

# Thermal Printer Technical Manual

V 1.00

**Revision Record**

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## 1 Summary

This development manual contains all control commands of REGO portable thermal printer and thermal POS printer. It is about the use of various control commands and notes. Different models have different parameters and functions, so in this manual may not contain all the commands. The commands of specific models, please refer to the printer's manual.

### 1.1 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]** Give the allowable ranges for the arguments.
- [Description]**  
Describe the function of the command.
- [Notes]**  
Provide important information on setting and using the printer command, if necessary.
- [Default]** Give the default values, if any, for the command parameters.
- [Reference]** List related commands.
- [Example]** Provide examples using the command.

### 1.2 Glossary

#### Receive Buffer

Receive buffer is used to store raw data from the host, the raw data is temporarily stored in the reception buffer, and then processing in the order.

#### Print line buffer

Print line buffer is used to store a row data to be sent to the mechanism.

#### Print line buffer is full

It means current line buffer space can not contain the current processing data.

#### Print line buffer empty

The current print line buffer have not the printing data (row pointer is not necessarily at the beginning).

#### The beginning of a line

Row pointer at the start position of the print line. If the print line buffer is not empty, or set the print position by the command, are not satisfied with the condition of the beginning of a line.

#### Printable width

The printer can support a maximum lateral print range, determined by the printer itself. For example: For a 80mm wide printer, printing width is 72mm (576points), and for the 58mm wide printer, printing width is 48mm (384points).

#### Print Area

Print area set by the command. Print area must be less than or equal to a printable area.

#### Ignore

In this state, all the code including parameters are read and discarded, without any action.

### **Black mark mode**

Black mark is a black block which pre-printed on the paper, through it you can achieve position. The printer can be set to Black Label mode, in the Black mark mode, if you send the command FF or press the feed button , the printer will be a black mark position,detailed position command,please see FF related interpretations, black label detailed specifications in Appendix B .

## 1.3 Command List

Command	Name	Command classification		GS P influence
		Executing	Setting	
Printing control command				
LF	Print and line feed	○		
CR	Print and carriage return	○		
FF	Print and feed paper to a black mark(only black mark position)	○		
ESC J	Print and feed n vertical units	○		○
ESC d	Print and feed n lines	○		
Line spacing command				
ESC 2	Select default line spacing		○	
ESC 3	Select line spacing		○	○
Character parameter command				
ESC SP	Set right-side character spacing		○	○
ESC !	Select print mode(s)		○	
ESC %	Select/cancel user-defined character set		○	
ESC &	Define user-defined characters		○	
ESC -	Turn underline mode on/off		○	
ESC ?	Cancel user-defined characters		○	
ESC E	Turn emphasized mode on/off		○	
ESC G	Turn double-strike mode on/off		○	
ESC M	Select character font		○	
ESC R	Select an international character set		○	
ESC V	Turn 90□ □ clockwise rotation mode on/off		○	
ESC t	Select the character code page		○	
ESC {	Turn upside-down printing mode on/off		○	
GS !	Select character size		○	
GS B	Turn white/black reverse printing mode on/off		○	
Panel control command				
ESC c 5	Enable/disable printer buttons		○	
Paper sensor control command				
ESC c 3	Select paper sensor(s) to output paper-end signals		○	
ESC c 4	Select paper sensor(s) to stop printing		○	
Location parameter command			○	
HT	Horizontal tab		○	
ESC \$	Set absolute print position		○	○

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<b>ESC D</b>	Set horizontal tab positions		○	
<b>ESC \</b>	Set relative print position		○	○
<b>ESC a</b>	Select justification		○	
<b>GS L</b>	Set left margin		○	○
<b>GS W</b>	Set printing area width		○	○
<b>Graphics/image printed command</b>			○	
<b>ESC *</b>	Print bit image	○		
<b>GS *</b>	Define downloaded bit image		○	
<b>GS /</b>	Print downloaded bit image	○		
<b>FS P</b>	Printing pre download bitmap (FLASH)	○		
<b>GS v 0</b>	Print raster bit image	○		
<b>The printer status getting command</b>				
<b>DLE EOT</b>	Real-time status transmission	○		
<b>GS a</b>	Enable/disable automatic return	○		
<b>GS r</b>	Transfer status	○		
<b>ESC u</b>	Return peripheral status (cash box)	○		
<b>ESC v</b>	Return the paper sensor	○		
<b>Macro command</b>				
<b>GS :</b>	Start/end macro definition	○	○	
<b>GS ^</b>	Execute macro	○		
<b>Mechanical control command</b>				
<b>GS V</b>	Choose cutter pattern and cut paper	○		○
<b>ESC i</b>	Immediately Execute partial cut paper	○		
<b>ESC m</b>	Immediately Execute partial cut paper	○		
<b>Assist control command</b>				
<b>DLE ENQ</b>	Real-time request to printer	○		
<b>DEL DC4</b>	Generate pulse at real-time	○		
<b>ESC =</b>	Select peripheral device		○	
<b>ESC @</b>	Initialize printer	○	○	
<b>ESC p</b>	Cashbox control	○		
<b>GS I</b>	Transmit printer ID	○		
<b>GS P</b>	Set horizontal and vertical motion units		○	
<b>GS ( A</b>	Execute test print	○		
<b>GS ( D</b>	Enable/disable real-time command		○	
<b>GS ( H</b>	Set ID processing response	○		
<b>GS g 0</b>	Initialize maintenance counter		○	
<b>GS g 2</b>	Transmit maintenance counter	○		
<b>Chinese characters (double byte code characters) control instruction</b>			○	



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<b>FS !</b>	Set print mode(s) for Chinese characters		○	
<b>FS &amp;</b>	Select Chinese character mode		○	
<b>FS -</b>	Turn underline mode on/off for Chinese characters		○	
<b>FS .</b>	Cancel Chinese character mode		○	
<b>FS 2</b>	Define Chinese characters		○	
<b>FS C</b>	Choose the Chinese character code sets		○	
<b>FS S</b>	Set left- and right-side Chinese character spacing		○	○
<b>FS W</b>	Turn quadruple-size mode on/off for Chinese characters		○	
<b>1-D bar code printing command</b>				
<b>GS H</b>	Select printing position of HRI characters		○	
<b>GS f</b>	Select font for HRI characters		○	
<b>GS h</b>	Set bar code height		○	
<b>GS k</b>	Print bar code	○		
<b>GS w</b>	Set bar code width		○	
<b>2-D bar code printing command</b>				
<b>GS Z</b>	Select 2-D bar code type		○	
<b>ESC Z</b>	Print 2-D bar code	○		
<b>GS k</b>	Print 2-D bar code	○		

## 2 Print Command

### LF

<b>[Name]</b>	Print and feed one line		
<b>[Format]</b>	ASCII	LF	
	Hex	0A	
	Decimal	10	
<b>[Description]</b>	Print the data in the print buffer and feeds one line, based on the current line spacing.		
<b>[Notes]</b>	The command set the current position at the beginning of a line.		
<b>[Reference]</b>	ESC 2, ESC 3		

### FF (Standard model)

[Name]	Print and feed paper to a black mark	
[Format]	ASCII	FF
	Hex	0C
	Decimal	12
[Description]		
If the printer is setted in the black mark detection state, after printing the data of buffer, feed paper to the black mark, if there is no black mark,feeding paper 30cm stopped. If it is not a black mark detection state, ignore the command.		

