USER MANUAL

MediaPOS 80
THERMAL PRINTER

TABLE OF CONTENTS

1.GENERAL DESCRIPTION

1.1 Main Specifications

Item	Parameter
Print Method	Line thermal printer
Print Speed	150mm/s
Print Width	79.5±0.5mm
Print Density	8dots/mm, 576dots/line
Feed Paper Direction	Sensor feed paper automatically
Effective Print Width	72mm
Paper Solve Method	Auto cut（full cut or partial cut）
Print Head	CAPD347
Print Head Life	100KM
Cut Life	700,000

1.2 Print Paper

Item	Parameter
Paper model	Thermal line paper
Paper specification	Paper width： 79.5±0.5mm；

1.3 Character

Item	Parameter
Print Character	ASCII/GB18030Simplified Chinese/Traditional/Chinese/Multinational character set

1.4 Interface

Item	Parameter
Serial interface	RS-232 9pin serial port， support RTS/CTS; baudrate：2400bps~115200bps
	Data structure：1bit start bit+8bit data bit +1bit or more than 1 stop bit
USB interface	USB2.0

1.5 Control command

Item	Parameter
Dot graphic command	Support different density dot graphic and download graphic print
Character graphic command	Support ANK character、Chinese character double width、double height print，can change character line space.

1.6 Power and operation environment requirements

Item	Parameter
Power	DC24V，2A
Work temperature	0～50℃
Work humidity	0～85%
Storage temperature	-20°～60℃
Storage humidity	0～85%

2 .INSTALLATION AND OPERATION

2.1 Appearance

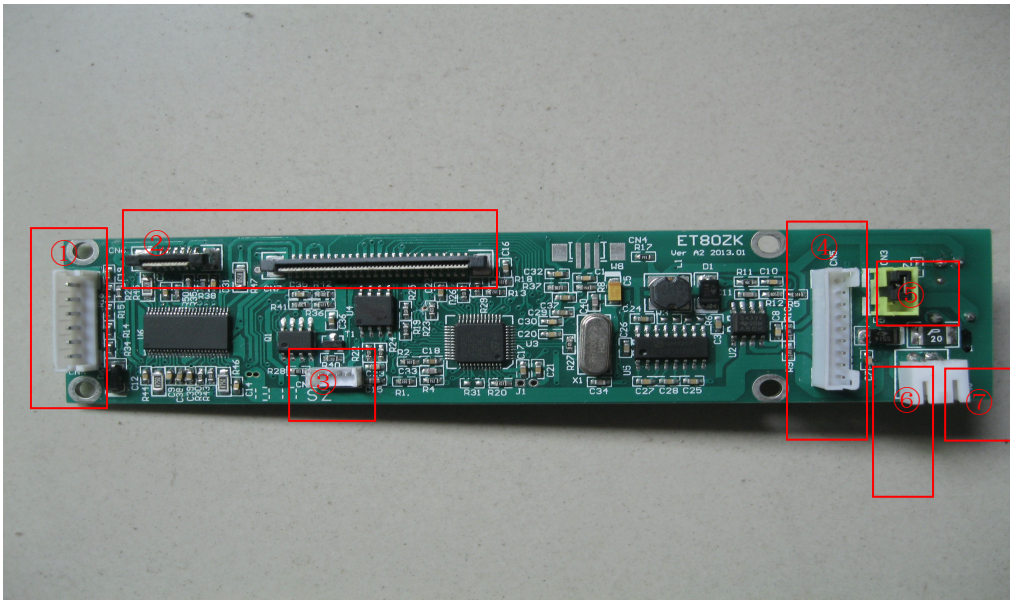


图2-1 打印模块外型图

2.2 Interface function

As picture 2-1：

① Feed paper button

② Print head connection socket

③ USB interface

④ RS232 interface

⑤ out-of-paper sensor

⑥ Power interface

⑦ Cash drawer interface

2.3 Indicator light and keys operation

Light：

- Power led：Normal work is green light
- Red light：Normal work, red light is off; error status, red light flash.

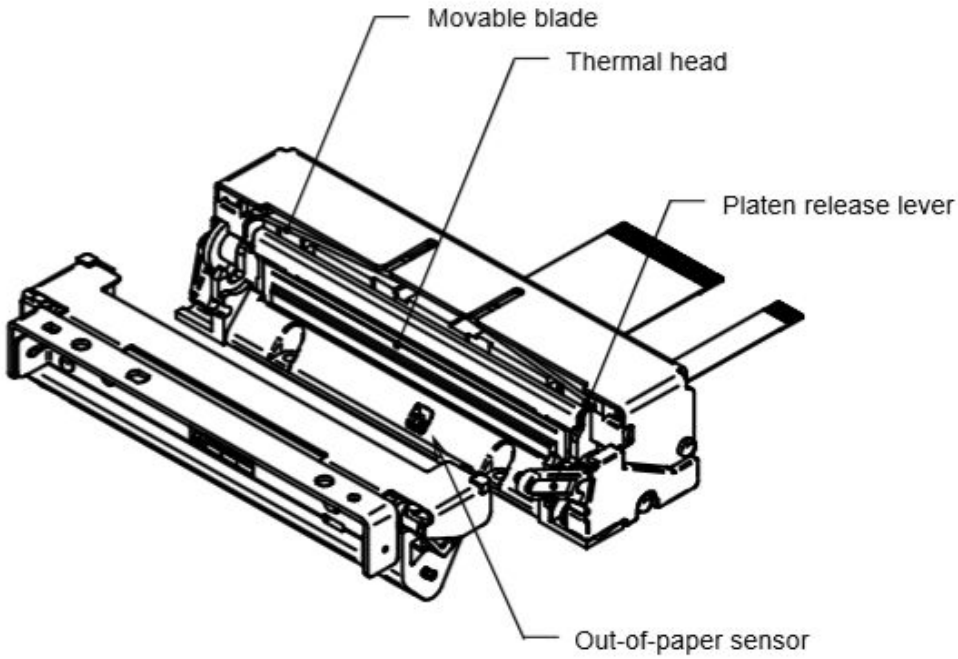

Print head over temperature

When print head is over temperature, the red light is flash,
recover until temperature is normal.
Out of paper, the red light is flash.

Key：

🗁 Self-test：The first method：Install paper, press “feed paper” button, then turn power on. After 2seconds, release feed paper button, the printer will print self-test automatically.

2.4 Print head



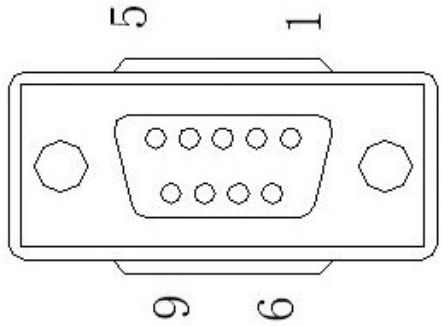
Picture 2-4.1 CAPD347 print head

2.5 Interface connection

2.5.1 Serial interface connection

MediaPOS 80 serial interface is compatible with RS232C, support RTS/CTS，details as below:

Data flow control method



Signal level：

MARK = -3 to -15 V: logistic "1"/ off

SPACE = +3 to +15 V: logistic "0"/on

Printer	PC
DB9F	DB9M
2 TXD	2 RXD
3 RXD	3 TXD
5 GND	5 GND
7 CTS	7 RTS
8 RTS	8 CTS

Each pin signal definition

Pin	Signal	Signal source	Illustration
3	RXD	Host PC	Printer receive data
4	RTS	Printer	Printer can receive date
5	GND	------	Ground
7	CTS	Printer	When you choose RTS/CTS，host PC is receiving data or not SPACE : shows that can receive data MARK: shows that host PC couldn't receive data
8	RST	Host PC	When you choose RTS/CTS，shows that PC is busy SPACE: shows that printer is get readyto receive data MARK: Printer is busy

Printer serial interface as default：

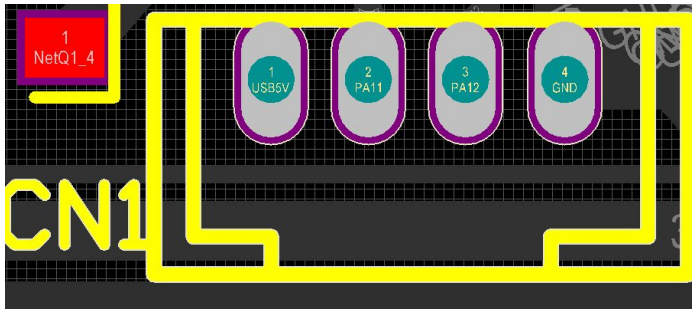
Baudrate：38400bps(as default）

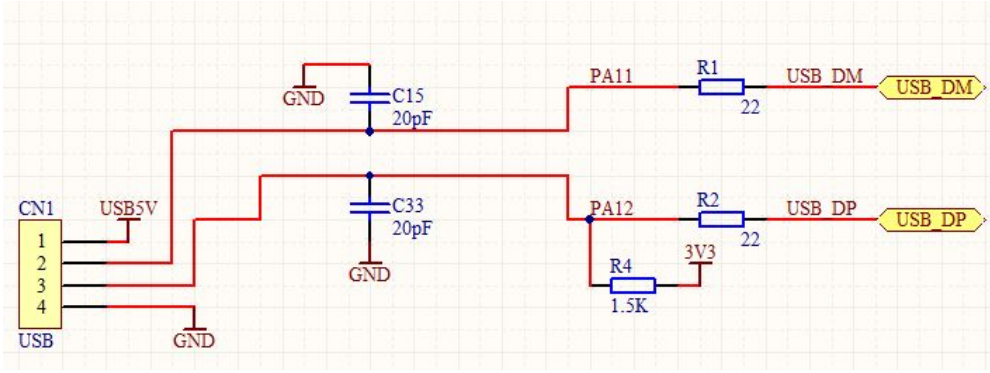
Data bit：8bit

Checkout：No
Stop bit：1bit or more than 1 bit
Handshaking：RTS/CTS

2.5.2 USB Interface connection

Socket type: 53047 Communication protocol: USB2.0
Schematic circuit diagram as below：





2.5.3 Power、Cash drawer interface connection

Schematic diagram as below：

Pin definition as below

Pin No.	Signal	Flow direction
1	Cash drawer driver signal	OUT
2	Cash drawer on/off status signal	IN
3	GND	-
4	+24V	-

3.MALFUNCTION EXCLUSION

Malfunction Phenomenon	Solution
Not electrified	Examine that the power adapter whether outputted voltage or not.
	Examine that the power output plug and printer whether connected well or not.
	Examine that the printer's power button whether opened or not.
Not carried the paper	Examine that the printer's roller paper whether used or not.
	Examine that the printer's roller paper whether jammed or not.
	Examine that the printer's test paper is dirty or not.
	Examine that the printer's cover pressing paper wheel whether pressed to position or not.
Printing unclear	Examine that the print head is dirty or not.
	Examine that the print paper is wet or not.
Not printed	Examine that the interface line of printer and PC whether connected well or not.

