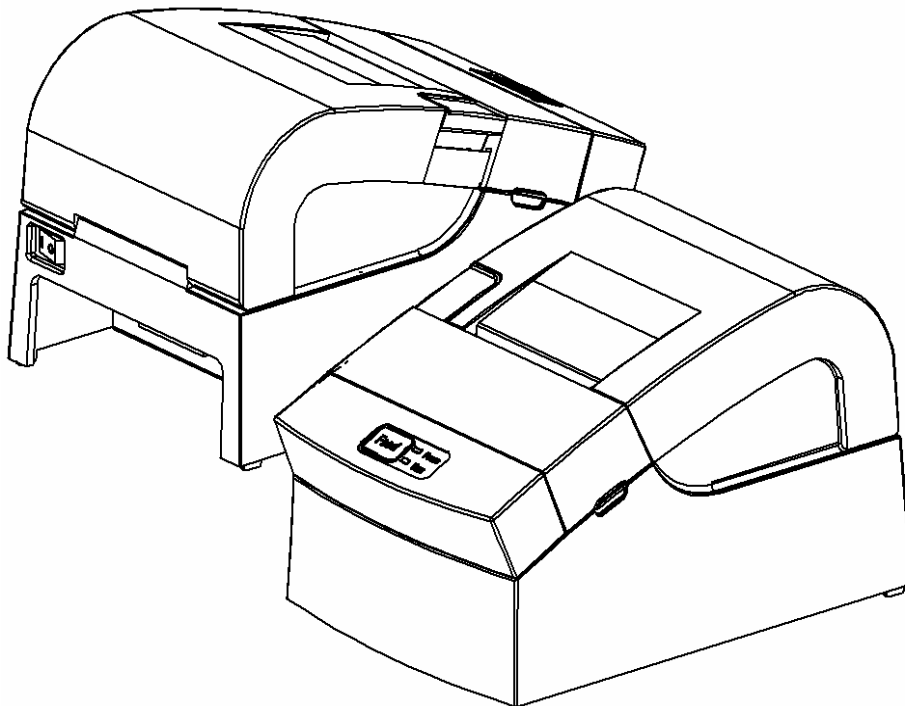


METAPACE

User Manual **Metapace T-4**

Thermal Printer
Rev. 1.00



<http://www.metapace.com>

■ Safety Warning

Proper use of this product can prevent hazardous or physical harm. Make sure all following instructions are followed when using this product.



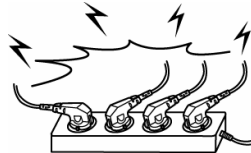
Warning

Violation of following instructions may cause serious injury or risk of life.

Do not connect several plugs into a socket.

- High temperature or fire may cause a danger.
- Use the plug before wiping it in case of contamination of foreign material or water.
- Do not insert the plug into a socket with loosened slots.
- Use approved multi-slots socket.

Prohibit



Please use the adapter provided.

- Other adapter may cause a danger.

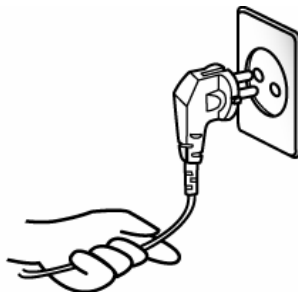
Prohibit



Do not pull the power cord when unplugging.

- Power cord may cause a fire or malfunction resulting in harms.

Prohibit



Keep it in plastic bag and keep out of reach of children.

- Plastic bag capped on the children's heads may cause hazard.

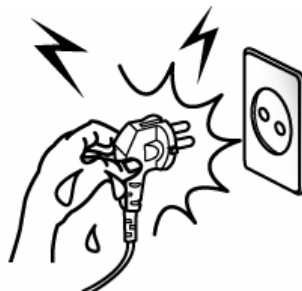
Prohibit



Do not insert or remove the plug with wet hands.

- May cause electric shock.

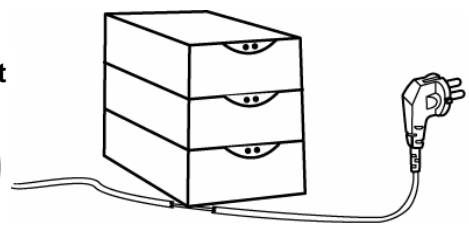
Prohibit



Do not bend the power cord or put heavy things on it, ensuring no damage to the cord.

- May cause a fire.

Prohibit





Caution

Violation of following instructions may cause slight injury or damage to the product.

Power off and take following actions immediately in case of the product producing smoke, or strange smell or sound.

- Power off the printer and remove the plug from the socket immediately in case of exceptional situation.
- Make sure whether there is smoke, and take it to distributor for repair.

Plug Prohibit



Keep the drier out of reach of children.

- Eating the drier may result in serious harm to health.

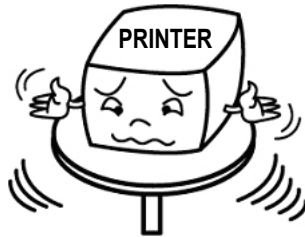
Prohibit



Install the product in a stable place.

- Falling down may cause damage to the product or injury.

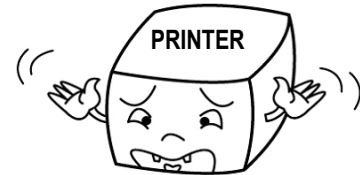
Prohibit



Use the approved product. Do not disassemble, repair or alter the product.

- Consult the distributor for damage to the product.
- Do not touch the sharp blade on the auto cutter.

No disassembling



Note that no water or foreign material is allowed in the printer body.

- Power off the printer, unplug from the socket and contact the distributor in case that there is water or foreign material in the body.

Prohibit



Do not use a malfunctioned product that may cause a fire or electric shock.

- Power off the printer, remove the plug from the socket and contact the distributor.

Socket Prohibit



■ WEEE (Waste Electrical and Electric Equipment)



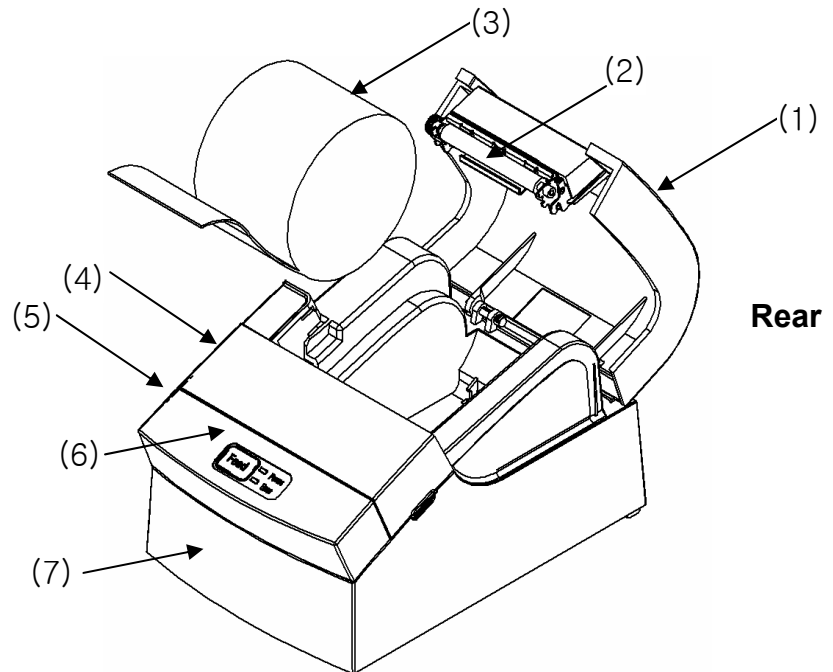
The product marked with this symbol or relevant text indicates that the product cannot be discarded with other family wastes at the end of its life. Please separately dispose of it from other wastes to avoid any harm to the environment and human being. Observe the Recycling Policy to make full use of the limited resource. The household user can contact the distributor or local service office for any information about proper disposal methods and premises. The commercial user can contact the supplier or dispose as per the terms provided in the Purchase Contract. This product cannot be disposed with other commercial wastes.

■ Symbol material: PET

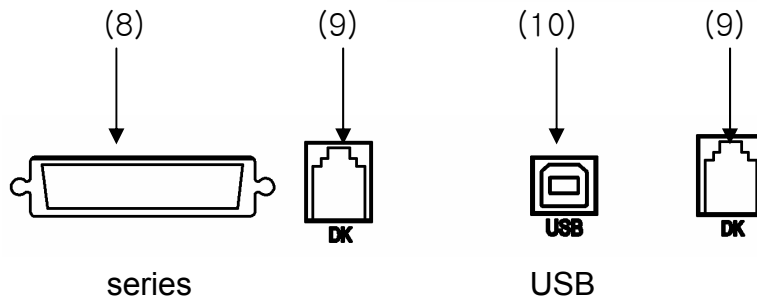
■ Introduction

Assembly Name

- (1) COVER PAPER
- (2) ROLLER ASS'Y
- (3) PAPER
- (4) COVER CUTTER
- (5) COVER FUCNTION
- (6) CASE MAIN
- (7) CASE LOWER
- (8) COMMUNICATION PORT
- SERIAL
- (9) CASH DRAWER (RJ-11)
- (10) USB COMMUNICATION



Rear



series, USB The printer is a banking peripheral device and can be used with ECR, POS etc.

Its main features are shown as follows:

- 1. High speed printing;
- 2. Thermal printing with low noise;
- 3. RS-232 series interface, USB2.0 interface.
- 4. Reception of data is possible via Data buffer, even in printing process.
- 5. The Document Image Processing button enables selection of different printing density.

