REGO Thermal Printer

Technical Manual

V 1.02

Beijing RuiGong Tech Co.,Ltd.

1.   Overview

This manual contains all the general control commands for the below REGO thermal printer models. It is about the use of various control commands and notes. However, different models have different specific parameters and functions, in this manual may not contain all of them. So please contact REGO technical team if there were any questions or supports required.

Emulation	Models supported	Notice
ESC/POS Line mode	Mobile: RG-MTP58B, RG-MTP80B, RG-MLP80A POS: RG-P58B, RG-P80A Kiosk: RG-K628, RG-K220, RG-K532, RG-K532-H Desktop: RG-DTP58	
ESC/POS Page mode	RG-MLP80A	
CPCL	RG-MLP80A	

Notice: RG-MLP80A supports both ESC/POS and CPCL.

2.   Command format

[Name]   The name of the command.
[Format]   The code sequence.
                 ASCII indicates the ASCII equivalents.
                 Hex indicates the hexadecimal equivalents.
                 Decimal indicates the decimal equivalents.
                 [ ]k indicates the contents of the [ ] should be repeated k times.
[Range]   Gives the allowable ranges, if any, for the command parameters.
[Description]   Describes the function of the command.
[Notes]   Provides important information on setting and using the printer command, if necessary.
[Default]   Gives the default values, if any, for the arguments.
[Reference]   Gives the references, if any.
[Example]   Provides examples for using the command.

3.   Explanation of terms

Receive Buffer
The receive buffer is used to store data from the Host. All received data is stored in this buffer temporarily and processed in the order received.

Print line buffer
Print line buffer is used to store one line of the data which will be sent to printer.

Print line buffer is full
It means current line buffer space is not enough to contain the current processing data.

Print line buffer empty
It means there 's no printing data in the current buffer (The pin may not be at the beginning of the line).

The beginning of one line
The pointer is at the beginning of the printing line. It will not meet such requirement if the print line buffer was not empty or the command had set the print position.

Effective printing width

It refers to the maximum printing width of the printer which depends on the printer itself. For example: for a 80mm paper width printer, its printing width is 72mm(576 dots), but for a 58mm paper width printer, the printing width can be 48mm(384 dots).

Printing area

The printing area can be set by command. Printing area must be smaller or equal to effective printing width.

Ignore

In this state, all the codes including parameters are invalid, without any action.

Black mark mode

Black mark is a black block which is pre-printed on the paper and through it you can achieve positioning. The printer can be set to Black Mark mode, in this situation, if you sent the command FF or press the feed button, the printer will reach a black mark position. Please check FF command to get detailed process of positioning, and check the specifications of black mark in Appendix B.

4.   ESC/POS Command Details

LF   Print and feed one line

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[Name]   Print and feed one line
[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.
[Notes]   The command set the current position at the beginning of a line.
[Reference]   ESC 2, ESC 3
[Example]   char SendStr[10] = {0x31,0x0A,0x32,0x33,0x0A,0x0A,0x34,0x35,0x36, 0x0A};
                   SendData(SendStr, 10);

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FF   Print and feed paper to a black mark

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[Name]   Print and feed paper to a black mark
[Format]   ASCII   FF
                  Hex   0C
                  Decimal   12
[Description]
If the paper type is continuous paper,
In standard mode: ignore the command.
In page mode: prints all the data in buffer and switches to standard mode from page mode, clear all the data in the buffer.
If the paper type is black mark or label paper,
In standard mode: feeds paper to a black mark.
In page mode: prints all the data in buffer and switches to standard mode from page mode, clear all the data in the buffer and feeds paper to a black mark. If there's no mark, feeds paper to 30cm and stops.

ESC FF   Print data in buffer in page mode

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[Name]   Print data in buffer in page mode
[Format]   ASCII   ESC   FF
                  Hex   1B   0C
                  Decimal   27   12
[Description] In page mode, prints all the data in buffer.
[Notes]
This command is only valid in page mode.
If the paper type is label paper, this command won't effect label positioning after printing.
It won't clear the data in buffer after printing. And commands ESC T, ESC W are invalid.
[Reference]   FF, ESC L, ESC S

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CR   Print and carriage return

[Name]   Print and carriage return
[Format]   ASCII   CR
              Hex   0D
              Decimal   13
[Description] When the command is enabled, this command functions the same as LF; when disabled, this command is ignored.
[Notes]
Set the print starting position to the beginning of the line.
The command is ignored with a serial interface model.
This command is valid according to printer setting with a parallel interface model printer.
[Reference]   LF

CAN   Delete data in buffer in page mode

[Name]   Delete data in buffer in page mode
[Format]   ASCII   CAN
              Hex   18
              Decimal   24
[Description] In page mode, prints all the data in buffer.
[Notes] This command is only valid in page mode.
[Reference] ESC L, ESC W
[Example] char SendStr[21] = {0x1B,0x4C,0x1B,0x57,0x20,0x00,0x00,0x00,0x40,
        0x01,0x90,0x01,0x31,0x32,0x33,0x0A,0x1B, 0x0C, 0x18,0x1B,0x0C};
        SendData(SendStr, 21);

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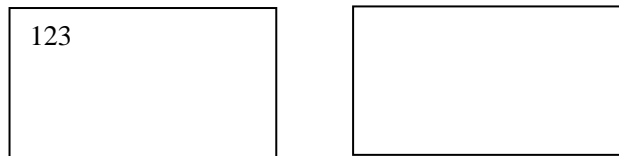
ESC J n   Print and feed paper

[Name]   Print and feed paper
[Format]   ASCII   ESC J   n
              Hex   1B   4A   n
              Decimal   27   74   n
[Range]   0 ≤ n ≤ 255
[Description]   Print the data in the print buffer and feed the paper [n × (vertical or horizontal motion unit)].
[Notes]
After printing, the current print position is at the beginning of a line.
Paper feed distance is not affected by command ESC 2 or ESC 3.
Horizontal and vertical motion units are set by the GS P.
In standard mode, the vertical motion unit (y) is used.
In page mode, this command functions as follows, depending on direction of the printing area and the starting position of the printable area:
¬ When the starting position is set to the upper left or lower right of the printable area using ESC T, the vertical motion unit (y) is used.

- When the starting position is set to the upper right or lower left of the printable area using ESC T, the horizontal motion unit (x) is used.

Maximum paper feed amount is 1016 mm (40 inches). If you exceed this distance, using the maximum distance.

[Reference]   GS P

[Example] char SendStr[10] = {0x31,0x32,0x33,0x1B,0x4A,0x60,0x34,0x35,0x36,0x0A};
          SendData(SendStr, 10);

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ESC L   Select page mode

[Name]   Select page mode

[Format]   ASCII   ESC   L
           Hex   1B   4C
           Decimal   27   76

[Description]   This command is used to switch from standard mode to page mode.

ESC S   Select standard mode

[Name]   Select standard mode

[Format]   ASCII   ESC   S
           Hex   1B   53
           Decimal   27   83

[Description]   This command is used to switch from page mode to standard mode.

ESC d n   Print and feed n lines

[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 print buffer and feeds the paper [n x (current line spacing)].

[Notes]

The maximum paper feed amount is 1016 mm(40 inch)

[Reference]   ESC 2, ESC 3

[Example] char SendStr[10] = {0x31,0x32,0x33,0x1B,0x64,0x05,0x31,0x32,0x33,0x0A};
          SendData(SendStr, 10);

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ESC 2   Select default line height

[Name]   Select default line height

[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50

[Description] ⬚ Set the line height to 4 mm {1⁄6"}.
[Notes] Line height is independent in standard mode and page mode.
[Reference] ESC 3

ESC 3 n   Set line height

[Name] Set line height

[Format]	ASCII	ESC	3	n
	Hex	1B	33	n
	Decimal	27	51	n

[Range] 0 ≤ n ≤ 255
[Description] Set the line height to [n ×(vertical or horizontal motion unit)].
[Notes] Maximum amount is 1016 mm (40'').
[Default] Default line height is 4mm (about 1⁄6 inch).
[Reference] ESC 2, GS P
[Example] char SendStr[29]
=\{0x31,0x32,0x33,0x0A,0x31,0x32,0x33,0x0A,0x1B,0x33,0xFF,0x31,0x32,0x33,0x0A,0x31,0x32,0x33,0x0A,0x1B,0x32,0x31,0x32,0x33,0x0A,0x31,0x32, 0x33,0x0A\};

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ESC SP n   Set right-side character spacing

[Name] Set right-side character spacing

[Format]	ASCII	ESC	SP	n
	Hex	1B	20	n
	Decimal	27	32	n

[Range] 0 ≤ n ≤255
[Description] Sets the right-side character spacing to [n × horizontal or vertical motion unit].
[Notes]⬚ ⬚ The maximum amount is 255⁄203 inches.
[Default] n = 0
[Reference] GS P
[Example] char SendStr[11] = \{0x31,0x32,0x33,0x0A,0x1B,0x20,0x08,0x31,0x32,0x33,0x0A\};
SendData(SendStr, 11);

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ESC ! n   Select print mode(s)

[Name]   Select print mode(s)

[Format]   ASCII   ESC   !   n
                    Hex   1B   21   n
                    Decimal   27   33   n

[Range]   0 ≤ n ≤ 255
[Description]   Select print mode(s) using n as follows:

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Standard ASCII font A (12 × 24)
	1	01	1	Compressed ASCII font B (9 × 17)
1,2	0	00	0	Undefined.
3	0	00	0	Emphasized mode not selected.
	1	08	8	Emphasized mode selected.
4	0	00	0	Double-height mode not selected.
	1	10	16	Double-height mode selected.
5	0	00	0	Double-width mode not selected.
	1	20	32	Double-width mode selected.
6	0	00	0	Undefined.
7	0	00	0	Underline mode not selected.
	1	80	128	Underline mode selected.

[Notes]
When double-width and double-height modes are selected, the characters are enlarged twice in the horizontal and vertical.
In addition to the space and 90 ° clockwise rotation of the characters set by HT, the rest characters can be underlined.
The thickness of the underline is that selected by ESC , regardless of the character size.
When some characters in a line are double or more height, all the characters on the line are aligned at the baseline.
ESC E can also turn on or off emphasized mode. However, the setting of the last received command is effective.
ESC - can also turn on or off underline mode. However, the setting of the last received command is effective.
GS ! can also select character size. However, the setting of the last received command is effective.
Emphasized mode is effective for alphanumeric and Chinese. All print modes except emphasized mode is effective only for alphanumeric.
[Default]   n = 0
[Reference]   ESC -, ESC E, GS !
[Example] char SendStr[7] = {0x1B,0x21,0x00,0x31,0x32,0x33,0x0A};
          SendData(SendStr, 7);
          char SendStr[7] = {0x1B,0x21,0xB9,0x31,0x32,0x33,0x0A};
          SendData(SendStr, 7);

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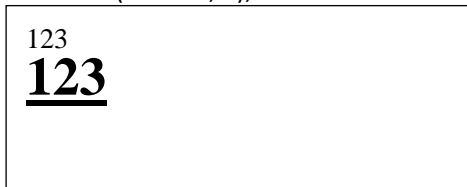
ESC % n   Select/cancel user-defined character set

[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 or cancel the 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.

[Notes]

When the user-defined character set is canceled, the internal character set is automatically selected.

n is available only for the least significant bit.

[Default]   n = 0

[Reference]   ESC &, ESC ?

ESC & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]   Define user-defined characters

[Name]	Define user-defined characters		
[Format]	ASCII	ESC &	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]
	Hex	1B	26	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]
	Decimal	27	38	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

[Range]

y = 3

$32 ≤ c_1 ≤ c_2 ≤ 126$

0 ≤ x ≤ 12 Standard ASCII Font A (12× 24)

0 ≤ x ≤ 9 Compressed ASCII Font B (9 × 17)

0 ≤ d ≤ 255

$k = c_2 − c_1 + 1$

[Description] Define user-defined characters.

y specifies the number of bytes in the vertical direction.

c1 specifies the beginning character code for the definition, and c2 specifies the final code.

x specifies the number of dots in the horizontal direction.

[Notes] ⑦

The allowable character code range is from ASCII code <20>H to <7E>H (95 characters).

It is possible to define multiple characters for consecutive character codes.

If only one character is desired, use c1 = c2.

d is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.

The data to define a user-defined character is (y× x) bytes.

Set a corresponding bit to 1 to print a dot or 0 to not print a dot.

The user-defined character definition is cleared when:

-ESC @ is executed.

-ESC ? is executed.

-FS q is executed.

- GS * is executed.

-2-D bar code is executed.

-The printer is reset or the power is turned off.

When the user-defined characters are defined in font B (9 × 17), only the most significant bit of the 3rd byte of data in vertical direction is effective.

[Default]   The internal character set

[Reference] ESC %, ESC ?

[Example]

When font A (12 ×24) is selected.
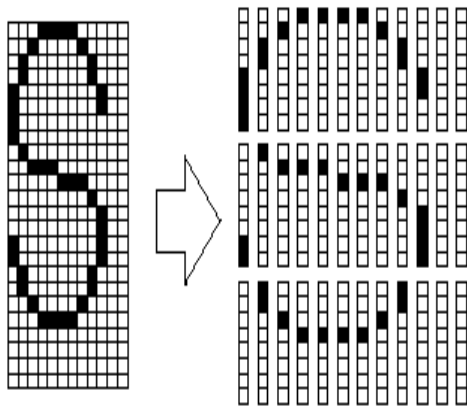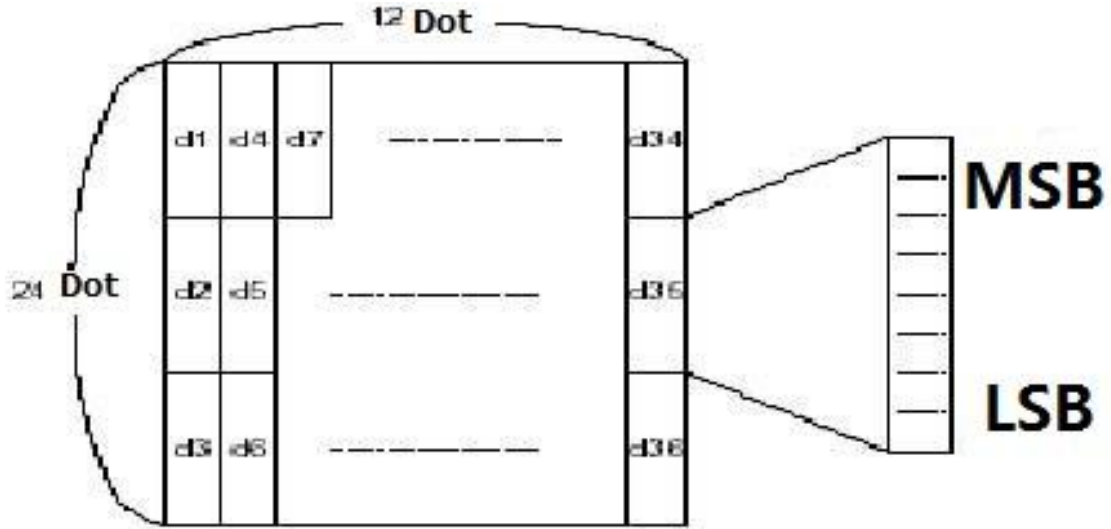
d1= <0F>H d4 = <30>H d7 = <40>H . . . .

d2 = <03>H d5 = <80>H d8 = <40>H . . . .

d3 = <00>H d6 = <00>H d9 = <20>H . . . .