### CR

---

**[Name]** Print and carriage return

<b>[Format]</b>	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.

**[Reference]** LF

### ESC J n

---

**[Name]** Print and feed paper

<b>[Format]</b>	ASCII	ESC	J	n
	Hex	1B	4A	n
	Decimal	27	74	n

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

**[Description]** Print the data in the print buffer and feed the paper [ $n \times$  (vertical or horizontal motion unit)].

**[Notes]**

After printing, the current print position at the beginning of a line.

Paper feed distance is not affected by ESC 2 or ESC 3 command set.

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 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

### ESC d n

---

**[Name]** Print and feed n lines

<b>[Format]</b>	ASCII	ESC	d	n
	Hex	1B	64	n
	Decimal	27	100	n

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

**[Description]** Print the data in the print buffer and feed the paper [Character line].

**[Notes]** □

Set the print starting position to the beginning of the line.

This command does not affect the line spacing set by ESC 2 or ESC 3.

Maximum paper feed amount is 1016 mm, when the value of setting is greater than 1016 mm, using maximum value.

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

## ESC 2

---

<b>[Name]</b>	Select default line height		
<b>[Format]</b>	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50
<b>[Description]</b>	<input type="checkbox"/> Set the line height to 4 mm {1/6"}.		
<b>[Notes]</b>	Line height is independent in standard mode and page mode.		
<b>[Reference]</b>	ESC 3		

## ESC 3 n

---

<b>[Name]</b>	Set line height			
<b>[Format]</b>	ASCII	ESC	3	n
	Hex	1B	33	n
	Decimal	27	51	n
<b>[Range]</b>	$0 \leq n \leq 255$			
<b>[Description]</b>	Set the line height is [n × (vertical or horizontal motion unit)].			
<b>[Notes]</b>	<p>Line height is independent in standard mode and page mode.</p> <p>Horizontal and vertical motion units are set by the GS P, change this setting does not affect the current line height.</p> <p>In standard mode, the vertical motion unit (y) is used.</p> <p>In page mode, this command functions as follows, depending on the starting position of the printable area:</p> <ul style="list-style-type: none"> <li>→ 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.</li> <li>• 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.</li> </ul> <p>Maximum paper feed amount is 1016 mm (40"). If you exceed this distance, using the maximum distance.</p>			
<b>[Default]</b>	Default line height is 4mm (about 1/6 inch).			
<b>[Reference]</b>	ESC 2, GS P			

## ESC SP n

---

<b>[Name]</b>	Set right-side character spacing			
<b>[Format]</b>	ASCII	ESC	SP	n
	Hex	1B	20	n
	Decimal	27	32	n
<b>[Range]</b>	0 ≤ n ≤255			
<b>[Description]</b>	Set the character spacing for the right side of the character to [n×horizontal or vertical motion units].			
<b>[Notes]</b>	<input type="checkbox"/> <input type="checkbox"/>			

When characters are enlarged, the spacing is enlarged the same times value.

This command does not affect the setting of Chinese characters.

This command sets values independently in each mode (standard and page modes).

The horizontal and vertical motion unit are specified by GS P. Changing the horizontal or vertical motion unit does not affect the current right-side spacing.

In standard mode, the horizontal motion unit (y) is used.

In page mode, this command functions as follows, depending on 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,

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the horizontal 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 vertical motion unit (x) is used.

The maximum right spacing is 255/203 inches. Any settings more than this value are automatically converted to the maximum right spacing.

[Default]      n = 0

[Reference]    GS P

### ESC ! n

[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 !

### ESC % n

[Name]          Select/cancel user-defined character set

<b>[Format]</b>	ASCII	ESC	%	n
	Hex	1B	25	n
	Decimal	27	37	n

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

**[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)]

**[Name]** Define user-defined characters

<b>[Format]</b>	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  
 $32 \leq c1 \leq c2 \leq 126$   
 $0 \leq x \leq 12$  Standard ASCII Font A (12 × 24)  
 $0 \leq x \leq 9$  Compressed ASCII Font B (9 × 17)  
 $0 \leq d \leq 255$   
 $k = c2 - c1 + 1$

**[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]** □

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.

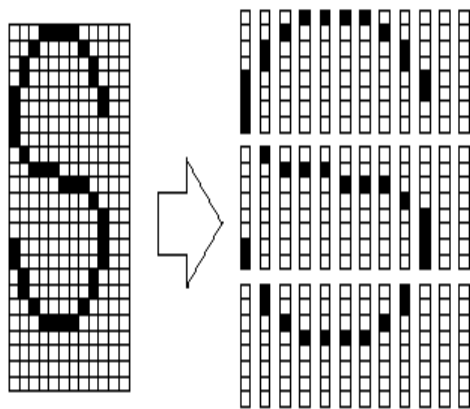
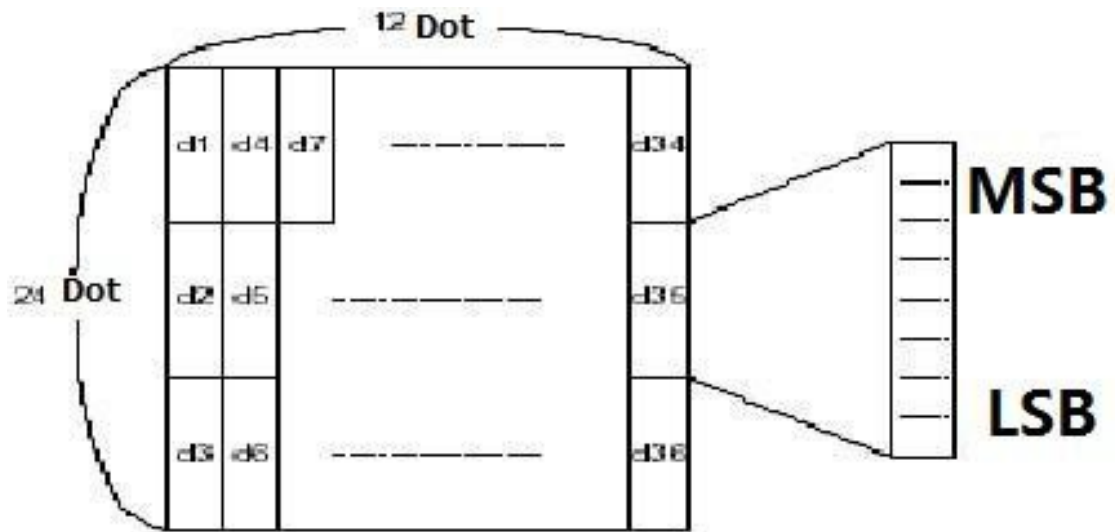
When the user-defined characters are defined in font B (9 × 17), only the most significant bit of the 3rd byte of data in vertical direction is effective.