4.PRINTING CONTROL COMMAND

4.1 Printer setup command

Printer setup command, the set that can record content even power off：

ASCⅡ ESC N m n

Decimal 27 78 m n

Hex 1B 4E m n

Parameter		Parameter	
m=3 Choose cutter	n=1 default partial cut n=0 default full cut default n=1 partial cut	m=7 choose black mark mode	n=1 choose black mark mode n=0 choose that not black mark mode default n=0 choose that not black mark mode
m=8 Choose Chinese character mode	n=1 choose Chinese character mode n=0 exit Chinese character mode Default n=1 choose Chinese character mode	Notes	Black mark function, not suggest to open, Or, may will cause unrecoverable error.
m=9 change to BIG5	n=0 choose 18030 n=1 choose BIG5 default n=0 choose 18030	m=10 Choose 58mm or 80mm	n=0 80mm n=1 58mm default n=0 80mm

4.1 List of Commands

命令	说明
HT	Horizontal tab
LF	Print and line feed
CR	Print and carriage return
DLE EOT	Transmit real-time status
ESC !	Select print modes
ESC $	Set absolute print position
ESC @	Initialize printer
ESC *	Select bit-image mode
ESC -	Turn underline mode on/off
ESC 2	Turn underline mode on/off
ESC 3	Turn underline mode on/off

ESC a	Select justification
ESC c 5	Enable/disable panel butons
ESC d	Print and feed n lines
ESC p	Cash draw control
ESC i	Full cut
ESC j	Retreat paper
ESC m	Partial cut
ESC t	Select character code table
ESC D	Set horizontal tab positions
ESC E	Turn emphasized mode on/off
ESC G	Turn double-strike mode on/off
ESC J	Print and feed paper
ESC N	Set chosen function
ESC R	Select an international character set
ESC SP	Set right-side character spacing
FS p	Print NV bit image
FS q	Define NV bit image
GS !	Set character size
GS *	Define downloaded bit image
GS /	Print downloaded bit image
GS (E	Set the baud rate
GS h	Set bar code height
GS k	Print bar code
GS v 0	Print grating bit image
GS w n	Set bar code width
GS H n	Select print position of HRI characters
GS L	Set left margin
GS V	Select cut mode and cut paper
GS W	Set print area width
Chinese Character Control Command	
FS !	Set print modes for Chinese character
FS &	Set Chinese characters mode
FS .	Cancel Chinese mode
FS S	Set Chinese character spacing
FS W	Turn quadruple-size mode on/off for Chinese characters
Special control command	
1B FD n	Set print density
1B FD 15 n	Auto cut after installing paper

GS (k	Print QR Code

4.2 Detailed Explanation of Commands

HT

[Name] Horizontal tab

[Format] ASCII HT

HEX 09

Decimal 9

[Description] Moves the print position to the next horizontal tab position.

[Paticularize] • If didn't set the next horizontal tab position, then this command will be ignored.

• If the next horizontal tab position is out of the print area, then moving the print position to "print area width+1.

• Set horizontal position through **ESC D** command.

• Print position set on"print area width+1"and receive this command, the printer moves ahead when buffer full, and execute the horizontal tab position at the starting of the next line.

[Reference] **ESC D**

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. Moves the print position to the next horizontal tab position.

[Note] This command set the print position to the starting of the line.

[Reference] **ESC 2， ESC 3**

CR

[Name] Print and carriage return

[Format] ASCII CR

HEX 0D

Decima 13

[Description] Allow feed paper automatically, the function of this command is the same as LF command.

This command will be ignored when do not allow to feed paper automatically.

[Paticularize] For serial interface mode, the feed paper fuction of this command could be ignored.

DLE EOT n

[Name] Transmit real-time status

[Format] ASCII DLE EOT n

HEX 10 04 n

Decimal 16 4 n

[Range] 1 ≤ n ≤ 4

[Description] Transmit the real-time status. Parameter n used to be appointed the printer transmitting status. The definition as follows:

n = 1: Transmit printer status.

n = 2: Transmit offline cause status.

n = 3: Transmit error cause status.

n = 4: Transmits roll paper sensor status.

[Particularize] • The printer transmits the current status, each status is one byte data.

• When transmitting the status, the printer can not confirm whether the host can receive the data or not.

• Starts to execute when the printer received this command.

• In serial interface mode, even if the printer lacated on offline status, full receiving buffer, or executed this command when error occurred.

• In parallel interface mode, can not execute this command when the printer is busy.When the printer located in offline status, Memory Switch 1-3 lacated on ON, the printer can not go to BUSY status.

• Reply (ASB) automatically through GS a command, need to make a distinction the sending satus of DLE EOT command and ASB status. （Refer to appendix C, transmitting status identification ）

• If the printer don't be selected peripheral device command ESC = , the selected command remain in effect.

[Notes] Whenever get <10>H<04>H<n>(1 n 4) data sequence, will transmit the status.

For example in the following commands：

ESC m nL nH d1 ... dk , d1=<10>H, d2=<04>H, d3=<01>H

Can not use this command when there are 2 or more bytes in the command.

For example：

If want to send **ESC 3 n** to the printer, before sending the n, DTR (for host is DSR)will be changed to MARK， so before receiving the n, interrupt **DLE EOT 3**. The code of **DLE EOT 3** <10>H will be dealed with

as the code of **ESC 3** <10>H.

n = 1 Printer status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Select off.
1	On	02	2	Not used. Select on.
2	On	04	4	Not used. Select on.
3	Off	00	0	Online.
	On	08	8	Offline.
4	On	10	16	Not used. Select on.
5	Off	00	0	Do not wait online error recovery.
	On	20	32	Wait online error recovery.
6	Off	00	0	Feed paper button switch off.
	On	40	64	Feed paper button switch on.
7	Off	00	0	Not used, Select off.

NOTE：bit 5：Online error is the process that the printer will execute waiting switch on/off during the macro command and self-test.

n = 2 ： Offline status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Select off.
1	On	02	2	Not used. Select on.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed by the paper FEED button.
	On	08	8	Paper is being fed by the paper FEED button.
4	On	10	16	Not used. Select on.
5	Off	00	0	No paper end stop.
	On	20	32	Printing stopped by paper end.
6	Off	00	0	No error.
	On	40	64	Error occurred.
7	Off	00	0	Not used. Select off.

Bit 5：Turn on when stopping print when the no paper sensor detected paper end.

n = 3: Error status

Bit	Off/On	Hex	Decimal	Fuction
0	Off	00	0	Not used. Select off.
1	On	02	2	Not used. Select on.
2	Off	00	0	No mechanical error.

	On	04	4	Mechanical error occurred.
3	Off	00	0	No autocut error.
	On	08	8	Autocut error occurred.
4	On	10	16	Not used. Select on.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error.
	Off	40	64	Automatically recoverable error occurred.
7	On	00	0	Not used. Select off.

Bit 2：While the cover is opening, the printer showed it as the mechanical error.

Bit 6：If the temperature of print head is extremely high, bit 6 will be turn on, until temperature of the print head effectively comes down or open the cover during printing.

n = 4: Roll paper sensor status

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not used. Select off.
1	On	02	2	Not used. Select on.。
2，3	Off	00	0	No paper end detected by paper near-end sensor.
	On	0C	12	Paper near-end detected by paper near-end sensor.
4	On	10	16	Not used. Select on.
5，6	Off	00	0	Paper near-end sensor：with paper.
	On	60	96	Paper near-end detect printing to the paper end.
7	Off	00	0	Not used. Select off.

[Reference] **DLE ENQ**， **GS a**， **GS r**

ESC ! n

[Name] Select print modes

[Format] ASCII ESC ! n

Hex 1B 21 n

Decimal 27 33 n

[Range] 0 ≤ n ≤ 255

[Description] Select print modes by the data of appointing parameter n.The definition of n as follows:

Bi	Off/On	Hex	Decimal	Function

t				
0	Off	00	0	Character type A (12× 24)。
	On	01	1	Character type B (9× 17)。
1	-	-	-	Undefined
2	-	-	-	Undefined
3	Off		0	Emphasized mode is turned off.
	On		8	Enphasized mode is turned on.
4	Off		0	Double height canceled
	On		16	Double height selected
5	Off		0	Double width canceled
	On		32	Double width selected
6	-	-	--	Undefined
7	Off		0	Underline mode is turned off
	On		128	Underline mode is turned on

［Particularize] When selecting the double height and width mode at the same time, print 4 times characters .

The printer can add the underline to all characters, but can not add the underline to blank and clockwise switching 90 which set by HT command.

The thickness of the underline set by ESC, unrelated with the character size.

When the double or more height characters in one line, all characters will be justified along basis line

ESC M could be set the font type of characters. The last command received that is effective.

ESC E Empahsized mode is turned on/off. The last command received that is effective.

ESC – Under mode is turned on/off, the last command received that is effective.

GS ! Set character size. The last command received that is effective.

Emphasized mode is affect for English and Chinese characters. All print mode only affect for English expect for emphasized mode.

[Default] n = 0

[Reference] **ESC -**, **ESC E**, **GS !**

ESC ! n

[Name] Select print modes

[Format] ASCII ESC ! n

Hex 1B 21 n

Decimal 27 33 n

[Range] 0 ≤ n ≤ 255

[Description] Select print modes by the data of appointing parameter n.The definition of n as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character type A (12× 24)。
	On	01	1	Character type B (9× 17)。
1	-	-	-	Undefined
2	-	-	-	Undefined
3	Off		0	Emphasized mode is turned off.
	On		8	Enphasized mode is turned on.
4	Off		0	Double height canceled
	On		16	Double height selected
5	Off		0	Double width canceled
	On		32	Double width selected
6	-	-	--	Undefined
7	Off		0	Underline mode is turned off
	On		128	Underline mode is turned on

［Particularize] When selecting the double height and width mode at the same time, print 4 times characters .

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GS ! Set character size. The last command received that is effective.

Emphasized mode is affect for English and Chinese characters. All print mode only affect for English expect for emphasized mode.

[Default] n = 0

[Reference] **ESC -**, **ESC E**, **GS !**

ESC $ nL nH

[Name] Set absolute print position

[Format] ASCII ESC $ nL nH

Hex 1B 24 nL nH

Decimal 27 36 nL nH

[Range] 0 ≤ nL ≤ 255

0 ≤nH ≤ 255

[Description] Set the distance from the beginning of one line to the position which will be printed the characters.

