POS88Ⅴ
Developer Guide

（VER 1.1）

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Format Specification

In this part,it indicates how to use this technical manual,please read this manual before programming.

This manual including parts below:

1） The name and overview of function.This is the first part of command description.Here we proposes the command of ASCII barcode and its function.

2） Format. This part uses ASCII barcode format,HEX format,Decimal format to describe this command.

If there is no special note,the part of value range is decimal digit.For example, 1 ≤ n ≤ 4,the no.1 is decimal digit but not it in ASCII.

3） Range.Give the range of the variable.

4） Description.Give the detailed explanation of the command.

5） Notes.Give the notice of the command.Under different mode and coordinate with different command,this may cause interaction,so in this part gives these details.

6） Reference.Give other commands which are interrelated or similar with this.

---> DLE EOT n Real-time status transmission

---> [Format] ASCII DLE EOT n

Hex	10	04	n
Decimal	16	4	n

---> [Range] 1 ≤ n ≤ 4

---> [Description] Sending the printer state that designated by parameter n:

…..

---> [Notice] ·When printer receives the command,it will return the interrelated status immediately.

….

---> [Reference]

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HT

[Name] Horizontal tab

[Format] ASCII HT

Hex 09

Decimal 9

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

[Notice] • This command will be ignored if the next horizontal tab has not been setted.

• If the next horizontal tab position exceeds the printing area,the printer sets the printing position to the [Pringting width + 1].

• Horizontal tab position is setted by **ESC D**.

• If this command is received when the printing position is at [printing width+1],the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of next line.

• The default horizontal tab position for the paper roll is font ASCII(12*24)every 8 characters(9^{th},17^{th},25^{th}……).

• When the current buffer is full,the printer will carry out the proceeding below:

Under standard mode,the printer prints content of current line,and sets the printing position at the beginning of next line.

Under page mode,the printer carry out word wrap,and sets the printing position at the beginning of next line.

[Reference] **ESC D**

LF

[Name] Printing and feeding line

[Format] ASCII LF

Hex 0A

Decimal 10

[Description] Printing the datas in the print buffer and feeding one line,the line space is the same as currently .

[Notice] This command sets the print position at the beginning of the line.

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

FF

[Name] Printing under page mode and return to standard mode.

[Format] ASCII FF

Hex 0C

Decimal 12

[Description] Printing content in buffer and return to standard mode.

[Notice] · This command is effective only under page mode.

· Clear the contents after printing.

· The printing area setted by ESC W reverts to default value.

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· The printer does not cut paper.
· This command sets the current position at the beginning of the line.

[Reference] **ESC FF, ESC L, ESC S**

CR

[Name] Print and carriage return

[Format]

ASCII	CR
Hex	0D
Decimal	13

[Description] When current command is allowed,it is equal to LF command;When it is forbidden,it is ignored.

[Notice] · Setting the printing position as the beginning of the line
· The command will be ignored under serial interface mode.
· Under parallel mode,whether the command is effective is up to the configuration fothe printer.

[Reference] **LF**

CAN

[Name] Delete the contents in buffer under page mode

[Format]

ASCII	CAN
Hex	18
Decimal	24

[Description] Delete contents in current area under page mode.

[Notice] · This command is only effective under page mode.
· If there is overlap section between previous setted area and current area,the overlap section will be delete.

[Reference] **ESC L**, **ESC W**

DLE EOT n

[Name] Real-time status transmission

[Format]

ASCII	DLE	EOT	n
Hex	10	04	n
Decimal	16	4	n

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

[Description] Sending the printer state that designated by parameter n:
n = 1：Sending state of the printer
n = 2：Sending off-line state
n = 3：Sending error state
n = 4：Sending state of paper sensor

[Notice] ·When printer receives the command,it will return the interrelated status

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immediately.

·Avoideing to insert this command into 2 or more command sequences.

·This command will be also valid even the printer is set to forbid by the command ESC =(selecting perpheral).

·When sending printer current state,each state is indicated by 1 byte.

·Transmission state value of the printer can not confirm whether the master computer received.

·Printer will carry out the command immediately once received.

·This command is just available to the serial printer.The printer will carry out the command immediately under any state.

n = 1: Printer State

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fix as 0
1	1	02	2	Fix as 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	Online
	1	08	8	Offline
4	1	10	16	Fix as 1
5,6				Undefined
7	0	00	00	Fix as 0

n = 2: Offline State

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fix as 0
1	1	02	2	Fix as1
2	0	00	0	Close the cover
	1	04	4	Open the cover
3	0	00	0	Not pressing the feed button
	1	08	8	Pressing the feed button
4	1	10	16	Fix as 1
5	0	00	0	The printer is not out of paper
	1	20	32	The printer is out of paper
6	0	00	0	No error state
	1	40	64	Error state
7	0	00	0	Fix as 0

n = 3: Error State

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Fix as 0
1	1	02	2	Fix as 1

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2	-	-	-	Undefined
3	0	00	0	No error on the cutter
	1	08	8	Error on the cutter
4	1	10	16	Fix as 1
5	0	00	0	No unrecoverable error
	1	20	32	Have unrecoverable error
6	0	00	0	No automatic recovery error
	1	40	64	Have automatic recovery error
7	0	00	0	Fix as 0

n = 4: Paper sensor state

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Fix as 0
1	1	02	2	Fix as 1
2,3	0	00	0	Paper is enough
	1	0C	12	Paper is out
4	1	10	16	Fix as 1
5,6	0	00	0	Paper ending sensor:have paper
	1	60	96	Paper ending sensor:paper is out
7	0	00	0	Fix as 0

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

DLE ENQ n

[Name] Real time request

[Format]

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

[Range] 1 ≤n ≤ 2

[Description] Responding to the request of master computer.Meaning of “n” is as below:

n	Request content
1	Recover from the error and restart printing the line that the error occurred. ·This command will be ignored if the error is recoverable.
2	Recover from the error and clear the command to receive and print the content in buffer. ·This command will be ignored if the error is recoverable.

[Notice] ·This command is only available when the cutter has error.

·Under serial mode,the printer will carry out the command immediately.

·Under parallel mode， the command will not be carried out when the printer is busy.

·Try not to insert this command into the command sequence of 2 or more bytes.

·This command will be also available even the printer is set to forbid by the command ESC =(selecting perpheral)

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[Reference] **DLE EOT**

DLE DC4 fn m t (fn=1)

[Name] Real-time generating cash drawer firing pulse

[Format]

ASCII	DLE	DC4	fn	m	t
Hex	10	14	fn	m	t
Decimal	16	20	fn	m	t

[Range] fn = 1
m = 0, 1
1 ≤ t≤ 8

[Description] Generating the desired firing pulse at assigned pin of the cash drawer socket,the pin is appointed by “m”

m	**Connecting Pin**
0	Pin of cash drawer socket 2
1	Pin of cash drawer socket 5

Time of high level pluse is[t × 100 ms]，time of low level is [t × 100 ms]

[Notice] · The command will be ignored when the printer is under error condition.

·When the printer is carrying out the command of opening the cash drawer（ESC p or DEL DC4）,this command will be neglected.

·Under serial mode,the printer will carry out the command immediately once received.

·Under parallel mode,the printer will not carry out the command when it is busy.

·If the printing datas includes the same datas with this command,these datas will be carried out as this command.Users must be in view of this situation.

·Try not to insert this command into the command sequence of 2 or more bytes.

·This command will be also available even the printer is set to forbid by the command ESC =(selecting perpheral).

[Reference] **ESC p**

DLE DC4 fn a b (fn=2)

[Name] Carry out close-down sequence

[Format]

ASCII	DLE	DC4	fn	a	b
Hex	10	14	fn	a	b
Decimal	16	20	fn	a	b

[Range] fn = 2
a = 1
b = 8

[Description] · Carry out close-down sequence,send close-down notice.
· Save the value of counter.
· Set the interface as “busy”.
· Set the printer in standby mode.

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[Notice] ·If the printing datas includes the same datas with this command,these datas will be carried out as this command.Users must be in view of this situation.

·Try not to insert this command into the command sequence of 2 or more bytes.

· This command does not turn the power off,user needs to turn off the power after reveiving the close-down notice returned.

· After carrying out this command,the printer will not do any other things,in order to make the printer print again,user must turn it on again,or reset the hardware.

[Reference]

DLE DC4 fn d1…d7 (fn=8)

[Name] Clear the buffer

[Format]

ASCII	DLE	DC4	fn	d1…d7
Hex	10	14	fn	d1…d7
Decimal	16	20	fn	d1…d7

[Range] fn =8

d1=1，d2=3，d3=20，d4=1，d5=6，d6=2，d7=8

[Description] · Clear datas in receiving and printing buffer,and transfer clear response.

· Recover from error if there is any recoverable error.

[Notice] · Don't use this command in the system of using OPOS or JavaPOS driver.

·If the printing datas includes the same datas with this command,these datas will be carried out as this command.Users must be in view of this situation.

·Try not to insert this command into the command sequence of 2 or more bytes.

· After sending this command,do not send other datas before receiving the return state.

ESC FF

[Name] Print under page mode

[Format]

ASCII	ESC	FF
Hex	1B	0C
Decimal	27	12

[Description] Print contents in printer buffer under page mode.

[Notice] · This command is only effective under page mode.

· After printing ,the printer will not clear contents in printing buffer,characters setted and position of ESC T and ESC W.

[Reference] **FF, ESC L, ESC S**

ESC SP n

[Name] Setting the right space of characters

[Format]

ASCII	ESC	SP	n
Hex	1B	20	n
Decimal	27	32	n

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[Range] 0 ≤ n≤255

[Description] Setting the right space of character fro[n*units of lateral or longitudinal shifting]inches.

[Notice] · When characters are enlarged,the space will be enlarged in the same multiple.

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

· This command sets values independently in each mode.

· The GSP command can change the horizontal motion unit.But it will not change the right space.

· Under standard mode,the horizontal motion unit is used.

· Under page mode,selecting the horizontal or vertical motion unit according to direction and starting position,the methods are as below:

①When 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.

②When 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.

· The maximum right-side spacing is 255/203 inches. Any setting exceeding the maximum is converted to the maximum automatically.

[Default] n = 0

[Reference] **GS P**

ESC ! n

[Name] Select print mode

[Format]

ASCII	ESC	!	n
Hex	1B	21	n
Decimal	27	33	n

[Range] 0 ≤ n ≤ 255

[Description] Setting character print mode according to value of “n”

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Standard ASCII style (12 × 24)
	1	01	1	Compressing ASCII style (9 × 17)
1,2				Undefined
3	0	00	0	Cancel bold mode
	1	08	8	Select bold mode
4	0	00	0	Cancel double height mode
	1	10	16	Select double height mode
5	0	00	0	Cancel double width mode
	1	20	32	Select double width mode
6				Undefined
7	0	00	0	Cancel underline mode
	1	80	128	Select underline mode

[Notice] ·When both double-height and double-width modes are selected, quadruple size characters are printed.

·The printer can underline all characters, but can not underline the space set by

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HT or 90° clockwise rotated characters.

·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 $ nL nH

[Name] Setting 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] Sets the distance from the beginning of the line to the position at which subsequent characters are to be printed. The distance from the beginning of the line to the print position is [(nL + nH × 256) × (vertical or horizontal motion unit)] inches.

[Notice] ·Settings outside the specified printable area are ignored.

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

·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:

①When 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.

②When 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 % n

[Name] Select/cancel user-defined character set

[Format]	ASCII	ESC	%	n
	Hex	1B	25	n

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Decimal 27 37 n

[Range] 0 ≤ n ≤255

[Description] Selects or cancels 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.

[Notice] ·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] Defining user-defined characters

[Format] ASCII ESC & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

Hex 1B 26 y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

Decimal 27 38 y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

[Range] y = 3

32 ≤ c1 ≤ c2 ≤ 126

0 ≤ x ≤ 12 ASCII A (12× 24)

0 ≤ x ≤ 9 ASCII B (9 × 17)

0 ≤ d1 ... d(y × xk) ≤ 255

K=c2-c2+1

[Description] Defining user-defined characters

· y specifies the number of bytes in the vertical direction

· c1 specifies the beginning character code for the definition， c2 specifies the final code

· x specifies the number of dots in the horizontal direction

[Notice] · 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 onlyone character is desired,use c1 = c2。

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

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

· Setting a corresponding bit to 1 to print a dot or 0 to not print a dot.

· The user-defined character definition is cleared when:

① **ESC @** is carried out

② **ESC ?** is carried out

③ The printer is resetted 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.

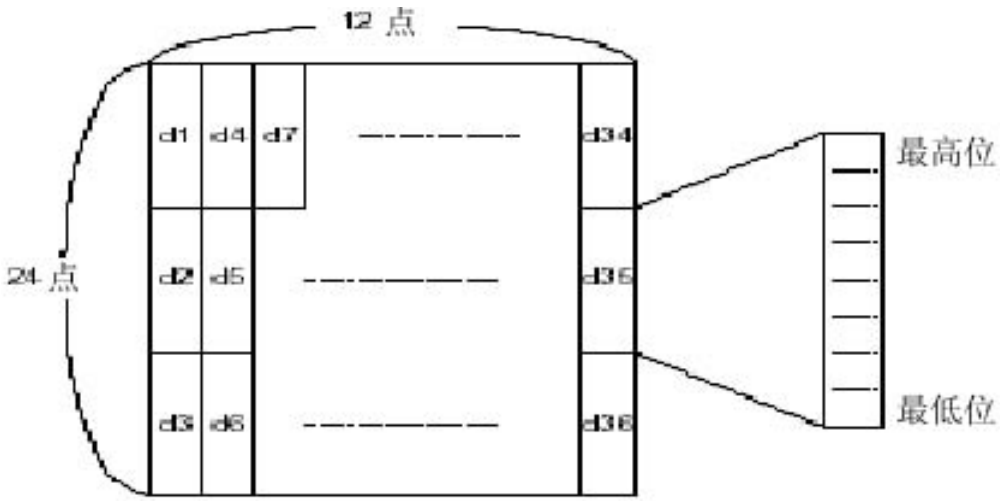
[Default] The internal character set

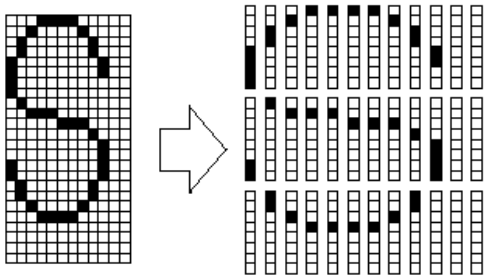
[Reference] **ESC %, ESC ?**

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[Example]

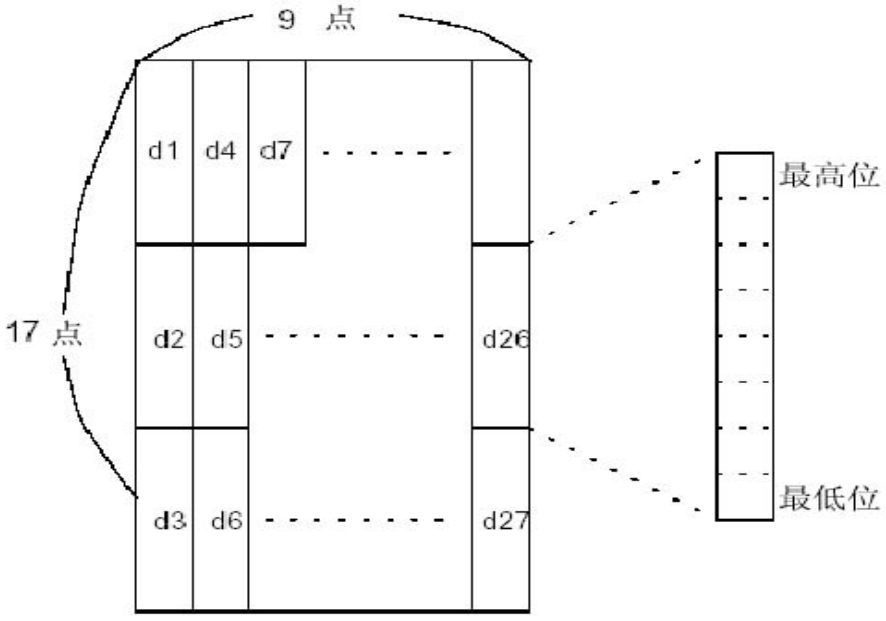
· When select standard ASCII (12 × 24)



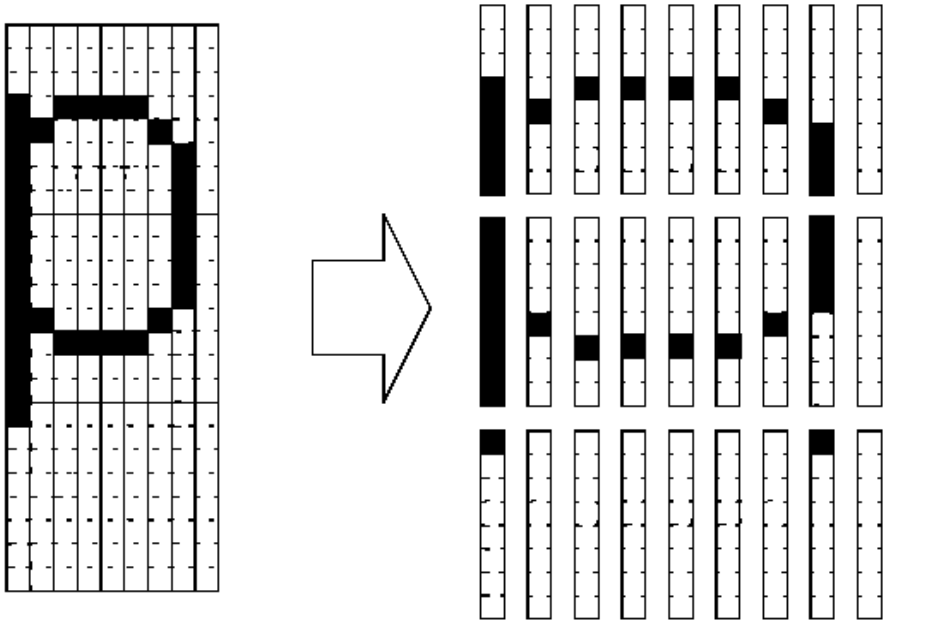


d1= <0F>H d4 = <30>H d7 = <40>H . . . .
d2 = <03>H d5 = <80>H d8 = <40>H . . . .
d3 = <00>H d6 = <00>H d9 = <20>H . . . .

