

# ESC Programming manual

## 1.Command list

Command	Name	Type	
		Execute	Set
<b>HT</b>	Horizontal tab	○	
<b>LF</b>	Print and line feed	○	
<b>DLE EOT</b>	Real-time status transmission	○	
<b>DLE ENQ</b>	Real-time printer requests	○	
<b>ESC SP</b>	Set right-side character spacing		○
<b>ESC !</b>	Select print mode		○
<b>ESC \$</b>	Set absolute print position	○	
<b>ESC @</b>	Initialize printer	○	○
<b>ESC *</b>	Select bit-image mode	○	
<b>ESC -</b>	Turn underline mode on/of		○
<b>ESC 2</b>	Select default line spacing		○
<b>ESC 3</b>	Set line spacing		○
<b>ESC a</b>	Select justification		○
<b>ESC c 4</b>	Select print paper sensor to stop printing		○
<b>ESC c 5</b>	enable/disable panel keys		○
<b>ESC d</b>	Print and feed n lines	○	
<b>ESC i</b>	Full cut	○	
<b>ESC m</b>	Partial cut	○	
<b>ESC t</b>	Select character code table		○
<b>ESC D</b>	Set horizontal tab position		○
<b>ESC E</b>	Turn emphasized mode on/off		○
<b>ESC G</b>	Turn double-strike mode on/off		○
<b>ESC J</b>	Print and feed paper	○	
<b>ESC M</b>	Select character font		○
<b>ESC R</b>	Select international character set		○
<b>FS p</b>	Print NV bit image	○	
<b>FS q</b>	Define NV bit image		○
<b>GS FF</b>	Feed black mark to start position	○	
<b>GS !</b>	Set character size		○
<b>GS *</b>	Define download big image		○
<b>GS /</b>	Print download big image	○	
<b>GS h</b>	Set bar code height		○
<b>GS k</b>	Print bar code	○	
<b>GS r</b>	Transmit status	○	
<b>GS v 0</b>	Print grating bit image	○	
<b>GS w</b>	Set bar code width		○
<b>GS H</b>	Select HRI character print position		○

<b>GS L</b>	Set left side blank measure		○
<b>GS V</b>	Select cut mode and cut paper	○	
<b>GS W</b>	Set printable width		○

Command	Name	Command type	
		Execute	Set
<b>FS !</b>	Set Chinese character print mode(s)		○
<b>FS &amp;</b>	Set Chinese mode		○
<b>FS .</b>	Cancel Chinese character mode		○
<b>FS S</b>	Set fullshaped Chinese character spacing		○
<b>FS W</b>	Turn quadruple size of Chinese character on/off		○
<b>GS ( B PL PH m n</b>	Memory Switch settings		○

**Command type:**

**Execute command:** The printer executes and changes the command that will not effect the following data.

**Set command:** The printer set by the relative symbol, these set will effect the following data.

## 2 Command overview

### 2.1 Command notation

[Name]	The name of the command
[Format]	The code sequence.
	[ ]k indicates the content in the [ ]should be repeated k times.
[Range]	Give the allowable range.
[Description]	Illustrate the function of the command.
[Description details]	Particular illustrate the command use .
[Notes]	If necessary,provide important information when set and use the printer command.
[Default value]	If command with the parameter, give the parameter default value.
[Reference]	List the relationship command.
	The data signed by <>H, is hexadecimal.
	The data signed by<>B, is binary system.

### 2.2 Terms explanation

#### (1) Receive buffer

The receive buffer is a buffer which store data from the PC. All received data are stored in this buffer, then processed in sequence.

#### (2) Print buffer

The print buffer used to store image data of printing.

#### (3) Full print buffer

When the print buffer is full, If the new print dat coming, the data in the print buffer area will be printed, and executed the operation of changing a new line. The same operation as the LF command.

#### (4) Line starting point

Satisfied the below conditions:

- There are no print data in the print buffer area.
- Appoint print position and not by ESC \$ or ESC \ command.

(5) Printable area

The printable area of this printer as below:

The standard mode, the length of the horizontal direction:

79.5 mm Paper width type: {576dots}

(6) Printable area

The printable range set by command , print area      printable area.

(7) Ignored

All commands on this condition, contains parameter, will be read, then discarded, but no operation.

(8) Inch

One inch is 25.4 mm

(9) MSB

The highest validity

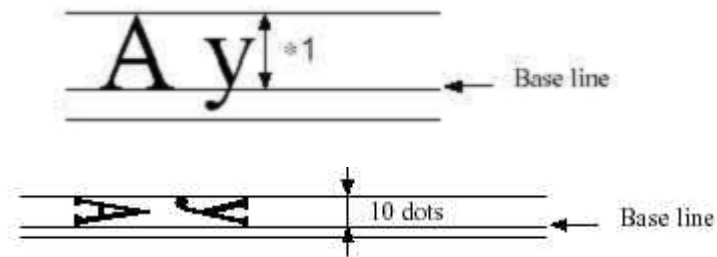
(10) LSB

The lowest validity

(11) Baseline

The standard position of the character data which be stored in the printing buffer . The normal character position of the standard mode and page mode as the below graphics:

\*1When the character font is A, the width is 21 dots. When the character font is B, the width is 16 dots



### 3.Command explanation details

#### HT

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[Name]	Horizontal tab
[Format]	ASCII     HT
	Hex        09
	Decimal    9
[Description]	Move print position to the next horizontal position.
[Specification]	. If do not set the next horizontal position, this command will be ignored,
	.If the next horizontal position out of the printable area, move the print position to "print width +1".
	. Set the horizontal position by ESC D.
	.This command received when the print position located on "printable area width +1", the printer executes the full print buffer area and prints the current line, and deals with the horizontal position at the beginning of the next line.
[Reference]	ESC D

#### LF

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[Name]	Print and line feed
[Format]	ASCII     LF
	Hex        0A
	Decimal    10
[Description]	Print the data in the buffer and feed one line which based on the current line spacing.
[Notes]	The print position set at the beginning position of the line by this command.
[Reference]	ESC2, ESC3

#### DLE EOT n

---

[Name]	Transmit real-time status
[Format]	ASCII     DLE        EOT        n
	Hex        10        04        n
	Decimal    16        4        n
[Range]	1≤n≤4
[Description]	Transmit real-time status. Parameter n used to appoint printer status. the definition as below:
	n=1: Transmit printer status.
	n=2: Transmit offline status.
	n=3: Transmit error status.
	n=4: Transmit roll paper sensor status.
[Specification]	·Transmit the current status, every status one byte.
	·Printer can't sure whether the PC can receive data when transmitting status.
	·Printer starts to execute when received this command.
	·Under the serial interface mode, Even the printer is offline, the received buffer is full, or the error occurred, also execute this command.
	. Under the parallel interface mode, when the printer is busy, can't execute this

command.

. When enable ASB by GS a command, must distinguish the status which be sent by DLE EOT or ASB status. (Refer to appendix C)

·Even the printer doesn't choose the external equipment command, the command which be selected by ESC= also effects.

[Notes] whenever received <10>H<04>H<n>(1≤n≤4) data sequence, the printer will still transmit status.

**For example:**

ESC \* m nL nH d1...dK, d1=<10>H, d3=<01>H

·Do not use this command within two or more than two bytes command.