**[Default]** The internal character set

**[Reference]** ESC %, ESC ?

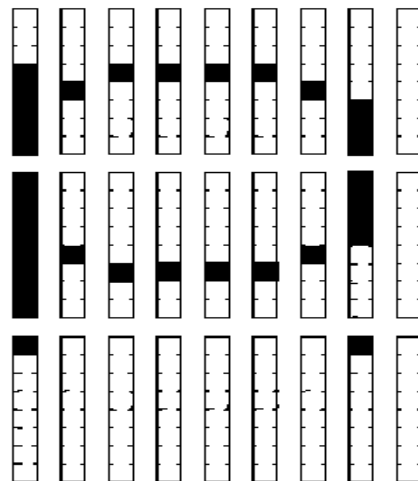
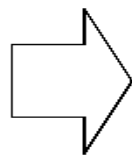
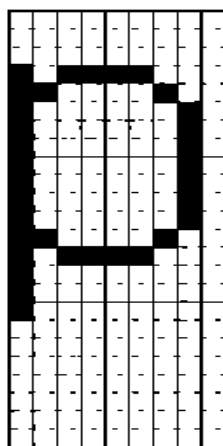
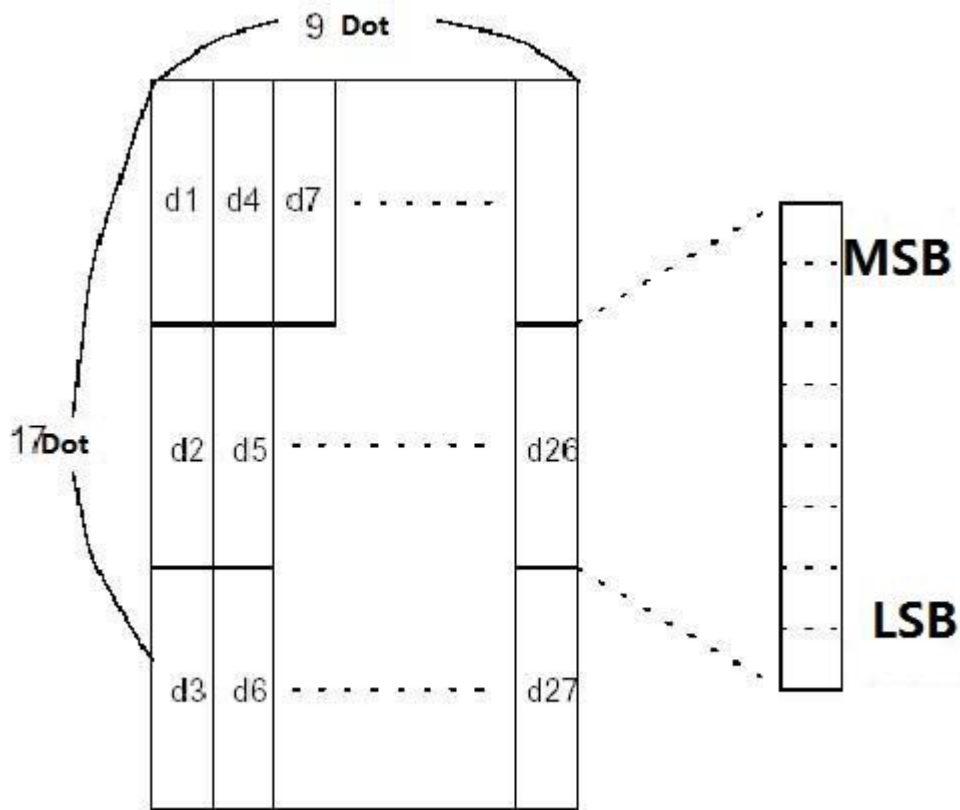
**[Example]**

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

[Name]	Turn underline mode on/off			
[Format]	ASCII	ESC	-	n
	Hex	1B	2D	n

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Decimal      27      45      n

[Range]  $0 \leq n \leq 2, 48 \leq n \leq 50$

[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 is 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 !

### ESC ? n

[Name]      Cancel user-defined characters

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

[Range]       $32 \leq n \leq 127$

[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

[Name]      Turn emphasized mode on/off

[Format]      ASCII      ESC      E      n  
Hex      1B      45      n  
Decimal      27      69      n

[Range]       $0 \leq n \leq 255$

[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] ☐ ☐



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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 !

### ESC G n

---

[Name] Turn on/off double-strike mode

[Format]	ASCII	ESC	G	n
	Hex	1B	47	n
	Decimal	27	71	n

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

[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

### ESC M n

---

[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

### ESC R n

---

[Name] Select an international character set

[Format]	ASCII	ESC	R	n
	Hex	1B	52	n
	Decimal	27	82	n

[Range]  $0 \leq n \leq 15$

[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	Denmark I
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

[Name] Turn 90° clockwise rotation mode on/off

[Format]      ASCII      ESC      V      n  
                 Hex          1B      56      n  
                 Decimal      27      86      n

[Range]       $0 \leq n \leq 2, 48 \leq n \leq 50$

[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 affects printing in standard mode. However, the setting is always effective. When underline mode is turned on, the printer does not underline 90° clockwise-rotated. Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double- width commands in normal mode.

[Default]      n = 0

[Reference]    ESC !,    ESC -☐

## ESC t n

[Name] Select character code table

[Format]      ASCII      ESC      t      n  
                 Hex          1B      74      n  
                 Decimal      27      116      n

[Range]       $0 \leq n \leq 255$

[Description] Select a page n from the character code table.

n	Code Page
---	-----------

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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	WCP1252 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]

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44	ISO-8859-15 [Latin 3]
45	Thai2
46	CP856

### ESC { n

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

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

[Range]         $0 \leq n \leq 255$

[Description]

Turn upside-down printing mode on or off.

When the LSB of n is 0, upside-down printing mode is turned off.

When the LSB of n is 1, upside-down printing 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.

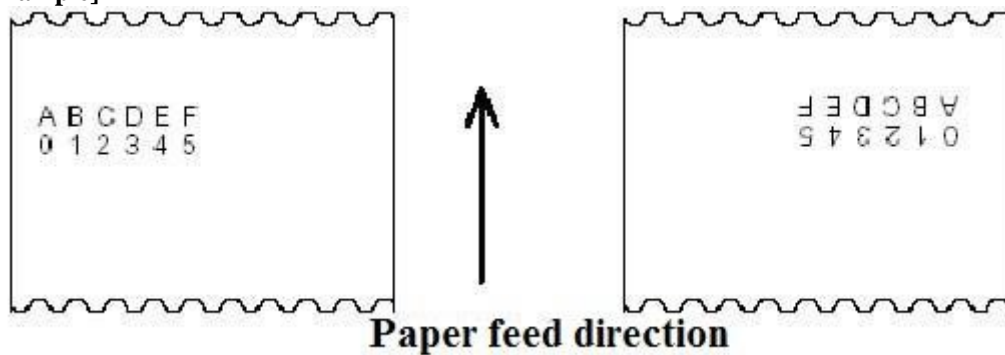
When this command is input in page mode, the printer performs only internal flag operations.