When font B (9 ×17) is selected.
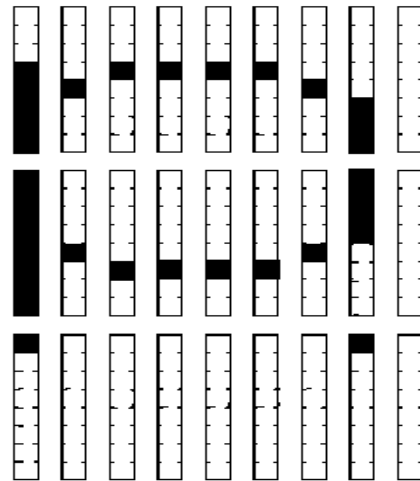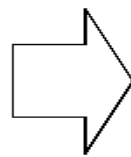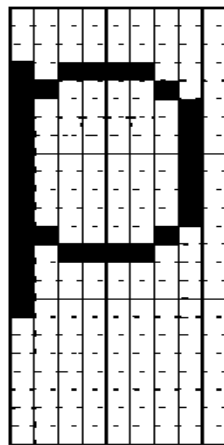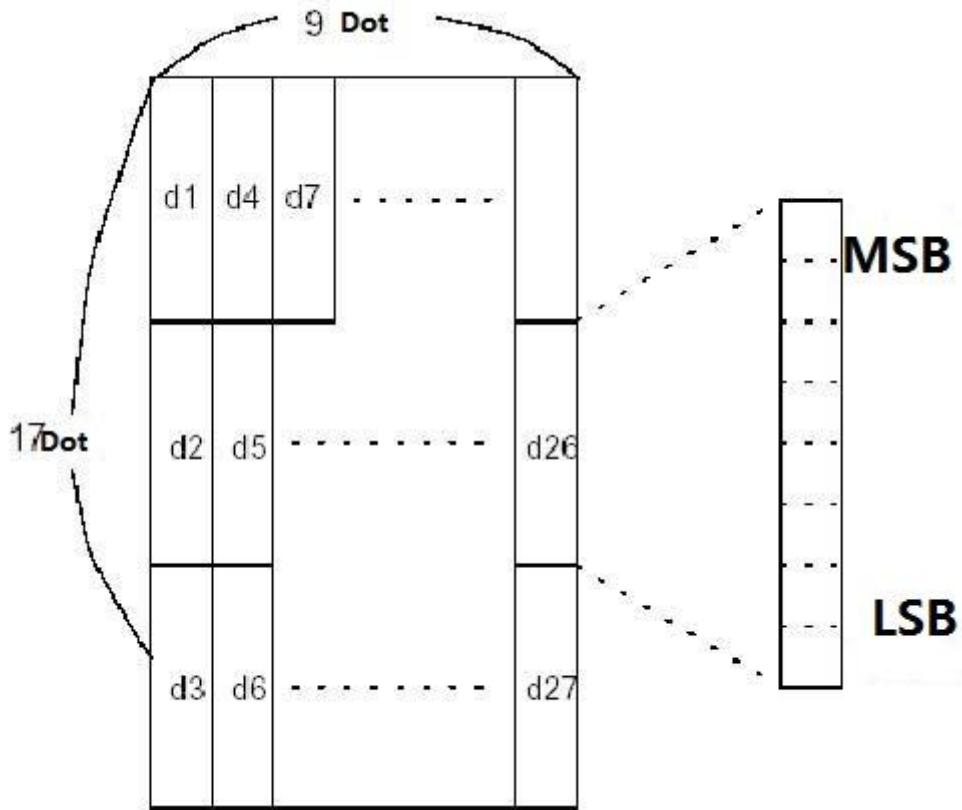
d1 = <1F>H   d4 = <08>H   d7 = <10>H...
d2 = <FF>H   d5 = <08>H   d8 = <04>H...
d3 = <80>H   d6 = <00>H   d9 = <00>H...

ESC - n   Turn underline mode on/off

[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] Turn underline mode on or off, based on the following values of n:

n	Function
0, 48	Turns off underline mode
1, 49	Turns on underline mode (1-dot thick)
2, 50	Turns on underline mode (2-dots thick)

[Notes] ⬜ ⬜

The printer can underline all characters (including right-side character spacing),but cannot underline the space set by HT.

The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.

When underline mode id turned off by setting the value of n to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off does not change. The default underline thickness is 1 dot.

Changing the character size does not affect the current underline thickness.

Underline mode can also be turned on or off by using ESC !. Note, however,that the last received command is effective.

This command does not affect the setting of Chinese characters.

[Default]   n = 0

[Reference]   ESC !

[Example] char SendStr[7] = {0x1B,0x2D,0x01,0x31,0x32,0x33,0x0A};
         SendData(SendStr, 7);

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ESC ? n   Cancel user-defined characters

[Name]   Cancel user-defined characters

[Format]   ASCII   ESC ?   n
         Hex   1B   3F   n
         Decimal   27   63   n

[Range]   32 ≤ n ≤127

[Description] Cancel user-defined characters.

[Notes]

This command cancels the pattern defined for the character code specified by n. After the user-defined characters is canceled, the corresponding pattern for the internal character is printed.

This command deletes the pattern defined for the specified code in the font selected by ESC !.

If a user-defined character has not been defined for the specified character code, the printer ignores this command.

[Reference]   ESC &, ESC %

ESC E n   Turn emphasized mode on/off

[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 or 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] ⬚ ⬚
Only the least significant bit of n is enabled.
This command and ESC ! turn on and off emphasized mode in the same way.
Be careful when this command is used with ESC !.
[Default]   n = 0
[Reference]   ESC !
[Example] char SendStr[11] = {0x31,0x32,0x33,0x0A,0x1B,0x45,0x01,0x31,0x32,0x33,0x0A};
        SendData(SendStr, 11);

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ESC G n   Turn on/off double-strike mode

[Name]   Turn on/off double-strike mode
[Format]   ASCII   ESC G   n
               Hex   1B   47   n
               Decimal   27   71   n

[Range]   0 ≤ n ≤ 255
[Description]
Turns double-strike mode on or 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] ⬚   ⬚
Only the lowest bit of n is enabled.
Printer output is the same in double-strike mode and in emphasized mode.
[Default]   n = 0
[Reference]   ESC E
[Example] char SendStr[11] = {0x31,0x32,0x33,0x0A,0x1B,0x47,0x01,0x31,0x32,0x33,0x0A};
        SendData(SendStr, 11);

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ESC M n   Select character font

[Name]   Select character font
[Format]   ASCII   ESC   M   n
               Hex   1B   4D   n

| | Decimal | 27 | 77 | n |

[Range] n = 0, 1, 48, 49
[Description] Select character fonts.

n	Function
0,48	Select Standard ASCII Font (12 × 24) ,Chinese Font (24 × 24)
1,49	Select Compressed ASCII Font (9 × 17) , Chinese Font (16 × 16)

[Default] n = 0
[Example] char SendStr[7] = {0x1B,0x4D,0x01,0x31,0x32,0x33,0x0A};
SendData(SendStr, 7);
char SendStr[20] = {1B 4D 00 B9 FE B9 FE B9 FE 0A 1B 4D 01 B9 FE B9 FE B9 FE 0A};
SendData(SendStr, 20);

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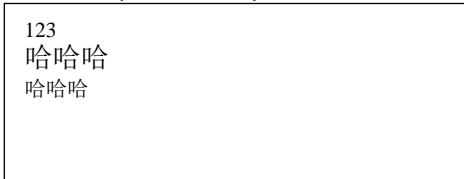
ESC R n   Select an international character set

[Name]   Select an international character set
[Format]   ASCII   ESC R   n
                Hex   1B   52   n
                Decimal   27   82   n
[Range]   0 ≤ n ≤ 15
[Description] Select an international character set n from the following table:

n	Character Set
0	U.S.A.
1	France
2	Germany
3	U.K.
4	DenmarkI
5	Sweden
6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin
13	Korea
14	Slovenia/Croatia
15	China

[Default] n=15, [Simplified Chinese]
n=0,〔Other models except simplified Chinese〕

ESC V n   Turn 90° clockwise rotation mode on/off

[Name]	Turn 90° clockwise rotation mode on/off		
[Format]	ASCII	ESC	V	n
	Hex	1B	56	n
	Decimal	27	86	n

[Range]   0 ≤ n ≤ 2, 48 ≤ n ≤ 50

[Description]   Turns 90°clockwise rotation mode on/off .n is used as follows:

n	Function
0,48	Turns off 90° clockwise rotation mode
1,49	Turns on 90° clockwise rotation mode
2,50	

[Notes] ⬚

This command is only valid in standard mode. However, the setting is always effective.

When underline mode is turned on, the underline can't be rotated 90° clockwise.

When turns 90°clockwise rotation mode on, the function of double-width and double-height is just opposite to it in standard mode.

[Default]   n = 0

[Reference]   ESC !,   ESC –⬚

[Example] char SendStr[7] = {0x1B,0x56,0x01,0x31,0x32,0x33,0x0A};

SendData(SendStr, 7);
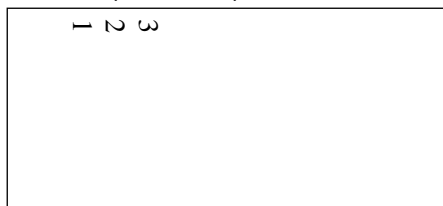
ESC t n   Select character code table

[Name]	Select character code table		
[Format]	ASCII	ESC	t	n
	Hex	1B	74	n
	Decimal	27	116	n

[Range]   0 ≤n ≤ 255

[Description]   Selects the page n from the character code table.

n	Code Page
0	CP437 [U.S.A., Standard Europe]
1	Katakana
2	PC850 [Multilingual]
3	PC860 [Portuguese]
4	PC863 [Canadian-French]
5	PC865 [Nordic]
6	WCP1251 [Cyrillic]
7	CP866 Cyrillic #2
8	MIK[Cyrillic /Bulgarian]
9	CP755 [East Europe，Latvian 2]

10	Iran
11	reserve
12	reserve
13	reserve
14	reserve
15	CP862 [Hebrew]
16	Ｗ CP1252 Latin I
17	WCP1253 [Greek]
18	CP852 [Latina 2]
19	CP858 Multilingual Latin I+Euro)
20	Iran II
21	Latvian
22	CP864 [Arabic]
23	ISO-8859-1 [West Europe]
24	CP737 [Greek]
25	WCP1257 [Baltic]
26	Thai 1
27	CP720[Arabic]
28	CP855
29	CP857[Turkish]
30	WCP1250[Central Eurpoe]
31	CP775
32	WCP1254[Turkish]
33	WCP1255[Hebrew]
34	WCP1256[Arabic]
35	WCP1258[Vietnam]
36	ISO-8859-2[Latin 2]
37	ISO-8859-3[Latin 3]
38	ISO-8859-4[Baltic]
39	ISO-8859-5[Cyrillic]
40	ISO-8859-6[Arabic]
41	ISO-8859-7[Greek]
42	ISO-8859-8[Hebrew]
43	ISO-8859-9[Turkish]
44	ISO-8859-15 [Latin 3]
45	Thai2
46	CP856

[Default]   n = 0

ESC { n   Turn upside-down print mode on/off

[Name]   Turn upside-down print mode on/off

[Format]	ASCII	ESC	{	n
	Hex	1B	7B	n
	Decimal	27	123	n

[Range]　　0 ≤ n ≤ 255
[Description]
Turn upside-down print mode on or off.
When the LSB of n is 0, upside-down print mode is turned off.
When the LSB of n is 1, upside-down print mode is turned on.
[Notes] ▯　▯
Only the lowest bit of n is valid.
This command is enabled only when processed at the beginning of a line in standard mode.
When this command is input in page mode, the printer performs only internal flag operations.
This command does not affect printing in page mode.
In upside-down printing mode, the printer rotates the line to be printed by 180°and then prints it.
[Default]　　n = 0

[Example]
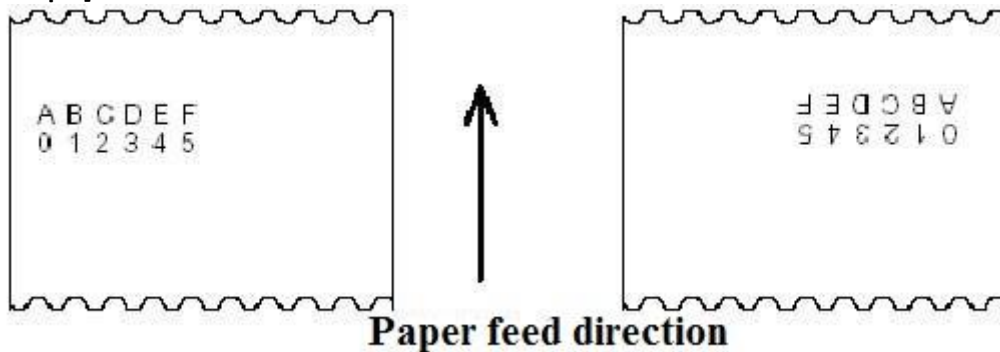
GS ! n　　Select character size

[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]
Select the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Bit	0/1	Hex	Decimal	Function
0~3	Character height selection. See Table 1			
4~7	Character width selection. See Table 2			

Character Height Selection			Character Width Selection		
Hex	Decimal	Vertical Enlarge	Hex	Decimal	Horizontal Enlarge
00	0	1 (normal)	00	0	1 (normal)
01	1	2(2 double-height)	10	16	2（2 double-width）
02	2	3	20	32	3
03	3	4	30	48	4
04	4	5	40	64	5
05	5	6	50	80	6
06	6	7	60	96	7
07	7	8	70	112	8

<div align="center">

Table 1   **Table 2**

</div>

[Notes] ⯀   ⯀

This command is effective for all characters (ASCII and Chinese) except for HRI characters.

If n is outside of the defined range, this command is ignored.

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 is reversed.

In page mode, vertical and horizontal directions are based on the character orientation.

When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.

ESC ! command can also turn double-width and double-height modes on or off. However, the last received command is effective.

[Default]   n = 0

[Reference]   ESC !

[Example]   char SendStr[14] ={0x1D,0x21,0x77,0x31,0x32,0x33,0x0A,0xB9,0xFE, 0xB9,0xFE, 0xB9,0xFE,0x0A};

SendData(SendStr, 14);

GS B n   Turn white/black reverse printing mode

[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]

Turn on or off white/black reverse printing mode.

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.

[Notes] ⯀   ⯀

Only the lowest bit of n is valid.

This command is available for all characters（except for HRI characters.）.

When white/black reverse printing mode is on, it also applied to character spacing set by ESC SP.
This command does not affect bit image, user-defined bit image, bar code, HRI characters, and spacing skipped by HT, ESC $, and ESC \.
This command does not affect the space between lines.
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.

[Default] n = 0
[Example] char SendStr[17] = {0x1D,0x42,0x00,0x31,0x32,0x33,0x0A,0x1D,0x42, 0x01,0xB9,
    0xFE,0xB9,0xFE,0xB9,0xFE,0x0A};
    SendData(SendStr, 17);

```
123
哈哈哈
```

ESC c 5 n Enable/disable panel buttons

[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 or disable the 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 the lowest bit of n is valid.
When the panel buttons are disabled, none of them are usable when the printer cover is closed.
In this printer, the panel buttons are the FEED button.
In the macro ready mode, the FEED button is enabled regardless of the settings of this command; however, the paper cannot be fed by using these buttons.
[Default] n = 0

ESC c 3 n Select paper sensor(s) to output paper end signals

[Name] Select paper sensor(s) to output paper end signals
[Format]

ASCII	ESC	c	3	n
Hex	1B	63	33	n
Decimal	27	99	51	n

[Range] 0 ≤ n ≤ 255
[Description]
Select the paper sensor(s) to output paper end signals.Each bit of n is used as follows:

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Paper roll near-end sensor disabled
	1	01	1	Paper roll near-end sensor enabled

1	0	00	0	Paper roll near-end sensor disabled
	1	02	2	Paper roll near-end sensor enabled
2	0	00	0	Paper roll end sensor disabled
	1	04	4	Paper roll end sensor enabled
3	0	00	0	Paper roll end sensor disabled
	1	08	8	Paper roll end sensor enabled
4~7	0	00	0	Undefined

[Notes] ⬚   ⬚

It is possible to select multiple sensors to output signals. Then, if any of the sensors detects a paper end, the paper end signal is output.

