

# Zonerich

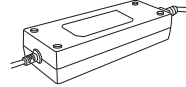
## **AB-T88**

MINI Thermal  
Printer  
USER'S MANUAL

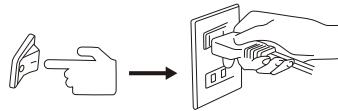
## NOTICE



You must use only the supplied adapter. It is dangerous to use other adapters.



Make sure the printer power is off before plug or unplug the cable.



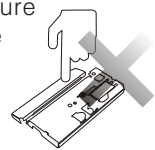
Please don't place the printer in humidity or dusty space, excessive humidity and dust may damage it.



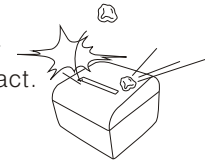
Do not put foods or drinks on the printer, in case that splash into the printer.



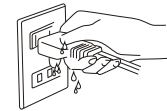
The print head has a high temperature after work. Please don't touch the print head or touch the motor shell in case scalded.



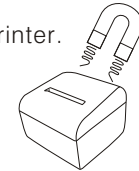
Avoid external impact when operating, do not fall the printer down and avoid vigorously impact.



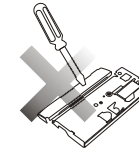
Do not plug or unplug with your hands wet. You can be electrocuted.



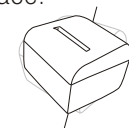
Avoid magnetic objects near the printer.



Don't use tweezers, knife, screwdriver or other hard objects touch the heating piece; for the heating piece will be hurt eternally.



Do not put printer on unstable surface.



# INTRODUCTION

The AB-T88 Thermal Printer is designed for use with electronic instruments such as system ECR, POS, banking equipment, computer peripheral equipment, etc.

## The main features of the printer are as follows:

1. High speed printing: 200mm per second max.
2. Low noise thermal printing.
3. RS-232, Parallel, USB, Ethernet Interface.
4. The data buffer allows the unit to receive print data even during printing.
5. Peripheral units drive circuit enables control of external devices such as cash drawer.
6. Bar code printing is possible by using a bar code command.

**Please be sure to read the instruction in this manual carefully before using your new AB-T88.**

## WARNING

Some semiconductor devices are easily damaged by static electricity. You should turn the printer "OFF", before you connect or remove the cables on the rear side, in order to guard the printer against the static electricity. If the printer is damaged by the static electricity, you should turn the printer "OFF".

**NOTE:** The socket-outlet shall be near the equipment and it shall be easy accessible.

All specifications are subjected to change without notice.

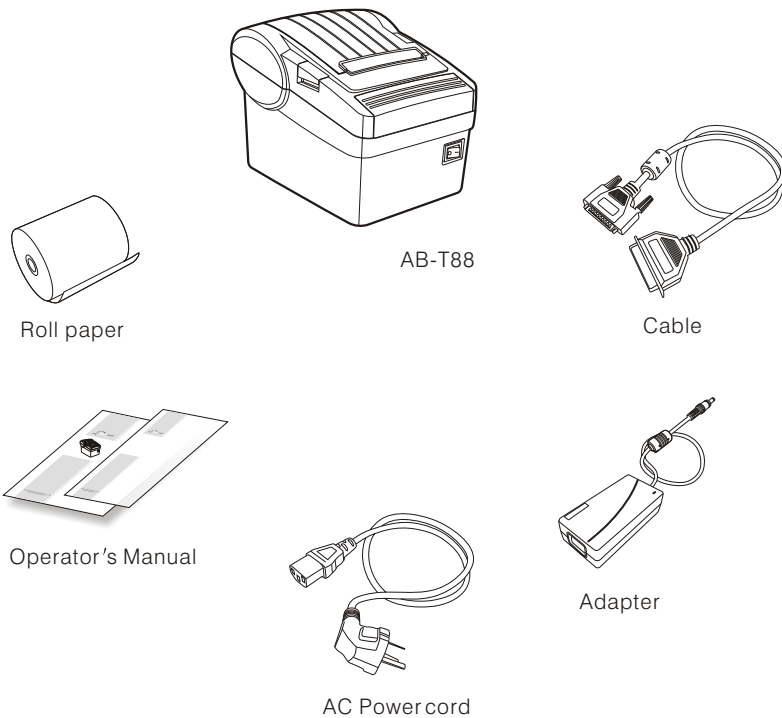
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# Chapter 1. Setting up the Printer

## 1-1. Unpacking

Your printer box should include these items. If any items are damaged or missing, please contact your dealer for assistance.



## 1-2. Using the Printer

### BUTTON

#### ● FEED

Press the FEED button once to advance paper one line. You can also hold down the FEED button to feed paper continuously.

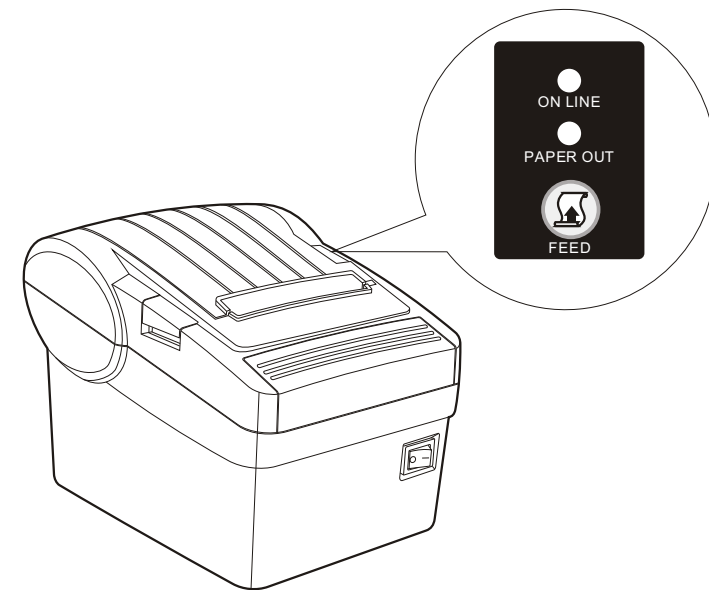
### PANEL LIGHTS

#### ● POWER

The POWER light (green) is on whenever the printer is on.

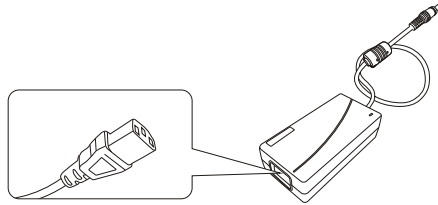
#### ● ON LINE

This light (green) is on when the printer is on line.



## Chapter 2. Connecting the cables

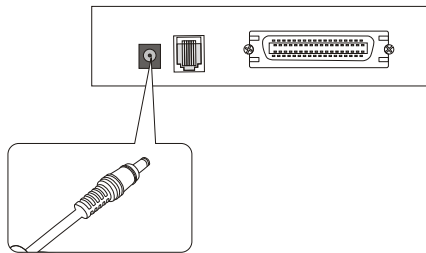
### 2-1. Connecting the AC Cable



**NOTE:** To remove the DC cable connector, make sure that the power supply's power cord is unplugged; then grasp the connector at the arrow and pull it out straight.

### 2-2. Connecting the AC adapter to the printer

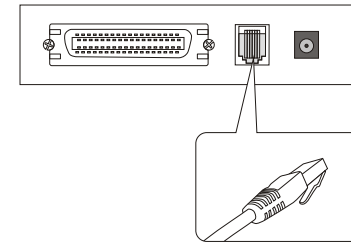
Connect the cable to the connector panel on the back of the printer. Which is shown below:



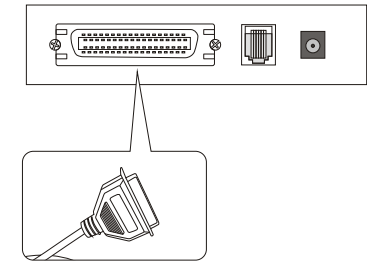
Power Connector Cable

**NOTE:** Before connecting any of the cables, make sure that both the printer and the host are turned off.

### 2-3. Connecting Interface Cable and Drawer Cable to the printer



Drawer kick-out Cable



Interface Connector Cable

Connect the Host Computer (POS/ECR) to the printer using an interface cable that matches the specifications of the printer and the Host computer (POS/ECR). Be sure to use a drawer that matches the printer's specification.