·When select compressed ASCII (9 × 17)



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ESC * m nL nH d1... dk

[Name] Selecting bit-map 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] Selecting a bitmap mode specified by m,storing the bitmap data in printing buffer,the number of bitmap is specified by nL and nH:

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

[Notice] · If the value of m exceeds the specified range,nL and the data following will be processedas normal data.

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· The nL and nH indicate the number of dots of the bitmap in ht ehorizonal direction.The total number of dots is nL + nH × 256。

· The part exceeds the current area will be ignored

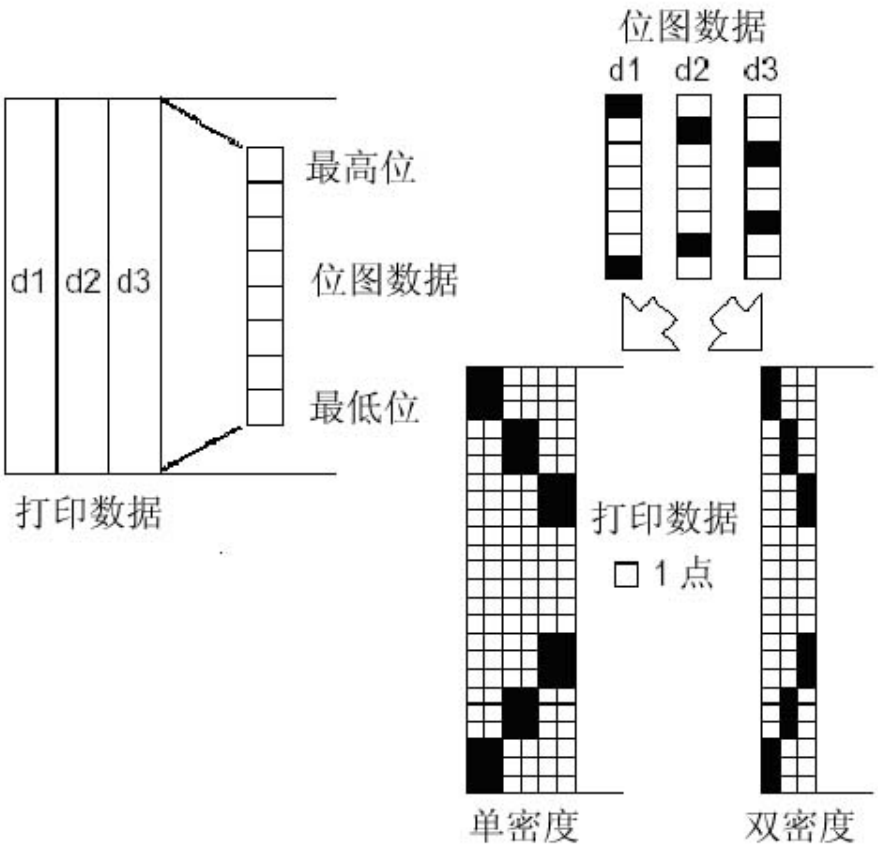
· d is the data of bitmap.Setting a corresponding bit to 1 to print a dot or to 0 to not print a dot.

· After finishing sending the bitmap data,the printer will return to normal data processing mode.

· This command will not be affected by other printing mode(wmphasized,double-strike,underline,character size enlarging or white-black reverse printing) except upside-down printing mode.

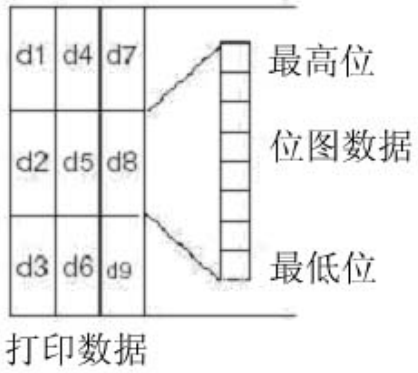
· The relationship between the data and printing dot is as below:

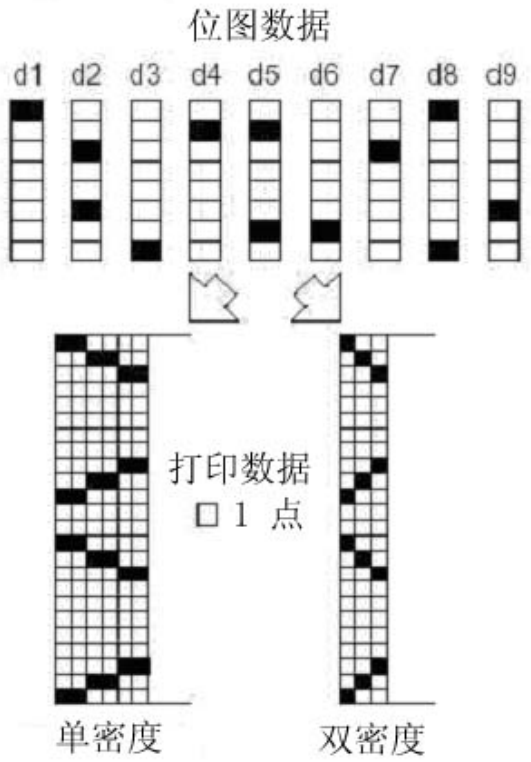
· When select 8dots density



·When select 24dots density:

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ESC - n

[Name] Selecting/Canceling underline mode

[Format]

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

[Range] 0 ≤ n ≤2, 48 ≤n ≤ 50

[Description] Selecting/Canceling underline mode according to value of n：

n	**Function**
0, 48	Canceling underline mode
1, 49	Selecting underline mode(1 dot wide)
2, 50	Selecting underline mode(2 dots wide)

[Notice]
·The printer can underline all characters (including right-side character spacing), But cannot underline the space set by HT.
·The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
·When underline mode id turned off by setting the value of n to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off Does not change. The default underline thickness is 1 dot.
·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 !**

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ESC 2

[Name] Select default line spacing

[Format] ASCII ESC 2

Hex 1B 32

Decimal 27 50

[Description] Selecting 32dots line space（4mm，about 1/6 inch）.

[Notice] ·The line spacing can be set independently in standard mode and in page mode.

[Reference] **ESC 3**

ESC 3 n

[Name] Setting line space

[Format] ASCII ESC 3 n

Hex 1B 33 n

Decimal 27 51 n

[Range] 0 ≤ n ≤ 255

[Description] Sets the line spacing to [n × vertical or horizontal motion unit] inches.

[Notice] · The line spacing can be setted independently in standard mode and in page mode.

· The horizontal and vertical motion unit are specified by **GS P** .Changing the horizontal or vertical motion unit does not affect the current line spacing.

· 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：

① When the starting position is setted to the upper left or lower right of the printable area using **ESC T** the horizontal motion unit(x) is used；

② When the starting position is setted to the upper right or lower left of the printable area using **ESC** T,the horizontal motion unit(x) is used；

· The maximum paper feed amount is 1016 mm (40 inches).Even if a paper feed amout of more than it is setted,the printer feeds the paper only 1016mm.

[Default] The default line height is 4mm (about 1/6 inch)。

[Reference] **ESC 2**, **GS P**

ESC = n

[Name] Selecting printer

[Format] ASCII ESC = n

Hex 1B 3D n

Decimal 27 61 n

[Range] 0≤ n ≤ 1

[Description] Selecting printer,the printer selected can receive the data from host computer ：

Bit	1/0	Hex	Decimal	Function

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0	0	00	0	Printer Forbided
	1	01	1	Printer Allowed
1-7				Undefined

[Notice] · When the printer is forbided,it will ignore all the command except the real-time command **(DLE EOT, DLE ENQ, DLE DC4**) until this command is allowed.

[Default] n = 1

ESC ? n

[Name] Cancel user-defined characters

[Format]

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

[Range] 32 ≤n ≤126

[Description] Cancel user-defined characters

[Notice] · This command cancels the pattern defined for the character code specified by n.After the user-defined character 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 !**

· This command will be ignored if there is no user-defined character.

[Reference] **ESC** &, **ESC %**

ESC @

[Name] Initialize printer

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

[Description] Clear the data in printing buffer,printing mode will be setted as the default mode when the power turns on.

[Notice] · DIP switch settings are not checked again.

· The data in receive buffer is not cleared.

· The macro definition is not cleared.

· flash bitmap data will not be cleared

· flash user's data will not be cleared

· Value setted by **GS (E** will not be cleared

ESC D n1...nk NUL

[Name] Setting horizontal tab position

[Format]

ASCII	ESC	D	n1...nk	NUL
Hex	1B	44	n1...nk	00

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Decimal 27 68 n1...nk 0

[Range] 1 ≤ n1 ≤n2 ≤…≤nk≤ 255

0 ≤ k ≤ 32

[Description] Setting horizontal tab position

· 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 setted.

[Notice] · The horizontal tab position is stored as a value of [character width*n] measured from the beginning of the line.The character width includes the rightside character spacing,and double-width characters are setted with twice the width of normal characters.

· This command cancels the previous horizontal tab setting

· When n = 8， the printing position is moved to column 9.

· Up to 32 tab positions(k=32) can be setted.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 position.

· 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 for 8 standard ASCII character for font A(12 × 24)

[Reference] **HT**

ESC E n

[Name] Turn emphasized mode on/off

[Format] ASCII ESC E n

Hex 1B 45 n

Decimal 27 69 n

[Range] 0 ≤ n ≤ 255

[Description] Turn emphasized mode on/off

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

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

[Notice] · Only the least significant bit of n is enabled.

· This command and **ESC !** turn on and off emphasized mode in the same way.

[Default] n = 0

[Reference] **ESC !**

ESC G n

[Name] Turn on/off double-strike mode

[Format] ASCII ESC G n

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	Hex	1B	47	n
	Decimal	27	71	n

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

[Description] Turn on/off double-strike mode

· 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.

[Notice] · 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 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] Prints the data in the print buffer and feeds the paper [n*vertical or horizontal motion unit] inches.

[Notice] · After printing is completed,this command sets the print starting position to the beginning of the line

· The paper feed amout set by this command does not affect the values set by **ESC 2 or ESC 3**.

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

· In standard mode,the printer uses the vertical motion unit(y).

· In page mode,this command functions as follows,depending on the starting position of the printable area:

① When the starting position is setted to the upper left or lower right oftheprintable area using **ESC T,**the vertical motion unit(y) is used;

② When the starting position is setted to the upper right or lower left oftheprintable area using **ESC T**,the horizontal motion unit(x) is used;

· The maximum line spacing is 1016 mm (40 inches). When the setting value exceedsthe maximum,it is converted to the maximum automatically.

[Reference] **GS P**

ESC L

[Name] Select page mode

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

[Description] Switches from standard mode to page mode.

[Notice] · This command is enabled only when processed at the beginning of a line in

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standard mode.

· This command has no effect in page mode.

· After printing by **FF** or **ESC S**,the printer returns to standard mode.

· This command sets the printing position at it specified by **ESC T** and **ESC W**.

· This command will switch tbe setting of the commands below to the value under page mode:

① Set right-side character spacing: **ESC SP, FS S**

② Set line space：**ESC 2, ESC 3**

· Only value settings is possible for the following commands in page mode;these commands are not executed.

① Turn 90° clockwise rotation mode on/off：**ESC V**

② Select justification：**ESC a**

③ Turn upside-down printing mode on/off：**ESC {**

④ Set left margin：**GS L**

⑤ Set printable area width：**GS W**

· The following command is ignored in page mode:

① Execute test print：**GS (A**

· The following command is not available in page mode:

① Print NV bitmap：**FS p**

② Define NV bitmap：**FS q**

③ Write to user NV memory：**FS g 1**

④ Print raster bit image：**GS v 0**

· The printer returns to standard mode when power is turned on,the printer is reset,or **ESC** @ is used.

[Reference] **FF, CAN, ESC FF, ESC S, ESC T, ESC W, GS $, GS **

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 font

n	Function
0,48	Select standard ASCII font (12 × 24)
1,49	Select compressed ASCII font (9 × 17)

[Default] n = 0

ESC R n

[Name] Select international character set

[Format]

ASCII	ESC	R	n
Hex	1B	52	n

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Decimal 27 82 n

[Range] 0 ≤n ≤ 15

[Description] Select the international character set n from the list below

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 characters except simplified Chinese］

[Reference]

ESC S

[Name] Select standard mode

[Format] ASCII ESC S

Hex 1B 53

Decimal 27 83

[Description] Select standard mode

[Notice] · This command is effective only in page mode.

· Data uffer in page mode are cleared.

· This command sets the print position to the beginning of the line

· The page mode area is resetted to default.

· This command switches the setting for the following commands to those for standard mode:

① Set right-side character spacing：**ESC SP, FS S**

② Select line space：**ESC 2, ESC 3**

· The following commands are enabled only to set in standard mode：

① Set printing area in page mode: **ESC W**

② Select print direction in page mode: **ESC T**

· The following commands will be ignored under standard mode：

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① Set absolute vertical print position in page mode： **GS $**

② Set relative vertical print position in page mode：**GS **

· Standard mode is selected automatically when power is turned on,the printer is resetted,or command **ESC** @ is used.

[Reference] **FF, ESC FF, ESC L**

ESC T n

[Name] Select print direction in page mode

[Format]

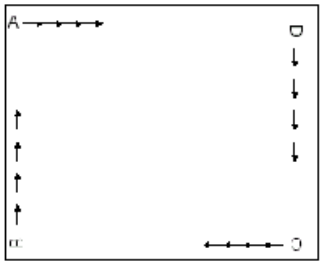
ASCII	ESC	T	n
Hex	1B	54	n
Decimal	27	84	n

[Range] $0 \le n \le 3$ $48 \le n \le 51$

[Description] Selects the print direction and starting position in page mode.

n specifies the print direction and starting position as follows：

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



[Notice] · When the command is input in standard mode,the printer executes only internal flag operation.This command does not affect printing in standard mode.

· Parameters for horizontal or vertical motion units (x or y) differ as follows,depending on the starting position of the printing area:

① If the starting position is the upper left or lower right of the printing area,data is buffered in the direction perpendicular to the paper feed direction:

Commands using horizontal motion units：**ESC SP, ESC $, ESC **

Commands using vertical motion units：**ESC 3, ESC J, GS $, GS **

② If the starting position is the upper right or lower left of the printing area,data is buffered in the paper feed direction:

Commands using horizontal motion units：**ESC 3, ESC J, GS $, GS **

Commands using vertical motion units：**ESC SP, ESC $, ESC **

[Default] n = 0

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

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] $0 \le n \le 2$, $48 \le n \le 50$

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

n is used as follows：

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

[Notice] · 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 W xL xH yL yH dxL dxH dyL dyH

[Name] Set printing area in page mode

[Format]

ASCII	ESC	W	xL xH	yL yH	dxL dxH	dyL dyH
Hex	1B	57	xL xH	yL yH	dxL dxH	dyL dyH
Decimal	27	87	xL xH	yL yH	dxL dxH	dyL dyH

[Range] $0 \leq$ xL, xH, yL, yH, dxL, dxH, dyL, dyH ≤ 255 (except dxL= dxH=0 or dyL= dyH=0)

[Description] · The horizontal starting position,vertical starting position,printing area width,and printing area height are defined as x0,y0,dx(inch),dy(inch),respectively.Each setting for the printing area is calculated as follows：

x0：x0 = [(xL + xH × 256) × horizontal motion unit]

y0：y0 = [(yL + yH × 256) × vertical motion unit]

dx：dx = [(dxL + dxH × 256) × horizontal motion unit]

dy：dy = [(dyL + dyH × 256) × vertical motion unit]

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

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

· If the printing area width or height is set to 0,the printer stops command processing and processes the following data as normal data.

· This command sets the position where data is buffered to the position specified by **ESC T** within the printing area.

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

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

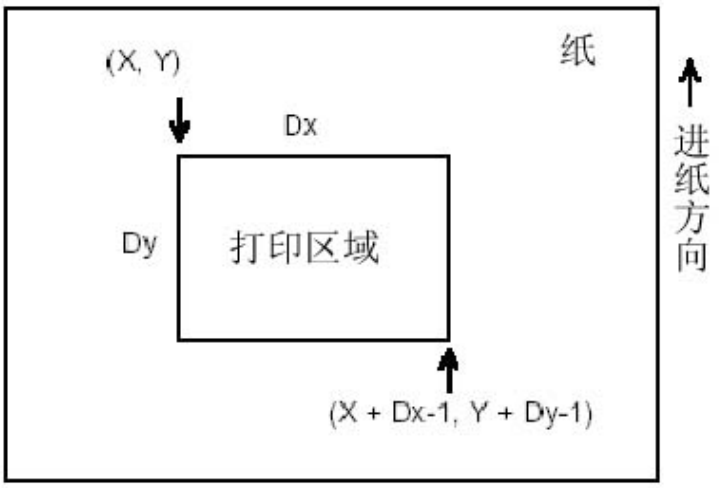
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position)

· The horizontal and vertical motion unit are specified by **GS P**，changing the horizontal or vertical motion unit does not affect the current printing area.