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

[Name] Select character size

[Format]     ASCII        GS        !        n  
              Hex        1D        21        n  
              Decimal    29       33        n

[Range]         $0 \leq n \leq 255$

(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

Table 1

Table 2

**[Notes]**

☐ ☐

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

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

**[Default]**            n = 0

**[Reference]**        ESC !

## GS B n

**[Name]**            Turn white/black reverse printing mode

**[Format]**        ASCII        GS        B        n  
                   Hex        1D        42        n  
                   Decimal    29        66        n

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

**[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

## ESC c 5 n

<b>[Name]</b>	Enable/disable panel buttons				
<b>[Format]</b>	ASCII	ESC	c	5	n
	Hex	1B	63	35	n
	Decimal	27	99	53	n

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

**[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 are 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

<b>[Name]</b>	Select paper sensor(s) to output paper end signals				
<b>[Format]</b>	ASCII	ESC	c	3	n
	Hex	1B	63	33	n
	Decimal	27	99	51	n

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

**[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 a serial interface.

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 is on, the paper roll near-end sensor is selected as the paper sensor outputting paper-end signals

If either bit 2 or bit 3 is on, the paper roll 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 present status.

**[Default]** n = 15

### ESC c 4 n

---

[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]  $0 \leq n \leq 255$

[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 is stopped only when the corresponding paper is selected for printing.

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

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

[Default]  $n = 2$

---

### HT

---

[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 unless the next horizontal tab position has 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 printing of the current line and horizontal tab processing from the beginning of the next line.

The default setting of the horizontal tab position for the paper roll is font A(12×24) every 8th character (9th, 17th, 25th, ... column).

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 print position placed at the beginning of the next line.

In page mode, the printer will feed line and print position placed at the beginning of the next line.

[Reference] ESC D

## ESC \$ nL nH

---

<b>[Name]</b>	Set absolute print position				
<b>[Format]</b>	ASCII	ESC	\$	nL	nH
	Hex	1B	24	nL	nH
	Decimal	27	36	nL	nH
<b>[Range]</b>	$0 \leq nL \leq 255$				
	$0 \leq nH \leq 255$				

**[Description]**

The distance from the beginning of the line to the print position is  $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$  inches.

**[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 units 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

---

<b>[Name]</b>	Set horizontal tab positions				
<b>[Format]</b>	ASCII	ESC	D	n1... nk	NUL
	Hex	1B	44	n1...nk	00
	Decimal	27	68	n1...nk	0
<b>[Range]</b>	$1 \leq n1 \leq n2 \leq \dots \leq nk \leq 255$				
	$0 \leq k \leq 32$				

**[Description]** Set horizontal tab positions.

n specifies the column number for setting a horizontal tab position from the beginning of the line.

k indicates the total number of horizontal tab positions to be set.

**[Notes]**

□ □

The horizontal tab position is stored as a value of  $[\text{character width} \times n]$  measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters.

This command cancels the previous horizontal tab settings.

When setting  $n = 8$ , the print position is moved to column 9 by sending HT.

Up to 32 tab positions ( $k = 32$ ) can be set. Data exceeding 32 tab positions is processed as normal data.

Transmit  $[n]k$  in ascending order and place a NUL code 0 at the end.

When  $[n]k$  is less than or equal to the preceding value  $[n]k-1$ , tab setting is finished and the following data is processed as normal data.

ESC D NUL cancels all horizontal tab positions.

The previously specified horizontal tab positions do not change, even if the character width changes.

The character width is memorized for each standard and page mode.

**[Default]**

The default tab positions are at intervals of 8 characters (columns 9, 17, 25,...) for font A



(12 × 24).

[Reference] HT

## ESC \ nL nH

[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]

Set the print starting position based on the current position by using the horizontal or vertical motion unit.

This command sets the distance from the current position to  $[(nL + nH \times 256) \times \text{horizontal or vertical motion unit}]$

[Notes] ☐ ☐

Any setting that exceeds the printable area is ignored.

When pitch N is specified to the right:  $nL + nH \times 256 = N$

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

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

The print starting position moves from the current position to  $[N \times \text{horizontal or vertical motion unit}]$ .

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

[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

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[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 justifies the space area according to HT, ESC \$ or ESC \.

[Default] n = 0

[Example]

Left justification

```
ABC
ABCD
ABCDE
```

Centering

```
  ABC
  ABCD
  ABCDE
```

Right justification

```
      ABC
      ABCD
      ABCDE
```

### GS L nL nH

[Name] Set left margin

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

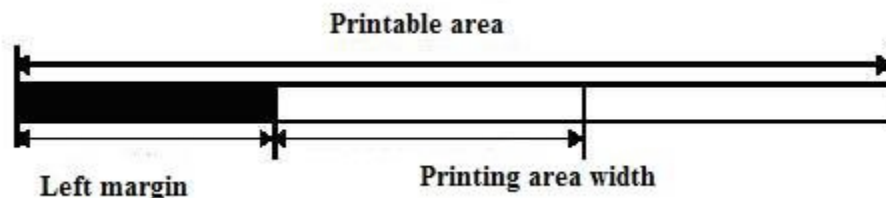
[Range]  $0 \leq nL \leq 255$

$0 \leq nH \leq 255$

[Description]

Set the left margin using nL and nH.

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



[Notes] □ □

This command is effective only 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

[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  $[(nL + nH \times 256) \times \text{horizontal motion unit}]$  inches.

**[Notes]** □ □

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

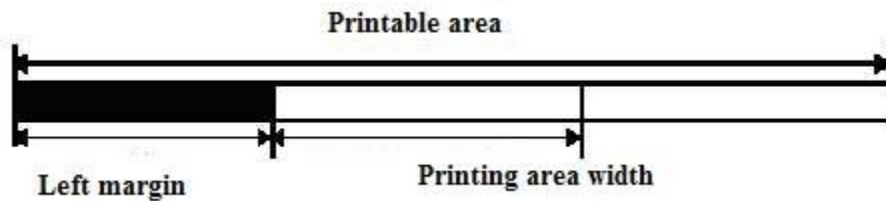
In page mode, the printer performs only internal flag operations.

This command does not affect printing in page mode.

If the [left margin + printing area width] exceeds the printable area, [printable area width - left margin] is used.