**For example:**

If want to transmit ESC 3 n to printer, before transmitting n, DTR(for the PC is DSR) will change to MARK, So, before receiving n, occurs that DLE EOT 3 interrupted, the code<10>H of DLE EOT 3 will be dealt with as the code<10> of ESC 3.

**n = 1 Printer status**

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Unused. Off
1	On	02	2	Unused. On
2	On	04	4	Unused. On
3	Off	00	0	Online
	On	08	8	Offline
4	On	10	16	Unused. On
5	Off	00	0	Unused. Off
6	Off	00	0	Unused. Off
7	Off	00	0	Unused. Off

**Note: bit 5: the online error is the process of the printer which executes macro command period and self-test period which waited push key.**

**n = 2 : Offline status**

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Unused. Off
1	On	02	2	Unused. On
2	Off	00	0	The print head bar closed
	On	04	4	The print head bar pened
3	Off	00	0	Unused. Off
4	On	10	16	Unused. Off
5	Off	00	0	Unused. Off
6	Off	00	0	Unused. Off
7	Off	00	0	Unused. Off

**Bit 5: When the without paper detector test that without paper and stop printing, it will cange to On.**

**n = 3: Error status**

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Unused. Off
1	On	02	2	Unused. On
2	Off	00	0	Unused. Off
3	Off	00	0	Unused. Off
4	On	10	16	Unused. On
5	Off	00	0	Unused. Off
6	Off	00	0	Unused. Off
7	Off	00	0	Unused. Off

**Bit 2:** The printer takes as error when print head bar raised, can not find black mark.

**Bit 6:** During printing, if over temperature of the print head, Set bit 6 to On, until the temperature declined effectively or raised the bar during printing.

**n = 4: Continuous paper sensor status**

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Unused. Off
1	On	02	2	Unused. On
2,3	Off	00	0	Roll paper near-end sensor: paper near to end
	On	0C	12	Roll paper near-end sensor: paper near end
4	On	10	16	Unused. On
5,6	Off	00	0	Roll paper near-end sensor: with paper
	On	60	96	Roll paper near-end sensor: paper near end
7	Off	00	0	Unused. Off

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

**DLE ENQ n**

[Name] Send real-time request to printer

[Format]      ASCII      DLE    ENQ    n  
                  Hex        10    05    n  
                  Decimal    16    5     n

[Range]        n=2

[Description] .Responds to a request from the host computer. n designates the following requests.

n	Request
1	Restart printing from the error recovered to appear error.
2	Recovers from an error after cleaning receive and print buffer

[Specification] .Only at the status of auto-cutter error, black mark error or print head bar raised, this command effects.  
 .The printer processes the data once received this command.  
 .Even the printer offline, full print buffer or serial interface mode error, still executing this command.  
 .At the parallel interface mode, this command can't be executed when the print is busy.  
 .After cleaning the data in the receive buffer and print buffer, DLE ENQ 2 enable printer

to recover from error. The printer reserves the set (For example ESC 1, ESC 3 and so on) which is effective when the error occurred. This command and ESC @ can initialize the printer completely. This command only effects that the error could be recovered, and except for the over temperature of the print head.

[Note] .Whenever receive <10>H<05>H<n>(1≤n≤2) data sequence, will send status.

**For example:**

ESC \* m nL nH dK,dl=<10>H, d2=<05>H, d3=<01>H

.The command date which contains two or more bytes, can't use this command.

**For example:**

If want to send the ESC 3 n to the printer, but before sending the n, DTR(DSR for the PC) will be changed to MARK, So, before receiving the n, DLE ENQ 2 will be interrupted. The code<10>H of DLE ENQ 2 will be dealt with as the code <10>H of ESC 3.

[Reference] **DLE EOT**

### **ESC SP n**

[Name] Set right-side character spacing

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

[Range] 0≤n≤255

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

[Specification] . At the double width mode, the right-side character spacing is two times than the the normal mode. When the characters be broadened n times, the right-side character spacing is n times than the normal mode.

.This command not effects the Chinese character setting.

[Default] n = 0

### **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 the print mode through designating the value of n. the definition of parameter n as below:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character type A(12×24).
	On	01	1	Character type B(9×17).
1	---	---	---	Undefined
2	---	---	---	Undefined
3	Off		0	Emphasized mode not selected.
	On		8	Emphasized mode selected.
4	Off		0	Double-height mode not selected.
	On		16	Double-height mode selected.

5	Off		0	Double=width mode not selected.
	On		32	Double-width mode selected.
6	---	---	---	Undefined
7	Off		0	Underline mode not selected.
	On		128	Underline mode selected.

- [Specification] .When select double-height and double-width mode at the same time , then printing four times size characters.
- .The printer can add the underline to all characters, But can't add the underline to the blank which causes by HT command or the character of revolving 90°according to wise clock direction.
- .The thickness of the underline set by ESC -, it is no relationship with the characters.
- . When some of double-height or more height characters in a line, all the characters in a line will be stayed at the same level on baseline.
- . ESC M cane set the font type of characters. the last be set of the received command will effect.
- . ESC E can be set or cancel the emphasize mode, the last be set of the received command will effect.
- .ESC – Enable/cancel underline mode, the last be set of the received command will effect.
- . GS ! can set the size of character. the last be set of the received command will effect.
- . The emphasize mode is effective for the English characters and Chinese. The entire print mode except for emphasize mode only effects for the English character.

[Default] n = 0

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

### **ESC \$ nL nH**

- [Name] Set absolute print position
- [Format]
- |         |     |    |    |    |
|---------|-----|----|----|----|
| ASCII   | ESC | \$ | nL | nH |
| Hex     | 1B  | 24 | nL | nH |
| Decimal | 27  | 36 | nL | nH |
- [Range]
- 0≤nL≤255
- 0≤nH≤255
- [Description]
- Set the space from the beginning of the line to the position of the print character which will be printed.
- . The space from the beginning of eth line to the print position is  $((nL+nH \times 256) \times 0.125 \text{ mm})$  .
- [Specification]
- .Designated the set which out of the printable area that will neglected.
- .At the normal mode , uses the horizontal unit(x).
- .At the page mode, with the different printable area start position that the horizontal or vertical moving unit is different, the specification as belows:
- ① When set the start position to the printable area's up-left or down-right by ESC T , uses the horizontal moving unit(x).
  - ② When set the start position to the printable area's up-right or down-left , uses the vertical moving unit(y).

[Reference]     **ESC \, GS \**

### **ESC @**

[Name]            Initialize printer

[Format]          ASCII     ESC     @  
                     Hex       1B       40  
                     Decimal 27       64

[Description]    Clean the data in the print buffer and reset the printer mode to the mods that effects when turning the power on.

[Notes]           ·Not check the DIP switch setting again.  
                     ·Not cleans the data in the receive buffer area.  
                     ·Not clean the macro definition.

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

[Name]            Select bit-image mode

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

[Range]           m=0, 1, 32, 33  
                     0≤nL≤255  
                     0≤nH≤3  
                     0≤d≤255

[Description]    Select bit-image mode to use m, the dot of bit-image specified by nL and nH, as the below table:

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

**Dpi: 1 inch print dot count per 25.4mm**

[Notes]           ·If the data of m over the specified range, then nL and the later data dealt with as the general data.  
                     ·nL and nH specifies the dots of the horizontal direction up bit image. Through nL+nH×256 and counts the dots.  
                     ·If the bit image date input overs one line which the dots be printed, then the over data will be neglected.  
                     ·d indicates bit image data. 1 sets by the relevance bit and prints one of dots, or sets 0 and not prints one of dots.