The command is available only with a parallel interface and is ignored with any other interfaces.

Sensor is switched when executing this command. The paper end signal switching be delayed depending on the receive buffer state.

If either bit 0 or bit 1 for n is on, the paper near-end sensor is selected as the paper sensor outputting paper-end signals

If either bit 2 or bit 3 for n is on, the paper end sensor is selected as the paper sensor outputting paper-end signals.

When all the sensors are disabled, the paper end signal always outputs a paper status.

[Default]   n = 3

ESC c 4 n   Select paper sensor(s) to stop printing

[Name]   Select paper sensor(s) to stop printing

[Format]   ASCII   ESC   c   4   n

              Hex   1B   63   34   n

              Decimal   27   99   52   n

[Range] 0 ≤ n ≤ 255

[Description] Select the paper sensor(s) used to stop printing when a paper-end is detected, using n as follows:

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Paper roll near end sensor disabled.
	1	01	1	Paper roll near end sensor enabled.
1	0	00	0	Paper roll near end sensor disabled.
	1	02	2	Paper roll near end sensor enabled.
4~7	0	00	0	Undefined.

[Notes] ⬚   ⬚

When a paper sensor is enabled with this command, printing only can be stopped by the selected paper sensor.

When a paper-end is detected by the paper sensor, the printer goes off-line after printing stops.

When either bit 0 or 1 of n is on, the printer selects the paper near-end sensor to stop printing.

[Default]   n = 2

HT   Horizontal tab

[Name]   Horizontal tab

[Format]   ASCII   HT

Hex   09
Decimal   9

[Description]   Move the print position to the next horizontal tab position.
[Notes]
This command is ignored if the next horizontal tab position hasn't been set.
If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [Printing area width + 1].
Horizontal tab positions are set with ESC D.
If this command is received when the printing position is at [printing area width+ 1], the printer executes print buffer-full and move the printing position to the beginning of the next line.
The default tab position is every 8-character(font A(12×24)) for one tab.
When the current line buffer is full, the printer performs the following actions:
In standard mode, the printer prints the contents of the current line and places the print position at the beginning of the next line.
In page mode, the printer will feed line and places the print position   at the beginning of the next line.
[Reference]   ESC D

ESC $ nL nH   Set absolute print position

[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]
Moves the print position to [(nL + nH×256)×(vertical or horizontal motion unit)] from the left edge of the print area.
[Notes] ⬜   ⬜
Settings outside the specified printable area are ignored.
The horizontal and vertical motion unit are specified by GS P.
The GS P command can change the horizontal (and vertical) motion unit.
However, the value cannot be less than the minimum horizontal movement amount, and it must be in even unit of the minimum horizontal movement amount.
In standard mode, the horizontal motion unit (x) is used.
In page mode, horizontal or vertical motion unit differs depending on the starting position of the printable area as follows:
When the starting position is set to the upper left or lower right of the printable area using ESC T, the horizontal motion unit (x) is used.
When the starting position is set to the upper right or lower left of the printable area using ESC T, the vertical motion unit (y) is used.
[Reference]   ESC \, GS $, GS \, GS P

ESC D n1...nk NUL   Set horizontal tab positions

[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 ≤ n1 ≤n2 ≤...≤nk≤ 255

$0 \leq k \leq 32$

[Description]

Set horizontal tab positions.

• n specifies the number of digits from the setting position to the left edge of the print
area.

• k is used to indicate the number of bytes set for the horizontal tab position.

[Default]

n = 8, 16, 24, 32, 40, ..., 232, 240, 248[for Font A (12 × 24) in a standard character size width]

[Reference]   HT

ESC \ nL nH   Set relative print position

[Name]   Set relative print position

[Format]   ASCII   ESC   \   nL   nH

Hex   1B   5C   nL   nH

Decimal   27   92   nL   nH

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

$0 \leq nH \leq 255$

[Description]

• Moves the print position to [(the current position.

• A positive number specifiesmovement to the left.

[Notes] ⬚   ⬚

Any setting that exceeds the printable area is ignored.

When pitch N is specified to the right: nL+ nH × 256 = N

When pitch N is specified to the left (the negative direction), use the complement of 65536.

When pitch N is specified to the left:nL+ nH × 256 = 65536 - N

The print starting position moves from the current position to [N × horizontal or vertical motion
unit].

The horizontal and vertical motion unit are specified by GS P.

The GS P command can change the horizontal (and vertical) motion unit.

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.

In standard mode, the horizontal motion unit is used.

In page mode, the horizontal or vertical motion unit differs as follows, depending on the starting
point of the printing area:

¬ When the starting position is set to the upper left or lower right of the printable area using ESC
T, the horizontal motion unit (x) is used.

- When the starting position is set to the upper right or lower left of the printable area using
ESC T, the vertical motion unit (y) is used.

[Reference]   ESC $, GS P

ESC a n   Select justification

[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] Align all the data in one line to the specified position. n selects the justification as follows:

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

[Notes] ☐ ☐
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]
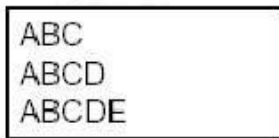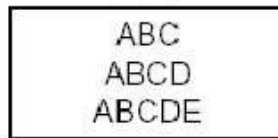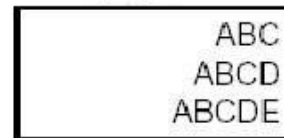
GS L nL nH   Set left margin

[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 the left margin using nL and nH.
The left margin is set to [(nL + nH × 256) × horizontal motion unit)] inches.
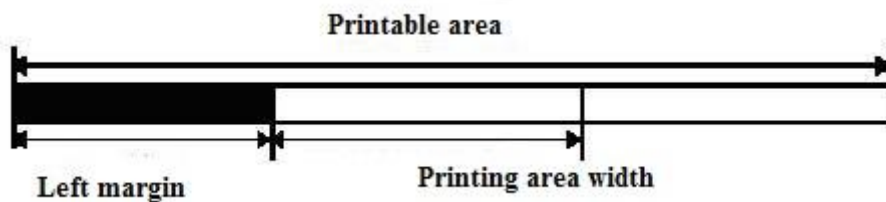
[Notes] ☐ ☐
This command is effective only when processed at the beginning of the line in standard mode.
If this command is input in page mode, the printer performs only internal flag operations.
This command does not affect printing in page mode.
If the setting exceeds the printable area, the maximum value of the printable area is used.
The horizontal and vertical motion units are specified by GS P. Changing the horizontal and vertical motion unit does not affect the current left margin.
[Default]   nL = 0, nH = 0
[Reference]   GS P, GS W

GS W nL nH   Set printing area width

[Name]	Set printing area width

[Format]

ASCII	GS	W	nL	nH
Hex	1D	57	nL	nH
Decimal	29	87	nL	nH

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

[Description]

Set the printing area width to the area specified by nL and nH.

The printing area width is set to [(nL + nH× 256)× horizontal motion unit)] inches.

[Notes] ⬚   ⬚

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

In page mode, the printer performs only internal flag operations.

This command does not affect printing in page mode.

If the [leftmargin + printing area width] exceeds the printable area, the printer uses

[Printable area width - left margin].

The horizontal and vertical motion units are specified by GS P. Changing the horizontal and vertical motion units does not affect the current left margin.

The horizontal motion unit is used for calculating the printing area width.
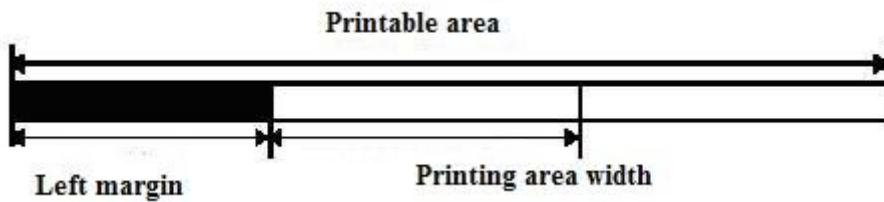
[Default]

(nL + nH × 256) = 576 ［80mm paper width model，72mm printable width］

(nL + nH × 256) = 512 ［80mm paper width model，64mm printable width］

(nL + nH × 256) = 384 ［58mm paper width model］

[Rerference]   GS L, GS P

[Example] char SendStr[10] = {0x1D,0x57,0x20,0x00,0x31,0x32,0x33,0x34,0x34,0x0A};
    SendData(SendStr, 10);

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12
34
4
```

ESC W xL xH yL yH dxL dxH dyL dyH   Set printing area in page mode

[Name]	Set printing area in page mode

[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 dxL=dxH=0 or dyL=dyH=0)

[Description]

The horizontal starting position, vertical starting position, printing area width,

and printing area height are defined as x0, y0, dx (inch), dy (inch), respectively.

Each setting for the printing area is calculated as follows:

x0 = [(xL + xH ´ 256) ´ 0.125 mm]

y0 = [(yL + yH ´ 256) ´ 0.125 mm]

dx = [(dxL + dxH ´ 256) ´ 0.125 mm]

dy = [(dyL + dyH ´ 256) ´ 0.125 mm]

[Notes]

If this command is input in standard mode, the printer executes only internal flag operation. This command does not affect printing in standard mode.

If the horizontal or vertical starting position is set outside the printable area, the printer stops command processing and processes the following data as normal data.

If the printing area width or height is set to 0, the printer stops command processing and processes the following data as normal data. This command sets the position where data is buffered to the position specified by ESC T within the printing area.

If (horizontal starting position + printing area width) exceeds the printable area, the printing area width is automatically set to (horizontal printable area -horizontal starting position).

If (vertical starting position + printing area height) exceeds the printable area,the printing area height is automatically set to (vertical printable area – vertical starting position).

Use 0.125 mm (0.0049") pitch for setting the horizontal starting position and printing area width, and use 0.125 mm pitch for setting the vertical starting position and printing area height.

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.
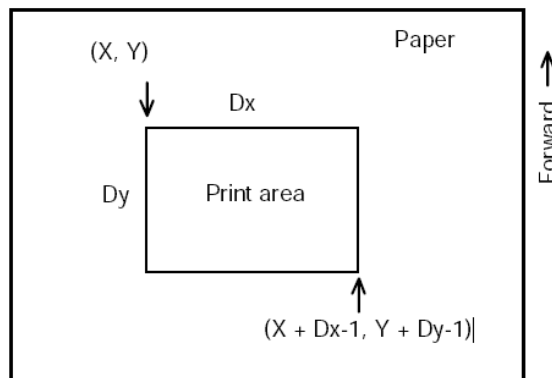
[Default]   xL = xH = yL = yH = 0

Depending on the model type selection by DIP switch 2-1 and 2-2, dxL, dxH, dyL, and dyH are as follows:

Selected model type	Number of dots in horizontal	Default value
82.5 mm paper-width model	640 dots	$dxL = 128, dxH = 2,$ $dyL = 152, dyH = 2$
79.5 mm paper-width model	576 dots	$dxL = 64, dxH = 2,$ $dyL = 226, dyH = 2$
60 mm paper-width model	448 dots	$dxL = 192, dxH = 1,$ $dyL = 181, dyH = 3$
58 mm paper-width model	432 dots	$dxL = 176, dxH = 1,$ $dyL = 216, dyH = 3$

[Reference] CAN, ESC L, ESC T

GS \ nL nH   Set relative vertical print position in page mode

[Name]   Set relative vertical print position in page mode
[Format]   ASCII   GS   \   nL nH
                Hex   1D   5C   nL nH
                Decimal   29   92   nL nH
[Range] 0 ≤ nL ≤ 255
        0 ≤ nH ≤ 255
[Description]
Sets the relative vertical print starting position from the current position in page mode.
This command sets the distance from the current position to [(nL + nH ´ 256)x0.125 mm)].
[Notes]
This command is ignored unless page mode is selected.
When the movement downward:
nL + nH x 256 = N
When the movement upward:
nL + nH x 256 = 65536 - N
Any setting that exceeds the specified printing area is ignored.
[Reference] ESC $, ESC T, ESC W, ESC \, GS $

GS $ nL nH   Set absolute vertical print position in page mode

[Name]   Set absolute vertical print position in page mode
**[Format]**   ASCII   GS $ nL nH
                Hex   1D   24   nL nH
                Decimal   29   36   nL nH
[Range] 0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255
[Description]
Sets the absolute vertical print starting position to buffer character data in page
mode.
This command sets the absolute print position to [(nL + nH x 256) x 0.125 mm].
[Notes]
This command is effective only in page mode.
If the [(nL + nHx 256) x (vertical or horizontal motion units)] exceeds the specified printing area,
this command is ignored.
The horizontal starting buffer position does not move.
The reference starting position is that specified by ESC T.
This command operates as follows, depending on the starting position of the printing area
specified by ESC T:
When the starting position is set to the upper left or lower right, this command sets the absolute
position in the vertical direction.
When the starting position is set to the upper right or lower left, this command sets the absolute
position in the horizontal direction.
[Reference] ESC $, ESC T, ESC W, ESC \, GS \
[Example]
char SendStr[29] = {0x1B,0x4C,0x1B,0x57,0x20,0x00,0x00,0x00,0x40,
        0x01,0x90,0x01, 0x32,0x32,0x32,0x32,0x32,0x32,
        0x0A,0x1D,0x5C,0x20,0x00,0x33,0x33,0x33,0x33, 0x0A,0x0C};
        SendData(SendStr, 29);
char SendStr[29] = {0x1B,0x4C,0x1B,0x57,0x20,0x00,0x00,0x00,0x40,
        0x01,0x90,0x01, 0x32,0x32,0x32,0x32,0x32,0x32,

0x0A,0x1D,0x24,0x20,0x00,0x33,0x33,0x33,0x33, 0x0A,0x0C};
SendData(SendStr, 29);