※ Note

The socket is required near the machine for use.

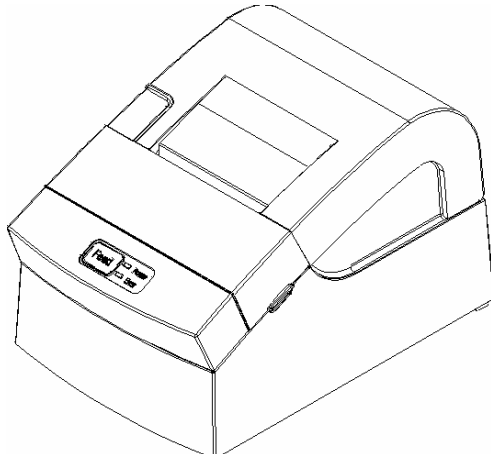
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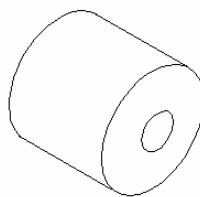
1. Installation and basic operations

1-1 Unpacking

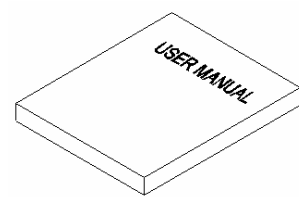
Make sure all following items are available. Please contact the distributor immediately in case of loss or damage.



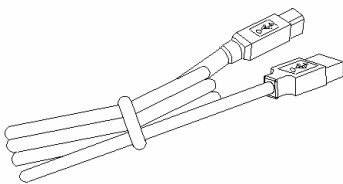
Metapace T-4



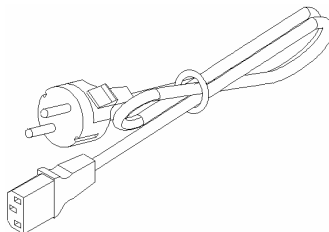
Paper



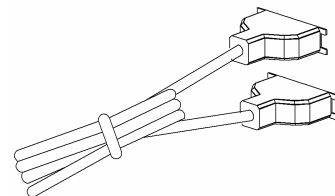
User Manual



Cable interface
USB



Power cord



Cable interface
Serial cable

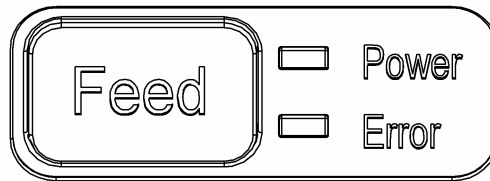
- Only one of the following cable interfaces is provided according to the model you purchase, USB, serial interface.

1-2 Installation Site

Keep the product away from the high temperature or direct sunlight.
Do not place it at the place full of moisture.
Keep it at a stable place and away from shock.
Leave enough space for the printer for convenient use.

1-3 Operation Panel

The Panel consists of one button and two indicators.



Button

FEED

To print one paper, press the FEED button.

To continuously print, press and hold the FEED button.

Indicator

The indicator indicates the state of the printer.

POWER (green)

The indicator lights when the printer powers on.

ERROR (red)

The indicator lights when the paper is used out, or the printer is in idle, or the cover opens.

2. Connection

2-1 AC Adapter Connection

It is required to use the power cord and adapter accompanied with the printer.

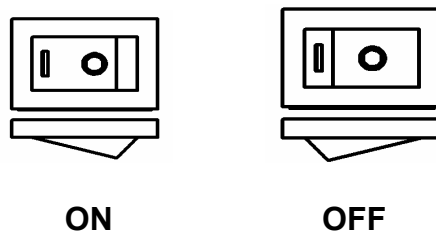
※ **Warning**

Improper power unit may cause a fire or hazard.

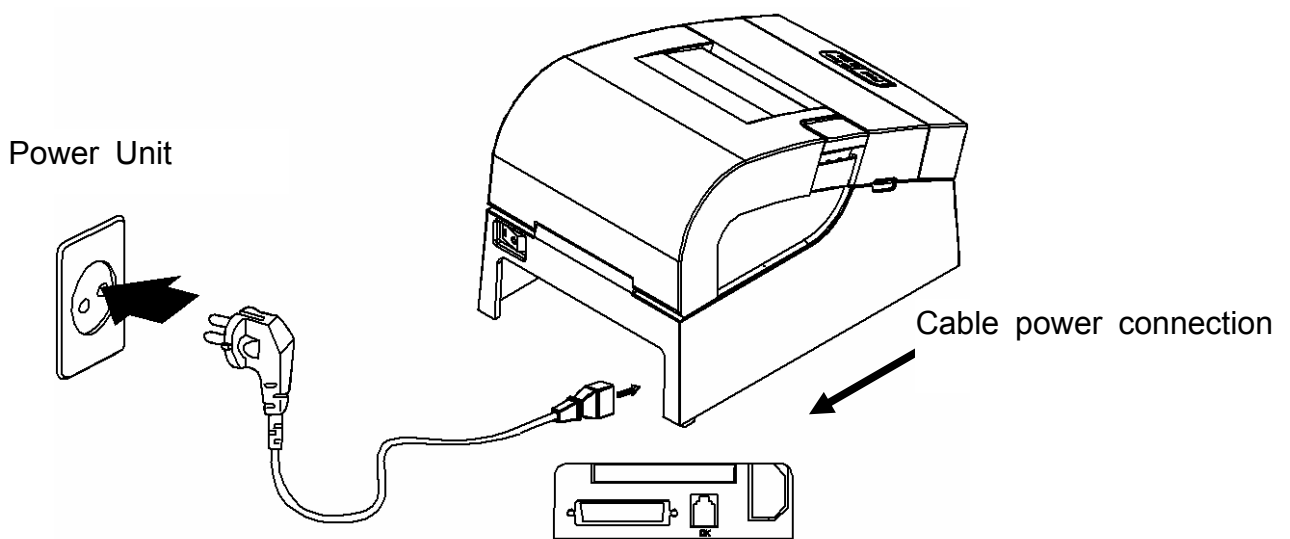
※ **Note**

1. Operate the product in the following orders for safety and durability after power on.

- 1) Connect power cord to the printer.
- 2) Identify the power switch of the printer.
 - The product is delivered in the "OFF" state. It is necessary to switch to "ON".
 - The printer power switch OFF



- 3) Connect the power cord with the power unit.
- 4) Place the power switch to "ON"

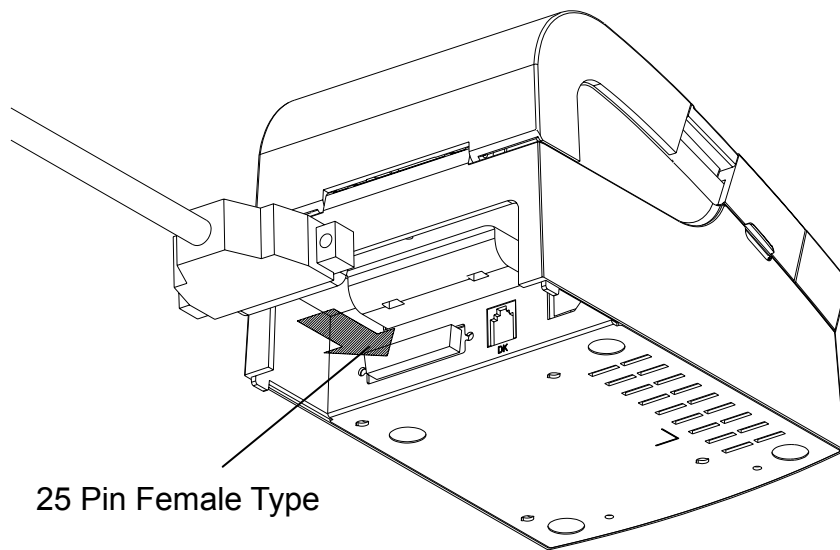


2. When the printer is "ON", the repeated switch of power supply will affect the service life and performance of the printer.