.If the printing scale width which sets by GS L and GS W is less than the requisite width which the data sends by ESC \* command, so executes the below operation for the error line(but the printing can't over the largest printing range):

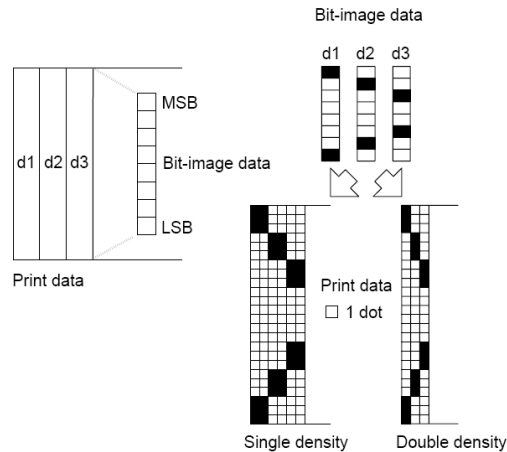
- ① The width of the printable area enlarges to the right and adapts to the data amount.
- ② If the step ① can't provide enough width for data, then the left will be decreased and adapt to data. For each bit data at the single density mode (m=1, 32), The printer prints two dots: for each bit data at the single density mode (m=1,33), the printer prints one bit. When calculating the data account in the line, all these should be considered.

.After printing one bit-image, the printer returns to the normal data deal mode.

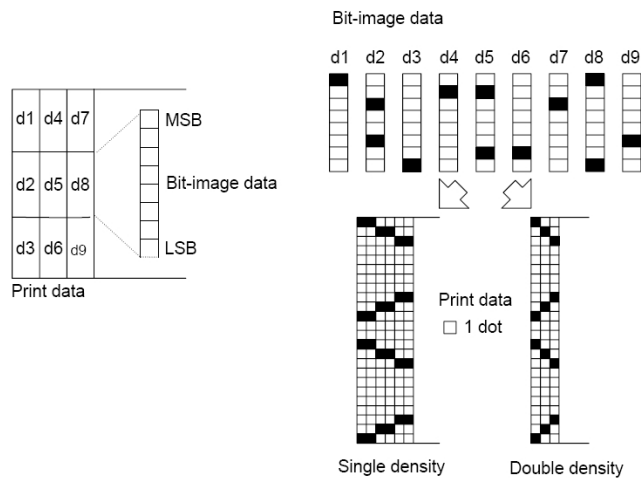
.This command not be affected by the printing mode (bold, repetition, underline, character size, or reverse blank printing), unless the reversed printing mode.

·The below graphic described the relations between bit image data and the dot which be printed.

#### When 8-dot bit image be selected:



#### When 24-dot bit image be selected:



## **ESC – n**

[Name] Turn underline mode on/off

[Format]      ASCII    ESC    -    n  
                 Hex     1B    2D    n  
                 Decimal 27    45    n

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

[Description]    On the basis of the below value, turns the underline mode on/off:

n	Function
0, 48	Turn underline off
1, 49	Turn underline on(one dot thickness)

[Notes]          .The printer can print the underline for all characters (contains right character space), but except for the blank which be set by HT.

.The printer can't print the underline for the characters which revolved 90°according to clockwise and reversing blank characters.

.Turns underline off through setting that the data of n is 0 or 48, the next data can't be printed the underline, and before turning the underline mode on, the degree of boldfaced not be changed, the boldfaced default underline is 1 dot.

.Change the character size not effects the current underline boldfaced degree.

.Use ESC ! also can turn underline on/off. But the final received command is effective.

[Default]        n = 0

[Reference]      **ESC !**

## **ESC 2**

[Name]          Select the line space

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

[Description]    Select the line space 3.75 mm(30×0.125 mm).

[Note]           .Line spacing could be set under the normal mode and the page mode.

[Reference]      ESC 3

## **ESC 3 n**

[Name]          Set the line space

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

[Range]         $0 \leq n \leq 255$

[Description]    Set the line space to (n×0.125 mm) .

[Default]        n = 30

[Reference]      **ESC 2**

## ESC a n

[Name]	Select justification			
[Format]	ASCII	ESC	a	n
	Hex	1B	61	n
	Decimal	27	97	n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$			
[Description]	Justify a line data according to the point position			
	Select justification by n as follows:			

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

[Notes]	In stable mode, this command is valid only the original line.
	If input this command in page mode, printer only executes inner sign operation.
	This command invalids in page mode.
	This command executes justification in print area.
	This command justifies the blank area according to <b>HT</b> , <b>ESC \$</b> or <b>ESC \</b> .

[Default] n = 0

[Examples]

**Left justification**

ABC
ABCD
ABCDE

**Centering**

ABC
ABCD
ABCDE

**Right justification**

ABC
ABCD
ABCDE

## ESC c 5 n

[Name]	Enable/disable panel buttons			
[Format]	ASCII	ESC	c	5
	Hex	1B	63	35
	Decimal	27	99	53
[Range]	$0 \leq n \leq 255$			
[Description]	Enable or disable the panel keys.			
	·When the LSB of n is 0, enabled the panel keys.			
	·When the LSB of n is 1, disabled the panel keys.			
[Notes]	·Only use the LSB of n.			
	·If disable the panel keys, then all keys can't use when closing the print head bar.			
	·For this printer, the only one panel key is feed paper key.			
[Default]	n = 0			

## ESC d n

[Name]	Print and feed n lines			
[Format]	ASCII	ESC	d	n
	Hex	1B	64	n
	Decimal	27	100	n
[Range]	$0 \leq n \leq 255$			

[Description] Print the data in the output print buffer area, and feed paper n lines.

[Notes] .This command set the line start point to the printing start position.  
 .This command not effect the line space which set by ESC 2 or ESC 3 command.  
 .The max quantity of feed paper is 1016 mm{40 inch}. If the specified quantity of feed paper{n×line space} is 1016 mm{40 inch}, the printer only feed paper 1016mm{40inch}.

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

### **ESC i**

[Name] Full cut

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

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

[Note] As it won't feed paper when executing this command, please assures that feed paper 5mm or more before executing this command next time, to avoid that the cutter be damaged.

[Default] The default is partial cut mode.

### **ESC m**

[Name] Partial cut

[Format] ASCII ESC m  
 Hex 1B 6d  
 Decimal 27 109

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

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

[Default] Partial cut mode is default.

### **ESC t n**

[Name] Select character code table

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

[Range] 0≤n ≤5, 16≤n ≤19, n=255

[Description] Select page n from the character code table:

n	Page
0	PC437[America, Europe standard]
1	Katakana
2	PC850[Multi-language]
3	PC860[Portuguese]
4	PC863[Canada-France]
5	PC865[North Europe]
16	WPC1252

17	PC866[Yugoslavia2]
18	PC852[Latin2]
19	PC858[Europe]
255	Space page

[Default] n = 0

[Reference] Character table

### **ESC D n1 . . . nk NUL**

[Name] Set horizontal tab positions

[Format]	ASCII	ESC	D	n1...nk	NUL
	Hex	1B	44	n1...nk	00
	Decimal	27	68	n1...nk	0

[Range] 1 ≤ n ≤ 255

0 ≤ k ≤ 32

[Description] .Sets the horizontal tab position.

