading

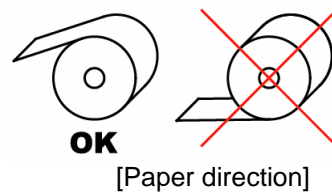


1. Please press down the feed button.
Please make sure the remains which
the paper comes out.

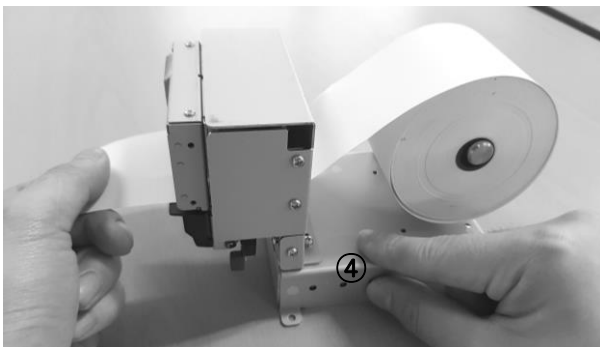


2. Please insert the paper deeply as image (②),
then the autoloading will be starting.
You can see the paper cut, after it's feeding.

Please make sure if the paper direction is correct.



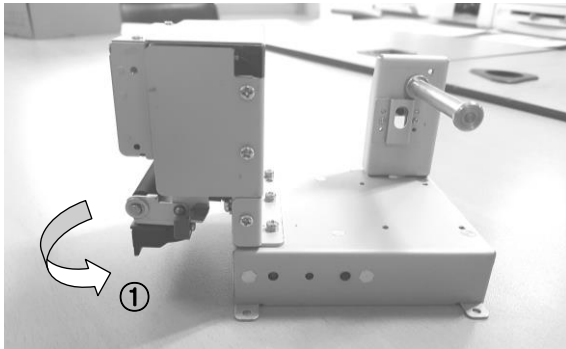
[Paper direction]



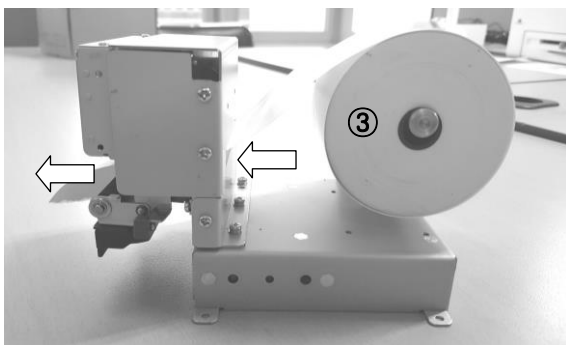
3. Please press the feed button to make sure if the paper
inserting is correct. (④)

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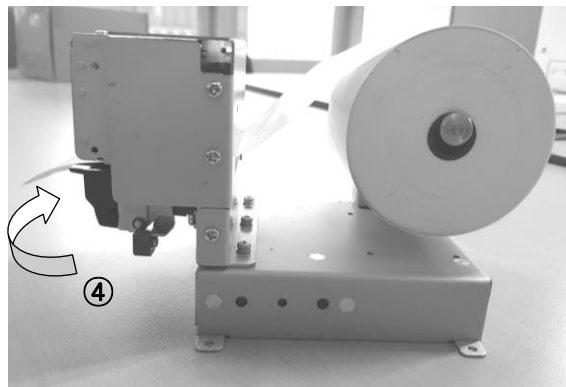
2-2) Setting a paper : Clamshell type



1. Please print the paper out.
2. Please open up the head up lever as image (①).



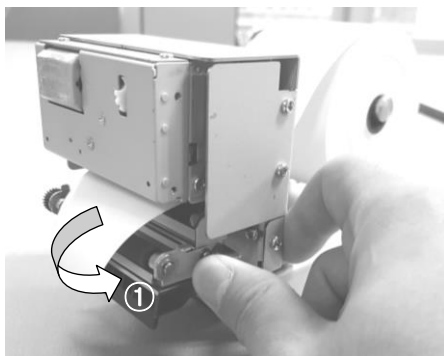
3. Please insert the paper in, until the end of paper is out of the paper guide. (③)



4. Please close up the head up lever. (④)

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2-3) Removing the paper jam



1. Please open up the head up lever.(①)
2. Please turn up the paper as image, and take out the paper jamm. (②)



When you repair the cutter in the printer, before that, please firstly turn off the printer

2-3) Self-test

1. Please power on, once the feed button is being pressed down.
2. The following information will be printed.

HMC-054 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
- Interface
- Dip Switch
- Sample printing

Please refer to the Dip switch info at 2-8).

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2-4) HEX Dump

1. Please switch 7 *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 Nine digits.
 - If it receives less than Nine digits, it will be printed if you press down feed button.
 - Control code (1F16 below) prints out as “.”.
 - 8016 more prints out as “^”.

[Sample]

| Hexadecimal | ASCII |
|----------------------------|-----------------|
| [HEX DUMP MODE] | |
| 41 42 43 44 45 46 47 47 49 | A B C D E F G H |
| 30 31 32 33 34 35 36 37 38 | 0 1 2 3 4 5 6 7 |
| FF1B 69 | ^ . i |

2-5) Update (on Board)

By using flash memory ,it's able to simply update on the PC.
Please conduct the updates, after refering the following steps.

1) Please power off and on.

2) Please check if the PC is connected with printer.

* If use the USB Interface, the time will be saved to update.

3) Please conduct the given update program.

The update will be started after ERROR LED is off for 4 seconds.

* Please do not power off / switch off Dip switch until the update ends.

4) The update will be end, once the update complete appears on the screen.

※ If the ERROR LED is appeared as on and off continuously, it could be error.

Please repeat these steps again, and check the interface cable, and the connections.

5) You can use the updated printer after update, it will be reset automatically then power off & on.

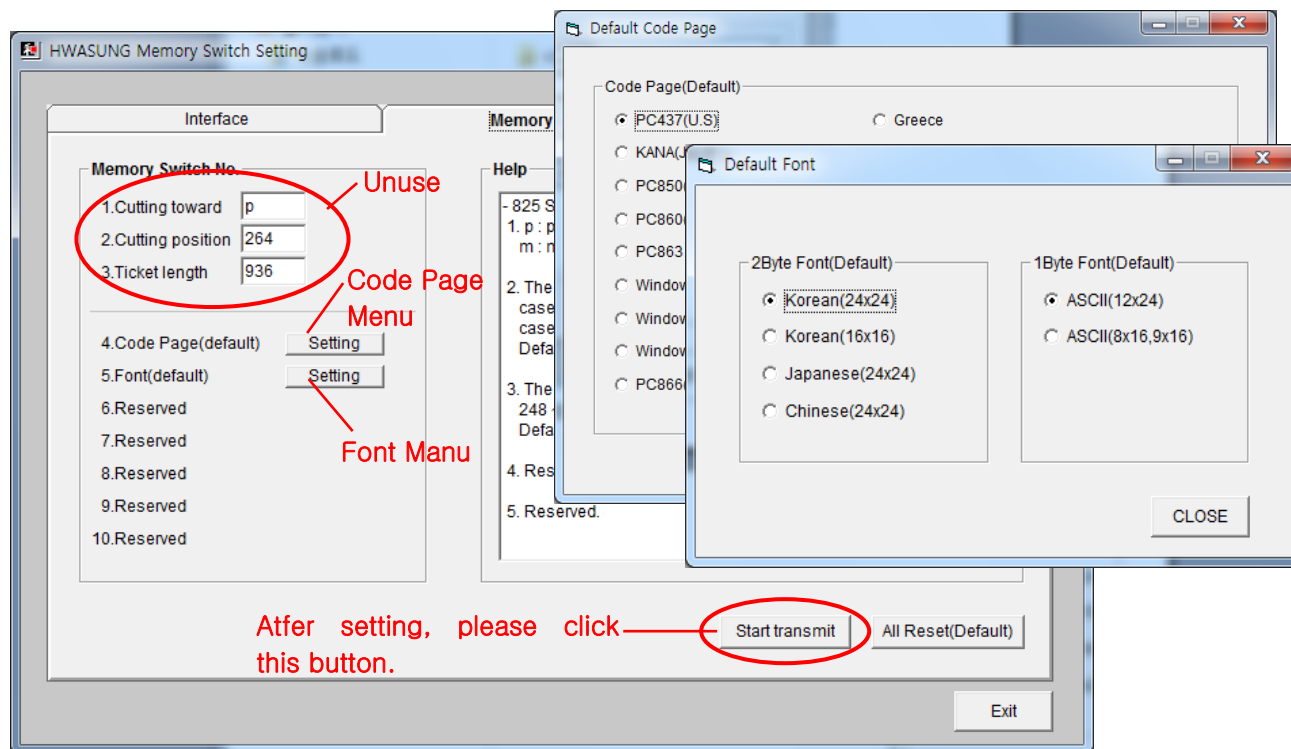
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2-6) Memory Switch

Setting memory switch: Functions are set by internal non-volatile memory.

- ※ For Setting, please use **utility program for setting memory switch** provided by us.
- ※ Setting value will not be erased even after power off, until next change.

