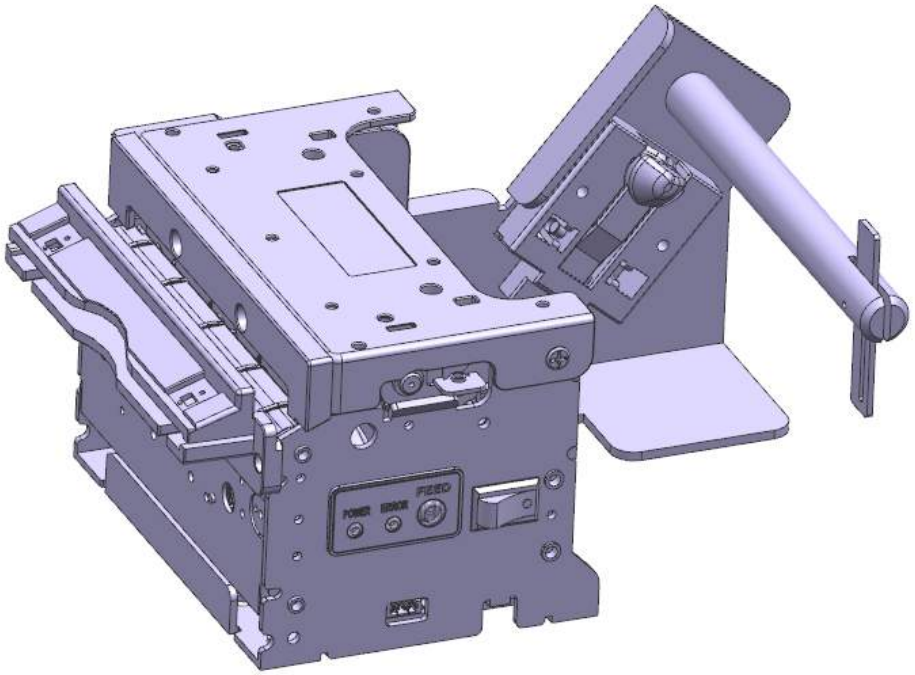
COMPODIS

HMK-830 Series

Technical Manual



HWASUNG
TICKET.KIOSK PRINTER

www.compodis.com

● Revision History

Version	Date of Revision	Revised Page	Contents
Ver. 2.00	Feb. 1, 2021		Revised and reissued
Ver. 2.01	Sep.29,2021	Page45, etc	Presenter Model name scheme change(HMKP-830 →HMK-830P)

● Product Manual

This manual describes the basic matters and how to use the HMK-830 series product.

Please adhere to the contents of this manual when installing and using the printer. Otherwise, you may have problems with your device.

The user is responsible for any losses resulting from improper handling and operation.

The contents of this document are subject to change without notice. If you are unsure of anything in this manual, or if you have any questions or concerns, please contact the place where you purchased the product.

● Warnings and Cautions for Safety

In order to use the product correctly and prevent safety accidents, be sure to observe the following.

Warning

Failure to observe the warning signs during use of the product may result in damage to the product and serious injury or death.

- Do not disassemble, repair or modify the product.
- Do not remove jammed paper while the power is on.
- Do not exceed the rated power.
- Do not wash. => Do not wash the product.
- Do not cause impact to the product.
- Do not leave the product in a humid place.

Caution

Failure to observe caution signs during use of the product may cause damage to the product and personal injury.

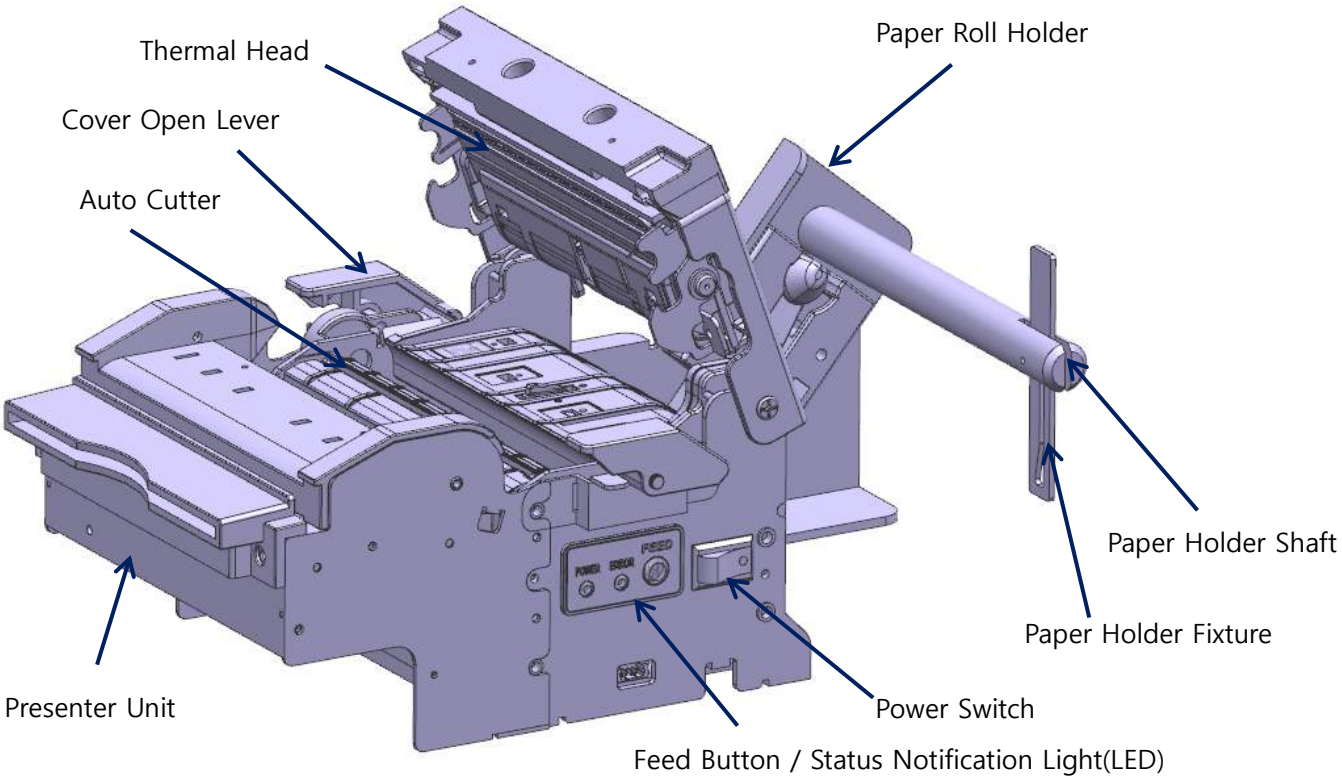
- If you detect any abnormalities in the product, please contact us for instructions on how to handle such => it.
- Make sure you turn off the power before removing foreign matter from the product.
- Provide regular ventilation if installed in a confined space.
- Avoid interference from surrounding installations when installing.
- Wire in a stable environment.
- Observe electrical appliance requirements.

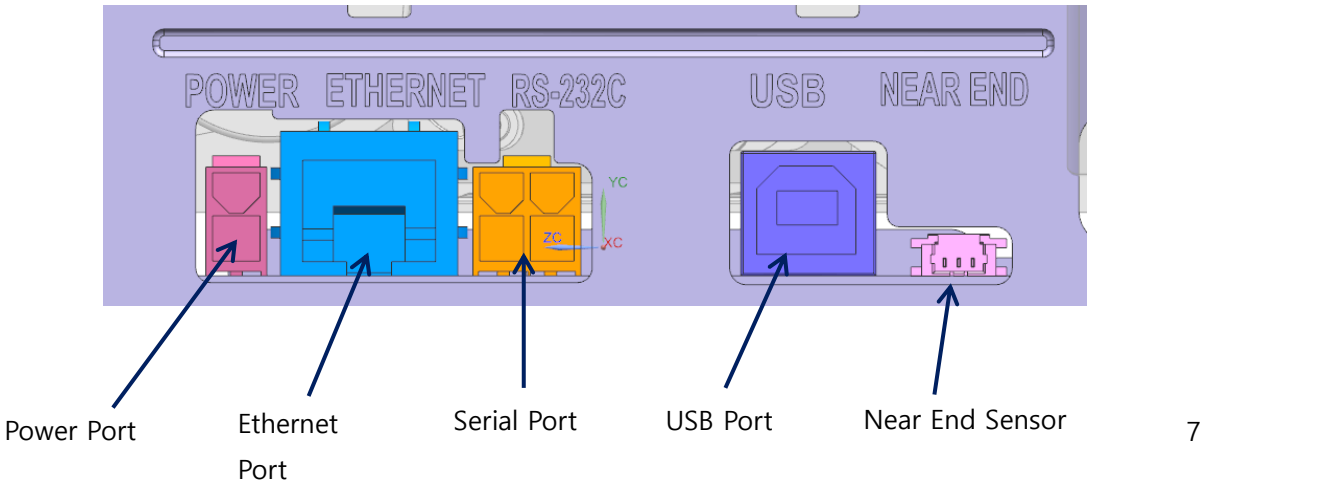
● Table of contents

Ⅰ. Printer Features

HMK-830 series printers are designed to be used by installing or connecting to Kiosk Systems. This printer uses direct thermal printing method and the paper width can be set to suit user's environment. Also, with HMK-830 Series Printers, both of Roll type paper and Fan Folder type paper can be used.

1. Printer Features



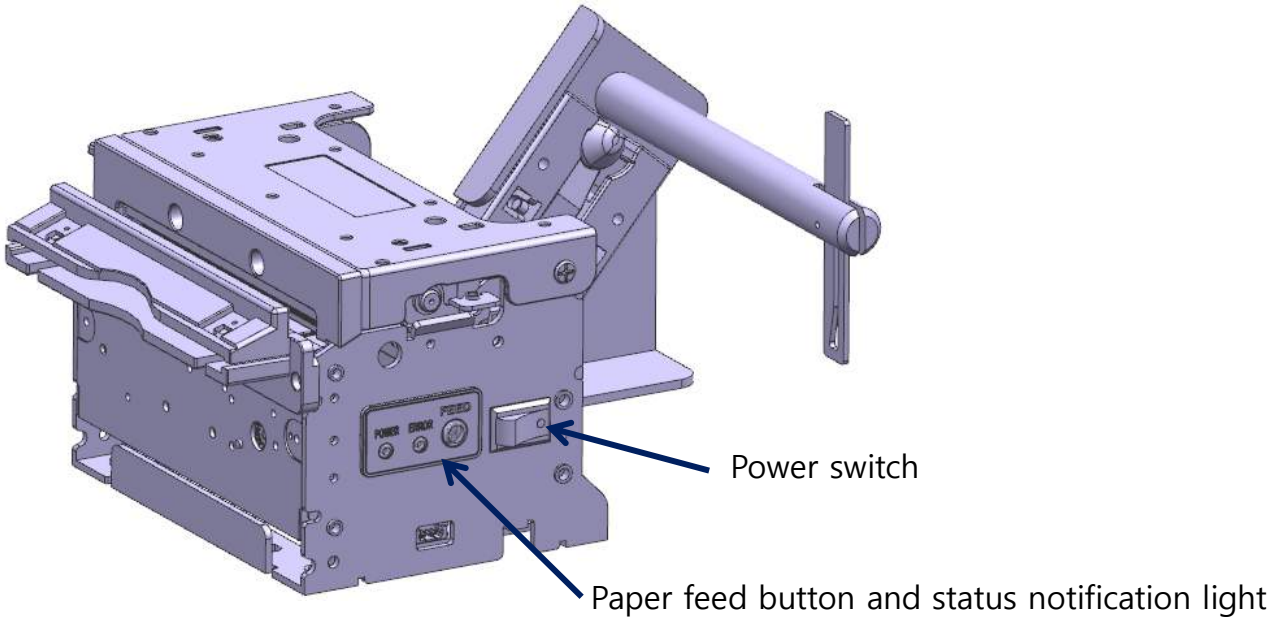


Ⅱ. Main Functions

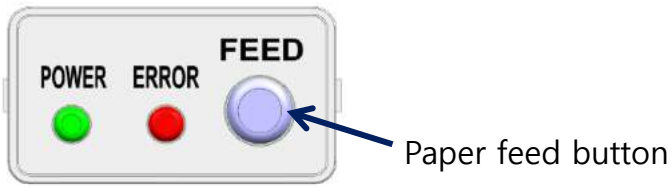
1. Power Switch/Paper Feed Button and Status Notification Indicator

1) Power Switch

The power switch is used to turn the power on or off, and it is also used for self test and changing printer status settings.



2) Paper Feed Button



The FEED button can perform the following functions.

① Paper feed: When paper is inserted, pressing the feed button feeds paper for as long as the button is pressed.

② Self Test: While holding the FEED button, turn on the power and then release the button after the Error light turns on once. The self test contents will then be printed. (Refer to the description of the Ⅲ. PRINTER USE GUIDE)

③ Checking and changing the printer status: If you turn on the power while holding the FEED button, the Error light flashes continuously. When the button is released at this time, the printer status menu is printed. (Refer to the description of the Ⅴ. PRINTER FUNCTION SETTINGS)

3) Status Notification Lights

Power light Error light(Error notification light)

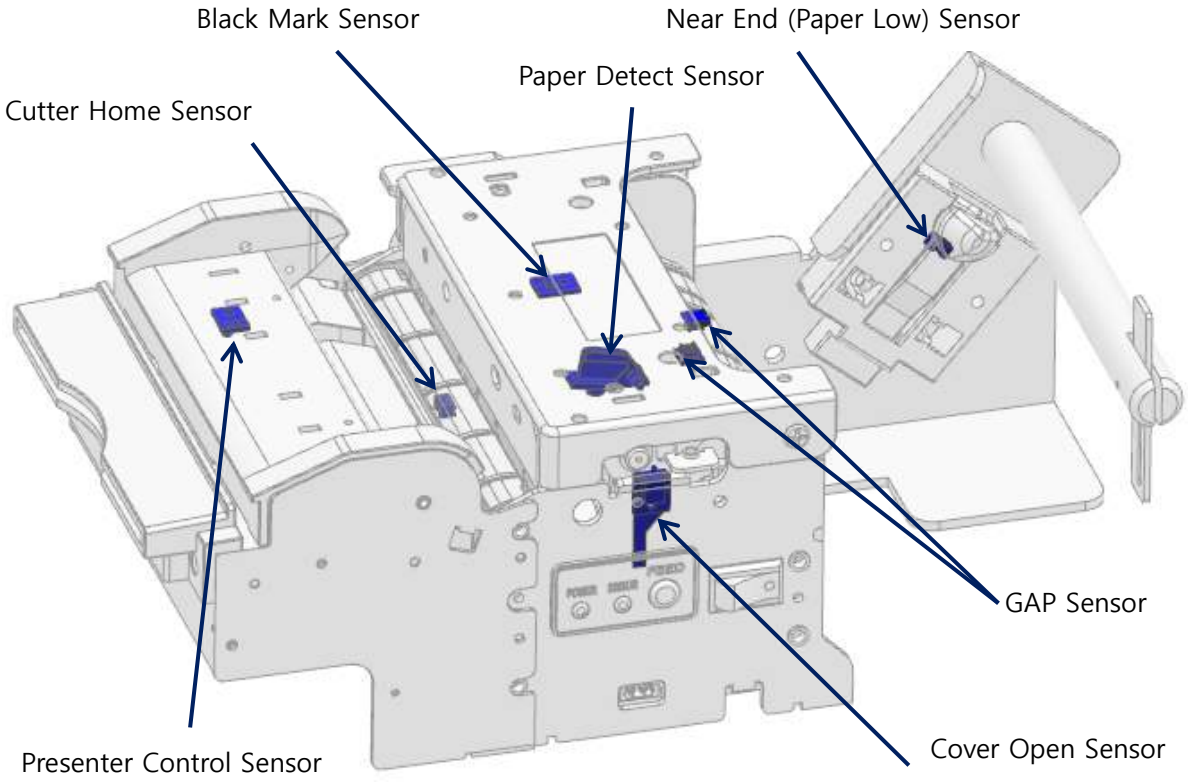
① Power light: When the power is turned on, the green power light turns on.

② Error light: Depending on the printer status, the light blinks to inform you of the printer status as shown below.

Notification light status	Notification sound	Printer status
Flashing briefly	Beep (short)	No paper
Long flashing	Beeeep (long)	Cover open, cutter jammed, paper jammed, etc.

2. Detect Sensors

Several detection sensors placed on the printer transmit the printer's status to the host system..



1) Cover Open Sensor

The cover open switch detects when the cover is open and stops the printing and ticket feeding process until the cover is closed.

2) Paper Detect Sensor

A sensor that detects the presence and absence of paper, used to control paper insertion and printing, as well as notifications to notify the user to reload paper.

3) Black Mark Sensor

It is used to control the starting point of printing by detecting the black mark position.

4) Cutter Home Sensor

The cutter sensor is used to detect if the paper has been cut.

5) Near End(Paper Low) Sensor

The Near End(Paper Low) Sensor(Paper shortage detection sensor) is a detection sensor that automatically informs the user when to change paper..

6) Adjustable GAP Sensor (OPTION)

When using label paper, it controls the printing position of the label paper by detecting the gap or black mark position between the label and the label.

7) Presenter Control Sensor (OPTION)

A sensor that detects the start and end of the paper so that the presenter can control the paper.

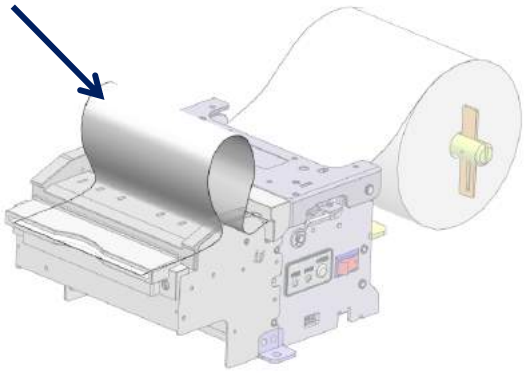
3. PRESENTER (OPTION)

When the presenter function is added, receipt handling becomes easy and the following functions can be used.