2-2 Interface Connection

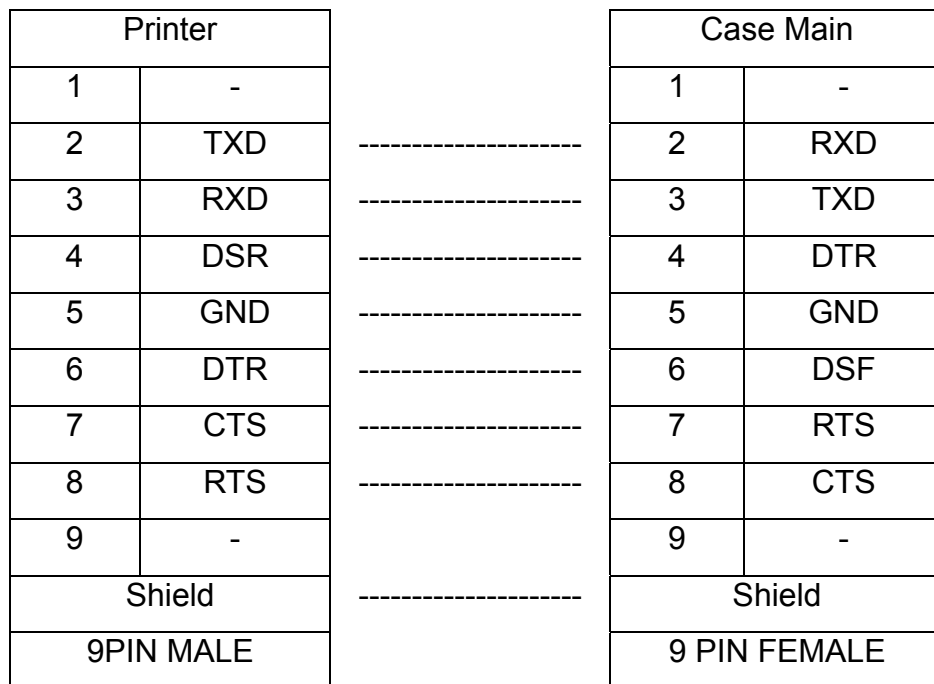
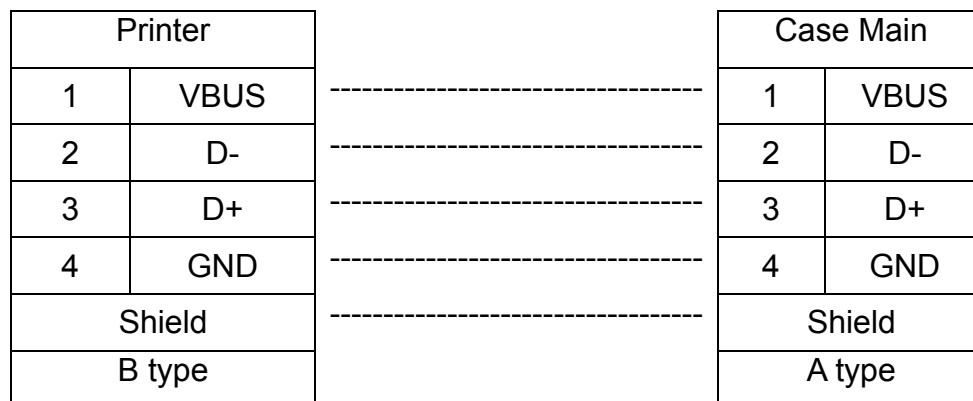
USB, serial interface cable is required for connecting the printer to the computer.

- Make sure the power of the printer and computer is switched on, then connect the cable interface to the printer.
- In the case of serial cable, assemble as the following picture shown.
- Connect the computer to the other end.



Make sure the power unit is removed from the plug of the device when the printer powers on or off, otherwise damage may be caused to the printer and power unit.

1. Make sure the printer has been switched off and the power unit removed from the plug of the device.
2. Check the label on the power unit to make sure the power plug is compatible with the required voltage.
3. Connect the DC cable connector of the power unit to the power connector of the printer as the following instruction.

2-2-1 Serial Interface**2-2-2 USB Interface**

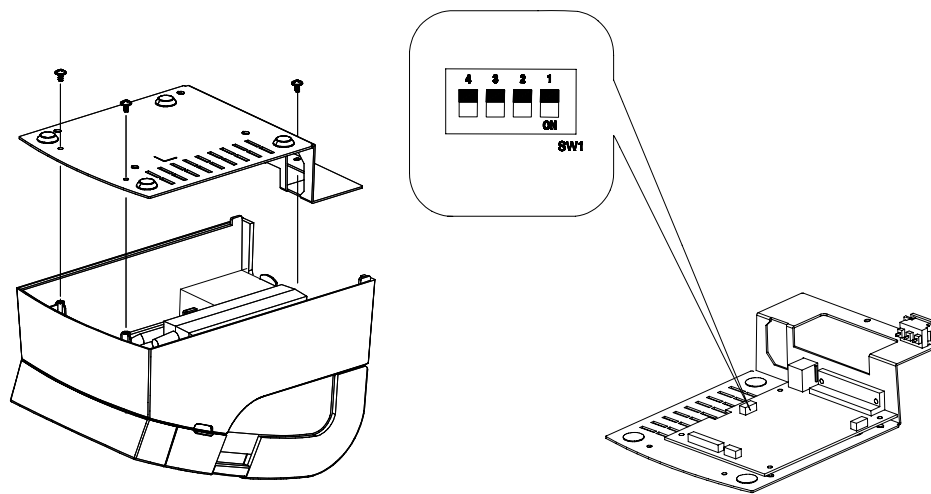
3. DIP Switch Setting

※ Note

It is required to turn off the printer when setting the DIP switch to prevent electrical rejection and damage to the printer.

Replacement of the contact device or the printing density can be set on the DIP switch.

1. Make sure the printer powers off.
2. Release the tray by removing 3 screws. The PCB on the tray is exposed.
3. Note that when the switch turns to “ON”, use the tweezer or sharp tool to unscrew the switch.



Refer to the following settings of the DIP switch.

3-1 Setting the DIP Switches

3-1-1 Setting the DIP switch (RS-232C Serial Interface)

• DIP Switch

SW	Function	ON	OFF	Default
1-1	Auto Cutter	Disable	Enable	OFF
1-2	Reserved			-
1-3	Baud Rate	Refer to Table 1		OFF
1-4				OFF

• Table 1 – Baud rate (bps) Selection

Transmission Speed	1-3	1-4	Default
9600	OFF	OFF	9600
19200	OFF	ON	
38400	ON	OFF	
115200	ON	ON	

3-1-2 Setting the DIP switch (USB2.0 Interface)

• DIP Switch

SW	Function	ON	OFF	Default
1-1	Auto Cutter	Disable	Enable	OFF
1-2	Reserved			-
1-3				-
1-4				-

3-2 Setting the Memory Switches

This printer has “Memory Switch” set which is software switches. Memory Switch set has “MSW1”, “MSW2”, “MSW8”, “MSW9” “Customize value”, “Serial communication condition”. “Memory Switch setting utility” can change the Memory Switch set to ON or OFF as shown in the table below. (default : all OFF)

※ **NOTE**

- The Memory Switch is available to be changed by three methods.
- Memory Switch setting utility.
- Control from BXL/POS command.

Settings of the Memory Switch are stored in the NV memory : therefore, even if the printer is turned off, the settings are maintained.

Metapace T-4

MSW2

Switch	Function	ON	OFF
1	Reserved	-	Fixed to OFF
2	Auto Cutter Function	Full Cutting	Partial Cutting
3~8	Code Page Selection	Refer to following Table	

MSW2-8	MSW2-7	MSW2-6	MSW2-5	MSW2-4	MSW2-3	Character Table
OFF	OFF	OFF	OFF	OFF	OFF	Page 0 437 (USA,standard Europe)
OFF	OFF	OFF	OFF	ON	OFF	Page 1 Katakana
OFF	OFF	OFF	ON	OFF	OFF	Page 2 850 (Multilingual)
OFF	OFF	OFF	ON	ON	OFF	Page 3 860 (Portuguese)
OFF	OFF	ON	OFF	OFF	OFF	Page 4 863 (Canadian-French)
OFF	OFF	ON	OFF	ON	OFF	Page 5 865 (Nordic)
OFF	OFF	ON	ON	OFF	OFF	Page 16 1252 (Latin I)
OFF	OFF	ON	ON	ON	OFF	Page 17 866 (Cyrillic #2)
OFF	ON	OFF	OFF	OFF	OFF	Page 18 852 (Latin 2)
OFF	ON	OFF	OFF	ON	OFF	Page 19 858 (Euro)
OFF	ON	OFF	ON	OFF	OFF	Page 21 862 (Hebrew DOS code)
OFF	ON	OFF	ON	ON	OFF	Page 22 864 (Arabic)
OFF	ON	ON	OFF	OFF	OFF	Page 23 Thai42
OFF	ON	ON	OFF	ON	OFF	Page 24 1253 (Greek)
OFF	ON	ON	ON	OFF	OFF	Page 25 1254 (Turkish)
OFF	ON	ON	ON	ON	OFF	Page 26 1257 (Baltic)
ON	OFF	OFF	OFF	OFF	OFF	Page 27 Farsi
ON	OFF	OFF	OFF	ON	OFF	Page 28 1251 (Cyrillic)
ON	OFF	OFF	ON	OFF	OFF	Page 29 737 (Greek)
ON	OFF	OFF	ON	ON	OFF	Page 30 775 (Baltic)
ON	OFF	ON	OFF	OFF	OFF	Page 31 Thai14
ON	OFF	ON	OFF	ON	OFF	Page 32 Hebrew Old code
ON	OFF	ON	ON	OFF	OFF	Page 33 1255 (Hebrew Newcode)
ON	OFF	ON	ON	ON	OFF	Page 34 Thai11
ON	ON	OFF	OFF	OFF	OFF	Page 35 Thai18
ON	ON	OFF	OFF	ON	OFF	Page 36 855 (Cyrillic)
ON	ON	OFF	ON	OFF	OFF	Page 37 857 (Turkish)
ON	ON	OFF	ON	ON	OFF	Page 38 928 (Greek)
ON	ON	ON	OFF	OFF	OFF	Page 39 Thai16
ON	ON	ON	OFF	ON	OFF	Reserved
ON	ON	ON	ON	OFF	OFF	Reserved
ON	ON	ON	ON	ON	OFF	Reserved
OFF	OFF	OFF	OFF	OFF	ON	Page 43 (PC852e)
OFF	OFF	OFF	OFF	ON	ON	Page 44 (PC864e)
OFF	OFF	OFF	ON	OFF	ON	Page 45 (PC865/PC1252e)
OFF	OFF	OFF	ON	ON	ON	Reserved
OFF	OFF	ON	OFF	OFF	ON	Page 47 ISO 8859-1(Latin I)

Metapace T-4

MSW9

Switch	Function	ON	OFF
1	Language Selection	Korean/Chinese	ENG
2~4	Reserved	-	Fixed to OFF
5~8	International Character Set Selection	Refer to following Table	