· Use the horizontal motion unit (x) for setting the horizontal starting position and printing area width,and use the vertical motion unit (y) for setting the vertical starting position and printing area height.

· When the horizontal starting position,vertical starting position,printing area width and printing area height are defined as X,Y Dx,and Dy respectively,the printing area is set as shown in the figure below：



[Default] Related to the configuration of the printer

[Reference] **CAN, ESC L, ESC T, GS P**

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 ≤ nl ≤ 255 0 ≤ nH ≤ 255

[Description] Sets 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 ×┐ 256)● × horizontal or vertical motion unit]

[Notice] ·Any setting that exceeds the printable area is ignored.

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

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

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

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

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

·In standard mode, the horizontal motion unit is used.

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

①When 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.

②When 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 ≤ n ≤ 2, 48 ≤ n ≤ 50

[Description] Aligns 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

[Notice] ·The command is enabled only when processed at the beginning of the line in standard mode.

·This command executes justification in the printing area.

·This command justifies the space area according to **HT, ESC $** or **ESC** \.

[Default] n = 0

[Example]



ESC c 3 n

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

[Format]

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

[Range] 0 ≤ n ≤ 255

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

·Each bit of n is used as follows:

Bit	**0/1**	**Hex**	**Decimal**	**Function**

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

[Notice] ·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.
· This command is only effective under parallel.
·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 paper sensor(s) to stop printing
·Value of n are as below：

Bit	**0/1**	**Hex**	**Decimal**	**Funtion**
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
2-7				Undefined

[Notice] ·When either bit 0 or 1 is on,paper roll near end sensor is enabled,when it tests the paper roll is ending,after printing the current text,the printer will enter off line state.

[Default] n = 0

ESC c 5 n

[Name] Enable/disable panel buttons

[Format]

ASCII	ESC	c	5	n
Hex	1B	63	35	n

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	Decimal	27	99	53	n

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

[Description] Enable/disable panel buttons

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

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

[Notice] ·Only the lowest bit of n is valid.

· When the panel buttons are disabled, none of them are usable

· 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 d n

[Name] Print and feed n lines

[Format]	ASCII	ESC	d	n
	Hex	1B	64	n
	Decimal	27	100	n

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

[Description] Prints the data in the print buffer and feeds n lines.

[Notice] ·This command sets 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.

· The maximum paper feed amount is 1016 mm (40 inches). If the paper feed amount (nx line spacing) of more than 1016 mm (40 inches) is specified, the printer feeds the paper only 1016 mm (40• inches).

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

ESC p m t1 t2

[Name] Generate Drawer kick-out connector 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

$0 \le t1 \le 255$, $0 \le t2 \le 255$

[Description] Outputs 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

[Notice] · The pluse On time is [t1 × 2 ms] ， and off time is [t2 × 2 ms]。

· If t2 < t1, the Off time is [t1 × 2 ms]。

[Reference] **DLE DC**4

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ESC t n

[Name] Selecting character code page

[Format]

ASCII	ESC	t	n
Hex	1B	74	n
Decimal	27	116	n

[Range] 0 ≤n ≤ 255

[Description] Select character code page n from the list below:

N	Code page	Code Page
0	CP437 [美国，欧洲标准]	CP437 [U.S.A., Standard Europe]
1	KataKana [片假名]	Katakana
2	PC850 [多语言]	PC850 [Multilingual]
3	PC860 [葡萄牙]	PC860 [Portuguese]
4	PC863 [加拿大-法语]	PC863 [Canadian-French]
5	PC865 [北欧]	PC865 [Nordic]
6	WCP1251 [斯拉夫语]	WCP1251 [Cyrillic]
7	CP866 斯拉夫2	CP866 Cyrilliec #2
8	MIK[斯拉夫/保加利亚]	MIK[Cyrillic /Bulgarian]
9	CP755 [东欧，拉脱维亚 2]	CP755 [East Europe，Latvian 2]
10	[伊朗，波斯]	Iran
11	保留	reserve
12	保留	reserve
13	保留	reserve
14	保留	reserve
15	CP862 [希伯来]	CP862 [Hebrew]
16	WCP1252 [拉丁语 1]	WCP1252 Latin I
17	WCP1253 [希腊]	WCP1253 [Greek]
18	CP852 [拉丁语 2]	CP852 [Latina 2]
19	CP858 [多种语言拉丁语 1+欧元符]	CP858 Multilingual Latin Ⅰ+Euro)
20	伊朗Ⅱ[波斯语]	Iran II
21	拉脱维亚	Latvian
22	CP864 [阿拉伯语]	CP864 [Arabic]
23	ISO-8859-1 [西欧]	ISO-8859-1 [West Europe]
24	CP737 [希腊]	CP737 [Greek]
25	WCP1257 [波罗的海]	WCP1257 [Baltic]
26	[泰文1]	Thai 1
27	CP720[阿拉伯语]	CP720[Arabic]
28	CP855	CP855
29	CP857[土耳其语]	CP857[Turkish]
30	WCP1250[中欧]	WCP1250[Central Eurpoe]
31	CP775	CP775
32	WCP1254[土耳其语]	WCP1254[Turkish]
33	WCP1255[希伯来语]	WCP1255[Hebrew]

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34	WCP1256[阿拉伯语]	WCP1256[Arabic]
35	WCP1258[越南语]	WCP1258[Vietnam]
36	ISO-8859-2[拉丁语2]	ISO-8859-2[Latin 2]
37	ISO-8859-3[拉丁语3]	ISO-8859-3[Latin 3]
38	ISO-8859-4[波罗的语]	ISO-8859-4[Baltic]
39	ISO-8859-5[斯拉夫语]	ISO-8859-5[Cyrillic]
40	ISO-8859-6[阿拉伯语]	ISO-8859-6[Arabic]
41	ISO-8859-7[希腊语]	ISO-8859-7[Greek]
42	ISO-8859-8[希伯来语]	ISO-8859-8[Hebrew]
43	ISO-8859-9[土耳其语]	ISO-8859-9[Turkish]
44	ISO-8859-15[拉丁语9]	ISO-8859-15 [Latin 3]
45	[泰文2]	Thai2
46	CP856	CP856

[Default] n = 0

[Reference]

ESC { n

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

[Format]

ASCII	ESC	{	n
Hex	1B	7B	n
Decimal	27	123	n

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

[Description] Turns on/off upside-down printing mode

·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.

[Notice] ·Only the lowest bit of n is valid.;

· This command is enabled only when processed at the beiginning of a line in standard mode.

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

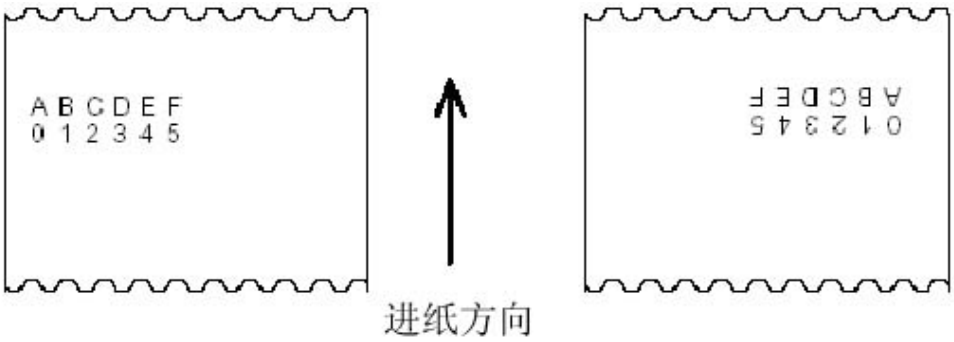
· This command does not affect printing in page mode.

· In upside-down printing mode,the printer rotates the line to be printed by 180° and then prints it.

[Default] n = 0

[Example]

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FS g 1 m a1 a2 a3 a4 nL nH d1 … dk

[Name] Define the NV user's memory

[Format]

ASCII	FS	g	1	m	a1	a2	a3	a4	nL	nH	d1 … dk	
Hex	1C	67	31	m	a1	a2	a3	a4	nL	nH	d1 … dk	
Decimal	28	103	49	m	a1	a2	a3	a4	nL	nH	d1 … dk	

[Range] m = 0

0 ≤ (a1 + a2 × 256 + a3 × 65536 + a4 × 16777216) ≤ 1023

(0 ≤ a1 ≤ 255, 0 ≤ a2 ≤ 3, a3 = 0, a4 = 0)

1 ≤ (nL + nH × 256) ≤ 1024 (0 ≤ nL ≤ 255, 0 ≤ nH ≤ 4)

32 ≤ d ≤ 255

k = (nL + nH × 256)

Total memory capacity = 1KB.

[Description] · Store (*nL* + *nH* × 256)byte data (*d1...dk*) to the NV user's memory whichi begins with (*a1* + *a2* × 256 + *a3* × 65536 + *a4* ×16777216)

[Notice] ·Carrying out the command of NV memory frequently will damage it,writing 10 times of NV memory a day is recommended.

· When the printer is carrying out this command,power off or reset the printer through interface will make the printer enter abnormal state.So please do not do those when the printer is carrying out this command.

· When the printer is carrying out this command and writing data into NV memory,the state of the printer will change into busy and stop receiving data.So when the printer is busy,please do not send data to the printer,including real-time command.

FS g 2 m a1 a2 a3 a4 nL nH

[Name] Read the NV user's memory

[Format]

ASCII	FS	g	2	m	a1	a2	a3	a4	nL	nH
Hex	1C	67	32	m	a1	a2	a3	a4	nL	nH
Decimal	28	103	50	m	a1	a2	a3	a4	nL	nH

[Range] m = 0

0 ≤ (a1 + a2 × 256 + a3 × 65536 + a4 × 16777216) ≤ 1023

(0 ≤ a1 ≤ 255, 0 ≤ a2 ≤ 3, a3 = 0, a4 = 0)

1 ≤ (nL + nH × 256) ≤ 80 (0 ≤ nL ≤ 80, nH = 0)

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[Description] · Send the byte data (*nL* + *nH*× 256) begins with (*a1* + *a2* × 256 + *a3* × 65536 + *a4* ×16777216)

[Notice] · Don't make PC to send any other data before this command finishing sending data.

GS ! n

[Name] Select character size

[Format]

ASCII	GS	!	n
Hex	1D	21	n
Decimal	29	33	n

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

（$1 \le$ vertical number of times ≤ 8，$1 \le$ horizontal number of times ≤ 8）

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

Bit	0/1	Hex	Decimal	Function
0-3	Character height selection，see table1			
4-7	Character width selection，see table 2			

Table 1

Character height selection

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

Table 2

Character width selection

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

[Notice] · This command is all characters（ASCII and Chinese）effective except for HRI.

· If n is out 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 !**

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GS $ nL nH

[Name] Set absolute vertical print position in page mode

[Format]

ASCII	GS	$	nL	nH
Hex	1D	24	nL	nH
Decimal	29	36	nL	nH

[Range] $0 \le nL \le 255, 0 \le nH \le 255$

[Description] ·Set absolute vertical print position in page mode

· This command sets the absolute print position to [(nL + nH × 256) × (vertical or horizontal motion unit)] inches.

[Notice] · This command is effective only in page mode.

· If [(nL + nH × 256) × (vertical or horizontal motion unit)]exceeds the specified printing area,this command is ignored.

· The horizontal starting buffer position does not move.

· The reference starting position is that specified by **ESC T** .

· This command and operates as follows,depending on the starting position of the printing area specified by **ESC T** ：

① When the starting position is setted to the upper left or lower right,this command sets the absolut position in the vertical direction.

② When the starting position is setted to the upper right or lower left,this command sets the absolute position in the horizontal direction

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

[Reference] **ESC $, ESC T, ESC W, ESC \, GS P, 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)

$0 \le n \le 2$, $48 \le n \le 50$

$1 \le m \le 3$, $49 \le m \le 51$

[Description] · Executes a test print with a specified test pattern on a specified paper.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	

m specifies a test pattern

m	Test pattern
1, 49	Hexadecimal dump

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2, 50	Priter status print
3, 51	Rolling pattern print

[Notice] · This command is enabled only when processed at the beginning of a line in standard mode.

· This command is not effective in page mode.

· When this command is received during macro definition,the printer ends macro definition and begins performing this command.

· After carrying out this command，the printer will reset automatically and read theDIP switch setting.

· The printer cuts the paper at the end of the test print.

· The printer is on buse state while this command is carrying out.

GS (D pL pH m [a1 b1] … [ak bk]

[Name] Permitting/Forbidding real-time command

[Format]

ASCII	GS	(	D	pL	pH	m	[a1 b1] … [ak bk]
Hex	1D	28	44	pL	pH	m	[a1 b1] … [ak bk]
Decimal	29	40	68	pL	pH	m	[a1 b1] … [ak bk]

[Range] 3 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

m = 20

a = 1, 2

b = 0, 1, 48, 49

[Description] · To confirm permitting/forbidding real-time command through a

· pL,pH（pL+pH×256）specify the number of byte after（m,[a1 b1]…[ak bk]）。

a	b	Function
1	0, 48	DLE DC4 fn m t (fn = 1):No treatment（Forbid）
	1, 49	DLE DC4 fn m t (fn = 1):Treatment（Permit）
2	0, 48	DLE DC4 fn a b (fn = 2): No treatment（Forbid）
	1, 49	DLE DC4 fn a b (fn = 2): Treatment（Permit）

[Notice] · If the bitmap data including the same data string with **DLE DC4** (*fn* = 1 or 2),we suggest to use this command to prihibit real-time command in advance.

GS (E pL pH fn [parameters]

[Name] Setting users' installed command

[Format]

ASCII	GS	(	E	pL	pH	fn	[parameters]
Hex	1D	28	45	pL	pH	fn	[parameters]
Decimal	29	40	69	pL	pH	fn	[parameters]

[Description] ·Controling users' setting mode.

· pL,pH（pL+pH×256）specify the number of byte afer pH（fn,[parameter]）。

· fn specifies the function

· [parameter] specifies the treatment of every function.

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fn	Format	Function no.	Name
1	GS (E pL pH fn d1 d2	1	Entry user setting mode
2	GS (E pL pH fn d1 d2 d3	2	Ending user setting mode
5	GS (E pL pH fn [a1 n1L n1H] ... [ak nkL nkH]	5	Setting the user's setting value
6	GS (E pL pH fn a	6	Sending the user's setting value
11	GS (E pL pH fn a d1…dk	11	Setting the configuration item of serial
12	GS (E pL pH fn a	12	Sending the configuration item of serial

[Notice] ·Carrying out the command of writing in NV memory frequently will damage it,writing 10 times of NV memory a day is recommended.

·When the printer is carrying out this command,power off or reset the printer through interface will make the printer enter abnormal state.So please do not do those when the printer is carrying out this command.

· When the printer is carrying out this command and writing data into NV memory,the state of the printer will change into busy and stop receiving data.So when the printer is busy,please do not send data to the printer,including real-time command.

· When using <Function 1、6 or12> to send data,before it is over,don't make PC to send other data

<Function 1 > **GS (E pL pH fn d1 d2** (fn=1)

[Name] Entry users setting mode

[Format]

ASCII	GS	(	E	pL	pH	fn	d1	d2
Hex	1D	28	45	pL	pH	fn	d1	d2
Decimal	29	40	69	pL	pH	fn	d1	d2

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

fn = 1

d1 = 73

d2 = 78

[Description] · Enter user setting mode and send back the notice of mode changing.