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]**

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

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

$(nL + nH \times 256) = 384$  [58mm paper width model]

**[Reference]** GS L, GS P

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

**[Name]** Select bit-image mode

<b>[Format]</b>	ASCII	ESC	*	m	nL	nH	d1...dk
	Hex	1B	2A	m	nL	nH	d1...dk
	Decimal	27	42	m	nL	nH	d1...dk

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

$0 \leq nL \leq 255$

$0 \leq nH \leq 3$

$0 \leq d \leq 255$

**[Description]** 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	$nL + nH \times 256$
1	8-dot double-density	8	68 DPI	203 DPI	$nL + nH \times 256$
32	24-dot single-density	24	203 DPI	101 DPI	$(nL + nH \times 256) \times 3$
33	24-dot double-density	24	203 DP	203 DPI	$(nL + nH \times 256) \times 3$

### [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  $nL + nH \times 256$ .

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

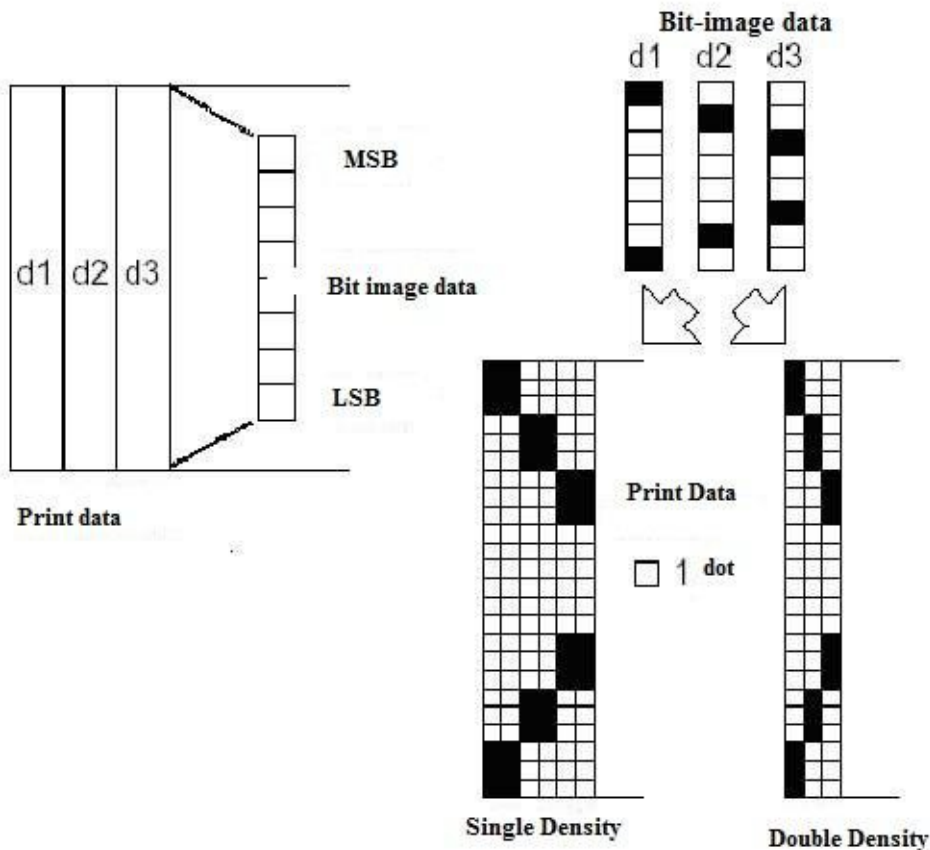
$d$  indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.

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

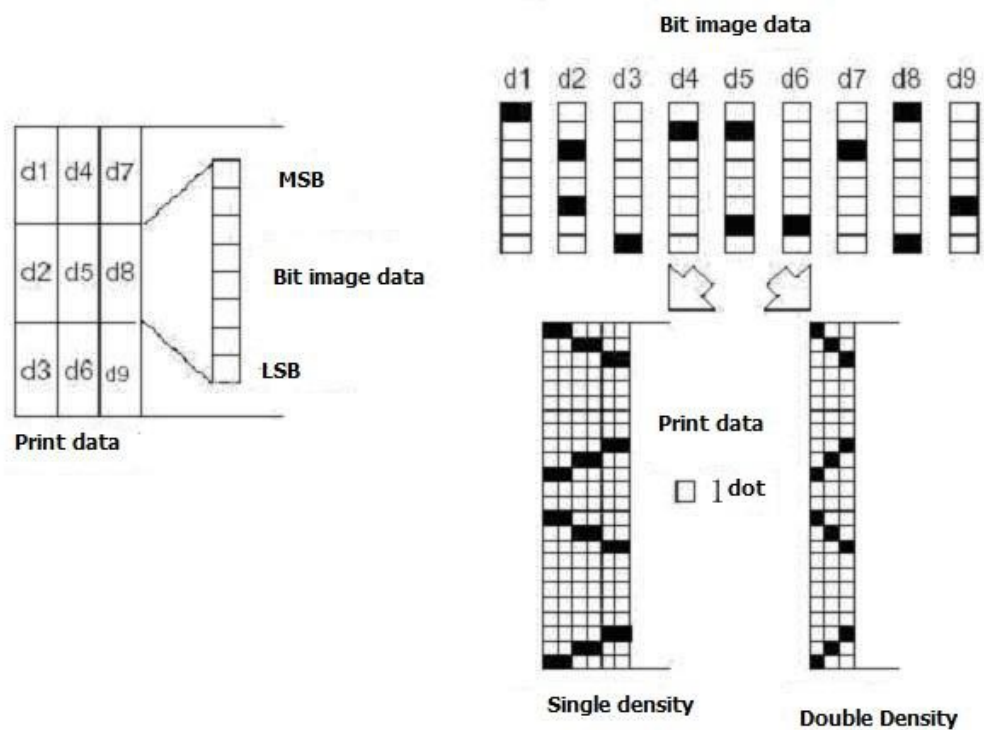
This command is not affected by print modes (emphasized, double-strike, underline, character size or white/black reverse printing), except upside-down printing mode.

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)**

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

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	Decimal	29	42	x	y	d1...dk
[Range]	$1 \leq x \leq 255$					
	$1 \leq y \leq 48$					
	$x \times y \leq 800$					
	$0 \leq d \leq 255$					
	$k = x \times y \times 8$					

### [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.

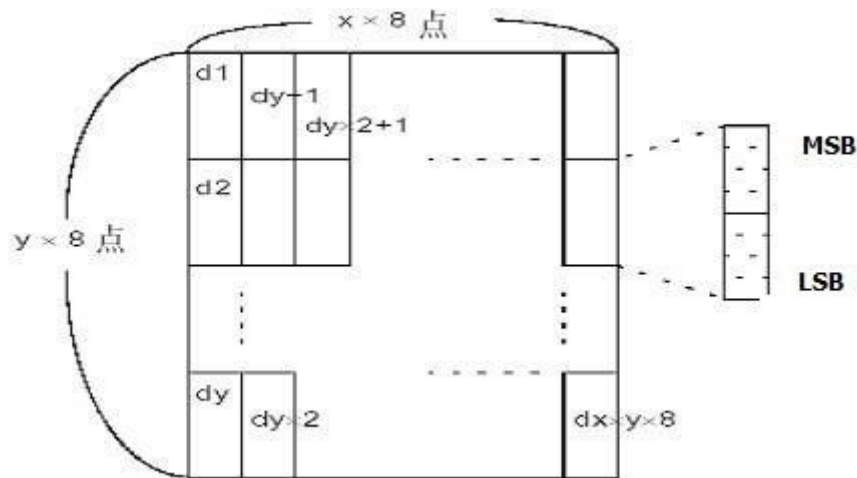
ESC & is executed.