```
222222
333
```
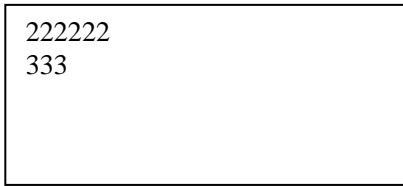
ESC T n   Select print direction in page mode

[Name]   Select print direction in page mode

[Format]   ASCII   ESC   T   n
                Hex   1B   54   n
                Decimal   27   84   n

[Range] 0 ≤ n≤ 3, 48 ≤ n ≤ 51

[Description]

Selects the print direction and starting position in page mode.

n specifies the print direction and starting position as follows:

n	Print Direction	Starting Position
0, 48	Left to right	Upper left (A in the figure)
1, 49	Bottom to top	Lower left (B in the figure)
2, 50	Right to left	Lower right (C in the figure)
3, 51	Top to bottom	Upper right (D in the figure)
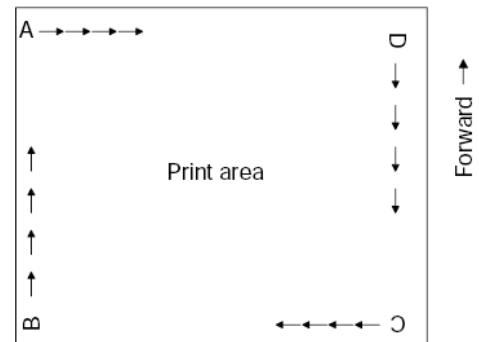
[Notes]

When the command is input in standard mode, the printer executes only internal flag operation.

This command does not affect printing in standard mode.

This command sets the position where data is buffered within the printing area

set by ESC W.

[Default] n = 0

[Reference] ESC $, ESC L, ESC W, ESC \, GS $, GS \

[Example]

char SendStr[23] = {0x1B,0x4C,0x1B,0x57,0x20,0x00,0x00,0x00,0x40, 0x01,
                0x90,0x01,0x1B,0x54,0x02,0x32,0x32,0x32, 0x32,0x32,0x32,0x0a,0x0C};

SendData(SendStr, 23);
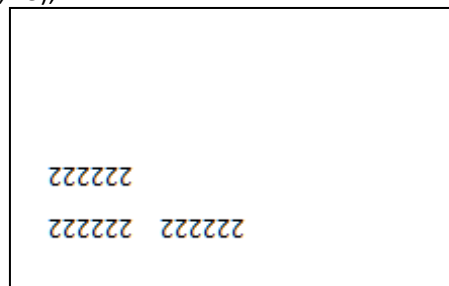
ESC *   m nL nH d1... dk   Select bit-image mode

[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] Select a bit-image mode using m for the number of dots specified by nL and nH, as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		Number of Dots	Dot Density	Dot Density	Number of Data (K)
0	8-dot single-density	8	68 DPI	101 DPI	nL + nH × 256
1	8-dot double-density	8	68 DPI	203 DPI	nL + nH × 256
32	24-dot single-density	24	203 DPI	101 DPI	(nL + nH × 256) × 3
33	24-dot double-density	24	203 DP	203 DPI	(nL + nH × 256) × 3

[Notes]🅐   🅑

If the values of m is out of the specified range, nL and data following are processed as normal data.

The nL and nH indicate the number of dots of the bit image in the horizontal direction. The number of dots is calculated by nL + nH × 256.

If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.

d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.

After printing a bit image, the printer returns to normal data processing mode.

This command is not affected by print modes (emphasized, double-strike, underline, character size or white/black reverse printing), except upside-down printing mode.

The relationship between the image data and the dots to be printed is as follows:

When 8-dot bit image is selected:
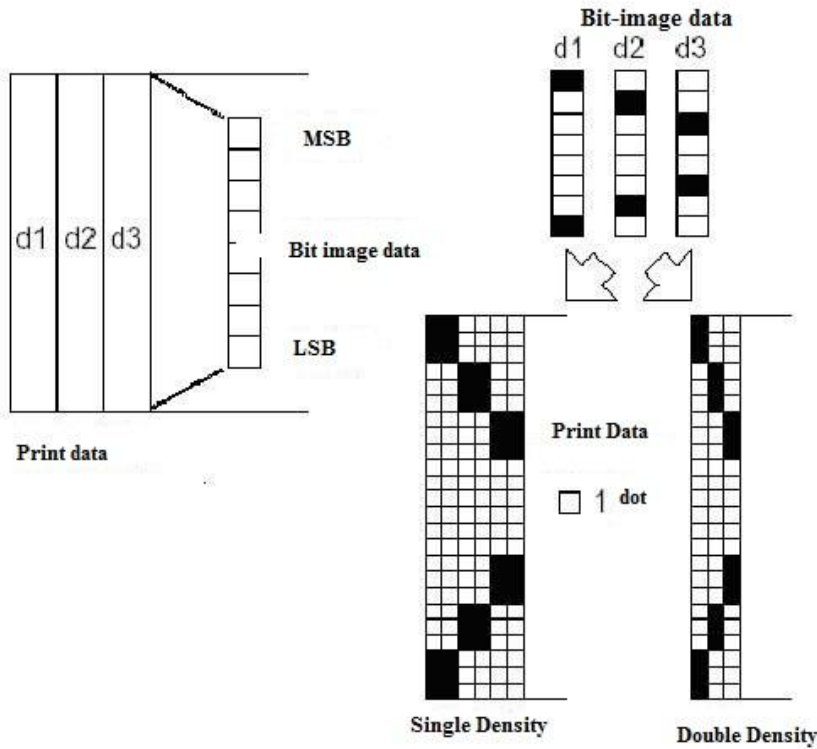
When 24-dot bit image is selected:
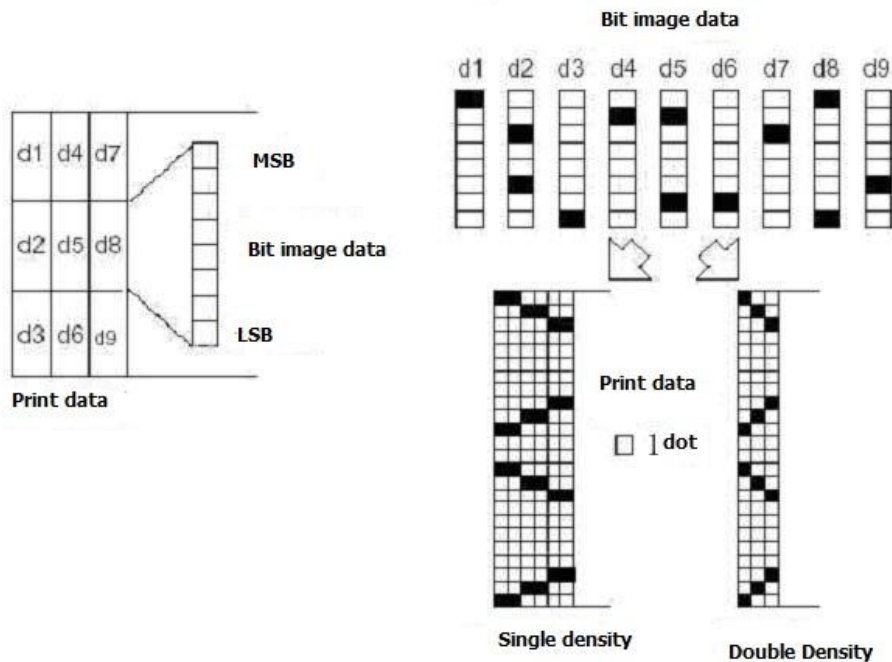
GS * x y d1...d(x × y × 8)   Define downloaded bit image

[Name]	Define downloaded bit image				
[Format]	ASCII	GS	*	x	y	d1...dk
	Hex	1D	2A	x	y	d1...dk

Decimal   29   42   x   y   d1...dk

[Range] $1 \le x \le 255$
$1 \le y \le 48$
$x \times y \le 800$
$0 \le d \le 255$
$k = x \times y \times 8$

[Description]

Define a downloaded bit image using the number of dots specified by x and y

x specifies the number of dots in the horizontal direction.

y specifies the number of dots in the vertical direction.

d specifies the data of bit map.

[Notes] ⬚   ⬚

The number of dots in the horizontal direction is $x \times 8$, in the vertical direction it is $y \times 8$.

If $x \times y$ is out of the specified range, this command is disabled.

The d indicates bit-image data. Data (d) specifies a bit printed to 1 and not printed to 0.

The downloaded bit image definition is cleared when:

ESC @ is executed.

ESC & is executed.

FS q is executed.

2-D bar code is executed.

Printer is reset or the power is turned off.

The following figure shows the relationship between the downloaded bit image and the printed data.
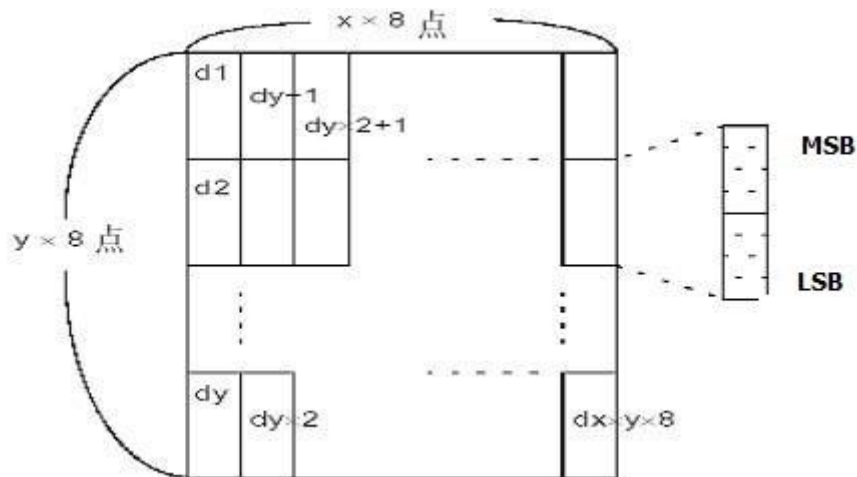
[Reference]   GS /

GS / m   Print downloaded bit image

[Name]   Print downloaded bit image

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

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

[Description]

Print a downloaded bit image using the mode specified by m. m selects a mode from the table below:

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

[Notes] ⍰ ⍰

This command is ignored if a downloaded bit image has not been defined.

In standard mode, this command is effective only when there is no data in the print buffer.

This command has no effect in the print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except for upside down printing mode.

If the downloaded bit-image to be printed exceeds the printable area, the excess data is not printed.

The command to print bitmap downloaded into RAM bitmap is not downloaded to the FLASH bitmap.

[Reference] GS *⍰

FS P n   Print NV bit image

[Name]   Print NV bit image

[Format]   ASCII   FS   P   n

                    Hex   1C   50   n

                    Decimal   28   80   n

[Range] $0 \le n \le 7$

[Description]

This command is used to print the binary bit image which is specified by n and preloaded in the printer's non-volatile memory.

The binary bit image can be created and downloaded by tools on the PC. The printer nonvolatile memory bit image can be generated through a dedicated tool on the PC and writes, the maximum width of the bit image depends on the maximum width of the corresponding printer, bit image size is up to 64KB.

[Notes]

This command is not effective when the specified NV bit image has not been defined.

In standard mode, this command is effective only when there is no data in the print buffer.

In page mode, this command is not effective.

This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated characters, etc.), except upside-down printing mode.

If the downloaded bit-image to be printed exceeds one line, the excess data is not printed.

The bit image must be a binary bit image.

It is required a specified tool to download the bit image, see REGO Tools.

GS v 0 m xL xH yL yH d1 … dk   Print raster bit image

[Name]   Print 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] $0 \le m \le 3, 48 \le m \le 51$

                    $1 \le (xL + xH \times 256) \le 256 (0 \le xL \le 255, xH = 0, 1)$

$1 \leq (yL + yH \times 256) \leq 2303 \ (0 \leq yL \leq 255, \ 0 \leq yH \leq 8)$

$0 \leq d \leq 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256) \ (\ k \neq 0)$

[Description] Print the raster bit image according to the mode specified by m as follows:

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

xL, xH, select the horizontal number of data bits (xL+xHx256).

yL, yH, select the vertical number of data bits (yL+yHx256).

d is the specified data(raster format).

[Notes]

In standard mode, this command is effective only when there is no data in the print buffer.

This command has no effect in such print modes (character size, emphasized, double-strike, upside-down, underline, white/black reverse printing, etc.).

Bit map beyond the printable area is not printed.

When this command is received during macro definition, the printer ends macro definition, and begins performing this command. The definition of this command should be cleared.

ESC a (Select justification) is also effective for raster bit images.

d indicates the bit-image data. Setting bit to 1 for each byte means print this dot and setting it to 0 means do not print.

[Example]   When xL+xH´256=64
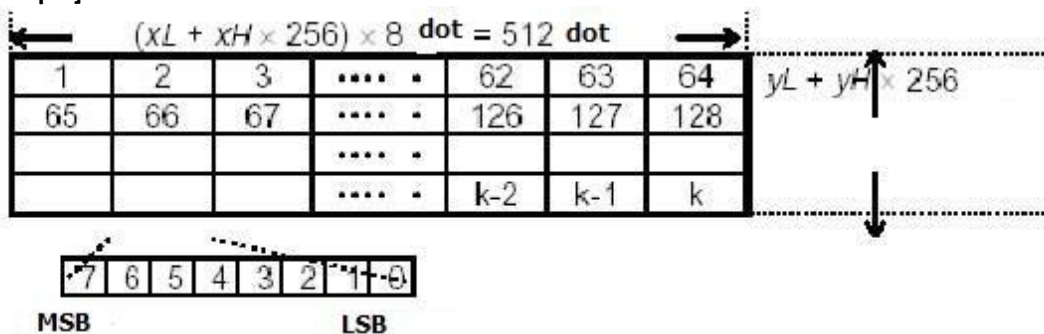
DLE EOT n   Real-time status transmission

[Name]   Real-time status transmission

[Format]   ASCII   DLE   EOT   n

Hex   10   04   n

Decimal   16   4   n

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

[Description]

Transmit the selected printer status specified by n in real-time, according to the following parameters:

n = 1: Transmit printer status

n = 2: Transmit off-line status

n = 3: Transmit error status

n = 4: Transmit paper roll sensor status

[Notes]

The status is transmitted whenever the data sequence <10>H<04>H<n> (1 £ n £ 4) is received.

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

Do not use this command within another command that consists of 2 or more bytes.

Example:

If you attempt to transmit ESC 3 n to the printer, but DTR (DSR for the host computer) goes to MARK before n is transmitted and then DLE EOT 3 interrupts before n is received, the code <10>H for DLE EOT 3 is processed as the code for ESC 3 <10>H.

The printer transmits the current status. Each status item is represented by one-byte of data.

The printer transmits the status without confirming whether the host computer can receive data.

The printer executes this command upon receiving it.

This command is executed even when the printer is offline, the receive buffer is full, or there is an error status with a serial interface model.

With a parallel interface model, this command cannot be executed when the printer is busy. This command is executed even when the printer is offline or in error status, when Memory Switch 1-3 is on with a parallel interface model.

When Auto Status Back (ASB) is enabled using the GS a command, the status transmitted by the DLE EOT command and the ASB status must be differentiated. (Refer to Appendix C, TRANSMISSION STATUS IDENTIFICATION.)

n = 1: Printer status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fixed value is 0
1	1	02	2	Fixed value is 1
2	0	00	0	Drawer open/close signal is LOW (connector pin 3).
	1	04	4	Drawer open/close signal is HIGH (connector pin 3).
3	0	00	0	On-line.
	1	08	8	Off-line.
4	1	10	16	Fixed value is 1
5,6	-	-	-	Undefined.
7	0	00	00	Fixed value is 0

n = 2: Off-line status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fixed value is 0
1	1	02	2	Fixed value is 1
2	0	00	0	Cover is closed.
	1	04	4	Cover is open.
3	0	00	0	No press FEED
	1	08	8	Press FEED
4	1	10	16	Fixed value is 1
5	0	00	0	not out of paper
	1	20	32	out of paper
6	0	00	0	No error.
	1	40	64	Error occurs.
7	0	00	0	Fixed value is 0

n = 3: Error status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fixed value is 0
1	1	02	2	Fixed value is 1

2	-	-	-	Undefined.
3	0	00	0	No auto-cutter error.
	1	08	8	Auto-cutter error occurs.
4	1	10	16	Fixed value is 1
5	0	00	0	No unrecoverable error.
	1	20	32	Unrecoverable error occurs.
6	0	00	0	No auto-recoverable error.
	1	40	64	Auto recoverable error occurs.
7	0	00	0	Fixed value is 0

n = 4: paper sensor status

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Fixed value is 0
1	1	02	2	Fixed value is 1
2,3	0	00	0	Paper roll near-end sensor: paper adequate.
	1	0C	12	Paper roll near-end sensor: paper is near out
4	1	10	16	Fixed value is 1
5,6	0	00	0	Paper roll end sensor: paper present.
	1	60	96	Paper roll end sensor: paper not present.
7	0	00	0	Fixed value is 0

[Reference] DLE ENQ, GS a, GS r

GS a n   Enable/Disable Automatic Status Back (ASB)

[Name] Enable/Disable Automatic Status Back (ASB)
[Format] ASCII GS a n
  Hex 1D 61 n
  Decimal 29 97 n
[Range] $0 \leq n \leq 255$
[Description] Enable or disable ASB and specifies the status items to include, using n as follows:

Bit	1/0	Hex	Decimal	Status for ASB
0	0	00	0	Drawer kick-out connector pin 3 status disabled.
	1	01	1	Drawer kick-out connector pin 3 status enabled.
1	0	00	0	On-line/off-line status disabled.
	1	02	2	On-line/off-line status enabled.
2	0	00	0	Error status disabled.
	1	04	4	Error status enabled.
3	0	00	0	Paper roll sensor status disabled.
	1	08	8	Paper roll sensor status enabled.
4~7	-	-	-	Undefined.

[Notes]

If any of the status items in the table above are enabled, the printer transmits the status when this command is executed. The printer automatically transmits the status whenever the enabled status item changes. The disabled status items may change, in this case, because each status transmission represents the current status.
If all status items are disabled, the ASB function is also disabled.
If the ASB is enabled as a default, the printer transmits the status when the printer data reception

and transmission are possible at the first time from when the printer is turned on.

The following four status bytes are transmitted without confirming whether the host is ready to receive data. The four status bytes must be consecutive, except for the XOFF code.

Since this command is executed after the data is processed in the receive buffer, there may be a time lag between data reception and status transmission.

When using DLE EOT, or GS r, the status transmitted by these commands and ASB status must be differentiated.

The status items to be transmitted are as follows:

First byte (printer information)

Bit	1/0	Hex	Decimal	Printer Status
0	0	00	0	Fixed value is 0
1	0	00	0	Fixed value is 0
2	0	00	0	Drawer kick-out connector pin 3 is LOW.
	1	04	4	Drawer kick-out connector pin 3 is HIGH.
3	0	00	0	On-line.
	1	08	8	Off-line.
4	1	10	16	Fixed value is 1
5	0	00	0	Cover is closed.
	1	20	32	Cover is open.
6	0	00	0	Paper is not being fed by using the PAPER FEED button.
	1	40	64	Paper is being fed by using the PAPER FEED button.
7	0	00	0	Fixed value is 0

Second byte (printer information)

Bit	1/0	Hex	Decimal	Printer Status
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	-	-	-	Undefined.
3	0	00	0	No auto cutter error.
	1	08	8	Auto cutter error occurred.
4	0	00	0	Fixed value is 0
5	0	00	0	No unrecoverable error.
	1	20	32	Unrecoverable error occurred.
6	0	00	0	No automatically recoverable error.
	1	40	64	Automatically recoverable error occurred.
7	0	00	0	Fixed value is 0

Bit 5: If these errors occur due to paper jams or the like, it is possible to recover by correcting the cause of the error and executing DLE ENQ n (1 ≤ n ≤ 2). If an error due to a circuit failure (e.g. wire break) occurs, it is impossible to recover.

Bit 6: is on when printing is stopped due to high print head temperature until the print head temperature drops sufficiently or when the paper roll cover is opened during printing.

Third byte (paper sensor information)

Bit	1/0	Hex	Decimal	Printer Status
0, 1	0	00	0	Paper roll near-end sensor: paper adequate.
	1	03	3	Paper roll near-end sensor: paper near end.
2, 3	0	00	0	Paper roll end sensor: paper present.

	1	0C	12	Paper roll end sensor: paper not present.
4	0	00	0	Fixed value is 0
5, 6	-	-	-	Undefined.
7	0	00	0	Fixed value is 0

Fourth byte (paper sensor information)

Bit	1/0	Hex	Decimal	Printer Information
0~3	-	-	-	Undefined.
4	0	00	0	Fixed value is 0
5, 6	-	-	-	Undefined.
7	0	00	0	Fixed value is 0

[Default]   n = 0
[Reference] DLE EOT, GS r

GS r n   Transmit status

[Name]   Transmit status
[Format]   ASCII   GS   r   n
                    Hex   1D   72   n
                    Decimal   29   144   n
[Range]   n = 1, 2, 49, 50
[Description]   Transmit the status specified by n as follows:

n	Function
1, 49	Transmit paper sensor status
2, 50	Transmit drawer kick-out connector status

Paper sensor status (n = 1, 49):

Bit	1/0	Hex	Decimal	Status
0, 1	0	00	0	Paper roll near-end sensor: paper adequate.
	1	03	3	Paper roll near-end sensor: paper adequate.
2, 3	0	00	0	Paper roll end sensor: paper adequate.
	1	0C	12	Paper roll end sensor: paper near end.
4	0	00	0	Fixed value is 0
5, 6	-	-	-	Undefined.
7	0	00	0	Fixed value is 0

Bits 2 and 3: When the paper end sensor detects a paper end, the printer goes off-line and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end. When the cover is opened, the state is shown in the state of the cover is closed, cannot execute this command.

Drawer kick-out connector status (n = 2, 50):

Bit	1/0	Hex	Decimal	Status
0	0	00	0	Drawer kick-out connector pin 3 is HIGH.
	1	01	1	Drawer kick-out connector pin 3 is HIGH.
1~3	-	-	-	Undefined.

4	0	00	0	Not used.Fixed value is 0
5, 6	-	-	-	Undefined.
7	0	00	0	Not used.Fixed value is 0

[Notes]
The command to the parallel port printer is invalid.
This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
When sending this command, before receiving the returned status data, don't send other data.

GS :   Start/end macro definition

[Name]   Start/end macro definition
[Format]   ASCII   GS   :
                 Hex   1D   3A
                 Decimal   29   58

[Description] Start/end macro definition
[Notes]
Macro definition starts when this command is received during normal operation.
Macro definition ends when this command is received during macro definition.
When GS ^ is received during macro definition, the printer ends macro definition and clears the definition.
Macro is not defined when the power is turned on.
The defined contents of the macro are not cleared by ESC @. Therefore,ESC @ can be included in the contents of the macro definition.
If the printer receives GS : again immediately after previously receiving GS : the printer remains in the macro undefined state.
The contents of the macro can be defined up to 2048 bytes. If the macro definition exceeds 2048 bytes, excess data is not stored.
[Reference]   GS ^

GS ^ r t m   Execute macro

[Name]   Execute macro
[Format]   ASCII   GS   ^   r   t   m
                 Hex   1D   5E   r   t   m
                 Decimal   29   94   r   t   m
[Range]   0 ≤ r ≤ 255
                 0 ≤ t ≤ 255
                 m = 0, 1
[Description]
Execute macro
· r specifies the number of times to execute the macro.
· t specifies the waiting time for executing the macro.
· m specifies macro executing mode.
When the LSB of m = 0,the macro executes r times continuously at the interval specified by t.
When the LSB of m = 1,after waiting for the period specified by t, the PAPER OUT LED indicators blink and the printer waits for the FEED button to be pressed. After the button is pressed, the

printer executes the macro once. The printer repeats the operation r times.

[Notes]

The waiting time is t × 100ms for every macro execution.

If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.

If the macro is not defined or if r is 0, nothing is executed.

When the macro is executed (m = 1), paper always cannot be fed by using the FEED button.

[Reference]　　　GS :

①GS V m ②GS V m n　　Select cut mode and cut paper

[Name]　　　Select cut mode and cut paper

[Format]　　　①ASCII　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 = 0, 48, 1, 49

　　　　　　　② m = 65, 66, 0 ≤ n ≤ 255

[Description] Select a mode for cutting paper and executes paper cutting. The value of m selects the mode as follows:

m		Cut paper mode
①	0, 48	Full cut
	1, 49	Partial cut
②	65	Feed paper (cutting position + [n ´ (vertical motion unit)]) and full cut
	66	Feed paper (cutting position + [n ´ (vertical motion unit)]) and partial cut

[Notes for ①and②]

Cutting status is different, depending on the installed auto cutter type.

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

Some printer models do not support the full cut, then perform a full or partial cut, the effect is the same.

For no cutter printer, the printer feeds to the tear paper position when executes this command.

[Note for ①]

m = 0, 48, 1, 49, the printer cuts paper directly.

[Notes for ②]

When m =65, 66, the printer feeds the paper to (cutting position + [n ´ vertical motion unit]) and cuts it.

The horizontal and vertical motion unit are specified by GS P.

The paper feed amount is calculated using the vertical motion unit.

DLE ENQ n　　Real-time request to printer

[Name]　　　Real-time request to printer

[Format]　　　ASCII　　　DLE　　ENQ n

　　　　　　　Hex　　　10　　05　　n

　　　　　　　Decimal　　16　　5　　n

[Range]　　　1 ≤ n ≤ 2

[Description]

Responds to a request from the host computer. n specifies the requests as follows:

n	Request
1	Recover from an error and restart printing from the line where the error occurred
2	Recover from an error aft clearing the receive and print buffers

[Notes]

This command is effective only when an auto-cutter error occurs.

The printer starts processing data upon receiving this command.

This command is executed when the printer is receiving the command with a serial interface model.

With a parallel interface model, this command can not be executed when the printer is busy.

This command should not be contained within another command that consists of two or more bytes.

When the printer is disabled with ESC = (Select peripheral device), the command is still valid.

[Reference]　　　DLE EOT

DLE DC4 fn m t (fn=1)　　Generate pulse at real-time

[Name]　　Generate pulse at real-time

[Format]　　ASCII　　　　DLE　　DC4　　fn　m　t

　　　　　　　　Hex　　　　　10　　14　　fn　m　t

　　　　　　　　Decimal　　　16　　20　　fn　m　t

[Range]　　　fn =1

　　　　　　　　m = 0, 1

　　　　　　　　1 ≤ t ≤ 8

[Description]　　Outputs the pulse specified by t to connector pin m as follows:

m	Connector pin
0	Drawer kick-out connector pin 2.
1	Drawer kick-out connector pin 5.

The pulse ON time is [t × 100 ms] and the OFF time is [t × 100 ms].

[Notes]

When the printer is in an error status when this command is processed, this command is ignored.

When the pulse is output to the connector pin specified while ESC p or DEL DC4 is executed while this command is processed, this command is ignored.

In serial interface model, this command is executed even when receiving the command.

In parallel interface model, this command cannot be executed when the printer is busy.

If print data includes the same character strings as this command, the printer performs the same operation specified by this command. The user must consider this.

This command should not be used within the data sequence of another command that consists of 2 or more bytes.

This command is effective even when the printer is disabled with ESC = (Select peripheral device).

[Reference]　　　ESC p

ESC = n　　Set peripheral device

[Name]　　　　Set peripheral device

[Format]　　ASCII　　　ESC　=　　　n

　　　　　　　　Hex　　　　　1B　　3D　　　n

	Decimal	27	61	n

[Range]   0≤ n ≤ 255

[Description] Selects the device to which the host PC transmits data, using n as follows:

n	Function
1, 3	Printer enabled
2	Printer disabled.

[Notes] ⬚   ⬚

When the printer is disabled (n = 2), all data except this command and the real-time commands are ignored.

[Default]   n = 1

ESC @   Initialize printer

[Name]   Initialize printer

[Format]   ASCII   ESC @

	Hex	1B	40
	Decimal	27	64

[Description]

Clear the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.

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.

Keeps the following data:

• Macro definition data.

• Contents stored in the NV user memory.

• Contents defined for the NV graphics (NV bit image).

• Maintenance counter value.

• Setting values specified with the customized values (memory switches), GS (E.

ESC p m t1 t2   Generate pulse

[Name]   Generate pulse

[Format]   ASCII   ESC p   m   t1   t2

	Hex	1B	70	m	t1	t2
	Decimal	27	112	m	t1	t2

[Range]   m = 0, 1, 48, 49

            0 ≤ t1 ≤ 255, 0 ≤ t2 ≤ 255

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

m	Connector pin
0, 48	Drawer kick-out connector pin 2.
1, 49	Drawer kick-out connector pin 5.

[Notes]

The pulse ON time is [t1 × 2 ms] and the OFF time is [t2 × 2 ms].

If t2 < t1, the OFF time is [t1 × 2 ms]

[Reference]   DLE DC4

GS I n　Check printer ID

[Name]		Check printer ID		
[Format]	ASCII	GS	I	n
	Hex	1D	49	n
	Decimal	29	73	n

[Range]　　1 ≤ n ≤ 3, 49 ≤ n ≤ 51, 65 ≤ n ≤ 69

[Description] Check printer ID specified by n as follows:

n	Printer ID	ID (hexadecimal)
1, 49	Printer model ID	printer models related
2, 50	Type ID	See table below.
3, 51	ROM version ID	printer model and batch related
65	Firmware version	printer model and batch related
66	Manufacturer	the actual manufacturer related
67	Printer name	the actual printer name related
68	Serial number	printer model and batch related
69	Supporting　　Chinese type	Simplified Chinese：Chinese Traditional Chinese：Chinese-BIG5

n = 2, Type ID

Bit	1/0	Hex	Decimal	Function
0	0	00	0	Two-byte character code not supported.
	1	01	1	Two-byte character code supported.
1	0	00	0	Auto-cutter not equipped.
	1	02	2	Auto-cutter equipped.
2	0	00	0	Not used.
3	0	00	0	Not used.
4	0	00	0	Fixed value is 0
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	0	00	0	Fixed value is 0

[Notes]

When 1 ≤ n ≤ 3 or 49 ≤ n ≤ 51, the printer returns to single-byte ID

When 65 ≤ n ≤ 69, return the following format:

Header information: Hexadecimal = 5FH / Decimal = 95 (1 byte)

Data: Printer Information

NUL: Hexadecimal = 00H / Decimal = 0 (1 byte)

GS P x y　Set horizontal and vertical motion units

[Name]		Set horizontal and vertical motion units		
[Format]	ASCII	GS	P	x　y
	Hex	1D	50	x　y
	Decimal	29	80	x　y

[Range]	0 ≤ x ≤ 255
	0 ≤ y ≤255

[Description]

Set the horizontal and vertical motion units to approximately 25.4/x mm { 1/xinches} and approximately 25.4/y mm {1/y inches}, respectively.