<Function 2 > **GS (E pL pH fn d1 d2 d3** (fn=2)

[Name] Ending user setting mode

[Format]

ASCII	GS	(	E	pL	pH	fn	d1	d2	d3
Hex	1D	28	45	pL	pH	fn	d1	d2	d3
Decimal	29	40	69	pL	pH	fn	d1	d2	d3

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

fn = 2

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d1 = 79
d2 = 85
d3 = 84

[Description] ·Ending user setting mode and resetting the software.
· Clearing the receiving and printing buffer.
· Resetting all the setting value influenced by powering on in RAM（Printing Range、font and other setting）,（It does not influence the data in NV memroy）

<Function 5 > **GS (E pL pH fn [a1 n1L n1H]…[ak nkL nkH]** (fn=5)

[Name] Setting the user's setting value

[Format]

ASCII	GS	(	E	pL	pH	fn	[a1 n1L n1H] ... [ak nkL nkH]
Hex	1D	28	45	pL	pH	fn	[a1 n1L n1H] ... [ak nkL nkH]
Decimal	29	40	69	pL	pH	fn	[a1 n1L n1H] ... [ak nkL nkH]

[Range] 4 ≤ (pL + pH × 256) ≤ 65533 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)
fn = 5
a = 5, 6, 97, 116, 118
0 ≤ (nL + nH × 256) ≤ 6, (nL + nH × 256) = 100, 65530 ≤ (nL + nH × 256) ≤ 65535
(0 ≤ nL ≤ 6, nH = 0, nL = 100, nH = 0, 250 ≤ nL ≤ 255, nH = 255) [when a = 5]
1 ≤ (nL + nH × 256) ≤ 9 (1 ≤ nL ≤ 9, nH = 0) [when a = 6]
(nL + nH × 256) = 1, 2, 4, 128 (nL = 1,2,4,128, nH = 0) [when a = 97]
(nL + nH × 256) = 1, 257 (nL = 1, nH = 0,1) [when a = 116]
(nL + nH × 256) = 70, 85 (nL = 70,85, nH = 0) when a = 118]

[Description] · Setting the user's setting value as the value of (nL + nH × 256).

a	Type of user's value
5	Printing Density
6	Printing Speed
97	Number of zone heating of thermal head
116	Printing control（single or double color）
118	Density of black in double color printing

· Setting printing density（a＝5）

(nL + nH × 256)	Printing Density	
100	Setting printing density according to DIP switch setting	
65530	Select Density Level1	Light
65531	Select Density Level 2	|
65532	Select Density Level 3	|
65533	Select Density Level 4	|
65534	Select Density Level 5	|
65535	Select Density Level 6	|
0	Select Density Level 7	Standard
1	Select Density Level 8	|
2	Select Density Level 9	|
3	Select Density Level 10	|
4	Select Density Level 11	|

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5	Select Density Level 12	|
6	Select Density Level 13	Dark

· Setting Printing Speed（a＝6）

(nL + nH × 256)	Printing Speed	
1	Select Speed Level 1	Slow
2	Select Speed Level 2	|
3	Select Speed Level 3	|
4	Select Speed Level 4	|
5	Select Speed Level 5	|
6	Select Speed Level 6	|
7	Select Speed Level 7	|
8	Select Speed Level 8	|
9	Select Speed Level 9	Fast

· Setting frequency of zone heating of thermal head（a＝97）

(nL + nH × 256)	frequency of zone heating of thermal head
1	One time heating
2	Two times heating
4	Four times heating
128	Automatic control frequency of zone heating

· Printing control（Single or double color）（a＝116）

(nL + nH × 256)	Printing Control
1	Single color printing control
257	Double color printing control

· When select double color printing,prohibiting use the single color thermal paper.

· Density of black in double color printing（a＝118

(nL + nH × 256)	Black Density
70	Light
85	Standard

· Black density is only valid under double color printing mode

[Default] (nL + nH × 256) = 100 (nL = 100, nH = 0) [When a = 5]
(nL + nH × 256) = 9 (nL = 9, nH = 0) [When a = 6]
(nL + nH × 256) = 128 (nL = 128, nH = 0) [When a = 97]
(nL + nH × 256) = 1 (nL = 1, nH = 0) [When a = 116]
(nL + nH × 256) = 85 (nL = 85, nH = 0) [When a = 118]

<Function 6 > **GS (E pL pH fn a** (fn=6)

[Name] Sending user's setting value

[Format]

ASCII	GS	(	E	pL	pH	fn	a
Hex	1D	28	45	pL	pH	fn	a
Decimal	29	40	69	pL	pH	fn	a

[Range] (pL + pH × 256) = 2 (pL = 2, pH =0)
fn = 6
a = 5, 6, 97, 116, 118

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[Description] · Sending user's setting value confirmed by a.

a	Type of user's setting value
5	Printing Density
6	Printing Speed
97	frequency of zone heating of thermal head
116	Printing control(single or double color)
118	Density of black in double color printing

<Function 11 > **GS (E pL pH fn a d1 … dk** (fn=11)

[Name] Setting configuration item of serial

[Format]

ASCII	GS	(	E	pL	pH	fn	a	d1 …dk
Hex	1D	28	45	pL	pH	fn	a	d1 …dk
Decimal	29	40	69	pL	pH	fn	a	d1 …dk

[Range] 3 ≤ (pL + pH × 256) ≤ 65533 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

fn = 11

a = 1

48 ≤ d ≤ 57

[Description] ·Setting the configuration item of serial a as the value of d

a	Configuration item
1	Baud rate

· Setting of baud rate（a＝1）

d1 … dk	Baud rate
"2400"	2400 bps
"4800"	4800 bps
"9600"	9600 bps
"19200"	19200 bps
"38400"	38400 bps
"57600"	57600 bps
"115200"	115200 bps

[Notice] · The configuration item setted by this function can be actived by carrying out **GS (E** <function 2> or resetting the printer.Notice:the PC must can make itself to communicate with the printer.

[Default] · *d1...dk* = "38400"。

<Function 12 > **GS (E pL pH fn a** (fn=12)

[Name] Sending configuration item of serial

[Format]

ASCII	GS	(	E	pL	pH	fn	a
Hex	1D	28	45	pL	pH	fn	a
Decimal	29	40	69	pL	pH	fn	a

[Range] (pL + pH × 256) =2 (pL = 2, pH = 0)

fn = 12

a = 1

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[Description] ·Sending the configuration item of the serial which specified by a .

a	Configuration Item
1	Baud rate

GS (H pL pH fn [parameters]

[Name] Request to send response or state

[Format]

ASCII	GS	(	H	pL	pH	fn	[parameters]
Hex	1D	28	48	pL	pH	fn	[parameters]
Decimal	29	40	72	pL	pH	fn	[parameters]

[Description] · Responses of different processing tags (ID).

· pL,pH（pL+pH×256）indicates the byte count（fn,[parameter]）after pH.

· fn means function。

· [parameter] indicates the processing of every function.

fn	Format	Fn no.	Function Name
48	GS (H pL pH fn m d1 d2 d3 d4	48	Setting the reponses of processing tags(ID)

[Notice] · Do not use this command on the printer system controled by OPOS or JavaPOS driver.

<Function 48 > GS (H pL pH fn m d1 d2 d3 d4 (fn=48)

[Name] Setting response of processing tags (ID)

[Format]

ASCII	GS	(	H	pL	pH	fn	m	d1 d2 d3 d4
Hex	1D	28	48	pL	pH	fn	m	d1 d2 d3 d4
Decimal	29	40	72	pL	pH	fn	m	d1 d2 d3 d4

[Range] (pL + pH × 256) = 6 (pL = 6, pH = 0)

fn = 48

m = 48

32 ≤ d ≤ 126

[Description] · Conserve the processing tags (ID) indicated by（d1，d2，d3，d4,when the tag is sent back,it indicates all the data before this function have been carried out.

GS (K pL pH fn [parameters]

[Name] Selecting the printing control method

[Format]

ASCII	GS	(	K	pL	pH	fn	[parameters]
Hex	1D	28	4B	pL	pH	fn	[parameters]
Decimal	29	40	75	pL	pH	fn	[parameters]

[Description] ·Selecting the printing control method

· pL,pH（pL+pH×256）indicates the byte count（fn,[parameter]）after pH.

· fn means the function

· [parameter] indicates the processing of every function.

fn	Format	Fn no.	Function Name

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50	GS (K pL pH fn m	50	Selecting printing speed
97	GS (K pL pH fn m	97	Selecting frequency of zone heating of thermal head

<Function 50 > **GS (K pL pH fn m** (fn=50)

[Name] Selecting the printing speed

[Format]

ASCII	GS	(	K	pL	pH	fn	m
Hex	1D	28	4B	pL	pH	fn	m
Decimal	29	40	75	pL	pH	fn	m

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

fn = 50

0 ≤ m ≤ 9， 48 ≤ m ≤ 57

[Description] ·Selecting the printing speed

m	Printing Speed	
0，48	Value setted by command **GS (E** <function 5：a＝6>	
1，49	Select speed level 1	slow
2，50	Select speed level 2	|
3，51	Select speed level 3	|
4，52	Select speed level 4	|
5，53	Select speed level 5	|
6，54	Select speed level 6	|
7，55	Select speed level 7	|
8，56	Select speed level 8	|
9，57	Select speed level 9	fast

[Notice] · When select the low power consumption mode,the setted value above will be ignored.

[Default] m = 0 （Value setted by command **GS (E** <function 5：a＝6>）

<Function 97 > **GS (K pL pH fn m** (fn=97)

[Name] Selecting frequency of zone heating of thermal head

[Format]

ASCII	GS	(	K	pL	pH	fn	m
Hex	1D	28	4B	pL	pH	fn	m
Decimal	29	40	75	pL	pH	fn	m

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

fn = 97

0 ≤ m ≤ 2， 48 ≤ m ≤ 50，m = 4，52，128

[Description] ·Selecting frequency of zone heating of thermal head

m	Printing Speed
0，48	Value setted by command **GS (E** <function 5：a＝97>
1，49	1 time heating
2，50	2 times heating
4，52	4 times heating
128	Automatic control frequency of zone heating

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[Notice] · It is valid when select the single color printing,when select the autocontrol method,it is one time heating printing normally,when there are more printing dots(high capacity),it will be two times heating printing,

· When select the double color printing,the heating method of the thermal printer head will be fixed as “2 times heating printing”.

·When select the low power consumption mode,the setted value above will be ignored

[Default] m = 0 （Value setted by command **GS (E** <function 5：a＝97>）

GS (L pL pH m fn [parameters]

GS 8 L p1 p2 p3 p4 m fn [parameters]

[Name] Setting figures

[Format]

ASCII	GS	(	L	pL	pH	m	fn	[parameters]		
Hex	1D	28	4C	pL	pH	m	fn	[parameters]		
Decimal	29	40	76	pL	pH	m	fn	[parameters]		
ASCII	GS	8	L	p1	p2	p3	p4	m	fn	[parameters]
Hex	1D	38	4C	p1	p2	p3	p4	m	fn	[parameters]
Decimal	29	56	76	p1	p2	p3	p4	m	fn	[parameters]

·Description below only direct at command **GS (L** to explain

· Notice: **GS (L** and **GS 8 L** have the same function

· If the parameters in format descriotion exceeded 65533,it will use **GS 8 L**。

·Differences between **GS (L** and **GS 8 L** have been listed in the form below,there is no expliaction of **GS 8 L** in the command function descrition below,but the parameters of [Range]、[Description] 、[Notice] 、[Default]] except in the form below are all the same with **GS (L**.

<The parameters in the form show the number of parameters after pH or p4 >

Command	Parameters	Structure	Mac
GS (L	pL，pH	2byte	65,535
GS 8 L	P1，p2，p3，p4	4byte	4,294,967,295

[Description] · Processing the graphicdata.

· pL,pH（pL+pH×256）indicates the byte count （m,fn,[parameter]）after pH.

· fn means function

· [parameter] indicates processing of each funtion.

fn	Format	Fn no.	Function Name
0,48	GS (L pL pH m fn	48	Memory capacity of send NV graph
2,50	GS (L pL pH m fn	50	Printing the graphdata in buffer
3,51	GS (L pL pH m fn	51	Sending remaining NV graph memroy capacity
64	GS (L pL pH m fn d1 d2	64	Sending defined index code of NV graph

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65	GS (L pL pH m fn d1 d2 d3	65	Deleting all the NV graphdata
66	GS (L pL pH m fn kc1 kc2	66	Deleting the indicated NV graphdata
67	GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1... [c d1...dk]b	67	Defining the NV graphdata（raster format）
69	GS (L pL pH m fn kc1 kc2 x y	69	Ptinting the indicated graphdata
112	GS (L pL pH m fn a bx by c xL xH yL yH d1…dk	112	Storing the graphdata in printing buffer（raster format）

[Notice] ·Carrying out the command of writing in NV memory frequently will damage it,writing 10 times of NV memory a day is recommended.

·When the printer is carrying out this command,power off or reset the printer through interface will make the printer enter abnormal state.So please do not do those when the printer is carrying out this command.

· When the printer is carrying out this command and writing data into NV memory,the state of the printer will change into busy and stop receiving data.So when the printer is busy,please do not send data to the printer,including real-time command.

· When using <Function 48、51 or 64> to send data,before it is over,don't send other data.When use <function 64>,user must use the specified handshake protocol.

<Function 48 > **GS (L pL pH m fn** (fn=0，48)

[Name] Sending NV graph memory capacity

[Format]								
	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	67	pL	pH	m	fn

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

m = 48

fn = 0，48

[Description] · Sending all the memory capacity of NV graph（Byte count of NV graph storage area）.

<Function 50 > **GS (L pL pH m fn** (fn=2，50)

[Name] Printing the graphdata in printing buffer

[Format]								
	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	67	pL	pH	m	fn

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

m = 48

fn = 2，50

[Description] · Printing the graphdata processed by **GS (L**<function 112> in buffer.

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<Function 51 > **GS (L pL pH m fn** (fn=3，51)

[Name] Sending remaining memory capacity of NV graph

[Format]	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	67	pL	pH	m	fn

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)
m = 48
fn = 3，51

[Description] ·Sending remaining byte count of NV graph memory.

<Function 64 > **GS (L pL pH m fn d1 d2** (fn=64)

[Name] Sending defined index code list of NV graph

[Format]	ASCII	GS	(	L	pL	pH	m	fn	d1	d2
	Hex	1D	28	4C	pL	pH	m	fn	d1	d2
	Decimal	29	40	67	pL	pH	m	fn	d1	d2

[Range] (pL + pH × 256) = 4 (pL = 4, pH = 0)
m = 48
fn = 64
d1 = 75
d2 = 67

[Description] ·Sending defined index code list of NV graph

<Function 65 > **GS (L pL pH m fn d1 d2 d3** (fn=65)

[Name] Delete all the NV graphdata

[Format]	ASCII	GS	(	L	pL	pH	m	fn	d1	d2	d3
	Hex	1D	28	4C	pL	pH	m	fn	d1	d2	d3
	Decimal	29	40	67	pL	pH	m	fn	d1	d2	d3

[Range] (pL + pH × 256) = 5 (pL = 5, pH = 0)
m = 48
fn = 65
d1 = 67
d2 = 76
d2 = 82

[Description] ·Delete all the NV graphdata

<Function 66 > **GS (L pL pH m fn kc1 kc2** (fn=66)

[Name] Delete the specified NV graphdata

[Format]	ASCII	GS	(	L	pL	pH	m	fn	kc1	kc2

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Hex	1D	28	4C	pL	pH	m	fn	kc1	kc2
Decimal	29	40	67	pL	pH	m	fn	kc1	kc2

[Range] (pL + pH × 256) = 4 (pL = 4, pH = 0)
m = 48
fn = 65
32 ≤ kc1 ≤ 126
32 ≤ kc2 ≤ 126

[Description] · Delete the NV graphdata specified by index code（kc1 and kc2）.

<Function 67 >

GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1…dk]1…[c d1…dk]b (fn=67)

[Name] Defining NV graphdata

[Format]

ASCII	GS	(	L	pL pH m fn a kc1 kc2 b xL xH yL yH [c d1…dk]1…[c d1…dk]b
Hex	1D	28	4C	pL pH m fn a kc1 kc2 b xL xH yL yH [c d1…dk]1…[c d1…dk]b
Decimal	29	40	67	pL pH m fn a kc1 kc2 b xL xH yL yH [c d1…dk]1…[c d1…dk]b

[Range] (pL, pH) for **GS (L**:
12 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)
(p1, p2, p3, p4) for **GS 8 L**:
12 ≤ (p1 + p2 × 256 + p3 × 65536 + p4 × 16777216) ≤ 4294967295
(0 ≤ p1 ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)
Order parameter of **GS (L** and **GS 8 L**:
m = 48
fn = 67
a = 48
32 ≤ kc1 ≤ 126
32 ≤ kc2 ≤ 126
b = 1 ［when select single color control printing］
b = 1, 2 ［when select double color control printing］
1 ≤ (xL + xH × 256) ≤ 8192 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 32)
1 ≤ (yL + yH × 256) ≤ 2304 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 9)
c = 49 ［when select single color control printing］
c = 49, 50 ［when select double color control printing］
0 ≤ d ≤ 255
k = (int ((xL + xH × 256) + 7) / 8) × (yL + yH × 256)
Max capacity = 256 KB

[Description] · Defining the NV graphdata specified by index code（kc1 and kc2）.
· b indicates the number of the color of parameter defined.
· xL,X indicate the number of horizontal dot (xL + xH × 256)。
· yL,yH indicate the number of transversal dot (yL + yH × 256)。
· c indicates the color of parameter.

c	The defined color of parameter (*)
49	Color 1
50	Color 2

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(*) Color 1 indicates the black of specified double color thermal paper.
Color 2 indicates the red of specified double color thermal paper.

· d indicates the defined data（raster format）。

[Notice] · When there is no enough space to store the NV graphdata indicated by (xL + xH × 256) and (yL + yH × 256),this function will be ignored.

· When carrying out this function,it will occupy the NV graphdata area : data bule（k）＋control information byte count（24 byte）

· NV graph and NV bitmap（**FS q**）can not be defined at the same time,when carrying out this function,it will delete all the NV bitmap.

<Function 69 > **GS (L pL pH m fn kc1 kc2 x y** (fn=69)

[Name] Printing the specified NV graphdata

[Format]

ASCII	GS	(	L	pL	pH	m	fn	kc1	kc2	x	y
Hex	1D	28	4C	pL	pH	m	fn	kc1	kc2	x	y
Decimal	29	40	67	pL	pH	m	fn	kc1	kc2	x	y

[Range] (pL + pH × 256) = 6 (pL = 6, pH = 0)

m = 48

fn = 69

32 ≤ kc1 ≤ 126

32 ≤ kc2 ≤ 126

x = 1，2

y = 1，2

[Description] · Printing the NV graphdata indicated by index code（kc1 and kc2）.