1) Loop Function

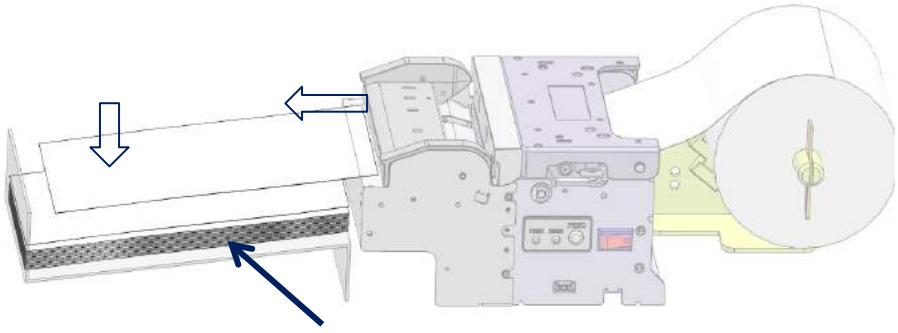
If the length of the printout is longer than a certain level, this function keeps the paper in the middle until printing is finished. Users can only take the contents after printing is complete, ensuring safety.

Paper loop status



2) Eject Function

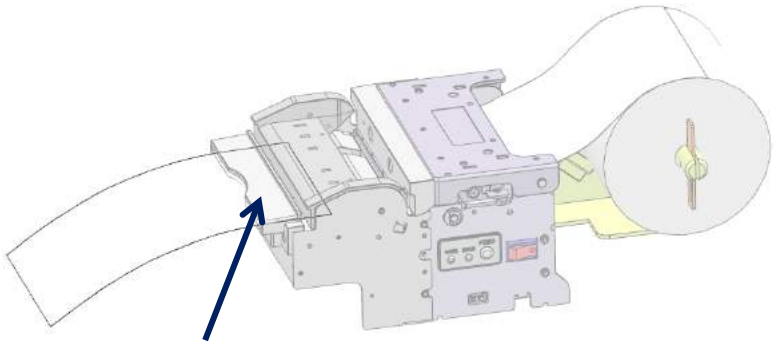
When printing is finished, the ticket or receipt is released out of the machine. When printing multiple tickets in a row, it is arranged in the order in which they were printed. (Ticket holder sold separately)



Stack printed Tickets

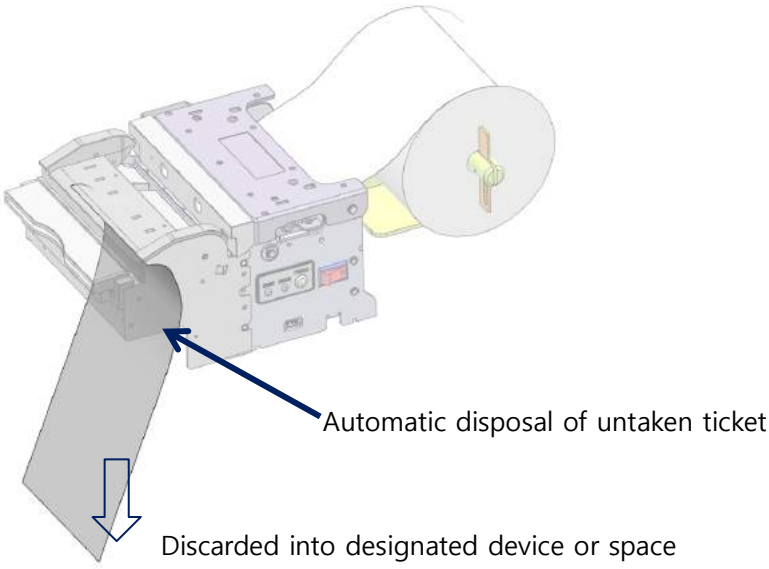
3) Hold Function

Function of the presenter holding the paper until the user takes the printed ticket or receipt.



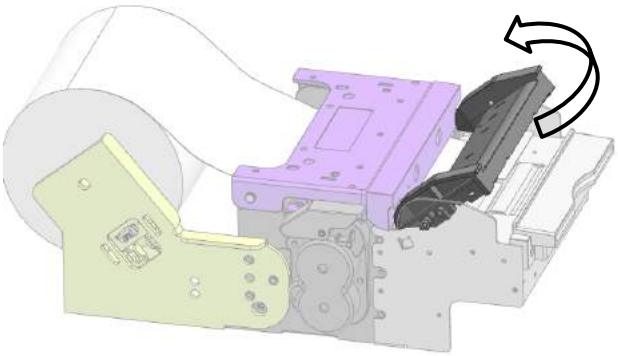
4) Automatic Retract(Dispose) Function

If the user does not take the printed ticket or receipt after a certain period of time, it is the function to collect and discard the printed material into the designated device or space.



5) Presenter Jam removal method

If a paper jam occurs in the presenter, raise the Cover open roller in the direction of the arrow to open it, remove the paper, and close the Cover open roller again.

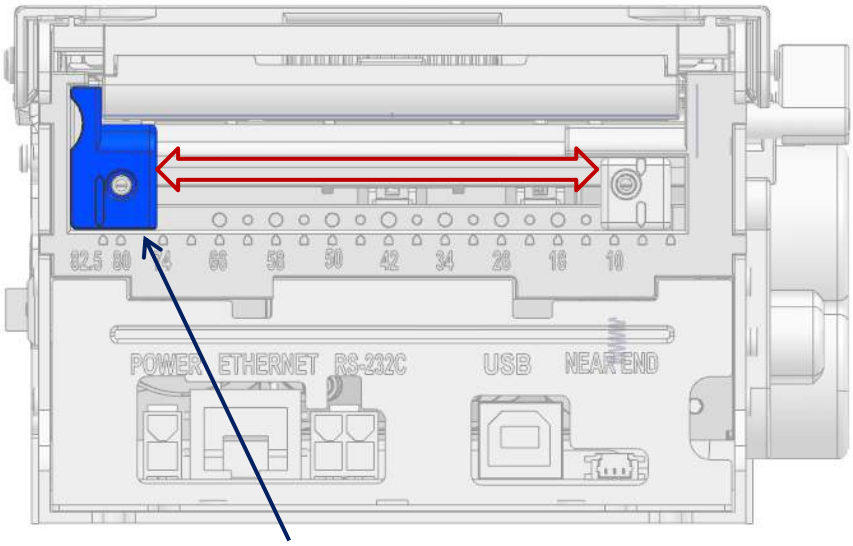


4. Adjustable Guide & Sensor Function (OPTION)

With the Adjustable(movable) Guide & Sensor option, you can adjust the position of the paper guides and sensors to set the paper width as you need.

1) Paper width adjustment method

Set the Adjustable Paper Guide in the left and right direction of the arrow to match the width of the paper to be used. (Adjustment range: 25mm ~ 82.5mm)



Adjustable Paper Guide

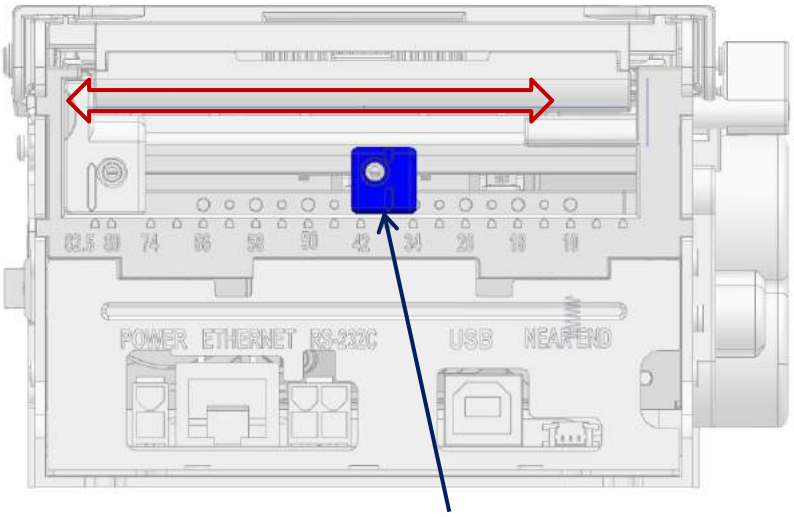
2) Gap Sensor / Black mark Sensor (Gap Detection Sensor / Black mark Detection Sensor)

The Adjustable Guide & Sensor type product can be used as a gap sensor or a black mark sensor, and can be used by moving the sensor position to the required position.

3) Black mark Sensor setting method

Set by moving the black mark sensor holder to the left and right of the arrow according to the position of the black mark on the paper.

If necessary, it can be adjusted by referring to the position display scale at the bottom.



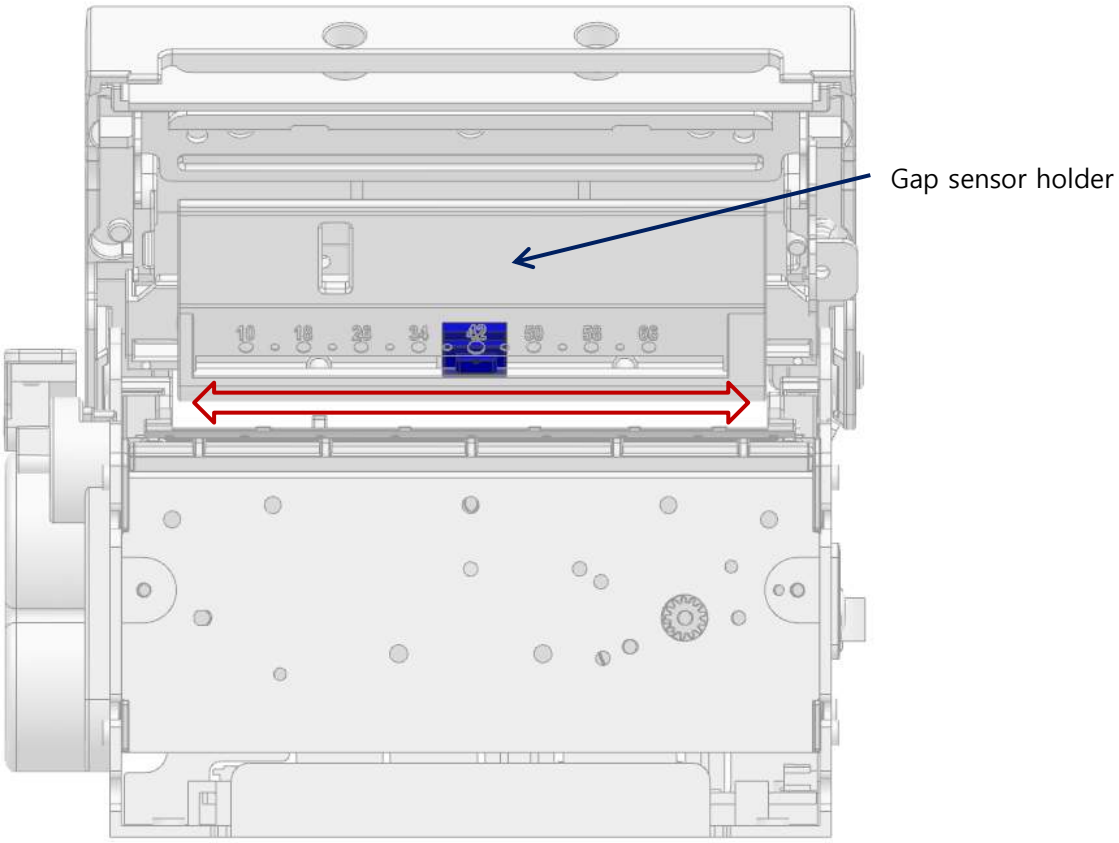
Black mark sensor holder

4) GAP Sensor position setting method

① Adjustment of the position of the gap sensor in the image below is the same as Adjustment of the black mark sensor, so adjust the same as the black mark sensor setting method.

② Press the cover open lever to open the cover.

③ To adjust the position of the gap sensor located on the upper cover, adjust the gap sensor holder in the direction of the arrow so that the position matches with the gap sensor at the bottom (using a tool such as tweezers).



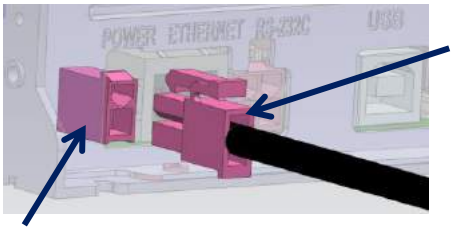
CAUTION If the position of GAP Sensor is not aligned with position of the black mark detection sensor at the bottom, the sensor sensitivity may decrease as much as it is not aligned. In that case, gap detection may not be possible, so make sure to align them.

Ⅲ. Printer Use Guide

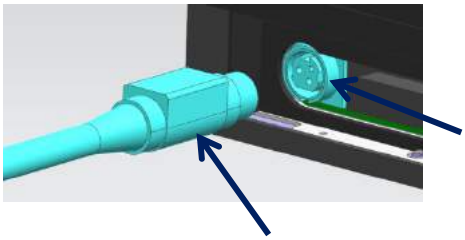
1. Power port connection method

When connecting power, be sure to connect the power cable to the power port while the power switch turned off.

① 2 hole power cable connection



② 3 hole power cable connection



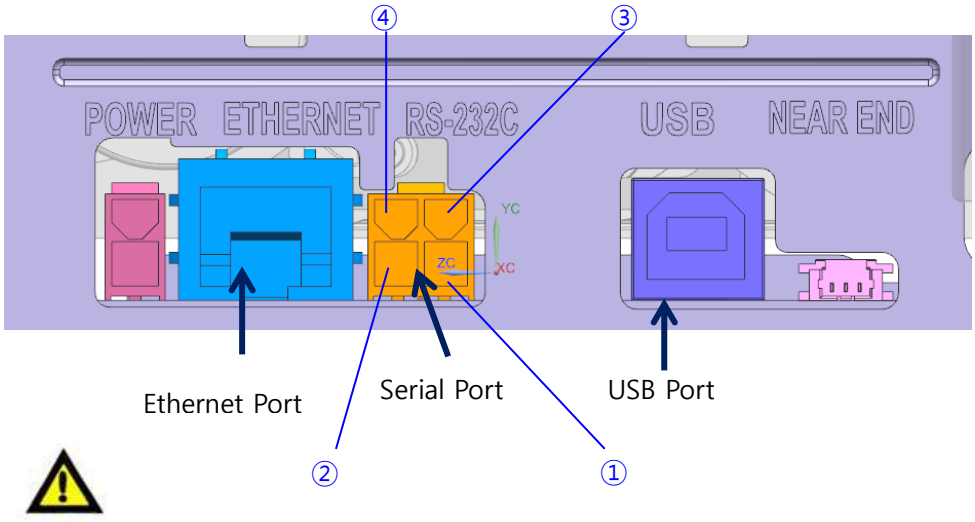
WARNING The rated power of this product is 24V, so do not use a power supply that is out of specification. It may cause product failure or safety accident.

CAUTION Please use only the power supply provided by our company for the power supply.

Be sure to connect according to the instructions in the manual.

2. Interface connection

Use an interface cable that meets the specifications of the host.

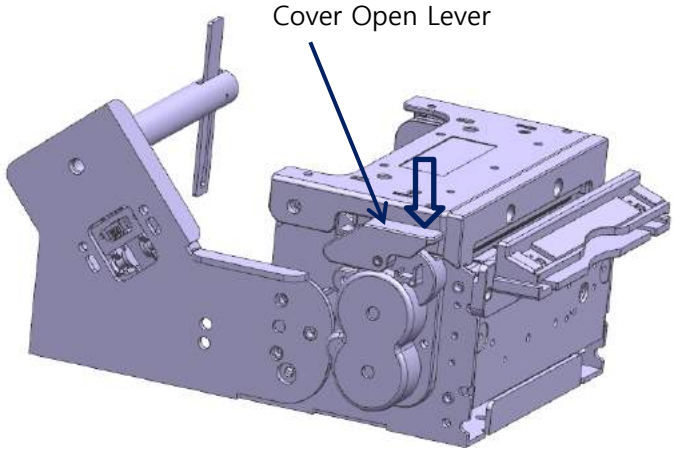


CAUTION When connecting a communication cable, be sure to that the power switch is turned off.

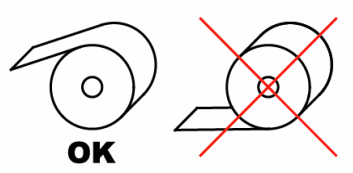
3. Paper Change

1) Cover open method

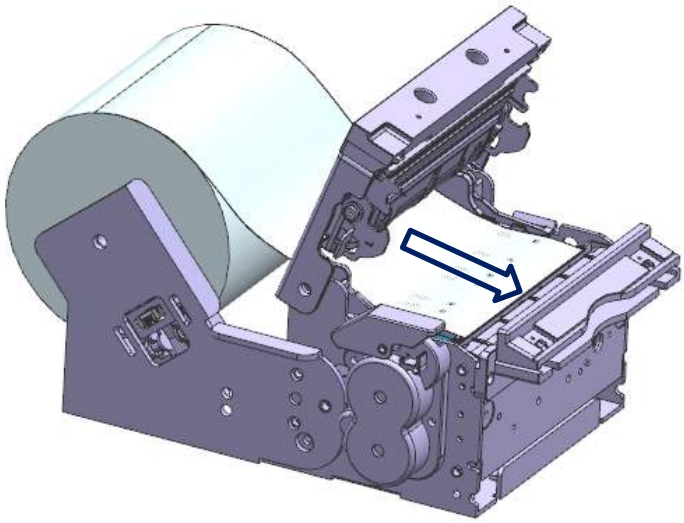
① Press the open lever in the direction of the arrow to open the printer cover



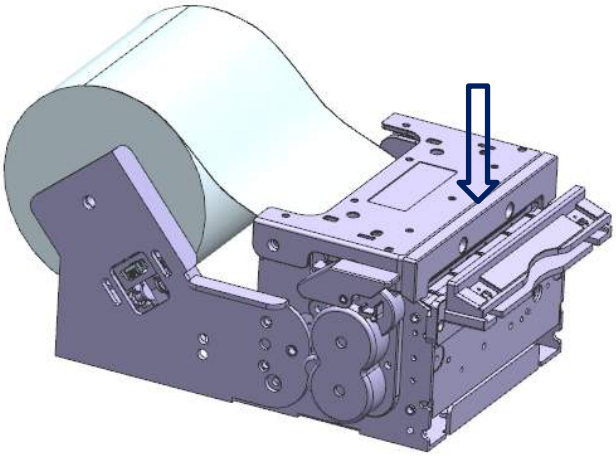
② Insert paper into the opened paper slot. Be careful not to change the side to be printed on the paper at this time.