When x and y are set to 0, the default setting of each value is used.

[Notes] ⯑ ⯑

The horizontal direction is perpendicular to the paper feed direction and the vertical direction is the paper feed direction.

In standard mode, the following commands use x or y, regardless of character rotation (upside-down or 90°clockwise rotation):

Commands using x: ESC SP, ESC $, ESC \, FS S, GS L, GS W

Commands using y: ESC 3, ESC J, GS V

In page mode, the following command use x or y, depending on character orientation:

When the print starting position is set to the upper left or lower right of the printing area using ESC T (data is buffered in the direction perpendicular to the paper feed direction):

Commands using x: ESC SP, ESC $, ESC W, ESC \, FS S

Commands using y: ESC 3, ESC J, ESC W, GS $, GS \, GS V

When the print starting position is set to the upper right or lower left of the printing area using ESC T (data is buffered in the paper feed direction):

Commands using x: ESC 3, ESC J, ESC W, GS $, GS \

Commands using y: ESC SP, ESC $, ESC W, ESC \,FS S, GS V

The command does not affect the previously specified values.

The calculated result from combining this command with others is truncated to

the minimum value of the mechanical pitch.

One inch equals 25.4mm.

[Default]

x = 203，y = 203, When a mobile unit is a printed dot. The horizontal distance of 1/8mm, the vertical distance of 1/8mm.

[Reference]   ESC SP, ESC $, ESC 3, ESC J, ESC W, ESC \, GS $, GS L, GS V, GS W, GS \

GS (A pL pH n m   Execute test print

[Name]   Execute test print

[Format]   ASCII   GS   (A   pL   pH   n   m
                  Hex   1D   28   41   pL   pH   n   m
                  Decimal   29   40   65   pL   pH   n   m

[Range]   (pL+ pH × 256)=2   (pL=2, pH=0)
                  0 ≤ n ≤ 2, 48 ≤ n ≤ 50
                  1 ≤ m ≤ 3, 49 ≤ m ≤ 51

[Description] ⯑   ⯑

Execute a test print. The method is determined by n,m.

pL and pH specifies the number of the parameter such as n, m to (pL + (pH * 256)) bytes.

n specifies the paper to be tested.

n	Paper
0, 48	Basic sheet (paper roll)
1, 49	Paper roll
2, 50	

The content of printing is determined by m

m	Content
1, 49	Hexadecimal dump
2, 50	Printer status print
3, 51	Rolling pattern print

[Description] ⃞   ⃞
This command is enabled only when processed at the beginning of a line in standard mode.
This command is no effect in page mode.
When this command is received during macro definition, the printer ends macro definition and begins performing this command.
After the test print is finished, the printer resets itself automatically. Therefore, the already-defined data before this command is executed, such as an user defined characters, downloaded bit image, and macro, becomes undefined, and the receive buffer and print buffer are cleared, and each setting returns to the default value. The printer also re-reads the DIP switch settings.
The printer cuts the paper at the end of the test print.
The printer goes BUSY while this command is executed.

GS (D pL pH m [a1 b1] … [ak bk]   Enable/disable real-time command

[Name]	Enable/disable real-time command							
[Format]	ASCII	GS	(	D	pL	pH	m	[a1 b1] … [ak bk]
	Hex	1D	28	44	pL	pH	m	[a1 b1] … [ak bk]
	Decimal	29	40	68	pL	pH	m	[a1 b1] … [ak bk]

[Range]   3 ≤ (pL + pH × 256) ≤ 65535   (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)
m = 20
a = 1, 2
b = 0, 1, 48, 49

[Description] Enable or disable the real-time command specified by a.
pL, pH specify (pL + pH × 256) as the number of bytes after pH (m and [a1 b1]...[ak bk])

a	b	Function
1	0, 48	DLE DC4 fn m t (fn = 1): Not processed (disabled).
	1, 49	DLE DC4 fn m t (fn = 1): Processed (enabled).
2	0, 48	DLE DC4 fn a b (fn = 2): Not processed (disabled).
	1, 49	DLE DC4 fn a b (fn = 2): Processed (enabled).

[Notes]
  If graphics data includes a data string matching DLE DC4 (fn = 1 or 2), it is recommended to use this command in advance to disable the real-time commands.

GS (H pL pH fn m d1 d2 d3 d4 （fn=48） Set the process ID response

[Name]	Set the process ID response										
[Format]	ASCII	GS	(	H	pL	pH	fn	m	d1 d2	d3	d4
	Hex	1D	28	48	pL	pH	fn	m	d1 d2	d3	d4
	Decimal	29	40	72	pL	pH	fn	m	d1 d2	d3	d4

[Range]   (pL + pH × 256) = 6 (pL =6, pH = 0)
fn = 48
m = 48
32 ≤ d ≤ 126

[Description]
Set the processed ID specified by (d1, d2, d3, d4) return to the host.

GS g 0 m nL nH   Initialize maintenance counter

[Name]   Initialize maintenance counter
[Format]   ASCII   GS   g   0   m   nL   nH
                  Hex   1D   67   30   m   nL   nH
Decimal   29   103   48   m   nL   nH
[Range]   m =0
                  (nL + nH × 256) = 20, 21, 50, 70   (nL = 20, 21, 50, 70, nH = 0)
[Description]
Set the resettable maintenance counter specified by (nL + nH×256) to 0.

nL + nH × 256		
Hex	**Decimal**	**Maintenance counter [Units]**
14	20	Number of line fed. [Lines]
15	21	Number of head energizations. [Times]
32	50	Number of auto cutter operations. [Times].
46	70	Duration of printer operation. [Hours].

[Notes]
Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to write to the NV memory less than 10 times a day.
If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Do not turn the power off or do not reset the printer via an interface while this command is being executed.
While processing this command, the printer may become BUSY while writing the data to the NV memory and stops receiving data. Therefore, do not transmit data from the host computer while the printer is BUSY.
[Reference]   GS g 2

GS g 2 m nL nH   Transmit maintenance counter

[Name]   Transmit maintenance counter
[Format]   ASCII   GS   g   2   m   nL   nH
                  Hex   1D   67   32   m   nL   nH
                  Decimal   29   103   50   m   nL   nH
[Range]   m =0
                  (nL + nH × 256) = 20, 21, 50, 70, 148, 149, 178, 98
                  (nL = 20, 21, 50, 70, 148, 149, 178, 198 , nH = 0)
[Description]
Transmit the value of the maintenance counter specified by (nL + nH × 256).

nL + nH × 256			
Hex	**Decimal**	**Maintenance counter [Units]**	**Kind of counter**
14	20	Number of line feeds. [Lines]	Resettable (can be reset)
15	21	Number of times head is energized. [Times]	
32	50	Number of auto cutter operations. [Times].	
46	70	Duration of printer operation. [Hours].	
94	148	Number of line feeds. [Lines]	Cumulative
95	149	Number of times head is energized.	

		[Times]	
B2	178	Number of auto cutter operations. [Times].	
C6	198	Duration of printer operation. [Hours].	

[Notes]
The maintenance counter values are measurements; therefore, their values will be affected by the timing of errors and how and when the power is turned off.
When this command is transmitted, the data following must not be transmitted until the status is received.
[Reference]　　GS g 0

FS ! n　　Set print mode(s) for Chinese characters

[Name]　　　　Set print mode(s) for Chinese characters
[Format]　　ASCII　　　　FS　　　!　　　n
　　　　　　　　Hex　　　　　1C　　　21　　　n
　　　　　　　　Decimal　　　28　　　33　　　n

[Range]　　0 ≤ n ≤ 255
[Description]　　Set the print mode for Chinese characters, using n as follows:

Bit	0/1	Hex	Decimal	Function
0	0	00	0	Chinese Font A(24 × 24)
	1	01	1	Chinese Font B (16 × 16)
1				Undefined.
2	0	00	0	Double-width mode is OFF.
	1	04	4	Double-width mode is ON.
3	0	00	0	Double-height mode is OFF.
	1	08	8	Double-height mode is ON.
4~6	-	-	-	Undefined.
7	0	00	0	Underline mode is OFF.
	1	80	128	Underline mode is ON.

[Notes]　　　
When both double-width and double-height modes are set (including right- and left-side character spacing), quadruple-size characters are printed.
The printer can underline all characters (including right- and left-side character spacing), but cannot underline the space set by HT and 90° clockwise-rotated characters.
The thickness of the underline is that specified by FS -, regardless of the character size.
When some of the characters in a line are double or more height, all the characters on the line are aligned at the baseline.
It is possible to emphasize the Kanji character using FS W or GS !, the setting of the last received command is effective.
It is possible to turn under line mode on or off using FS -, and the setting of the last received command is effective.
[Default]　　　　n = 0
[Reference]　　　FS - , FS W, GS !

FS &   Select Chinese character mode

[Name]	Select Chinese character mode		
[Format]	ASCII	FS	&
	Hex	1C	26
	Decimal	28	38

[Description] Select Chinese character mode.

[Notes]

When the Chinese character mode is selected, the printer checks whether the code is for Chinese or not, then processed the first byte and the second byte if the code is for Chinese.

Character mode is automatically selected on the printer power.

[Reference]   FS ., FS C

FS - n   Turn underline mode on/off for Chinese characters

[Name]	Turn underline mode on/off for Chinese characters		
[Format]	ASCII	FS	-	n
	Hex	1C	2D	n
	Decimal	28	45	n

[Range]   0 ≤ n ≤ 2, 48 ≤ n ≤ 50

[Description]

Turn underline mode for Chinese characters on or off, based on the following values

n	Function
0, 48	Turn off underline mode for Chinese characters
1, 49	Turn on underline mode for Chinese characters (1-dot thick)
2, 50	Turn on underline mode for Chinese characters (2-dot thick)

[Notes] ▯   ▯

The printer can underline all characters (including right- and left-side character spacing), but cannot underline the space set by HT and 90° clockwise-rotated characters.

After the underline mode for Chinese characters is turned off by setting n to 0, underline printing is no longer performed, but the previously specified underline thickness is not changed. The default underline thickness is 1 dot.

The specified line thickness does not change even when the character size changes.

It is possible to turn underline mode on or off using FS !, and the last received command is effective.

[Default]   n = 0

[Reference]   FS !

FS .   Cancel Chinese character mode

[Name]	Cancel Chinese character mode		
[Format]	ASCII	FS	.
	Hex	1C	2E
	Decimal	28	46

[Description]   Cancel Chinese character mode.

[Notes]

When the Chinese character mode is not selected, all character codes are processed one byte at a

time as ASCII code.
Chinese character mode is selected when the power is turned on.
[Reference]   FS &, FS C

FS 2 c1 c2 d1...dk   Define user-defined Chinese characters

[Name]   Define user-defined Chinese characters

[Format]   ASCII   FS   2   c1   c2   d1...dk
                Hex   1C   32   c1   c2   d1...dk
                Decimal   28   50   c1   c2   d1...dk

[Range]   c1 and c2 indicate character codes for the defined characters.
                c1 = FEH
                A1H ≤ c2 ≤ FEH
                0 ≤ d ≤ 255
                k = 72

[Description]
Define user-defined Chinese characters for the character codes specified by c1 and c2.

[Notes] ▯   ▯
c1 and c2 indicate character codes for the defined characters. c1 specifies for the first byte, and c2 for the second byte.
d indicates data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.
You can define up to 10 characters.

[Default]
no user-defined characters
Between user-defined characters and data relationship shown below:
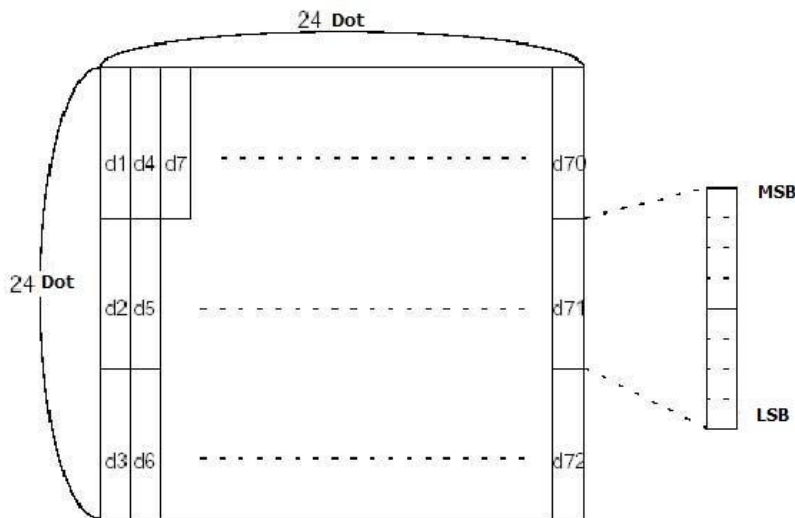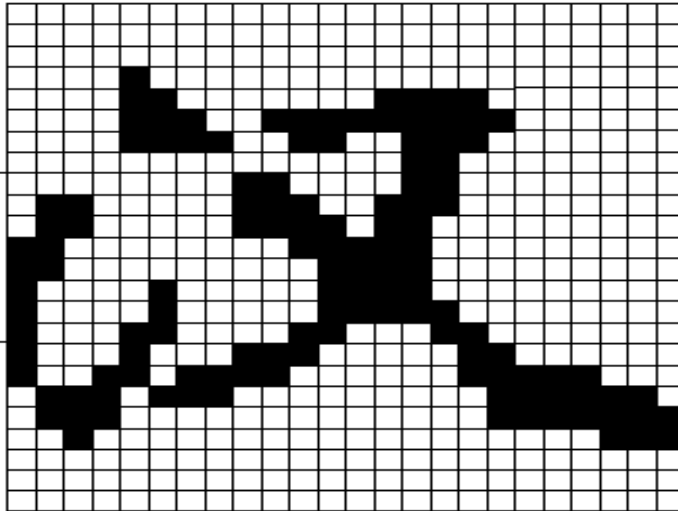
D1=00H, D4=00H, D7=00H, D10=00H. . . . . . .
D2=1FH, D5=78H, D8=60H, D11=00H. . . . .
D3=C0H, D6=30H, D9=38H, D12=70H. . . . .

FS C n   Select Chinese character code system

[Name]   Select Chinese character code system
[Format]   ASCII   FS   C   n
               Hex   1C   43   n
               Decimal   28   67   n
[Range]   n=0, 1, 48, 49
[Description]   Select Chinese character code system

n	Select Chinese character code system
0, 48	Simplified Chinese (GB2312 or GB18030)
1, 49	Traditional Chinese (BIG5)

[Notes]
This command does not change the parameter settings in Flash.
After executing ESC @command, turn off the power or printer reset to their default values..
[Default]   n = 0 Simplified Chinese models.
                 n = 1 Traditional Chinese models.

FS S n1 n2   Set left- and right-side Chinese character spacing

[Name]   Set left- and right-side 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 left- and right-side Chinese character spacing n1 and n2, respectively.
When the printer model used supports GS P, the left-side character spacing is [n1 × horizontal or vertical motion units], and the right-side character spacing is [n2 × horizontal or vertical motion units].

[Notes]

When double-width mode is set, the left- and right-side character spacing is twice the normal value.

The horizontal and vertical motion units are set by GS P. The previously specified character spacing does not change, even if the horizontal or vertical motion unit is changed using GS P.

In standard mode, the horizontal motion unit is used.

In page mode, the horizontal or vertical motion unit differs in page mode,depending on starting position of the printable area as follows:

When the starting position is set to the upper left or lower right of the printable area, the horizontal motion unit (x) is used.

When the starting position is set to the upper right or lower left of the printable area, the vertical motion unit (y) is used.

The maximum right-side spacing is approximately 36 mm. Any setting exceeding the maximum is converted to the maximum automatically.

[Default]   n1 = 0, n2 = 0

[Reference]   GS P

FS W n   Turn quadruple-size mode on/off for Chinese characters

[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 or off for Chinese characters.

When the LSB of n is 0, quadruple-size mode for Chinese characters is turned off.

When the LSB of n is 1, quadruple-size mode for Chinese characters is turned on.

[Notes]

Only the lowest bit of n is valid.

In quadruple-size mode, the printer prints the same size characters as when double-width and double-height modes are both turned on.

When quadruple-size mode is turned off using this command, the following characters are printed in normal size.

When some of the characters on a line are different in height, all the characters on the line are aligned at the baseline.

FS ! or GS ! can also select and cancel quadruple-size mode by selecting double-height and double-width modes, and the setting of the last received command is effective.

[Default]   n = 0

[Reference]   FS !, GS !

GS H n   Select printing position for HRI characters

[Name]   Select printing position for HRI characters

[Format]   ASCII   GS   H   n

                  Hex   1D   48   n

                  Decimal   29   72   n

[Range]   0 ≤ n ≤ 3, 48 ≤ n ≤ 51

[Description]

Select the printing position of HRI characters when printing a bar code.n selects the printing position as follows:

n	Printing position
0, 48	Not printed
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above and below the bar code

HRI indicates Human Readable Interpretation.
[Notes]
HRI characters are printed using the font specified by GS f.
[Default]   n = 0
[Reference]   GS f, GS k

GS f n   Select font for Human Readable Interpretation (HRI) characters

[Name]   Select font for Human Readable Interpretation (HRI) characters
[Format]   ASCII   GS   f   n

                Hex   1D   66   n

                Decimal   29   102   n
[Range]   n = 0, 1, 48, 49
[Description]
Select a font for the HRI characters used when printing a bar code. n selects a font from the following table:

n	Font
0, 48	Standard ASCII characters (12 × 24)
1, 49	Compressed ASCII characters (9 × 17)

[Notes]
HRI indicates Human Readable Interpretation.
HRI characters are printed at the position specified by GS H.
[Default]   n = 0
[Reference]   GS H, GS k

GS h n   Select bar code height

[Name]   Select bar code height
[Format]   ASCII   GS   h   n

                Hex   1D   68   n

                Decimal   29   104   n
[Range]   1 ≤ n ≤ 255
[Description] Select bar code height
                n specifies the number of dots in the vertical direction.
[Default]   n = 60
[Reference] GS k

①GS k m d1...dk NUL②GS k m n d1...dn   Print bar code

[Name]   Print bar code

[Format]　　①ASCII　GS　　k　　　m　　d1...d k　NUL
　　　　　　　　Hex　　　1D　　6B　　m　　d1...d k　00
　　　　　　　　Decimal　29　　107　　m　　d1...d k　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 depends on the bar code system used)

② 65 ≤ m ≤ 73 (n and d depends on the bar code system used)

[Description]

Select a bar code system and prints the bar code. m selects a bar code system as follows:

m		Bar Code System	Number of Characters	d
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	JAN 8 (EAN8)	7 ≤ k ≤ 8	48 ≤ d ≤ 57
	4	CODE39	1 ≤ k ≤ 255	45 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37,43
	5	ITF	1 ≤ k ≤ 255	48 ≤ d ≤ 57
	6	CODABAR	1 ≤ k ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 68 , 36, 43, 45,46,47,58
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	JAN 8 (EAN8)	7 ≤ n ≤ 8	48 ≤ d ≤ 57
	69	CODE39	1 ≤ n ≤ 255	45 ≤ d ≤ 57, 65 ≤ d ≤ 90, 32, 36, 37,43 d1 = dk = 42
	70	ITF	1 ≤ n ≤ 255	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	2 ≤ n ≤ 255	0 ≤ d ≤ 127

[Notes for ①]

This command ends with a NUL code.

When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes bar code data and processes the following data as normal data.

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.

The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

[Notes 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.

[Notes 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.

This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated character, etc.), except for upside-down printing mode.

[Notes 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 code width 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.

When CODE128 (m = 73) is used:

Refer to Figure A，CODE 128 for detailed information and character set.

When using the CODE 128,follow the instructions below code:

①Before bar code data must select the character set(CODE A, CODE B or CODE C).

②Select the character set is transmitted by the character"{"and other characters are combined to complete; ASCII character "{"by continuously transmitting the character "{"twice to complete.

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

[Example]

Example data for printing "No. 123456"

In this example, the printer first prints "No." using CODE B, then prints the following numbers using CODE C.

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

No.123456

If the top of the bar code data is not the code set selection character, the printer stops command processing and processes the following data as normal data.

If combination of "{" and the following character does not apply any special character, the printer stops command processing and processes the following data as normal data.

If the printer receives characters that cannot be used in the special code set, the printer stops

command processing and processes the following data as normal data.

The printer does not print HRI characters that correspond to the shift characters or code set selection characters.

HRI character for the function character is space.

HRI characters for the control character (<00>H to <1F>H and <7F>H) are space.

<Others> Be sure to keep spaces on both right and left sides of a bar code. (Spaces are different depending on the types of the bar code.)

[Reference]   GS H, GS f, GS h, GS w, Appendix A

GS w n   Set bar code width

[Name]   Set bar code width
[Format]   ASCII   GS   w   n
                    Hex   1D   77   n
                    Decimal   29   119   n
[Range]   2 ≤ n ≤ 6
[Description]

Set the horizontal size of the bar code. n specifies the bar code width as follows:

n	Module Width (mm) for Multi-level Bar Code （mm）	Binary-level Bar Code	
		Thin element width (mm)	Thick element width (mm)
2	0.25	0.25	0.625
3	0.375	0.375	1.0
4	0.5	0.5	1.25
5	0.625	0.625	1.625
6	0.75	0.75	1.875

Multi-level bar codes are as follows:

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

Binary-level bar codes are as follows:

CODE39, ITF, CODABAR

[Default]   n = 2
[Reference]   GS k

GS Z n   Select 2-D code type

[Name]   Select 2-D code type
[Format]   ASCII   GS   Z   n
                    Hex   1D   5A   n
                    Decimal   29   90   n
[Range]   0 ≤n ≤ 2
[Description]

Select 2-D code type

n = 0 Select PDF417

n = 1 Select DATA MATRIX

n = 2 Select QR CODE

[Reference]   ESC Z

ESC Z m n k dL dH d1 …dn   Print 2-D bar code

[Name]   Print 2-D bar code

[Format]   ASCII   ESC   Z   v   r   k   nL nH   d1 …dn

Hex   1B   5A   v   r   k   nL nH   d1 …dn

Decimal   27   90   v   r   k   nL nH   d1 …dn

[Range]

The meaning and scope of the parameters are different, according to the 2-D code type is selected by GS Z .

The bar code of different Parameter v,r, different meanings.

a. PDF417 2-D code

$1 \le v \le 30$ indicates the number of characters per line. Different models, different paper width, the maximum value of v should be within the max value of this model.

$0 \le r \le 8$ indicates error correction levels.

b. DATA MATRIX 2-D code

$0 \le v \le 144$ Indicates graph height(o:automatic selection)

$8 \le r \le 144$ Indicates graph width(v=0,invalid).

c. QR CODE 2-D code

$0 \le v \le 40$ Indicates graph version(o:automatic selection)

r =76,77,81,72   Indicates error correction levels.(L:7%, M:15%,Q:25%,H:30%)。

Parameter k, n(nL, nH), d parameter meaning.

$1 \le k \le 6$ Indicates vertical magnification.

$1 \le n \le 65535$ Indicates the data length of printing a bar code is n, nL, nH is the low and high of n(n = dL + dH × 256).

$0 \le dn \le 255$ Indicates bar code data.

[Description]

According to the 2-D bar code type is selected by GS Z,printing 2-D bar code graph.

[Reference]   GS Z

[Example]   char SendStr[20] = {0x1D,0x5A,0x02,0x1B,0x5A,0x05,0x03,0x03,0x0A,
        0x00,0x31, 0x32,0x33,0x34,0x35,0x36,0x37,0x38,0x39, 0x30};
        SendData(SendStr, 20);

①GS k m v r d1...dn NUL ②GS k m v r nL nH d1...dn   Print 2-D bar code

[Name]   Print 2-D bar code

[Format]   ①ASCII   GS   k   m   v   r   d1...dn   NUL

Hex   1D   6B   m   v   r   d1...dn   00

Decimal   29   107   m   v   r   d1...dn   0

②ASCII GS   k   m   v   r   d1...dn   NUL

Hex   1D   6B   m   v   r   nL nH   d1... dn

Decimal   29   107   m   v   r   nL nH   d1... dn

[Range]   ①$32 \le m \le 34$
        ②$97 \le m \le 99$

The bar code of different Parameter v, r, different meanings.

a. PDF417 2-D bar code

1 ≤ v ≤ 30 indicates the number of characters per line. Different models, different paper width, the maximum value of v should be within the max value of this model.

0 ≤ r ≤ 8 indicates error correction levels.

b. DATA MATRIX 2-D bar code

0 ≤v ≤ 144   Indicates graph height(o:automatic selection)

8 ≤ r ≤ 144   Indicates graph width(v=0,invalid).

c. QR CODE 2-D bar code

0 ≤ v ≤ 40 Indicates graph version(o:automatic selection)

1 ≤ r ≤ 4   Indicates error correction levels(L:7%,M:15%,Q:25%,H:30%)。

· Parameter n(nL, nH), d Parameter meaning.

1 ≤ n ≤ 65535   Indicates the data length of printing a bar code is   n, nL, nH is the low and high of n(n = dL + dH × 256).

0 ≤ dn ≤ 255   Indicates bar code data。

[Description]

Select a type of 2-D code and print bar codes.

When using the first form, the command to 00 end, d1 ... Dn as bar code data when using the second form, nH n after full character d1 ... Dn as bar code data.

mused to select the bar code type, as follows:

	m	Bar Code Type	Data length	v	r	d
①	32	QR Code	1 ≤ n ≤ 65535	0 ≤ v ≤ 40	1 ≤ r ≤ 4	0 ≤ dn ≤ 255
	33	Data Matrix	1 ≤ n ≤ 65535	0 ≤v ≤ 144	8 ≤ r ≤ 144	0 ≤ dn ≤ 255
	34	PDF417	1 ≤ n ≤ 65535	1 ≤ v ≤ 30	0 ≤ r ≤ 8	0 ≤ dn ≤ 255
②	97	QR Code	1 ≤ n ≤ 65535	0 ≤ v ≤ 40	1 ≤ r ≤ 4	0 ≤ dn ≤ 255
	98	Data Matrix	1 ≤ n ≤ 65535	0 ≤v ≤ 144	8 ≤ r ≤ 144	0 ≤ dn ≤ 255
	99	PDF417	1 ≤ n ≤ 65535	1 ≤ v ≤ 30	0 ≤ r ≤ 8	0 ≤ dn ≤ 255

[Notes]

When printing 2-D code using this command, bar code magnification is decided by the n ,n is set by the GS w.

[Reference]   ESC Z, GS w

[Example]   char SendStr[11] = {0x1D,0x6B,0x20,0x03,0x03,0x31,0x32,0x33,0x34, 0x35,0x00};
          SendData(SendStr, 11);

5. CPCL Command Details

START commands

[Name]   Start command

[Format]   ！ {offset}   200   200   {height}   {qty}

[Description]

{offset}: offset of the whole barcode in horizontal direction

200: horizontal resolution，203dots/inch（8dots/mm）

200: vertical resolution，203dots/inch（8dots/mm）

{height}: the max height of barcode, the unit is dot

{qty}: the quantity of printed barcode, the most is 1024pcs.

  [Example]:
   ! 0 200 200 210 1
   TEXT 24 0 30 40 Hello World
   FORM
   PRINT