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

.k indicates the number of bytes that set for the horizontal tab position.

[Notes] .The horizontal position stored as a value, the value is (the character width×n) which be measured from the beginning of the line. The width of the character contains the character right-side space, and the double width character to be dealt with as the double width of the normal character.

.This command delete the advanced set horizontal position.

.When n=8, the print position be moved to ninth through sending HT.

.Can set to 32 position (k=32). The data over 32 position which be dealt with as the normal data.

.Transmits (n) k according to raise sequence and set a NUL code 0 on the end.

.ESC D NUL cancel all of the horizontal position.

.Even the character width changed, the advanced specified horizontal position won't be changed.

.At the normal and page mode, the character width be memorized.

[Default] Default position is the 8 character space (for example 9,17,25...) of the type A(12×24).

[Reference] HT

### **ESC E n**

[Name] Turn emphasized mode on/off

[Format]	ASCII	ESC	E	n
	Hex	1B	5	n
	Decimal	27	69	n

[Range] 0 ≤ n ≤ 255

[Description] Turn emphasized mode on/off.

When the LSB of n is 0, emphasized mode is turned off.

When the LSB of n is 1, emphasized mode is turned on.

[Notes] Permits to only the LSB of n.

This command turns emphasized mode on/off by the same command as ESC ! Be care, when this command used the same time as ESC !.

[Default] n = 0  
[Reference] **ESC !**

### **ESC G n**

---

[Name] Turn double-strike mode on/off

[Format]

ASCII	ESC	G	n
Hex	1B	47	n
Decimal	27	71	n

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

[Description] Turn double-strike mode on/off.  
When the LSB of n is 0, double-strike mode is turned off.  
When the LSB of n is 1, double-strike mode is turned on.

[Notes] Permits to use only the LSB of n.  
The same output in double-strike mode and emphasized mode.

[Default] n = 0

[Reference] **ESC E**

### **ESC J n**

---

[Name] Print and feed paper

[Format]

ASCII	ESC	J	n
Hex	1B	4A	n
Decimal	27	74	n

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

[Description] Print the data in the print buffer and feed the paper (  $n \times 0.125 \text{ mm}$  ) .

[Notes] ·After printing, this command set the starting position of printer to the beginning of the line.  
·Feed paper quantity set by this command that will not effect the data which set by ESC 2 or ESC 3 command.

### **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] Selects character font.

n	Function
0,48	Character font A(12×24)
1,49	Character font B(9×17)

[Specification] .ESC ! can select the character type. But, the set is effective which only set by the final received command.

[Reference] **ESC !**

**ESC R n**

[Name] Select an international character set

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

[Rang]             $0 \leq n \leq 13$ 

[Description]    Select the data of n according to the below table, set international character set.

n	Character Set
0	U.S.A.
1	France
2	Germany
3	England
4	Denmark I
5	Sweden
6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea

[Default]    n = 0

[Reference]    International character set

**FS p n m**

[Name]        Print NV bit image

[Format]        ASCII    FS    p    n    m  
                   Hex        1C    70   n    m  
                   Decimal    28   112   n    m

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

[Description]    Print NV bit image by m which be specified.

m	Mode	Vertical Density	Horizontal Density
0,48	Normal	203.2dpi	203.2 dpi
1,49	Double width	203.2 dpi	101.6 dpi
2,50	Double height	101.6 dpi	203.2 dpi
3,51	Four times size	101.6 dpi	101.6 dpi

**Dpi: {1 inch} print dot per 25.4mm**

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

.m specified bit image mode.

[Specification]    .NV bit image is a bit image which defined at the not easy losing memory. Defined by FS q , printed by FS q.

.This command will not effect when the specified NV bit image not existed.

.This command not be effected by the print mode (bold, repetition, underline, character size, or reverse blank printing), except the reversed print mode.

- ① At the NV bit image mode, the width of printable area right extends to a vertical line. In such circumstances, Print can't over the printable area.
- ② If the width of printable area can't extend a vertical line, then the left blank will be narrowed and to held a vertical line.

.If the printable download bit image over a line, then the over data not to be printed.

.At the normal and double width mode, this command feed paper n dots, n is the height of NV bit image, Under the double height and four times size mode, this command feeds paper 2n dots, n is the height of NV bit image, it's not relevant to the line spacing which set by ESC 2 or ESC 3.

.After printing bit image, this command sets the print position at the beginning of a line, and deal with the continued data as the normal data.

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

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

[Name] Define NV bit image

[Format]    ASCII        FS        q        n    [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n  
             Hex        1C        71        n    [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n  
             Decimal    28        113      n    [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n

[Range]     $1 \leq n \leq 255$   
              $0 \leq xL \leq 255$   
              $0 \leq xH \leq 3$  (when  $1 \leq (xL + xH \times 256) \leq 1023$ )  
              $0 \leq yL \leq 255$   
              $0 \leq yH \leq 1$  (when  $1 \leq (yL + yH \times 256) \leq 288$ )  
              $0 \leq d \leq 255$   
              $K = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$   
             The total of defined data area=192k bytes

[Description]    Define NV bit image which uses the specific value n.  
                     .n specifies the quantity of NV bit image.  
                     .xL, xH specifies the dot count of the horizontal direction in defined NV bit image, the dot count is  $(xL + xH \times 256) \times 8$ .  
                     .yL, yH specifies the dot count of the vertical direction in defined NV bit image, the dot count is  $(yL + yH \times 256) \times 8$ .

[Specification]    .This command cancels the NV bit image which defined by this command. At the serial defined data, the printer can't define any one of data renewable. If renew to define certain data, then all data needs to send again.  
                     .From the beginning to deal with this command to finish hardware reset, can't execute mechanical operation (contains initialized print head position when opening the print head bar, feed paper used the paper feeding button and so on.)  
                     .During deal with this command, when writing data to user NV memory, the printer is busy and stops receiving data. So, Disabled sending data during executing this command, contains real-time command.

.NV bit image is a bit image which defined at the not easy losing memory. Defines and prints FS p by FS q.

.This command effects after the seven bytes<FS~yH> be dealt with normally.

.When the data quantity over the left capacity of the scale which defined by xL, xH, yL, yH, the printer deals with xL, xH, yL, yH out of the defined scale.

.At any one of group bit image except for the first group, when the printer meets that xL,xH, yL, yH over the defined scale, then stop dealing with this command, and begin to write to NV image. At this moment disabled the undefined NV bit image (undefined), but any NV bit image defined before still effective.

.d indicates the defined data. At the data (d), one bit specified one print dot and one 0 bit specified one which can't print dot.

.n be defined the quantity of NV bit image by this command. The quantity goes up according to the sequence which begins from bit image 01H. Therefore the first data group [xL xH yL yH dL...dK] is the NV bit image 01H. The last data group [xL xH yL yH dL...dK] is the NV bit image n. The total count is consistent with the NV bit image which set by FS p command.

.The definition data of one NV bit image formed by [xL xH yL xH dL...dK]. So, when only have one NV bit image n=1, the printer only deals with the data group [xL xH yL yH dL...dK] one time. The printer uses  $([data:(xL+xH \times 256) \times (yL+yH \times 256) \times 8] + [header:4])$  bytes of the NV memory.