- 1). Turn off both the printer and the Host computer (POS/ECR).
- 2). Plug the interface cable connector into the printer's interface connector, then tighten the screws on both sides of the connector. In case of the parallel interface, squeeze the wire dips on the printer together until they lock in place on both sides of the connector.
- 3). Plug the drawer cable into the drawer kick-out connector on the back of the printer next to the interface connector. Do not connect a telephone line to the drawer kick-out connector; otherwise the printer and the telephone line may be damaged.
- 4). Turn on the Printer and Host computer (POS/ECR).

### WARNING

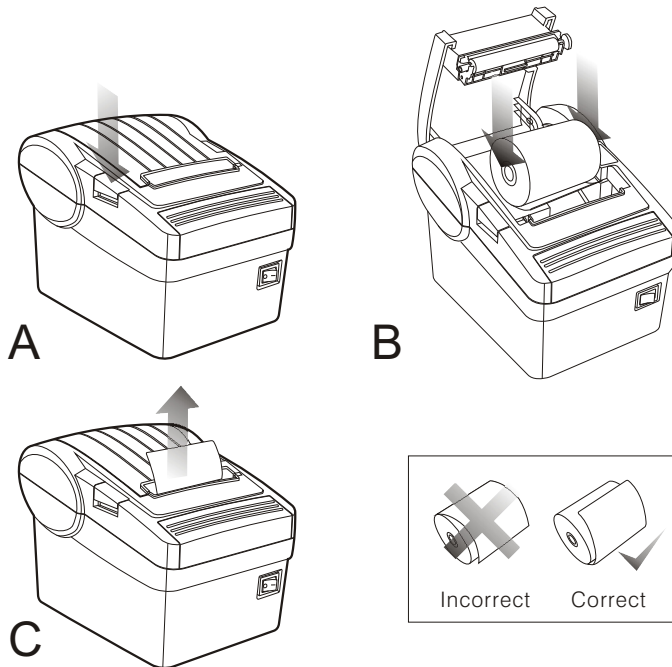
When connecting or disconnecting the power supply from the printer, make sure that the power supply is not plugged into an electrical outlet. Otherwise you may damage the power supply or the printer.

If the power supply's rated voltage and your outlet's voltage do not match, contact your dealer for assistance. Do not plug in the power cord. Otherwise, you may damage the power supply or the printer.

## Chapter 3. Installing the roll paper

### 3-1. Installing or Replacing the Roll Paper

1. Make sure that the printer is not receiving data; otherwise, data may be lost.
2. Open the paper roll cover by pressing the cover-open button.
3. Remove the used paper roll core if there is one.
4. Insert the paper roll as shown.
5. Be sure the correct direction that the paper comes off the roll.
6. Pull out a small amount of paper, as shown. Then close the cover.



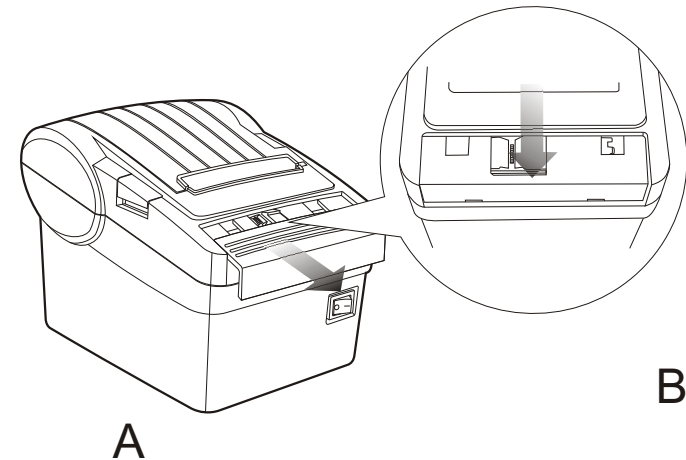
**NOTE:** Be sure to use roll paper that meet the specification. Do not use roll paper that have the paper glued to the core, if that the printer cannot detect the paper end correctly.

**NOTE:** Do not open the print cover while the printer is operating. This may damage the printer.

**NOTE:** When closing the cover, press the center of printer cover firmly to prevent paper miss-loading

### 3-2. Removing Jammed Paper

1. Turn the printer off and press the cover open button.
2. Remove jammed paper, reinstall the roll, and close the cover.
3. If paper is caught in the cutter and you cannot open the printer cover, open the cutter cover as shown in A.
4. Open the cutter cover.
5. Turn the knob (as shown in B). Until the cutter blade to the normal position.



6. Close the cutter cover.
7. Open the printer cover and remove the jammed paper.

**NOTE:** Do not touch the print head because it can be very hot after printing.

### 3-3. Cleaning the Print Head

Turn off the printer, open the paper roll cover, and clean the thermal elements of the print head with a cotton swab moistened with an alcohol solvent (ethanol, methanol, or IPA).

Recommend to clean the thermal head periodically (generally every 3 months) to maintain receipt print quality.

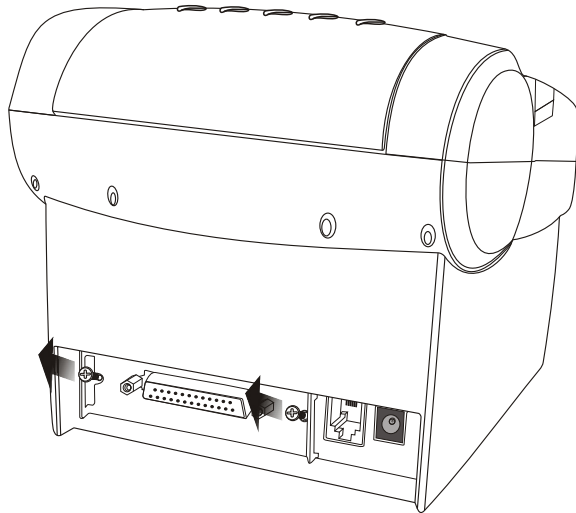
**NOTE:** After printing, the print head can be very hot. Be careful not to touch it and to let it cool before you clean it. Do not damage the print head by touching it with your fingers or any hard object.

## Chapter 4. Replacing interfaces

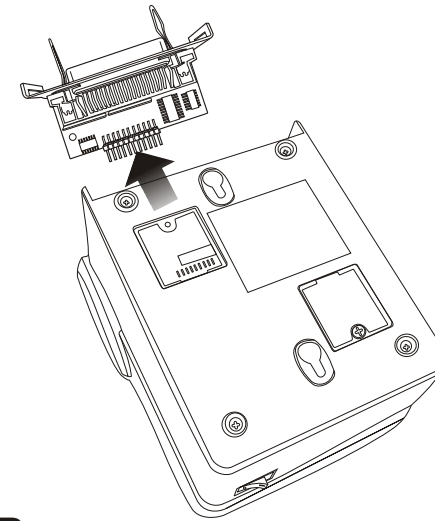
The standard configuration of the printer contains an interface inside. Users can buy serial, parallel, USB, ethernet interface separately according to user's requirement. The printer supports replacing the interface by users.