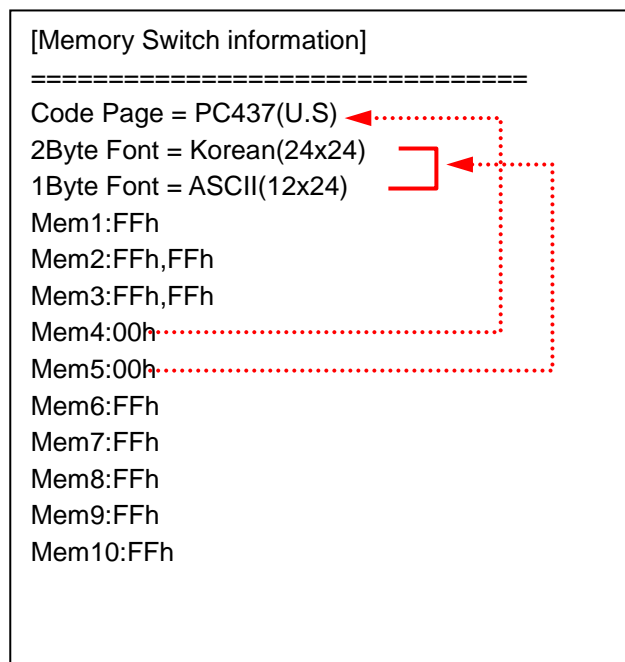
| Memory SW | Set Value | Description |
|-----------|--------------------|---|
| SW1 | Reserved | |
| SW2 | Reserved | |
| SW3 | Reserved | |
| SW4 | Standard Code Page | For setting default value, select one of the code page by country |
| SW5 | Base Font | For setting default value in 2 bite code, select one of Korean(24x24), Korean(16x16), Japanese(24x24) or Chinese(24x24). For setting default value in 1 bite code, select one of ASCII(12x24) or ASCII(8x16,9x16). |
| SW6 | Reserved | |
| SW7 | Reserved | |
| SW8 | Reserved | |
| SW9 | Reserved | |
| SW10 | Reserved | |



2) Verifying Memory Switch Modification

* After making a modification in memory switch, please verify the changes using self-test.

The printer will start the self-test process when you turn on the power while pressing down on the FEED button, and press the FEED button one more time to indicate the details of memory switch.



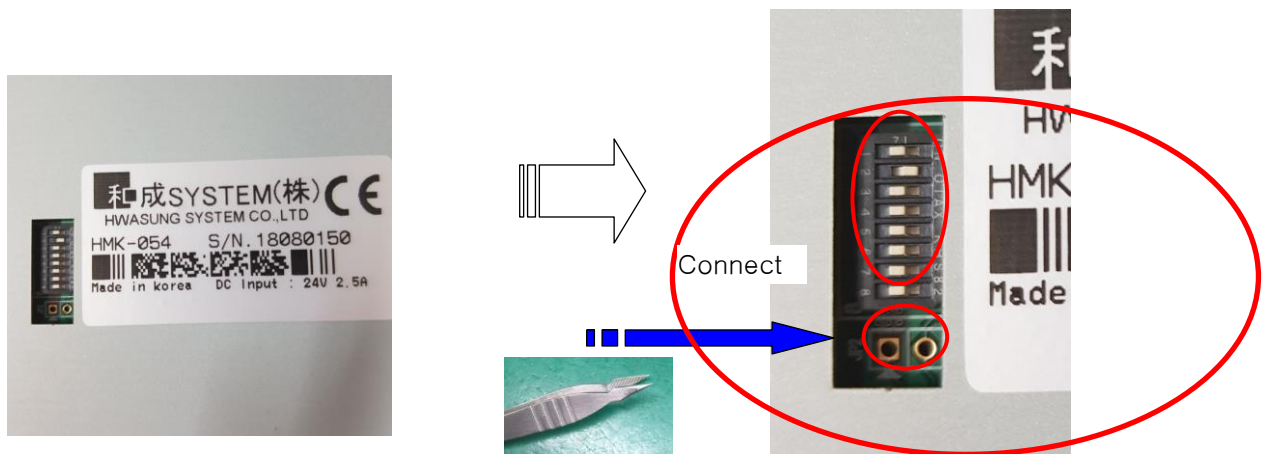
(Sample of verifying memory switch through self-test)

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2-7) Rebooting Firmware

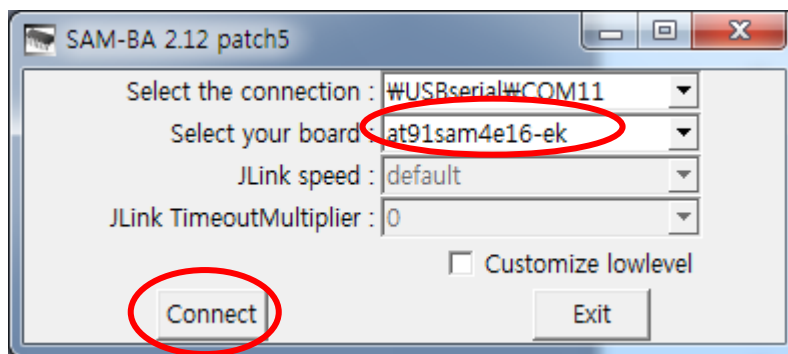
* If the firmware is damaged or cannot be booted due to the update error, you may use the methods below to recover..

- 1) Check for the jumper which is beside Dip Switch on the bottom of printer
- 2) By using Pin Header(2.5mm), connect the JP2 pins together to short the circuit.



(Tool or Conductor Tools)

- 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)

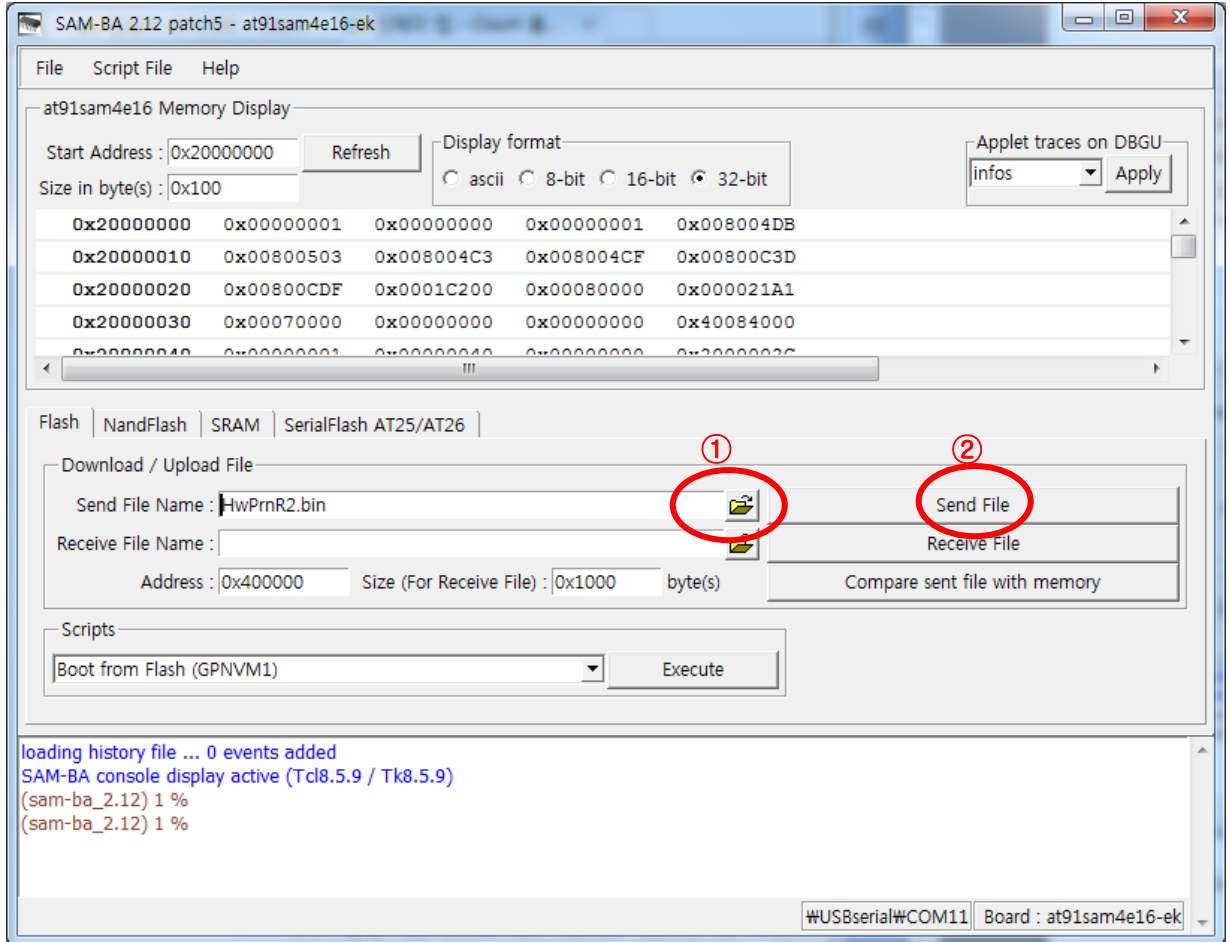


- 5) After rebooting, Please remove JP2(Jumper Pins)
* If you skip this step, the printer would not reboot even after the firmware recovery because it would delete the data.