③ Insert paper enough so that the end of the paper comes out to the front of the printer's platen roller.



④ Close the cover by pressing it in the direction of the arrow



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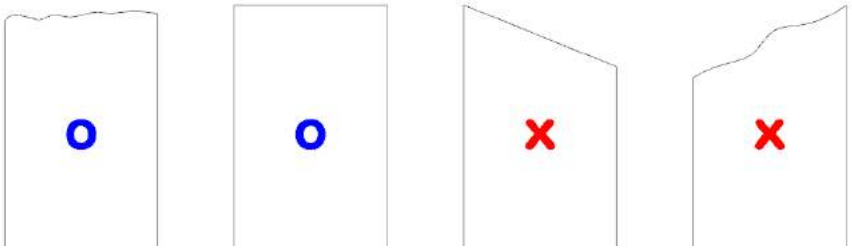
CAUTION When closing the cover, be sure to press the middle part of the cover (near the arrow) to close it. Otherwise, blurring of the print, etc. may occur.

2) Auto Loading Method

① Turn on the Printer's Power

Cut the end of the paper straight as shown below with scissors.



CAUTION If the end of the paper is not cut straight as shown in the example, the paper may not be inserted properly or a paper jam may occur.

① When the paper is pushed to the paper detect sensor inside the paper input port with the cover closed, the printer will start the auto loading, and the paper is cut after a certain length is fed.

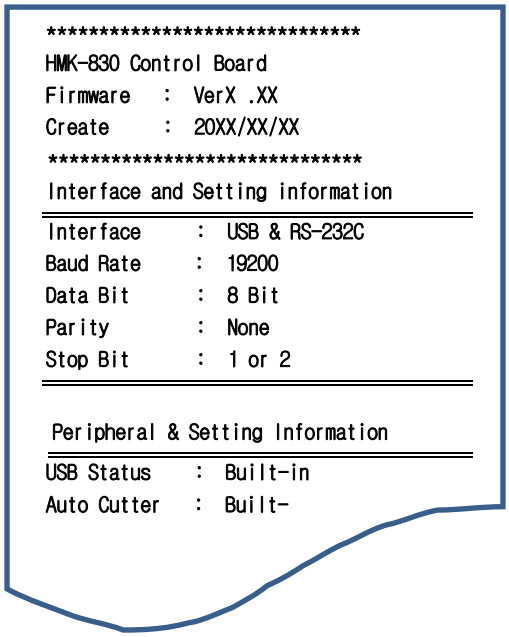
4. Self Test

You can check the current settings of the printer through the self test.

① With the power off, turn on the printer while pressing down on the feed button

② If you turn on the power and keep pressing the feed button (about 1second), the red ERROR light flickers, and when you remove the feed button, the printing begins.

③ Printing contents are printed as follows.



- Model Name
- Firmware Version and Created Date
- Interface Setting
- Sample Print

5. HEX Dump Print

After setting HEX DUMP in the setting mode, turn the power off and on. After printing as [HEX DUMP MODE], it will print all receiving data to 16 hexadecimal data for all receiving data. This would be useful when developing an application because this notifies the transmission status.

Prints if 12 digits is received.

Data under 12 digits will print when you press the feed button

Control Code ($1F_{16}$ or below)will be printed as "."

80_{16} or above will be printed as "^".

[Print Sample]

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

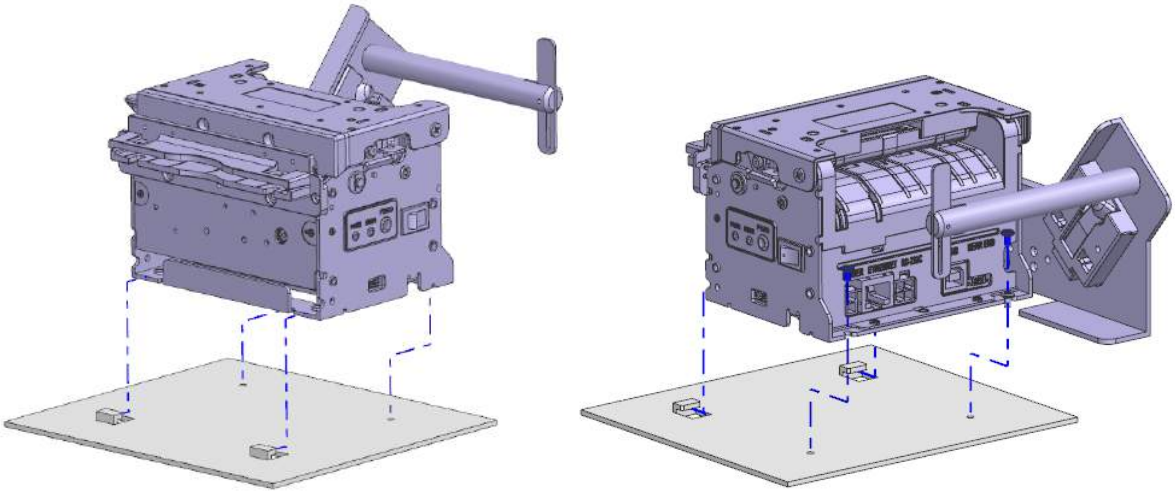
IV. Printer installation method

1. Example of Printer installation method

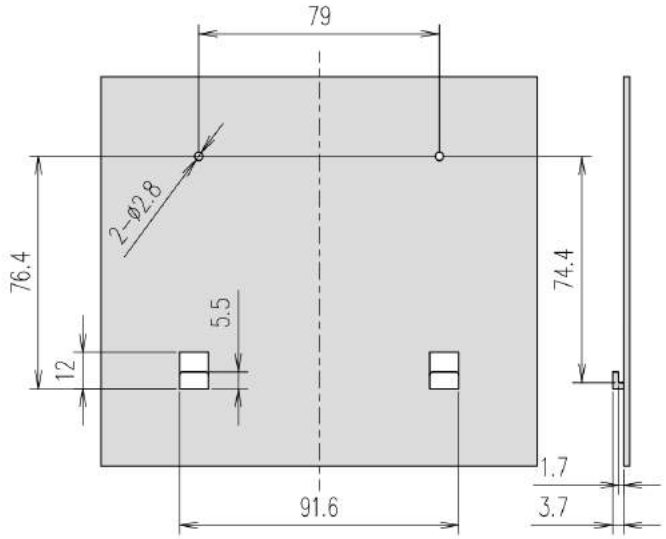
This is an example of how to mount the printer on the product.

1) Method by making Hook shapes on the Top side and mounting the Printer

Hang the two fronts of the printer on the hook and screw it to two holes on the rear.



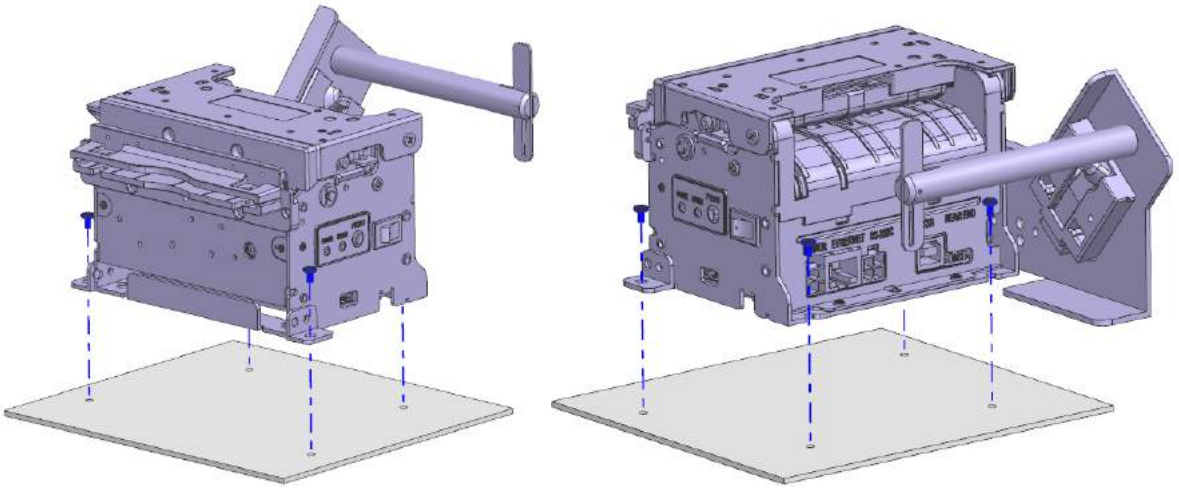
Please refer to the drawing below to design the fixture.



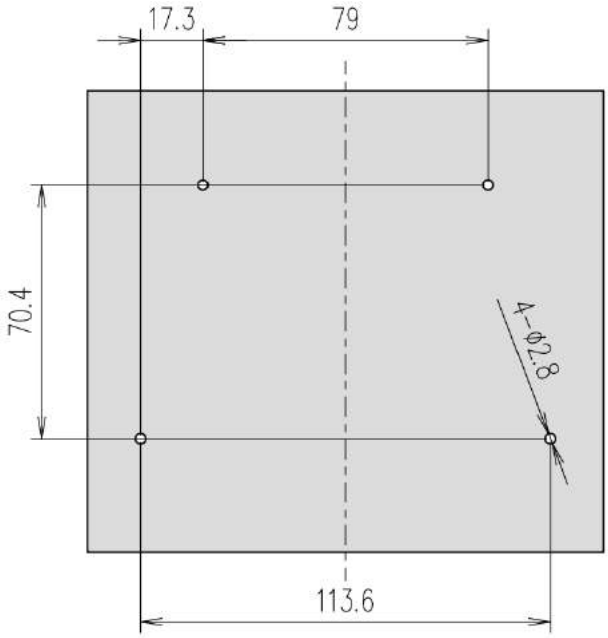
* (Recommended screw : M3 x 5 B-TITE)

2) Method by using Mount Brackets for fixing and mounting the Printer

Fit the printer into the hole and screw it into the 4 holes.



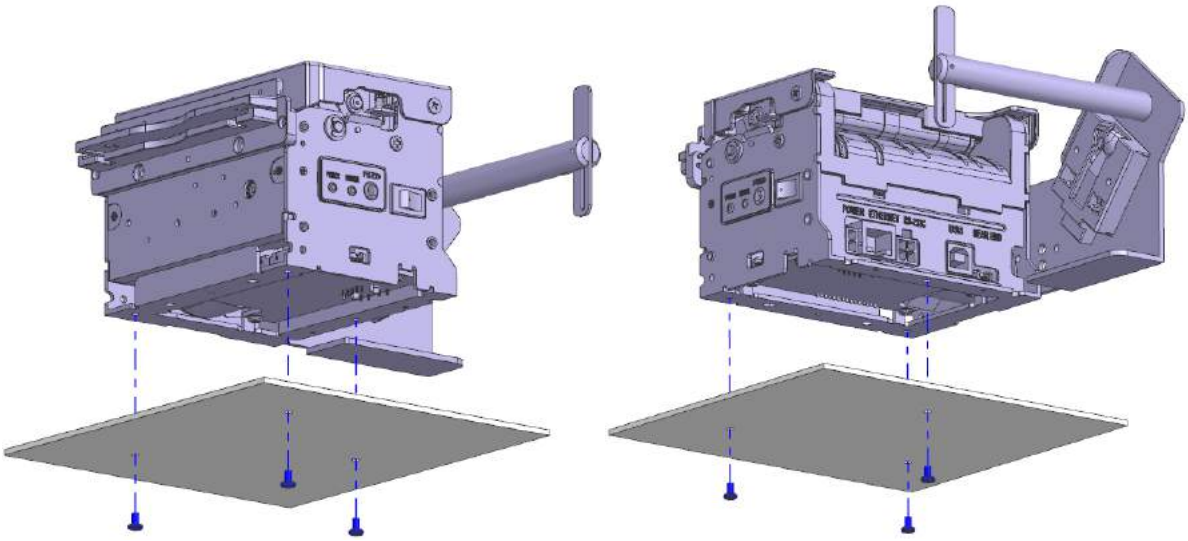
Please refer to the drawing below to design the fixture.



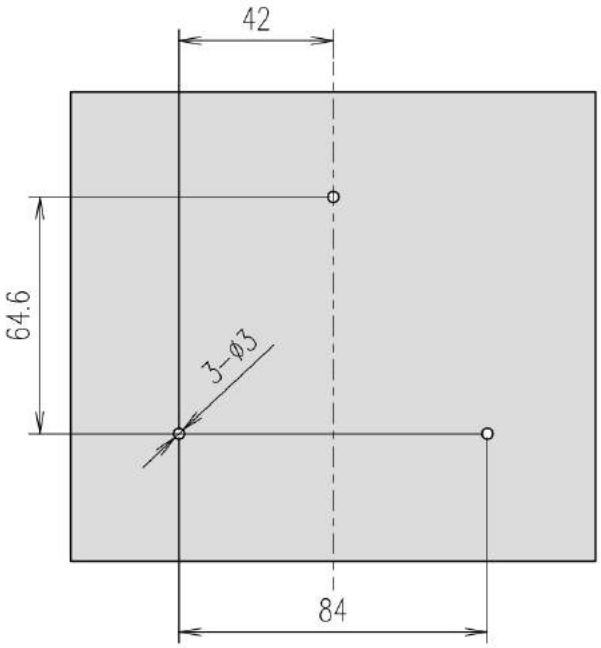
* (Recommended screw : M3 x 5 B-TITE)

3) Method by mounting in the floor (BOTTOM) side

Fit the printer into the hole and screw it into the 4 holes.



Please refer to the drawing below to design the fixture.



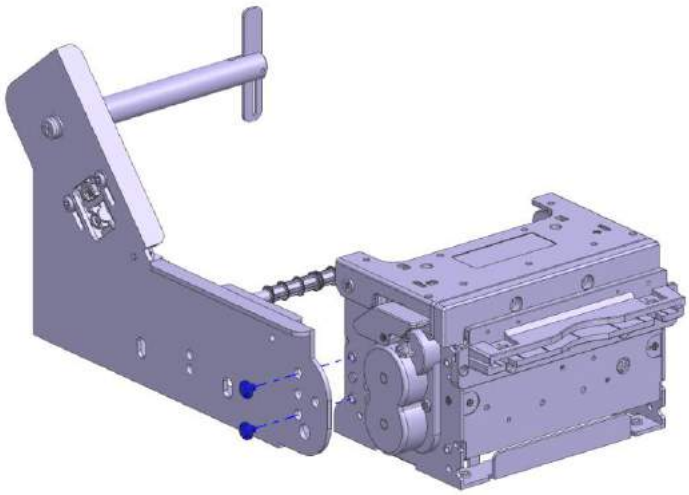
* (Recommended screw : M3 x 5 B-TITE)

2. Large sized paper holder installation method(OPTION)

If you select the Large sized paper holder option for an out diameter of Ø100 or more paper, the paper holder and the printer will be delivered as separated. You can assemble and use the paper holder in the following way.

1) Assembling the paper holder

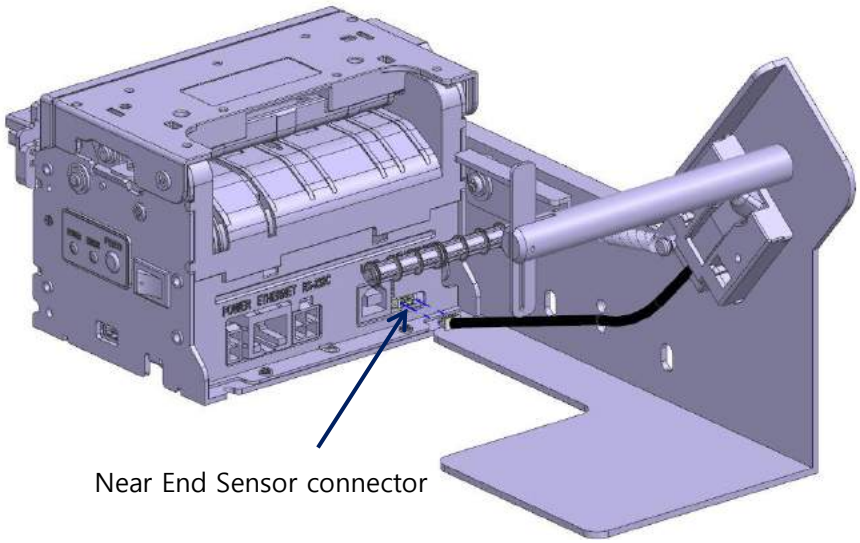
Align the paper holder with the hole in the side of the printer and screw it in two places.



(Recommended screw: 3 x 5 B-TITE)

2) Connecting the Near End Sensor connector

Connect the Near End Sensor cable connector to the Near End Sensor connector on the printer.