· The magnification times(vertical and horizontal) of graphdata is confirmed by x,y.

X，y	vertical	horizontal
1	203dpi	203dpi
2	101dpi	101dpi

<Function 112> **GS (L pL pH m fn a bx by c xL xH yL yH d1…dk** (fn=112)

[Name] Storing NV graphdata in buffer（raster format）

[Format]

ASCII	GS	(	L	pL pH m fn a bx by c xL xH yL yH d1…dk
Hex	1D	28	4C	pL pH m fn a bx by c xL xH yL yH d1…dk
Decimal	29	40	67	pL pH m fn a bx by c xL xH yL yH d1…dk

[Range] (pL, pH) for **GS (L**：

12 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

(p1, p2, p3, p4) for **GS 8 L**：

12 ≤ (p1 + p2 × 256 + p3 × 65536 + p4 × 16777216) ≤ 4294967295

(0 ≤ p1 ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)

Order parameter of **GS (L** and **GS 8 L**:

m = 48

fn = 112

a = 48

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bx = 1, 2 ［when select single color control printing］
by = 1, 2 ［when select double color control printing］
c = 49 ［when select single color control printing］
c = 49, 50 ［when select double color control printing］
1 ≤ (xL + xH × 256) ≤ 2047 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 7)
when select single color control printing：
1 ≤ (xL + xH × 256) ≤ 1662 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 6) ［by = 1］
1 ≤ (yL + yH × 256) ≤ 831 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 3 ［by = 2］
when select double color control printing：
1 ≤ (xL + xH × 256) ≤ 831 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 3) ［by = 1］
1 ≤ (yL + yH × 256) ≤ 415 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 1 ［by = 2］
0 ≤ d ≤ 255
k = (int ((xL + xH × 256) + 7) / 8) × (yL + yH × 256)
Max capacity = 256 KB

[Description] · Storing NV graphdata in buffer（raster format）。
·The magnification times(vertical and horizontal) of graphdata is confirmed by x,y.

Bx，by	vertical	horizontal
1	203dpi	203dpi
2	101dpi	101dpi

· c indicates the color of parameter.

c	The defined color of parameter (*)
49	Color 1
50	Color 2

(*)Color 1 indicates the black of specified double color thermal paper.
Color 2 indicates the red of specified double color thermal paper.
· xL，xH indicate the number of horizontal dot (xL + xH × 256)。
· yL，yH indicate the number of vertical dot (yL + yH × 256)。
· d indicates the stored data（raster format）.

[Notice] · Double color printing must use the special double color thermal paper.
· Special model printer can support double color printing.

GS (N pL pH fn [parameters]

[Name] Select font

[Format]

ASCII	GS	(	N	pL	pH	fn	[parameters]
Hex	1D	28	4E	pL	pH	fn	[parameters]
Decimal	29	40	78	pL	pH	fn	[parameters]

[Description] ·Select font
· pL,pH（pL+pH×256）indicate the byte count（fn,[parameter]）after pH
· fn means function
· [parameter] indicates the processing of each funtion.

fn	Format	Fn no.	Function Name
48	GS (N pL pH fn m	48	Select the character color

[Notice] · This command is only valid when double color printing

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<Function 48 > **GS (N pL pH fn m** (fn=48)

[Name] Select character color

[Format]

ASCII	GS	(	N	pL	pH	fn	m
Hex	1D	28	4E	pL	pH	fn	m
Decimal	29	40	78	pL	pH	fn	m

[Range] (pL + pH × 256) = 6 (pL = 6, pH = 0)

fn = 48

m = 49，50

[Description] ·Select character color

M	character color (*)
49	Color 1
50	Color 2

(*))Color 1 indicates the black of specified double color thermal paper.（High heating capacity）。

Color 2 indicates the red of specified double color thermal paper.（Low heating capacity）。

[Notice] ·Special model printer can support double color printing.

[Default] m = 49

GS (k pL pH cn fn [parameters]

[Name] Setting and printing symbols

[Description] · Processing the symbolic data

· pL,pH（pL+pH×256）indicate the byte count（cn,fn,[parameter]）after pH

· cn means the type of seat No.

· fn means function

· [parameter] indicates processing of each funtion

Cn	Symbol type
48	PDF417 （two-dimension code）
49	QR CODE （two-dimension code）

cn	fn	Format	Fn No,	Function Name
48	65	GS (k pL pH cn fn n	065	PDF417：Setting columns number of printing data area
	66	GS (k pL pH cn fn n	066	PDF417：Setting lines number
	67	GS (k pL pH cn fn n	067	PDF417：Setting width of module
	68	GS (k pL pH cn fn n	068	PDF417：Setting row height
	69	GS (k pL pH cn fn m n	069	PDF417：Setting level of error correction
	70	GS (k pL pH cn fn m	070	PDF417：Selecting option
	80	GS (k pL pH cn fn m d1…dk	080	PDF417：Storing data in symbol storage area

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	81	GS (k pL pH cn fn m	081	PDF417：Printing the symbolic data in symbol storage area
	82	GS (k pL pH cn fn m	082	PDF417：Sending information of symbolic data size in symbol storage area
49	65	GS (k pL pH cn fn n1 n2	165	QR CODE：Selecting mode
	67	GS (k pL pH cn fn n	167	QR CODE：Setting the size of module
	69	GS (k pL pH cn fn n	169	QR CODE：Setting level of error correction
	80	GS (k pL pH cn fn m d1…dk	180	QR CODE：Storing data in symbol storage area
	81	GS (k pL pH cn fn m	181	QR CODE：Printing the symbolic data in symbol storage area
	82	GS (k pL pH cn fn m	182	QR CODE：Sending information of symbolic data size in symbol storage area

· “symbolic data” indicates the data before the code received by<function 80 or 180>

· “symbol storage area” indicates the area storing the data before the code received by <function 80 or 180>

[Notice] ·When using <Function 82 or 182> to send data,before it is over,don’t send other data.

<Function 065 > **GS (k pL pH cn fn n** (cn=48,fn=65)

[Name] PDF417：Setting lines number of printing area

[Format]

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

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

cn = 48

fn = 65

0 ≤ n ≤ 30

[Description] ·Setting lines number of PDF417 printing area.

· When n=,it means automatic processing.Under this condition,the line number of data printing area can be gotten from printing digit number or printing range.

· When n≠0,the line number of data printing area is n digits.

[Notice] · Line number does does not include the data below.

· Start and end symbol

· Right and left line indexs symbol

[Default] n = 0

[Reference]

<Function 066 > **GS (k pL pH cn fn n** (cn=48,fn=66)

[Name] PDF417：Setting rows

[Format]

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	pL	pH	cn	fn	n

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	Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 48
fn = 66
n =0, 3 ≤ n ≤ 90

[Description] · Setting PDF417 rows
·When n=,it means automatic processing.Under this condition,the row number of data printing area can be gotten from printing digit number or printing range.
· When n≠0,the row number of data printing area is n digits.

[Default] n = 0

<Function 067 > **GS (k pL pH cn fn n** (cn=48,fn=67)

[Name] PDF417：Setting width of module

[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n
	Hex	1D	28	6B	pL	pH	cn	fn	n
	Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 48
fn = 67
2 ≤ n ≤ 8

[Description] ·Setting width of PDF417 module as n dots

[Default] n = 3

<Function 068 > **GS (k pL pH cn fn n** (cn=48,fn=68)

[Name] PDF417：Setting height of module

[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n
	Hex	1D	28	6B	pL	pH	cn	fn	n
	Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 48
fn = 68
2 ≤ n ≤8

[Description] · Setting the height of PDF417 module as［n ×module width］。

[Default] n = 0

<Function 069 > **GS (k pL pH cn fn m n** (cn=48,fn=69)

[Name] PDF417：Setting level of error correction

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

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

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cn = 48

fn = 69

m = 48, 49

48≤ n ≤56 [当m =48]

0≤ n ≤40 [当m =48]

[Description] ·Setting level of error correction of PDF417

· When m = 48,setting level of error correction as “level mode”,and cancel the error correction setted by “rate mode”.The digit count of error correction is as below:

n	funtion	Digit count
48	Level 0	2
49	Level 1	4
50	Level 2	8
51	Level 3	16
52	Level 4	32
53	Level 5	64
54	Level 6	128
55	Level 7	256
56	Level 8	512

·When m = 49,setting level of error correction as the level confirmed by digit data size according to“rate mode”,and cancel the error correction setted by “level mode”

Setting the rate as n×10%,the error correction level is confirmed by the formula ［data digit×n×0.1＝（A）］（decimal part rounds down）,the error correction digit is as below:

Result（A）	Function	Digit count
0～3	Level 1	5
4～10	Level 2	8
11～20	Level 3	16
21～45	Level 4	32
46～100	Level 5	64
101～200	Level 6	128
201～400	Level 7	256
401 or above	Level 8	512

[Default] m =49, n = 1

<Function 070 > **GS (k pL pH cn fn m** (cn=48,fn=70)

[Name] PDF417：Selecting the option

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

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

cn = 48

fn = 70

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m = 0, 1

[Description] ·Selecting the option of PDF417

m	Function
0	Select standard PDF417
1	Select necked PDF417

[Default] m = 0

<Function 080 > **GS (k pL pH cn fn m d1…dk** (cn=48,fn=80)

[Name] PDF417：Storing data in symbol storage area

[Format]

ASCII	GS	(	k	pL	pH	cn	fn	m	d1…dk
Hex	1D	28	6B	pL	pH	cn	fn	m	d1…dk
Decimal	29	40	107	pL	pH	cn	fn	m	d1…dk

[Range] 4 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255 , 0 ≤ pH ≤ 255)

cn = 48

fn = 80

m = 48,

0 ≤ d ≤ 255

K = (pL + pH × 256) - 3

[Description] ·Storing PDF417 symbolic data (d1…dk)in symbol storage area.

<Function 081 > **GS (k pL pH cn fn m** (cn=48,fn=81)

[Name] PDF417：Printing the symbolic data in symbol storage area

[Format]

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

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

cn = 48

fn = 81

m = 48,

[Description] · Coding and printing the PDF417 symbolic data stored in symbol storage area by **GS (k** <Function 080>.

[Notice] · User must reserve enough safe blank area for printing PDF417(including top and bottom,left and right margins defined by the PDF417 symbol standard)

· Under standard mode, the printer can not print the symbols height beyond 831dots.

<Function 082 > **GS (k pL pH cn fn m** (cn=48,fn=82)

[Name] PDF417：Sending size information of the symbolic data in symbol storage area

[Format]

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

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[Range] (pL + pH × 256) =3 (pL = 3 ,pH = 0)
cn = 48
fn = 82
m = 48,
[Description] · Sending code size information of PDF417 symbolic data stored in symbol storage area by **GS (k** <Function 080>.
[Notice] · This funcation can not print
· Size information does not includethe safe blank area（top and bottom,left and right margins defined by the PDF417 symbol standard）

<Function 165 > **GS (k pL pH cn fn n1 n2** (cn=49,fn=65)

[Name] CODE of Q: Selecting mode
[Format]

ASCII	GS	(	k	pL	pH	cn	fn	n1	n2
Hex	1D	28	6B	pL	pH	cn	fn	n1	n2
Decimal	29	40	107	pL	pH	cn	fn	n1	n2

[Range] (pL + pH × 256) = 4 (pL = 4, pH = 0)
cn = 49
fn = 65
n1 = 49, 50
n2 = 0
[Description] · Selecting mode of QR CODE.

n1	Function
49	Selecting computational algorithm mode 1
50	Selecting computational algorithm mode 2

[Default] n1 = 50，n2 = 0

<Function 167 > **GS (k pL pH cn fn n** (cn=49,fn=67)

[Name] QR CODE：Setting size of the module
[Format]

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

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 49
fn = 67
1 ≤ n ≤16
[Description] · Setting size of the QR CODE module as n dots.
[Default] n = 3

<Function 169 > **GS (k pL pH cn fn n** (cn=49,fn=69)

[Name] QRCODE：Setting error correction level

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[Format] ASCII GS (k pL pH cn fn n
Hex 1D 28 6B pL pH cn fn n
Decimal 29 40 107 pL pH cn fn n
[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 49
fn = 69
48≤ n ≤51
[Description] ·Setting error correction level of QR CODE.

N	Function	Reference：Rate of recovery code
48	Selecting level L	7%
49	Selecting level M	15%
50	Selecting level Q	25%
51	Selecting level R	30%

[Default] n=48

<Function 180 > **GS (k pL pH cn fn m d1…dk** (cn=49,fn=80)

[Name] QR CODE：Storing data in symbol storage area
[Format] ASCII GS (k pL pH cn fn m d1…dk
Hex 1D 28 6B pL pH cn fn m d1…dk
Decimal 29 40 107 pL pH cn fn m d1…dk
[Range] 4 ≤ (pL + pH × 256) ≤ 7092 (0 ≤ pL ≤ 255 , 0 ≤ pH ≤ 27)
cn = 49
fn = 80
m = 48,
0 ≤ d ≤ 255
K = (pL + pH × 256) - 3
[Description] · Storing the symbolic data （d1…dk）of QR CODE in symbol storage area.

<Function 181 > **GS (k pL pH cn fn m** (cn=49,fn=81)

[Name] QR CODE：Printing the symbolic data in symbol storage area
[Format] ASCII GS (k pL pH cn fn m
Hex 1D 28 6B pL pH cn fn m
Decimal 29 40 107 pL pH cn fn m
[Range] (pL + pH × 256) =3 (pL = 3 ,pH = 0)
cn = 49
fn = 81
m = 48,
[Description] · Coding and printing the QR CODE symblic data stored in symbol storage area by **GS (k** <Function 180>.
[Notice] ·User must reserve enough safe blank area for printing QR CODE (including top and

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bottom,left and right margins defined by the QR CODE symbol standard).

<Function 182 > **GS (k pL pH cn fn m** (cn=49,fn=82)

[Name] QR CODE：Sending size information of the symbolic data in symbol storage area

[Format]

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

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

cn = 49

fn = 82

m = 48,

[Description] ·Sending size information of the QR CODE symbolic data stored in symbol storage area by **GS (k** <Function 180>.

[Notice] · This function can not be used in printing

·Size information does not includethe safe blank area（top and bottom,left and right margins defined by the QR CODE symbol standard）.

GS * x y d1...d(x × y × 8)

[Name] Define downloaded bitmap

[Format]

ASCII	GS	*	x	y	d1...dk
Hex	1D	2A	x	y	d1...dk
Decimal	29	42	x	y	d1...dk

[Range] $1 \le x \le 255$, $1 \le y \le 48$

$x \times y \le 1536$

$0 \le d \le 255$

k=x× y× 8

[Description] Defines a downloaded bit map 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 od bitmap.

[Notice] · The number of dots in the horizontal direction is x × 8,in the vertical direction is y × 8.

· If x × y is out of the specified range,this command is disabled.

· d indicates bit map data.Data (d) specifies a bit printed to 1 and not printed to 0.

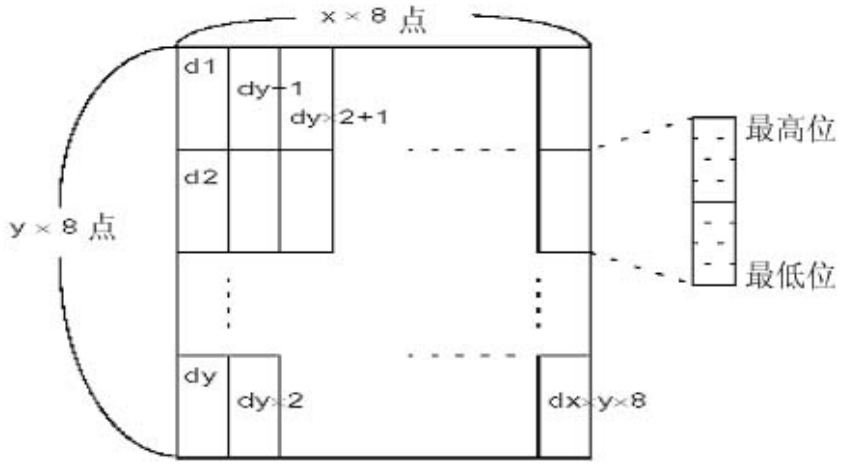
· The downloaded bitmap definition is cleared when：

① **ESC @** is executed.

② The printer resets or the power is off.

· The following figure shows the relationship between the download bitmap and the printed data：

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[Reference] **GS /**

GS / m

[Name] Print download bitmap

[Format]

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

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

[Description] Prints a downloaded bitmap using the mode specified by m.

m selects a mode from the table below：

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

[Notice]

· 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 upsidedown printing mode.

· If the download bitmap to be printed exceeds the printable area,the excess data is not printed.

. The bitmap downloaded by this command is the bitmap in RAM but not in FLASH.

[Reference] **GS** *

GS :

[Name] Star/end marco definition

[Format]

ASCII	GS	:	
Hex	1D	3A	
Decimal	29	58	

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[Description] Star/end marco definition

[Notice] · Macro definition stars when this command is received during normal operation.Macro definition ends when this commands 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 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 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.

[Notice] · Only the lowest bit of n is valid.

· This command is available for built-in characters and user-defined characters(except HRI character).

· When white/black reverse printing mode is on,it also applied to character spacing setted by **ESC SP**.

· This command does not affect bitmap,user-defined bitmap,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

GS H n

[Name] Select printing position for HRI characters

[Format]

ASCII	GS	H	n
Hex	1D	48	n
Decimal	29	72	n

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

[Description] Selects the printing position of HRI characters when printing a barcode.