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

.Though defining ASB, the printer not send the ASB status or execute status test during dealing with this command.

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

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

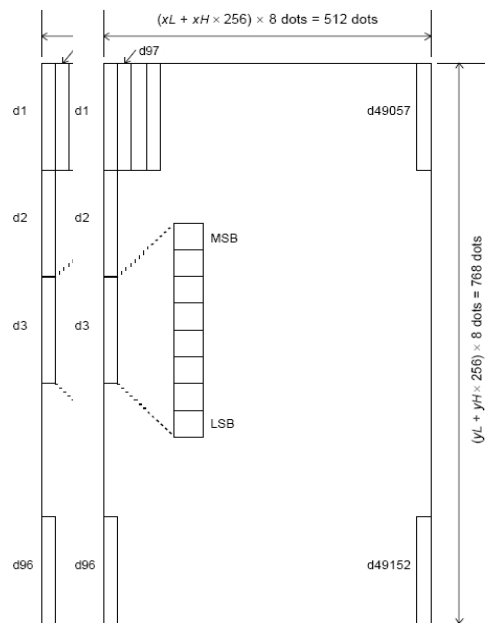
.This command only executes the definition of NV bit image, not executes printing. The printing of NV bit image executed by FS p command.

[Notes] Frequently executes the written command which could be broken the NV memory. So, suggest that execute the written operation not over ten times for NV memory in a day.

.After the process of putting one bit image into NV memory, the printer executes one hardware reset operation. So, defines the user-defined character, downloads bit image and macro after finishing this command. The printer clears receiving and printing buffer area, and resets to the effective mode when connecting the power supply.

[Reference] FS p

[For example] When xL = 64, xH = 0, yL = 96, yH = 0



## GS FF

[Name] Feed black mark to start position

[Format]	ASCII	GS	FF
	Hex	1D	0C
	Decimal	29	12

[Description] Feed black mark paper to start position.

[Notes] When just set black mark sensor by DIP SW-1-1, this command is effective.

This command set the print position to the beginning of the line.

Even execute this command at the beginning of the black mark start position, the printer will not print to the next print start position.

[Reference] **GS ( F,**

## GS ! n

[Name] Set character size

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

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

( $1 \leq \text{vertical double counts} \leq 8$ ,  $1 \leq \text{horizontal double counts} \leq 8$ )

[Description] Set the height of the character by bit 0 to 2, set the width of the character by bit 4 to 6. as below:

Bit	Off/On	Hex	Decimal	Function
0				Sets the height of character. See table 2.
1				
2				
3				
4				Sets the width of character. See table 1.
5				
6				
7				

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

**Table 1**

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

**Table 2**

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

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

.At the standard mode, the vertical direction is the feed paper direction. However, when the character direction revolved clockwise 90°, the relation of vertical direction and horizontal direction will be reversed.

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

.Enable/disable the double width and double height mode by ESC ! command. The set of command which received at the last will be effected.

[Default] n = 0

[Reference] **ESC !**

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

[Name] Define download bit image

[Format] ASCII GS \* x y d1...d(x× y× 8)

Hex 1D 2A x y d1...d(x× y× 8)

Decimal 29 42 x y d1...d(x× y× 8)

[Range] 1≤x≤255

1≤y≤48(x× y×1536)

0≤d≤255

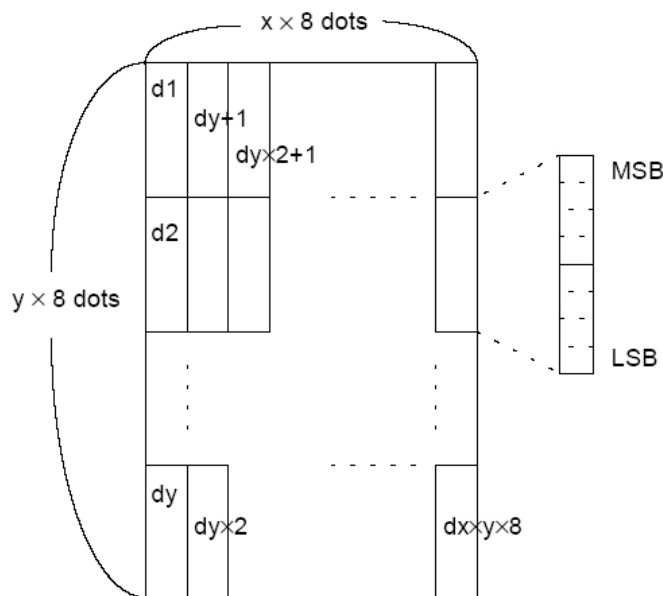
[Description] Specifies dot counts by taking x and y and defines the download bit image.

.x specifies the horizontal dot counts.

.y specifies the vertical dot counts.

- [Notes]
- .The dot counts of horizontal direction is  $x \times 8$ ; the dot counts of vertical direction is  $y \times 8$ .
  - .If  $x \times y$  over the specified scale, then this command will be disabled.
  - .d indicates the bit image data. The data (d) specifies the print bit is 1, the not print bit is 0.
  - .At the below status, clean the download bit image definition:
    - ① Execute ESC @.
    - ② Execute ESC &.
    - ③ The printer reset or turn the power off.

.The connection between download bit image and print data as below:



[Reference]

## GS / m

[Name] Print download 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] Printed the download bit image by the mode which specified by m.

m set the mode from the below table:

m	Mode	Vertical dot density	Horizontal dot density
0,48	Normal	203.2 dpi	203.2 dpi
1,49	Double width	203.2 dpi	101.6 dpi
2,50	Double height	101.6 dpi	203.2 dpi
3,51	Four times size	101.6 dpi	101.6 dpi

**Dpi: per 25.4 mm{one inch} print dot count**

- [Notes]
- .If the bit image data undefined, then this command will be ignored.
  - .At the standard mode, this command effects only when there are no data in the print buffer area.
  - .This command is not effective at the print mode [bold, overlap, underline, character size or reverses blank printing], except for up-down print mode.

.If the near-printing download bit image over the printable area, then the over data will not print

.The download bit image at the page mode refer to picture.

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

- ① The width of the printable area which extends to the right and holds the data capacity.
- ② If the step ① haven't provided enough width for data, then narrows the left blank to hold the data.

Each data at the normal mode (m=0, 48) and double height mode (m=2,50), the printer prints one dot; Each data at the double width mode (m=1, 48) and four double mode (m=3, 51), the printer prints two dots.

[Reference] GS \*

### GS h n

[Name] Set the bar code height

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

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

[Description] Set the bar code height  
n sets the dot counts at the vertical direction.