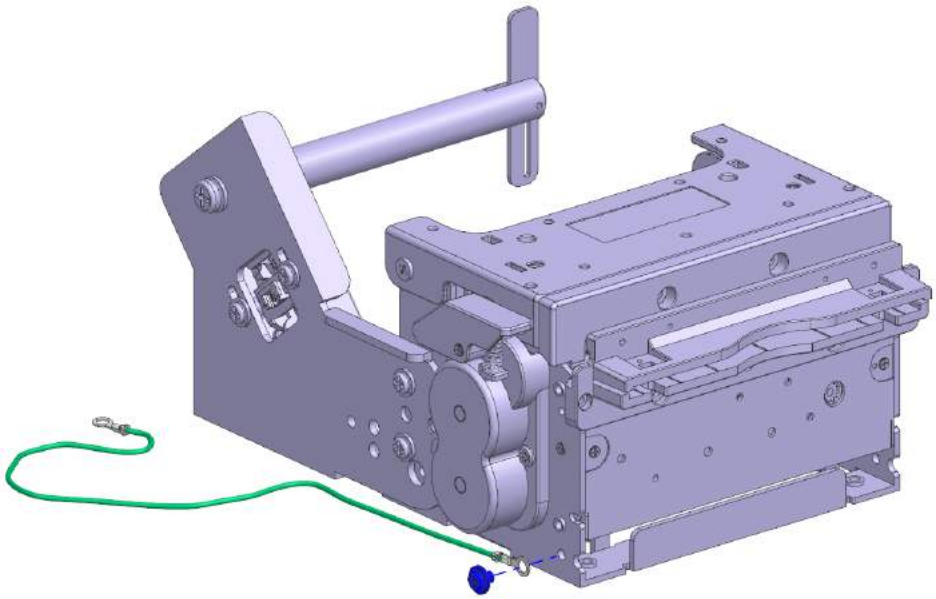


3. Electrostatic discharge and ground current handling

Ground (FG) a separate ground terminal on the printer frame and the frame of the product's outer case.

You can prevent damage to the printer's control board and thermal head from ESD(Electro Static Discharge).

As shown in the image below, align the ground cable with the printer frame ground hole, fix it with screws, and ground the other end of the ground cable to the outer case of the product.



CAUTION It is recommended to ground the printer to the product surely when installing the printer. Otherwise, it may cause printer failure.

※ Note: To prevent static electricity on the paper during printing, you can use an Anti-Static Brush by additional installing it at the paper exit.

Ⅴ. Printer Function Settings

There are two ways to set the printer's functions such as serial communication conditions, Ethernet, black mark, etc., which are: a manual setting method in which the printer itself is changed, and a method using tools such as a memory switch program that connects to a PC. For the direct communication method through the Window Driver, refer to the separate manual attached with the setting program on our website.

1. Setting Manually

1) If the power is turned on while holding the FEED button for more than 2 seconds, the ERROR light turns off and then on and off repeatedly, and the items for which settings can be adjusted are printed as follows.

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

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

2) Item change and specification are determined by the length of time that the FEED button is pressed.

Pressing the FEED button for less than 1 second will change to the next item. For example, if you want to adjust the print density, press the FEED button for the less than 1 second 5 times to change the item to "5. Print Density".

After that, if you press and hold the FEED button for more than 1 second, the item is specified