```
┌─────────────────────────────────┐
│                                 │
│   Hello World                   │
│                                 │
│                                 │
│                                 │
└─────────────────────────────────┘
```
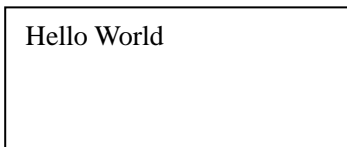
PRINT Commands

[Name]   Print command
[Format]   {command}
[Description]   {command}:PRINT
                Under CPCL command mode, this is the last command to stop print command or
                to print file; When carrying out the print command, the printer exits the control
                range. One "Enter" must be needed after the print commands.
                If error happened during printing, print again after recovery from error.
[Example]   ! 0 200 200 210 1
                TEXT 24 11 30 40 ………………
                PRINT

```
┌─────────────────────────────────┐
│                                 │
│   ………………                        │
│                                 │
│                                 │
│                                 │
└─────────────────────────────────┘
```
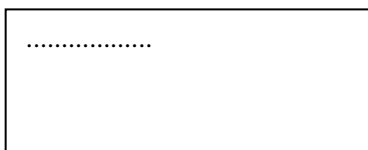
FORM Commands

[Name]   Positioning command
[Format]   {command}
[Description] {command}: FORM
                After using FORM command, the printer will feed paper to the beginning of next
                label. The printer finds the beginning of next label according to the gap between
                two labels.

TEXT Commands

[Name]   Text command
[Format]   {command} {font} {size} {x} {y} {data}
[Description] {command} :TEXT(or T), TEXT90(T90), TEXT180(T180)
                {font}: choose font
                {size}: choose font size
                {x}：   the beginning of horizontal printing
                {y}:   the beginning of vertical printing
                {data}: printed text content

Choose Text type:

TEXT(or T)	Print text in normal direction
TEXT90(T90)	Print text in rotated 90 degree direction
TEXT180(T180)	Print text in rotated 180 degree direction

Choose Font:

font	Font dot
24	Character (12*24),Chinese character (24*24)
55	Character (8*16),Chinese character (16*16)

Choose Size:

Height		Width	
size	Enlarge vertically	**size**	Enlarge horizontally
0	1(normal)	0	1 (normal)
1	2(twice height)	10	2 (twice width)
2	3	20	3
3	4	30	4
4	5	40	5
5	6	50	6
6	7	60	7
7	8	70	8

[Example]   **Input：**

! 0 200 200 210 1
TEXT 24 11 30 40 Hello World
PRINT