[Default] n=162

[Reference] GS k

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

[Name] Print bar code

[Format] ①ASCII GS k m d1 ... dk NUL  
Hex 1D 6B m d1 ... dk 00  
Decimal 29 107 m d1 ... dk 0  
②ASCII GS k m n d1 ... dn  
Hex 1D 6B m n d1 ... dn  
Decimal 29 107 m n d1 ... dn

[Range] ①  $0 \leq m \leq 6$  (k and d decided by the used bar code system)  
②  $65 \leq m \leq 73$  (n and d decided by the used bar code system)

[Description] Select bar code system and print bar code.  
m select bar code system as the below table

	m	Bar code system	Character number	Note
①	0	UPC-A	11 k 12	48 d 57
	1	UPC-E	11 k 12	48 d 57
	2	JAN13 (EAN13)	$12 \leq k \leq 13$	48 d 57
	3	JAN8 (EAN8)	7 k 8	48 d 57
	4	CODE39	1 k	48 d 57, 65 d 90, 32, 36, 37, 43, 45, 46, 47

②	5	ITF	$1 \leq k$ (k is odd)	$48 \leq d \leq 57$
	6	CODABAR	$1 \leq k$	48 d 57, 65 d 68, 36, 43, 45, 46, 47, 58
	7	Standard EAN13	$12 \leq k \leq 13$	48 d 57
	8	Standard EAN8	$7 \leq k \leq 8$	48 d 57
	65	UPC-A	$11 \leq n \leq 12$	48 d 57
	66	UPC-E	$11 \leq n \leq 12$	48 d 57
	67	JAN13 (EAN13)	$12 \leq n \leq 13$	48 d 57
	68	JAN8 (EAN8)	$7 \leq n \leq 8$	48 d 57
	69	CODE39	$1 \leq n \leq 255$	48 d 57, 65 d 90, 32, 36, 37, 43, 45, 46, 47
	70	ITF	$1 \leq n \leq 255$ (n is even)	48 d 57
	71	CODABAR	$1 \leq n \leq 255$	48 d 57, 65 d 68, 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \leq n \leq 255$	0 d 127
	73	CODE128	$1 \leq n \leq 255$	0 d 127
	74	Standard EAN13	$12 \leq n \leq 13$	48 d 57
	75	Standard EAN8	$7 \leq n \leq 8$	48 d 57

[Explanation ①]

.This command ended by NUL.

.When the used bar code system is UPC-A or UPC-E, print the bar code and process the continued data as the normal data after the printer received 12 bytes bar code data.

.When the used bar code system is JAN13 (EAN13) , print the bar code and process the continued data as the normal data after the printer received 13 bytes bar code data.

.When the used bar code system is JAN8 (EAN8) , print the bar code and process the continued data as the normal data after the printer received 8 bytes bar code data.

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

[Explanation ②]

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

.If n over the specified scale, then the printer stops to process this command, and processes the continued data as the normal data.

#### The notes at the standard mode

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

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

.This command feeds paper as the printing bar code, In spite of the line spacing which set by  $E \sum X2$  or  $E \sum X3$ .

.This command effects only when there are no data in the printing buffer area. When there are data in the printing buffer area, the printer processes the continued data of m as the normal

data.

.After printing the bar code, this command sets the print position at the beginning of a line.

.This command no effects by the print mode(over-striking, overlap, underline, character size, opposites blank printing, or character 90°revolved and so on.), except for the reversed print mode.

### The notes at the page mode

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

.If d over the specified scale, the printer stops to process this command and processes the continued data as the normal data. In such circumstance, the position of data buffer area not changed.

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

.Refer to the section 3.9 the page mode.

### When using thermal lable:

.If the bar code width is not fit for the present lable, the over part to be printed on the next mark.

### When using CODE93 (m=72):

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

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

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

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

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



When using CODE128 (m = 73) :

Prints GS k 72 7 67 111 100 101 13 57 51



**When takes CODE128 (m=73):**

.About CODE128 bar code and code table information , refer to the appendix E.

.When the printer uses CODE128, please considers the below which about the data transmitting data:

- ① The head of bar code data font needs to be the code font selected character(CODE A, CODE B, or CODE C), takes to be selected the first using code fond.
- ② Defines the special character by character "{" and a character group. Defines ASCII character "{" through continuing transmitting "{" twice.

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

[For example]      Print the actual example data of "No. 123456"

At this actual example, first the printer takes CODE B to print "No.", then takes CODE C to print the below figures.

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



.If the data font head of bar code is not the code fond selected character, the printer stops to command disposal, and processes the continued data as the normal data.

- .If the combined of "{" and continued characters is not fit for the any special characters, the printer stops to command disposal, and processes the continued data as the normal data.
- .If the printer received characters which can't be used to special code font, the printer stops to command disposal, and processes the continued data as the normal data.
- .The printer doesn't print the HRI characters which relatives to shift characters or code font selected characters.
- .The HRI characters of function character is blank.
- .The HRI characters is the blank which about control characters (<00>H to <7F>H).

[Others] Be sure to reserve spacing at the left and right of bar code.

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

### **GS r n**

[Name] Transmit status

[Format] ASCII GS r n  
Hex 1D 72 n  
Decimal 29 114 n

[Range] n=1, 49

[Description] Transmits the status n which specified by n as below:

n	Function
1,49	Transmit the print paper sensor status

[Notes] .When taking serial interface, If set DTR/DSR control, the printer only transmits one byte after be sure that the PC have received the date (DSR signal is SPACE). If the PC haven't got ready to receive data (DSR signal is MARK), the printer waited until the PC have got ready to.

If set SON/XOFF control, the printer only transmits one byte, and be not sure the DSR signal status.

.Execute this commands when the data affects in the printing buffer area. So, between receiving this command and transmitting status, may be have a time spacing, it decided by the status of receiving buffer area.

.When takes ASB by GS a, distinguished the transmitting status of GS r and ASB status which refers to the table in the appendix C.

.The transmitting status types as below:

#### **The print paper sensor status (n=1,49)**

Bit	Off/On	Hex	Decimal	ASB status
0,1	Off	00	0	Paper near-end sensor: printing pape enough.
	On	03	3	Paper near-end sensor: printing pape enough.
2,3	Off	00	0	Paper-end sensor: printing pape enough.
	On	(0C)	(12)	Paper-end sensor: without paper.
4	Off	00	0	Unused. Off is fixed.
4,6	-	-	-	Undefined.
7	On	00	0	Unused. Off is fixed.

Bit 2 and 3: When the paper-end sensor tests the printing paper-end, the printer enters into offline. So, bit

2 and 3 not transmits without paper status.

[Reference] DLE EOT, GS

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

[Name] Print grating bit image

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

[Range]  $0 \leq m \leq 3$ ,  $48 \leq m \leq 51$   
 $0 \leq xL \leq 255$   
 $0 \leq xH \leq 255$  here  $1 \leq (xL + xH \times 256) \leq 128$   
 $0 \leq yL \leq 255$   
 $0 \leq yH \leq 8$  here  $1 \leq (yL + yH \times 256) \leq 4095$   
 $01 \leq d \leq 255$   
 $K = (xL + xH \times 256) \times (yL + yH \times 256)$  ( $k \neq 0$ )

[Description] Sets grating bit image m as below:

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	203.2 dpi	203.2 dpi
1, 49	Double width	203.2 dpi	101.6 dpi
2, 50	Double height	101.6 dpi	203.2 dpi
3, 51	Four times size	101.6 dpi	101.6 dpi