MSW9-8	MSW9-7	MSW9-6	MSW9-5	International Character Set
OFF	OFF	OFF	OFF	0. USA
OFF	OFF	OFF	ON	1. France
OFF	OFF	ON	OFF	2. Germany
OFF	OFF	ON	ON	3. UK
OFF	ON	OFF	OFF	4. Denmark
OFF	ON	OFF	ON	5. Sweden
OFF	ON	ON	OFF	6. Italy
OFF	ON	ON	ON	7. Spain
ON	OFF	OFF	OFF	8. Japan
ON	OFF	OFF	ON	9. Norway
ON	OFF	ON	OFF	10. Denmark II
ON	OFF	ON	ON	11. Spain II
ON	ON	OFF	OFF	12. Latin America
ON	ON	OFF	ON	13. Korea

MSW10

Switch	Function	ON	OFF
1	Reserved	-	Fixed to OFF
2	Font Size Selection	Font C(9x24)	Font A(12x24)
3	Print Density	Dark	Normal
4~5	Reserved	-	Fixed to OFF
6~8	Partial Cut Step Selection	Refer to following Table	

MSW10-8	MSW10-7	MSW10-6	Step
OFF	OFF	OFF	85 Steps (Default)
OFF	OFF	ON	82 Steps
OFF	ON	OFF	83 Steps
OFF	ON	ON	84 Steps
ON	OFF	OFF	86 Steps
ON	OFF	ON	87 Steps
ON	ON	OFF	88 Steps
ON	ON	ON	89 Steps

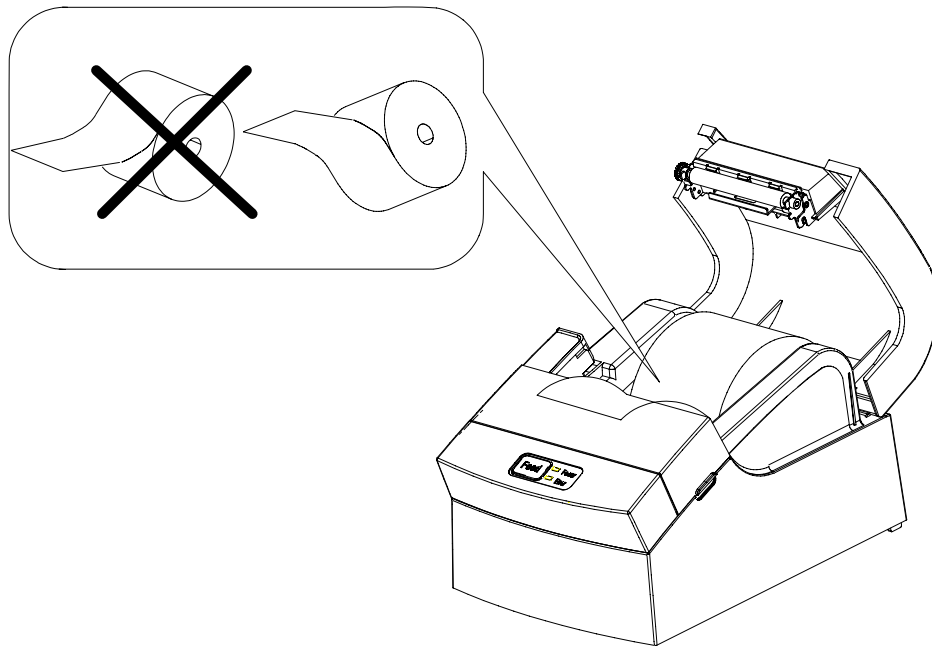
4. Paper Loading

Please use the standard paper.

※ Note

It is important to power off the printer in the process of paper loading.

1. Open the paper cover and take out all used paper.
2. Load the paper in the proper direction as the following shown in case of paper jam.



3. Place the paper to the extent that it can be exposed from the printer. Additionally, close the cover.
4. Power on the printer.

5. Sample Test

1. Sample Printing Test

*** Sample Test Start-up**

After loading paper and close the cover and the PAPER FEED button pressed and held, the sample test will start upon power on. The self-test will conduct printing according to the existing setting of the following information available.

- Software version control
- DIP switch state

*** Preparation State**

The printer will print the message "Please press the FEED BUTTON" after printing the existing setting state. LED flickering indicates the printer is in the preparation state for printing test.

2. Self-test Completion

Upon the printing test completion, the printer will print " ** TEST COMPLETED **", indicating the test is finished.

It is necessary to restart printing if the self-test is not over yet.

6. Hexadecimal Dumping

This function is designed for advanced user to send and receive the data accurately and identify the software problems. The Hexadecimal Dumping function is helpful for searching special terms because all data and command statements are printed in hexadecimal form. Please follow the steps below to use the hexadecimal dumping function.

1. Open the paper cover after the printer powers off.
2. With the FEED button pressed and held, power off the printer, then close the cover
3. Go to the Hexadecimal Dumping mode.
4. Please execute the item where the printer sends data.
Printer prints all data in two separate rows.
The hexadecimal code appears in the first row, and the ASCII code corresponding to the hexadecimal code in the second row.

1B	21	00	1B	26	02	40	40		. ! . . & . @ @
1B	25	01	1B	63	34	00	1B		. % . . c4 . .
41	42	43	44	45	46	47	48		ABCDEFGH

- If there is no corresponding ASCII code, the period (.) is printed.
- In the Hexadecimal Dumping mode, do not use other commands than DEL EOT and DLE ENQ.

5. Upon the hexadecimal dumping is finished, power off the printer.
6. The Hexadecimal Dumping mode will be removed when the printer powers on next time.

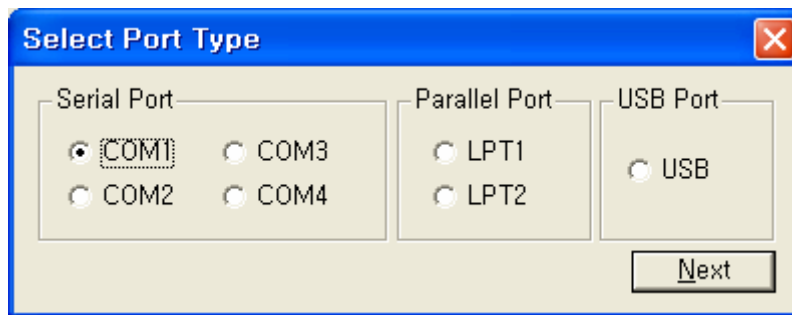
7. Specification

Printing Method	Thermal printing	
Resolution	203Dpi (8 dot/mm)	
Printing Width	48mm	
Paper Width	58.0±0.5mm	
Strings Per Line	32 (Font A) (12x24) / 42 (Font C) (9x24)	
Printing Speed	About 19 lines/sec Max. 65 mm/sec at 25°C/printing duty 12.5%	
Paper	Thickness: 0.062 ~ 0.075mm	
	Roller size: Ø80mm	
	Paper size - Internal diameter: Ø12mm (0.47") - External diameter: Ø18mm (0.71")	
Receive Buffer Size	4K bytes	
Voltage	100~240 VAC	
Environment	Temperature	0 ~ 45°C (operating) -20 ~ 60°C (storage)
	Humidity	10 ~ 80% RH (operating) 10 ~ 90% RH (storage)
MCBF	Mean time to repair	20,000,000 line
	Thermal tab	100km

8. WINDOWS Driver Setting

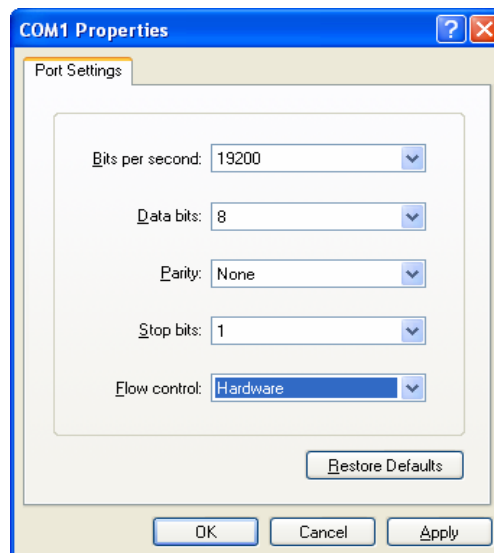
8-1 Serial (RS-232C) Interface Model Windows Driver Setting

1. After executing the product setting CD, go to Metapace T-4 Drivers > Windows Driver > Drivers folder > execute Metapace T-4_WIN_Vx.x.xx.exe
2. Select "Next" from the window at the initial setting.
3. Install Select "Install" from the "Ready to Install the Program" window.
4. Select a serial port from the "Select Port Type", and then select "Next".



(Fig 1)

5. The computer will reboot after selecting an example from the "Question".
6. Upon reboot, operate as follows: Start > Setting > Printer and Scan > Metapace T-4 Icon > Right click > Select "Property".
7. After selecting the "Port" button from the "Property" window, select "Self-diagnosis" and "Agree", and then select "OK".



8. After selecting the "General" from the "Property" window, select test page for printing and make sure whether the speed is faster.