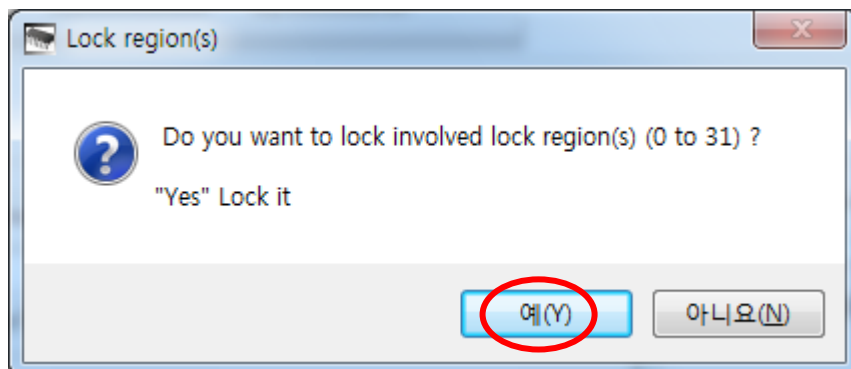
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- 6) Click the “ Icon “ in the Send file Name then after open the firmware file for Target model,
Then, Click “Send File Button”

* Notice : Do not revise the Parameter value.

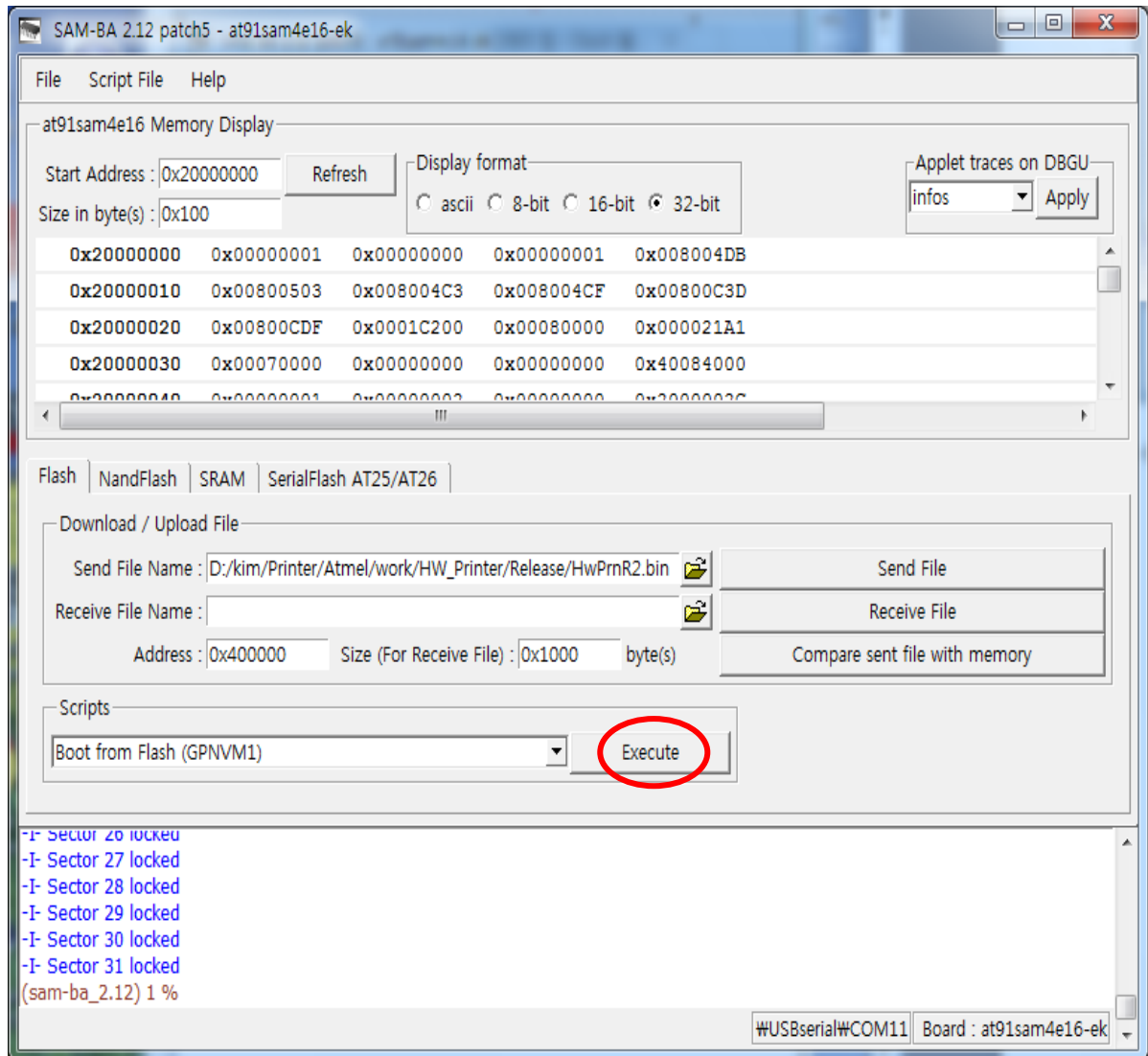


- 7) After the file is complete to transfer, Click “Yes “



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



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

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2-8) Dip Switch

1)SW1 :

| SW1 | Realtime command Valid/Invalid |
|-----|--------------------------------|
| ON | DLE Command valid |
| OFF | DLE Command invalid |

2)SW2,3 :

| SW2 | SW3 | Baud Rate(BPS) |
|-----|-----|----------------|
| OFF | OFF | 9600 |
| ON | OFF | 19200 |
| ON | ON | 38400 |
| OFF | ON | 115200 |

3)SW4 :

| SW4 | Jam Sensor |
|-----|--------------------|
| ON | Jam Sensor valid |
| OFF | Jam Sensor invalid |

4)SW5,6 :

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

5)SW7 :

| SW7 | Print mode |
|-----|------------|
| ON | Hex Dump |
| OFF | Normal |

6)SW8 :

| SW8 | Factory Mode |
|-----|---------------|
| ON | Factory Mode |
| OFF | Standard Mode |

2-9) Connector (Internal)

1)CN1 : Power connector (YAW396-02, Yeonho) ↔ Housing : YH396-02

| Pin | Circuit | Remark |
|-----|---------|--------|
| 1 | V+ | +24 |
| 2 | V- | GND |

2)CN2 : Power switch connector (YMW025-02R, Yeonho, or 5268-02A, Molex)

| Pin | Circuit | Remark |
|-----|---------|--------|
| 1 | V+ | +24 |
| 2 | V+ | +24 |

3)CN3 : Functional extension connector (20017WS-07P, Yeonho, or 53014-07, Molex)

| Pin | Circuit | Remark |
|-----|---------|--------------------------------|
| 1 | VCC_A | LED power (680 ohm resistance) |
| 2 | VDD | +5V |
| 3 | ERR_LED | Erro LED Output |
| 4 | FEED_IN | FEED SW Input |
| 5 | NEAR_C | Near end sensor Input |
| 6 | A | Near end sensor Power |
| 7 | GND | |

4)CN4 : Mechanism connector (SMW200-32C, Yeonho)

| Pin No. | Circuit | Remark | Pin No. | Circuit | Remark |
|---------|----------|-------------|---------|----------|--------------------------------|
| 1 | Vp | +24V | 17 | /STROBE2 | TPH STROBE2 |
| 2 | Vp | +24V | 18 | SI | TPH Serial Input |
| 3 | Vp | +24V | 19 | Vp | +12V |
| 4 | CLK | TPH CLOCK | 20 | Vp | +12V |
| 5 | /LATCH | TPH LATCH | 21 | CUT_A | Cutter Control A |
| 6 | /STROBE1 | TPH STROBE1 | 22 | CUT_B | Cutter Control B |
| 7 | TH | Thermister | 23 | HM_SW | Cutter Home Switch |
| 8 | GND | GND | 24 | Paper_A | Paper sensor power |
| 9 | GND | GND | 25 | Paper_C | Paper sensor output signal |
| 10 | GND | GND | 26 | HD_UP | Cover open signal |
| 11 | GND | GND | 27 | A | Motor Operation A |
| 12 | GND | GND | 28 | B | Motor Operation B |
| 13 | GND | GND | 29 | /A | Motor Operation /A |
| 14 | GND | GND | 30 | /B | Motor Operation /A |
| 15 | VDD | +5V | 31 | MARK_A | Blackmark sensor power |
| 16 | /STROBE3 | TPH STROBE3 | 32 | MARK_C | Blackmark sensor output Signal |

5) CN5 : RS232C connector (DSUB9, FEMALE)

| Pin | Circuit | Remark |
|-----|---------|--------|
| 1 | N.C | |
| 2 | TxD | |
| 3 | RxD | |
| 4 | N.C | |
| 5 | GND | |
| 6 | DTR | |
| 7 | CTS | |
| 8 | RTS | |
| 9 | N.C | |

6) CN6 : USB connector (Type B)

| Pin | Circuit | Remark |
|-----|---------|------------|
| 1 | VBUS | VBUS Input |
| 2 | D- | Data- |
| 3 | D+ | Data+ |
| 4 | GND | Signal GND |
| 5 | FG1 | Frame GND1 |
| 6 | FG2 | Frame GND2 |