The distance from the beginning of one line to the position which will be printed is:

[(nL + nH× 256) ×0.125 mm]。

[Particularize] The set which be appointed as the print area will be ignored.

In stable mode, use the horizontal motor unit (x).

In page mode, horizontal or vertical motor unit wihich will be different as the original of printable area, as follows:

①When **ESC T** set the original position to the up left or lower right printable area,using the horizontal motor unit (x).

②When **ESC T** set the original position to the up right or lower left printablearea,using the vertical motor unit (y).

[Reference] **ESC **, **GS $**, **GS **

ESC % n

[Name] Select/cancel user-defined character set

[Format] ASCII ESC % n

Hex 1B 25 n

Decimal 27 37 n

[Range] 0 ≤ n ≤ 255

[Description] Select/cancel user-defined character set.

When the LSB of n is 0, the user-defined character set is canceled.

When the LSB of n is 1, the user-defined character set is selected.

[Particularize] When select cancel user-defined character set, automatically select inner character set.

n only valid at least significant bit.

[Default] n = 0

[Reference] **ESC &**, **ESC ?**

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 modes to the modes that were in effect when the power was turned on.

[Notes] The set of DIP swith and Memory Switch won't check.

The data in receiving buffer area won't be cleared.

Macro definition won't be cleared.

ESC * m nL nH d1... dk

[Name] Select bit-image mode

[Format] 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 ≤nL ≤255

0 ≤nH ≤3

0≤ d ≤ 255

[Description] Selects bit-image mode by m, the bit image dot set by nL and nH, as above table:

m	Mode	Vertical direction		Horizontal direction	
		Dot	Dot density	Dot density	Data number (K)
0	8-dot single-density	8	67.7 dpi	101.6 dpi	nL + nH× 256
1	8-dot double-density	8	67.7 dpi	203.2 dpi	nL + nH ×256
32	24-dot single-density	24	203.2 dpi	101.6 dpi	(nL + nH × 256) ×3
33	24-dot double-density	24	203.2 dpi	203.2 dpi	(nL + nH × 256) ×3

Dpi: {1 inch}/25.4mm print dot

[Notes] If the data of m overs the defined range, then the data of n and after n will be dealt as the rule data.

nL and nH indicates the bit-image data in the horizontal direction.

Calculate the dot through nL + nH × 256.

If input the bit-image data that overs the printable dots in one line, then the over data will be ignored.

d indicates bit-image data. Set the relative bit to 1 and print one point, or set to 0 and do not print one point.

If the printable width which set by **GS L** and **GS W** is smaller than the data which sent by ESC *, Then executing the following operation to the line which have problems (but the printing can not over the max printable area):

① The printable width extend to the right and meet the data content.

② If the step ① can not apply the enough width to the data, so the left will be decreased to apply the relative data. For the bit data in the single density mode (m = 0, 32), The printer has two points: for the bit dat in the double density mode (m = 1, 33), the printer prints one point.

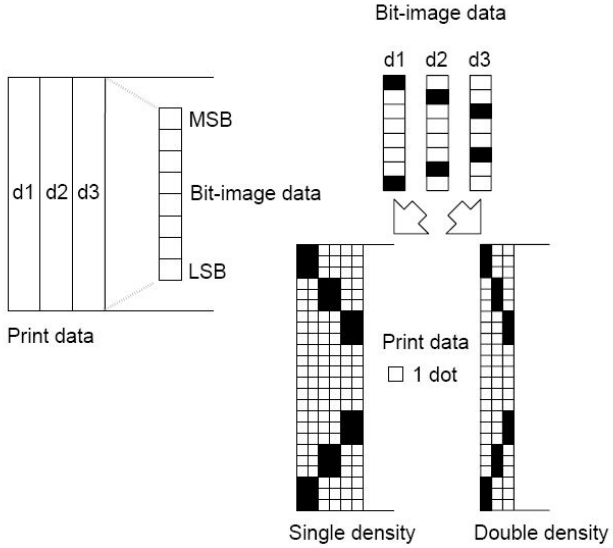
When calculating the data content in one line, these have to consider.

After printing one bit-image, the printer return to the common data dealing mode.

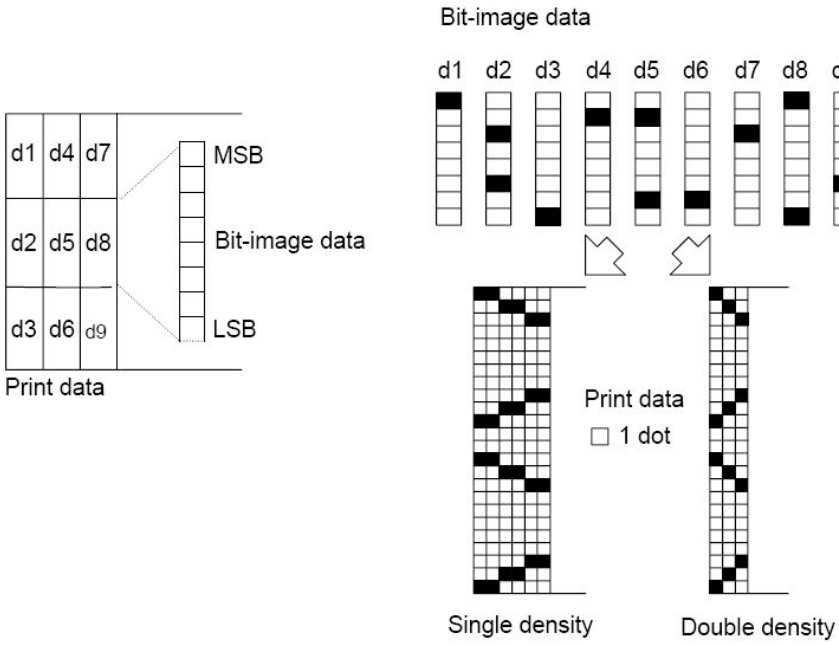
This command won't be affected by printing mode(bold、overlapping、underline、character size、or inverse printing), except for upside down print mode.

The following figures describes the the relationship of image data and printing dot.

8-dot bit-image is selected:



- 24-dot bit-image is selected:



ESC – n

[Name] Turn underline mode on/off

[Format] ASCII ESC -

n

Hex 1B 2D

n

Decimal 27 45

n

[Range] 0 ≤ n ≤ 2, 48 ≤ n ≤ 50

[Description] Turns underline mode on/off:

n	Function
0, 48	Turns off underline mode.
1, 49	Turns on underline mode (1 dot width)

[Notes] The printer can print all character with underline (include the right spacing of character), except for blank which set by HT.

The printer can not print underline of the character of clockwise 90 and reverse character.

Turns off underline mode by setting the data of n with 0 or 48, the following data won't print underline, and the bold won't change before turing off underline mode. The bold of default underline is 1 dot.

Changes the character size won't affect the bold of underline.

Turned on/off underline mode by ESC !. but notes that the last receiving command is valid.

[Default] n = 0

[Reference] ESC !

ESC 2

[Name] Select default line spacing

[Format] ASCII ESC 2

Hex 1B 32

Decimal 27 50

[Description] Sets the line spacing to 3.75mm (30 0.125mm).

[Note] Line spacing set independently in stable mode and page mode.

[Reference] **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] Set line spacing [n × 0.125mm].

[Notes] Sets line spacing independently in stable mode and page mode.

In stable mode, uses vertical unit (y).

In page mode, as the printable original position , the function of this command as followings:

① When set the original position to printable up left or down right by ESC T, uses vertical motor unit (y).

② When set the original position to printable up right or down left by ESC T, used the horizontal motor unit (x).

[Default] n = 30

[Reference] **ESC 2**

ESC a n

[Name] Select justification

[Format] ASCII ESC a

n

Hex 1B 61 n

Decimal 27 97 n

[Range] 0 ≤ n ≤ 2, 48 ≤ n ≤50

[Description] Justify a line data according to the point position

Select justification by n as follows:

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

[Notes] In stable mode, this command is valid only the original line.

If input this command in page mode, printer only executes inner sign operation.

This command invalids in page mode.

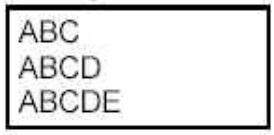
This command executes justification in print area.

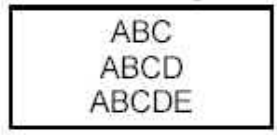
This command justifys the blank area according to **HT** , **ESC $** or **ESC **.

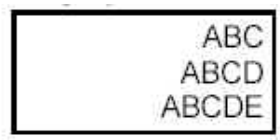
[Default] n = 0

[Examples]

Left justification **Centering** **Right justification**







ESC c 5 n

[Name] Enable/disable panel buttons

[Format] ASCII ESC c

5 n

Hex 1B 63

35 n

Decimal 27 99

53 n

[Range] 0 ≤n ≤255

[Description] Enable/disable panel buttons.

When the LSB of n is 0, the panel buttons are enabled.

When the LSB of n is 1, the panel buttons are disabled.

[Notes] Only uses the LSB of n.

If disable the panel buttons, so close the printer cover, all buttons are disable.

For this printer, the only one panel button is feed paper button.

When locates in macro executing conditions, however how to set this command, feed paper button are enable. But can not feed paper.

[Default] n = 0

ESC d n

[Name] Print and feed n lines

[Format] ASCII ESC d n

Hex 1B 64 n

Decimal 27 100 n

[Range] 0 ≤ n ≤ 255

[Description] Prints the data in the right buffer and feeds the paper n.

[Notes] This command set the print starting position to line starting position.

This command can not effect the line spacing which set by ESC 2 or ESC 3.

The max feed paper measure is 1016 mm{40inch}. If the specified feed paper measure (n line spacing) overs 1016mm{40inch}, so the printer only feed paper 1016mm{40 inch}.

[Reference] **ESC 2** , **ESC 3**

ESC p m n1 n2

[Name] Cash draw control

[Format] ASCII ESC p m n1 n2

Hex 1B 70 m n1 n2

Decimal 27 112 m n1 n2

[Range] m=0, 0<n1≤n2≤255

[Description] According to n1,n2, and produced the pulse which existed a certain time space, this orders be used to control the cash drawer movement.

The open time is n1×2ms, the closed time is n2×2ms

ESC i

[Name] Full cut

[Format] ASCII ESC i

Hex 1B 69

Decimal 27 105

[Description] After receiving this command, the printer executes full cut.

[Note] As it won't feed paper when executing this command, please assures that feed paper5mm or more before executing this command next time, to avoid that the cutter be damaged.

[Default] The default is partial cut mode.

ESC j n

[Name] Retreat paper

[Format] ASCII ESC j n

Hex 1B 6A n

Decimal 27 106 n

[Description] Retreat paper when receiving the command.

[Note] Because the printer will not feed paper when executing this command, so at least there are 5mm feed paper in next operation, avoid to break cuter.