8-2 USB2.0 Interface Model Windows Driver Setting

1. After executing the product setting CD, go to Metapace T-4 > Drivers > Windows Driver > Drivers folder > execute Metapace T-4_WIN_Vx.x.xx.exe
2. Select "Next" from the window at the initial setting.
3. Install Select "Install" from the "Ready to Install the Program" window.
4. Select a serial port from the "Select Port Type", and then select "Next". (See Fig 1)
- 5-1. For WINDOW 2000/VISTA/2008 Server/7
 - ① Open the "Information" window, restart the printer after power it off, and then select "OK".
 - ② The computer will reboot after the setting is completed.
- 5-2. For WINDOW XP/2003 Server
 - ① Open the "Information" window, restart the printer after power it off, and then select "OK".
 - ② Open the "New hardware check" window, select "Proceed to next". The computer will reboot after the USB driver setting is completed.

※ Reference

Click "OK" or "Continue Anyway" when the information related to the electronic signature appears during the setting process.

6. Upon reboot, operate as follows: Start > Setting > Printer and Scan > Metapace T-4 Icon > Right click > Select "Property".
7. After selecting the "General" from the "Property" window, select test page for printing and make sure whether the speed is faster.

9. Control Command List

Command	Name
HT	Horizontal tab
LF	To print and Line Feed
CR	To print and Carriage Return
DLE EOT	To send the real time status
ESC SP	To set the right side space of the characters
ESC !	To set the printing mode
ESC \$	To set the absolute position
ESC %	To select/cancel the defined character
ESC &	To select the character to define
ESC *	To set the bit image mode
ESC -	To set/clear the underline mode
ESC 2	To set the 1/6 inches line space
ESC 3	To set the line space
ESC =	To set the peripheral devices
ESC ?	To cancel the defined character
ESC @	To initialize the printer
ESC D	To set the position of horizontal tab
ESC E	To select the highlight mode
ESC J	To print and paper feed
ESC R	To select the Multilanguage character set
ESC V	To set/clear 90° clockwise rotated character
ESC \	To set the relative position
ESC a	To align position
Esc d	To print and n-line feed
Esc p	To generate pulse
Esc t	To select the character code table
Esc {	To select/clear vertical inverted character printing
FS p	To print the NV image
FS q	To define the NV image
GS !	To select the character size
GS (E	To Customize NV memory area
GS *	To define download bit image
GS /	To print the download bit image
GS :	To begin/end macro definition
GS B	To set/clear black and with inversion mode
GS H	To select HRI character printing position
GS I	To transmit the printer ID
GS L	To set the left margin
GS V	To Select cut mode and cut paper
GS W	To set the output size
GS ^	To run the macro
GS f	To select the font for HRI characters
GS h	To select the bar code height
GS k	To print the bar code
GS v	To print the raster bit image
GS w	To select the bar code size

10. Summary of Control Command

HT

[Name] Horizontal Tab
[Type] ASCII HT
HEX 09
Decimal 9

[Description] Set the horizontal tab if you want to use the print position.

LF

[Name] To print and line feed
[Type] ASCII LF
HEX 0A
DECIMAL 10

[Description] To print the data in the printer buffer and feed one line.

CR

[Name] To print and carriage return
[Type] ASCII HT
HEX 0D
DECIMAL 13

[Description] To print the data in the printer buffer and move the printer head to the beginning position of the line.

DLE EOT *n*

[Name] To send the real-time status
[Type] ASCII DLE EOT *n*
HEX 10 04 *n*
DECIMAL 16 4 *n*

[Range] $1 \leq n \leq 4$

[Description] Real-time status of the printer selected by *n* as shown below will be sent.

n = 1: To transmit the printer status
n = 2: To transmit the off-line status
n = 3: To transmit the error status
n = 4: To transmit the paper-sensing status

n = 1: Printer Status

Bit	Off/On	HEX	DECIMAL	Function
0	Off	00	0	Not used. Fixed to Off
1	On	02	2	Not used. Fixed to On
2	Off	00	0	Not used
3	Off	00	0	On-line
	On	08	8	Off-line
4	On	10	16	Not used. Fixed to On
5-6	-	-	-	Not defined
7	Off	00	0	Not used. Fixed to Off

n = 2: Off-line Status

Bit	Off/On	HEX	DECIMAL	Function
0	Off	00	0	Not used. Fixed to Off
1	On	02	2	Not used. Fixed to On
2	Off	00	0	Cover is closed
	On	04	4	Cover is open
3	Off	00	0	Paper is not fed through the paper feed button
	On	08	8	Paper is fed through the paper feed button
4	On	10	16	Not used. Fixed to On
5	Off	00	0	Not used. Fixed to Off
6	Off	00	0	Not used. Fixed to Off
7	Off	00	0	Not used. Fixed to Off

n = 3: Error Status

Bit	Off/On	HEX	DECIMAL	Function
0	Off	00	0	Not used. Fixed to Off
1	On	02	2	Not used. Fixed to On
2	-	-	-	Not defined
3	Off	00	0	Not used. Fixed to Off
4	On	10	16	Not used. Fixed to On
5	Off	00	0	Not used. Fixed to Off
6	Off	00	0	Not used. Fixed to Off
7	Off	00	0	Not used. Fixed to Off

n = 4: Continuous Paper Detection Status

Bit	Off/On	HEX	DECIMAL	Function
0	Off	00	0	Not used. Fixed to Off
1	On	02	2	Not used. Fixed to On
2,3	Off,Off	00	0	Not used. Fixed to Off
	On,On	0C	12	Not used. Fixed to Off
4	On	10	16	Not used. Fixed to On
5,6	Off	00	0	Paper roll sensor. Paper is detected.
	On	60	96	Paper roll end is detected by the paper roll sensor
7	Off	00	0	Not used. Fixed to Off

ESC SP *n*

[Name] To set the right side space of the characters

[Type] ASCII ESC SP *n*
 HEX 1B 20 *n*
 DECIMAL 27 32 *n*

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

[Description] To set the right side space of the characters

ESC ! *n*

[Name] To set the printer mode

[Type] ASCII ESC ! *n*
 HEX 1B 21 *n*
 DECIMAL 27 33 *n*

[Range] $0 \leq n \leq 255$ [Description] Printer mode is set depending on the value of *n* as follows

Bit	Off/On	HEX	DECIMAL	Function
0	Off	00	0	Font A(12x24) Selected
	On	01	1	Font C(9x24) Selected
1	Off	00	0	Not defined
	On	02	2	Not defined
2	-	-	-	Not defined
3	Off	00	0	Highlight mode is not set
	On	08	8	Highlight mode is set
4	Off	00	0	Double-height mode is not selected
	On	10	16	Double-height mode is selected
5	Off	00	0	Double-width mode is not selected
	On	20	32	Double-width mode is selected
6	-	-	-	Not defined
7	Off	00	0	Underline mode is not selected
	On	80	128	Underline mode is selected

ESC \$ *nL nH*

[Name] To set absolute position

[Type] ASCII ESC \$ *nL* *nH*
 HEX 1B 24 *nL* *nH*
 DECIMAL 27 36 *nL* *nH*

[Range] $0 \leq nL \leq 255$ $0 \leq nH \leq 255$

[Description] To set the distance from the beginning point of the line and print the characters. The distance from the beginning point for the printing position means horizontal or vertical motion unit.

ESC % *n*

[Name] To select/cancel user defined character set

[Type] ASCII ESC % *n*
 HEX 1B 25 *n*
 DECIMAL 27 37 *n*

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

[Description] To select/cancel user-defined character set.

User-defined character set is cancelled when LBS of *n* is 0,

User-defined character set is selected when LBS of *n* is 1.

ESC & *y c1 c2 [x1 d1... d(y X x1)]...[xk d1...d(y X xk)]*

[Name] To define user-defined characters

[Type] ASCII ESC & *y c1 c2 [x1 d1... d(y X x1)]...[xk d1...d(y X xk)]*
 HEX 1B 26 *y c1 c2 [x1 d1... d(y X x1)]...[xk d1...d(y X xk)]*
 DECIMAL 27 38 *y c1 c2 [x1 d1... d(y X x1)]...[xk d1...d(y X xk)]*

[Range] $y = 3$

$32 \leq c1 \leq c2 \leq 126$

$0 \leq x \leq 12$ (Font A (12×24))

$0 \leq d1... d(y \times xk) \leq 255$

[Description] To define user defined characters.

y defines the number of bytes in the vertical direction.

c1 defines the code of beginning character, and *c2* defines the end code.

x defines number of dots in horizontal direction.

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

[Name] To set bit image mode

[Type] ASCII ESC * *m nL nH d1... dk*
 HEX 1B 2A *m nL nH d1... dk*
 DECIMAL 27 42 *m nL nH d1... dk*

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

$0 \leq nL \leq 255, 0 \leq nH \leq 3, 0 \leq d \leq 255$

[Description] Use *m* to select the bit image, where number of dots is defined by *nL* and *nH* as shown below.

<i>m</i>	Mode	Vertical Direction		Horizontal Direction (*1)	
		Number of dots	Density	Density	Number of Data (k)
0	8-dot single-density	8	67 DPI	100 DPI	$nL + nH \times 256$
1	8-dot double-density	8	67 DPI	200 DPI	$nL + nH \times 256$
32	24-dot single-density	24	200 DPI	100 DPI	$(nL + nH (256))(3)$
33	24-dot double-density	24	200 DPI	200 DPI	$(nL + nH (256))(3)$

ESC – *n*

[Name] To set/clear underline mode

[Type] ASCII ESC - *n*
 HEX 1B 2D *n*
 DECIMAL 27 45 *n*

[Range] $0 \leq n \leq 2, 48 \leq n \leq 50$ [Description] Underline mode is set or cleared depending on the value of *n*.