and the current setting value is output.

```
[Print Density]
-> 1. Normal
   2. Medium
   3. Dark
   4. Most Dark

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

"->" indicates the currently set value.

3) In the same way, press for less than 1 second to toggle to the item you want to change and then set the item.

For example, if you want to change the current setting value from "1. Normal" to "4. Most Dark", simply press the FEED button 4 times and then press and hold 1 time.

- It was changed successfully!

This indicates that the change was successful.

- The value is invalid, try again!

This is displayed when the selected item is invalid or when you move to another menu without changing the item.

4) If the change is made successfully, the changeable items printed first are displayed.

If you need to make further adjustments, you can proceed in the same way.

Turn the power off and on after making all the changes.

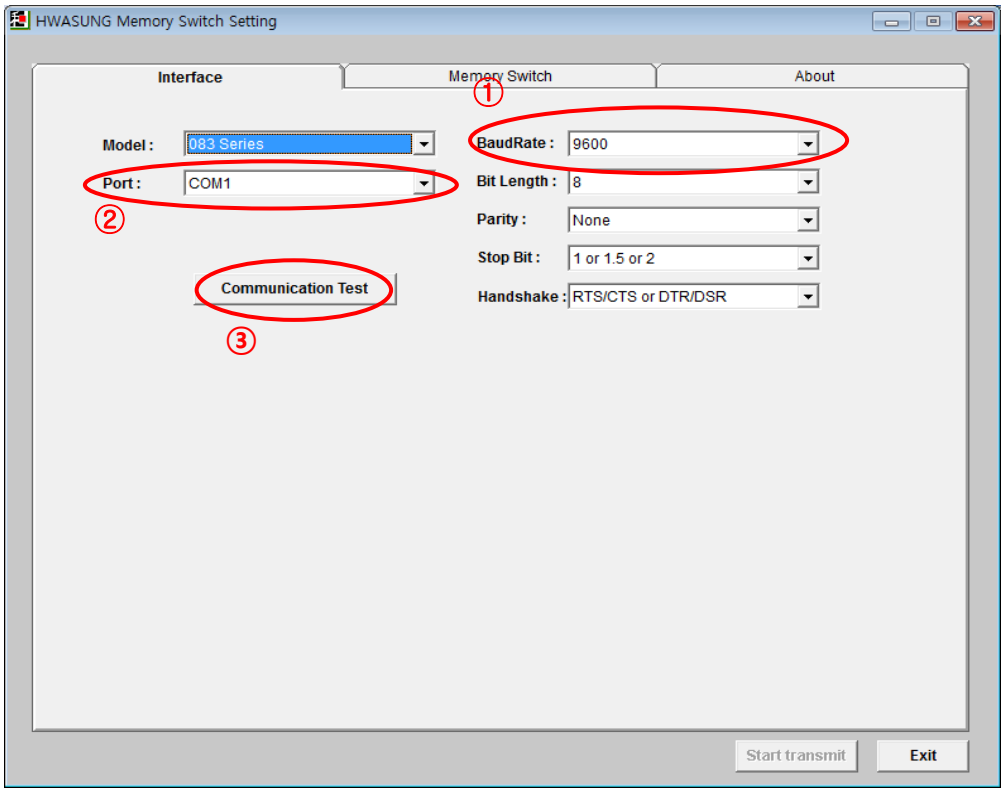
2. Set Using Memory Switch Program

Using the utility program, memory switch settings such as printer functions as well as conditions of communication the host can be set. The memory switch utility program is provided on our website.

CAUTION When setting, all the contents of the memory switch are deleted, so please reset => set again items such as code page and print options.

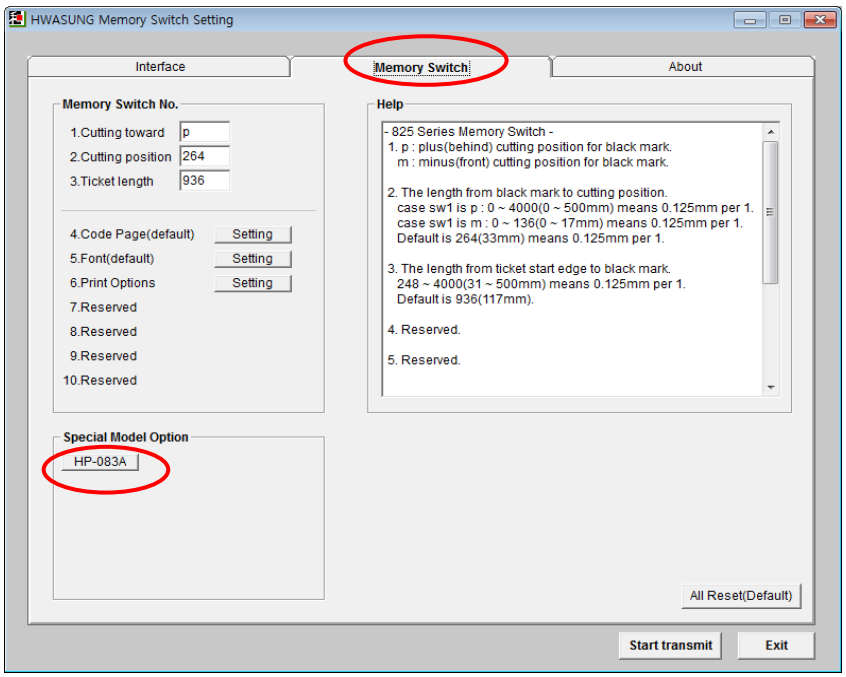
1) Turn on the power after connecting the printer and the interface cable.

2) Open the utility program and select the current communication conditions. For communication conditions, refer to the self-test parameters.

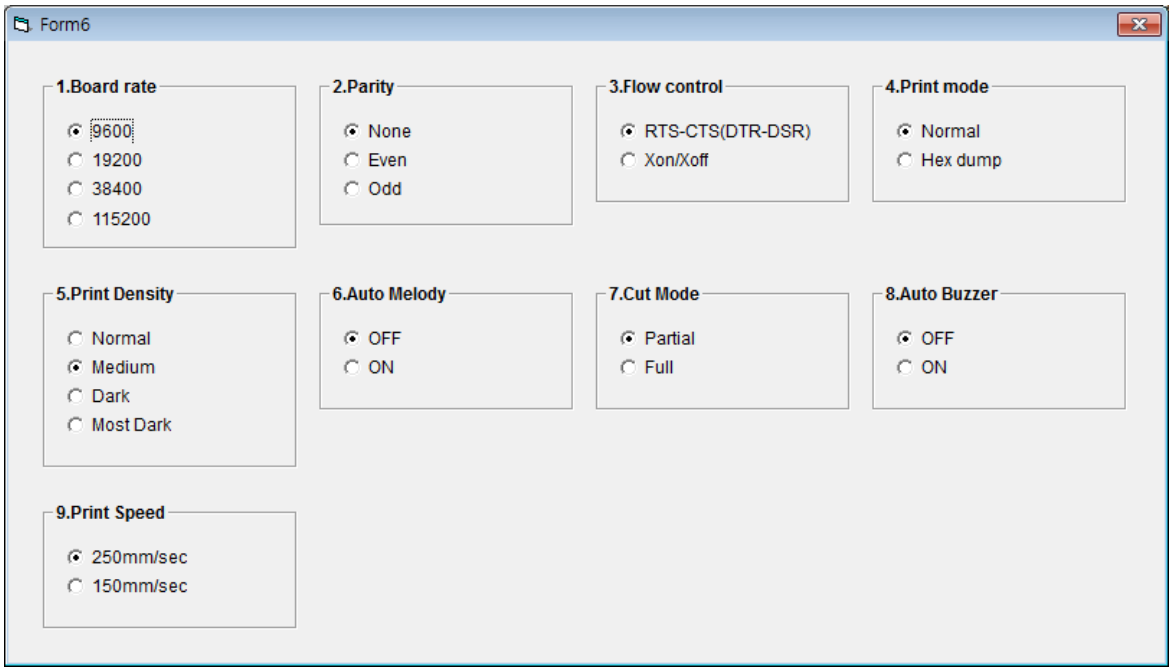


If communication is successful, the Start transmit button is activated.

3) After pressing the Memory Switch tab, click HMK-830 in Special Model Option.



4) You can set the required value when the following window appears. Note that after completing selection, you must press the 'Start transmit' button with the window open.



After setting, turn the power off and on to apply the set values.

3. Firmware Update

With the adoption of flash memory, you can easily update the printer program from a PC.

When updating, be sure to read the steps below.

1) Turn the power off and then back on.

2) Make sure that the communication cable is connected with the printer.
(You can shorten the update time by using a USB cable.)

3) Run the provided update program, set the model name and communication port, and perform the update.
The ERROR LIGHT turns off, and after a few seconds, it flashes rapidly and the update starts.
Never turn off the printer power before the update is completed.

4) When the update complete mark appears, the update is completed.
※ If there is an update error during update, the ERROR LIGHT blinks slowly. After closing the update program, check the model and communication cable for abnormalities. After checking that the values are correct, run the update program again and repeat step 1).

5) After the update is completed, it is automatically reset and becomes available to use.

※ For more information on updating firmware, please check our website or contact the person in charge.

4. Ethernet Interface Settings

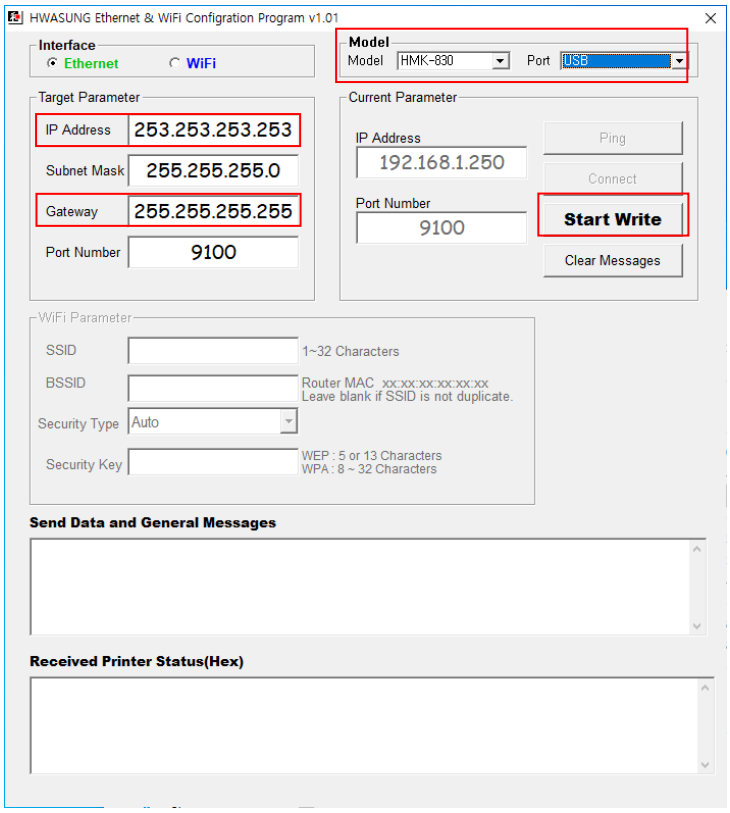
1) When Using in Static IP Mode

① Connect the network cable and USB cable to the printer.

② In the printer settings, set Ethernet to ON and IP Mode to Static IP, and then turn on the power.

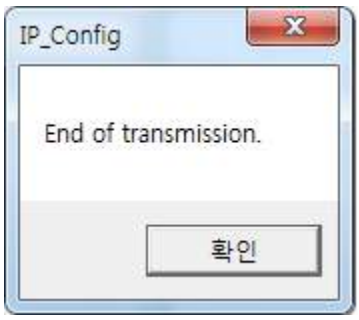
③ Run the IP Configuration setting utility program.

④ Select HMK-830 for the printer model and USB for the port.



⑤ Enter the IP address and gateway you want to use in the Target Parameter column and click Start Write.

⑥ The message “End Transmit” is displayed and the setting is completed.



⑦ Turn off the printer and remove the USB cable.

⑧ Turn on the printer while pressing the FEED button.

Self-test printing is performed and the set IP address, etc. is printed.

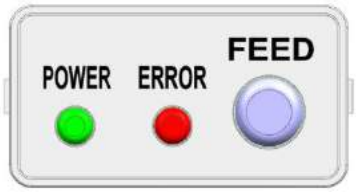
⑨ After ensuring that the set values are correct, turn the power off and on, and the printer will boot with these user values, and the application can use these user values for communication.

CAUTION After booting to the factory default values (Boot into Default Value), the set values cannot be changed if the IP address conflicts with the network IP address. In this case, do not use a router, and connect directly to the PC to avoid IP address conflict, or use it in Dynamic IP DHCP Mode. Refer to (Next 2) when using in Dynamic IP DHCP Mode.

2) When Using in Dynamic IP DHCP Mode

1) Connect the network cable to the printer.

2) Turn on the power by setting Ethernet ON, and setting the IP Mode to Dynamic IP DHCP. The printer starts protocol exchange communication with the host as the Error light blinks every 1 second. If connection is successful, the Error light stops blinking.



Connection attempt: Blinks at 1 second intervals.

Connection successful: Flashing stops and returns to print standby.

3) Turn off the printer.

4) Turn on the printer while pressing the FEED button.

Self-test printing is performed, and the IP address automatically acquired in DHCP Mode is printed.

5) After checking the automatically acquired IP address, turn the power off and on, and the printer will boot up with this automatically acquired value, and applications can communicate with this value.

CAUTION When booting in Dynamic IP DHCP Mode, the automatically acquired communication parameter values may change every time, so special attention is required.

If network IP address conflict occurs while booting in Static IP Mode and changing communication parameter settings, use this mode to set. However, it is recommended to use Static IP Mode for communication with the application.

5. Ticket Paper Settings

It is possible to use the memory switch utility to save the ticket paper settings to the printer.

For detailed ticket setting instructions, please refer to the manual attached to the memory switch utility on the website.

VI. Product Specifications

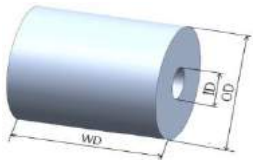
1. Printer Specifications

Item		Specifications (based on 203 DPI)					
Printing method		Thermal dot line printing					
Resolution (dot size)		203DPI, 300DPI (optional)					
Dots per line		640 dots					
Paper feed width (1 step)		0.125mm					
Paper thickness		50㎛ - 200㎛					
Paper width		Fixed type: 60mm, 77mm, 80mm, 82.5mm					
		Adjustable Guide Type: 25mm - 82.5mm					
Paper outer diameter size		Φ100 or less, Φ150, Φ200, Φ 250, Φ300					
Paper width		82.5mm	80mm	80mm	72mm	60mm	58mm
Printing width		80mm	77mm	72mm	64mm	54mm	48mm
Number of characters per line	Font A (12x24)	53	51	48	42	36	32
	Font B (9x16)	71	68	64	56	48	42
	Korean A (24x24)	26	25	24	21	18	16
	Korean B (16x16)	40	38	36	32	27	24
Printing speed	Receipt mode	Max 300mm/s					
	Ticket mode	Max 250mm/s					
Font size	Font A (12x24)	1.50 x 3.00mm					
	Font B (9x16)	1.13 x 2.00mm					
	Korean A (24x24)	3.00 x 3.00mm					
	Korean B(16x16)	2.00 x 2.00mm					
Number of characters		English 95					
		Extended characters (Code page): 128 x 10					
Barcode	1D	UPC-E, EAN8, EAN13, ITF, CODABAR, CODE39, CODE93, CODE128					
	2D	PDF417, QR CODE					
Cutter		Guillotine method (complete cutting, partial cutting possible)					

Interface	Serial	RS232C
	USB	USB2.0 Full Speed
	Ethernet	IEEE 802.3i 10Base-T (10Mbps)
Receiving Buffer		4Kbyte
SRAM		256Kbyte (optional SDRAM 64MB expandable)
Flash ROM		2Mbyte (optional 128MB expandable)
SMPS rating	Input voltage	100V ~ 240V(AC)
	Output voltage	24V(DC)
	Output current	2.5A 60W
Life (25°C, standard condition)		Head 150Km Cutter: 1,000,000 times (for print duty 12%, it may vary slightly depending on the paper used.)
Temperature range		Operating temperature -20°C ~ 60°C(#1) Storage temperature -25°C - 60°C
Humidity range		Operating humidity 40 - 85% RH (non-condensing) Storage humidity 40 - 95% RH

(#1) Guaranteed operating temperature range of the product is only from 0°C to 45°C, the guaranteed life time of product may be reduced if used outside the guaranteed temperature range.

2. Presenter Specifications

Item	Specification	
Paper Width (WD)	25mm - 82.5mm	
Core inner diameter (ID)	Min. Φ25.4	
Receipt/Ticket length	65mm - 500mm	
Thickness	50㎛ - 80㎛	80㎛ - 200㎛
Outer diameter (OD)	Up to 300mm	Folding recommended
Roll (wound) direction	Outer O, Inner X	
Ticket Retraction(Ticket collection)	Possible	Possible
Through Pass(Simultaneous pass)	Possible	Possible
Loop	Possible	Not possible
Ejection Speed	700 mm/s	
Retraction Speed	700 mm/s	
Retraction Wait time	Adjustable (Max. 60 sec)	

3. Interface Specifications

1) USB

- Specifications: USB 2.0 compatible, Full Speed (12Mb) compatible

- Connector: Type B

- Cable: USB2.0 cable

- Data method: Bulk IN, Bulk OUT

  * Bulk IN : End point 6

  * Bulk OUT : End point 2

  * Full Speed: Max Packet Size 64 Bytes (Bulk OUT), 64 Bytes (Bulk IN)

2) Serial (RS-232C)

- Data transmission method: Serial

- Hand shake: Hardware (RTS/CTS or DTR/DSR)

- Baud Rate: 9600, 19200, 38400, 57600, 115203., BPS

- Data bits: 8 bits

- Parity: None, Odd, Even

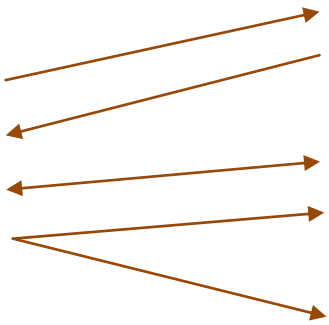
- Stop bits: 1, 2 bits

- Connector: HANLIM CHD1140-4

- Cable: DSUB9 (Female) - 4-pin exclusive cable

Printer

Pin	Signal	Input and output
1	TxD	Output
2	RxD	Input
4	GND	-
3	RTS	Output



Host

Pin	Signal	Input and output
1	DCD	-
2	RxD	Input
3	TxD	Output
4	DTR	Output
5	GND	-
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	RI	-

3) Ethernet

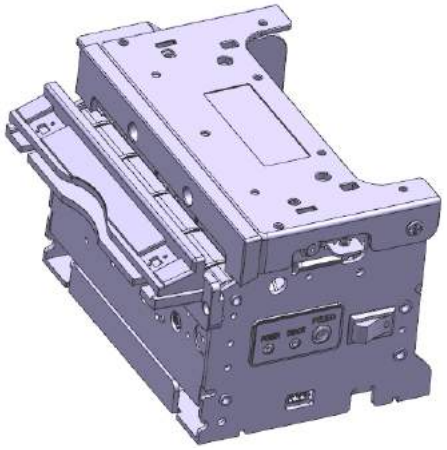
- Communication protocol: TCP/IP
- Communication specifications: IEEE 802.3 10BASE-T and IEEE 802.3u 100BASE-TX
- Connector: RB1-125BAG1A (UDE)
- Pin arrangement

Pin No.	Signal Name	Input/Output	Description
1	TD+	OUT	Transmit Data+
2	TD-	OUT	Transmit Data-
3	TCT	OUT	
4	NC	-	None Connection
5	NC	-	None Connection
6	RCT	IN	
7	RD+	IN	Receive Data+
8	RD-	IN	Receive Data-