```
Hello World
```
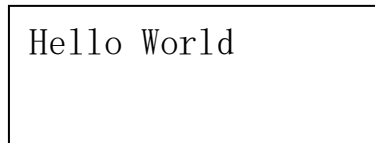
LINE Commands

[Name]   Line printing command
[Format]   {command}LINE（L）{x0} {y0 } {x1} {y1} {width}
[Description]   {command}:LINE（or L）
        {x0}:   X-coordinate of the top-left corner
        {y0}:   Y-coordinate of the top-left corner
        {x1}:   X-coordinate of:
              -top right corner for horizontal
              -bottom left corner for vertical
        {y1}:   Y-coordinate of:
              -top right corner for horizontal
              -bottom left corner for vertical
        {width}: Line width

[Example]

! 0 200 200 210 1
LINE 0 0 200 0 1
LINE 0 0 200 200 2
LINE 0 0 0 200 3
PRINT
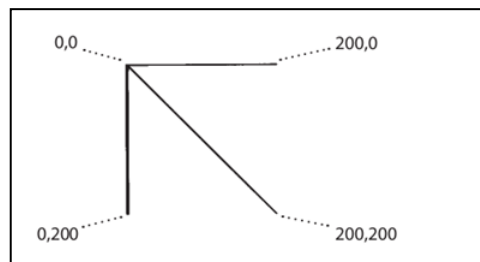
BOX Commands

[Name]	Box command
[Format]	{command} {x0} {y0 } {x1} {y1} {width}
[Description]	{command}:BOX
	{x0}: X-coordinate of the top left corner
	{y0}: Y-coordinate of the top left corner.
	{x1}: X-coordinate of the bottom right corner.
	{y1}: Y-coordinate of bottom right corner
	{width}: Unit-width of the lines forming the box

[Example]

```
! 0 200 200 210 1
BOX 0 0 200 200 1
PRINT
```

0,0
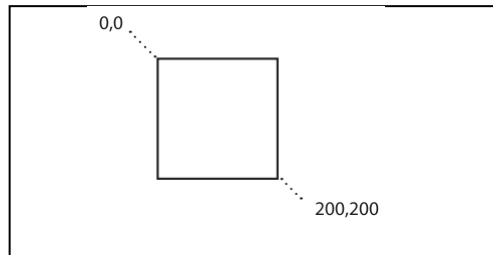
200,200

SETBOLD Commands

[Name]	Set bold character
[Format]	{command} {value}
[Description]	{command}: SETBOLD
	{value}: bold or not
	1: yes
	0: no

[Example]

```
! 0 200 200 210 1
SETBOLD 1
TEXT 24 0 0 0 This text is in bold
SETBOLD 0
TEXT 24 0 252 0 But this text is normal.
PRINT
```

This text is in bold But this text is normal.

INVERSE-TEXT Commands

[Name]	Inverse-text commands
[Format]	{command} {value}
[Description]	{command}: INVERSE-TEXT(or IT)
	{value}inverse-text yes or not
	1: Yes
	0: No

[Example]

```
! 0 200 200 210 1
```

T 24 11 0 10 Normal Display
INVERSE-TEXT 1
T 24 11 0 60 Inverse Display
INVERSE-TEXT 0
T 24 11 0 110 Normal Display
PRINT

> Normal Display
> Inverse Display
> Normal Display
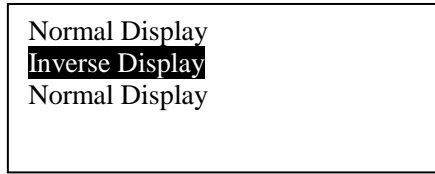
INVERSE-LINE Commands

[Name]   Inverse-line Command
[Format]   {command} {x0} {y0 } {x1} {y1} {width}
[Description] {command}: INVERSE-LINE（or IL）
           {x0}: X-coordinate of the top left corner
   {y0}: Y-coordinate of the top left corner.
           {x1}: X-coordinate of:
                -top right corner for horizontal
                -bottom left corner for vertical
          {y1}: Y-coordinate of:
                -top right corner for horizontal
                -bottom left corner for vertical
          {width}: Width of the inverse-line
[Example]

    ! 0 200 200 210 1
    TEXT 24 11 30 45 SAVE
    TEXT 24 11 30 95 MORE
    INVERSE-LINE 0 45 145 45 45
    INVERSE-LINE 0 95 145 95 45
    PRINT

UNDERLINE-TEXT Commands

[Name]   Underline-Text Command
[Format]   {command} {value}
[Description] {command}：UNDERLINE -TEXT(or UT)
           {value} means to print underline or not
           1：Print Underline One Dot
           2：Print Underline Two Dot
           0：Cancel printing underline
[Example]

    ! 0 200 200 210 1
    T 24 11 0 10 Normal
    UNDERLINE-TEXT 1
    T 24 11 0 60 Underline One Dot
    UNDERLINE-TEXT 2
    T 24 11 0 110 Underline Two Dot
    UNDERLINE-TEXT 0

T 24 11 0 160 Normal
PRINT