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 is the character of bar code content notice.

[Notice] · HRI characters are printed using the font specified by **GS f** .

[Default] n = 0

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

GS I n

[Name] Transmit printer ID

[Format] ASCII GS I n

Hex 1D 49 n

Decimal 29 73 n

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

[Description] Transmits the printer ID specified by n as follows:

n	Printer ID	**Specification**	**ID (hexadecimal)**
1,49	Printer model ID	SP-POS88 series	20
2,50	Printer model ID	See the table below	
3,51	ROM version ID	Depends on ROM version	
65	Firmware version ID	Depends on Firmware version	
66	Manufacturer		
67	Printer Name	POS88V	
68	Serial number	Depends on serial number	
69	Support type	Simple Chinese: CHINA GB2312 Simple Chinese (Third level): CHINA GB18030 Taiwan model：TAIWAN BIG-5	

n = 2,printer type ID

Bit	**Off/On**	**Hex**	**Decimal**	**Function**
0	OFF	00	0	Two-byte character code not supported
	ON	01	1	Two-byte character code supported
1	ON	02	2	With cutter（Fixed）
2	OFF	00	0	Not used
3	OFF	00	0	Not used
4	OFF	00	0	Not used，Fixed as 0
5	_	_	_	Undefined

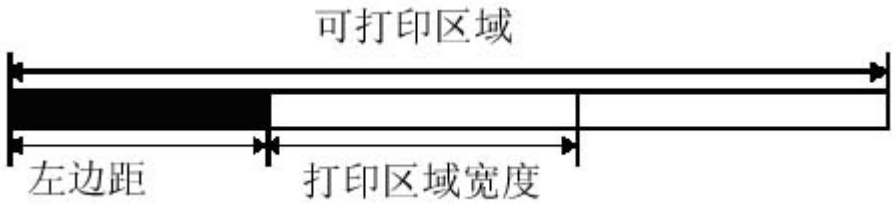
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6	_	_	_	Undefined
7	OFF	00	0	Not used，Fixed as 0

[Notice] · When 1 ≤ n ≤ 3 or 49 ≤ n ≤ 51,the printer will be back to single byte ID
· When 65 ≤ n ≤ 69, the returning format is as below：
Header: Hexadecimal = 5FH / Decimal = 95 (1 byte)
Data: Printer information
NUL: Hexadecimal = 00H / Decimal = 0 (1 byte)

GS L nL nH

[Name] Set left margin
[Format] ASCII GS L nL nH
Hex 1D 4C nL nH
Decimal 29 76 nL nH
[Range] 0 ≤ nL ≤ 255
0 ≤ nH ≤ 255
[Description] · Set left margin by nL and nH；
· Set the left margin as [(nL + nH × 256) × horizontal motion unit)] inches



[Notice] ·This command is effective only processed at the beginning of the line in standard mode.
· Under page mode,this command is invalid,the printer will process this command as command character.
· This command will not affect the printing under 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 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 ≤ x ≤ 255

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0 ≤ y ≤255

[Description] ·Sets the horizontal and vertical motion units to approximately 25.4/ x mm（ 1/ x inch）and approximately 25.4/ y mm（1/ y inch）。

· When x and y are setted as 0， x and y are as default。

[Notice] ·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 o 90 clockwise rotation)；

① Command using x ： **ESC SP, ESC $, ESC \, FS S, GS L, GS W**

② Command using y ： **ESC 3, ESC J, GS V**

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

① 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)：

Command using x： **ESC SP, ESC $, ESC W, ESC \, FS S**

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

② 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)：

Command using x： **ESC 3, ESC J, ESC W, GS $, GS **

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

· This command does not affect other settings.

· The minimum motion unit is the result from combining this command with others.

· One inch equal to 25.4mm.

[Default] x = 203, y = 203，at this time,one motion unit is a printing point.The horizontal distence is 1/8mm，vertical distence is 1/8mm。

[Reference] **ESC S**P, **ESC** $, **ESC** 3, **ESC** J, **ESC** W, **ESC** \, **GS** $, **GS** L, **GS** V, **GS** W, **GS **

①GS V m ②GS V m n

[Name] Select the cutting mode and cut paper

[Format]

①ASCII	GS	V	m	
Hex	1D	56	m	
Decimal	29	86	m	
②.ASCII	GS	V	m	n
Hex	1D	56	m	n
Decimal	29	86	m	n

[Range] ① m = 0，48，1， 49

② m = 65，66， 0 ≤n ≤255

[Description] Select a kind of cutting mode and cut paper.

Select the cutting mode according to the value of m：

M	**Cutting mode**
0，1，48，49	Partial cutting
65，66	Feeding paper（cutting position+[n ×（vertical motion unit） inch]）and cutting it.

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[Notice①and②]

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

[Notice②] · m = 0，48，1， 49，printer cuts the paper directly.

· When m = 65，66，the printer feeds paper[distence between printing positionand cutter position+ n ×（vertical motion unit）]and cut paper.

·The horizontal and vertical motion unit are specified by **GS P**

·The paper feed amount is calculated using the vertical motion unit (y).

GS W nL nH

[Name] Set printing area width

[Format]

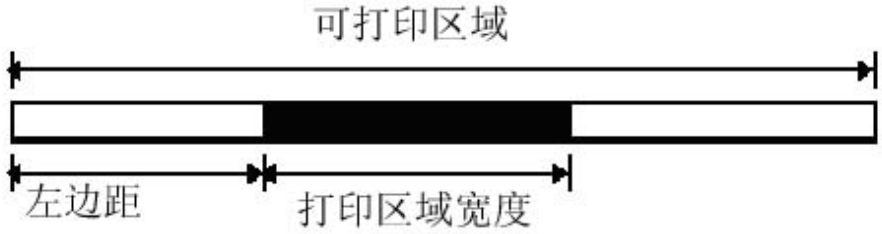
ASCII	GS	W	nL	nH
Hex	1D	57	nL	nH
Decimal	29	87	nL	nH

[Range] 0 ≤ nL ≤ 255

0 ≤ nH ≤ 255

[Description] Sets the printing area width to the area specified by nL and nH.·

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



[Notice] ·This command is effective only processed at the beginning of the line.

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

·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 unit does not affect the current left margin.

·The horizontal motion unit is used for calculating the printing area width.

[Default] nL = 64, nH = 2

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

GS \ nL nH

[Name] Set relative vertical print position in page mode

[Format]

ASCII	GS	\	nL	nH
Hex	1D	5C	nL	nH
Decimal	29	92	nL	nH

[Range] 0 ≤ nL ≤ 255

0 ≤ nH ≤ 255

[Description] Sets the relative vertica print starting position from the current position in page mode

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·This command sets the distance from the current position to [(nL+nH×256)×vertical or horizontal motion unit] inches.

[Notice] ·This command is ignored unless page mode is selected.

·When pitch N is specified to the movement downward：nL + nH × 256 = N

When pitch N is specified to the movement upward (the negative direction), use the complement：nL + nH × 256 = 65536 - N

·Any setting that exceeds the specified printing area is ignored.

·This command function as follows, depending on the print starting position set by **ESC T**：

① When the starting position is set to the upper left or lowe right of the printing, the vertical motion unit (y) is used.

② When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (x) is used.

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

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

[Reference] **ESC $, ESC T, ESC W, ESC \, GS $, GS P**

GS ^ r t m

[Name] Execute macro

[Format]

ASCII	GS	^	r	t	m	
Hex	1D	5E	r	t	m	
Decimal	29	94	r	t	m	

[Range] $0 \le r \le 255$

$0 \le t \le 255$

$m = 0, 1$

[Description] Executes a 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 × 100 ms

When the LSB of m=1：

The sensor of the printer will flash after waiting for t × 100 ms,until user press the feeding button,the printer will execute the macro and repeats for r times.

[Notice] ·The waiting time is t × 100 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 :**

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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] Enables or disables ASB and specifies the status items to include, using n as follows：

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

[Notes] ·If any of the status items in the table above are enabled, the printer transmits the status when this command is executed. The printer automatically transmits the status whenever the enabled status item changes. The disabled status items may change, in this case,because each status transmission represents the current status.

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

· The printer does not confirm whether the PC is ready when it returns the status byte automatically.

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

·When the printer is setted disabled by ESC = commandm,the printer will also return the status automatically as setted.

·The status to be transmitted are as follows:

First byte (printer information)

Bit	Off/On	Hex	Decimal	Printer Status
0	Off	00	0	No use,fix as 0
1	Off	00	0	No use,fix as 0
2	Off	00	0	Drawer kick-out connector pin 3 is Low
	On	04	4	Drawer kick-out connector pin 3 is High
3	Off	00	0	On-line
	On	08	8	Off-line
4	On	10	16	No use,fix as 0
5	Off	00	0	Cover is closed
	On	20	32	Cover is open
6	Off	00	0	Paper is not be fed by using the Paper Feed button

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	On	40	64	Paper is fed by using the Paper Feed button
7	Off	00	0	No use,fix as 0

第二字节 (打印机信息)

Bit	Off/On	Hex	Decimal	Printer Status
0	-	-	-	Undefined
1	-	-	-	Undefined
2	-	-	-	Undefined
3	Off	00	0	No auto cutter error
	On	08	8	Auto cutter error
4	Off	00	0	No use,fix as 0
5	Off	00	0	No recoverable error
	On	20	32	Recoverable error happened
6	Off	00	0	No recoverable error
	On	40	64	Recoverable error happened
7	Off	00	0	No use,fix as 0

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

Bit 6: 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	Off/On	Hex	Decimal	Printer Status
0,1	Off	00	0	Paper roll near-end sensor:paper present
	On	03	3	Paper is ending
2,3	Off .	00	0	Paper roll near-end sensor:paper present
	On .	0C	12	Paper is out
4	Off	00	0	No use,fix as 0
5,6	-	-	-	Undefined
7	Off	00	0	No use,fix as 0

Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Printer Status
0-3	-	-	-	Undefined
4	Off	00	0	No use,fix as 0
5,6	-	-	-	Undefined
7	Off	00	0	No use,fix as 0

GS b n

[Name] Flat modal On/Off

[Format] ASCII GS b n

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Hex 1D 62 n
Decimal 29 98 n

[Range] 0 ≤ n ≤ 255

[Description] Turn on/off the flat modal

· When the lowest bit of n is 0,the flat modal is off

· When the lowest bit of n is 1,the flat modal is on

[Notice] · It is valid only when n is at the lowest bit

· Flat modal is valid to inner wide and self-defining character.

· Even the flat modal is on,it will be not working of the width or height of the character is normal size.

[[Default] n = 0

[Reference] **GS** H, **GS k**

GS f n

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

[Format] ASCII GS f n
Hex 1D 66 n
Decimal 29 102 n

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

[Description] Selects 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 (12 × 24)
1,49	Compressed ASCII (9 × 17)

[Notice] ·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 g 0 m nL nH

[Name] Initializing computer maintenance

[Format] ASCII GS g 0 nL nH
Hex 1D 67 30 nL nH
Decimal 29 103 48 nL nH

[Range] m =0

(nL + nH × 256) = 20, 21, 50, 70 (nL = 20, 21, 50, 70, nH = 0)

[Description] Setting the computer maintenace that can be cleared and specified by（nL+nH × 256）to 0

nL + nH × 256
Hex Decimalist Maintenance Counter［Unit］

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14	20	Feeding lines［line］
15	21	Thermal head heating times［time］
32	50	Cutter operation times［time］
46	70	Printer working time［hour］

[Notice] ·Carrying out the command of writing in NV memory frequently will damage it,writing 10 times of NV memory a day is recommended.

·When the printer is carrying out this command,power off or reset the printer through interface will make the printer enter abnormal state.So please do not do those when the printer is carrying out this command.

· When the printer is carrying out this command and writing data into NV memory,the state of the printer will change into busy and stop receiving data.So when the printer is busy,please do not send data to the printer,including real-time command.

[Reference]

GS g 2 m nL nH

[Name] Sending maintenance counter

[Format]					
ASCII	GS	g	2	nL	nH
Hex	1D	67	32	nL	nH
Decimal	29	103	50	nL	nH

[Range] m =0

(nL + nH × 256) = 20, 21, 50, 70 , 148 , 149, 178, 198

(nL = 20, 21, 50, 70, , 148 , 149, 178, 198 , nH = 0)

[Description] Sending the value of maintenance counter specified by（nL+nH × 256）.

nL + nH × 256

Hex	Decimalist	Maintenance Counter［Unit］	Type of Maintenance Counter
14	20	Feeding lines［line］	
15	21	Thermal head heating times［time］	Can be resetted
32	50	Cutter operation times［time］	（Can be cleared）
46	70	Printer working time［hour］	
94	148	Feeding lines［line］	
95	149	Thermal head heating times［time］	Accumulated
B2	178	Cutter operation times［time］	
C6	198	Printer working time［hour］	

[Notice] · Value of maintenance counter is a measured value,so it is affected by timing error,turning off method and at what time to turn off.

· Please do not send other datas before the PC receiving the returned data when carrying out this command.

[Reference]

GS h n

[Name] Select bar code height

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[Format] ASCII GS h n
Hex 1D 68 n
Decimal 29 104 n
[Range] $1 \le n \le 255$
[Description] Select bar code height
The bar code height is n dots.
[Default] n = 162
[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$0 \le m \le 6$ （k and d depends on the bar code system used）
②$65 \le m \le 73$ （k and d depends on the bar code system used）
[Description] Selects a bar code system and prints the bar code.
m selects a bar code system as follows：

	m	**Bar code style**	**Character numner**	**d**
①	0	UPC-A	$11 \le k \le 12$	$48 \le d \le 57$
	1	UPC-E	$11 \le k \le 12$	$48 \le d \le 57$
	2	JAN13 (EAN13)	$12 \le k \le 13$	$48 \le d \le 57$
	3	JAN 8 (EAN8)	$7 \le k \le 8$	$48 \le d \le 57$
	4	CODE39	$1 \le k \le 255$	$45 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37,43
	5	ITF	$1 \le k \le 255$	$48 \le d \le 57$
	6	CODABAR	$1 \le k \le 255$	$48 \le d \le 57$, $65 \le d \le 68$, 36, 43, 45,46,47,58
②	65	UPC-A	$11 \le n \le 12$	$48 \le d \le 57$
	66	UPC-E	$11 \le n \le 12$	$48 \le d \le 57$
	67	JAN13 (EAN13)	$12 \le n \le 13$	$48 \le d \le 57$
	68	JAN 8 (EAN8)	$7 \le n \le 8$	$48 \le d \le 57$
	69	CODE39	$1 \le n \le 255$	$45 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37,43 d1 = dk = 42
	70	ITF	$1 \le n \le 255$	$48 \le d \le 57$
	71	CODABAR	$1 \le n \le 255$	$48 \le d \le 57$ $65 \le d \le 68$, 36, 43,45,46,47 58
	72	CODE93	$1 \le n \le 255$	$0 \le d \le 127$
	73	CODE128	$2 \le n \le 255$	$0 \le d \le 127$

[Notice ①

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·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.

[Notice 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.

[Notice （standard mode]）]

· If the bar code data d exceeds the range,this command will be ignored.

· If the horizontal size of the bar code exceeds the printing area,it will be ignored.

·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.

[Notice （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, this command is ignored.

·If bar code width exceeds the printing area, this command is ignored.

When CODE128 (m = 73)：

·Refer to Appendix A for the information of the CODE 128 bar code and its code table.

·When using the CODE 128 in this printer, take the following points into account for data transmission:

① The top of the bar code data string must be code set selection character (any of CODE A,CODE B or CODE C) which selects the first code set.

② Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

Specific character	**ASCII**	**Transmit data Hex**	**Decimal**

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

[Example] Example data for printing "No. 123456"

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

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



·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 r n

[Name] Transmit status

[Format]

ASCII	GS	r	n
Hex	1D	72	n
Decimal	29	114	n

[Range] n = 1, 2, 49, 50

[Description] Transmits the status specified by n：

n	**Function**
1，49	Transmit paper sensor status

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2，50　Transmits drawer status

[Notice] **.** This command is only effective for the printer with serial interface.

·This command is executed when the data in the receive buffer is developed. Therefore,there may be a time lag between receiving this command and transmitting the status,depending on the receive buffer status.

·The status types to be transmitted are shown below:

Paper sensor status（ n = 1，49 ）：

Bit	0/1	Hex	Decimal	Status
0，1	0	00	0	Paper near-end sensor,paper adequate
	1	03	3	Paper near-end sensor,paper is ending
2，3	0	00	0	Paper end sensor, paper adequate
	1	0c	12	Paper end sensor,paper is out
4	0	00	0	No use,fix as 0
5，6				Undefined
7	0f	00	0	No use,fix as 0

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

Bit	0/1	Hex	Decimal	Status
0	0	00	0	Drawer kick-out connector pin 3 is LOW
	1	01	1	Drawer kick-out connector pin 3 is HIGH
1- 3				Undefined
4	0	00	0	No use,fix as 0
5，6				Undefined
7	0	00	0	No use,fix as 0

[Reference] **DLE EOT，GS a**

GS w n

[Name] Set bar code width

[Format] ASCII GS w n

Hex 1D 77 n

Decimal 29 119 n

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

[Description] Set the horizontal size of the bar code.

n specifies the bar code width as follows:

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

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·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**

Chinese Character Control Cpmmand

FS ! n

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

[Format]

ASCII	FS	!	n
Hex	1C	21	n
Decimal	28	33	n

[Range] 0 ≤n ≤ 255

[Description] Sets the print mode for Chinese characters, using n as follows:

Bit	0/1	Hex	Decimal	Function
0, 1				Undefined
2	0	00	0	Double-width is canceled
	1	04	4	Select double-width
3	0	00	0	Double-height is canceled
	1	08	8	Select double-height
4-6				Undefined
7	0	00	0	Under-line is canceled
	1	80	128	Select under-line

[Notice] ·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 Chinese 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 !**

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FS &

[Name] Select Chinese character mode

[Format]

ASCII	FS	&
Hex	1C	26
Decimal	28	38

[Description] Select Chinese character mode

[Notice] ·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.