<i>n</i>	Function
0,48	Underline mode is cleared
1,49	Underline mode is selected (Dot thickness – 1)
2,50	Underline mode is selected (Dot thickness – 2)

ESC 2

[Name] To set the 1/6 inches line space

[Type] ASCII ESC 2
 HEX 1B 32
 DECIMAL 27 50

[Description] To set the line space to 1/6 inches

ESC 3 *n*

[Name] To set the line space

[Type] ASCII ESC 3 *n*
 HEX 1B 33 *n*
 DECIMAL 27 51 *n*

[Range] $0 \leq n \leq 255$ [Description] Line space will set to [*n* X vertical or horizontal motion unit] inches.**ESC = *n***

[Name] To set the peripheral devices

[Type] ASCII ESC = *n*
 HEX 1B 3D *n*
 DECIMAL 27 61 *n*

[Range] $0 \leq n \leq 255$ [Description] Device sending the data to the host computer is selected by using *n*.

Bit	Off/On	HEX	DECIMAL	Function
0	-	-	-	Not defined
1	Off	00	0	Printer is not recognized
	On	02	1	Printer is recognized
2-7	-	-	-	Not defined

ESC ? *n*

[Name] To cancel the user defined character set

[Type]	ASCII	ESC	?	<i>n</i>
	HEX	1B	3F	<i>n</i>
	DECIMAL	27	63	<i>n</i>

[Range] $32 \leq n \leq 126$

[Description] To cancel the user-defined character sets.

ESC @

[Name] To initialize the printer

[Type]	ASCII	ESC	@
	HEX	1B	40
	DECIMAL	27	64

[Description] This function purges the data in the buffer when the power is on or recovers the printer mode.

ESC D *n1...nk* NUL

[Name] To set the horizontal tab position

[Type]	ASCII	ESC	D	<i>n1...nk</i>	NUL
	HEX	1B	44	<i>n1...nk</i>	00
	DECIMAL	27	68	<i>n1...nk</i>	0

[Range] $1 \leq n \leq 255$

$0 \leq k \leq 32$

[Description] To set the horizontal tab position

n defines the number of columns for the horizontal table from the beginning point of the line.

k is the total number of horizontal tabs.

ESC E *n*

[Name] To set highlight mode

[Type]	ASCII	ESC	E	<i>n</i>
	HEX	1B	45	<i>n</i>
	DECIMAL	27	69	<i>n</i>

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

[Description] To select/clear highlight mode

Highlight mode is cleared when the LSB is 0.

Highlight mode is set when the LSB is 1.

ESC J *n*

[Name] To print and paper feed

[Type]	ASCII	ESC	J	<i>n</i>
	HEX	1B	4A	<i>n</i>
	DECIMAL	27	74	<i>n</i>

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

[Description] To print the data in the printer buffer and feed the paper.

n x vertical or horizontal motion unit inches

ESC R *n*

[Name] To select multilanguage character sets

[Type] ASCII ESC R *n*

HEX 1B 52 *n*

DECIMAL 27 82 *n*

[Range] $0 \leq n \leq 10$

[Description] To select the multilanguage character set with *n*.

Chinese version is not supported.

<i>n</i>	Character set	<i>n</i>	Character set
0	U.S.A.	6	Italy
1	France	7	Spain
2	Germany	8	Japan
3	U.K.	9	Norway
4	Denmark I	10	Denmark II
5	Sweden		

	Country	ASCII code (hexadecimal number)											
		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A.	#	\$	@	[	\	\]	^	'	{	|	}	~
1	France	#	\$	à	°	ç	§	^	'	é	ù	è	..
2	Germany	#	\$	§	Ä	Ö	Ü	^	'	ä	ö	ü	β
3	U.K.	£	\$	@	[	\	\]	^	'	{	|	}	~
4	Denmark I	#	\$	@	Æ	Ø	Å	^	'	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain	Pt	\$	@	í	Ñ	¿	^	'	..	ñ	}	~
8	Japan	#	\$	@	[	¥	]	^	'	{	|	}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü

ESC V *n*

[Name] To set/clear 90° clockwise rotated character sets

[Type] ASCII ESC V *n*
 HEX 1B 56 *n*
 DECIMAL 27 86 *n*

[Range] $0 \leq n \leq 1$, $48 \leq n \leq 49$ [Description] To set/clear 90° clockwise rotated character sets depending on the value of *n*.

<i>n</i>	Function
0,48	To clear the 90° clockwise rotated character
1,49	To set the 90° clockwise rotated character

ESC \ *nL nH*

[Name] To set the relative printer position

[Type] ASCII ESC \ *nL* *nH*
 HEX 1B 5C *nL* *nH*
 DECIMAL 27 92 *nL* *nH*

[Range] $0 \leq nL \leq 255$ $0 \leq nH \leq 255$ [Description] The beginning point is based on the current position by the horizontal and vertical motion unit. This command sets the position from the current position. [(*nL* + *nH* X 256) X (horizontal or vertical motion unit)].**ESC a *n***

[Name] Selective adjustment

[Type] ASCII ESC a *n*
 HEX 1B 61 *n*
 DECIMAL 27 97 *n*

[Range] $0 \leq n \leq 2$, $48 \leq n \leq 50$ [Description] All data for aligning in a line have clear positions.
Adjustment type by the selection of *n* is as follows.

<i>n</i>	Adjustment
0,48	Left adjustment
1,49	Middle adjustment
2,50	Right adjustment

ESC d *n*[Name] To print and *n* line feed

[Type] ASCII ESC D *n*
 HEX 1B 64 *n*
 DECIMAL 27 100 *n*

[Range] $0 \leq n \leq 255$ [Description] To print the data in the buffer and feed *n* lines

ESC p m t1 t2

[Name] To generate pulse

[Format] ASCII ESC p *m* *t1* *t2*
 Hex 1B 70 *m* *t1* *t2*
 Decimal 27 112 *m* *t1* *t2*

[Range] m = 0, 1, 48, 49
 0 ≤ t1 ≤ 255, 0 ≤ t2 ≤ 255

[Description] Outputs the pulse specified by t1 and t2 to connector pin m as follows.

<i>m</i>	Connector pin
0, 48	Drawer kick-out connector pin 2
1, 49	Drawer kick-out connector pin 5

ESC t n

[Name] To select the character code table

[Type] ASCII ESC t *n*
 HEX 1B 74 *n*
 DECIMAL 27 116 *n*

[Range] 0 ≤ n ≤ 5, n = 11, 255

[Description] *n* is used to select the character code table as follows.
 Chinese version is not supported.

<i>n</i>	Page
0	0: PC437 [U.S.A., standard Europe]
1	1: Katakana
2	2: PC850 [Multilingual]
3	3: PC860 [Portuguese]
4	4: PC863 [Canadian-French]
5	5: PC865 [Nordic]
11	11: PC858 [Euro]
255	Space page

[Default value] *n* = 0**ESC { n**

[Name] To select/cancel the vertical inverted printing mode

[Type] ASCII ESC { *n*
 HEX 1B 7B *n*
 DECIMAL 27 123 *n*

[Range] 0 ≤ n ≤ 255

[Description] To select or cancel the vertical inverted printing mode of the characters
 - Vertical inverted mode is canceled when LSB is 0.
 - Vertical inverted mode is selected when LSB is 1.

FS p n m

[Name] NV image output

[Type] ASCII FS p n m
 HEX 1C 70 n m
 DECIMAL 28 112 n m

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

[Description] NV image is printed in various sizes depending on the value of m .

m	Mode	Vertical dot density	Horizontal dot density
0,48	Normal	200 DPI	200 DPI
1,49	Double-width	200 DPI	100 DPI
2,50	Double-height	100 DPI	200 DPI
3,51	Quadruple	100 DPI	100 DPI

n is the NV image number defined by using FS q command.

m defines the image mode.

FS q n [xL xH yH d1 ...dk]1...[xL xH yL yH d1...dk]n

[Name] To define NV image

[Type] ASCII FS q n [xL xH yH d1 ...dk]1...[xL xH yL yH d1...dk]n
 HEX 1C 71 n [xL xH yH d1 ...dk]1...[xL xH yL yH d1...dk]n
 DECIMAL 28 113 n [xL xH yH d1 ...dk]1...[xL xH yL yH d1...dk]n

[Range] $1 \leq n \leq 255$, $0 \leq nL \leq 255$, $0 \leq d \leq 255$

$0 \leq xH \leq 33$ (when $1 \leq xL + xH \times 256 \leq 1023$)

$0 \leq yL \leq 1$ (when $1 \leq yL + yH \times 256 \leq 288$)

$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$

Total defined data area = 1M bits(128K bytes)

[Description] The value of n is used to define the NV image. The value n is the defined NV image number.

- xL and xH are used to set the NV image to $(xL + xH(256)) \times 8$ dots in horizontal direction.

- yL and yH are used to set the NV image to $(yL + yH(256)) \times 8$ dots in vertical direction.

GS ! n

[Name] To select the character size

[Type] ASCII GS ! n
 HEX 1D 21 n
 DECIMAL 29 33 n

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

($1 \leq \text{Vertical number of times} \leq 8$, $1 \leq \text{Horizontal number of times} \leq 8$)

[Description] Bits 0 to 2 are used to select the height of the characters and the bits 4 to 7 are used to select the width of the characters.