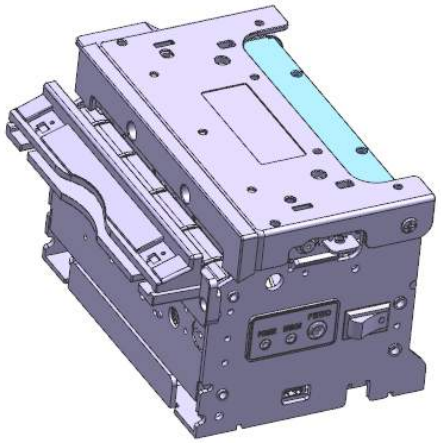
Ⅶ. Product appearance and dimensions

1. HMK-830(A)B

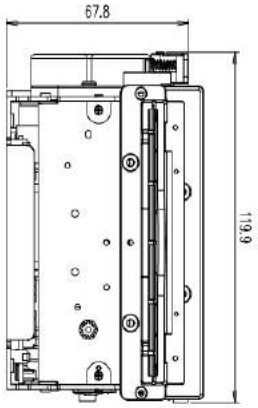
HMK-830 Series has the BOARD inside the printer.

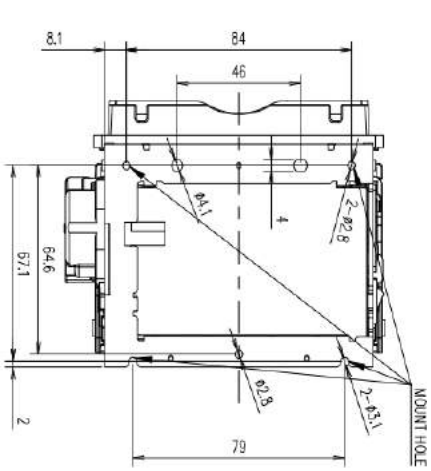


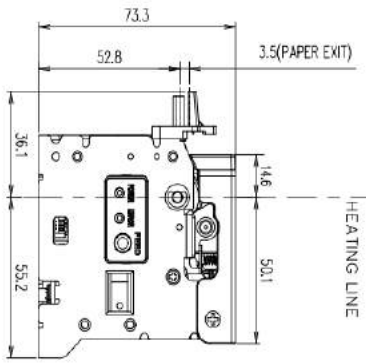
HMK-830B (Fixed Guide Type)

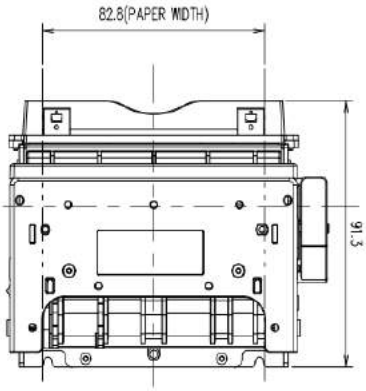


HMK-830AB (Adjustable Guide&Sensor Type)



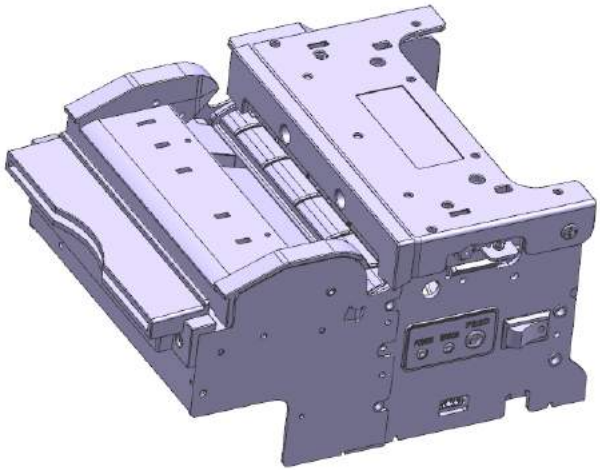




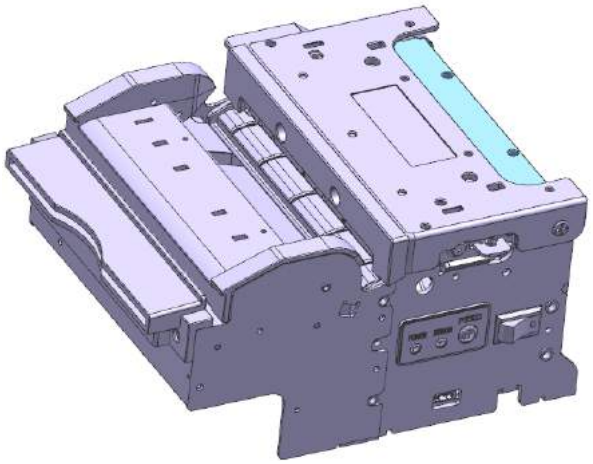


2. HMK-830(A)PB

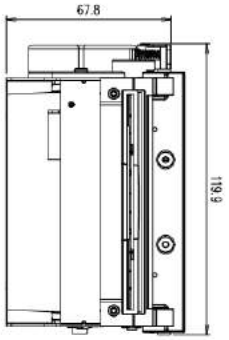
HMK-830P is the Presenter attached Model.

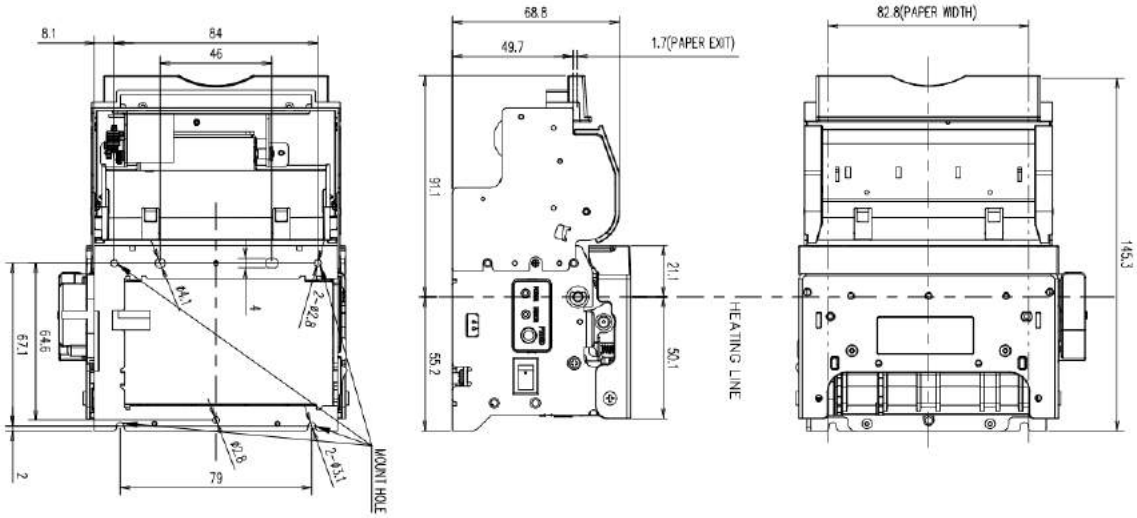


HMK-830PB
(Fixed Guide Type)



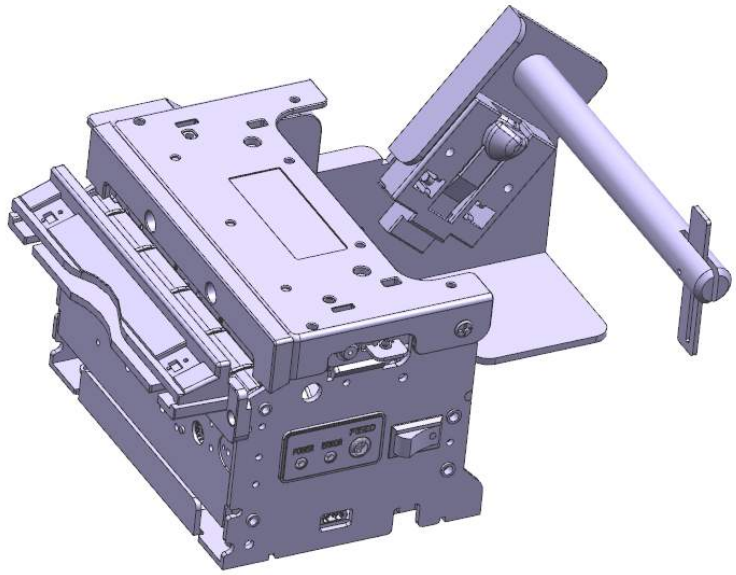
HMK-830APB
(Adjustable Guide&Sensor Type)



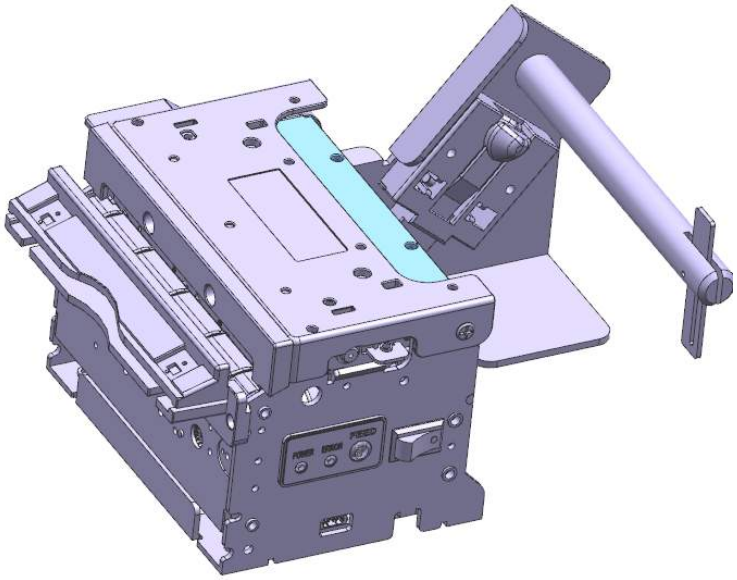


3. HMK-830(A)

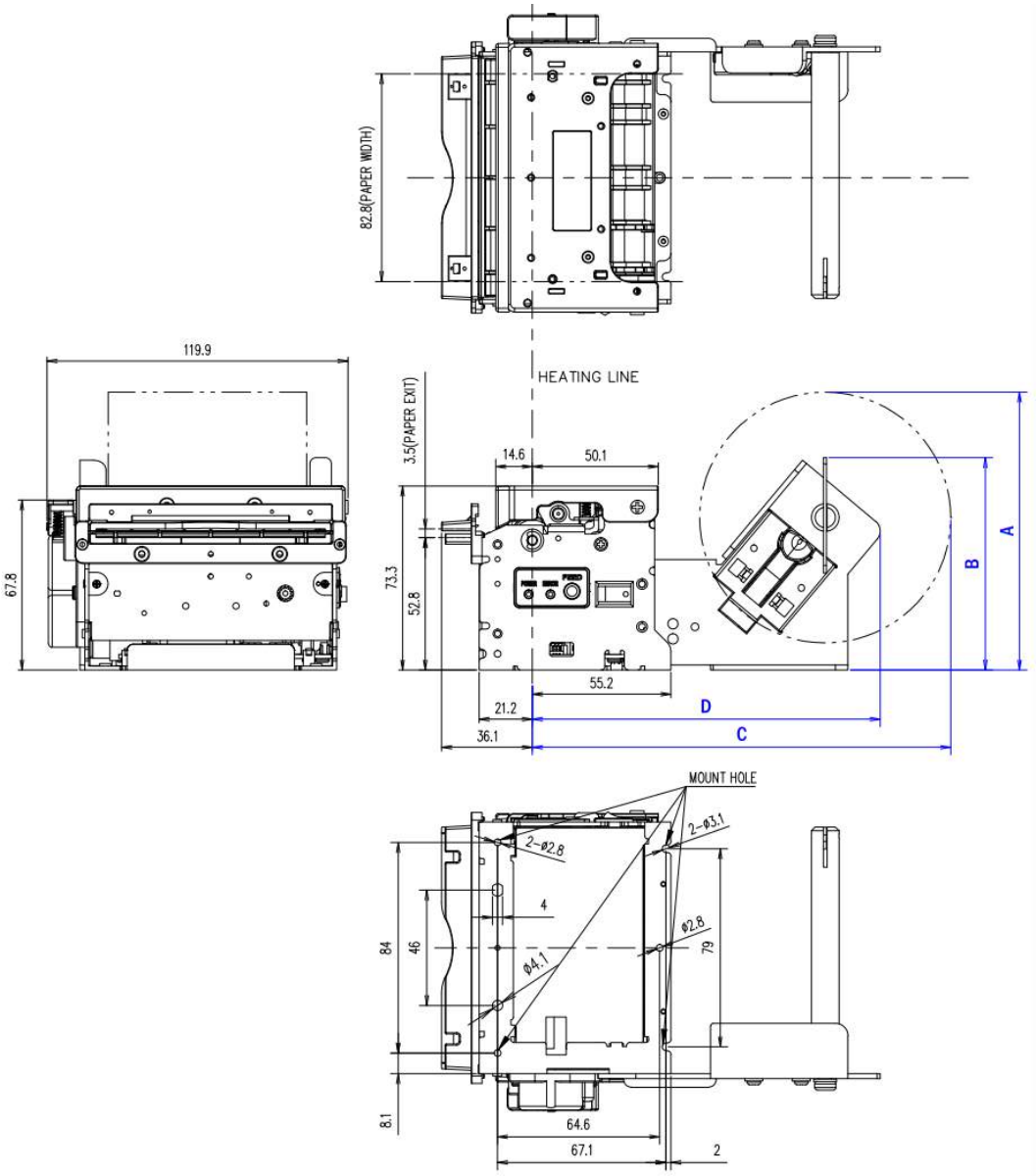
HMK-830 is the Paper holder attached Model. The Image below is based on the use of 100mm out diameter paper.



HMK-830 (Fixed Guide Type)



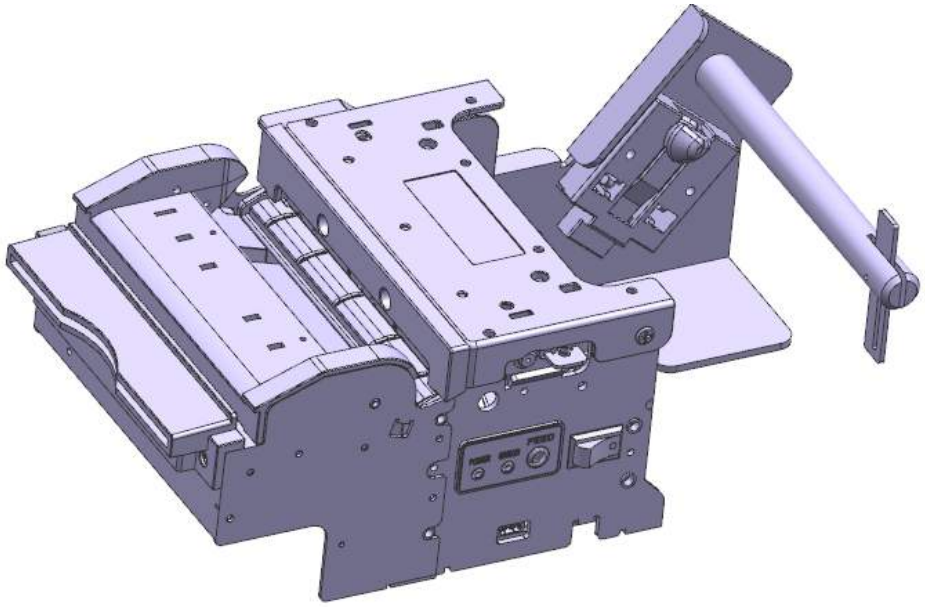
HMK-830A (Adjustable Guide & Sensor Type)



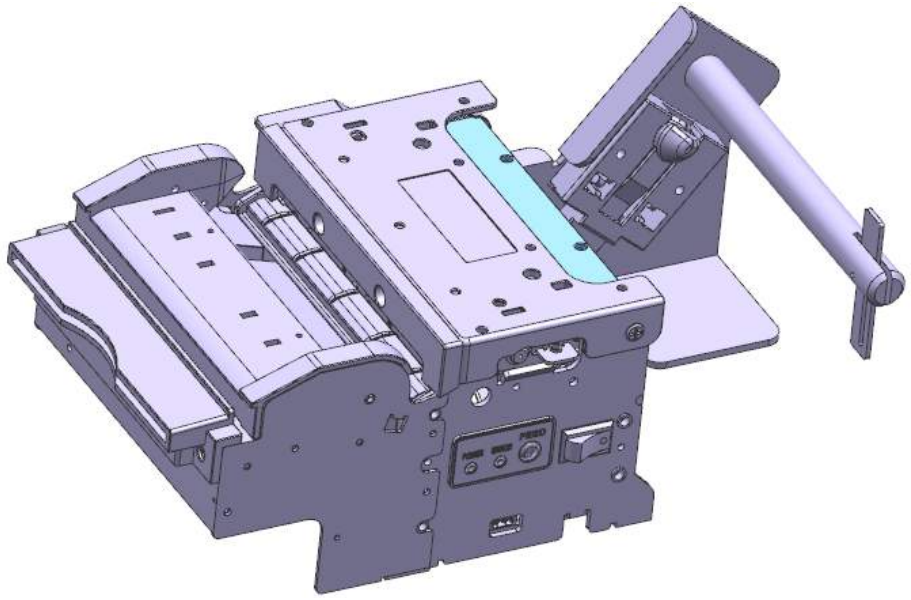
Model Name	A	B	C	D
HMK-830S, HMK-830AS (Ø100)	110.8	84.7	166.6	138.5
HMK-830M, HMK-830AM (Ø150)	164.9	121.6	264	219.8
HMK-830L, HMK-830AL (Ø200)	233.6	160.9	332.5	262.7

4. HMK-830(A)P

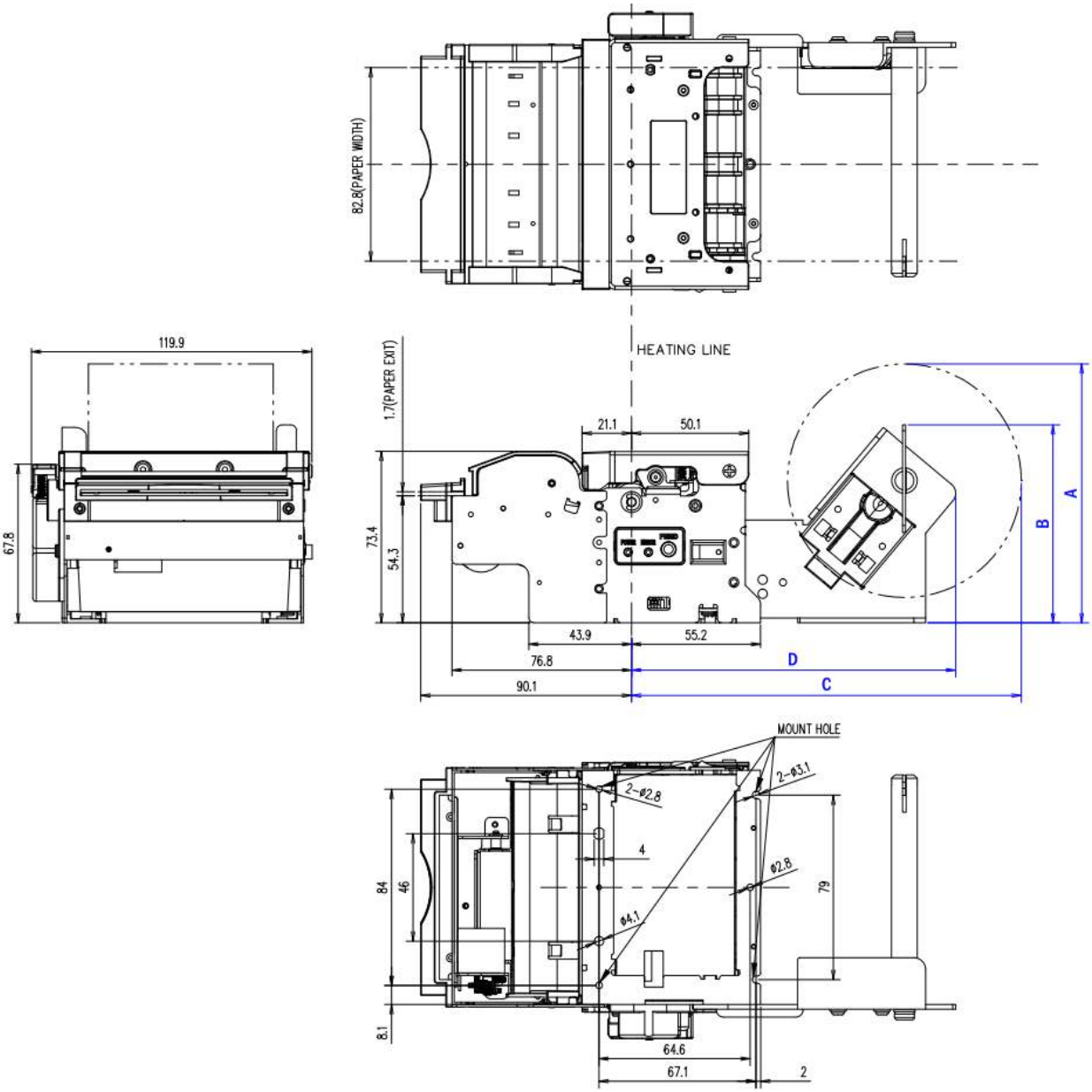
HMK-830P is the Presenter and Paper holder attached Model. The Image below is based on the use of 100mm out diameter paper.



HMK-830P (Fixed Guide Type)



HMK-830AP (Adjustable Guide & Sensor Type)



Model Name	A	B	C	D
HMK-830PS, HMK-830APS (Ø100)	110.8	84.7	166.6	138.5
HMK-830PM, HMK-830APM (Ø150)	164.9	121.6	264	219.8
HMK-830PL, HMK-830APL (Ø200)	233.6	160.9	332.5	262.7

Ⅷ. Command Specifications

DC3 i	Cutting after automatic detection of black line	89
SUB 1	Select rule line 1	89
SUB 2	Select rule line 2	89
SUB W	WRITE rule line data	90
SUB C	CLEAR rule line data	90
SUB O	Rule line ON	90
SUB F	Rule line OFF	91
SUB P	Print rule line 1 dotted line	91
ESC t	Set international code page	92
DLE	Real-time Ethernet status check	93

CR

Function	Print and line feed	
Code	ASCII	CR
	Hex	0Dh
	Decimal	13
Description	Same as LF	

LF

Function	Print and line feed	
Code	ASCII	LF
	Hex	0Ah
	Decimal	10
Description	① STANDARD MODE: Prints data and line feeds as the line space setting.	
	② PAGE MODE: Line feeds as the line space setting.	
Caution	LF immediately after CR is ignored.	

CAN

Function	Delete print data	
Code	ASCII	CAN
	Hex	18h
	Decimal	24
Description	Delete print data in print area.	

HT

Function	Horizontal tab	
Code	ASCII	HT
	Hex	09h
	Decimal	9
Description	Move print position to next tab.	
Caution	Tab position is set to ESC+'D'+n.	

FF

Function	Prints page mode and returns to STANDARD MODE.			
Code	ASCII	FF		
	Hex	0Ch		
	Decimal	12		
Description	Returns to STANDARD mode after printing the data on the page.			
Caution	Use ESC+FF if you do not want to return to STANDARD MODE.			

SUB+'x'+n

Function	Extended Graphic Mode, Korean mode			
Code	ASCII	SUB	x	n
	Hex	1A	78h	n
	Decimal	26	120	n
Range	0≤n≤1			
Initial value	n=0			
Description	n=0: Korean mode - When the first code is A1h or higher, 2 bytes are processed and converted into Korean automatically. n=1: Extended Graphic Mode - All codes are processed as 1-byte codes. Extended Graphic characters can be printed.			

SUB+'R'+n

Function	Set the border(outline) of characters			
Code	ASCII	SUB	b	n
	Hex	1A	52h	n
	Decimal	26	82	n
Range	0≤n≤1			
Description	n=0: Remove border (rectangle) of characters. n=1 Enables border (rectangle) of characters.			
Caution	When enlarged horizontally, it is effective up to the size of 8 times; however, when enlarged vertically, it is effective only up to the size of 2 times.			

SUB+'s'+n				
Function	Set print speed			
Code	ASCII	SUB	s	n
	Hex	1A	73h	n
	Decimal26	82	n	
Range	1≤n≤14			
Initial value	n=14			
Description	n=1: Prints at a speed of 70mm/s. n=2: Prints at a speed of 80mm/s. n=3: Prints at a speed of 90mm/s. n=4: Prints at a speed of 100mm/s. n=5: Prints at a speed of 110mm/s. n=6: Prints at a speed of 120mm/s. n=7: Prints at a speed of 130mm/s. n=8: Prints at a speed of 140mm/s. n=9: Prints at a speed of 150mm/s. n=10: Prints at a speed of 160mm/s. n=11: Prints at a speed of 170mm/s. n=12: Prints at a speed of 180mm/s. n=13: Prints at a speed of 190mm/s. n=14: Prints at a speed of 200mm/s.			

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

Function	Horizontal tab position setting				
Code	ASCII	ESC	D	n1...nk	NUL
	Hex	1B	44h	n1...nk	00
	Decimal	27	68	n1...nk	0
Range	1≤n≤255, 0≤k≤32				
Description	Set the horizontal tab position.				
Caution	n denotes the number of digits from the start of the line to the set position. k is the total number of tabs in a row.				

ESC+SP+n

Function	Set the amount of space to the right of ASCII characters.			
Code	ASCII	ESC	SP	n
	Hex	1B	20h	n
	Decimal	27	32	n
Range	0≤n≤255			
Initial value	n=0			
Description	Set the space to the right of ASCII characters to nx 0.125mm.			
Caution	Spacing for Korean is set using FS+'S'+n.			

ESC+'!'+n

Function	Collective setting of ASCII character decorations			
Code	ASCII	ESC	!	n
	Hex	1B	21h	n
	Decimal	27	33	n
Range	0≤n≤255			
Initial value	n=0			
Description	Sets the font and character decoration all at once			
Caution	For Korean, only font and highlight are applied.			

Bit	Function	Hex	Decimal
0	0: Font 12x24, Select 24x24	00h	0
	1: Font 8x16, Select 16x16	01h	1
1	-	-	-
2	-	-	-
3	0: Highlight off	00h	0
	1: Highlight on	08h	8
4	0: Vertical enlargement off	00h	0
	1: Vertical enlargement on	10h	16
5	0: Horizontal enlargement off	00h	0
	1: Horizontal enlargement on	20h	32
	-	-	-
7	0: Underline off	00h	0
	1: Underline on	80h	128

ESC+'$'+nL+nH

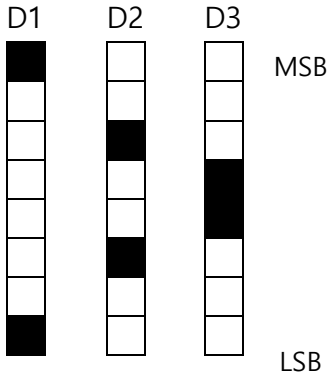
Function	Setting of absolute position				
Code	ASCII	ESC	$	nL	nH
	Hex	1B	24h	nL	nH
	Decimal	27	36	nL	nH
Range	0≤nL+nH×256≤65535, 0≤nL≤255, 0≤nH≤255				
Initial value	nL=0, nH=0				
Description	The print position is moved from the end of the left margin to the (nL+nH×256)×0.125mm position. When the print area is exceeded, it moves to the end point of the left margin.				

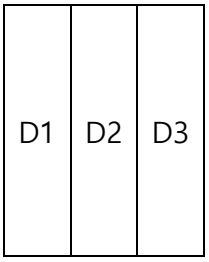
ESC+'*'+m+nL+nH+d1+...+dk

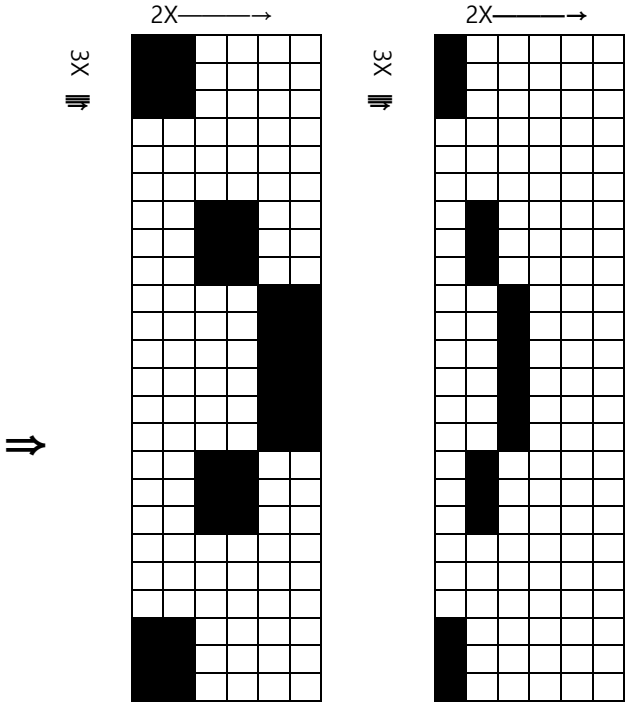
Function	Setting of bit image						
Code	ASCII	ESC	*	m	nL	nH	d1...dk
	Hex	1B	2Ah	m	nL	nH	d1...dk
	Decimal	27	42	m	nL	nH	d1...dk
Range	m = 0, 1, 32, 33 1≤nL+nH×256≤1023, 0≤nL≤255, 0≤nH≤3, 0≤d≤255						
Initial value							
Description	Bit data is printed as graphic data in mode m by the number of dots designated by nL+nH×256.						

m	mode	Number of dots in vertical direction	Number of dots in horizontal direction	Number of data (k)
0	8 dots single density	8	224	nL+nH×256
1	8 dots double density	8	448	nL+nH×256
32	24 dots single density	24	224	(nL+nH×256)×3
33	24 dots double density	24	448	(nL+nH×256)×3

8-dot mode

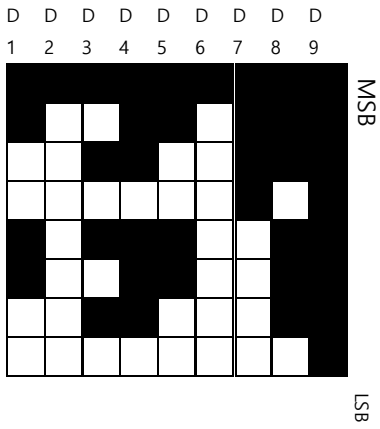




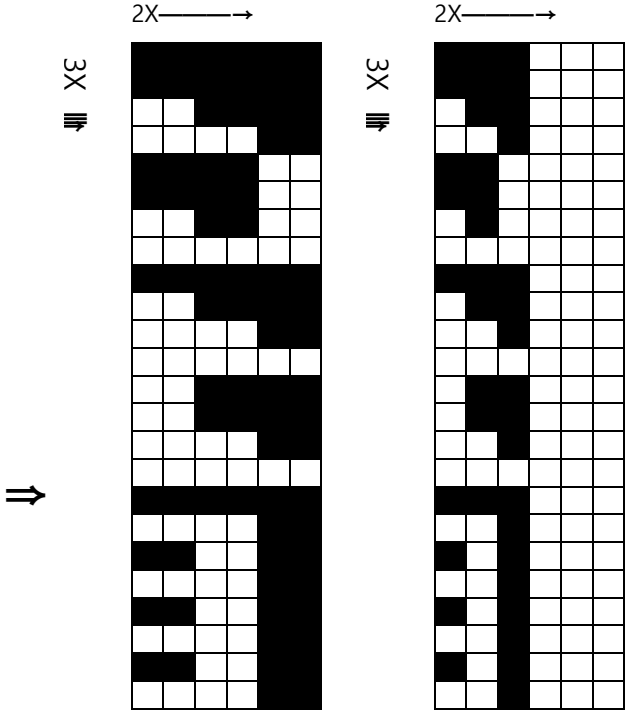


Single density Double density

24-dot mode



D1	D4	D7
D2	D5	D8
D3	D6	D9



Single density Double density

ESC+'-'+n

Function	Set / Cancel underline			
Code	ASCII	ESC	-	n
	Hex	1B	2Dh	n
	Decimal	27	45	n
Range	0≤n≤255			
Initial value	n=0			
Description	Set / Cancel underline.			

n	Function
0	Underline off
1	Set underline thickness to 0.125mm
2	Set underline thickness to 0.25mm
3	Set underline thickness to 0.375mm
4	Set underline thickness to 0.5mm
5	Set underline thickness to 0.625mm
6	Set underline thickness to 0.75mm
7	Set underline thickness to 0.875mm

ESC+'2'

Function	Set initial line spacing		
Code	ASCII	ESC	2
	Hex	1B	32h
	Decimal	27	50
Range	0≤n≤255,		
Initial value	n=0		
Description	Set the row spacing to the initial value 4mm.		

ESC+'3'+n

Function	Set row spacing			
Code	ASCII	ESC	3	n
	Hex	1B	33h	n
	Decimal	27	51	n
Range	0≤n≤255,			
Initial value	n=0			
Description	Set row spacing to nx 0.125mm.			

ESC+'@'

Function	Printer reset		
Code	ASCII	ESC	@
	Hex	1B	40h
	Decimal	27	64
Range	0≤n≤255		
Description	Clear buffer and initialize all parameters.		

ESC+'E'+n

Function	Set bold font			
Code	ASCII	ESC	E	n
	Hex	1B	45h	n
	Decimal	27	69	n
Range	0≤n≤255			
Initial value	n=0			
Description	Bold format is turned off when n=0.			
	Bold format is turned on when n=1.			

ESC+'G'+n

Function	Set double print(double strike) font			
Code	ASCII	ESC	G	n
	Hex	1B	47h	n
	Decimal	27	71	n
Range	0≤n≤255			
Initial value	n=0			
Description	n=0 : Cancel Double print font			
	n=1 : Set Double print font.			

ESC+'J'+n

Function	Feeding			
Code	ASCII	ESC	J	n
	Hex	1B	4Ah	n
	Decimal	27	74	n
Range	0≤n≤255			
Description	After printing the data in the buffer, it is fed by n x 0.125mm.			

ESC+'j'+n

Function	Back Feeding			
Code	ASCII	ESC	j	n
	Hex	1B	6Ah	n
	Decimal	27	106	n
Range	0≤n≤255			
Description	After printing the data in the buffer, it is back-fed by nx 0.125mm.			

ESC+'M'+n

Function	Font selection			
Code	ASCII	ESC	M	n
	Hex	1B	4Dh	n
	Decimal	27	77	n
Range	0≤n≤255			
Initial value	n=0			
Description	Set the printer font.			

n			
Upper 4 bits (2-byte font)		Lower 4 bits (ASCII, 1-byte font)	
0000	Korean 24x24 Gothic	0000	12x24
0001	Korean 16x16 Dotum font	0001	8x16 (9x16)
0010	Japanese 24x24 Ming font	0010	Reservation
0011	Chinese 24x24 Gothic	0011	Reservation

CAUTION If you set the memory switch using the memory switch setting utility, you can select and use one of the above fonts as the default font without this command. For details, refer to the memory switch setting items.

ESC+'R'+n

Function	Setting of international characters			
Code	ASCII	ESC	R	n
	Hex	1B	52h	n
	Decimal	27	82	n
Range	0≤n≤13			
Initial value	n=13			
Description	International characters are set as shown in the table below.			

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

ESC+'a'+n

Function	Set printing position alignment			
Code	ASCII	ESC	a	n
	Hex	1B	61h	n
	Decimal	27	97	n
Range	0≤n≤2			
Initial value	n=0			
Description	Align the printing position			

n	Alignment position
0	Left