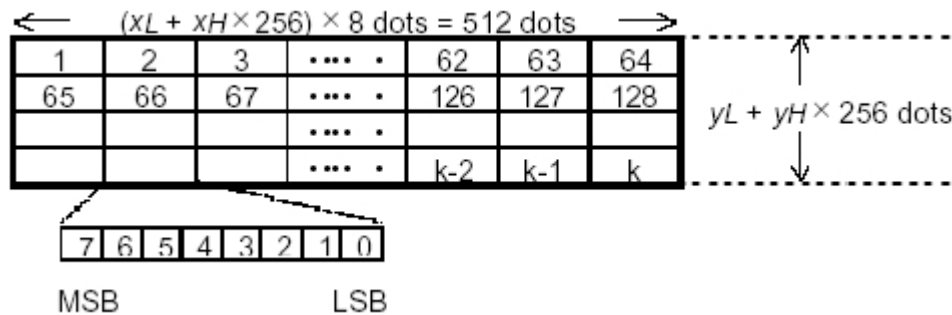
(dpi: per 25.4 mm{one inch} printing dots)

· xL, xH, sets bit image horizontal direction data bytes( $xL + xH \times 256$ )

· yL, yH, sets bit image vertical direction data bytes( $yL + yH \times 256$ )

- [Notes]
- At the standard mode, this command only effects when there are no data in the printing buffer area.
  - For the grating bit image printing, this command no effects by the printing mode(character size, over striking, overlap, up-down printing, underline, reverses blank printing mode and so on).
  - If the printable area width which set by GS L and GS W is narrower than the min width , the printer only extends the problem line to the nine width. The min width for normal mode ( $m=0,48$ ) and double height mode( $m=2, 50$ ) is a dot, for the double width mode( $m=1,49$ ) and four times size mode( $m=3,51$ ) is two dots.
  - The data out of the printing area be read, and discarded one by one.
  - If the printing position of continued character is the multiple of 8. The continued will be the character printing position of grating bit image, sets by HT(horizontal table), ESC \$(set absolute printing position), ESC \ (set relative printing position) and GS L(set left side spacing).
  - The set by ESC a (set justification) for the grating bit image is effective.
  - Receive this command during macro definition, the printer finishes the macro definition, and begins to execute this command. Should clear the definition of this command.
  - d designates bit image data. Set the printing dot 1, no printing dot 0.

[For example] When  $xL + xH \times 256 = 64$



### GS w n

[Name]	Set bar code width			
[Format]	ASCII	GS	w	n
	Hex	1D	77	n
	Decimal	29	119	n
[Range]	$2 \leq n \leq 6$			
[Description]	Set bar code horizontal size.			

n set the bar code width as below:

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

·The below is the multi-bar code:

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

·The below is the two-bar code:

CODE39, ITF, CODABAR

[Short data]	n=3
[Reference]	GS k

### GS H n

[Name]	Select the print position of HRI character			
[Format]	ASCII	GS	H	n
	Hex	1D	48	n
	Decimal	29	72	n
[Range]	$0 \leq n \leq 3, 48 \leq n \leq 51$			
[Description]	When print bar code, select the print position of HRI character. n selects the print position, the table as the below table:			

n	Print position
0,48	Not print
1,49	Up the bar code
2,50	Below the bar code

3,51	Up and below the bar code
------	---------------------------

**Note:** The position of the printer prints HRI characters is not set according to the standard position.

.HRI (Human Readable Interpretation) indicates the readable bar code relevant characters .

[Note] .Takes the characters which specified by GS f to print HRI characters.

[Default] n = 0

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

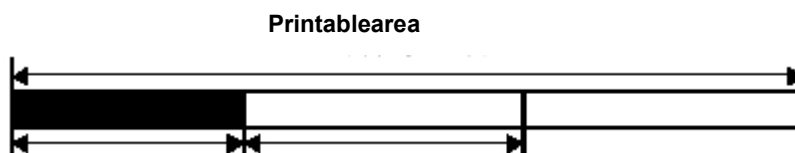
### **GS L nL nH**

[Name] Set left-side blank quantity

[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 side blank quantity by nL and nH  
.The left side blank quantity set to  $[(nL + nH \times 256) \times 0.125 \text{ mm}]$



**The left side blank      The width of printable width**

[Notes] .At the standard mode, this command only effects when processing at the beginning of a line.

.If set over the printable area , then using the max value of the printing unit.

.When executing the light bit image command (GS v o), set the left side blank quantity through this command, and only can take the unit of the 8 bits. If the left side blank quantity which wanted be set can't divide by 8, then omit the remainder counts.

[Default] nL = 0, nH = 0

[Reference] **GS W**

### **①GS V m ②GS V m n**

[Name] Select cut paper mode and cut paper

[Format] ①ASCII GS V m  
Hex 1D 56 m  
Decimal 29 86 m  
②ASCII GS V m n  
Hex 1D 56 m n  
Decimal 29 86 m n

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

[Description] Select one cut paper mode, and execute cut paper operation. Select model by taking the value of m, as below:

[The description for ① and ② ]

.According to the different auto-cut paper machine type, the cut paper status is different.

.This command effects only when processing this command at the beginning of a line.

[The specification for ①]

.Only partial cut paper; not full cut paper.

[The specification for ②]

.When  $n = 0$ , the printer feeds paper to cut paper position and cuts paper.

.When  $n \neq 0$ , the printer feeds paper to (cut paper position+[ $n \times 0.125 \text{ mm}$  {0.0049inch}]) and cut paper.

## GS W nL nH

[Name] Set print area width

[Format] ASCII GS W nL nH

Hex 1D 57 nL nH

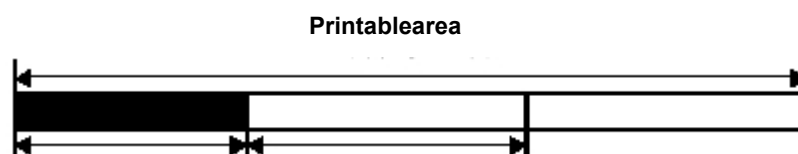
Decimal 29 87 nL nH

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

$0 \leq nH \leq 255$

[Description] nL and nH set the print area width.

.The printable width set to  $[(nL + nH \times 256) \times 0.125 \text{ mm}]$ .



**The left side blank      The width of printable width**

[Notes] .This command only effects when processing at the beginning of the line.

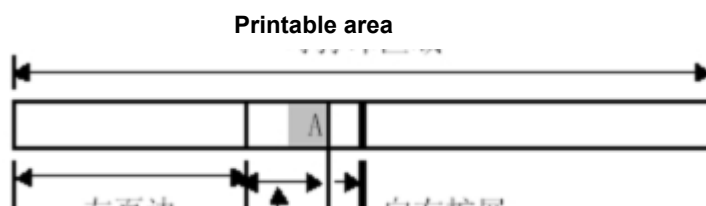
.If the set value over the printable area, takes the max printable area.

.The set PRI of GS L is surpass than the set PRI of GS W. If [the left side blank + printable area width] over the printable area, the printer takes [printable area width-the left side blank].

However, not takes the set which sets through GS W even if at the current print, reserves the set which sets through GS W.

.If the width which set in the printable area is smaller than the width of one character, when printing character data, executes the below disposals:

- ① The printable area width extend to the right and adapt one character.



**The left side      Extends to the right**

**The printable area width set by nL and nH**

- ② If extends the printable area width not enough, then narrows the right spacing.

.If the width which sets by the printable area is narrower than a vertical line, when printing non-character data (for example, bit image, the bit image of user-defined), only for the problem lines to the below disposals:

- ① Extend the printable area width to the right and adapts a vertical line of bit image in the printable area.
- ② If extends the printable area width not enough, then narrows the left spacing to adapt a

vertical line.