### Replacing the interface:

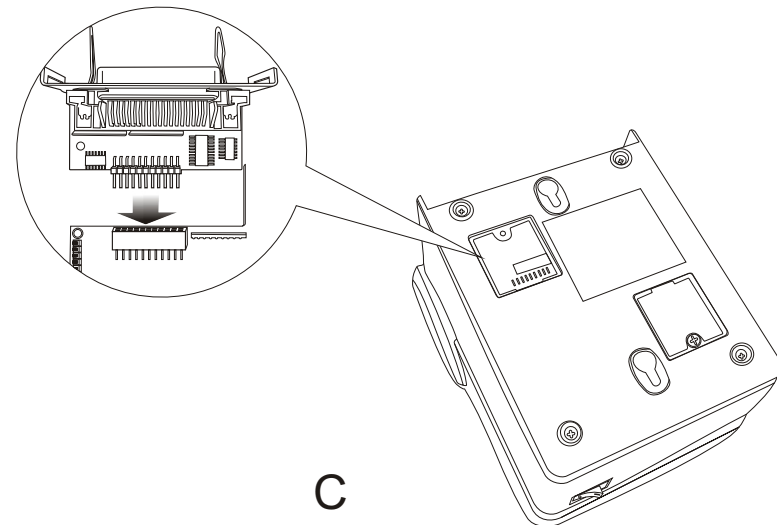
1. Loosen the screws as (A)
2. Take away the interface as (B)
3. Insert the interface as (C)
4. Install the Screws again



A



B



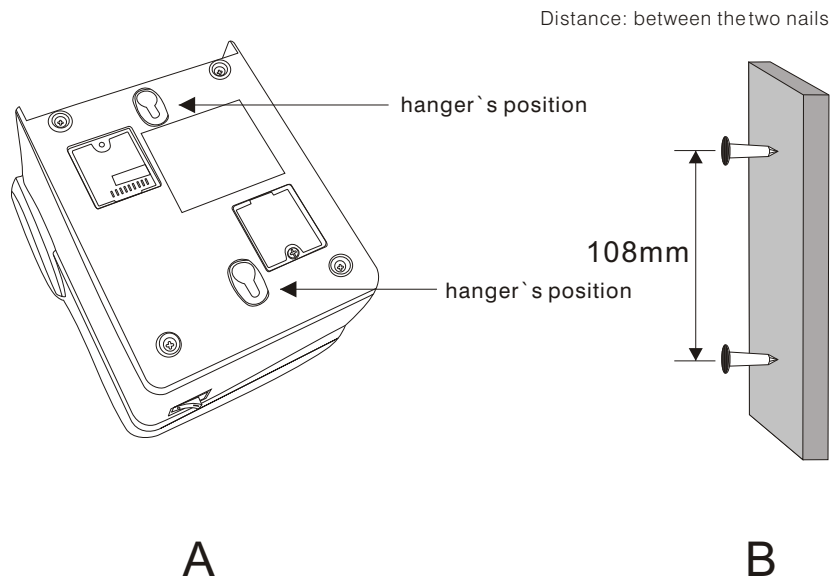
C

Observe the connectors through the grids.

## Chapter 5. Hang the printer

To save the space, the printer can be hung on the wall.

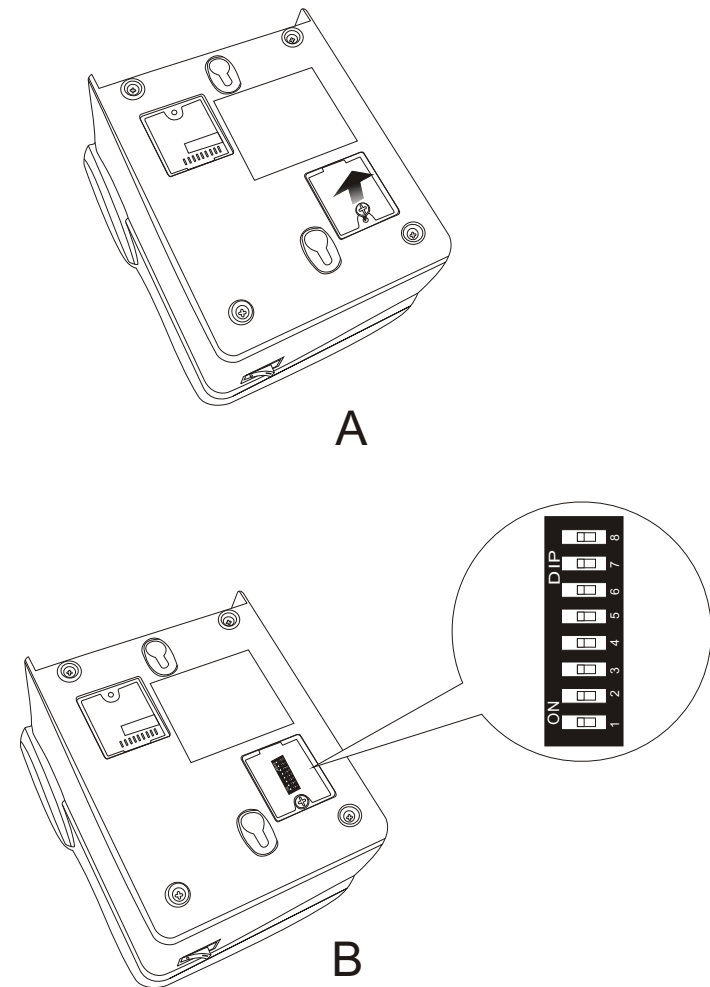
1. Put two nails in the wall. The distance of the two nails as (B)
2. Ensure the hangers fit to the nails, hang the printer on the wall.



## Chapter 6. DIP switch explanation

### 6-1 Set the DIP switches

On the bottom of the printer, there are two metal covers fixed by screws. The bottom one on picture A is for DIP switches. Unscrew the screw and take away the metal cover, users will find the DIP switches as picture B shows.





## 6-2 DIP switch explanation

Baud Rate	DIP1	DIP2
9600bps	ON	ON
19200bps	ON	OFF
38400bps	OFF	ON
115200bps	OFF	OFF

Beep	DIP3	Density	DIP4
ON	ON	light	ON
ON	OFF	dark	OFF

Parallel Port Mode "Parallel State Effective"	Check Mode "Serial Status Effective"	DIP5	DIP6
Normal mode	NONE	ON	ON
	NONE	ON	OFF
	Odd Parity	OFF	ON
Print Server Mode	Even Parity	OFF	OFF

Print Mode	DIP7
48 characters Mode	ON
42 Epson Mode	OFF

Byte Mode	DIP8
Double-Byte Mode	ON
SingleByte Mode	OFF

## ZONERICH MODE



Zonerich Thermal Printer Firmware

MODEL:AB-T88(Version:1.1)  
 Receive buffer: 3KB  
 Printer method: Line Thermal  
 Printer speed: 200mm/s  
 Autocutter unit: Enable  
 NV bit image: Enable  
 Interface option: LPT  
 Character set: Alphanumeric&GB-2312  
 Paper roll width: 80mm  
 Characters per line(CPL): 48 ZONERICH Mode

## EPSON MODE



Zonerich Thermal Printer Firmware

MODEL:AB-T88(Version:1.1)  
 Receive buffer: 3KB  
 Printer method: Line Thermal  
 Printer speed: 200mm/s  
 Autocutter unit: Enable  
 NV bit image: Enable  
 Interface option: LPT  
 Character set: Alphanumeric&GB-2312  
 Paper roll width: 80mm  
 Characters per line(CPL): 42 Epson Mode

## Chapter 7. Self test and Hexadecimal Dumping

### 7-1 Self test

The self-test checks whether the printer has any problem. If the printer does not function properly, contact your dealer.

1. Make sure paper roll has been installed properly.
2. Turn on the power while holding down the FEED button. The self-test begins.
3. The printer is ready to receive data when it completes the self-test.

### 7-2 Hexadecimal Dumping

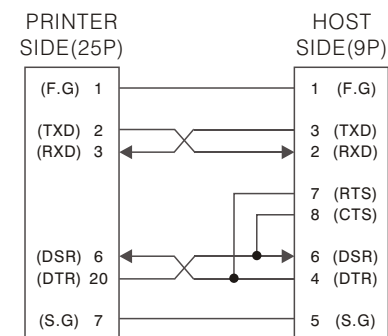
This feature allows experienced users to see exactly what data is coming to the printer. This can be useful in finding software problems. When you turn on the hexadecimal dump function, the printer prints all commands and data in hexadecimal format along with a guide section to help you find specific commands.

To use the hexadecimal dump function, follow these steps:

1. Turn off the printer, take out the roll paper.
2. Make sure there is no roll paper in the printer.
3. Turn on the power while holding down the FEED button.
4. Open the paper cover, put roll paper in printer and then close the paper cover. The printer will print "DUMP", printer enters the hexadecimal dump mode.
5. Run any software program that sends data to the printer. The printer will print all the codes it receives in a two-column format. The first column contains the hexadecimal codes and the second column gives the ASCII characters that correspond to the codes.