ESC m

[Name] Partial cut

[Format] ASCII ESC m

Hex 1B 6d

Decimal 27 109

[Description] The printer received this command, then executing partial cut at present position.

[Note] As the printer do not feed paper when executing this command, so before executing this command in the next time, assure that feed paper at least 5mm or more, prevent cutter broken.

[Default] Partial cut mode is default.

ESC t n

[Name] Select character code table

[Format] ASCII ESC t n

Hex 1B 74 n

Decimal 27 116 n

[Range] 0 ≤n ≤ 5, 16 ≤n ≤ 19, n = 255

[Decription] Select page n from the character code table.

n	Page
0	PC437 [Std.Europe]
1	Katakana
2	PC850 [Multilingual]
3	PC860 [Portuguese]
4	PC863 [Canadian]
5	PC865 [Nordic]
6	PC866 [West Europe]
7	Greek
8	Hebrew
9	East Europe
10	Iran
16	WPC1252
17	PC866 [Cyrillic#2]
18	PC852 [Latin2]
19	PC858 [Europe]
20	IranⅡ
21	Latvian
22	Arabic
23	PT151, 1251
24	PC747
25	WPC1257
27	Vietnam
28	PC864
29	PC1001
30	Uigur
31	Hebrew
32	WPC1255 (Iarael)
255	Thai
50	PC437[Std.Europe]
51	Katakana
52	PC437[Std.Europe]
53	PC858[Multilingual]
54	PC852 [Latin 2]
55	PC860[Portuguese]
56	PC861[Icelandic]
57	PC863[Canadian]
58	PC865[Nordic]

59	PC866[Russian]
60	PC855[Bulgarian]
61	PC857[Turkey]
62	PC862[Hebrew]
63	PC864[Arabic]
64	PC737[Greek]
65	PC851[Greek]
66	PC869[Greek]
67	PC928[Greek]
68	PC772[Lithuanian]
69	PC774[Lithuanian]
70	PC874[Thai]
71	WPC1252[Latin-1]
72	WPC1250[Latin-2]
73	Wpc1251[Cyrilic]
74	PC3840[Russian]
75	PC3841[Russian standard]
76	PC3843[Poland]
77	PC3844[CS2]
78	PC3845[Hungarian]
79	PC3846[Turisk]
80	PC3847[Brazil-ABNT]
81	PC3848[bRAZIL]
82	PC1001[Arabic]
83	PC2001[;otjiamoam]
84	PC3001[Estonian-1]
85	PC3002[Estonian -2]
86	PC3011[Latvian-1]
87	PC3012[Latvian -2]
88	PC3021[Bulgarian]
89	PC3041[Multa]
90	PC1254[Turkey]
91	PC1257[Baltic]
92	PC1256[Arab]

[Default] n = 0

[Reference] Character tables

ESC D n1 . . . nk NUL

[Name] Set horizontal tab positions

[Format] ASCII ESC D n1 . . . nk NUL

Hex 1B 44 n1 . . . nk 00

Decimal 27 68 n1 . . . nk 0

[Range] 1 ⩽ n ⩽ 255

0 ⩽ k ⩽ 32

[Description] Set horizontal tab positions.

n specifies the number from the beginning of one line, uses to set horizontal position.

k indicates the total data which set by horizontal position.

[Notes] Horizontal position as a data to store, this data is [character width n], is measuring from the beginning of the line. The character width includes the right spacing of the character, and double width character set by double width of stable character.

This command delects the horizontal position which set before.

When set n = 8, the print position moved to the ninth row by sending HT.

Could be set position to 32 (k = 32). The data overs 32 will be dealt as normal data.

As sort ascending to transmit [n] k and put one NUL 0 at last.

When [n] k is less than or equal to the fore data, sets position which be finished, and the continued data dealt as normal data.

ESC D NUL cancel all horizontal position.

Even if changes the character width, the fore specified horizontal position also do not change.

For stable and page mode, character width will be memoried.

[Default] Default position is 8 character spacing (raw 9，17，25 ...) of type A (12 24).

[Reference] **HT**

ESC E n

[Name] Turn emphasized mode on/off

[Format] ASCII ESC E n

Hex 1B 45 n

Decimal 27 69 n

[Range] 0 ⩽ n ⩽ 255

[Description] Turn emphasized mode on/off.
When the LSB of n is 0, emphasized mode is turned off.
When the LSB of n is 1, emphasized mode is turned on.
[Notes] Permits to only the LSB of n.
This command turns emphasized mode on/off by the same command as ESC ! Be care, when this command used the same time as ESC !.
[Default] n = 0
[Reference] **ESC !**

ESC G n

[Name] Turn double-strike mode on/off
[Format] ASCII ESC G
n
Hex 1B 47
n
Decimal 27 71
n
[Range] 0 ≤ n ≤255
[Description] Turn double-strike mode on/off.
When the LSB of n is 0, double-strike mode is turned off.
When the LSB of n is 1, double-strike mode is turned on.
[Notes] Permits to use only the LSB of n.
The same output in double-strike mode and emphasized mode.
[Default] n = 0
[Reference] **ESC E**

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 and outputs the data in print buffer area, and feed paper [n × 0.125 mm].
[Notes] After printing, this command set the original position to the beginning of one line.
The feed paper quatinty do not affect the data which set by ESC 2 or ESC 3.
In stable mode, the printer uses vertical unit(y).

In page mode, according to the printable original position, the function of this command as follows:

① When set original position to printable up left or down right by ESC T, uses vertical motor unit (y).

② When set original position to printable up right or down left by ESC T, uses horizontal motor unit (x).

ESC N m n

[Name] Set chosen function

[Format] ASCII ESC N m n

Hex 1B 4E m n

Decimal 27 78 m n

[Description]

Partial cut：m=3;n=1

Full cut：m=3;n=0

Chinese mode：m=8;n=1

Exit Chinese mode：m=8;n=0

Change to BIG5：m=9;n=1

Change to 18030：m=9;n=0

ESC R n

[Name] Select an international character set

[Format] ASCII ESC R n

Hex 1B 52 n

Decimal 27 82 n

[Range] 0 n 13

[Description] Select an international character set according to the following table.

n	International character set
0	USA
1	France
2	Germany
3	UK
4	Denmark I
5	Sweden

6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea

[Default] n = 0

[Reference] International character set

ESC SP n

[Name] Set right-side character spacing

[Format] ASCII ESC SP n

Hex 1B 20 n

Decimal 27 32 n

[Range] 0 ≤ n ≤ 255

[Description] Set right-side character spacing [n× 0.125 mm].

[Particularize] For double width mode, right-side character spacing is the twice than the unusal mode.When the characters enlarges to n times, right-side character spacing is the n times than the usual mode.

This command does not affect the setting of the Chinese characters.

This command set righ-side character spacing in stable mode and page mode.

[Default] n = 0

FS p n m

[Name] Print NV bit image

[Format] ASCII FS p n m

Hex 1C 70 n m

Decimal 28 112 n m

[Range] 1 ≤ n ≤ 255

0 ≤ m≤ 3 , 48≤m ≤ 51

[Description] Prints NV bit image n using m.

m	Mode	Vertical direction	Horizontal direction
0, 48	Normal	203.2 dpi	203.2 dpi
1, 49	Double -width	203.2 dpi	101.6 dpi
2, 50	Double -height	101.6 dpi	203.2 dpi
3, 51	Quadru ple	101.6 dpi	101.6 dpi

dpi: per 25.4 mm{1inch} print dot

n is the quantity of NV bit image(defined by ES q).

m specify bit image mode

[Particularize] NV bit image defined bit image in NVM. Define by FS q, print by FS P.

When the appointed NV bit image absent, this command is invalid.

In stable mode, this command effects only when there are no data in buffer area.

In page mode, this command is invalid.

This command do not effected by print mode（bold print，overlap print，underline，character size，anti-white print or character 90 rotation etc.），except reversal print mode.

If set the NV bit image print area width which is less than a vertical line by GS L and GS W, Executes the following operation only for problem line. In NV bit image mode, a vertical line means the dot of normal mode (m 0, 48) and double height mode (m 2, 50)，two dots of double width mode (m 1, 49) and quadruple mode (m 3, 51).

① In NV bit image mode, the print area width extendes to right to a vertical line. In this case, print can not over the print area.

② If the print area width can not extend to a vertical line, the left blank decreases to contain a vertical line.

If the download bit image overs one line, do not print the over data.

In normal and double width mode, this command feed paper n dots, n is the height of NV bit image, In double height and qu adruple mode, this command feed paper 2n dots, n is NV bit image height, do not related with the line spacing which set by ESC 2 and ESC 3.

After printing bit image, this command set the print position at the original of one line, and deal with the continued data as normal data.

[Reference] **ESC ***, **FS q** , **GS /** , **GS v 0**

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

[Name] Define NV bit image

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

Hex 1C 71 n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n

Decimal 28 113 n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n

[Range] 1 ≤n ≤ 255

0 ≤ xL≤255

0 ≤xH ≤ 3 (when 1 ≤ (xL+ xH× 256) ≤ 1023

0 ≤ yL ≤ 255

0 ≤ yH ≤ 1 (when 1 ≤ (yL+yH× 256) ≤ 288

0 ≤ d ≤ 255

k = (xL+xH × 256) × (yL+ yH ×256) × 8

Total defined data area = 192K byte

[Description] Set NV bit image by specified n.

n specify the quantity of NV bit image.

xL, xH for defined NV bit image points the dot of horizontal direction (xL+ xH× 256) ×8.

yL, yH for defined NV bit image points the dot of vertica direction (yL+yH× 256) × 8.

[Particularize] This command cancels all defined NV bit image by this command. The defined data, the printer can not defind anyone of data repeatly. If repeat certain data, so all data should be sent once again.

During deal with this command to finish reseting hardware, can not execute mechanism operation （contains when the cover is open to initialize the print head position, feed paper by feed paper button etc.）.

During deals with this command, when writing data to user NV memory, the printer is busy and stop receiving data. So forbid to transmit data during execute this command, contain real-time command.

NV bit image is one bit image which definds in NVM. Prints by FS p which defined by FS q.

In stable mode, This command only effecs on the original line.

In page mode, this command is invalid.

The 7 bytes <FS yH> of this command, after normal dealing with, this command effecs.

. When the data quantity overs the left capacity range, the printer processes the

range which defined by xL, xH, yL, yH.

. At the first group bit image, when any parameters in xL, xH, yL, yH overs the defined range, this command is disabled.

.At any one of group bit image except for the first group, when the printer meets that xL,xH, yL, yH overs the defined scale, stops processing this command, and begins to write NV image. At this moment, the undefined NV bit image (undefined)is disabled, but any NV bit image defined before always affects.