3. General Specification

3-1) Specification

- 1) Printing Method : Direct thermal
- 2) Total dots : 432 Dots
- 3) Resolution : 8dot/mm, 203dpi, 1dot=0.125mm
- 4) Speed (Max) : Standard 120mm/sec, 150mm/sec(Max)
- 5) Printing width : 54mm
- 6) Paper width : 60mm(Max)
- 7) Character a line : 36 (ASCII 12 x 24), 18 (Korean 24 x 24), 54 (ASCII 8 x 16)

3-2) FONT

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

3-3) Bueffer (Internal)

Receive buffer : 8K Byte

3-4) Electrical specification

1) Operation voltage

| | | |
|--------|---------|------------------------------------|
| Driver | 24V±10% | Motor, Thermal print head |
| Logic | 5V±5% | Logic, Paper sensor, Headup sensor |

2) Current consumption

Average : 1.5A

Peak : 7.4A

3-5) Operation environment

- 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 environment

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

3-7) MCBF

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

3-8) Weight

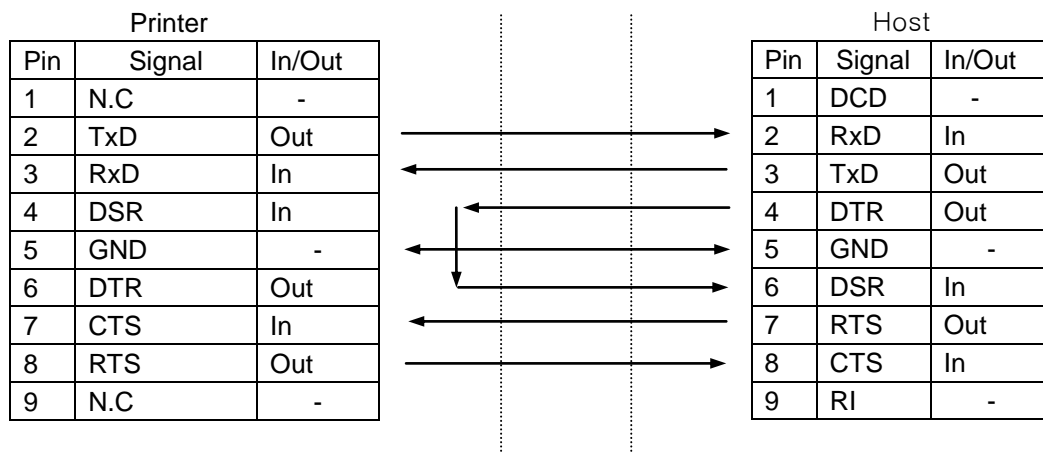
HMK-054 : about 0.89kg, HMB-054 : about 0.54kg, HMB-054 : about 1.20kg

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4. Interface

4-1) RS-232C

- 1) Data transmission : Serial
- 2) Hand shake : Hardware (RTS/CTS)
- 3) Baud Rate : 9600, 19200, 38400, 57600 BPS
- 4) Data bit : 8bit
- 5) Parity : None, Odd, Even
- 6) Stop bit : 1, or 1.5 or 2 bits
- 7) Connector : DSUB-9 Female



※ Please use DSUB9(Male)-SUB9(Female) straight (1:1) Full cable.

4-2) USB

- 1) Specification : USB 2.0, Full Speed(12Mb)
- 2) Connector : Type B
- 3) Cable : USB2.0
- 4) Data : Bulk IN, Bulk OUT

- Bulk IN : End point 6,
- Bulk OUT : End point 1
- Full Speed : Max Packet Size 64 Byte(Bulk OUT), 64 Byte(Bulk IN)

| Pin | Signal | In/out |
|-----|--------|--------|
| 1 | VBus | In |
| 2 | D- | In/out |
| 3 | D+ | In/out |
| 4 | GND | GND |

5.Command

| Command | Function | Page |
|---------|--|------|
| CR | Print and carriage return | 26 |
| LF | Print and line feed | 26 |
| CAN | Cancel print data in page mode | 26 |
| HT | Horizontal tab | 26 |
| FF | Printing the page mode & return to standard mode | 27 |
| SUB x | Extended Graphic Mode | 27 |
| SUB p | Off line printing according to the paper detection | 27 |
| SUB b | Blackmark Detect | 27 |
| SUB R | Outlinie of character (Tetragon) | 28 |
| SUB s | Printing Speed | 28 |
| SUB i | Auto cutting at black mark | 28 |
| SUB 1 | Choice of rule 1 | 28 |
| SUB 2 | Choice of rule 2 | 29 |
| SUB W | Writing the rule data | 29 |
| SUB C | Rule CLEAR | 29 |
| SUB O | Rule ON | 29 |
| SUB F | Rule OFF | 29 |
| SUB P | Printing a dot of Rule | 30 |
| SUB B | Barcode (2 dimension code) | 30 |
| ESC D | Horizontal tab position | 31 |
| ESC SP | Set character right side spacing (ASCII) | 31 |
| ESC ! | Select / Cancel user-defined character set | 31 |
| ESC \$ | Set the absolute position of printing | 32 |
| ESC * | Set bit image mode (vertical) | 33 |
| ESC - | Turn underline for ASCII | 34 |
| ESC 2 | Set initial line spacing | 35 |
| ESC 3 | Set line spacing using minimum units | 35 |
| ESC @ | Printer reset (Initialize printer) | 35 |
| ESC E | Set emphasized mode | 35 |
| ESC G | Set double-strike mode | 36 |
| ESC J | FEED | 36 |
| ESC j | BACK FEED | 36 |
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| ESC R | Select international character set | 38 |
| ESC a | Align position | 38 |
| ESC d | Printing & line feeding | 39 |
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| ESC i | Paper cutting | 39 |
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| ESC S | Set Standard | 40 |
| ESC L | Set the pagemode in direction | 40 |
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| | | |
|---------------|--|----|
| ESC W | Print and line feed | 42 |
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| FS & | Set the korean in extended graphic mode | 43 |
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| FS W | Set the font size of Korean | 45 |
| FS q | Register Non Volatile logo(bit-image) | 45 |
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| GS k | Printing of barcode | 49 |
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| GS r | Checking the status | 51 |
| GS a | Auto reply of status | 51 |
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| DLE ENQ | Realtime buffer clear | 53 |
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| GS I | Firmware Version Transmission | 55 |

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 poosition
[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 detect | | | |
| [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 | | | |

| | | | |
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SUB+'R'+n

| | | | | |
|------------|--|-----|-----|---|
| [Name] | Set the character outline | | | |
| [Format] | ASCII | SUB | b | n |
| | Hex | 1A | 52h | n |
| | Decimal | 26 | 82 | n |
| [Range] | $0 \leq n \leq 1$ | | | |
| [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=8(120mm/sec) | | | |
| [Descript] | n=1 : 50mm/sec | | n=7 : 110mm/sec | |
| | n=2 : 60mm/sec | | n=8 : 120mm/sec | |
| | n=3 : 70mm/sec | | n=9 : 130mm/sec | |
| | n=4 : 80mm/sec | | n=10 : 140mm/sec | |
| | n=5 : 90mm/sec | | n=11 : 150mm/sec | |
| | n=6 : 100mm/sec | | | |
| [Caution] | Please control density, if it is low. | | | |

SUB+'i'

| | | | | |
|------------|--|-----|-----|--|
| [Name] | Auto cutting at black mark | | | |
| [Format] | ASCII | SUB | i | |
| | Hex | 1A | 69h | |
| | Decimal | 26 | 105 | |
| [Descript] | Cutting at black mark | | | |
| [Caution] | Cutting the black mark at the next range if the range is exceed. | | | |
| | Please do not use the command, if you don't use the paper without blackmark. It causes a jam error. | | | |

SUB+'1'

| | | | | |
|------------|--|-----|-----|--|
| [Name] | Choice of rule 1 | | | |
| [Format] | ASCII | SUB | 1 | |
| | Hex | 1A | 31h | |
| | Decimal | 26 | 49 | |
| [Descript] | Choose the rule 1 of two rules (rule1 or rule2). | | | |

| | | | |
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SUB+'2'

| | | | |
|------------|--|-----|-----|
| [Name] | Choice of rule 2 | | |
| [Format] | ASCII | SUB | 1 |
| | Hex | 1A | 32h |
| | Decimal | 26 | 50 |
| [Descript] | Choose the rule 2 of two rules (rule1 or rule2). | | |

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

| | | | | | | |
|------------|---|-----|-----|----|----|-------|
| [Name] | Writing the rule data | | | | | |
| [Format] | ASCII | SUB | W | nL | nH | kL kH |
| | Hex | 1A | 57h | nL | nH | kL kH |
| | Decimal | 26 | 87 | nL | nH | kL kH |
| [Range] | 0≤nL+nHx256≤448, (0≤nL≤255, 0≤nH≤3) 0≤kL+kHx256≤448, (0≤kL≤255, 0≤kH≤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] | Rule 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] | Rule 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 rull will be preserved. | | |

SUB+'P'

| | | | |
|------------|---|-----|-----|
| [Name] | Printing a dot of Rule. | | |
| [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. | | |

SUB+'B'+n1+n2+n3+d1.....dk

| | | | | | | | | |
|----------------|---|---|----|-----|----|-----------|----|-----------|
| [Name] | 2 dimension barcode (2D) | | | | | | | |
| [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] | Plesae refer to the following table. | | | | | | | |
| [Descript] | Please use the barcode according to the number of data. | | | | | | | |
| | n1 : Type of 2D barcode | | | | | | | |
| | n2 : Number of data | | | | | | | |
| | n3 : Size of barcode | | | | | | | |
| | d1... dk : Barcode data | | | | | | | |

| | |
|----|--------------------|
| n1 | Type of 2D barcode |
| 1 | PDF417 |
| 2 | QR code |

1) PDF417

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

| | |
|----|-----------------|
| n3 | Size of barcode |
| 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 barcode |
| 1 | Version 1 |
| 3 | Version 3 |
| 5 | Version 5 |
| 9 | Version 9 |

※PDF417 Vertial size automatic setting.