## Chapter 8. Interface

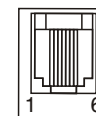
### RS-232C Cable Connection



### Interface Connector Serial Interface (RS-232)

Pin No.	Signal name	Direction	Function
1	FG	-	Frame Ground
2	TxD	Output	Transmit Data
3	RxD	Input	Receive Data
4	RTS	Output	Ready To Send
5	CTS	Input	Clear To Send
6	DSR	Input	Data Set Ready
7	SG	-	Signal Ground
20	DTR	Output	Data Terminal Ready

### Drawer Connector



Pin No.	Signal name	Direction
1	Frame ground	-
2	Drawer Kick-out drive signal 1	Output
3	Drawer open/close signal	Input
4	+24V	-
5	Drawer Kick-out drive signal	Output
6	Signal ground	-

## Parallel Interface (IEEE-1284)

Pin No.	Source	Compatibility Mode	Nibble Mode	Byte Mode
1	Host	nStrobe	HostClk	HostClk
2	Host/Printer	Data0(LSB)	-	Data0(LSB)
3	Host/Printer	Data1	-	Data1
4	Host/Printer	Data2	-	Data2
5	Host/Printer	Data3	-	Data3
6	Host/Printer	Data4	-	Data4
7	Host/Printer	Data5	-	Data5
8	Host/Printer	Data6	-	Data6
9	Host/Printer	Data7(MSB)	-	Data7(MSB)
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy/Data3,7	PtrBusy
12	Printer	Perror	AckDataReq/Data2,6	AckDataReq
13	Printer	Select	Xflag/Data1,5	Xflag
14	Host	nAutoFd	HostBusy	HostBusy
15	-	NC	NC	NC
16	-	GND	GND	GND
17	-	FG	FG	FG
18	Printer	Logic-H	Logic-H	Logic-H
19~30	-	GND	GND	GND
31	Host	nInit	nInit	nInit
32	Printer	nFault	nDataAvail/Data0,4	nDataAvail
33	-	GND	ND	ND
34	Printer	Dk_status	ND	ND
35	Printer	5V	ND	ND
36	Host	nSelectIn	1284-Active	1284-Active

## Chapter 9.Specification

Printing method	Thermal line printing
Dot density	203 dpi×203 dpi (8×8 dots/mm)
Printing width	72 mm {2.83"}, 576 dot positions
Character structure	12 × 24,9 × 17
Characters per line	48/42
Number of characters	Alphanumeric characters: 95
Print speed	Approx. 200 mm/s {5.9"/s} max.; 47.2lps, max. (3.18 mm {1/8"} feed); 35.5lps, max. (4.23 mm {1/6"} feed, at 24 V, 28°C {82°F}, density level 1). Speed is adjusted automatically depending on the voltage applied and head temperature.
Paper feed speed	Approx. 200 mm/s {approx. 5.9"/s} continuous paper feed
Line spacing (default)	4.23 mm {1/6"}
Paper roll (single-ply)	Size: Width: 79.5 mm ± 0.5 mm {3.13" ± 0.02"} Maximum outside diameter: 80 mm {3.26"} Paper roll spool diameter: Inside: 12 mm {0.47"}; Outside: 18 mm {0.71"}
Interface (compatible)	RS-232C/Bi-directional parallel/USB/Ethernet (OPTION)
Receive buffer	3KB
Power supply	24 VDC ± 10%
Life	Mechanism: 15,000,000 lines Thermal head: 100 million pulses, 100km Autocutter: 1,500,000 cuts
MTBF	360,000 hours
MCBF	52,000,000 lines
Temperature	Operating: 5°C ~ 45°C {41°F ~ 113°F} Storage: -10°C ~ 50°C {14°F ~ 122°F}, except for paper
Humidity	Operating: 30 to 80% RH Storage: 10 to 90% RH, except for paper
Overall dimensions	145(W)×192(D)×142(H)mm
Weight (mass)	Approximately: 1.55kg

# Chapter10.PRINT CONTROL COMMAND

## 10-1 Command List

No.	Command	Description	Hexadecimal Code	Page
1	HT	Horizontal tab	<09>	19
2	LF	Printing and paperfeed	<0A>	19
3	CR	Back to printing	<0D>	19
4	ESC !	Select print mode	<1B><21><n>	20
5	ESC *	Specifying the bitimage mode	<1B><2A><m><n1><n2>d1...dk	20
6	ESC 2	Specifying 1/6-inch linefeed rate	<1B><32>	21
7	ESC 3	Setting line feed rate of minimum pitch	<1B><33><n>	21
8	ESC 9	Generating the specified pulses	<1B><39><m><n1><n2>	22
9	ESC @	Initializing the printer	<1B><40>	22
10	ESC A	Set line spacing	<1B><41><n>	22
11	ESC D	Select character Double-heightmode	<1B><44>	22
12	ESC H	Select character Double-heightmode	<1B><48><n>	23
13	ESC I	Select character Double-heightmode	<1B><49>	23
14	ESC J	Printing and feeding paper in minimum pitch	<1B><4A><n>	23
15	ESC L	Selecting page mode	<1B><4C>	23
16	ESC W	Defining the print area in page mode	<1B><57><xL><xH><yL><yH> <dxL><dxH> <dyL><dyH>	24
17	ESC X	Select character Double-width mode	<1B><58><n>	25
18	ESC a	Select justification	<1B><61><n>	26
19	ESC d	Printing and feeding the paper by "n" lines	<1B><64><n>	26
20	ESC j	Printing and feeding paper in minimum pitch	<1B><6A><n>	27
21	ESC m	Partial cut	<1B><6D>	27
22	ESC p	Generating the specified pulses	<1B><70><m><n1><n2>	27
23	FS p	Print NV bit image	<1C><70><n><m>	28
24	FS q	Define NV bit image	<1C><71><n>.....	28
25	GS !	Select character size	<1D><21><n>	30
26	GS b	Turn white/black reverse printing mode	<1D><42><n>	31
27	GS V	Cutting the paper	(1)<1D><56><m> (2)<1D><56><m><n>	32
28	GS v 0	Printing of raster bit image	<1D><76><30><m><xL><xH> <yL><yH>d1...dk	33
29	GS h	Specifying the height of the bar code	<1D><68><n>	34
30	GS w	Set bar code width	<1D><77><n>	34
31	GS k	Printing the bar code	(1)<1D><6B><m>d1...dk<NUL> (2)<1D><6B><m><n>d1...dk	34

## 10-2 Descriptions of Each Item

[Name]	The name of the command.
[Format]	The code sequence.
[Range]	Gives the allowable ranges for the arguments.
[Description]	Describes the command's function.
[Details]	Describes the usage of the command in detail.
[Default]	Gives the default values, if any, for the command parameters.
[Example]	Gives examples of how to use the command.

Hex indicates the hexadecimal equivalents.  
Decimal indicates the decimal equivalents.

## 10-3 Control Commands

<b>HT</b>	
[Name]	Horizontal tab
[Format]	ASCII HT Hex 09 Decimal 9
[Description]	Moves the print position to the next horizontal tab position.
[Details]	<ul style="list-style-type: none"> <li>This command is ignored unless the next horizontal tab position has been set.</li> <li>If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [Printing area width + 1].</li> <li>Horizontal tab positions are set with <b>ESC D</b>.</li> <li>If this command is received when the printing position is at [printing area width + 1], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line.</li> <li>The default setting of the horizontal tab position for the paper roll is font A(12 x 24) every 8th character (9th, 17th, 25th, ... Column).</li> </ul>
[Reference]	<b>ESC D</b>

## LF

[Name]	Print and line feed
[Format]	ASCII LF Hex 0A Decimal 10
[Description]	Prints the data in the print buffer and feeds one line based on the current line spacing.
[Details]	This command sets the print position to the beginning of the line.
[See Also]	<b>ESC 2, ESC 3</b>

## CR

[Name]	Print and carriage return
[Format]	ASCII CR Hex 0D Decimal 13
[Description]	When automatic line feed is enabled, this command functions the same as <b>LF</b> ; When automatic line feed is disabled, this command is ignored.
[Details]	<ul style="list-style-type: none"> <li>Sets the print starting position to the beginning of the line.</li> <li>The automatic line feed is ignored with a serial interface model.</li> </ul>
[See Also]	<b>LF</b>

## ESC ! N

[Name]	Select print mode(s)
[Format]	ASCII    ESC    !    n Hex       1B    21    n Decimal   27    33    n
[Range]	0 ≤ n ≤ 255
[Description]	Selects print mode(s) using n as follows:

Bit	Off/On	Hex	Decimal	Function
0				Default font
1	-	-	-	Undefined
2	-	-	-	Undefined
3	-	-	-	Undefined
4	Off On	00 10	0 16	Double-height mode not selected Double-height mode selected
5	Off On	00 20	0 32	Double-width mode not selected Double-width mode selected
6	-	-	-	Undefined
7	-	-	-	Undefined

[Details]	<ul style="list-style-type: none"> <li>When both double-height and double-width modes are selected, quadruple size characters are printed.</li> <li>The printer can underline all characters.</li> <li>When some characters in a line are double or more height, all the characters on the line are aligned at the baseline.</li> <li><b>GS !</b> can also select character size. However, the setting of the last received command is effective.</li> <li>Emphasized mode is effective for alphanumeric and Kanji. All print modes except emphasized mode is effective only for alphanumeric.</li> </ul>
[Default]	N = 0
[See Also]	GS !