Bit	Off/On	HEX	DECIMAL	Function
0 ~ 1				Height of the characters. Refer to the Table 2
4 ~ 5				Width of the characters. Refer to the Table 1

Table 1: Width of the characters		
HEX	DECIMAL	Width
00	0	1 (normal)
10	16	2 (double-width)

Table 2: Height of the characters		
HEX	DECIMAL	Height
00	0	1 (normal)
01	1	2 (double-height)

GS (E pL pH fn [parameter]

[Name] To Customize NV memory area

[Description] Customize the NV user memory area. The table below explains the functions available in this command. Executes commands related to the user setting mode by specifying the function code fn.

fn	Format	No.	Function
1	GS (E pL pH fn d1 d2	1	Changes into the user setting mode
2	GS (E pL pH fn d1 d2 d3	2	Ends the user setting mode sessio. (Performs a soft reset.)
3	GS (E pL pH fn [a1 b18...b11]... [ak bk8...bk1]	3	Sets value(s) for the memory switch
4	GS (E pL pH fn a	4	Transmits the settings of the memory switch to the host

[Notes] - pL, pH specifies (pL + pH x 256) as the number of bytes after pH (fn and [parameter]).

- The user setting mode is a special mode to change the values in the NV user memory with this command.
- In Function 2, the printer performs software reset. Therefore, the printer clears the receive and print buffers, and resets all settings (user-defined characters, macros, and the character style) to the mode in effect at power on.
- Frequent write commands by this command, may damage the NV memory. Therefore, it is recommended to write to NV memory no more than 10 times a day.
- While processing this command, the printer is BUSY while writing data to the user NV memory and stops receiving data. Therefore it is prohibited to transmit data including the real-time commands during the execution of this command.

<Function 1> GS (E pL pH fn d1 d2 (fn=1)

[Format] ASCII GS (E pL pH fn d1 d2
Hex 1D 28 45 pL pH fn d1 d2
Decimal 29 40 69 pL pH fn d1 d2

[Range] (pL + pH x 256) = 3 (pL=3, pH=0)
fn=1
d1=73, d2=78

[Description] ▪ Enter the user setting mode and notifies that the mode has changed.

	HEX	DECIMAL	Number of Data
Header	37H	55	1 byte
Flag	20H	32	1 byte
NUL	00H	0	1 byte

- The following commands are enabled in the user setting mode.
<Function 2> through <Function 12> of GS (E, GS I.

<Function 2> GS (E pL pH fn d1 d2 d3 (fn=2)											
[Format]	ASCII	GS	(	E	pL	pH	fn	d1	d2	d3	
	Hex	1D	28	45	pL	pH	fn	d1	d2	d3	
	Decimal	29	40	69	pL	pH	fn	d1	d2	d3	
[Range]	(pL + pH x 256) = 4 (pL=4, pH=0) fn=2 d1=79, d2=85, d3=84										
[Description]	<ul style="list-style-type: none"> Ends the user setting mode and performs a software reset. Therefore, the printer clears the receive and print buffers, and resets all settings (user-defined character, downloaded bit images, macros, and the print mode) to the mode that was in effect at power on. This function code (fn=2) is enabled only in the user setting mode. 										

<Function 3> GS (E pL pH fn [a1 b18...b11]...[ak bk8...bk1] (fn=3)											
[Format]	ASCII	GS	(	E	pL	pH	fn	[a1 b18...b11]...	[ak bk8...bk1]		
	Hex	1D	28	45	pL	pH	fn	[a1 b18...b11]...	[ak bk8...bk1]		
	Decimal	29	40	69	pL	pH	fn	[a1 b18...b11]...	[ak bk8...bk1]		
[Range]	10 ≤ (pL + pH x 256) ≤ 65535 fn=3 a=2, 9,10 b=48, 49, 50										
[Default]	▪ all switches are set to Off (b=48).										
[Description]	▪ Change the memory switch specified by a to the values specified by b. - When b=48, the applicable bit is turned to Off. - When b=49, the applicable bit is turned to On. - When b=50, the applicable bit is not changed. ▪ When a=2, the memory switch 2 is set as follows :										
	Bit	Setting value				Function					
	1					Reserved					
	2	48				Autocutter Function : Partial Cutting					
		49				Autocutter Function : Full Cutting					
	3~8	Codepage selection									
	▪ When a=9, the memory switch 9 is set as follows :										
	Bit	Setting value				Function					
	1	48				ENG					
		49				Chinese/Korean					
	2~4					Reserved					
	5~8	International Character Set selection									
	▪ When a=10, the memory switch 10 is set as follows										
	Bit	Setting value				Function					
	1					Reserved					
	2	48				Font A(12x24)					
		49				Font C(9x24)					
	3	48				Printing density : Normal					
		49				Printing density : Dark					
	4~5					Reserved					
	6~8					Partial cutting step selection					

<Function 4> GS (E pL pH fn a (fn=4)

[Format] ASCII GS (E pL pH fn a
Hex 1D 28 45 pL pH fn a
Decimal 29 40 69 pL pH fn a

[Range] (pL + pH x 256) = 2 (pL=2, pH=0)
fn=4
a=1, 2, 8, 9, 10, 11

[Description] ▪ Transmits the setting value(s) of the memory switch specified by a.

	HEX	DECIMAL	Amount of Data
Header	37H	55	1 byte
Flag	21H	33	1 byte
Data	30H or 31H	48 or 49	8 bytes
NUL	00H	0	1 byte

- Data for the setting is transmitted as 8 bytes or a data string in the order from bit 8 to bit 1, as follows :
 - Off : HEX = 30H / DECIMAL = 48
 - On : HEX = 31H / DECIMAL = 49

GS * x y d1...d (x X y X 8)

[Name] To define the download bit image

[Type] ASCII GS * x y d1...d (x X y X 8)
Hex 1D 2A x y d1...d (x X y X 8)
Decimal 29 42 x y d1...d (x X y X 8)

[Range] $1 \leq x \leq 255$
 $1 \leq y \leq 48$ where, $x \times y \leq 1536$
 $0 \leq d \leq 255$

[Description] Download bit image is used as clear dot by x and y.

- x: number of dots in horizontal direction
- y: number of dots in vertical direction (download bit image printing)

GS / m

[Name] To print download bit image

[Type] ASCII GS / m
Hex 1D 2F m
Decimal 29 47 m

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

[Description] The printing of download bit image is used as a clear mode by m.
Mode is selected by m as shown in the following table.

m	Mode	Vertical Dot Density	Horizontal Dot Density
0,48	Normal	200 DPI	200 DPI
1,49	Two times horizontal magnification	200 DPI	100 DPI
2,50	Two times vertical magnification	100 DPI	200 DPI
3,51	Overall two times magnification	100 DPI	100 DPI

GS :

[Name] To define beginning/end of macro

[Type] ASCII GS :

 HEX 1D 3A

 DECIMAL 29 58

[Description] To define beginning/end of macro

GS B *n*

[Name] Black and White switching printer mode on/off

[Type] ASCII GS B *n*

 HEX 1D 42 *n*

 DECIMAL 29 66 *n*

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

[Description] Black and White switching printer mode

- Black and White switching mode is OFF when LSB is 0
- Black and White switching mode is ON when LSB is 1

GS H *n*

[Name] To select the printing position of the HRI characters

[Type] ASCII ESC H *n*

 HEX 1D 48 *n*

 DECIMAL 29 72 *n*

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

[Description] To select the printing position of HRI characters when printing the bar code

 Select the printing position using *n* as shown below

<i>n</i>	Printing position	<i>n</i>	Printing position
0,48	No printing	2,50	Under the bar code
1,49	Over the bard code	3,51	Both over and under the bar code

- HRI (Human Readable interpretation)

[Default value] $n = 0$ **GS I *n***

[Name] To send the printer ID

[Type] ASCII ESC I *n*

 HEX 1D 49 *n*

 DECIMAL 29 73 *n*

[Range] $1 \leq n \leq 3$, $49 \leq n \leq 51$ [Description] To send the printer ID using *n* as shown below

<i>n</i>	Printer ID	Specifications	ID (HEXaDECIMAL)
1,49	Printer Model ID	Metapace T-4	30
2,50	Type ID		02
3,51	ROM Version ID	Depends on ROM version	10

GS L nL nH

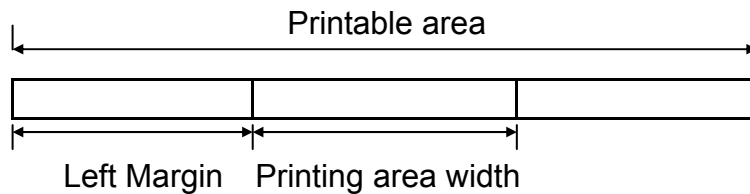
[Name] To set the left margin

[Type] ASCII GS L nL nH
 HEX 1D 4C nL nH
 DECIMAL 29 76 nL nH

[Range] $0 \leq nL \leq 255$
 $0 \leq nH \leq 255$

[Description] Left margin is determined by nL and nH.

Left margin is set to $[(nL + nH \times 256) \times (\text{horizontal motion unit})]$ inches



① GS V m ② GS V m n

[Name] To Select cut mode and cut paper

[Type] ① ASCII GS V m
 HEX 1D 56 m
 DECIMAL 29 86 m
 ② ASCII GS V m n
 HEX 1D 56 m n
 DECIMAL 29 86 m n

[Range] ① $m = 1, 49$
 ② $m = 66, 0 \leq n \leq 255$

[Description] Selects a mode for cutting paper and executes paper cutting.

The value of m selects the mode as follows.

m	Print Mode
0, 1, 49	Partial cut (one point center uncut)
66	Feeds paper (cutting position + $[n \times (\text{vertical motion unit})]$), And cuts the paper partially (one point center uncut).