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

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

ESC+SP+n

| | | | | |
|-----------------|---|-----|-----|---|
| [Name] | Set character right side spacing (ASCII) | | | |
| [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 | | | |

ESC+'!' +n

| | | | | |
|-----------------|---|-----|-----|---|
| [Name] | Set / Cancel user-defined character set all at once | | | |
| [Format] | ASCII | ESC | ! | n |
| | Hex | 1B | 21h | n |
| | Decimal | 27 | 33 | n |
| [Range] | 0≤n≤255 | | | |
| [Initial Value] | n=0 | | | |
| [Descript] | Set font & character in the same time | | | |
| [Caution] | - | | | |

| 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 |

| | | | |
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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 (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 |
|---------|----|----|---|----|----|---------|

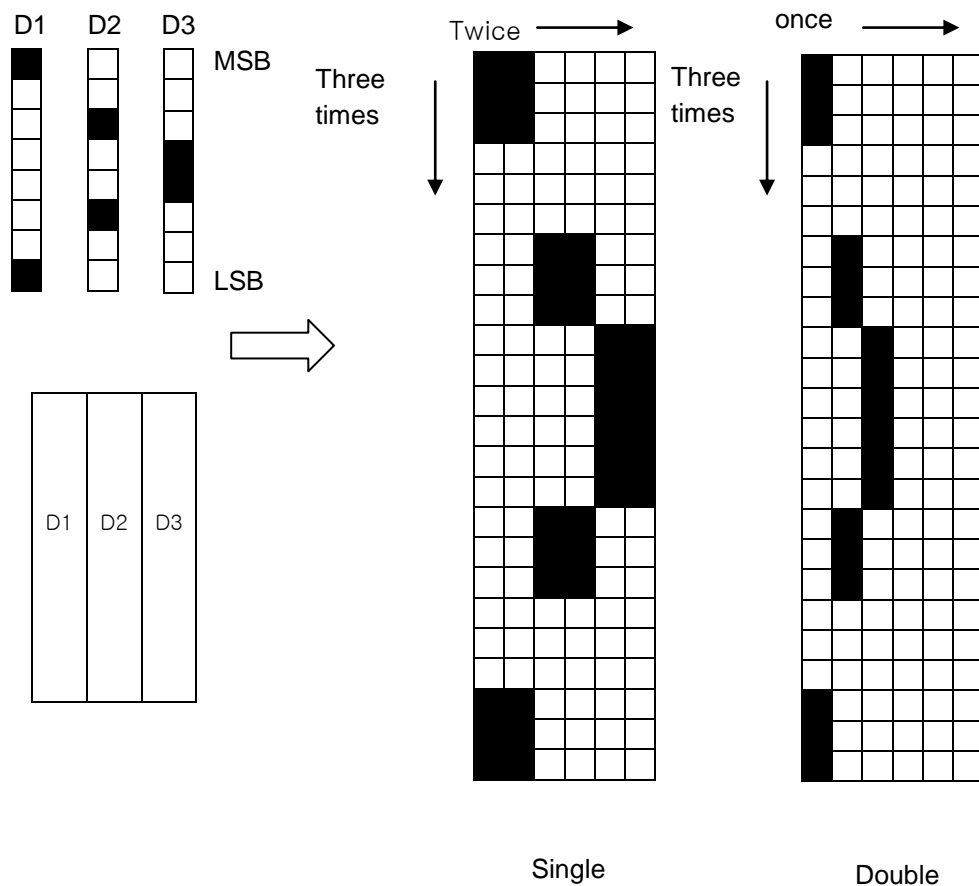
[Range] m=0,1,32,33

$$1 \leq n_L + n_H \times 256 \leq 1023, 0 \leq n_L \leq 255, 0 \leq n_H \leq 3, 0 \leq d \leq 255$$

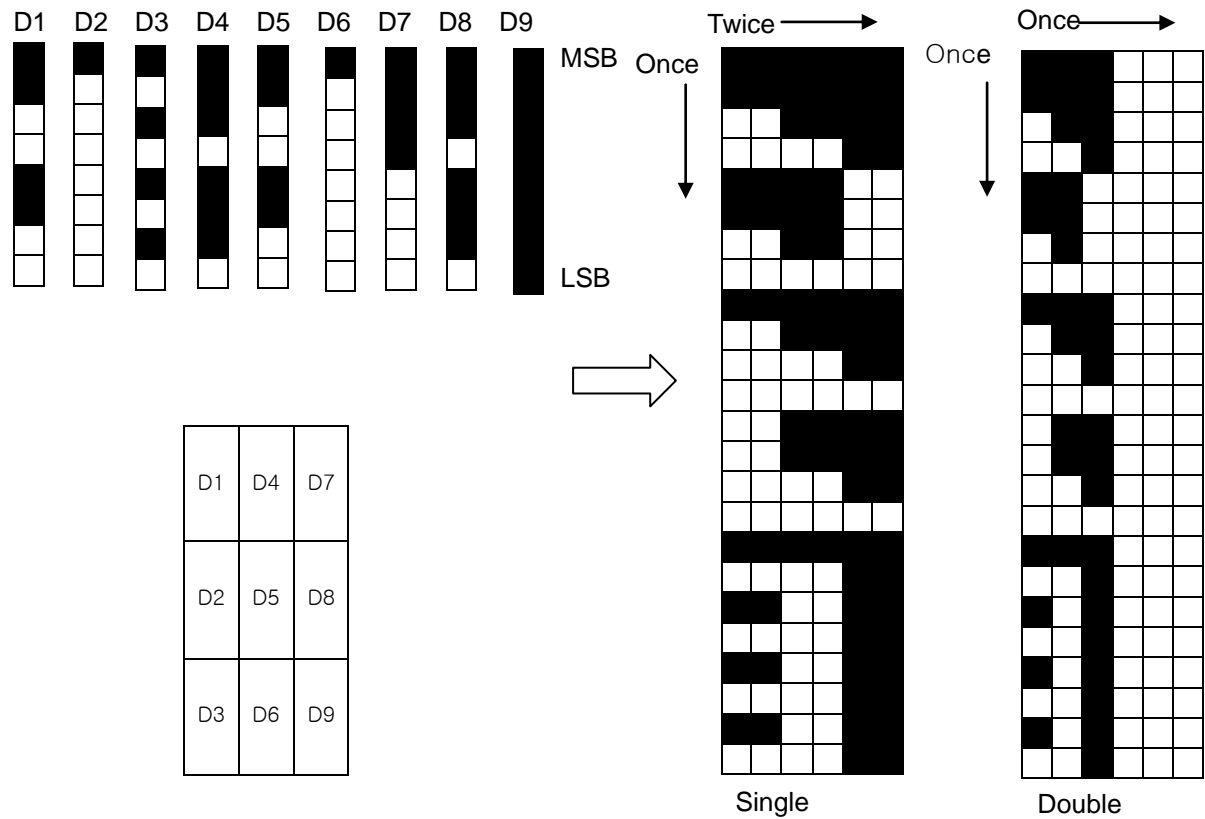
[Descirpt] Due to fixing nL+nHx256, Printing from bit data to graphic data in Mode m

| m | Mode | | Dots in vertical | Dots in horizontal | Data (k) |
|----|--------|----------------|------------------|--------------------|---------------|
| 0 | 8dots | Single Density | 8 | 224 | nL+nHx256 |
| 1 | 8dots | Double Density | 8 | 448 | nL+nHx256 |
| 32 | 24dots | Single Density | 24 | 224 | (nL+nHx256)x3 |
| 33 | 24dots | Double Density | 24 | 448 | (nL+nHx256)x3 |

- 8 dots Mode



•24 dots Mode



ESC+¹+²+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 initial line spacing | | |
| [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 line spacing using mimium units | | | |
| [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 (Initialize the 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 | | | |
|--------------------------------|-------------------------|---------------------------|-----------------------------------|
| Precedence 4bits(Korean fonts) | | Subordinate 4bits (ASCII) | |
| 0000 | Korean 24x24 Gothic | 0000 | 12x24 |
| 0001 | Korean 16 x 16 General | 0001 | 8x16(9x16) |
| 0010 | Japanese 24 x 24 Bodoni | 0010 | 56x88 big fonts, only 0~9 numbers |
| 0011 | Chinese 24 x 24 Gothic | 0011 | Reservation |

Notice : When you set up one of fonts, you can use “Memory Switch Setting program
“ without commend. If you need any more information, please refer to How to use Memory
Switch Setting Program.