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

[Name]	Print downloaded bit image			
[Format]	ASCII	GS	/	m
	Hex	1D	2F	m
	Decimal	29	47	m
[Range]	$0 \leq m \leq 3, 48 \leq m \leq 51$			

### [Description]

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

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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

[Name]	Print prestore bitmap			
[Format]	ASCII	FS	P	n
	Hex	1C	50	n
	Decimal	28	80	n
[Range]	$0 \leq n \leq 7$			

[Description]

Specified by the print instruction n previously stored in the printer nonvolatile memory in a binary bitmap.

The printer nonvolatile memory bit map can be generated through a dedicated tool on the PC and writes, the biggest point bit map width maximum width corresponding to a different printer, bit map size up to 64KB.

[Notes]

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

Bit map must be a 2 values bit map.

This command has no effect in the print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), it is invalid in page mode.

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

Required special tools download and print bitmap, see Printer Settings Utility software. Download this way without losing bitmap, unless re-download other bitmap will be overwritten.

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

[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]	$0 \leq m \leq 3, 48 \leq m \leq 51$										
	$1 \leq (xL + xH \times 256) \leq 256 (0 \leq xL \leq 255, xH = 0, 1)$										
	$1 \leq (yL + yH \times 256) \leq 2303 (0 \leq yL \leq 255, 0 \leq yH \leq 8)$										
	$0 \leq d \leq 255$										
	$k = (xL + xH \times 256) \times (yL + yH \times 256) (k \neq 0)$										

[Description] Select Raster bit-image mode. The value of m selects the mode, as follows:

m	Mode	Vertical	Horizontal
---	------	----------	------------

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		Dot Density (DPI)	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 number of data bits ( $xL+xH \times 256$ ) in the horizontal direction for the bit image.

yL, yH, select the number of data bits ( $yL+yH \times 256$ ) in the vertical direction for the bit image.

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 all print modes (character size, emphasized, double-strike, upside-down, underline, white/black reverse printing, etc.) for raster bit image.

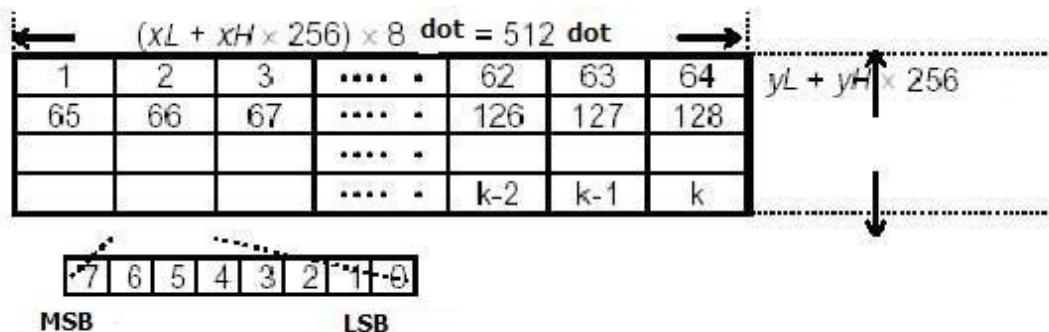
Bit map beyond the printable area is not printed.

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.

The ESC a (Select justification) setting is also effective on raster bit images.

d indicates the bit-image data. Set time a bit to 1 prints a dot and setting it to 0 does not print a dot.

**[Example]** When  $xL+xH \times 256=64$



## DLE EOT n

**[Name]** Real-time status transmission

<b>[Format]</b>	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]

This command should not be used within the data sequence of another command that consists of 2



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or more bytes. After the printer receiving this command, it will be return to related status.

Even though the printer is not selected using ESC = (select peripheral device), this command is effective.

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

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

The printer executes this command upon receiving it.

With a parallel interface model, this command is invalid. This command is executed in any status when the printer receiving the command.

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

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Bit	I/O	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

[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	I/O	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, when the status changes, the printer automatically returns four bytes of printer status.

If all status items are disabled, the ASB function is also disabled.

The printer automatically returns the status byte, not sure if the host computer is ready.

The command execution sequence along with other commands, so return to the setting from automatic to send commands to a valid state has a certain time delay.

Even if the printer is set to make ESC = inactive state, the printer automatically set based upon the status of the return.

Automatic return status information as follows:

First byte (printer information)

Bit	I/O	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.

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	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 ( $1 \leq n \leq 2$ ). If an error due to a circuit failure (e.g. wire break) occurs, it is impossible to recover.

Bit 6: When printing is stopped due to high print head temperature until the print head Temperature drops sufficiently or when the paper roll cover is open during printing, bit 6 is On.

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.

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4	0	00	0	Fixed value is 0
5, 6	-	-	-	Undefined.
7	0	00	0	Fixed value is 0

[Default]     n = 0

### GS r n

[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 is invalid.

After the data in the receive buffer of this command is processed, executing the command, therefore, to send the command and receive to return status has a certain time lag.

When sending this command, before receiving the returned status word, don't send other data.

### ESC u n

Recommend using GS r command,because it is upward compatible to ESC u command, and ESC u is obsolete command of ESC / POS command set .

[Name] Transmit Peripheral device state  
[Format]     ASCII        ESC        u        n  
              Hex        1B        75        n  
              Decimal    27        117       n

[Description]  
Transmit the peripheral device state of 1-byte data,as follows:

Bit	1/0	Hex	Decimal	Printer 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	Fixed value is 0
5, 6	-	-	-	Undefined
7	0	00	0	Fixed value is 0

[Notes]  
When sending this command, before receiving the returned status word, don't send other data.

### ESC v

Recommend using GS r command,because it is upward compatible to ESC v command, and ESC v is obsolete command of ESC / POS command set .

[Name] Transfer paper sensor status  
[Format]     ASCII        ESC        v  
              Hex        1B        76  
              Decimal    27        118       n

[Description]  
Transmit the paper sensor status of 1-byte data,as follows:

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

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.

[Notes]  
When sending this command, before receiving the returned status word, don't send other data.

## GS :

---

<b>[Name]</b>	Start/end macro definition		
<b>[Format]</b>	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 exceed 2048 bytes, excess data is not stored.

**[Reference]** GS ^

## GS ^ r t m

---

<b>[Name]</b>	Execute macro				
<b>[Format]</b>	ASCII	GS	^	r	t m
	Hex	1D	5E	r	t m
	Decimal	29	94	r	t m
<b>[Range]</b>	$0 \leq r \leq 255$ $0 \leq t \leq 255$ $m = 0, 1$				

**[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  $t \times 100\text{ms}$  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

---

<b>[Name]</b>	Select cut mode and cut paper			
<b>[Format]</b>	①ASCII	GS	V	m
	Hex	1D	56	m

---

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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]

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

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

For no cutter printer,the printer executes the instruction manual to go only paper to tear off position.

### [Note for ①]

m = 0, 48, 1, 49,the printer cutting 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 .

## ESC i

Recommend using GS V command,because it is upward compatible to ESC i command, and ESC i is obsolete command of ESC / POS command set .

[Name]	Partial cut		
[Format]	ASCII	ESC	i
	Hex	1B	69
	Decimal	27	105

[Description] Executing one partial cut paper,no feeding paper.