GS W nL nH

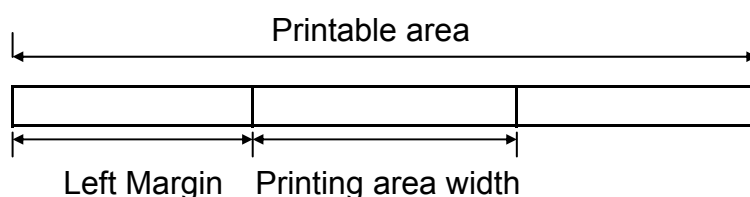
[Name] To set the printing area

[Type] ASCII GS W nL nH
 HEX 1D 57 nL nH
 DECIMAL 29 87 nL nH

[Range] $0 \leq nL \leq 255, 0 \leq nH \leq 255$

[Description] Printing area is accurately set by nL and nH.

Printing area is set to $[(nL + 256 \times nH) \times (\text{horizontal motion unit})]$ inches.



GS ^ r t m

[Name] To run the macro

[Type] ASCII GS ^ r t m
 HEX 1D 5E r t m
 DECIMAL 29 94 r t m

[Range] $0 \leq r \leq 255$, $0 \leq t \leq 255$, $0 \leq m \leq 1$

[Description] To run the macro

- *r*: Repetition frequency of macro execution.
- *t*: Delay time for executing all macros is $t \times 100$ msec.
- *m*: Macro execution mode

LSB of *m* = 0Macros will be executed *r* times continuously with a delay time of *t*.LSB of *m* = 1

After waiting for the delay time *t*, paper out LED indicator blinks, and the printer is in standby until the feed button is pressed. Once the button is depressed, the printer executes the macro once. And this operation is repeated *r* times.

GS f n

[Name] To select the font of HRI (Human Readable interpretation) characters

[Type] ASCII GS f n
 HEX 1D 66 n
 DECIMAL 29 102 n

[Range] $n = 0, 48$

[Description] To select the font of HRI characters used for barcode printing

Chinese version is not supported.

Select the font as in the table shown below.

<i>N</i>	Font
0,48	Font A (12 * 24)

GS h n

[Name] To set the height of the barcode

[Type] ASCII GS h n
 HEX 1D 68 n
 DECIMAL 29 104 n

[Range] $1 \leq n \leq 255$

[Description] To set the height of the barcode

n is number of dots in vertical direction.[Default value] *n* = 162

① GS k m d1...dk NUL ② GS k m n d1...dn

[Name] To printer barcode

[Type]	① ASCII	GS	k	m	d1...dk	NUL
	HEX	1D	6B	m	d1...dk	00
	DECIMAL	29	107	m	d1...dk	0
	② ASCII	GS	k	m	n	d1...dn
	HEX	1D	6B	m	n	d1...dn
	DECIMAL	29	107	m	n	d1...dn

[Range] ① $0 \leq m \leq 6$ (Values for k and d are determined by the barcode system.)

② $65 \leq m \leq 73$ (Values for n and d are determined by the barcode system.)

[Description] Select the bar code system and print the barcode.

<i>m</i>		Barcode System	Number of Characters	Remarks
①	0	UPC-A	11≤k≤12	48≤d≤57
	1			
	2	JAN 13(EAN)	12≤k≤13	48≤d≤57
	3	JAN8(EAN)	7≤k≤8	48≤d≤57
	4	CODE39	1≤k	48≤d≤57,65≤d≤90,32,36,37,43,45,46,47
	5	ITF	1≤k (even number)	48≤d≤57
	6	CODABAR	1≤k	48≤d≤57,65≤d1≤68,36,43,45,46,47,58

M		Barcode System	Number of Characters	Remarks
②	65	UPC-A	11≤n≤12	48≤d≤57
	66			
	67	JAN13(EAN)	12≤n≤13	48≤d≤57
	68	JAN8(EAN)	7≤n≤8	48≤d≤57
	69	CODE39	1≤n≤255	48≤d≤57,65≤d≤90,32,36,37,43,45,46,47
	70	ITF	1≤n≤255 (even number)	48≤d≤57
	71	CODABAR	1≤n≤255	48≤d≤57,65≤d1≤68 36,43,45,47,58
	72	CODE93	1≤n≤255	0≤d≤127
	73	CODE128	2≤n≤255	0≤d≤127

[When using CODE93 ($m=72$)]

- The printer will print the beginning of the HRI string with HRI character (□).
- The printer will print the end of the HRI string with the HRI character (□).
- The printer will print the control characters with HRI character (■ + an alphabetic character).

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Control character			HRI character	Control character			HRI character
ASCII	HEX	DECIMAL		ASCII	HEX	DECIMAL	
NUL	00	0	■U	DLE	10	16	■P
SOH	01	1	■A	DC1	11	17	■Q
STX	02	2	■B	DC2	12	18	■R
ETX	03	3	■C	DC3	13	19	■S
EOT	04	4	■D	DC4	14	20	■T
ENQ	05	5	■E	NAK	15	21	■U
ACK	06	6	■F	SYN	16	22	■V
BEL	07	7	■G	ETB	17	23	■W
BS	08	8	■H	CAN	18	24	■X
HT	09	9	■I	EM	19	25	■Y
LF	0A	10	■J	SUB	1A	26	■Z
VT	0B	11	■K	ESC	1B	27	■A
FF	0C	12	■L	FS	1C	28	■B
CR	0D	13	■M	GS	1D	29	■C
SO	0E	14	■N	RS	1E	30	■D
SI	0F	15	■O	US	1F	31	■E
				DEL	7F	127	■T

<Example> Output GS k 72 7 67 111 100 101 13 57 51



[When using CODE128 ($m=73$)]

- When CODE128 is used for the printer, the details of the data transmission are as follows.

- ① Code set character in front of the barcode string
One of CODE A, CODE B, or CODE C must be selected.

※ Description of the CODE128 bar code

CODE128 barcode is the combination of three types of code sets and 103 different barcode characters, and one barcode can represent 128 ASCII codes and two digit numbers. Each code set can represent the following characters.

- * Code set A: ASCII character 00H to 5FH
- * Code set B: ASCII character 20H to 7FH
- * Code set C: Two digits number (100 numerals from 00 to 99)

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The following characters can be represented by the CODE128 barcode.

* SHIFT characters

In the code set A, the character right next to the SHIFT follows the process of code set B. SHIFT character cannot be used in code set C.

* Code set selection character (CODE A, CODE B, CODE C).

This character converts the code set A, B, or C into following code set.

* Function character (FNC1, FNC2, FNC3, FNC4)

Using function characters depends on the application program.

Only FNC1 can be used in code set C.

- ② Special characters are defined as the combination of two characters, "{", and one character. ACSII character "{" is defined as two consecutive transmissions of "{".

Specific character	Transmit data		
	ASCII	HEX	DECIMAL
SHIFT	{S	7B,53	123,83
CODE A	{A	7B,41	123,65
CODE B	{B	7B,42	123,66
CODE C	{C	7B,43	123,67
FNC1	{1	7B,31	123,49
FNC2	{2	7B,32	123,50
FNC3	{3	7B,33	123,51
FNC4	{4	7B,34	123,52
"{"	{{	7B,7B	123,123

<Example> Example for printing "No. 123456"

In this example, code B is used for "No." and the following numbers are printed in code B.

GS k 73 10 123 66 78 111 46 123 67 12 34 56



- * If there is no code selection character in front of the bar code data, the printer will stop executing the command and the following data will be processed as general data.
- * If "{" and the following character does not correspond to the certain special character, the printer will stop executing the command, the following data will be processed as general data.
- * Code selection character and the SHIFT character are not printed as HRI characters.
- * FUNCTION characters will be shown as spaces in HRI characters.
- * Control characters (<00>H to <1F>H and <7F>H) will be shown as spaces in HRI characters.

<Miscellaneous> The empty space on the left and right sides of the barcode must be secured.

(The empty space requirements are different depending on barcode type.)

GS v 0 m xL xH yL yH dl...dk

[Name] To print raster bit image

[Type] ASCII GS v 0 m xL xH yL yH dl...dk
 HEX 1D 76 30 m xL xH yL yH dl...dk
 DECIMAL 29 118 48 m xL xH yL yH dl...dk

[Range] $0 \leq m \leq 3$, $48 \leq m \leq 51$
 $0 \leq xL \leq 255$, $0 \leq xH \leq 255$, $0 \leq yL \leq 255$
 $0 \leq d \leq 255$
 $k = (xL + xH \times 256) \times (yL + yH \times 256)$ (k=0)

[Description] To select the raster bit-image mode

The value of m for selecting each mode is as follows.

m	Mode	Vertical dot density	Horizontal dot density
0,48	Normal	200dpi	200dpi
1,49	Double-width	200dpi	100dpi
2,50	Double-height	100dpi	200dpi
3,51	Quadruple	100dpi	100dpi

- xL and xH are for selecting the number of data bit (xL + xH x 256) in horizontal direction of the image.
- yL and yH are for selecting the number of data bit (yL + yH x 256) in vertical direction of the image.

GS w n

[Name] To set the barcode width

[Type] ASCII GS w n
 HEX 1D 77 n
 DECIMAL 29 119 n

[Range] $2 \leq n \leq 6$

[Description] To set the width of the barcode

n	Module width (mm) for Multi-level Bar Code	Bi-level Bar Code	
		Thin element width (mm)	Thick element width (mm)
2	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.500	0.500	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2.000

- Multilevel barcode: UPC-A, UPC-E, JAN13, CODE93, CODE128
- Bi-level barcode: CODE39, ITF, CODABAR

[Default value] n = 3