*** Caution** : In case of Big Font as 56x88, it would be possible to extend font size as much as
Double(Width and Length) and other fonts would be possible to extend the font size as
octuple

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 as 14 units((#,\$,@,[,W,],^`,`,{,|,},~)

| 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+'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 | | | |
| [Descript] | You can set up the code page according to the following table. | | | |
| [Caution] | SUB + x command 1 byte valid. Korean mode is not invalid. | | | |

| n | Code Page |
|----|-------------------------------|
| 0 | PC437(US) |
| 1 | KANA(JAPAN) |
| 2 | GREEK |
| 3 | Windows1251 |
| 4 | PC866(Cyillic #2) |
| 5 | Windows1250(Poland) |
| 6 | PC850(Multilingual) |
| 7 | PC860(Portugal) |
| 8 | Windows1252 |
| 9 | Iran System Encoding Standard |
| 10 | PC857(Turkish) |
| 11 | PC864(ARABIC) |

ESC+'S'

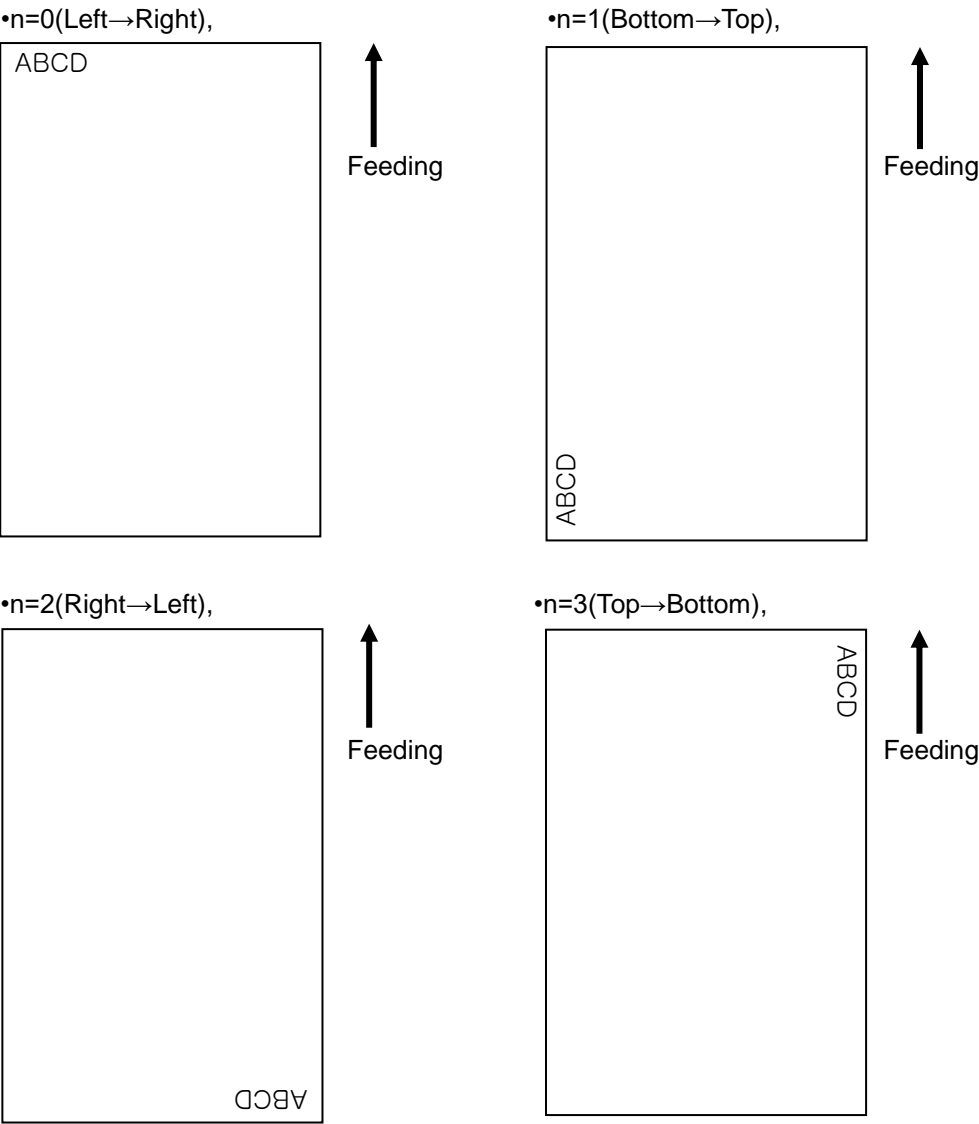
| | | | |
|------------|--|-----|-----|
| [Name] | Set the Standard mode | | |
| [Format] | ASCII | ESC | S |
| | Hex | 1B | 53h |
| | Decimal | 27 | 83 |
| [Descript] | Switches from page mode to standard mode | | |

ESC+'L'

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


ESC+'T'+n

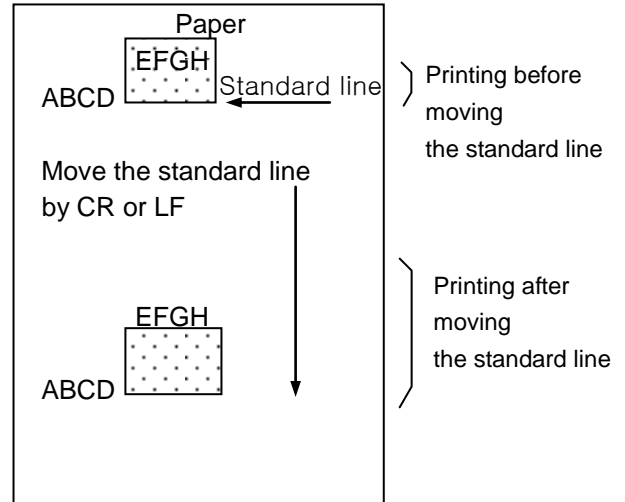
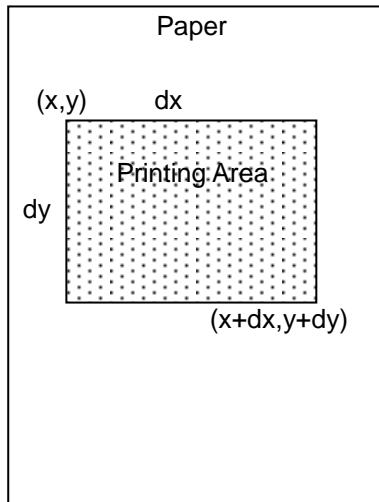
| | | | | |
|-----------------|--|-----|-----|---|
| [Name] | Select print direction in page mode | | | |
| [Format] | ASCII | ESC | T | n |
| | Hex | 1B | 54h | n |
| | Decimal | 27 | 84 | n |
| [Range] | 0≤n≤3 | | | |
| [Initial Value] | n=0 | | | |
| [Descript] | Select the print direction & start 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] | $0 \leq xL + xH \times 256 \leq 65535$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 255$) | | | | | | | | | | |
| | $0 \leq yL + yH \times 256 \leq 65535$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 255$) | | | | | | | | | | |
| | $1 \leq dxL + dxH \times 256 \leq 65535$ ($0 \leq dxL \leq 255$, $0 \leq dxH \leq 255$) | | | | | | | | | | |
| | $1 \leq dyL + dyH \times 256 \leq 65535$ ($0 \leq dyL \leq 255$, $0 \leq dyH \leq 255$) | | | | | | | | | | |
| [Initial Value] | $(xL + xH \times 256) = 0$ (0mm, xL=0, xH=0) | | | | | | | | | | |
| | $(yL + yH \times 256) = 0$ (0mm, yL=0, yH=0) | | | | | | | | | | |
| | $(dxL + dxH \times 256) = 448$ (56mm, dxL=C0h, dxH=01h) | | | | | | | | | | |
| | $(dyL + dyH \times 256) = 1200$ (150mm, dyL=B0h, dyH=04h) | | | | | | | | | | |
| [Descript] | Set printing area & starting point | | | | | | | | | | |
| | Horizontal starting point : $(xL + xH \times 256) \times 0.125\text{mm}$ | | | | | | | | | | |
| | Vertical starting point : $(yL + yH \times 256) \times 0.125\text{mm}$ | | | | | | | | | | |
| | Horizontal size : $(dxL + dxH \times 256) \times 0.125\text{mm}$ | | | | | | | | | | |
| [Caution] | Vertical size : $(dyL + dyH \times 256) \times 0.125\text{mm}$ | | | | | | | | | | |
| | 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
(Pls refer the command of SUB+'x'+n)

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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 | 기 능 |
| 0 | Cancel the underline |
| 1 | 0.125mm |
| 2 | 0.25mm |
| 3 | 0.375mm |
| 4 | 0.5mm |
| 5 | 0.625mm |
| 6 | 0.75mm |
| 7 | 0.875mm |

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 $n2 \times 0.125\text{mm}$

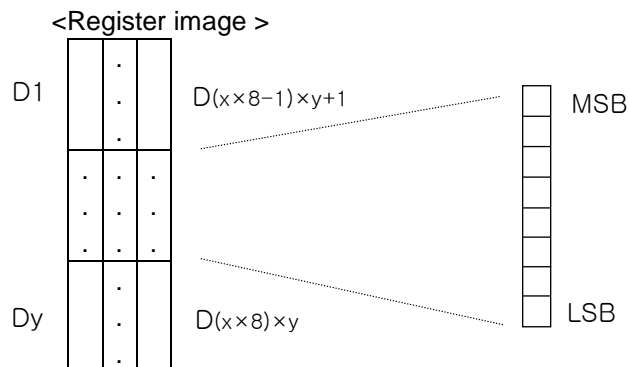
FS+'W'+n

| | | | | |
|-----------------|--|----|-----|---|
| [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 | | | |

You can register very easily, if you download the program of logo registration.



| | | | |
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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≤n≤255, 0≤m≤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≤n1≤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 |

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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

| | | | |
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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 $(nL+nH \times 256) \times 0.125\text{mm}$.