[Notes] Partial cut

## ESC m

Recommend using GS V command,because it is upward compatible to ESC m command, and ESC m is obsolete command of ESC / POS command set .

[Name]	Partial cut		
[Format]	ASCII	ESC	m
	Hex	1B	6D
	Decimal	27	109

**[Description]** Executing one partial cut paper, no feeding paper.

**[Notes]** Partial cut

### DLE ENQ n

**[Name]** Real-time request to printer

**[Format]**

ASCII	DLE	ENQ	n
Hex	10	05	n
Decimal	16	5	n

**[Range]**  $1 \leq n \leq 2$

**[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

**[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.
- Try not to insert the command in the command sequence 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)

**[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  
 $1 \leq t \leq 8$

**[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  $[t \times 100 \text{ ms}]$  and the OFF time is  $[t \times 100 \text{ ms}]$ .

**[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.



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

[Reference] ESC p

### ESC = n

[Name] Set peripheral device

[Format]    ASCII        ESC        =        n  
             Hex        1B        3D        n  
             Decimal    27        61        n

[Range]     $0 \leq n \leq 255$

[Description] Selects device to which host computer sends data, using n as follows:

n	Function
1, 3	Printer enabled
2	Printer disabled.

[Notes] ☐ ☐

When the printer is disabled( $n = 2$ ), it ignores all data except for error-recovery commands (DLE EOT, DLE ENQ, DLE DC4) until it is enabled by this command.

[Default]     $n = 1$

### ESC @

[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.

[Notes]

The data in the receive buffer is not cleared.

The macro definition is not cleared.

The Flash image user is not cleared.

The Flash image data

Maintenance counter value is not cleared.

The setting value is specified by GS (E is not cleared).

### ESC p m t1 t2

[Name] Generate pulse

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

[Range]     $m = 0, 1, 48, 49$

$0 \leq t1 \leq 255, 0 \leq t2 \leq 255$

[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.

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### [Notes]

The pulse ON time is [  $t_1 \times 2$  ms] and the OFF time is [  $t_2 \times 2$  ms].

If  $t_2 < t_1$ , the OFF time is [  $t_1 \times 2$  ms]

[Reference] DLE DC4

## GS I n

[Name] Check printer ID

[Format] ASCII GS I n  
Hex 1D 49 n  
Decimal 29 73 n

[Range]  $1 \leq n \leq 3$ ,  $49 \leq n \leq 51$ ,  $65 \leq n \leq 69$

[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  $1 \leq n \leq 3$  or  $49 \leq n \leq 51$ , the printer returns to single-byte ID

When  $65 \leq n \leq 69$ , 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

[Name] Set horizontal and vertical motion units

[Format] ASCII GS P x y  
Hex 1D 50 x y  
Decimal 29 80 x y

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

$$0 \leq y \leq 255$$

**[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

**[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

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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]

[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]  $3 \leq (pL + pH \times 256) \leq 65535$  ( $0 \leq pL \leq 255, 0 \leq pH \leq 255$ )  
 $m = 20$   
 $a = 1, 2$   
 $b = 0, 1, 48, 49$

[Description] Enable or disable the real-time command specified by a.  
pL, pH specify  $(pL + pH \times 256)$  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)

[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]  $(pL + pH \times 256) = 6$  ( $pL = 6, pH = 0$ )  
 $fn = 48$   
 $m = 48$   
 $32 \leq d \leq 126$

### [Description]

Save the processed ID specified by (d1, d2, d3, d4) returned to the host.

## GS g 0 m nL nH

**[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		Maintenance counter [Units]
Hex	Decimal	
14	20	Number of line fed. [Lines]
15	21	Number of head energization. [Times]
32	50	Number of autocutter operations. [Times].
46	70	Printer operation time. [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

**[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		Maintenance counter [Units]	Kind of counter
Hex	Decimal		
14	20	Number of line feeds. [Lines]	Resettable (can be reset)
15	21	Number of times head is energized. [Times]	
32	50	Number of autocutter operations. [Times].	
46	70	Printer operation time. [Hours].	
94	148	Number of line feeds. [Lines]	Cumulative
95	149	Number of times head is energized. [Times]	
B2	178	Number of autocutter operations. [Times].	
C6	198	Printer operation time. [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

---

**[Name]** Set print mode(s) for Chinese characters

<b>[Format]</b>	ASCII	FS	!	n
	Hex	1C	21	n
	Decimal	28	33	n

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

**[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 &

---

**[Name]** Select Chinese character mode

<b>[Format]</b>	ASCII	FS	&
	Hex	1C	26
	Decimal	28	38

**[Description]** Select Chinese character mode.

**[Notes]**

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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

---

[Name] Turn underline mode on/off for Chinese characters

[Format]     ASCII        FS        -        n  
              Hex        1C        2D        n  
              Decimal    28        45        n

[Range]      $0 \leq n \leq 2$ ,  $48 \leq n \leq 50$

[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 .

---

[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

---

[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.

$c1 = FEH$   
 $A1H \leq c2 \leq FEH$   
 $0 \leq d \leq 255$   
 $k = 72$

## [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.

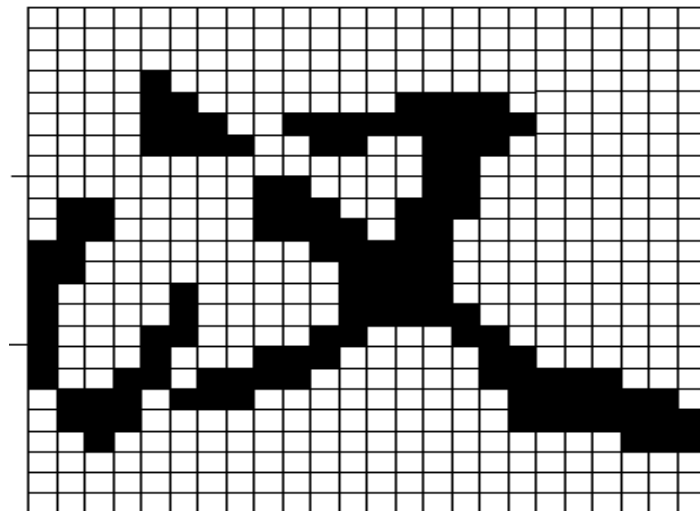
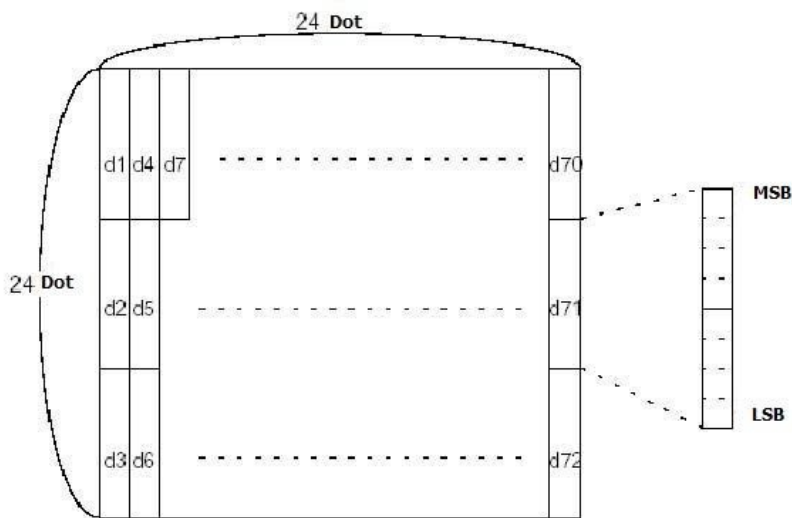
d indicates data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.