## (1) ESC \* m n1 n2 d1...dk

[Name]	Select bit-image mode
[Format]	ASCII    ESC    *    m    n1    n2    d1...dk Hex       1B    2A    m    n1    n2    d1...dk Decimal   27    42    m    n1    n2    d1...dk
[Range]	m = 0, 1, 32, 33, 0 ≤ n1 ≤ 255, 0 ≤ n2 ≤ 3, 0 ≤ d ≤ 255
[Description]	Selects a bit-image mode using m for the number of dots specified by (n1 + n2 x 256). Set a bit to 1 to print a dot, or set a bit to 0 to not print a dot. d indicates the bit image data. The modes selectable by m are as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		Number of Dots	Dot Density (dpi)	Dot Density (dpi)	Number of Data (K)
0	8-dot single-density	8	60	90	n1 + n2 x 256
1	8-dot double-density	8	60	180	n1 + n2 x 256
32	24-dot single-density	24	180	90	(n1 + n2 x 256) x 3
33	24-dot double-density	24	180	180	(n1 + n2 x 256) x 3

[dpi: dots per 25.4 mm {1"}]

[Details]	<ul style="list-style-type: none"> <li>If the values of m is out of the specified range, n1 and data following are processed as normal data.</li> <li>The n1 and n2 indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by n1 + n2 x 256.</li> <li>If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.</li> <li>d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.</li> <li>After printing a bit image, the printer returns to normal data processing mode.</li> <li>This command is not affected by print modes (emphasized, double-strike, underline, character size or white/black reverse printing), except upside-down printing mode.</li> </ul>
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## ESC 2

[Name]	Select default line spacing
[Format]	ASCII    ESC    2 Hex       1B    32 Decimal   27    50
[Description]	Selects approximately 4.23 mm {1/6"} spacing.
[Details]	The line spacing can be set independently in standard mode and in page mode.
[See Also]	ESC 3

## ESC 3 n

[Name]	Set line spacing
[Format]	ASCII    ESC    3    n Hex       1B    33    n Decimal   27    51    n
[Range]	0 ≤ n ≤ 255
[Description]	Sets the line spacing to [n x vertical or horizontal motion unit].
[Details]	<ul style="list-style-type: none"> <li>The line spacing can be set independently in standard mode and in page mode.</li> <li>In standard mode, the vertical motion unit (y) is used.</li> <li>The maximum paper feed amount is 1016 mm {40"}. Even if a paper feed amount of more than 1016 mm {40"} is set, the printer feeds the paper only 1016 mm {40"}.</li> </ul>
[Default]	Approx 4.23 mm {1/6"}.
[See Also]	ESC 2

## ESC 9 m n1 n2

[Name]	Generating the specified pulses					
[Format]	ASCII	ESC	9	m	n1	n2
	Hex	1B	39	m	n1	n2
	Decimal	27	57	m	n1	n2
[Range]	m = 0, 0 ≤ n1 ≤ 255, 0 ≤ n2 ≤ 255					
[Description]	The signals specified by n1 and n2 are output to the connector pin specified by m.					

## ESC @

[Name]	Initialize printer		
[Format]	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64
[Description]	Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.		
[Details]	<ul style="list-style-type: none"><li>• The data in the receive buffer is not cleared.</li><li>• The macro definition is not cleared.</li><li>• The NV bit image data is not cleared.</li><li>• The data of the NV user memory is not cleared.</li></ul>		

## ESC A n

[Name]	Set line spacing		
[Format]	ASCII	ESC	A n
	Hex	1B	41 n
	Decimal	27	65 n
[Range]	0 ≤ n ≤ 255		
[Description]	Sets the line spacing to [n x vertical or horizontal motion unit].		
[Details]	<ul style="list-style-type: none"><li>• The line spacing can be set independently in standard mode and in page mode.</li><li>• In standard mode, the vertical motion unit (y) is used.</li><li>• The maximum paper feed amount is 1016 mm {40"}. Even if a paper feed amount of more than 1016 mm {40"} is set, the printer feeds the paper only 1016 mm {40"}.</li></ul>		
[Default]	Approx 4.23mm {1/6"}.		
[See Also]	ESC 2		

## ESC D

[Name]	Select character Double-height mode		
[Format]	ASCII	ESC	D
	Hex	1B	44
	Decimal	27	68
[Description]	Select character Double-height mode.		

## ESC H n

[Name]	Select character Double-height mode		
[Format]	ASCII	ESC	H n
	Hex	1B	48 n
	Decimal	27	72 n
[Range]	1 ≤ n ≤ 8		
[Description]	Select character Double-height mode.		

## ESC I

[Name]	Select character Double-height mode		
[Format]	ASCII	ESC	I
	Hex	1B	49
	Decimal	27	73
[Description]	Select character Double-height mode.		

## ESC J n

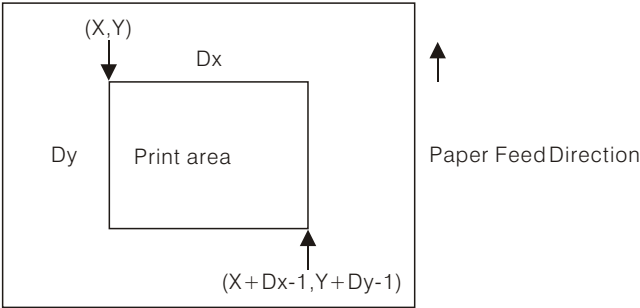
[Name]	Print and feed paper		
[Format]	ASCII	ESC	J n
	Hex	1B	4A n
	Decimal	27	74 n
[Range]	0 = n = 255		
[Description]	Prints the data in the print buffer and feed the paper [n x vertical or horizontal motion unit].		
[Details]	<ul style="list-style-type: none"><li>• After printing is completed, this command sets the print starting position to the beginning of the line.</li><li>• The paper feed amount set by this command does not affect the values set by ESC 2 or ESC 3.</li><li>• In standard mode, the printer uses the vertical motion unit (y).</li><li>• The maximum line spacing is 1016mm {40"}. When the setting value exceeds the maximum, it is converted to the maximum automatically.</li></ul>		

## ESC L

[Name]	Select page mode		
[Format]	ASCII	ESC	L
	Hex	1B	4C
	Decimal	27	76
[Description]	Switches from standard mode to page mode.		
[Details]	<ul style="list-style-type: none"><li>• This command is enabled only when processed at the beginning of a line in standard mode.</li><li>• This command has no effect in page mode.</li><li>• The following command is not available in page mode, Print raster bit image: <b>GS v 0</b></li><li>• The printer returns to standard mode when power is turned on, the printer is reset, or ESC @ is used.</li></ul>		