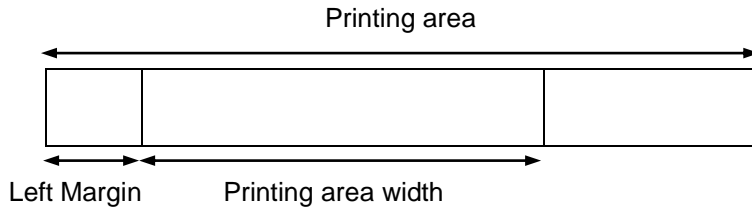
GS+'V'+m

[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≤nL≤255, 0≤nH≤255 | | | | |
| [Initial Value] | nL+nH×256=448 (56mm, nL=0, nH=0) | | | | |
| [Descript] | Set printing area width from the left margin in (nL+nH×256)×0.125mm | | | | |



GS+'h'+n

| | | | | |
|-----------------|------------------------------------|----|-----|---|
| [Name] | Select barcode height | | | |
| [Format] | ASCII | GS | h | n |
| | Hex | 1D | 68h | n |
| | Decimal | 29 | 104 | n |
| [Range] | 1≤n≤255 | | | |
| [Initial Value] | n=162 (20.25mm) | | | |
| [Descript] | Select barcode height by n×0.125mm | | | |

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

[Caution] In CODE128, add "{", set as 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 |

Please add up the initial character of CODE A, CODE B, CODE C at the first, so that you could know the kind of 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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GS+'v'+0'+m+xL+xH+yL+yH+d1+...+dk

[Name] Raster 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) = $(xL + xH \times 256) \times (yL + yH \times 256)$

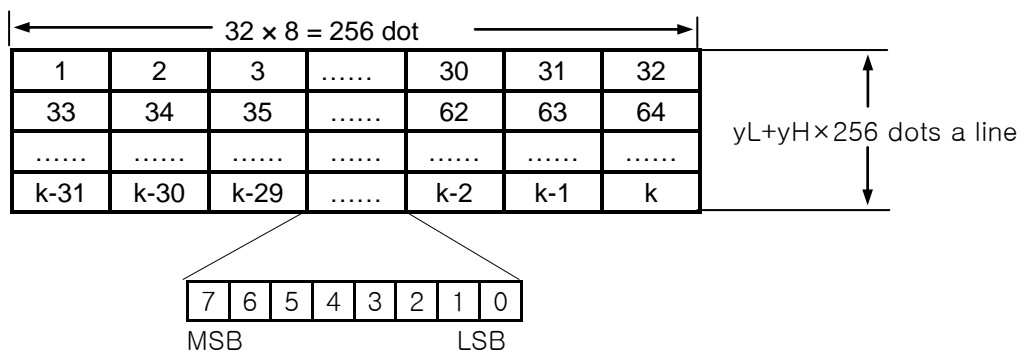
[Descript] The raster bit image will be recognized in mode m.
xL,xH appoint the data (byte) of horizontal at image data.
yL,yH appoint the data (dot line) of vertical at image data.

* d is a data for raster 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,



DLE+ENQ+n

[Name] Raltime buffer clear, or reset.

| | | | | |
|----------|---------|-----|-----|---|
| [Format] | ASCII | DLE | ENQ | n |
| | Hex | 10h | 05h | n |
| | Decimal | 16 | 5 | n |

[Range] n=2,3

1)n=2

[Descript] The realtime will clear each buffer of the printer,
as soon as this command is conducted.

[Caution] It is only valid, once the DIP SW1 is *up. *up : on.
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.)
You don't need to be caution,once this command will be invalid if it's online.

2)n=3

[Descript] The realtime will reset the printer, as soon as this command is conducted.

[Range] It is only valid, once the DIP SW1 is *up. *up : on.

The command ESC+@ will be reset.

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

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 realtime send a byte of printer status, when this command is conducted. | | | |
| [Caution] | It is only valid, once the DIP SW1 is *up. *up : on. | | | |
| | Please refer to the table of the printer status. | | | |
| | 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.) | | | |

<data 1 byte of status transmission>

| bit | status | Hex | Decimal |
|-----|-------------------------|-----|---------|
| 0 | 0 : Paper valid | 00h | 0 |
| | 1 : Paper invalid | 01h | 1 |
| 1 | 0 : Printer head down | 00h | 0 |
| | 1 : Printer head up | 02h | 2 |
| 2 | 0 : Paper jam invalid | 00h | 0 |
| | 1 : Paper jam valid | 04h | 4 |
| 3 | 0 : Paper remains | 00h | 0 |
| | 1 : Paper near end | 08h | 8 |
| 4 | 0 : Print finish. | 00h | 0 |
| | 1 : Printing or feeding | 10h | 16 |
| 5 | 0 : No cutter error | 00h | 0 |
| | 1 : cutter error | 20h | 32 |
| 6 | 0 | 00h | 0 |
| 7 | 0 | 00h | 0 |

※ The status of bit 4 is only valid, once the command is DLE+EOT+n,
the others are fixed 0.

※ If the near end sensor is not available, the bit 3 is 1 all the time.

※ Please use the command, after you set up GS+"a"+n unavailable.

ex) If the status is 3, it means the paper is end, the head up.

GS+'l'+n

[Name] Fimware Version Transmission
[Format] ASCII GS l n
Hex 1D 49h n
Decimal 29 73 n
[Range] n=65
[Descript] Fimware Version Transmission on printer
예) Verx.xx

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

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

6-1-1) DLL function (Funtions)

1) long HwaUSB1.Open(LPCTSTR SelPrinter);

Please open USB port as Printer Model("HMK-054").

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

2) longPrintStr(LPCTSTR data);

It prints the character line.

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

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

3) long PrintCmd(unsigned char data);

It prints the data one (1) byte.

Please use the 'PrintPackage function' as below, if there are a lot of datas to print.

Then you are able to increase the speed of the transmission.

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

| | | | |
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4) long NewRealRead(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)

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.

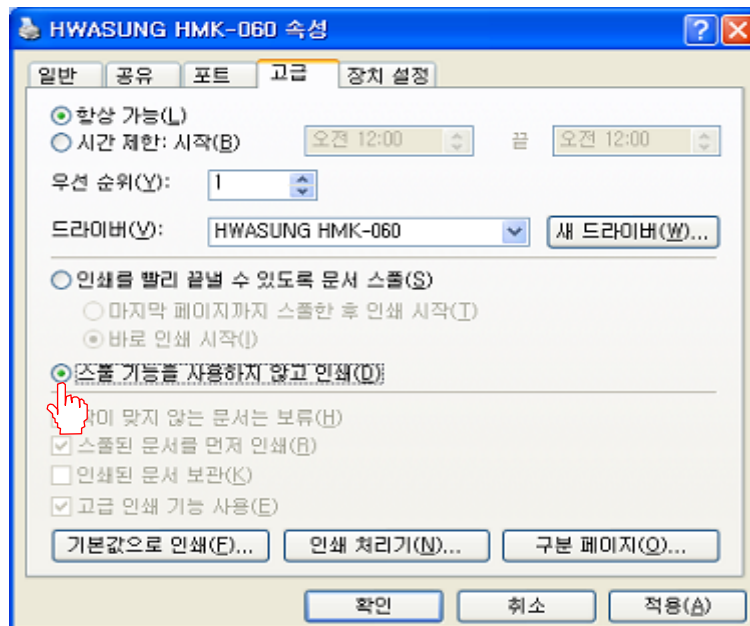
Notice Please ask the sample program for more details.

6-2) DLL NOITCE

If you use Windows driver together, when you use DLL,

The data of Windows driver and The data of DLL can not be delivered properly.