·Chinese character mode is selected when the power is turned on.

[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] $0 \le n \le 2, 48 \le n \le 50$

[Description] Turns underline mode for Chinese characters on or off, based on the following values of n.

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

[Notice] ·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 .

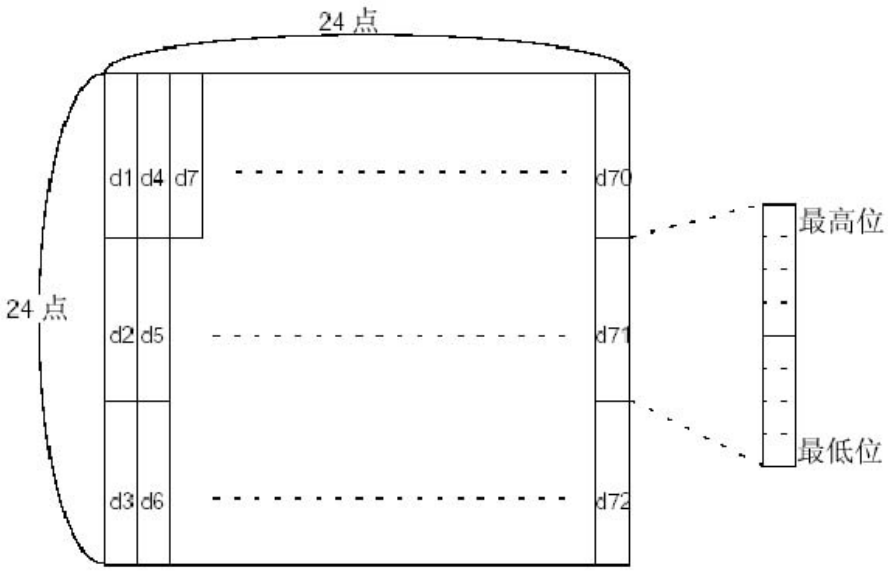
[Name] Cancel Chinese character mode

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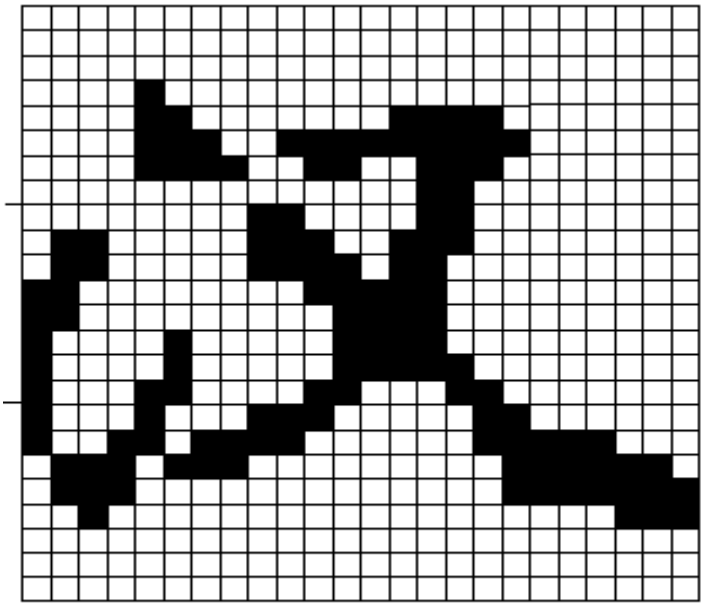
[Format] ASCII FS .
Hex 1C 2E
Decimal 28 46
[Description] Cancel Chinese character mode
[Notice] ·When the Chinese character mode is not selected, all character codes are processed one byte at a time as ASCII code.
·Chinese character mode is selected when the power is turned on.
[Reference] **FS** &, **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 ≤ c2 ≤ FEH
0 ≤ d ≤ 255
k = 72
[Description] Defines user-defined Chinese characters for the character codes specified by c1 and c2.
[Notice] ·c1 and c2 indicate character codes for the defined characters. c1 specifies for the first byte,and c2 for the second byte.
·d indicates the dot data. Set a corresponding bit to 1 to print a dot or to 0 to not print a dot.
[Default] No user defined Chinese character
The relationship between user defined Chinese character and data is as below:



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D1=00H, D4=00H, D7=00H, D10=00H. . . . . .
D2=1FH, D5=78H, D8=60H, D11=00H. . . . . .
D3=C0H, D6=30H, D9=38H, D12=70H. . . . . .

FS C n

[Name] Selecting Chinese character code system

[Format]

ASCII	FS	C	n1	n2
Hex	1C	43	n1	n2
Decimal	28	67	n1	n2

[Range] n=0，1，48，49

[Description] Selecting Chinese character code system

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

[Notice] · This command does not change the parameter setting of Flash.

· It will revert to defaults after carrying out the **ESC** @ command、turning off the power or resetting the printer.

[Default] n = 0 Simple Chinese model

n = 1 Traditional Chinese model

FS S n1 n2

[Name] Set left- and right-side Chinese character spacing

[Format]

ASCII	FS	S	n1	n2
Hex	1C	53	n1	n2
Decimal	28	83	n1	n2

[Range] $0 \leq n1 \leq 255$

$0 \leq n2 \leq 255$

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[Description] Set left- and right-side Chinese character spacing as n1 and n2.
·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].

[Notice] ·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:
①When 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.
②When 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.
③The max of Chinese right space is about 36mm,take the max value when exceeds this value.

[Default] n1 = 0, n2 = 0

[Reference] **GS P**

FS W n

[Name] Selece / Cancel double-height/width of Chinese character

[Format]

ASCII	FS	W	n
Hex	1C	57	n
Decimal	28	87	n

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

[Description] Selece / Cancel double-height/width of Chinese character
·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.

[Notice] ·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 !**

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Old Commands

FS p n m

Recommend to use command **GS (L** (function 69) insteading of command **FS p**,it upward compaible with **FS p** command，**FS p** command is disused.

[Name] Printing the bitmap download in FLASH

[Format]

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

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

[Description] Printing the bitmap download in FLASH according to the mode specified by m

m	Mode	Axoal Resolution (DPI)	Lateral Resolution (DPI)
0.48	Normal Mode	203	203
1.49	Double Width Mode	203	101
2.50	Double Height Mode	101	203
3.51	Double Width & Height Mode	101	101

· n indicates the figure number of the bitmap（defined by command **FS q**）

· m specifies the mode of printing bitmap

[Details]

· Flash bitmap is the one definined and stored in Flash storage by **FS q** and printing by **FS p** command.

· This command is invalid when the Flash bitmap does not be defined.

· Under standard mode,this command is only valid when there is no data in printing buffer

· This command does not be affected by other printing mode(such as:double height,double width,under line,character enlarging,invert printing,clockwise rotation for 90° and so on)except upside down printing.

· If the download bitmap exceeding the printing area,the exceeding part will not be printed

· After printing the bitmap,the printer will change another line,and processing data next according to normal mode.

[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

Recommend to use command **GS (L** (function 67) insteading of command **FS q**, it upward compaible with **FS q** command，**FS q** command is disused.

[Name] Defining Flash bitmap

[Format]

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

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

$0 \le xL \le 255$

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$1 \le (xL + xH \times 256) \le 1023$

$1 \le (yL + yH \times 256) \le 288$

$0 \le d \le 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$

The max download file size of Flash is 8096 bytes

[Description] Defining Flash bitmap:

· n indicates the number of Flash bitmap going to be defined.

· xL、 xH indicate the horizontal dot of Flash bitmap as (xL + xH × 256) × 8。

· yL、 yH indicate the vertical dot of Flash bitmap as (yL + yH × 256) × 8。

[Notice] ·Carrying out the command of writing in Flash memory frequently will damage it,writing 10 times of Flash memory a day is recommended.

·This command will delete all the Flash bitmap defined by itself before,the printer can not redefine one of the defined bitmap last time.In this case,it must resend all the datas.

·When the printer is carrying out this command and writing data into Flash memory,the state of the printer will change into busy and stop receiving data.So when the printer is busy,please do not send data to the printer,including real-time command.

· The Flash bitmap is the one stored in Flash memory by command **FS q** and printed by command **FS p**

· Under standard mode,this command is only valid when it is at the beginning of the line.

· From FS to yH seven bytes are processed as command datas,not a part of the graph data.

· When the bitmap bytes exceed the range defined by xL,xH,yL,yH at its left,the printer only processes the data in the range.

· In the first group of Flash bitmap,when any parameter of xL,xH,yL,yH exceeds the defined range,this command will be invalid.

· When download multiple bitmaps,if xL,xH,yL,yH processed by printer exceed the range,the printer will stop carrying out this command.The bitmap before this command is valid,and after is invalid.

· d is the defined bitmap data,the relevant bit is 1 means printing,0 means no printing.

· This command defines n curtains Flash bitmap.The serial-number of each bitmap builts up from 1.So,the first data group [xL xH yL yH d1...dk] is the data of Flash bitmap 1,the last data group [xL xH yL yH d1...dk] is the data of Flash bitmap n.When using **FS p** command to print the bitmap and so do.

· Datas defining a Flash bitmap are made up by [xL xH yL yH d1...dk].So when there is only one bitmap,n=1.The byte count occupied by the printer is as below: [bitmap byte count：（ xL + xH × 256）×（ yL + yH × 256）× 8] + [header information：4]

· The max download fild of Flash is 64K bits (8K bytes),this command can define many curtains Flash bitmap,but it can not define a bitmap exceeds 64K bits(different printers have different download space,please reference from the printer

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configuration information)

· Before writing in the Flash space,the printer will be in busy state

· During processing this command,the printer will not send state or carry out status inquiry

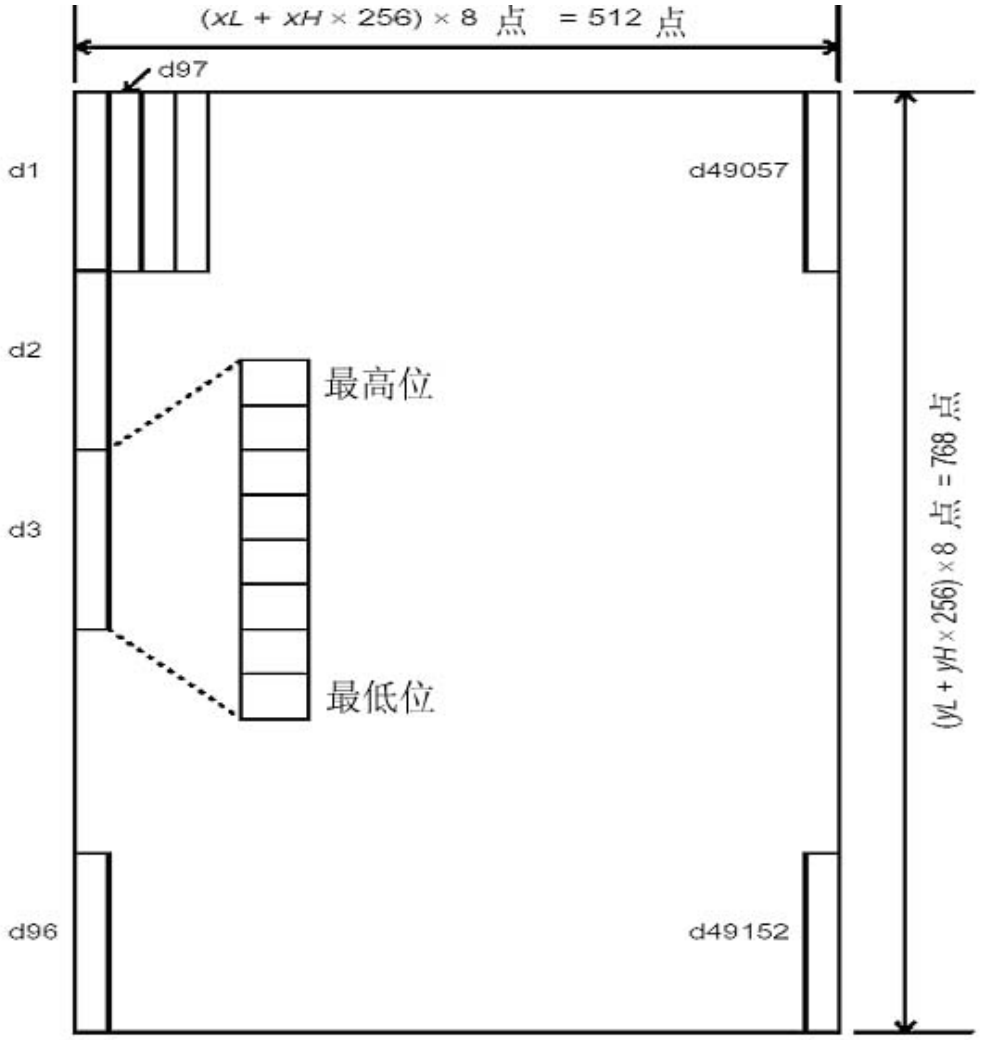
· If receiving this command when carrying out macro definition,the printer will finish it and begin to carry out this command

· If one of the Flash bitmap is defined,carrying out **ESC** @ command,resetting,or turn off the power can not delete it

· This command is only used for defining Flash bitmap but not printing,printing the Flash bitmap is carrying out by **FS p** command.

[Reference] **FS p**

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



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

Recomand to use **GS (L** （function 112 and 50)command insteading of **GS v 0** command to make it upward compatible with **GS v 0** command,**GS v 0** is abandoned

[Name] Print raster bit image

[Format] ASCII GS v 0 m xL xH yL yH d1...dk

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

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

$0 \le xL \le 255$

$0 \le xH \le 255$

$0 \le yL \le 255$

$0 \le d \le 255$

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

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

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

·xL, xH, select the number of data bits (xL+ xH×256) in the horizontal direction for the bit image.

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

[Notice] ·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.

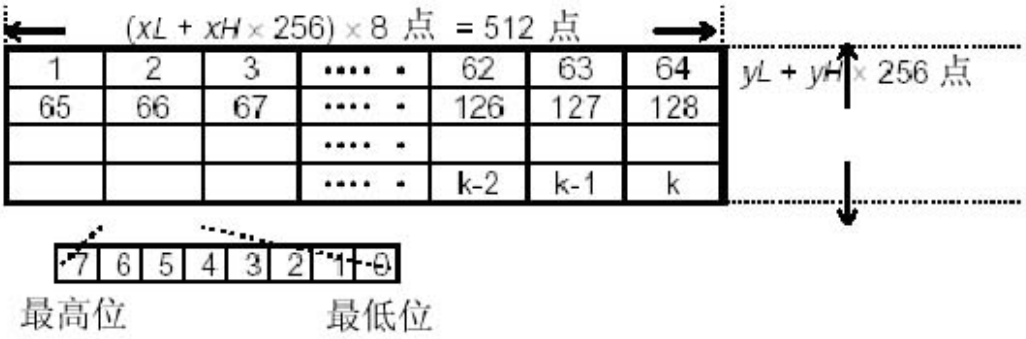
· Part exceeds the printing area will not be printed.

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

·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.

· 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 × 256 = 64



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ESC c 0 n

[Name] Select paper type

[Format] ASCII ESC c 0 n

Hex 1B 63 30 n

Decimal 27 99 40 n

[Range] $0 \leq n \leq 2$

[Description] Select paper type

n = 0, select common paper;

n = 1, 2, select black mark paper.

[Notice] . Black mark paper is the paper with black mark.

. When black mark paper is selected, please don't use common paper, otherwise the printer will feed paper continuously by **GS FF**. When common paper is selected, please don't use black mark paper, otherwise the paper will alarm paper out.

[Default] n = 0

[Reference] GS FF

GS FF

[Name] Black mark paper localization

[Format] ASCII GS FF

Hex 1D 0C

Decimal 29 12

[Description] The printer feeds paper to the position of the next black mark.

[Notice] ·This command is only effective for black mark paper.

. When black mark paper is selected, please don't use common paper, otherwise the printer will feed paper continuously.

[Reference **ESC c 0**

GS # n

[Name] Define downloaded bit image

[Format] ASCII GS # n

Hex 1D 23 n

Decimal 29 33 n

[Range] $1 \leq n \leq 8$

[Description] Select the current download bitmap no.,down load the bitmap and printing it are all proceeded according to this number.

[Notice] ·This command is only effective for the bit image in RAM, and is ineffective for the bit image in FLASH.

. The downloaded bit image definition is cleared when the printer is reset or the power is turned off.