You can define up to 10 characters.

## [Default]

no user-defined characters

Between user-defined characters and data relationship shown below:



$D1=00H, D4=00H, D7=00H, D10=00H. \dots\dots$   
 $D2=1FH, D5=78H, D8=60H, D11=00H. \dots\dots$   
 $D3=COH, D6=30H, D9=38H, D12=70H. \dots\dots$



## FS C n

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

<b>[Name]</b>	Set left- and right-side Chinese character spacing				
<b>[Format]</b>	ASCII	FS	S	n1	n2
	Hex	1C	53	n1	n2
	Decimal	28	83	n1	n2
<b>[Range]</b>	$0 \leq n1 \leq 255$				
	$0 \leq n2 \leq 255$				

### [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

<b>[Name]</b>	Turn quadruple-size mode on/off for Chinese characters
---------------	--

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<b>[Format]</b>	ASCII	FS	W	n
	Hex	1C	57	n
	Decimal	28	87	n

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

**[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

**[Name]** Select printing position for HRI characters

<b>[Format]</b>	ASCII	GS	H	n
	Hex	1D	48	n
	Decimal	29	72	n

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

**[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

**[Name]** Select font for Human Readable Interpretation (HRI) characters

<b>[Format]</b>	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

[Name] Select bar code height

[Format] ASCII GS h n  
Hex 1D 68 n  
Decimal 29 104 n

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

[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

[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  $0 \leq m \leq 6$  (k and d depends on the bar code system used)

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

[Description]

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

m	Bar System	Code	Number of Characters	d
①	0	UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	1	UPC-E	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	2	JAN13 (EAN13)	$12 \leq k \leq 13$	$48 \leq d \leq 57$
	3	JAN 8 (EAN8)	$7 \leq k \leq 8$	$48 \leq d \leq 57$
	4	CODE39	$1 \leq k \leq 255$	$45 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43$
	5	ITF	$1 \leq k \leq 255$	$48 \leq d \leq 57$
②	6	CODABAR	$1 \leq k \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
	65	UPC-A	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	66	UPC-E	$11 \leq n \leq 12$	$48 \leq d \leq 57$
	67	JAN13 (EAN13)	$12 \leq n \leq 13$	$48 \leq d \leq 57$
	68	JAN 8 (EAN8)	$7 \leq n \leq 8$	$48 \leq d \leq 57$

69	CODE39	$1 \leq n \leq 255$	$45 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43$ $d1 = dk = 42$
70	ITF	$1 \leq n \leq 255$	$48 \leq d \leq 57$
71	CODABAR	$1 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
72	CODE93	$1 \leq n \leq 255$	$0 \leq d \leq 127$
73	CODE128	$2 \leq n \leq 255$	$0 \leq d \leq 127$

## [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:

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

② Select 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

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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



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

[Name] Set bar code width

[Format]	ASCII	GS	w	n
	Hex	1D	77	n
	Decimal	29	119	n

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

### [Description]

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

n	Module (mm) Multi-level Code (mm)	Width for Bar	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

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

[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

$1 \leq v \leq 30$  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.

$0 \leq r \leq 8$  Indicates error correction levels.

b. DATA MATRIX 2-D code

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

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

c. QR CODE 2-D code

$0 \leq v \leq 40$  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.

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

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

$0 \leq dn \leq 255$  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

## ①GS k m v r d1...dn NUL ②GS k m v r nL nH d1...dn

[Name]	Print 2-D bar code
--------	--------------------

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<b>[Format]</b>	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
<b>[Range]</b>	①	$32 \leq m \leq 34$						
	②	$97 \leq m \leq 99$						

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

a. PDF417 2-D bar code

$1 \leq v \leq 30$  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.

$0 \leq r \leq 8$  Indicates error correction levels.

b. DATA MATRIX 2-D bar code

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

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

c. QR CODE 2-D bar code

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

$1 \leq r \leq 4$  Indicates error correction levels(L:7%,M:15%,Q:25%,H:30%).

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

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

$0 \leq dn \leq 255$  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.

used to select the bar code type, as follows:

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

### [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

## 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 software breaks. In the character set C, only FNC1 available.



## A.2 haracter Set

Characters of Character Set A

Charac ters	Transmit Data		Character s	Transmit Data		Character s	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,3	123,49
NAK	15	21	;	3B	59	FNC2	1	123,50
SYN	16	22	<	3C	60	FNC3	7B,3	123,51
ETB	17	23	=	3D	61	FNC4	2	123,52
CAN	18	24	>	3E	62	SHIFT	7B,3	123,83
EM	19	25	?	3F	63	CODEB	3	123,66
SUB	1A	26	@	40	64	CODEC	7B,3	123,67
ESC	1B	27	A	41	65		4	
FS	1C	28	B	42	66		7B,5	
GS	1D	29	C	43	67		3	
RS	1E	30	D	44	68		7B,4	
US	1F	31	E	45	69		2	
SP	20	32	F	46	70		7B,4	
!	21	33	G	47	71		3	
"	22	34	H	48	72			
#	23	35	I	49	73			
\$	24	36	J	4A	74			
%	25	37	K	4B	75			

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### Characters of Character Set B

Charac ters	Transmit Data		Charact ers	Transmit Data		Charact ers	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			

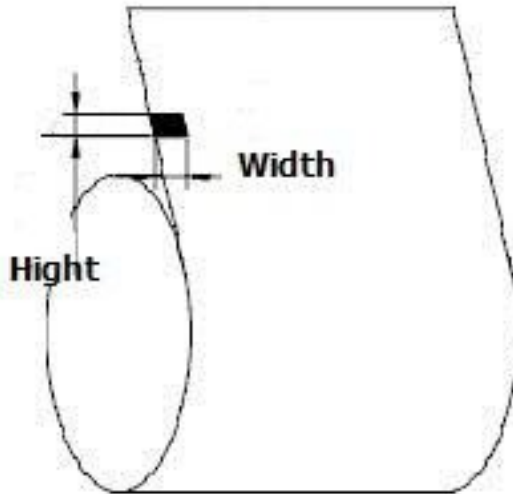
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### Characters of Character Set C

Charac ters	Transmit Data		Charact ers	Transmit Data		Charact ers	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 CODEA CODEB	7B,31	123,49
25	19	25	63	3F	63		7B,41	123,65
26	1A	26	64	40	64		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			

## 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:**  $\text{width} \geq 7\text{mm}$

**Height range:**  $4\text{mm} \leq \text{height} \leq 6\text{mm}$

**The reflectance of infrared light:**  $< 10\%$  (the rest of the paper width of the black mark reflectance of infrared light for  $> 65\%$ )