1	Center
2	Right

ESC+'d'+n

Function	Print and n row feed			
Code	ASCII	ESC	d	n
	Hex	1B	64h	n
	Decimal	27	100	n
Range	0≤n≤255			
Description	Feeds by n line(s) after printing data.			

ESC+'{'+n

Function	180° rotation			
Code	ASCII	ESC	{	n
	Hex	1B	7Bh	n
	Decimal27	123	n	
Range	0≤n≤255			
Initial value	n=0			
Description	Prints by rotating 180°.			
Caution	The reference point moves from the left end to the right end.			

n	Function
0	Turn off 180° rotation
1	Turn on 180° rotation

ESC+'i'

Function	Full Cutting		
Code	ASCII	ESC	i
	Hex	1B	69h
	Decimal27	105	
Description	The paper is fully cut.		

ESC+'m'

Function	Partial Cutting		
Code	ASCII	ESC	m
	Hex	1B	6Dh
	Decimal27	109	
Description	The paper is partially cut.		
Caution	In the case of the presenter model, partial cutting is set to invalid and full cutting is performed.		

FS+'!'+n

Function	Collective setting of Korean character printing mode			
Code	ASCII	FS	!	n
	Hex	1C	21h	n
	Decimal28	33	n	
Range	0≤n≤255			
Initial value	n=0			
Description	Set Korean printing mode character decoration collectively			
Caution	Applies only to Korean.			

Bit	Function	Hex	Decimal
0	-	00h	0
1	-	00h	0
2	Horizontal enlargement off	00h	0
	Horizontal enlargement on	04h	4
3	Vertical enlargement off	00h	0
	Vertical enlargement on	08h	8
4	-	00h	0
5	-	00h	0
6	-	00h	0
7	Underline off	00h	0
	Underline on	80h	128

FS+'&'

Function	Korean character mode (2-byte mode) setting		
Code	ASCII	FS	&
	Hex	1C	26h
	Decimal28	38	
Description	Sets Korean mode (2-byte mode).		
Caution	Necessary when printing Korean characters in extended graphic mode. It is automatically recognized during Korean mode, so no setting is required. (Refer to SUB+'x'+n command.)		

FS+'.'

Function	Cancel Korean character mode (2-byte mode)		
Code	ASCII	FS	.
	Hex	1C	2Eh
	Decimal28	46	
Description	Korean mode (2-byte mode) is deactivated.		
Caution	Necessary when deactivating 2-byte mode during extended graphic mode. It is automatically recognized during Korean mode, so no setting is required. (Refer to SUB+'x'+n command.)		

FS+'-'+n

Function	Set Korean Character underline			
Code	ASCII	FS	-	n
	Hex	1C	2Dh	n
	Decimal28	45	n	
Range	0≤n≤2			
Initial value	n=0			
Description	Sets underlining of Korean characters.			

n	Function
0	Deactivates underlining of Korean characters.
1	The thickness of Korean underline is set to 0.125mm.
2	The thickness of Korean underline is set to 0.25mm.

FS+'S'+n1+n2

Function	Set spacing between Korean characters				
Code	ASCII	FS	S	n1	n2
	Hex	1C	53h	n1	n2
	Decimal28	83	n1	n2	
Range	0≤n1≤255, 0≤n2≤255				
Initial value	n=0				
Description	Sets spacing between Korean characters.				
	The left space between Korean characters is set to n1×0.125mm.				
	The right space between Korean characters is set to n2×0.125mm.				

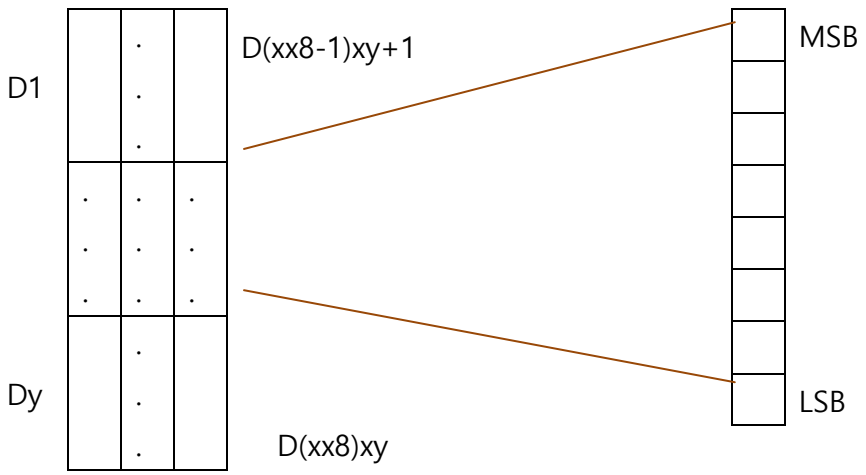
FS+'W'+n

Function	Set Korean Character size			
Code	ASCII	FS	W	n
	Hex	1C	57h	n
	Decimal28	87	n	
Range	0≤n1≤255			
Initial value	n=0			
Description	Korean character size is set to be double horizontally and vertically. When n=0, 2X horizontal and 2X vertical are disabled. When n=1, 2X horizontal and 2X vertical are set.			

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

Function	Registration of NV (non-volatile) logo (bit image)
Code	ASCII FS q n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n Hex 1C 71h n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n Decimal 28 113 n (xL xH yL yH d1..dk)1...(xL xH yL yH d1..dk)n
Range	1≤n≤255 0≤xL+xH×256≤65535 (0≤xL≤255, 0≤xH≤255) 0≤yL+yH×256≤65535 (0≤yL≤255, 0≤yH≤255) 0≤d≤255 k=(xL+xH×256)×(yL+yH×256)×8 The registrable capacity is up to 64KB.
Description	Registers the designated NV (non-volatile) logo (bit image) in non-volatile memory. n means the total number of NV logos. xL,xH sets the number of dots in the horizontal direction of (xL+xH×256)×8. yL,yH sets the number of dots in the vertical direction of (xL+xH×256)×8. k means the number of bit images of one NV logo.
CAUTION	As long as the NV logo does not exceed the capacity, several types can be registered, but when re-registering, care must be taken to ensure that all of them are erased and then re-registered.

<Registered image>



FS+'p'+n+m

Function	NV logo print				
Code	ASCII	FS	p	n	m
	Hex	1C	70h	n	m
	Decimal28	112	n	m	
Range	1≤n≤255, 0≤m≤3				
Initial value	n=0				
Description	The registered NV logo is printed in m mode. n refers to the nth registered logo.				

m	Printing mode
0	STANDARD
1	Horizontal enlargement
2	Vertical enlargement
3	Horizontal and vertical enlargement

GS+'!'+n

Function	Set the character enlargement ratio			
Code	ASCII	GS	!	n
	Hex	1D	21h	n
	Decimal29	33	n	
Range	0≤n1≤255 (However, the maximum value of horizontal and vertical enlargement is limited to 8.)			
Initial value	n=0			
Description	Sets the character enlargement ratio.			

CAUTION

When enlarging horizontally and vertically at the same time, add both numbers below.

Example) 3 times horizontally, 3 times vertically: n=32+2=34

Bit	Function
0-3	Sets the vertical enlargement ratio.
4-7	Sets the horizontal enlargement ratio.

Horizontal enlargement

n(Hex)	n(Decimal)	Enlargement ratio
00h	0	1X
10h	16	2X
20h	32	3X
30h	48	4X
40h	64	5X
50h	80	6X
60h	96	7X
70h	112	8X

Vertical enlargement

n(Hex)	n(Decimal)	Enlargement ratio
00h	0	1X
01h	1	2X
02h	2	3X
03h	3	4X
04h	4	5X
05h	5	6X
06h	6	7X
07h	7	8X

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

Function	Set the print density						
Code	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							
Description	Sets the print density.							

m	Print density	m	Print density
-	-	0	Standard Density
251	Density level -5	1	Density level +1
252	Density level -4	2	Density level +2
253	Density level -3	3	Density level +3
254	Density level -2	4	Density level +4
255	Density level -1	5	Density level +5

CAUTION

If a Density other than the standard Density is specified, the life of the head is shortened.

It is recommended to print below the standard density.

GS+'B'+n

Function	Printing Black & White in reverse			
Code	ASCII	GS	B	n
	Hex	1D	42h	n
	Decimal	29	66	n
Range	0≤n≤255			
Initial value	n=0			
Description	Select the Printing black and white in reverse. When n=0, standard printing When n=1, black and white reverse printing			

GS+'H'+n

Function	Designates barcode HRI character print position.			
Code	ASCII	GS	H	n
	Hex	1D	48h	n
	Decimal	29	72	n
Range	0≤n≤3			
Initial value	n=0			
Description	Sets the printing position of barcode numbers and characters.			

n	Printing position
0	No printing
1	Prints on top of the barcode.
2	Prints at the bottom of the barcode.
3	Prints on top and at the bottom of the barcode.

GS+'L'+nL+nH

Function	Sets the left margin.				
Code	ASCII	GS	L	nL	nH
	Hex	1D	4Ch	nL	nH
	Decimal29	76	nL	nH	
Range	0≤nL≤255, 0≤nH≤255				
Initial value	nL+nH×256=0 (nL=0, nH=0)				
Description	Sets the left margin to (nL+nH×256)×0.125mm.				

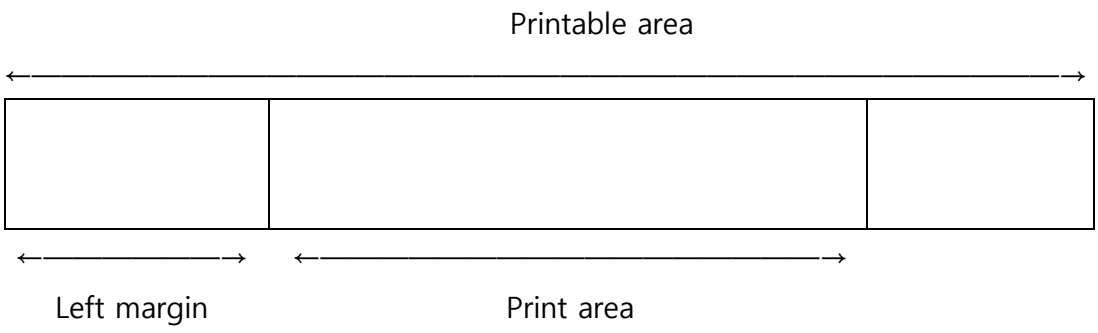
GS+'V'+m

Function	Paper cutting			
Code	ASCII	GS	V	m
	Hex	1D	56h	m
	Decimal29	86	m	
Range	0≤m≤1			
Initial value	m=0			
Description	Paper is cut using the specified options.			

m	Function
0	Full Cutting
1	Partial Cutting

GS+'W'+nL+nH

Function	Designates the printing area.				
Code	ASCII	GS	W	nL	nH
	Hex	1D	57h	nL	nH
	Decimal29	87	nL	nH	
Range	0≤nL≤255, 0≤nH≤255				
Initial value	nL+nH×256=448 (56mm, nL=0, nH=0)				
Description	Sets the printing area to (nL+nH×256)×0.125mm in the left margin.				



GS+'h'+n				
Function	Sets the barcode height.			
Code	ASCII	GS	h	n
	Hex	1D	68h	n
	Decimal29	104	n	
Range	1≤n≤255			
Initial value	n=162 (20.25mm)			
Description	The barcode height is set to n×0.125mm.			

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

Function Barcode printing

Code						
	ASCII	GS	k	m	d1...dn	NUL
	Hex	1D	6Bh	m	d1...dn	00h
	Decimal29	107	m	d1...dn	0	

Range 1≤m≤7, n and d differ depending on the barcode (see table below).

Description Prints barcode

m	Barcode type	n (number of barcode data)	d (barcode data)
1	UPC-E	n=7 (verification characters added automatically)	48≤d≤57
2	EAN13	n=12 (verification characters added automatically)	48≤d≤57
3	EAN8	n=7 (verification character added automatically)	48≤d≤57
4	CODE39	1≤n (start and stop characters added automatically)	48≤d≤57, 65≤d≤90 d=32,36,37,43,45,46,47
5	ITF (I of 2/5)	1≤n (odd, even numbers)	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 (verification and stop characters added automatically)	0≤d≤127

Caution In CODE128, in the case of special characters as shown in the table below, add "{" to set to 2 bytes.

Special characters	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

In addition, the starting character of CODE A, CODE B, or CODE C must be added at the beginning to distinguish the CODE 128 type.

CODE128 classification	Starting character	Example of printing barcode data "ABCD"
CODE A	g	"gABCD"
CODE B	h	"hABCD"
CODE C	i	"iABCD"

GS+'w'+n

Function Sets the horizontal size of the barcode.

Code

ASCII	GS	w	n
Hex	1D	77h	n
Decimal29	119	n	

Range 1≤n≤4

Initial value n=2

Description Sets the horizontal size of the barcode.

n	Multi-level barcode Module width	2-level barcode	
		Narrow element	Wide element
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

GS+'r'+n

Function	Status check response			
Code	ASCII	GS	r	n
	Hex	1D	72h	n
	Decimal29	114	n	
Range	n=1			
Description	Transmits the current status of the printer.			

CAUTION

Since this command cannot be received while the printer is offline, the status cannot be checked. Therefore, it is desirable to use real-time status check (DLE+EOT+n).

GS+'a'+n

Function	Enabling and disabling status check automatic response			
Code	ASCII	GS	a	n
	Hex	1D	61h	n
	Decimal29	97	n	
Range	0≤n≤1			
Initial value	n=1			
Description	Set or cancel the status check automatic response function.			

This printer has a function enabling it to automatically respond when the status changes after checking the printer status. This command can be used to enable or disable this function.