.d indicates defined data. At the data (d), one bit specifies one dot which need to print and one 0 bit specifies one dot which do not need to print.

.This command put n to define as the quantity o NV bit image. The quantity goes up from bit image 01H. So the first data group [xL xH yL yH dl...dK] is the NV bit image 01H. The last data group [xL xH yL yH dl...dK] is the NV bit image n. The total the same as the NV bit image quantity which be set by FS p.

. One NV bit image defined data consists of [xL xH yLl xH dl...dK]. So, when only has one NV bit image n=1, the printer only processes the data group [xl xH yL yH dl...dK] once. The printer uses ([data:(xL+xH×256) × (yL+yH×256) × 8]+[header:4]) bytes of the NV memory.

.The definded area of this printer is 192K bytes (max). This command can define several bit images, but can't define the bit image which the total capacity [bit image data+head] overs 192K bytes.

.Whatever how to set DIP switch 2-1, the printer enters "busy" before writing NV memory.

.Even set ASB, the printer do not send the ASB status or execute status test during process this command.

.When receive this command during macro definition, the printer stops macro definition and executes this command.

.Once defines one NV bit image, it can't be executed ESC @, and deleted when reset and power off.

.This command only executes the definition of NV bit image, do not execute print. NV bit image print executed by FS p.

[Notes] . Writes command frequently which could be broken the NV memory.

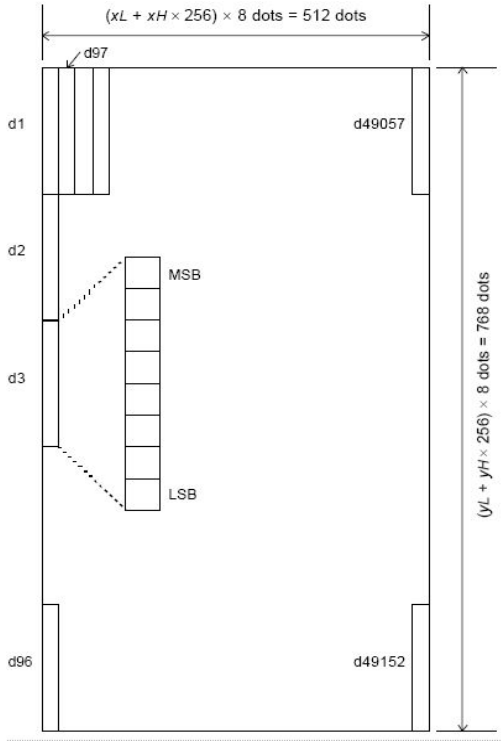
So, suggests that executes the written operation less than ten times.

.After the process of putting one bit image into NV memory, the printer executes one hardware reset operation. So, defines the user-defined character, download bit image and macro after finishing this command. The printer clears receive and print buffer area, and reset to the effective

mode when turing the power on. At this moment, the switch DIP set will be checked once again.

[Reference] FS p

[Examples] 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 ≤ 8, 1 ≤horizontal≤ 8)

[Description] Set character height by 0-2, character width by 4-6. As follows:

Bit	Off/on	Hex	Decimal	Function
0				
1				Set character height. See table 2.
2				

3	
4	Set character width. See table 1.
5	
6	
7	

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

Table 1
Set character width

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

Table 2
Set character height

[Notes] .This command affects to all characters (English characters and Chinese) except for HRI character.

.If n is out of the definition scale, this command will be ignored.

. In stable mode, the vertical direction is the feed paper direction. However, when thecharacter direction rotates clockwise 90°, the vertical direction and horizontal direction will be reversed.

.In page mode, the vertical direction and horizontal direction are on basis of the character direction.

.When enlarging the characters in a line by the different size, all characters in a line will be paralleled along the baseline.

.Turn double width and height mode by ESC !. The set of command which received at last will be affected.

[Default] n = 0

[Reference] **ESC !**

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

[Name] Defines down-load bit image

[Format] ASCII GS

x y d1...d(x y 8)

Hex 1D 2A x

y d1...d(x y 8)

Decimal 29 42 x

y d1...d(x y 8)

[Range] 1 ≤x ≤ 255

1 ≤ y ≤ 48 (x × y × 1536)

0 ≤ d ≤255

[Description] Specifies dot by x and y, and defines the down-load bit image.

x specify horizontal dot.

y specify vertical dot.

[Notes] Horizontal direction dot is x × 8； Vertical direction dot is y × 8.

When x × y overs the defined range, this command is disabled.

d *indicates bit image dat. Data* (d) specifies that print bit is 1， Do not print bit that is 0.

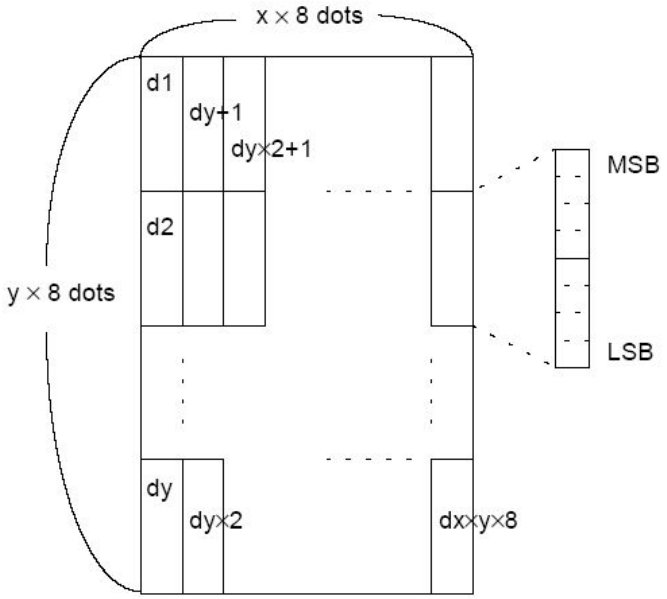
In following case, clear down-load bit image definition ：

① Executes **ESC @** .

② Executes **ESC &** .

③ The printer reset or turn the power of.

The connection between down-load bit image and print data as follows.



[Reference] **GS /**

GS / m

[Name] Prints down-load bit image

[Format] ASCII GS /

m

Hex	1D	2F	m
Decimal	29	47	m

[Range] 0 ⩽ m ⩽ 3, 48 ⩽ m ⩽ 51

[Description] Prints down-load bit image by mode which defines by m.

m set mode from following table：

m	Mode	Vertical dot density	Horizontal dot density
0, 48	Stable	203.2 dpi	203.2 dpi
1, 49	Double width	203.2 dpi	101.6 dpi
2, 50	Double height	101.6 dpi	203.2 dpi
3, 51	Quadruple	101.6 dpi	101.6 dpi

dpi: per 25.4 mm {1inch}

[Notes] .If the bit image data has not defined, then this command will be ignored.

.In stable mode, this command affects only when there are no data in the printing buffer area.

.This command is invalid in print mode [bold, overlap, underline, character size or reverses blank printing], except for up-down printing mode.

.If the download bit image which will be printed overs the printable area, then the over data can not print.

.If the printable width which set by GS L and GS W is less than the asked width by GS to send the data, then executes the following continued operation for the problem lines [the print can not over the max printable area].

① The width of the printable area which extends to the right and holds the data capacity.

② If the step ① can't provided enough width for data, then narrows the left blank to hold the data.

Each data in stable mode (m=0, 48) and double height mode (m=2,50), the printer prints one dot;

Each data under the double width mode (m=1, 48) and four double mode (m=3, 51), the printer prints two dots.

[Reference] **GS ***

GS (E pL pH fn a d1...dk

Set the baud rate

[Format] ASCII GS (E *pL pH fn a d1 ... dk*

Hex 1D 28 45 *pL pH fn a d1 ... dk*

Decimal 29 40 69 *pL pH fn a d1 ... dk*

[Range] $3 \le (pL + pH \cdot 256) \le 65535$ ($0 \le pL \le 255$, $0 \le pH \le 255$)

$fn = 11$

$a = 1$

$48 \le d \le 57$

[Description] Set serial port baud rate

d1…dk	Transmission speed
“2400”	2400 bps
“4800”	4800 bps
“9600”	9600 bps
“19200”	19200 bps
“38400”	38400 bps
“57600”	57600 bps
“115200”	115200 bps

[Details] First make the PC and the printer is currently set to the same baud rate, and printer should be in normal working condition, there is no error when the printer must be restarted for the new settings to take effect.

[Example] The following is a hexadecimal data set using different baud rate

```
//2400
1d 28 45 08 00 0b 01 22 32 34 30 30 22
//4800
1d 28 45 08 00 0b 01 22 34 38 30 30 22
//9600
1d 28 45 08 00 0b 01 22 39 36 30 30 22
//19200
1d 28 45 09 00 0b 01 22 31 39 32 30 30 22
//38400
1d 28 45 09 00 0b 01 22 33 38 34 30 30 22
//57600
1d 28 45 09 00 0b 01 22 35 37 36 30 30 22
//115200
1d 28 45 0a 00 0b 01 22 31 31 35 32 30 30 22
```

GS h n

[Name] Set bar code height

[Format] ASCII GS h n

Hex 1D 68 n

Decimal 29 104 n

[Range] 1 ≤ n ≤ 255

[Description] Set bar code height

n set vertical dot

[Default] n = 162

[Reference] **GS k**

①GS k m d1 . dk NUL ②GS k m n d1 . dn

[Name] Set bar code

[Format] ①ASCII GS k m d1 ... dk NUL

Hex 1D 6B m d1 ... dk 00

Decimal 29 107 m d1 ... dk 0

②ASCII GS k m n d1 ... dn

Hex 1D 6B m n d1 ... dn

Decimal 29 107 m n d1 ... dn

[Range] ① 0 ≤ m ≤ 6 (k and d decided by the used bar code system)

② 65 ≤ m ≤73 (n and d decided by the used bar code system)

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

m select the following bar code system

m		Bar code system	Character number	Notes
①	0	UPC-A	11≤ k ≤12	48 ≤ d ≤57
	1	UPC-E	11 ≤ k ≤ 12	48 ≤ d ≤57
	2	JAN13 (EAN13)	12 ≤k ≤13	48 ≤ d ≤57
	3	JAN8 (EAN8)	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 (k is even)	48 ≤ d ≤ 57
	6	CODABAR	1 ≤ k	48 ≤ d ≤ 57, 65 ≤d ≤ 68, 36, 43, 45, 46, 47, 58
	7	Standard EAN13	12≤ k ≤13	48 ≤ d ≤57
	8	Standard EAN8	7≤ k ≤ 8	48 ≤ d ≤57
②	65	UPC-A	11≤ n ≤12	48 ≤ d ≤57
	66	UPC-E	11≤ n ≤12	48 ≤ d ≤57

	67	JAN13 (EAN13)	12 ⩽ n ⩽ 13	48 ⩽ d ⩽57
	68	JAN8 (EAN8)	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 (n is even)	48 ⩽ d ⩽ 57
	71	CODABAR	1 ⩽ n ⩽ 255	48 ⩽ d ⩽ 57, 65 ⩽d ⩽ 68, 36, 43, 45, 46, 47, 58
	72	CODE93	1 ⩽ n ⩽255	0 ⩽ d ⩽ 127
	73	CODE128	1 ⩽ n ⩽ 255	0⩽ d ⩽ 127
	74	Standard EAN13	12 ⩽ n ⩽ 13	48⩽ d ⩽ 57
	75	Standard EAN8	7 ⩽n ⩽8	48 ⩽d ⩽ 57

[Note ①]

This command finished by NUL.