```
Normal
Underline One Dot
Underline Two Dot
Normal
```

SETSP Commands

[Name]   Change spacing between text characters
[Format]   {command} {spacing}
[Description]   {command}：SETSP
                {spacing}：Spacing between characters, default is 0.
[Example]

```
! 0 200 200 210 1
T 24 11 0 10 Normal Spacing
SETSP 5
T 24 11 0 60 Spread Spacing
SETSP 0
T 24 11 0 110 Normal Spacing
PRINT
```

```
Normal Spacing
S p r e a d   S p a c i n g
Normal Spacing
```

CENTER Commands

[Name]   Center Command
[Format]   {command}
[Description]   The content in current line to be showed in center

LEFT Commands

[Name]   Left Command
[Format]   {command}
[Description]   The content in current line to be showed on the left

RIGHT Commands

[Name]   Right Command
[Format]   {command}
[Description]   The content in current line to be showed on the right

PREFEED Commands

[Name]   Prefeed dots(length) before printing
[Format]   {command}   {length}
[Description]   {command}:PREFEED
                     { length }: dots(8dot/mm)
[Example]

       ! 0 200 200 210 1
      PREFEED 40
      TEXT 7 0 0 20 PREFEED EXAMPLE
      PRINT
    Prefeed 40dots(5mm)

PREFEED EXAMPLE

POSTFEED Commands

[Name]   Postfeed dots(length) before printing
[Format]   {command}   {length}
[Description]   {command}：POSTFEED
                   { length }：dots(8dot/mm)
[Example]

     ! 0 200 200 210 1
     POSTFEED 40
     TEXT 7 0 0 20 POSTFEED EXAMPLE
     PRINT
     Postfeed 40dots(5mm)

POSTFEED EXAMPLE

BARCOD-TEXT Commands

[Name]   HRI character command
[Format]   {command} {font number} {font size} {offset}
[Description] {command}：BARCODE-TEXT(or BT)
           {font number}：HRI character font (Fixed to 12*24)
           {font size}：HRI character size (Fixed to original size)
           {offset}：Offset between HRI character and barcode.
[Example]

     ! 0 200 200 210 1
     BARCODE-TEXT 24 0 50
     BARCODE 128 1 1 50 0 20 123456789
     BARCODE-TEXT OFF
     PRINT

BARCODE Commands

[Name]   Barcode Command

1D Barcode

[Format]   {command} {type} {width} {ratio} {height} {x} {y} {data}

[Description]   {command}：   BARCODE(or B)

{type}： Barcode type

Type Value	Barcode type
UPCA	UPC-A
UPCE	UPC-E
EAN13	JAN13 (EAN13)
EAN8	JAN 8 (EAN8)
39	CODE39
CODABAR	CODABAR
93	CODE93
128	CODE128(Auto)

{width}: width of the narrow barcode.

{ratio}: Ratio of the wide barcode to the narrow barcode

0 = 1.5 : 1	20 = 2.0:1	26 = 2.6:1
1 = 2.0 : 1	21 = 2.1:1	27 = 2.7:1
2 = 2.5 : 1	22 = 2.2:1	28 = 2.8:1
3 = 3.0 : 1	23 = 2.3:1	29 = 2.9:1
4 = 3.5 : 1	24 = 2.4:1	30 = 3.0:1
	25 = 2.5:1	

{height}: height of the barcode

{x}:Horizontal starting position

{y}:Vertical starting position

{data}:Barcode data

[Example]

> ! 0 200 200 210 1
> BARCODE 128 1 1 50 150 10 HORIZ.
> TEXT 24 0 210 65 HORIZ.
> PRINT

2D Barcode

PDF417

[Format] {command} {type} {x} {y} {XD n} {YD n} {C n} {S n}

{data}

<ENDPDF>

[Example] {command}：   BARCODE(or B)

{type}： PDF-417

{x}： Horizontal starting position

{y}：Vertical starting position

{XD n}：Width of the narrowest element. Range is 1 to 32, default is 2.

{YD n}：Height of the narrowest element. Range is 1 to 32, default is 6.

{C n}：   Character numbers of each line. Range is 1 to 30, default is 3.

{S n}：   Security level indicates maximum amount of errors to be detected and/or corrected. Range is 0 to 8; default is 1.

{data}：Barcode data

<ENDPDF>：Terminates PDF-417

[Example]

```
! 0 200 200 210 1
B PDF-417 10 20 XD 3 YD 12 C 3 S 2
PDF Data
ABCDE12345
ENDPDF
T 24 11 10 100 PDF Data
T 24 11 10 150 ABCDE12345
PRINT
```

QR Code

[Format] {command} {type} {x} {y} [M n] [U n]

{data}

<ENDQR>

[Description] {command}：   BARCODE(or B)

{type}：QR

{x}：Horizontal starting position

{y}：Vertical starting position

[M n]：QR code model number Range is 1 or 2. Default is 2

[U n]：Width/Height of the module. Range is 1 to 6, default is 6.

{data}：QR barcode data，See the following examples，{data} includes some mode selection symbols in addition to actual input data character string. The type of the input data could be recognized automatically by printer software or set "manually". There is a separator (comma) between mode selection symbols and the actual data.

{data}format：

<Error Correction Level><Mask No.><Data Input Mode (should be "A")>,<Data character String>

Error Correction Level should be one of the following symbols：

H-Ultra high reliability level(Level H)

Q-High reliability level (Level Q)

M-Standard level(Level M)

L-High density level(Level L)

Mask Number may be omitted or have a value from 0 to 8:：

None – Automatic selection of the mask by software;

From 0 to 9 – use mask with corresponding number (0 to 9)

<ENDQR>:Terminates QR code.

[Example]

```
! 0 200 200 500 1
B QR 10 100 M 2 U 10
MA,QR code ABC123
ENDQR
```

T 24 11 10 300 code ABC123
PRINT

QR code ABC123

GRAPHICS Commands

[Name]   Graphics Command
[Format]   {command} {width} {height} {x} {y} {data}

[Description]   {command}：Choose from the following

EXPANDED-GRAPHICS (or EG): Prints expanded graphics
COMPRESSED-GRAPHICS (or CG): Prints compressed graphics
{ width }: Byte-width of image
{ height }:Dot-height of image
{x}：   Horizontal starting position
{y}:   Vertical starting position
{data}: Graphics data

Bit-mapped graphics can be printed by using graphics commands. ASCII hex (hexadecimal) is used for expanded graphics data (see example). Data size can be reduced to one-half by utilizing the COMPRESSED-GRAPHICS commands with the equivalent binary characters(s) of the hex data. When using CG, a single 8 bit character is sent for every 8bits of graphics data. When using EG two characters (16bits) are used to transmit 8bits of graphics data, making EG only half as efficient. Since this data is character data, however, it can be easier to handle and transmit than binary data.

[Example]

! 0 200 200 210 1
EG 2 16 90 45 F0F0F0F0F0F0F0F0F00F0F0F0F0F0F0F0F
F0F0F0F0F0F0F0F00F0F0F0F0F0F0F0F
PRINT

6. Appendix A: CODE128 code

A.1 CODE128 code

CODE 128 code passing alternate character sets A,B character set and character set C,capable of 128 and 100 ASCII characters from 00 to 99 digits, and some special characters are encoded.Each

character set encoding of characters is as follows:
·Character Set A: ASCII characters 00H to 5FH
·Character Set B: ASCII characters 20H to 7FH
·Character Set C: 00 ~ 99 of 100 digital
CODE 128 code can also be encoded for the following special characters:
· SHIFT character
"SHIFT"to make the character behind the bar code symbol SHIFT convert the first character from the character set A to character set B,or B to convert from character set to character set A,began to recover from the second character to SHIFT previously used character set."SHIFT"character set only character set conversion between A and B used in the character,it does not make the current coded character set C character enters or exits the state.
·Character set selection character(CODE A, CODE B, CODE C)
These characters can convert it back to a character set encoding of characters A, B or C.
·Function character(FNC1, FNC2, FNC3, FNC4)
These features are useful depends on the application soft ware breaks.In the character set C, only FNC1 available.

A.2 Character Set

Characters of Character Set A

Characters	Transmit Data		Characters	Transmit Data		Characters	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
NULL	00	0	&	26	38	L	4C	76
SOH	01	1	'	27	39	M	4D	77
STX	02	2	(	28	40	N	4E	78
ETX	03	3	)	29	41	O	4F	49
EOT	04	4	*	2A	42	P	50	80
ENQ	05	5	+	2B	43	Q	51	81
ACK	06	6	,	2C	44	R	52	82
BEL	07	7	-	2D	45	S	53	83
BS	08	8	.	2E	46	T	54	84
HT	09	9	/	2F	47	U	55	85
LF	0A	10	0	30	48	V	56	86
VT	0B	11	1	31	49	W	57	87
FF	0C	12	2	32	50	X	58	88
CR	0D	13	3	33	51	Y	59	89
SO	0E	14	4	34	52	Z	5A	90
SI	0F	15	5	35	53	[	5B	91
DLE	10	16	6	36	54	\	5C	92
DC1	11	17	7	37	55	]	5D	93
DC2	12	18	8	38	56	^	5E	94
DC3	13	19	9	39	57	_	5F	95
DC4	14	20	:	3A	58	FNC1	7B,31	123,49
NAK	15	21	;	3B	59	FNC2		123,50
SYN	16	22	<	3C	60	FNC3	7B,32	123,51
ETB	17	23	=	3D	61	FNC4		123,52
CAN	18	24	>	3E	62	SHIFT	7B,33	123,83
EM	19	25	?	3F	63	CODEB		123,66
SUB	1A	26	@	40	64	CODEC	7B,34	123,67
ESC	1B	27	A	41	65			
FS	1C	28	B	42	66		7B,53	
GS	1D	29	C	43	67			
RS	1E	30	D	44	68		7B,42	
US	1F	31	E	45	69			
SP	20	32	F	46	70		7B,43	
!	21	33	G	47	71			
"	22	34	H	48	72			
#	23	35	I	49	73			
$	24	36	J	4A	74			
%	25	37	K	4B	75			

Characters of Character Set B

Characters	Transmit Data		Characters	Transmit Data		Characters	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
SP	20	32	F	46	70	l	6C	108
!	21	33	G	47	71	m	6D	109
"	22	34	H	48	72	n	6E	110
#	23	35	I	49	73	o	6F	111
$	24	36	J	4A	74	p	70	112
%	25	37	K	4B	75	q	71	113
&	26	38	L	4C	76	r	72	114
'	27	39	M	4D	77	s	73	115
(	28	40	N	4E	78	t	74	116
)	29	41	O	4F	79	u	75	117
*	2A	42	P	50	80	v	76	118
+	2B	43	Q	51	81	w	77	119
,	2C	44	R	52	82	x	78	120
-	2D	45	S	53	83	y	79	121
.	2E	46	T	54	84	z	7A	122
/	2F	47	U	55	85	{	7B,7B	123,123
0	30	48	V	56	86	|	7C	124
1	31	49	W	57	87	}	7D	125
2	32	50	X	58	88	—	7E	126
3	33	51	Y	59	89	DEL	7F	127
4	34	52	Z	5A	90	FNC1	7B,31	123,49
5	35	53	[	5B	91	FNC2	7B,32	123,50
6	36	54	\	5C	92	FNC3	7B,33	123,51
7	37	55	]	5D	93	FNC4	7B,34	123,52
8	38	56	^	5E	94	SHIFT	7B,53	123,83
9	39	57	_	5F	95	CODEA	7B,41	123,65
:	3A	58	`	60	96	CODEC	7B,43	123,67
;	3B	59	a	61	97			
<	3C	60	b	62	98			
=	3D	61	c	63	99			
>	3E	62	d	64	100			
?	3F	63	e	65	101			
@	40	64	f	66	102			
A	41	65	g	67	103			
B	42	66	h	68	104			
C	43	67	i	69	105			
D	44	68	j	6A	106			
E	45	69	k	6B	107			

Characters of Character Set C

Characters	Transmit Data		Characters	Transmit Data		Characters	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
0	00	0	38	26	38	76	4C	76
1	01	1	39	27	39	77	4D	77
2	02	2	40	28	40	78	4E	78
3	03	3	41	29	41	79	4F	79
4	04	4	42	2A	42	80	50	80
5	05	5	43	2B	43	81	51	81
6	06	6	44	2C	44	82	52	82
7	07	7	45	2D	45	83	53	83
8	08	8	46	2E	46	84	54	84
9	09	9	47	2F	47	85	55	85
10	0A	10	48	30	48	86	56	86
11	0B	11	49	31	49	87	57	87
12	0C	12	50	32	50	88	58	88
13	0D	13	51	33	51	89	59	89
14	0E	14	52	34	52	90	5A	90
15	0F	15	53	35	53	91	5B	91
16	10	16	54	36	54	92	5C	92
17	11	17	55	37	55	93	5D	93
18	12	18	56	38	56	94	5E	94
19	13	19	57	39	57	95	5F	95
20	14	20	58	3A	58	96	60	96
21	15	21	59	3B	59	97	61	97
22	16	22	60	3C	60	98	62	98
23	17	23	61	3D	61	99	63	99
24	18	24	62	3E	62	FNC1	7B,31	123,49
25	19	25	63	3F	63	CODEA	7B,41	123,65
26	1A	26	64	40	64	CODEB	7B,42	123,66
27	1B	27	65	41	65			
28	1C	28	66	42	66			
29	1D	29	67	43	67			
30	1E	30	68	44	68			
31	1F	31	69	45	69			
32	20	32	70	46	70			
33	21	33	71	47	71			
34	22	34	72	48	72			
35	23	35	73	49	73			
36	24	36	74	4A	74			
37	25	37	75	4B	75			

7. Appendix B:Pre-printed black mark Description

If you use pre-printed black mark to carry bill location, be sure to observe the following guidelines when printing pre-printed black mark,otherwise it may cause the printer does not recognize the black mark.Pre-printed black mark specification:
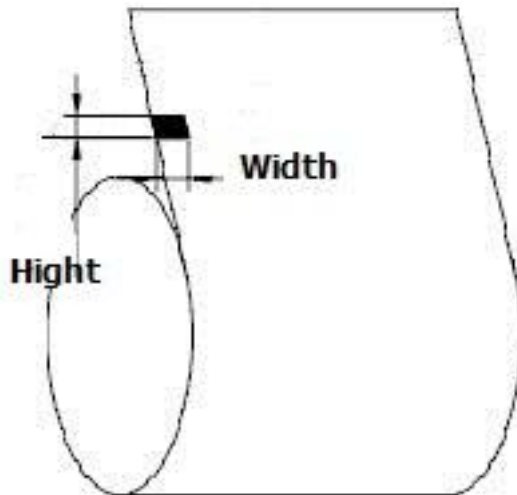
Printing Position: As shown above,the black mark on the left edge of the text to be printed surface.
Width:width ≥ 7mm
Height range:4mm ≤height≤ 6mm
The reflectance of infrared light:<10%(the rest of the paper width of the black mark reflectance of infrared light for>65%)