n	Function
0	Status check automatic response function disabled
1	Status check automatic response function enabled

<Status transmission data>

Bit	State	Hex	Decimal
0	0: There is paper. 1: No paper.	00h 01h	0 1
1	0: Printer head down 1: Printer head up	00h 02h	0 2
2	0: Paper not jammed. 1: Paper jammed.	00h 04h	0 4
3	0: Paper remained enough. 1: Not much paper left.	00h 08h	0 8
4※	0: Print completed 1: During printing or feeding	00h 10h	0 16
5	0: No cutter error(jam). 1: There is a cutter error(jam).	00h 20h	0 32
6	0 (Not used)	00h	0
7	0: No paper in the auxiliary sensor. 1: There is paper in the auxiliary sensor.	00h 80h	0 128

※ The status value of bit 4 is valid only when real-time command DLE + EOT + n command is executed, otherwise it is fixed to 0.

ESC+'S'

Function	STANDARD mode designation		
Code	ASCII	ESC	S
	Hex	1B	53h
	Decimal27	83	
Description	Change from Page mode to STANDARD mode.		

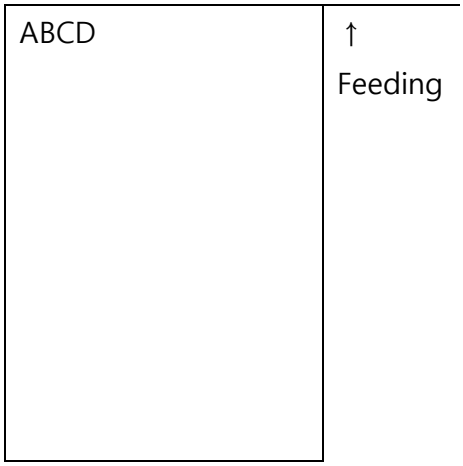
ESC+'L'

Function	Set Page mode		
Code	ASCII	ESC	L
	Hex	1B	4Ch
	Decimal27	76	
Range	0≤n≤255		
Initial value	n=0		
Description	Switch from STANDARD mode to Page mode.		

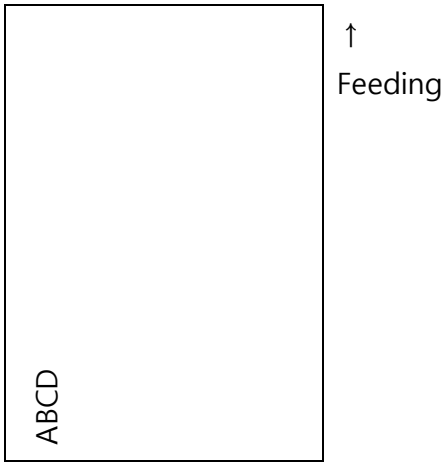
ESC+'T'+n

Function	Set the printing direction of page mode.			
Code	ASCII	ESC	T	n
	Hex	1B	54h	n
	Decimal27	84	n	
Range	0≤n≤3			
Initial value	n=0			
Description	Sets the printing direction and starting point of page mode.			

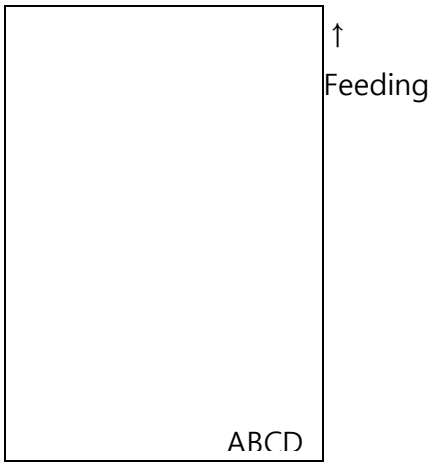
When N=0 (left → right),



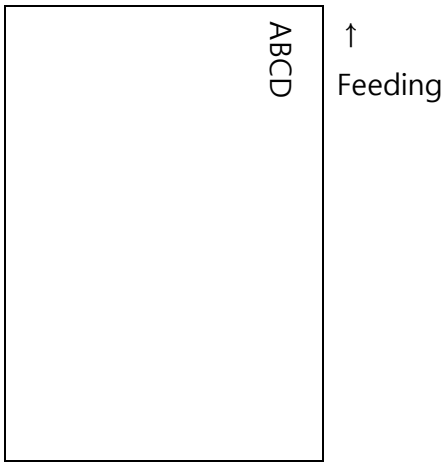
When N=1 (bottom → top),



When N=2 (top → bottom),



When N=3 (top → bottom),



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

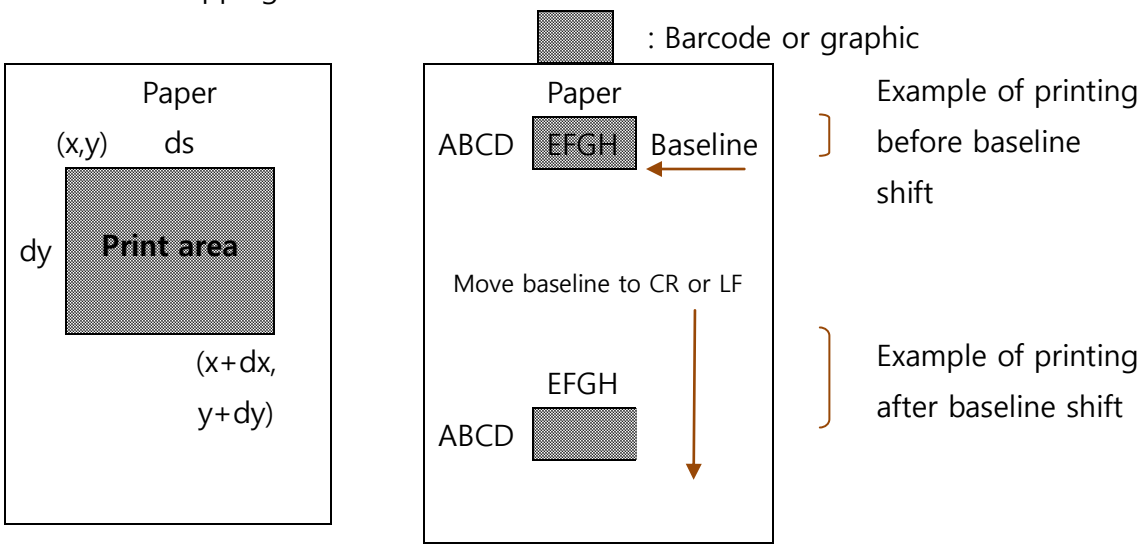
Function	Set Page mode print area										
Code	ASCII	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH
	Hex	1B	57h	xL	xH	yL	yH	dxL	dxH	dyL	dyH
	Decimal27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH	

Range
0≤xL+xH×256≤65535 (0≤xL≤255, 0≤xL≤255)
0≤yL+yH×256≤65535 (0≤yL≤255, 0≤yL≤255)
1≤dxL+dxH×256≤65535 (0≤dxL≤255, 0≤dxL≤255)
1≤dyL+dyH×256≤65535 (0≤dyL≤255, 0≤dyL≤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)

Description
Sets the starting point and size of the printing area.
Horizontal starting point: (xL+xH×256) × 0.125mm
Vertical starting point: (yL+yH×256) × 0.125mm
Horizontal size: (dxL+dxH×256) × 0.125mm
Vertical size: (dyL+dyH×256) × 0.125mm

CAUTION
The maximum configurable page width is limited to 56mm.
The maximum page length that can be set is limited to 150mm.
Since barcode and graphic data are also edited based on the baseline, when the size exceeds the baseline, move the baseline to CR or LF to avoid overlapping.



ESC+FF

Function	Printing of the page area.		
Code	ASCII	ESC	FF
	Hex	1Bh	0Ch
	Decimal	27	12
Description	After editing the received data in the page area, when this command is received, the page area is collectively printed.		

Even after printing, the content of the page area is not erased, so when clearing the page area, use the ESC+S command.

DLE+ENQ+n

Function	Clearing each buffer in the printer in real time			
Code	ASCII	DLE	ENQ	n
	Hex	10h	05h	n
	Decimal16	5	n	
Range	n=2			
Description	n=2: Each buffer of the printer is cleared in real time.			

If data that matches this command is received, care must be taken as the same operation as this command is performed (bit image data, etc.).

DLE+EOT+n

Function Send the printer status values in real time.

Code

ASCII	DLE	EOT	n
Hex	10h	04h	n
Decimal16	4	n	

Range n=2

Description As soon as this command is received, 1 byte of the printer status value is transmitted in real time.

CAUTION

If data that matches this command is received, care must be taken as the same operation as this command is performed (bit image data, etc.).

<Status transmission data>

Bit	State	Hex	Decimal
0	0: There is paper. 1: No paper.	00h 01h	0 1
1	0: Printer head down 1: Printer head up	00h 02h	0 2
2	0: Paper not jammed. 1: Paper jammed.	00h 04h	0 4
3	0: Paper remained enough. 1: Not much paper left.	00h 08h	0 8
4	0: Print completed. 1: Printing or feeding in progress.	00h 10h	0 16
5	0: No cutter error(jam). 1: Cutter error(jam).	00h 20h	0 32
6	0 (Not used)	00h	0
7	0: No paper in the auxiliary sensor. 1: There is paper in the auxiliary sensor.	00h 80h	0 128

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

Function: Raster bit image (horizontal)

Code

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

Range: 0≤m≤3 또는 48≤m≤51,

1≤(xL+xH×256)≤150 (0≤xL≤150, xH=0)

1≤(yL+yH×256)≤436 (0≤yL≤255, 0≤yH≤1)

0≤d≤255 (yL+yH×256)

k (total number of data) = (xL+xH×256) × (yL+yH×256)

Description: Prints raster bit image in mode m.

xL,xH sets the number of data in the horizontal direction (bytes) of the image data.

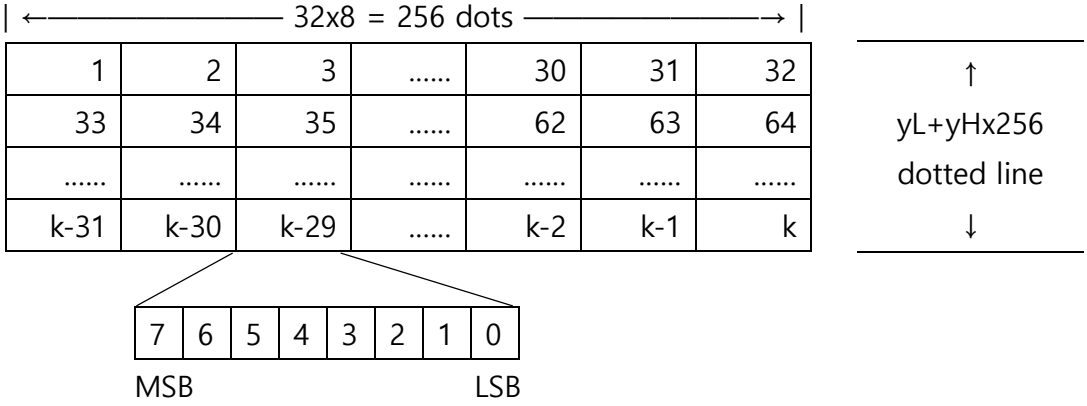
yL,yH sets the number of dotted lines in the vertical direction of the image data.

d indicates raster bit image data.

m	Mode	Enlargement
0, 48	Normal	1X
1, 49	Horizontal enlargement	2X horizontal
2, 50	Vertical enlargement	2X vertical
3, 51	Horizontal, vertical enlargement	2X horizontal, 2X vertical

Example) Unfolded image

When xL+xH×256 = 32 bytes,



SUB+'B'+n1+n2+n3+d1……dk

Function 2D barcode

Code

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

n1	2D barcode type
1	PDF417
2	QR code

1) PDF417

n2	Number of barcode data
	1 < n2 ≤ 255

n3	Barcode size
3	3 rows
4	4 rows
5	5 rows
6	6 rows
7	7 rows
8	8 rows
9	9 rows

2) QR code

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

n3	Barcode size
1	Version 1
3	Version 3
5	Version 5
9	Version 9

※ Vertical size is set automatically.

Description Select and use the appropriate barcode size according to the number of barcode data.

n1: 2D barcode type

n2: number of barcode data

n3: barcode size

d1… dk: barcode data

SUB+'z'+n

Function	Buzzer			
Code	ASCII	SUB	z	n
	Hex	1A	7Ah	n
	Decimal	26	122	n
Range	0≤n≤1			
Description	Turn on/off the buzzer			
	n= buzzer ON time			

N	
0	Buzzer OFF
1	Buzzer ON

DC3+'i'

Function	Cutting after Blackmark Auto-detection		
Code	ASCII	DC3	i
	Hex	13	69h
	Decimal	19	105
Description	When printing, the printer will automatically detect the blackmark and store the information in the internal memory switch and then reads the information registered in SW1, SW2 to cut the paper at the designated position.		
	※Refer to "5-2) Memory Switch for the detailed information.		

※ Please use the provided **Memory Switch Utility Program** to register data on the Memory Switch.

SUB+'1'

Function	Select rule line 1		
Code	ASCII	SUB	1
	Hex	1A	31h
	Decimal26	49	
Description	Rule line 1 is selected among rule lines 1 and 2.		

SUB+'2'			
Function	Select rule line 2		
Code	ASCII	SUB	1 => 2
	Hex	1A	32h
	Decimal26	50	
Description	Rule line 2 is selected among rule lines 1 and 2.		

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

Function	WRITE rule line data						
Code	ASCII	SUB	W	nL	nH	kL	kH
	Hex	1A	57h	nL	nH	kL	kH
	Decimal	26	87	nL	nH	kL	kH
Range	0≤nL+nH×256≤640、(0≤nL≤255, 0≤nH≤3)						
	0≤kL+kH×256≤640、(0≤kL≤255, 0≤kH≤3)						
Description	Writes 1 from nL+nH×256 to kL+kH×256 on the selected rule line.						
 CAUTION	It is ignored if the defined range is exceeded.						
	Once written, the data is preserved without being erased until the clear rule lines command is received or the power is turned off.						

SUB+'C'

Function	Clears rule line data.		
Code	ASCII	SUB	C
	Hex	1A	43h
	Decimal	26	67
Description	All selected rule lines are cleared to 0.		
 CAUTION	To speed up processing, rule line print ON/OFF is used for printing/non-printing of rule lines written once, and this level=>Command is used to re-write rule line data.		

SUB+'O'

Function	Rule line ON		
Code	ASCII	SUB	O
	Hex	1A	4Fh
	Decimal	26	79
Description	Rule lines are set to Valild(ON). When it is enabled, it is written once and the selected rule lines are printed along with the character.		

SUB+'F'

Function	Rule line OFF		
Code	ASCII	SUB	F
	Hex	1A	46h
	Decimal26	70	
Description	Rule lines are set to OFF, and rule line data is preserved.		

SUB+'P'

Function	Print rule line 1 dotted line		
Code	ASCII	SUB	P
	Hex	1A	50h
	Decimal26	80	
Description	Rule line 1 dotted line is printed.		

CAUTION

When printing character and graphic, do not use this command, but use the rule lines ON command. This command should be used to print rule lines in the space between row and row.

ESC+'t'+n

Function	International code page setting			
Code	ASCII	ESC	t	n
	Hex	1B	74h	n
	Decimal27	116	n	
Range	0≤n≤8			
Initial value	n=0			
Description	International characters of each code page are set as shown in the table below.			

CAUTION

Valid when set to 1-byte mode with SUB + x command or FS + "." command.

Invalid when set to 2-byte mode.

n	Code Page
0	PC437 (US)
1	KANA (JAPAN)
2	Greece
3	Windows1251
4	PC866 (Cyrillic #2)
5	Windows1250 (Poland)
6	PC850 (Multilingual)
7	PC860 (Portugal),
8	Windows1252
9	Iran System Encoding Standard
10	PC857 (Turkish)

DLE+AAh+U+80h+T+ABh

Function When using Ethernet, the printer status value is transmitted in real time.

Code

ASCII	DLE					
Hex	10h	AAh	55h	80h	54h	ABh
Decimal16	170	85	128	84	171	

Description This command works only when using Ethernet.

As soon as this command is received, 1 byte of the printer status value is transmitted in real time.

CAUTION

When data matching this command is received, care must be taken as the same operation as this command is performed (bit image data, etc.).

<Status transmission data>

Bit	State	Hex	Decimal
0	0: There is paper.	00h	0
	1: No paper.	01h	1
1	0: Printer head down	00h	0
	1: Printer head up	02h	2
2	0: Paper not jammed.	00h	0
	1: Paper jammed.	04h	4
3	0: Paper is left enough.	00h	0
	1: Not much paper left.	08h	8
4	0: Print completed.	00h	0
	1: Printing or feeding in progress.	10h	16
5	0: No cutter error(jam).	00h	0
	1: Cutter error(jam).	20h	32
6	0 (Not used)	00h	0
7	0: No paper in the auxiliary sensor.	00h	0
	1: There is paper in the auxiliary sensor.	80h	128