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APPENDIX A: CODE128 BAR CODE

A.1 Description of the CODE128 Bar Code

In CODE128 bar code system, it is possible to represent 128 ASCII characters and 2-digit numerals using one bar code character that is defined by combining one of the 103 bar code characters and 3 code sets. Each code set is used for representing the following characters:

·Code set A: ASCII characters 00H to 5FH

·Code set B: ASCII characters 20H to 7FH

·Code set C： 00~99,100 numbers

The following special characters are also available in CODE128:

· SHIFT Characters

In code set A, the character just after SHIFT is processed as a character for code set B. In code set B, the character just after SHIFT is processed as the character for code set A. SHIFT characters cannot be used in code set C.

·Code set selection character (CODE A, CODE B, CODE C)

This character switches the following code set to code set A, B, or C.

·Function character (FNC1, FNC2, FNC3, FNC4)

The usage of function characters depends on the application software. In code set C, only FNC1 is available.

A.2 Code Tables

Printable characters in code set A

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
NULL	00	0	(	28	40	P	50	80
SOH	01	1	)	29	41	Q	51	81
STX	02	2	*	2A	42	R	52	82
ETX	03	3	+	2B	43	S	53	83
EOT	04	4	,	2C	44	T	54	84
ENQ	05	5	-	2D	45	U	55	85
ACK	06	6	.	2E	46	V	56	86
BEL	07	7	/	2F	47	W	57	87
BS	08	8	0	30	48	X	58	88
HT	09	9	1	31	49	Y	59	89
LF	0A	10	2	32	50	Z	5A	90
VT	0B	11	3	33	51	[	5B	91
FF	0C	12	4	34	52	\	5C	92
CR	0D	13	5	35	53	]	5D	93
SO	0E	14	6	36	54	^	5E	94
SI	0F	15	7	37	55	_	5F	95
DLE	10	16	8	38	56	FNC1	7B,31	123,49
DC1	11	17	9	39	57	FNC2	7B,32	123,50
DC2	12	18	:	3A	58	FNC3	7B,33	123,51

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

Printable characters in code set B

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
SP	20	32	H	48	72	p	70	112
!	21	33	I	49	73	q	71	113
"	22	34	J	4A	74	r	72	114
#	23	35	K	4B	75	s	73	115
$	24	36	L	4C	76	t	74	116
%	25	37	M	4D	77	u	75	117
&	26	38	N	4E	78	v	76	118
'	27	39	O	4F	79	w	77	119
(	28	40	P	50	80	x	78	120
)	29	41	Q	51	81	y	79	121
*	2A	42	R	52	82	z	7A	122
+	2B	43	S	53	83	{	7B,7B	123,123
,	2C	44	T	54	84	|	7C	124
-	2D	45	U	55	85	}	7D	125
.	2E	46	V	56	86	—	7E	126
/	2F	47	W	57	87	DEL	7F	127
0	30	48	X	58	88	FNC1	7B,31	123,49
1	31	49	Y	59	89	FNC2	7B,32	123,50
2	32	50	Z	5A	90	FNC3	7B,33	123,51

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3	33	51	[	5B	91	FNC4	7B,34	123,52
4	34	52	\	5C	92	SHIFT	7B,53	123,83
5	35	53	]	5D	93	CODEA	7B,41	123,65
6	36	54	^	5E	94	CODEC	7B,43	123,67
7	37	55	_	5F	95			
8	38	56	`	60	96			
9	39	57	a	61	97			
:	3A	58	b	62	98			
;	3B	59	c	63	99			
<	3C	60	d	64	100			
=	3D	61	e	65	101			
>	3E	62	f	66	102			
?	3F	63	g	67	103			
@	40	64	h	68	104			
A	41	65	i	69	105			
B	42	66	j	6A	106			
C	43	67	k	6B	107			
D	44	68	l	6C	108			
E	45	69	m	6D	109			
F	46	70	n	6E	110			
G	47	71	o	6F	111			

Printable characters in code set C

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
0	00	0	40	28	40	80	50	80
1	01	1	41	29	41	81	51	81
2	02	2	42	2A	42	82	52	82
3	03	3	43	2B	43	83	53	83
4	04	4	44	2C	44	84	54	84
5	05	5	45	2D	45	85	55	85
6	06	6	46	2E	46	86	56	86
7	07	7	47	2F	47	87	57	87
8	08	8	48	30	48	88	58	88
9	09	9	49	31	49	89	59	89
10	0A	10	50	32	50	90	5A	90
11	0B	11	51	33	51	91	5B	91
12	0C	12	52	34	52	92	5C	92
13	0D	13	53	35	53	93	5D	93
14	0E	14	54	36	54	94	5E	94
15	0F	15	55	37	55	95	5F	95
16	10	16	56	38	56	96	60	96
17	11	17	57	39	57	97	61	97
18	12	18	58	3A	58	98	62	98

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19	13	19	59	3B	59	99	63	99
20	14	20	60	3C	60	FNC1	7B,31	123,49
21	15	21	61	3D	61	CODEA	7B,41	123,65
22	16	22	62	3E	62	CODEB	7B,42	123,66
23	17	23	63	3F	63			
24	18	24	64	40	64			
25	19	25	65	41	65			
26	1A	26	66	42	66			
27	1B	27	67	43	67			
28	1C	28	68	44	68			
29	1D	29	69	45	69			
30	1E	30	70	46	70			
31	1F	31	71	47	71			
32	20	32	72	48	72			
33	21	33	73	49	73			
34	22	34	74	4A	74			
35	23	35	75	4B	75			
36	24	36	76	4C	76			
37	25	37	77	4D	77			
38	26	38	78	4E	78			
39	27	39	79	4F	79			

Appendix B：Printing mode and its transformation

B.1 Summary

The printer has two kinds of working mode:standard and page mode.Under standard mode,the printer will print and feed once the printing buffer is full or receiving the printing or feeding command.But under page mode,all the printing data and feeding command are stored in the specified memory space,the printer does not carry out any operation until receiving a **ESC FF** or **FF** command,the printer will print all the content in the printing area.

For example: when the printer received “ABCDEF”<**LF**>under standard mode,it will print out “ABCDEF”immediately and feed a line.But under page mode,the printer will write”ABCDEF”in the printing area of memory,and the printing data next will be put in the next line of the printing area. **ESC L** command switches the printer to page mode,all the data after this will be processed under page mode.Carrying out **ESC FF** command in this way can print all the data received,if carrying out **FF** command can not only print all the data received,but also switch the printer to standard mode.Carrying out **ESC S** command can also switch the printer to standard mode,but it will not print the data reveived under page mode,or delete the data.

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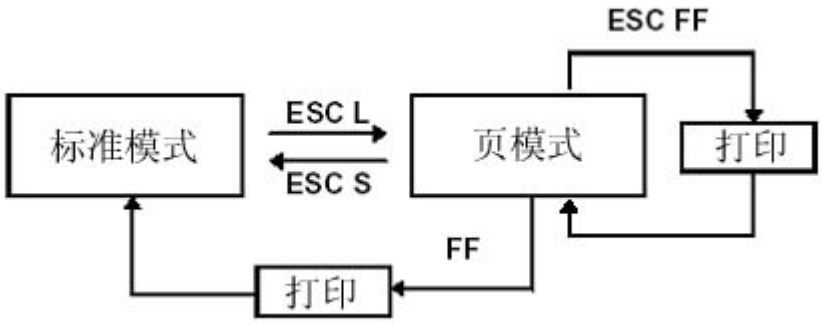


Fig B.1 Switching between standard and page mode

B．2 Setting kinds of values under standard and page mode

1） Some commands（such as：**ESC SP**、 **ESC 2**、**ESC 3**、and **FS S**）can be used under standard and page mode,and the parameters are all the same.But the setting under two modes are independent,they are stored separately.

B．3 Setting the printing area

1） The printing area is setted by **ESC W** command.If all the operation of printing and feeding have been finished before receiving **ESC W** command,the left side(when you face the printer) is setted as the origin of coordinates(x0,y0) of the printing area.The width(dx) of recrangular printing area extends to the right side from origin if coordinates(x0,y0)in the direction of x(perpendicular to the feeding direction),height(dy)in the direction of y(direction of feeding paper).If there is not printing area setted by **ESC W** command,the printing area will be as default.

2) After setting the printing area and its direction(setted by **ESC T** command),the data received will be arranged in the printing area as it shows in Fig B.2,point A is defaulted as the starting position(when a character is printed,point A is the baseline).
The download bitmap or bar code in the printing data make the current position as its lower left corner and justify with the baseline.

3) Before receiving a command including feeding paper（such as：**LF** or **ESC J**）,if the printing data have exceeded the printing area,the printer will feed a line of paper automatically （feeding how much paper depends on the line height setted by ESC 2 and ESC 3）,at the same time,the printing position moves to the beiginning of next line.

4) The default line height is 4mm（about 1/6 inch）,equal to 32dots on the lengthwise direction.If the printing data of next line including the character enlarged over 2 times on the lengthwise direction,or the bitmap occupies more than 2 lines,or the bar code is higher than normal character,the paper feeding quantity can not meet the need,make the character overlap of two lines.In order to avoid this,user can increase the line height.

Eg:

Using the formulae below when printing a 6 characters height download bitmap:
{Vertres（8×6）- feeding points of printing area start position（24）} × logitudinal shift units（203/203）= 24，this means if print a whole bitmap,it need to make the printing position move down 24 dots from the printing area start position.

Using the comamnds below：

ESC W xL, **xH**, **yL**, **yH**, **dxL**, **dxH**, **dyL**, **dyH**

ESC T n

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ESC 3 24 ß Setting new line height
LF ß Feeding a line of paper
GS / 1
ESC 2 ß Reverting the line height to the default value

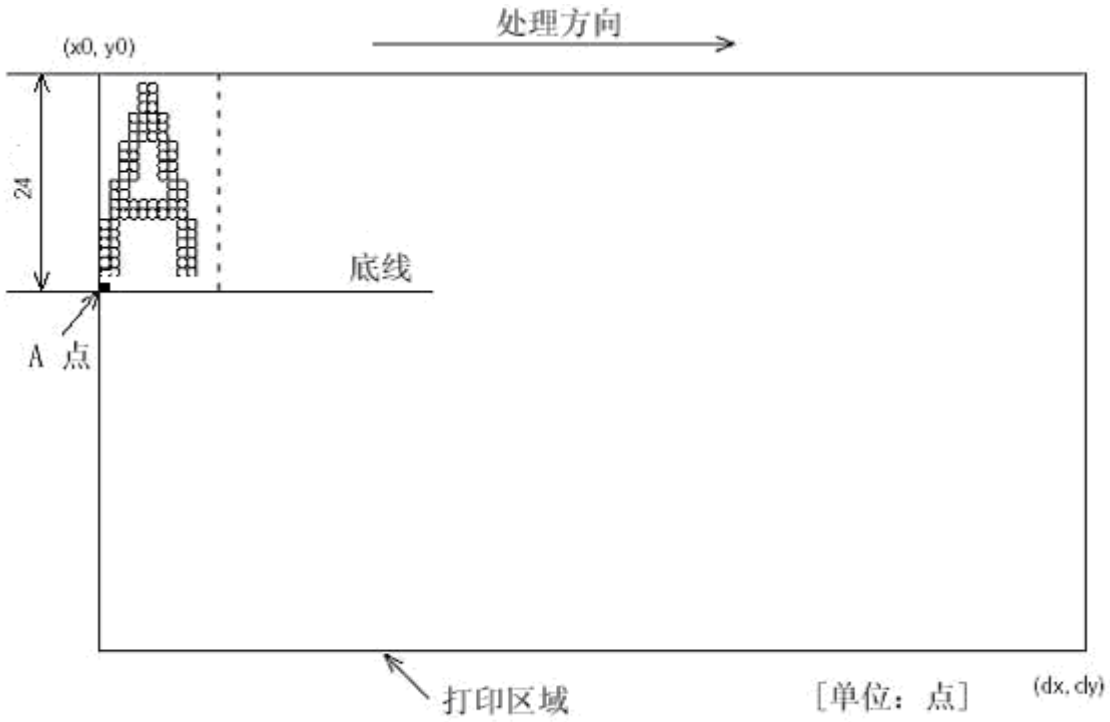
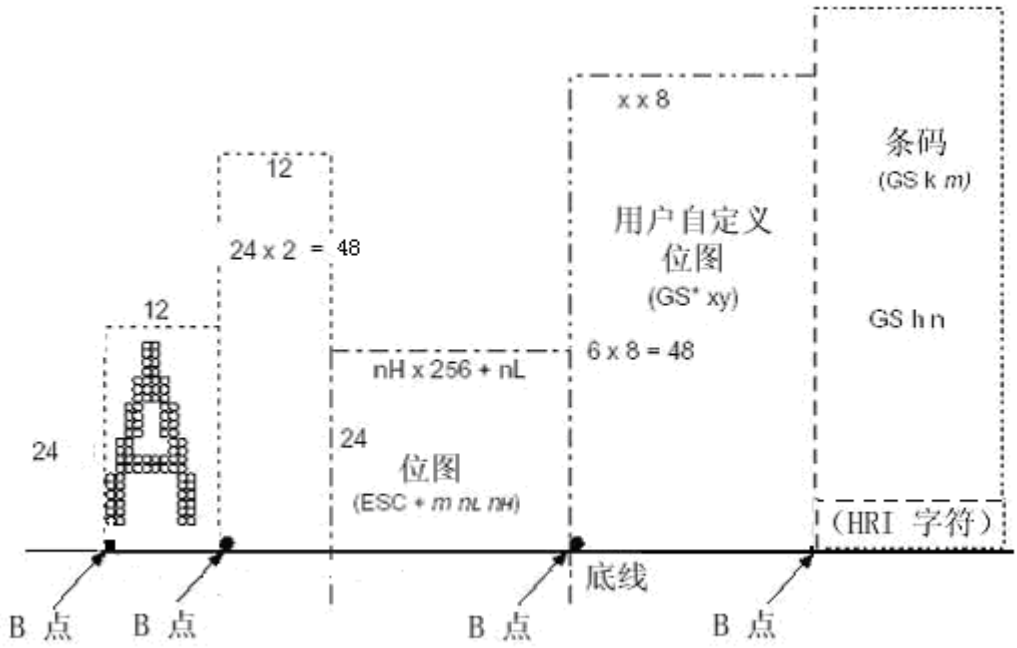


Fig B.2 Storage position of character data



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Fig B.3 Storage position of character data

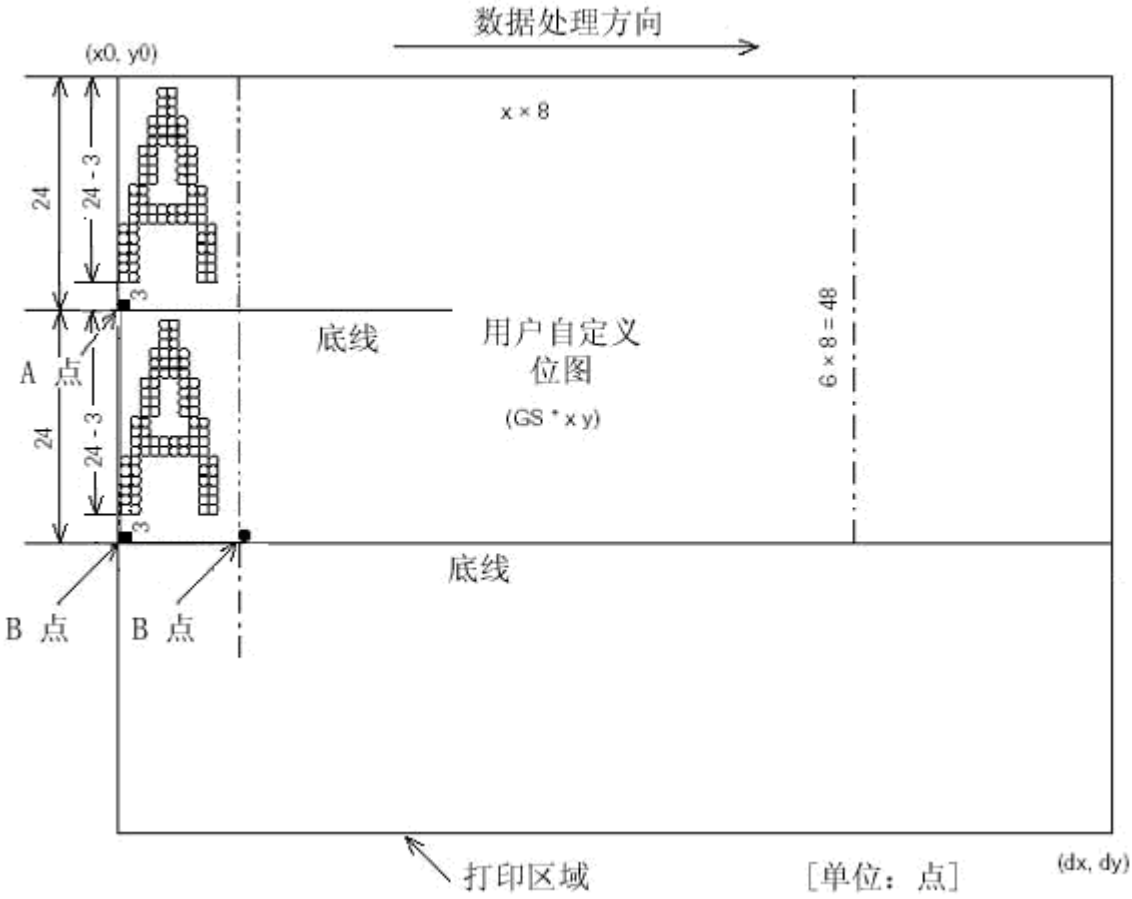


Fig B.3 Storage position of download position

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