ESC W xLxH yL yHdxL dxH dyLdyH

[Name]	Defining the print area in pagemode
[Format]	ASC II       ESC    W    xL xH yL yH dxL dxH dyL dyH Hex           1B    57    xL xH yL yH dxL dxH dyL dyH Decimal       27    87    xL xH yL yH dxL dxH dyL dyH
[Range]	0 = xL, xH, yL, yH, dxL, dxH, dyL, dyH = 255 except for dxL = dxH = 0 or dyL = dyH = 0
[Description]	Defines the location and size of the print area. <ul style="list-style-type: none"><li>• Horizontal start point = [(xL + xH x 256) x basic calculation pitch] inches</li><li>• Vertical start point = [(yL + yH x 256) x basic calculation pitch] inches</li><li>• Horizontal length = [(dxL + dxH x 256) x basic calculation pitch] inches</li><li>• Vertical length = [(dyL + dyH x 56) x basic calculation pitch] inches</li></ul>
[Details]	<ul style="list-style-type: none"><li>• When standard mode is selected, this command only executes the internal flagging of the printer without affecting the printing in standard mode.</li><li>• If the horizontal start point or vertical start point is out of the printable area, this command is canceled and the next data is handled as normal data.</li><li>• If the horizontal length or vertical length is 0, this command is canceled and the next data is handled as normal data.</li><li>• If the “horizontal start point + horizontal length” is greater than the horizontal printable area, the “horizontal printable area - horizontal start point” is taken as the horizontal length.</li><li>• If the “vertical start point + vertical length” is greater than the vertical printable area, the “vertical printable area - vertical start point” is taken as the vertical length.</li><li>• Fractions resulting from calculations are corrected with the minimum pitch of the mechanism, and the remainder are omitted.</li><li>• The horizontal start point and horizontal length are calculated with the basic calculation pitch (x). The vertical start point and vertical length are calculated with the basic calculation pitch (y).</li><li>• When the horizontal starting position, vertical starting position, printing area width, and printing area height are defined as X, Y, Dx, and Dy respectively, the printing area is set as shown in the figure below.</li></ul>



- This printable area for this printer is approximately 72.2 mm {512/180"} in the horizontal direction and approximately 117.3 mm {1662/360"} in the vertical direction.  
XL = xH = yL = yH = 0  
dxL = 0, dxH = 2, dyL = 126, dyH = 6

[Default]

ESC X n

[Name]	Select character Double-width mode
[Format]	ASCII       ESC    X    n Hex           1B    58    n Decimal       27    88    n
[Range]	1 ≤ n ≤ 8
[Description]	Select character Double-width mode.

## ESC a n

[Name]	Select justification
[Format]	ASCII    ESC    a    n Hex       1B    61    n Decimal   27    97    n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$
[Description]	Aligns all the data in oneline to the specified position n selects the justification as follows:

n	Justification
0, 48	Left justification
1, 49	Centering
2, 50	Right justification

- [Details]
- The command is enabled only when processed at the beginning of the line in standard mode.
  - If this command is input in page mode, the printer performs only internal flag operations.
  - This command has no effect in page mode.
  - This command executes justification in the printing area.
  - This command justifies the space area according to HT, ESC \$ or ESC \.

[Default] n = 0

[Example] Left justification      Centering      Right justification

ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE
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## ESC d n

[Name]	Print and feed n lines
[Format]	ASCII    ESC    d    n Hex       1B    64    n Decimal   27    100   n
[Range]	$0 \leq n \leq 255$
[Description]	Prints the data in the print buffer and feeds n lines.
[Details]	<ul style="list-style-type: none"> <li>• This command sets the print starting position to the beginning of the line.</li> <li>• This command does not affect the line spacing set by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>• The maximum paper feed amount is 1016 mm {40"}. If the paper feed amount (nx line spacing) of more than 1016 mm {40"} is specified, the printer feeds the paper only 1016 mm {40"}.</li> </ul>

[See Also] **ESC 2, ESC 3**

## ESC j n

[Name]	Print and feed paper
[Format]	ASCII    ESC    j    n Hex       1B    6A    n Decimal   27    106   n
[Range]	$0 \leq n \leq 255$
[Description]	Prints the data in the print buffer and feed the paper [nx vertical or horizontal motion unit].
[Details]	<ul style="list-style-type: none"> <li>• After printing is completed, this command sets the print starting position to the beginning of the line.</li> <li>• The paper feed amount set by this command does not affect the values set by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>• In standard mode, the printer uses the vertical motion unit (y).</li> <li>• The maximum line spacing is 1016 mm {40"}. When the setting value exceeds the maximum, it is converted to the maximum automatically.</li> </ul>

## ESC m

[Name]	Partial cut
[Format]	ASCII    ESC    m Hex       1B    6D Decimal   27    109
[Description]	Cut the paper partially.
[Details]	<ul style="list-style-type: none"> <li>• During cutting, printing and paper feeding is stopped.</li> <li>• This command is valid only when an auto-cutter is connected.</li> </ul>

## ESC p m n1 n2

[Name]	Generating the specified pulses
[Format]	ASCII    ESC    p    m    n1    n2 Hex       1B    70    m    n1    n2 Decimal   27    112   m    n1    n2
[Range]	$m = 0, 0 \leq n1 \leq 255, 0 \leq n2 \leq 255$
[Description]	The signals specified by "n1" and "n2" are output to the connector pin specified by "m".



## FS p n m

[Name]	Print NV bit image
[Format]	ASC II    FS    p    n    m Hex        1C    70   n    m Decimal    28    112 n    m
[Range]	$1 \leq n \leq 4$ $0 \leq m \leq 3, 48 \leq m \leq 51,$

[Description] Prints a NVbit image n using the mode specified by m.

m	Mode	Vertical Dot Density	Horizontal Dot Density
0,48	Normal	203 DPI	203 DPI
1,49	Double-width	203 DPI	101 DPI
2,50	Double-heigh	101 DPI	203 DPI
3,51	Quadruple	101 DPI	101 DPI

N is the number of the NV bit image.  
M specifies the bit image mode.

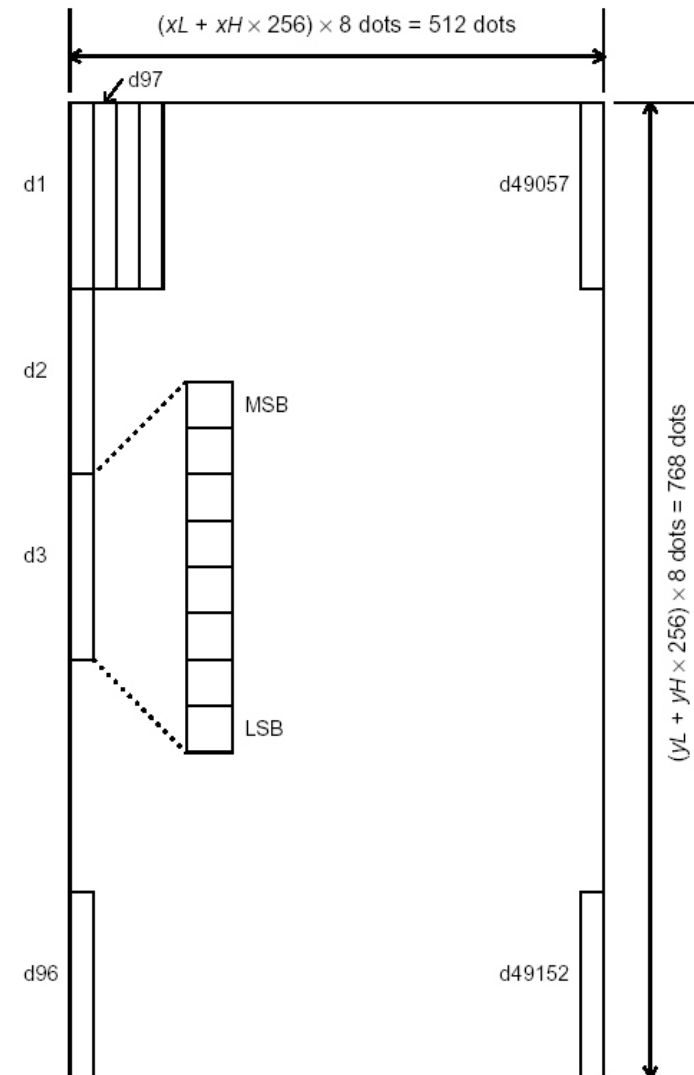
## FS q n [xL xH yLyH d1...dk]1...[xL xHyL yH d1...dk]n

[Name]	Define NV bitimage
[Format]	ASC II    FS    q    n    [xLxH yLyH d1...dk]1 Hex        1C    71   n    [xL xHyL yH d1...dk]1 Decimal    28    113 n    [xL xHyL yH d1...dk]1
[Range]	$1 \leq n \leq 4$ $0 \leq xL \leq 72$ $xH=0$ $0 \leq yL \leq 255$ $0 \leq yL \leq 1$ (when $1 \leq (yL+yH \times 256) \leq 288$ ) $0 \leq d \leq 255$ $k = (xL + xH \times 256) \times (yL+yH \times 256) \times 8$ Total defined data area = 2Mbits (256K bytes)

[Description] Define the NVbit image specified by n..