When bar code system UPC-A or UPC-E be used，the printer receives 12 bytes bar code data, and then printing bar code and processing the continued data as normal data.

When bar code system JAN13 (EAN13) be used，the printe receives 13 bytes bar code data, and then printing bar code and processing the continued data as normal data.

When bar code system JAN8 (EAN8) be used， the printer receives 8 bytes bar codedata, and then printing bar code and processing the continued data as normal data.

The number of ITF bar code data must be even. When inputting the odd number, the printer ignores the last receiving data.

[Note②]

n specifies bar code data bytes, and the printer processes n byte data as bar code data from the next character.

If n overs the specified range, the printer stops processing this command, and processes the continued data as the normal data.

[Notes in standard mode]

If d overs the specified range, the printer only feeds paper and processes the continued data as the normal data.

If horizontal direction size overs the printable area, the printer only feeds paper.

This command feeds paper as the requirement of bar code, do not relate the line spacing which set by ESC 3 or ESC 2 .

This command affects only no data in printing buffer area. When there

are data in printing buffer area, the printer processes the continued data of n as the normal data.

After printing bar code, this command set the origin line as the printing position.

This command do not affect the print mode (bold, overlap, underline, character size, invert blank print, or character 90°revolution etc.), except for the upside down print mode.

[Notes in page mode]

.This command makes bar code data in the print buffer area, but do not print. After processing bar code data, this command moves the print position to the right dot of bar code.

.If d overs the specified range, the printer stops processing the commands and deals with the continued data as the normal data. In such circumstances, data buffer area position does not change.

.If the bar code width overs the printable area, the printer doesn't print bar code, but moves data buffer area position to left to out of print area.

.Refer to the section 3.9 in page mode.

When using thermal label:

.If the bar code height can not meet the present label, the over parts will be printed on the next label.

When using CODE93 (m = 72)：

.The printer prints one HRI character (□) at the beginning of the HRI character font, as the origin character of HRI character font.

. The printer prints one HRI character (□) at the end of the HRI character font, as the end character of HRI character font.

.The printer prints HRI characters (■+one word character) as the control character (<00>H to <1F> and <7F>H):

Control Character			HRI	Control Character			HRI
ASCII	Hex	Decimal	Character	ASCII	Hex	Decimal	Character
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	EN	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

[For example] Print GS k 72 7 67 111 100 101 13 57 51

When using CODE128 (m = 73)：

. Refer to the information of CODE128 bar code and its code table, see the appendix E.

.When the printer uses CODE128, please considers the following data transmission:

① The head of bar code data font have to the code font select characters (CODE A, CODE B, or CODE C), be used to select the first used code font.

② Define the special characters by character “{” and one character group. Define ASCII character “{” through continuing to transmit “{” twice.

Special Character	Transmission 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

[For example] Print "No. 123456" data

As this sample, the printer prints “No” by CODE B firstly, then printing the following numbers by CODE C.

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

.If the head of bar code data is not the code font selected characters, the printer stops processing the command, and deals with the continued data as the normal data.

.If"{" and continued character group are not meet to any special characters, the printer stops processing the command, and deals with the continued data as the normal data.

.If the printer received the characters which can't be used to special code font, the printer stops processing the command, and deals with the continued data as the normal data.

.The printer doesn't print the HRI characters which relative to shift characters or code font selected characters.

.Related function HRI characers are blank.

.Related control characters (<00>H to <1F>H and HRI characters <7F>H) are blank.

<Anothers> Be sure to leave the spacing both on right and left bar code. (the different bar code type, the different spacing)

[Reference] **GS H**, **GS f**, **GS h**, **GS w**

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

[Name] Print grating 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 here 1≤ (xL + xH × 256) ≤ 128

0 ≤ yL ≤ 255

0 ≤ yH≤ 8 here 1 ≤ (yL + yH × 256) ≤ 4095

0 ≤d ≤255

k = (xL + xH × 256) (yL + yH × 256) (k ≠ 0)

[Description] Set grating bit image as follows:

m	Mode	Vertical dot density	Horizontal dot density
0, 48	Normal	203.2 dpi	203.2 dpi
1, 49	Double width	203.2 dpi	101.6 dpi
2, 50	Double height	101.6 dpi	203.2 dpi

3, 51	Four time size	101.6 dpi	101.6 dpi

(dpi: per 25.4 mm {1 inch}print dot)

xL, xH, set bit image horizontal direction data byte (xL+xH×256).

yL, yH, set bit image vertical direction data byte (yL+yH×256).

[Notes] In standard mode, this command affects only when there are no data in print buffer area.

For grating bit image print, this command doesn't affect by print mode (character size，bold，overlap，upside down print，underline，invert blank print etc.).

.If the printable area width which set by GS L and GS W is narrower than the min width, the printer only extends the problem line to the min width. The min width for the normal mode (m=0,48) and the double height mode(m=2, 50) are one dot, for the double width mode(m=1,49) and the four times mode(m=3,51) are two dots.

.The data out of the print area be read, and discarded one by one.

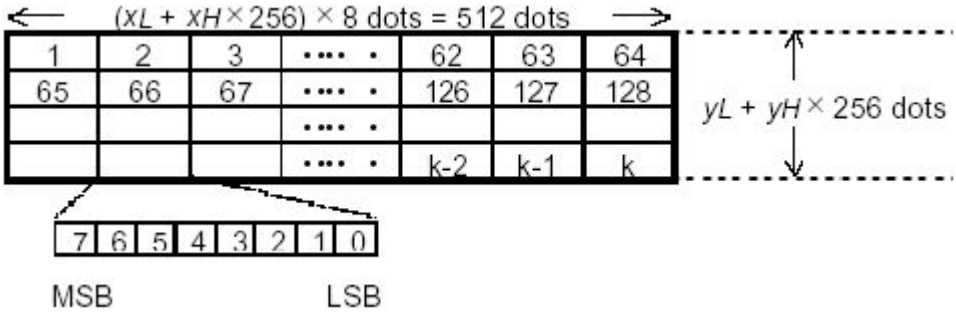
. If the continued character position is multiple of 8. The continuthe ed character print position as the grating bit image print, set by HT(horizontal table), ESC $(set absolute print position), ESC \ (set relative print position) and GS L(set left side spacing).

.The set by ESC a (set justification) for the grating bit image is also effective.

.Receive this command during macro definition, the printer finishes the macro definition, and begins to execute this command. The definition of this command should be cleared.

d specifies bit image data. Set the dot which will be printed as 1, the dot which won't be printed as 0.

[For example] When xL+xH×256=64



GS w n

[Name] Set bar code width

[Format] ASCII GS w n

Hex 1D 77 n

Decimal 29 119 n

[Range] 2≤n≤ 6

[Description] Set bar code horizontal size.

n set bar code width as follows:

n	Multi bar code unit width(mm)	Binary bar code	
		Narrow width(mm)	Wide width(mm)
2	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.560	0.500	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2.000

Multi bar code as follows:

UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, CODE128

. Binary bar code as follows:

CODE39, ITF, CODABAR

[Default] n = 3

[Reference] **GS k**

GS H n

[Name] Select print position of HRI characters

[Format] ASCII GS H n

Hex 1D 48 n

Decimal 29 72 n

[Range] 0 ≤ n ≤ 3; 48 ≤ n ≤51

[Description] Print bar code, select print position of HRI characters.

n select print position, as following table:

n	Print position
0, 48	Not print
1, 49	Above bar code
2, 50	Below bar code
3, 51	Above and below bar code

Note：Printing HRI character position does not set according to the standard position.

HRI （Human Readable Interpretation）indicates the barcode corresponding characters.

[Note] Print HRI character which set by GS F.

[Default] n = 0

[Reference] **GS f**, **GS k**

GS L nL nH

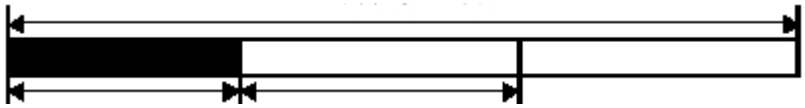
[Name] Set left margin

[Format]

ASCII	GS	L	nL	nH
Hex	1D	4C	nL	nH
Decimal	29	76	nL	nH

[Range] 0 ≤nL≤255

0 ≤ nH ≤ 255



[Description] Set left margin by nL and nH.

Set left margin [(nL + nH×256) ×0.125 mm].

The left side blank The width of printable width

[Notes] In stable mode, this command is valid only at the line origin position.

Input this command in page mode, the printer only executes the inner sign operation.

In page mode, this command can not affect the print.

If the set overs the printable area, so uses the max printing unit.

When execute (**GS v 0**)，set left margin by this command, 8 bits as unit.

If the left margin can not be deleted by 8, or, leave out remainder.

(For example) If (nL + nH × 256) = 20, set value as 16。

Note：Uses this command together with GS /、ESC *, print result may not the expected.

[Default] nL = 0, nH = 0

[Reference] **GS W**

①GS V m ②GS V m n

[Name] Select cut paper mode and cut paper

[Format]

①ASCII	GS	V	m
Hex	1D	56	m
Decimal	29	86	

m

②ASCII 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] Select cut paper mode, and execute cut paper operation. Select model by m, as follows:

[The particularize of ① and ②]

.As the difference of the autocut type, the cut paper status is different.

.This command affects only when processing this command at the printing origin.

[The particularize for ①]

Only partial cut; not full cut.

[The particularize for ②]

When n≠0, the printer feeds paper to (cut paper position+[n×0.125㎜ {0.0049 inch}] and cut paper.

GS W nL nH

[Name] Set pirnt area width

[Format] ASCII GS W

nL nH

Hex 1D 57 nL

nH

Decimal 29 87 nL

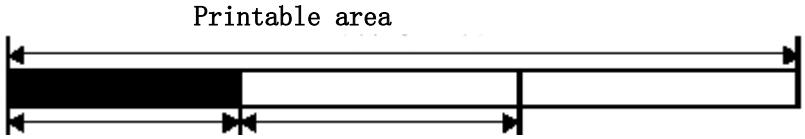
nH

[Range] 0 ≤ nL ≤ 255

0 ≤ nH ≤ 255

[Description] Set print area width by nL and nH.