[Reference] **GS L**

### **FS ! n**

[Name] Set character print mode(s)

[Format]        ASCII      FS      !      n  
                 Hex      1C      21      n  
                 Decimal 28      33      n

[Range]        0≤n≤255

[Description] Set the character print mode, set n as below:

Bit	Off/On	Hex	Decimal	Function
0	--	--	--	Undefined
1	--	--	--	Undefined
2	Off	00	0	Prohibit double width mode
	On	04	4	Permit double width mode
3	Off	00	--	Prohibit double height mode
	On	08	8	Permit double height mode
4	--	--	--	Undefined
5	--	--	--	Undefined
6	--	--	--	Undefined
7	Off	--	--	Undefined
	On	--	--	Undefined

[Specification]    · On the status of setting the double wide and height mode(contains the right and left character spacing), will print the four times size character.

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

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

                  · When some of characters in a line is double height characters or more, all character in this line will stand at the same level along datum line.

                  · Enlarge Chinese character could use FS W or GS ! command, the set is effective when received finally.

                  · The command which received finally is effective, the set is effective when received finally.

[Default]        n = 0

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

### **FS &**

[Name] Set Chinese character mode

Format        ASCII      FS      &  
                 Hex      1C      26  
                 Decimal 28      38

[Description] Select Chinese character mode.

[Specification]	<ul style="list-style-type: none"> <li>· This command only effects when select GB18030 code system.</li> <li>· GB18030 only effects double byte 1,2,3,4,5 area.</li> <li>· When select Chinese character mode, the printer processes all the Chinese code, two bytes each time.</li> <li>· The sequence arranged the Chinese code according to the first and the second byte.</li> <li>· When turn the power on, the printer enters into Chinese mode automatically.</li> <li>· When select Chinese character mode, at first the printer checks the code whether the Chinese: If it is the Chinese, then processes the first and the second bytes of Chinese code.</li> </ul>
[Reference]	FS FS C

### **FS .**

[Name]	Cancel Chinese character
[Format]	ASCII      FS      . Hex        1C      2E Decimal    28      46
[Description]	Cancel the Chinese character mode
[Specification]	<ul style="list-style-type: none"> <li>· This command only effects when select GB18030 code system.</li> <li>· When not select the Chinese character mode, all character code are ASCII code, per character processes each time.</li> <li>· When turns the power on, the printer enters into Chinese mode automatically.</li> </ul>
[Reference]	FS &, FS C

### **FS S n 1 n 2**

[Name]	Set Chinese right and left character spacing
[Format]	ASCII    FS    S    n1    n2 Hex      1C    53    n1    n2 Decimal 28    83    n1    n2
[Range]	0≤n1≤255 0≤n2≤255
[Description]	Respectively set left side and right side Chinese character spacing is n1 and n2. .The left side character spacing is [n1×0.125 mm ], the right character spacing is [n2×0.125 mm].
[Specification]	<ul style="list-style-type: none"> <li>.This command sets the left side and right side character spacing of normal size character. When setting double width mode, the left side and right side character spacing is twice than the normal mode.</li> <li>.Could set the spacing by this command respectively under the standard mode and page mode.</li> <li>.Under the standard mode, takes the horizontal moving unit.</li> <li>.Under the page mode, takes the horizontal moving unit or vertical moving unit changed by page mode, depends on the difference of printable area starting position. The specification as below:</li> <li>①When set the starting position to the printable area up-left or down-right by ESC T, uses the horizontal moving unit(y).</li> <li>②When set the starting position to the printable area up-right or down-left, uses the</li> </ul>

vertical moving unit(x).

- ③For appendix, the widest right side spacing about 32 mm(255×0.125 mm). Any set which over the max will change to the max value automatically.

[Default] n1 = 0, n2 = 0

## FS W n

[Name] Turn quadruple-size mode on/off for Chinese character

[Format] ASCII FS W n  
Hex 1C 57 n  
Decimal 28 87 n

[Rang] 0≤n≤255

[Description] Turn quadruple-size mode on/off for Chinese characters.  
.When the LSB of n is 0, quadruple-size mode is turned off.  
.When the LSB of n is 1, quadruple-size mode is turned on.

[Specification] .Only the LSB of n is effective.  
.Under the quadruple-size mode, the printing character size is the same as the printing character size when sets double width and double height.  
.When taking this command to turn the quadruple-size mode off, prints the following characters according to the size of normal characters.  
.When the different of some characters height in a line, all characters in this line will flush on the basis of baseline.  
.When the characters enlarged along the horizontal direction, the character enlarged to right, and the baseline according to the left side of characters.  
.Turn the quadruple-side mode on/off by FS ! or GS ! which could through selecting double width and double height mode. The command set which receives at last is also effective.

[Default] n=0

[Reference] FS !, GS !

## GS ( B PL PH m n

[Name] Setting up the Memory Switch

[Format] ASCII GS ( B PL PH m n  
Hex 1d 28 42 PL PH m n  
Decimal 28 40 66 PL PH m n

[Description] PL = 2, PH = 0;

m=0 or 1. When m=0, the code SW1 is represented; when m=1, the code SW2 is represented.

n represents the current 8 dialing settings, each bit representing a set value.

When m=0, the eight dialing states represented by n are as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	01	1	Black mark function (not yet turned on)
	On	00	0	
1	Off	02	2	Reserve
	On	00	0	Reserve

2	Off	04	4	Reserve
	On	00	0	Reserve
3	Off	08	8	PE output signal (not yet turned on)
	On	00	0	
4	Off	10	16	PNE signal output as normal (default)
	On	00	0	PNE signal output in reverse
5	Off	20	32	Buzzer on
	On	00	0	Buzzer off
6	Off	40	64	Set the baud rate: bit6 off, bit7 off: 38400 bit6 off, bit7 on: 9600 bit6 on, bit7 off: 19200 bit6 on, bit7 on: 115200
	On	00	0	
7	Off	80	128	
	On	00	0	

When m=1, the eight dialing states represented by n are as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Set the effective print width: bit0 off, bit1 off: 640 dots(invalid) bit0 on, bit1 off: 576 dots bit0 off, bit1 on: 448 dots bit0 on, bit1 on: 432 dots
	On	01	1	
1	Off	00	0	
	On	02	1	
2	Off	00	0	Set the print density: bit2 off, bit3 off: Normal bit2 on, bit3 off: Slightly dark bit2 off, bit3 on: Dark bit2 on, bit3 on: Slightly Light
	On	04	1	
3	Off	00	0	
	On	08	1	
4	Off	00	0	Paper is not removed, not printed (not yet enabled)
	On	10	16	
5	Off	00	0	Enable Cut paper after reload
	On	20	32	Disable Cut paper after reload is enable
6	Off	00	0	Turn off low speed printing
	On	40	64	Turn on low speed printing
7	Off	00	0	Set the default cut mode to full cut
	On	80	128	Set the default cut mode to half cut

- [Examples] 1) If set the baud rate 115200, turn on the buzzer, other by default, then m = 0, n = 0x3f; m = 1, n = 0xff;
- 2) If set the baud rate 38400, turn off the buzzer, low speed printing, other according to the default value, then m=0, n=0xdf; m=1, n=0xbf;
- [Default] When m=0, n=0xff; when m=1, n=0xff.