- N specifies the number of the defined NV bit image .
- XL, xH specifies  $(xL+xH \times 256) \times 8$  dots in the horizontal direction for the NVbit image you are defining.
- YL, yH specifies  $(yL+yH \times 256) \times 8$  dots in the vertical direction for the NVbit image you are defining.

[Example] When  $xL = 64, xH = 0, yL = 96, yH = 0$



## GS ! N

[Name]	Select character size
[Format]	ASCII    GS    !    n Hex       1D   21   n Decimal   29   33   n
[Range]	0 ≤ n ≤ 255 (1 ≤ vertical number of times ≤ 8, 1 ≤ horizontal number of times ≤ 8)
[Description]	Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Bit	Function	Hex Number	Decimal Number
0	Character height selection. See Table 2		
1			
2			
3			
4	Character width selection. See Table 1		
5			
6			
7			

Table 1 Character Width Selection

Hex	Decimal	Width
00	0	1 x (Standard)
10	16	2 x (Double width)
20	32	3 x
30	48	4 x
40	64	5 x
50	80	6 x
60	96	7 x
70	112	8 x

Table 2 Character Height Selection

Hex	Decimal	Width
00	0	1 x (Standard)
01	1	2 x (Double height)
02	2	3 x
03	3	4 x
04	4	5 x
05	5	6 x
06	6	7 x
07	7	8 x

[Details]	<ul style="list-style-type: none"> <li>• If n is outside of the defined range, this command is ignored.</li> <li>• In standard mode, the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90° clockwise-rotation mode, the relationship between vertical and horizontal directions are reversed.</li> <li>• In page mode, vertical and horizontal directions are based on the character orientation.</li> <li>• When characters are enlarged with different sizes on one line, all the characters on the line is aligned at the baseline.</li> <li>• The ESC ! command can also turn double-width and double-height modes on or off. However, the setting of the last received command is effective.</li> </ul>
[Default]	n = 0
[See Also]	ESC !

## GS b n

[Name]	Turn white/black reverse printing mode
[Format]	ASCII    GS    b    n Hex       1D   42   n Decimal   29   66   n
[Range]	0 ≤ n ≤ 255
[Description]	<p>Turns on or off white/black reverse printing mode.</p> <ul style="list-style-type: none"> <li>• When the LSB of n is 0, white/black reverse mode is turned off. When the LSB of n is 1, white/black reverse mode is turned on.</li> <li>• Only the lowest bit of n is valid.</li> <li>• This command is available for built-in characters and user-defined characters.</li> <li>• When white/black reverse printing mode is on, it also applied to character spacing set by ESC SP.</li> <li>• This command does not affect bit image, user-defined bit image, bar code, HRI characters, and spacing skipped by HT, ESC \$, and ESC \.</li> <li>• This command does not affect the space between lines.</li> <li>• White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.</li> </ul>
[Details]	
[Default]	n = 0

m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0,48	NORMAL MODE	203 DPI	203 DPI
1,49	DOUBLE WIDTH MODE	203 DPI	101 DPI
2,50	DOUBLE HEIGHT MODE	101 DPI	203 DPI
3,51	QUADRUPLE SIZE MODE	101 DPI	101 DPI

#### [Details]

- When data exist in the print buffer, this command is ignored.
- When a downloaded bit image has not been defined, this command is ignored.
- A portion of a downloaded bit image exceeding one line length is not printed.
- A downloaded character and a downloaded bit image cannot be defined simultaneously.

#### [See Also]

GS \*

- (1) GS V m  
(2) GS V m n

#### [Name]

Select cut mode and cut paper

#### [Format]

(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 ≤ n ≤ 255

#### [Description]

Performs the specified paper cutting.

m	Print mode
1, 49	Partial cut (one point left uncut)
66	Feeds paper (cutting position + [n x (vertical motion unit)]), and cuts the paper partially (one point left uncut).

#### [Details]

For (1) and (1) :

- This command is effective only processed at the beginning of a line.

For (1) :

- Only the partial cut is available; there is no full cut.

For (2) :

- When n = 0, the printer feeds the paper to the cutting position and cuts it.
- When n ≠ 0, the printer feeds the paper to (cutting position + [n x vertical motion unit]) and cuts it.
- The paper feed amount is calculated using the vertical motion unit (y). However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

## GS v 0 m xL xHyL yH d1...dk

#### [Name]

Printing of raster bit image

#### [Format]

ASCII GS v 0 m xL xH yL yH d1...dk  
Hex 1D 76 30 m xL xH yL yH d1...dk  
Decimal 29 118 48 m xL xH yL yH d1...dk

#### [Range]

0 ≤ m ≤ 3, 48 ≤ m ≤ 51, 0 ≤ xL ≤ 255, 0 ≤ xH ≤ 255,  
0 ≤ yL ≤ 255, 0 ≤ yH ≤ 8, 0 ≤ d ≤ 255,  
k = (xL + xH x 256) x (yL + yH x 256), however, k ≠ 0

#### [Description]

Prints raster bit images in mode "m".

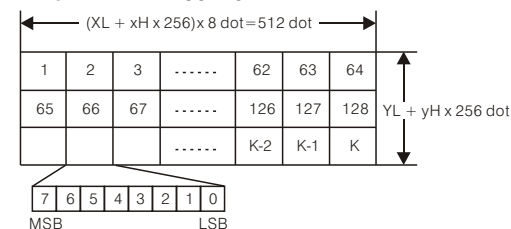
m	Mode Name	Dot Density in Vertical Direction	Dot Density in Horizontal Direction
0,48	NORMAL MODE	203 DPI	203 DPI
1,49	DOUBLE WIDTH MODE	203 DPI	101 DPI
2,50	DOUBLE HEIGHT MODE	101 DPI	203 DPI
3,51	QUADRUPLE SIZE MODE	101 DPI	101 DPI

#### [Details]

- xL, xH specify the number of data in horizontal direction of the bit image to (xL + xH x 256) bytes.
- yL, yH specify the number of data in vertical direction of the bit image to (yL + yH x 256) bytes.
- In STANDARD MODE, this command is valid only when there is no print data in the print buffer.
- Any of the print modes (Character size, emphasis, double strike, inverting, underlining, back-to-white reversing, etc.) does not affect the raster bit image.
- If the print area specified by GS L and GS W is narrower than a minimum width, the print area for that line only is extended to the minimum width. The minimum width is one dot in NORMAL MODE (m=0, 48) and DOUBLE HEIGHT MODE (m=2, 50), and 2 dots in DOUBLE WIDTH MODE (m=1, 49) and QUADRUPLE SIZE MODE (m=3, 51).
- Any part of data that is out of the print area is only read and discarded in units of dot.
- The setting of ESC a (Aligning characters) are also valid for the raster bit image.
- If this command is executed during macro definition, the macro definition is suspended, and the processing of the command starts. The macro is left undefined.
- "d" denotes defined data. Dots to be printed are specified as "1" and those not to be printed as "0".

#### [Example]

When xL + xH x 256 = 64:



## GS h n

[Name]	Define downloaded bit image
[Format]	ASCII GS h n Hex 1D 68 n Decimal 29 104 n
[Range]	$1 \leq n \leq 255$
[Description]	Selects the height of the bar code. n specifies the number of dots in the vertical direction.
[Details]	N = 162
[See Also]	GS k

## GS w n

[Name]	Set bar codewidth
[Format]	ASCII GS w n Hex 1D 77 n

(1) GS k m d1...dk NUL

(2) GS k m n d1...dn

[Name]	Print the bar code
[Format]	(1) ASCII GS V 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) $0 \leq m \leq 6$ (k and d depends on the bar code system used) (2) $65 \leq m \leq 73$ (n and d depends on the bar code system used)
[Description]	Selects a bar code system and prints the bar code. m selects a bar code system as follows:

For (1) :

m	Bar Code System	Number of Characters	Remarks
2	JAN13 (EAN13)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
3	JAN 8 (EAN8)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
4	CODE39	$1 \leq k$	$48 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43, 45, 46, 47$

For (2) :

m	Bar Code System	Number of Characters	Remarks
67	JAN13 (EAN13)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
68	JAN 8 (EAN8)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
69	CODE39	$1 \leq k \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43, 45, 46, 47$
73	CODE128	$2 \leq k \leq 255$	$0 \leq d \leq 127$

[Details]

### For (1):

- This command ends with a NUL code.
- When the bar code system used is JAN13 (EAN13), the printer prints the bar code after receiving 13 bytes bar code data and processes the following data as normal data.
- When the bar code system used is JAN8 (EAN8), the printer prints the bar code after receiving 8 bytes bar code data and processes the following data as normal data.