Set print area width as [(nL + nH× 256) × 0.125mm].



[Notes] This command only affects when processing the line origin.

If input this command in page mode, The printer executes inner sign

operation.

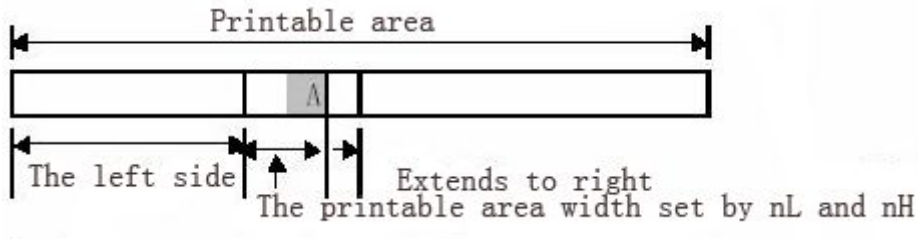
This command does not affect printing in page mode.

If set value overs the printable area, uses the max vaule of printable value.

The set priority of GS W is higher than GS L. If [Left blank+printable area width] overs the printable area, the printer uses [printable area width-left blank]. However, do not use the set which sets by GS W, reserve the set which sets by GS W.

If the printable area width set which is smaller than one character width, when printing character data, execute the following steps:

① The printable area width extends to right to meet one character.



② If printable area width couldn't be extended fully, decrease left page to meet one character.

③ If printable area width couldn't be extended fully, decrease right spacing.

If printable area width is smaller than one vertical line, when printing non-character data (for example, bit image, the user-defined bit image), only process the problem lines as follows:

① Extend printable area width to right and meet one vertical line of bit image in the printable area.

② If printable area width couldn't be extended fully, decrease left page to meet one vertical line.

[Default]

Mode type	Horizontal dot	Default
(82.5 mm paper width type)	640 dot	nL = 128, nH = 2
(79.5 mm paper width type)	576 dot	nL = 64, nH = 2
(60 mm paper width type)	448 dot	nL = 192, nH = 1
(58 mm paper width type)	432 dot	nL = 176, nH = 1

[Reference] **GS L**

4.3 Chinese Character Control Command

FS ! n

[Name] Set print mode for Chinese character

[Format] ASCII FS ! n

Hex 1C 21 n

Decimal 28 33 n

[Range] 0 ≤n ≤255

[Description] Set print mode for Chinese character, set n as follows:

Bit	Off/On	Hex	Decimal	Function
0	-	-	-	Undefined
1	-	-	-	Undefined
2	Off	00	0	Disable double width mode
	On	04	4	Enable double width mode
3	Off	00	.	Disable double height mode
	On	08	8	Disable double height mode
4	-	-	-	Undefined
5	-	-	-	Undefined
6	-	-	-	Undefined
7	Off	00	0	Disable underline mode
	On	08	128	Enable underline mode

[Particularize] . Set both double width mode and double height mode (contain right side and left side character spacing), will print four times character size.

. The printer can add underline to all characters (contain right side and left side character spacing), but can't add underline to the blank which set by HT command, and clockwise 90°revolved characters.

· The underline width specified by FS. It is not relevant to the character size.

· When some of characters in a line are double height or more times, all characters in this line will adjust along the base line.

· Bold Chinese character by FS W or GS !, the last received set is effective.

· Set/cancel the underline mode by FS, the last received set is effective.

[Default] n = 0

[Reference] **FS -**, **FS W** , **GS !**

FS &

[Name] Set Chinese character mode

[Format] ASCII FS &

Hex 1C 26

Decimal 28 38

[Description] Select Chinese character mode.

[Particularize] ·This command only affects when selecting GB18030 code system.

·GB18030 only supports double bytes 1、2、3、4、5 area.

·Select Chinese character mode, the printer processes all Chinese character code, two bytes each time.

·Process Chinese character code as the sequence of the first byte, the second byte.

·Turn the power on, the printer enter into Chinese character mode automatically.

·Select Chinese character mode, firstly the printer detects whether the code is Chinese character or not; If it is the Chinese character and processes the first byte and the second byte.

[Reference] **FS .**，**FS C**

FS .

[Name] Cancel Chinese mode

[Format] ASCII FS .

Hex 1C 2E

Decimal 28 46

[Description] Cancel Chinese mode

[Particularize] · This command only affects when selecting GB18030 code system.

· When Chinese character mode doesn't be selected, all character codes are ASCII code, process one character each time.

· Turn the power on, the printer enters into Chinese character mode automatically.

[Reference] **FS &**, **FS C**

FS S n 1 n 2

[Name] Set Chinese character spacing

[Format] ASCII FS S n1 n2

Hex 1C 53 n1 n2

Decimal 28 83 n1 n2

[Range] 0≤ n1≤255

0 ≤n2≤ 255

[Description] Set Chinese character spacing n1 and n2 separately.

Left Chinese character spacing is [n1×0.125 mm], Right Chinese character spacing is [n2× 0.125 mm].

[Particularize] .This command set left side and right side Chinese characters spacing in normal size. When setting double width mode, left side and right side Chinese characters spacing are twice than normal mode.

.Set spacing by this command separately in standard mode and page mode.
In standard mode, use horizontal motor unit.
In page mode, Horizontal motor unit or vertical motor unit is different according to pge mode, deponds on the origin print position. More as follows:
① set the origin position to the up-left or down-right of printable area by ESC T, use the horizontal motor unit(x).
②Set the origin position to the up-right or down-left of printable area, use the vertical motor unit(y).
③For allonge, the max right side spacing is about 32 ㎜(255×0.125 ㎜). Any set which overs the max will be changed to the max data automatically.

[Default] n1 = 0, n2 = 0

FS W n

[Name] Turn quadruple-size mode on/off for Chinese characters
[Format] ASCII FS W n
Hex 1C 57 n
Decimal 28 87 n
[Range] 0 ≤n ≤255
[Description] Turn quadruple-size mode on/off for Chinese characters.
When the LSB is 0, turn quadruple-size mode off for Chinese characters.
When the LSB is 1, turn quadruple-size mode on for Chinese character.
[Particularize] .Only LSB of n is effective.
.In quadruple-size mode, the print character size is the same as the print character size which be set double width and double height.
Turn quadruple-size mode off by this command, the following character size printed as normal size.
.Different character height in one line, all characters in this line will be adjusted on base line.
.Characters enlarges along the horizontal direction, characters enlarges to the right side on basis of the left side.
.Select double width and double height mode, turn quadruple-size mode on/off by FS ! or GS !. The last received command set is effective.
[Default] n = 0
[Reference] **FS ！， GS ！**

4.4 Special control command

1B FD n

[Name] Set print density

[Format] Hex 1B FD n

[Description] n=0，1，2，3。

n=0 ligt

n=1 normal

n=2 light thick

n=3 thick

1B FD 15 n

[Name] Auto cut after installing paper

[Format] Hex 1B FD 15 n

[Range] n = 0 close paper cut； n = 1 paper cut

[Default] n = 0

Print QR code:

GS (k PL PH cn fn n1 n2(cn=49 , fn=65)

[Name] QR Code: Select the model

[Format] ASCII GS (K pL pH cn fn n1 n2

Hex 1D 28 6B pL pH cn fn n1 n2

Decimal 29 40 107 pL pH cn fn n1 n2

[Range] (pL + pH × 256) = 4 (pL = 4 , pH = 0)

cn = 49，fn = 65，n1 = 49, 50，n2 = 0

[Default] n1 = 50 , n2 = 0

[Description] Selects the model for QR Code.

n1	Function
49	Selects model 1 conversion processing.
50	Selects model 2 conversion processing.

GS (k pL pH cn fn n (cn=49, fn=67)

[Name] Set the size of module

[Format] ASCII GS (k pL pH cn fn n

Hex 1D 28 6B pL pH cn fn n

Decimal 29 40 107 pL pH cn fn n

[Range] (pL + pH × 256) = 3 (pL = 3 , pH = 0)

cn = 49，fn = 67，1 ≤ n ≤ 16

[Default] n = 3

[Description] Sets the size of the module for QR Code to *n* dots.

GS (k pL pH cn fn n1 n2 (cn=49 , fn=69)

[Name] Select the error correction level

[Format] ASCII GS (k pL pH cn fn n

Hex 1D 28 6B pL pH cn fn n

Decimal 29 40 107 pL pH cn fn n

[Range] (pL + pH × 256) = 3 (pL = 3 , pH = 0)

cn = 49，fn = 69，48 ≤ n ≤ 51

[Default] n = 48

[Description] Selects the error correction level for QR Code.

n	Function	Reference: Approx. figure of recovery
48	Select error correction level L	7 %
49	Select error correction level M	15 %
50	Select error correction level Q	25%
51	Select error correction level H	30%

GS (k pL pH cn fn m d1.....dk (cn=49 , fn=80)

[Name] Store the data in the symbol storage area

[Format] ASCII GS (k pL pH cn fn m d1…dk

Hex 1D 28 6B pL pH cn fn m d1…dk

Decimal 29 40 107 pL pH cn fn m d1…dk

[Range] 4 ≤ (pL + pH × 256) ≤ 7092 (0 ≤ pL ≤ 255 , 0 ≤ pH ≤ 27)

cn = 49，fn = 80，m = 48，0 ≤ d ≤ 255，k = (pL + pH × 256) – 3

[Description] Stores the QR Code symbol data (*d1...dk*) into the symbol storage area.

GS (k pL pH cn fn m (cn=49 , fn=81)

[Name] Print the symbol data in the symbol storage area

Format] ASCII GS (k pL pH cn fn m

Hex 1D 28 6B pL pH cn fn m

Decimal 29 40 107 pL pH cn fn m

[Range] (pL + pH × 256) = 3 (pL = 3 , pH = 0)

cn = 49，fn = 81，m = 48

[Description] Encodes and prints the QR Code symbol data in the symbol storage area .

[Note] User must secure the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications) for QR Code printing.

GS (k pL pH cn fn m (cn=49 ， fn=82)

[Name] Transmit the size information of the symbol data in the symbol storage area

[Format]

ASCII	GS	(	k	pL	pH	cn	fn	m
Hex	1D	28	6B	pL	pH	cn	fn	m
Decimal	29	40	107	pL	pH	cn	fn	m

[Range] (pL + pH * 256) = 3 (pL = 3 , pH = 0)

cn = 49，fn = 81，m = 48

[Description] Transmits the size information for the encoded QR Code symbol data in the Symbol storage area .