In this case, please select as the following image



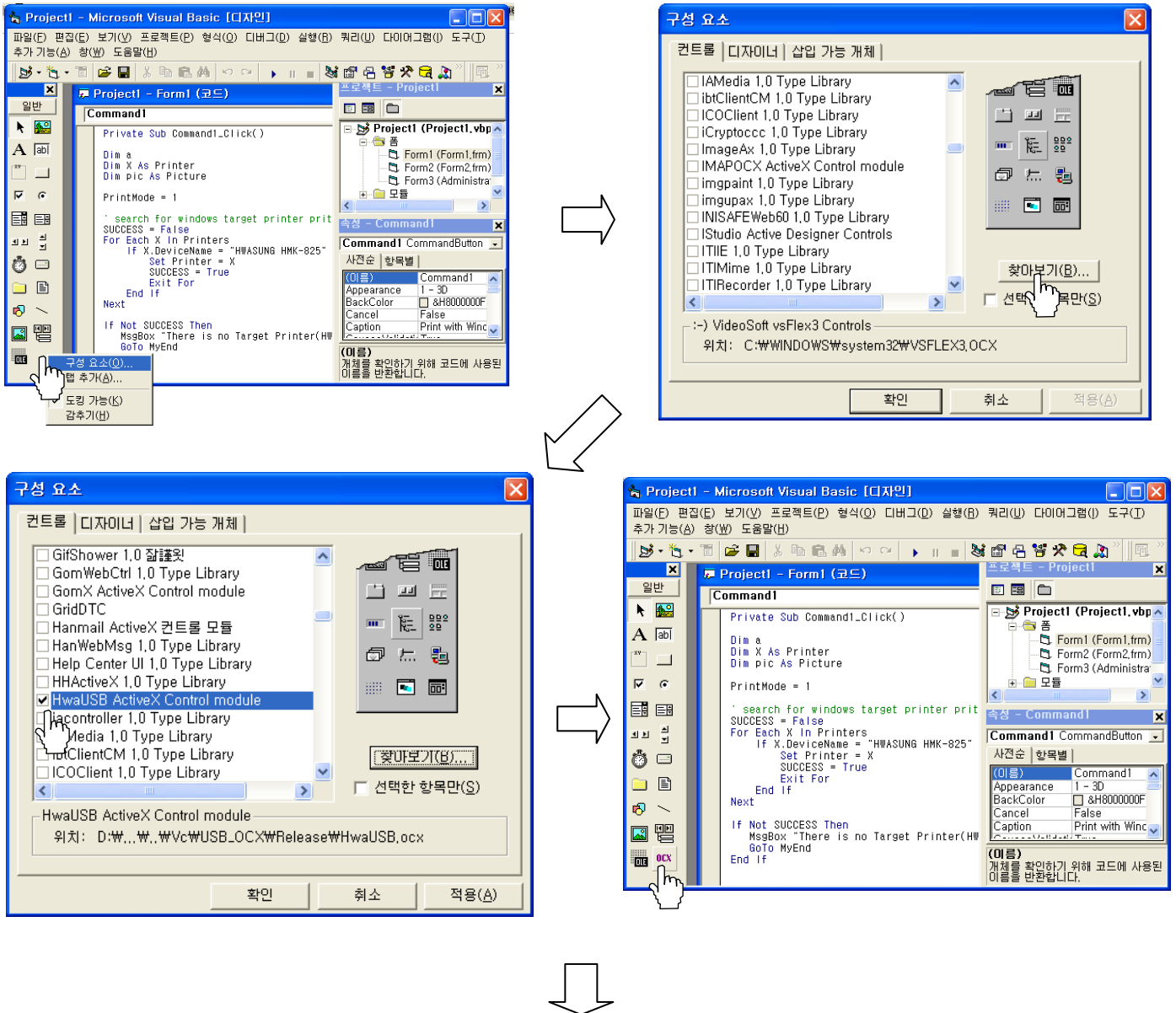
| | | | |
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6-3) OCX DRIVER

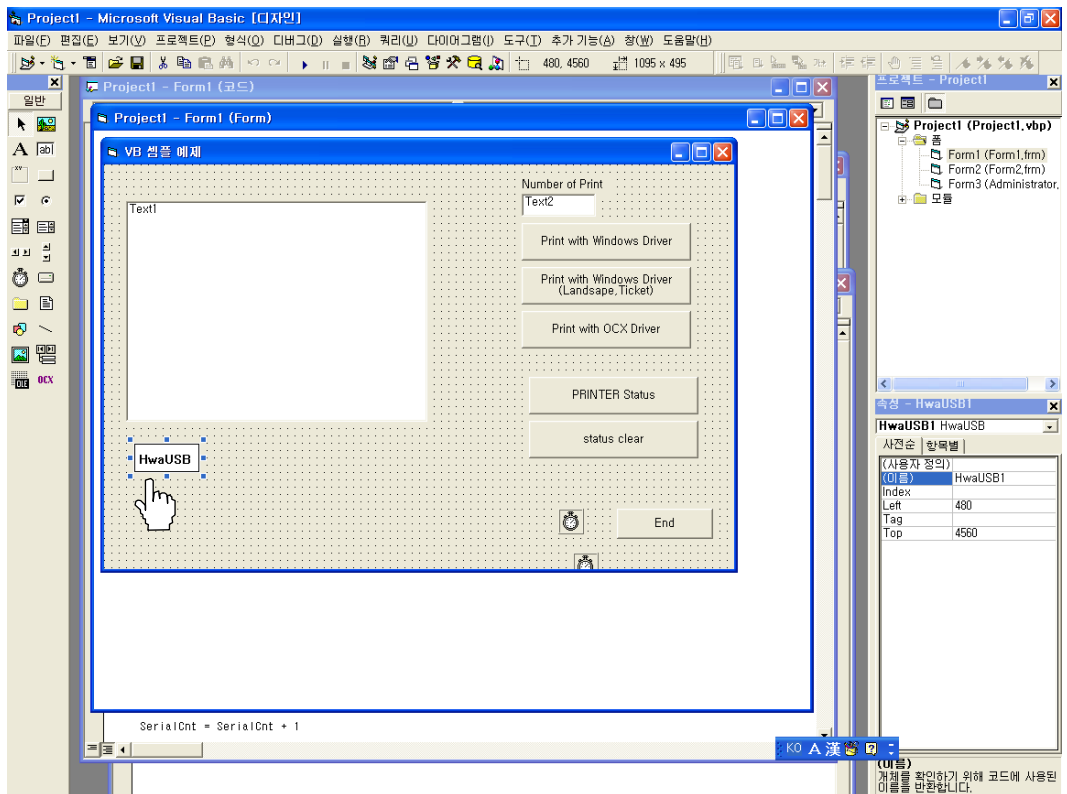
We recommend you to use DLL Driver then OCX Driver(Because when we update and we will use DLL Diver from now on)

6-3-1) 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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6-3-2) Funtions

1) long HwaUSB1.Open (LPCTSTR SelPrinter);

Please open USB port by Printer Model ("HMK-054").

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

2) void HwaUSB1.Close (void);

Please close USB port by Printer Model ("HMK-825").

- Parameters :
None
- Return :
None

3) long HwaUSB1.PrintStr (LPCTSTR data);

It prints the character line.

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

※ 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 :
Printing normal : 1
Printing error : 0

5) long HwaUSB1.RealRead (void);

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

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

[Caution]

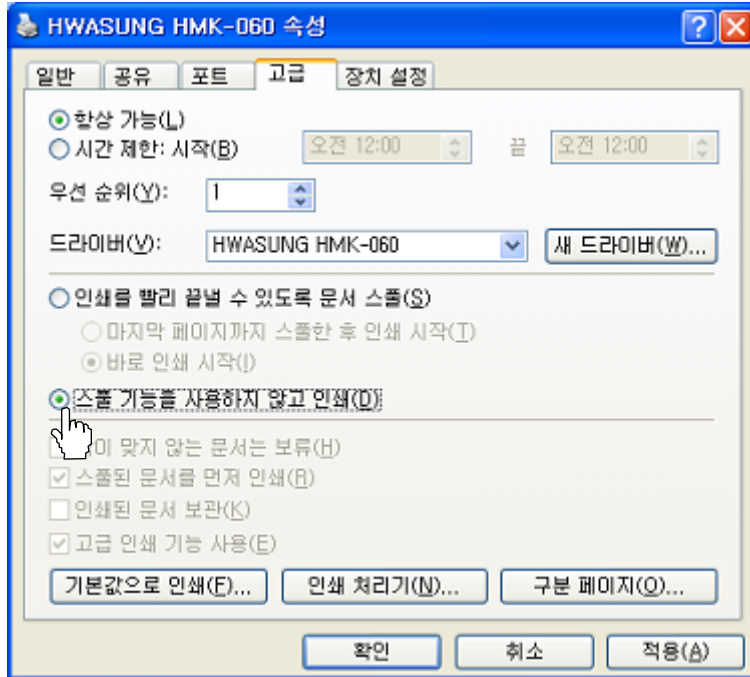
Please do not use the function we don't provide, because it causes the function damage.

Please contact us for the sample program.

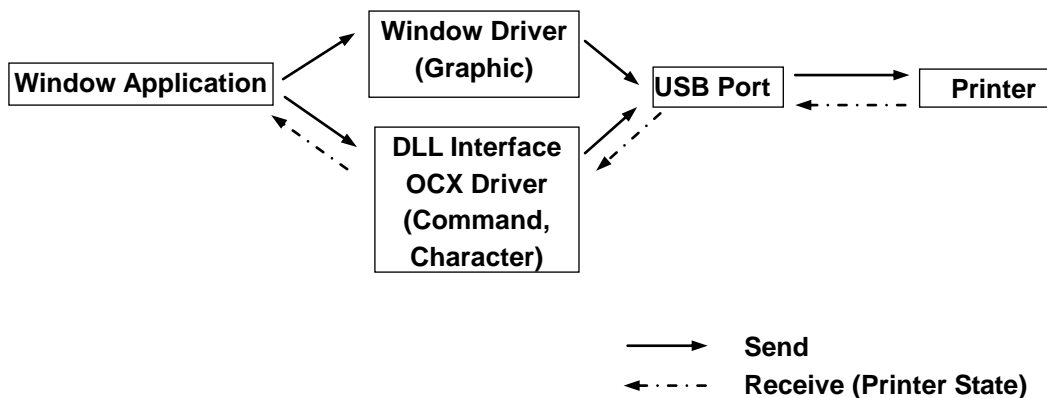
| | | | |
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6-4) Caution for using USB Interface

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.



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