### For (2):

- n indicates the number of bar code data, and the printer processes n bytes from the next character data as bar code data.
- If n is outside of the specified range, the printer stops command processing and processes the following data as normal data.

#### In standard mode:

- If d is outside of the specified range, the printer only feeds paper and processes the following data as normal data.
- If the horizontal size exceeds printing area, the printer only feeds the paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
- This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.
- After printing bar code, this command sets the print position to the beginning of the line.

#### In page mode:

- This command develops bar code data in the print buffer, but does not print it. After processing bar code data, this command moves the print position to the right side dot of the bar code.
- If d is out of the specified range, the printer stops command processing and processes the following data as normal data. In this case the data buffer position does not change.
- If bar codewidth exceeds the printing area, the printer does not print the bar code but moves the data buffer position to the left side out of the printing area.

# Chapter 11. Printer Driver

## 11-1. How to use Logo Download Tool

AB-T88 receipt printer supports StoreLogo printing. You can download max four images into printer and select which one to print on receipt.

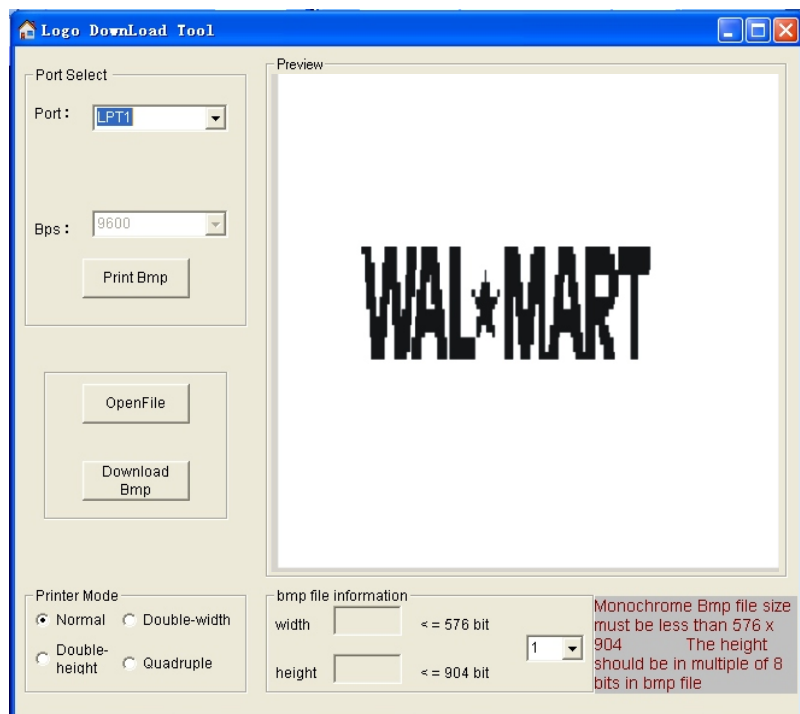
- 1) Install the driver for Logo Download Tool on Computer.
- 2) Run [Logo Download Tool].
- 3) Select the correct connected port of printer. The default port is LPT1.
- 4) Click [Open file] to select a image.

NOTE: \* The image must be Monochrome BMP file.

\* The Size of Monochrome BMP file must be less than 576x904 dots.

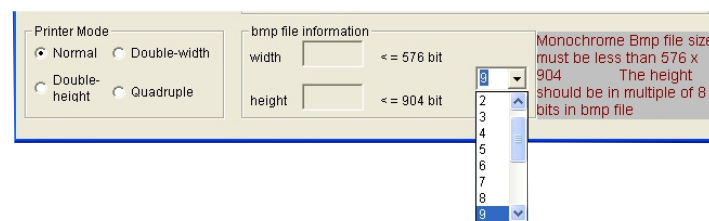
\* The height should be in multiple of 8 dots in Monochrome BMP file.

\* Herewith, strongly recommend to use *Microsoft Paint Tool* to edit image file. Otherwise, the printer will be failed to download or print.



- 5) Click [download bmp], and wait the printer to save the data.
- 6) After the printer download the image successfully, you can preview the image on the frame and the bmp file information as well.
- 7) Click [Print Bmp] button to check the printing effect. There are four Printing Mode options: Normal, Double-width, Double-height and Quadruple. The default mode is Normal printing.
- 8) Select [1] to download the first image.  
Select [2] to download the second image.  
Select [3] to download the third image.  
Select [4] to download the fourth image.

Total 16 logos can be uploaded onto printer



Note: The images will be saved into the flash memory of printer.  
Any new download operation will overwrite the former image.  
Please use AB-T88 printer driver to set the image printing mode.

## 11-2.Setting Printer Properties

The printer driver software can be found from CD disk packaged with printer.

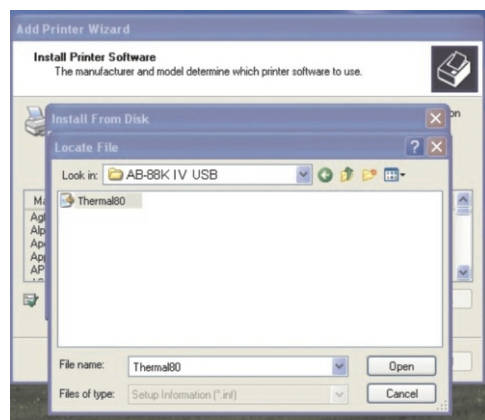
### 1) Install the printer driver software.

The printer driver should be installed according to following steps:

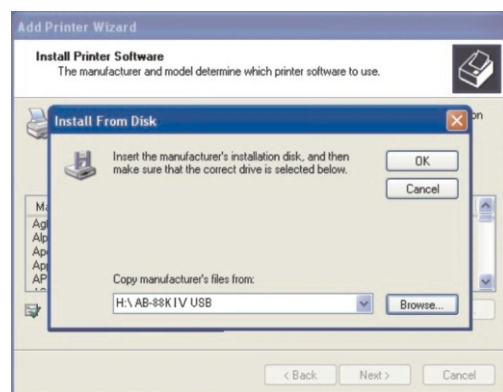
- Go to [Printers and Faxes] folder, click [Add a printer];
- Click [next] according to the direction of installation;
- Click [have disk...], to find & open \*.inf file of printer driver.

See Pic 12.2-1

- And then start to install the printer software. See Pic 12.2-2



Pic 12.2-1



Pic 12.2-2

### 2) After install the software successfully, open [Printing Preferences...].

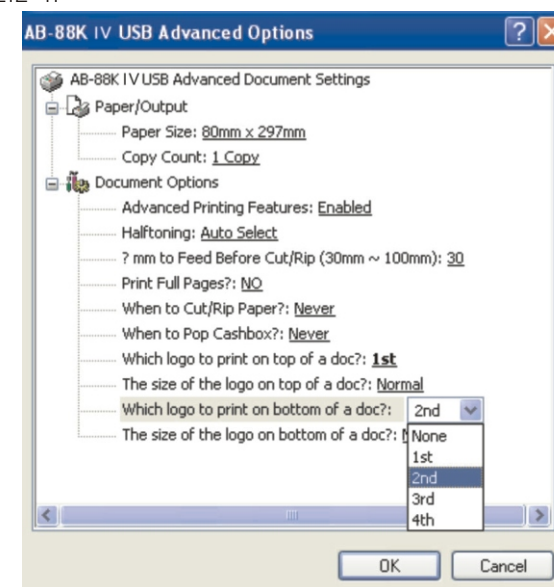


Pic 12.2-3

### 3) Open [Printing Preferences...] and [Advance] to go to Advanced Options.

Now, you can reset the Document Options by select the right items.

See Pic 12.2-4.



Pic 12.2-4