[Notes] This feature is not supported

APPENDIX A: MISCELLANEOUS NOTES

1. External Power Connection Notes

Connect the external power to the printer. and turn the power on when need. Be sure the correct connection, if it is wrong, may be damage the external power or the printer. Over high voltage or low voltage occurred, turn the power off as soon as possible.

2. Another Notes

- The printer operation
- When roll paper cover is closed, do not pull the roll paper.
- Thermal print head slice and driver IC are easy to damage, do not touch by metal.
- In printing process or after using one period time, thermal print head slice temperature turns to high, do not touch the print head slice.
- Do not use the roll paper cover usually when it is with roll paper.
- Do not touc the print head slice, dusty and other dirt materials with print head cover that will damage the print head.
- Thermal roll paper contains Na+, K+, Cl- that will damage the thermal element with thermal print head, so, please use the specified roll paper.
- Label paper can not be used.

APPENDIX B: ROLL PAPER SETUP

B1 Change roll paper

1、 Open the roll paper cover.
2、 Put the new roll paper.
3、 Pull one small part, and close the roll paper cover.

APPENDIX C： GET RIGHT FROM AUTOCUTTER ERROR

If the other materials, as clip, fall to autocutter and lock up autocutter, the printer turn to error status and recover operation automatically.

If the problem is not serious, autocutter recovers to the normal position automatically. (Error LED flash continuely, but error may be correct automatically.)

If autocutter does not return to the normal position, so run autocutter motor to return the

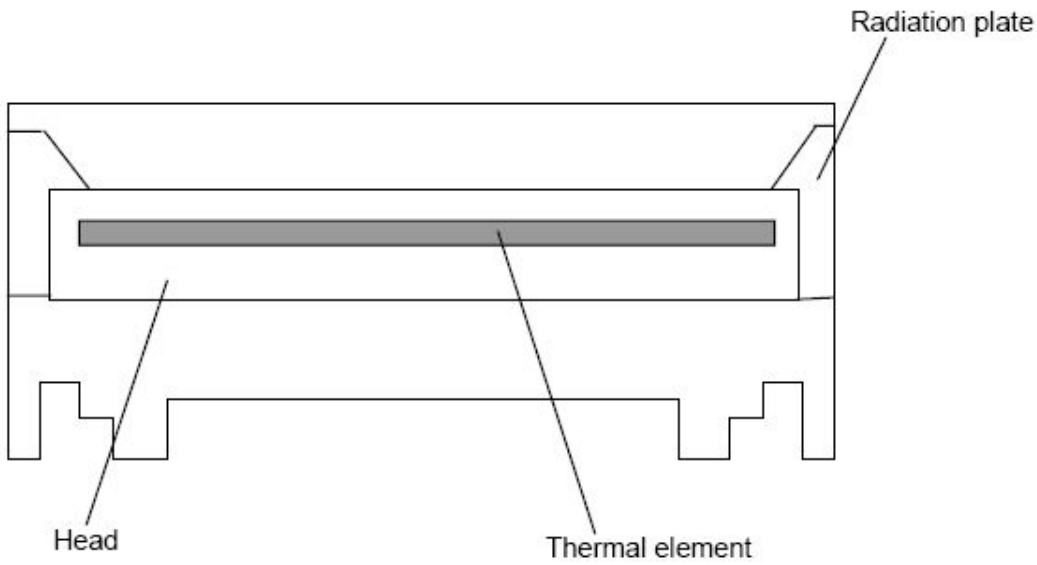
origin position.

If can not run motor geer, so contrarotate to loosen gear; then push feed paper button. Next, detect error LED, If error LED always flash, repeat the same step, until turn error LED off. When turning error LED off, autocutter cut returned to normal position. Open the cover, move the jammed paper, put the roll paper again. At last, close the cover.

APPENDIX D: CLEAN THE PRINT HEAD

Roll paper slice fallen to the print head, it will cause print quality, clean the print head as the following steps:

1. Turn the power off, and pull the power cable and communication out.
2. Open the roll paper cover.
3. Clean cotton with a little alcohol, paint to surface dirt slightly, do not use sandpaper, blade or force materials to clean print head slice! Or, the thermal print head slice will be damaged, and can not be recovered.
4. Clean the print head slice, after complete dry, do self test, watch the print result.



Note：Never clean the print head slice when the thermal print head slice is heat, Or, it will cause head slice to break.

APPENDIX E: CODE128 BAR CODE

E.1 CODE128 bar code description

In CODE128 bar code system, use one bar code character set, indicate 128 unit ASCII charactersand 2 bit data. These bar code characters specify 103 unit bar code characters and 3 unit code. Each code indicates the following characters:

Code set A: ASCII character from 00H to 5FH

Code set B: ASCII character from 20H to 7FH

Code set C: 2 bit natural digit character indicate by one character (100 unit natural digit from 00 to 99)

The following special characters in CODE128：

SHIFT characters

Code set A，the code follow with SHIFT will be processed as code B. Code B, the code followwith SHIFT will be processed as code A. SHIFT characters can not be used in code C.

Code set select character (CODE A, CODE B, CODE C)

The code set follow with this character turn to code AB or C.

Function characters (FNC1, FNC2, FNC3, FNC4)

Function character depends on application software. FNC1 is valid in code C.

E.2 Code table

Printable character in code set A

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
NUL	00	0	(	28	40	P	50	80
SOH	01	1	)	29	41	Q	51	81
STX	02	2	*	2A	42	R	52	82
ETX	03	3	+	2B	43	S	53	83
EOT	04	4	,	2C	44	T	54	84
ENQ	05	5	-	2D	45	U	55	85
ACK	06	6	.	2E	46	V	56	86
BEL	07	7	/	2F	47	W	57	87
BS	08	8	0	30	48	X	58	88
T	09	9	1	31	49	Y	59	89
LF	0A	10	2	32	50	Z	5A	90
VT	0B	11	3	33	51	[	5B	91
FF	0C	12	4	34	52	\	5C	92
CR	0D	13	5	35	53	]	5D	93
SO	0E	14	6	36	54	^	5E	94
SI	0F	15	7	37	55	_	5F	95
DLE	10	16	8	38	56	FNC1	7B, 31	123,49

DC1	11	17	9	39	57	FNC2	7B,32	123,50
DC2	12	18	:	3A	58	FNC3	7B,33	123,51
DC3	13	19	;	3B	59	FNC4	7B,34	123,52
DC4	14	20	<	3C	60	SHIFT	7B,53	123,83
NAK	15	21	=	3D	61	CODEB	7B,42	123,66
SYN	16	22	>	3E	62	CODEC	7B,43	123,67
ETB	17	23	?	3F	63			
CAN	18	24	@	40	64			
EM	19	25	A	41	65			
SUB	1A	26	B	42	66			
ESC	1B	27	C	43	67			
FS	1C	28	D	44	68			
GS	1D	29	E	45	69			
RS	1E	30	F	46	70			
US	1F	31	G	47	71			
SP	20	32	H	48	72			
!	21	33	I	49	73			
"	22	34	J	4A	74			
#	23	35	K	4B	75			
$	24	36	L	4C	76			
%	25	37	M	4D	77			
&	26	38	N	4E	78			
'	27	39	O	4F	79			

Printable character in code set B

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
SP	20	32	H	48	72	p	70	112
!	21	33	I	49	73	q	71	113
"	22	34	J	4A	74	r	72	114
#	23	35	K	4B	75	s	73	115
$	24	36	L	4C	76	t	74	116
%	25	37	M	4D	77	u	75	117
&	26	38	N	4E	78	V	76	118
'	27	39	O	4F	79	w	77	119
(	28	40	P	50	80	x	78	120
)	29	41	Q	51	81	y	79	121
*	2A	42	R	52	82	z	7A	122

+	2B	43	S	53	83	{	7B,7B	123,123
,	2C	44	T	54	84	|	7C	124
_	2D	45	U	55	85	}	7D	125
.	2E	46	V	56	86	—	7E	126
/	2F	47	W	57	87	DEL	7F	127
0	30	48	X	58	88	FNC1	7B,31	123,49
1	31	49	Y	59	89	FNC2	7B,32	123,50
2	32	50	Z	5A	90	FNC3	7B,33	123,51
3	33	51	[	5B	91	FNC4	7B,34	123,52
4	34	52	\	5C	92	SHIFT	7B,53	123,83
5	35	53	]	5D	93	CODEA	7B,41	123,66
6	36	54	^	5E	94	CODEC	7B,43	123,67
7	37	55	_	5F	95			
8	38	56	`	60	96			
9	39	57	a	61	97			
:	3A	58	b	62	98			
;	3B	59	c	63	99			
<	3C	60	d	64	100			
=	3D	61	e	65	101			
>	3E	62	f	66	102			
?	3F	63	g	67	103			
@	40	64	h	68	104			
A	41	65	i	69	105			
B	42	66	j	6A	106			
C	43	67	k	6B	107			
D	44	68	l	6C	108			
E	45	69	m	6D	109			
F	46	70	n	6E	110			
G	47	71	o	6F	111			

Printable character in code set C

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
00	00	0	40	28	40	80	50	80
01	01	1	41	29	41	81	51	81
02	02	2	42	2A	42	82	52	82
03	03	3	43	2B	43	83	53	83

04	04	4	44	2C	44	84	54	84
05	05	5	45	2D	45	85	55	85
06	06	6	46	2E	46	86	56	86
07	07	7	47	2F	47	87	57	87
08	08	8	48	30	48	88	58	88
09	09	9	49	31	49	89	59	89
10	0A	10	50	32	50	90	5A	90
11	0B	11	51	33	51	91	5B	91
12	0C	12	52	34	52	92	5C	92
13	0D	13	53	35	53	93	5D	93
14	0E	14	54	36	54	94	5E	94
15	0F	15	55	37	55	95	5F	95
16	10	16	56	38	56	96	60	96
17	11	17	57	39	57	97	61	97
18	12	18	58	3A	58	98	62	98
19	13	19	59	3B	59	99	63	99
20	14	20	60	3C	60	FNC1	7B,31	123,49
21	15	21	61	3D	61	CODEA	7B,41	123,65
22	16	22	62	3E	62	CODEB	7B,42	123,66
23	17	23	63	3F	63			
24	18	24	64	40	64			
25	19	25	65	41	65			
26	1A	26	66	42	66			
27	1B	27	67	43	67			
28	1C	28	68	44	68			
29	1D	29	69	45	69			
30	1E	30	70	46	70			
31	1F	31	71	47	71			
32	20	32	72	48	72			
33	21	33	73	49	73			
34	22	34	74	4A	74			
35	23	35	75	4B	75			
36	24	36	76	4C	76			
37	25	37	77	4D	77			
38	26	38	78	4E	78			
39	27	39	79	4F	79			