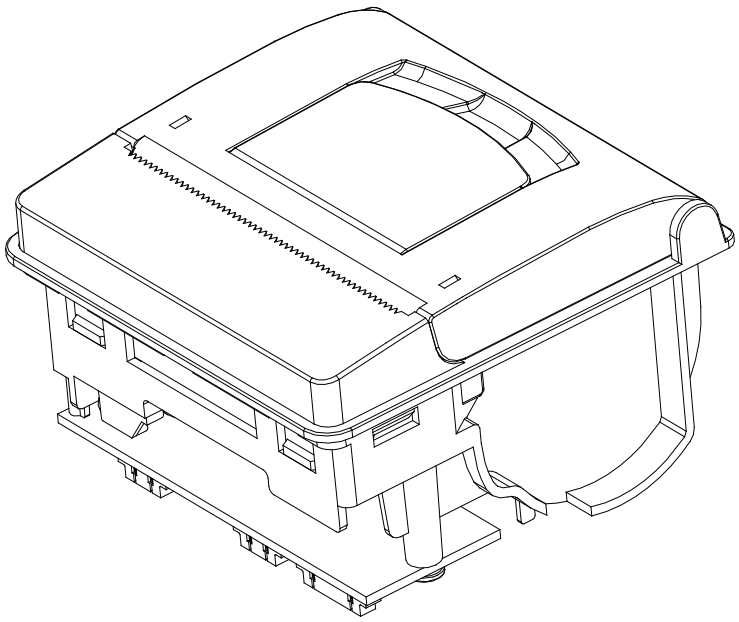
203UserManual



Contents

1. Outline

Printing Method:	Thermal
Paper Width:	57.5mm
Paper Diameter:	55mm
Resolution:	203DPI
Printing Speed:	Up to 90mm/s
BarcodeSupported:	125,UPC-A,UPC-E,EAN-8,EAN-13,Codebar, Code39,Code93,Code128,Code11,MSI
Font:	ASCII(12x24)
Graphic printing:	Direct bitmap printing
Paper Sensor:	Photo-sensor
Head temperature detection:	Thermistor
Communication Interface:	RS232 or RS232 with TTL level
Power supply:	12V/3A MAX.
Head Life:	50km
Printing width:	48mm
Operation condition:	5~45℃，20~90%RH(40℃)
Storage condition:	-40~60℃，20~93%RH(40℃)

2. HOW TO USE

2.1 Printing test

After power up, connect JP4 and disconnect, one test page will be printed.

2.2 On board LED

There is one LED on board to indicate the status of the board. The indicator is as follows:

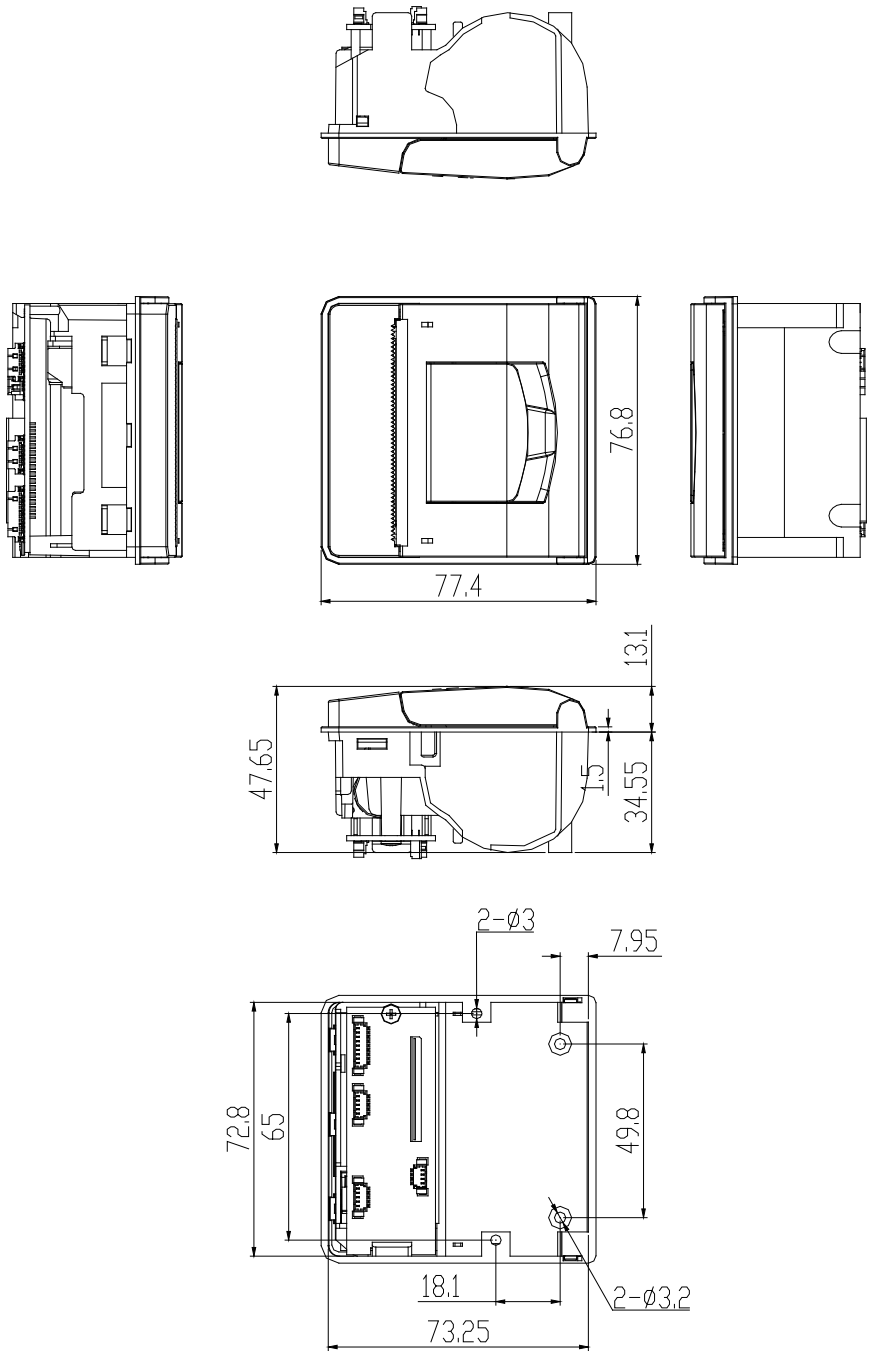
Blink one: Work well

Blink two: No printer is detected

Blink three: No paper is detected

Blank five: Printer mechanism is overheat.

3. MECHANISM



4. CONNECTOR

Serial communication connector

The EPM203-MRS printer integrates 2 serial communication connectors.

The RS232 connector is especially dedicated to the full RS232 protocol(+/-12V levels).

When the TTL connector is designed to handle TTL levels (0/5V levels).

Logic Signal	Voltage Level on RS232 Connector	Voltage Level on TTL Connector
0	From +3V to +12V	From 0V to 0.2V
1	From -3V to -12V	From 2 to 5V

The definition is as following:

Power connector

EPM device connectorJ5	User side matching connector
Molex 53047 Series 9 contacts(male)	Molex 51021 Series (female)

Pin number	Signal name
1	GND
2	
3	
4	
5	
6	POWER
7	
8	
9	

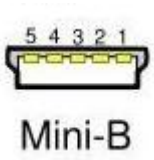
*RS232*Connector

EPM device connectorJ4	User side matching connector
Molex, 53047 Series 5 contacts(male)	Molex 51021 Series (female) Contacts:50079/50058

Pin number	Signal number
1	Gnd
2	Transmit data (Txd, printer output)

3	Receive data (Rxd, printer input)
4	CTS/DSR (printer input)
5	RTS/DTR (printer output)

USB Connector



Pin number	Signal number
1	VBUS
2	D-
3	D+
4	ID
5	GND

TTL Connector

EPM device connectorJ3	User side matching connector
Molex, 53047 Series 5 contacts(male)	Molex 51021 Series (female) Contacts:50079/50058

Pin number	Signal number
1	Gnd
2	Transmit data (Txd, printer output)
3	Receive data (Rxd, printer input)
4	CTS/DSR (printer input)
5	RTS/DTR (printer output)

5. ESC/POS PRINTING COMMAND SET

5.1 Command List

Type	Command	Name
Print Command	LF	Print and line feed
	CR	Print and carriage return
	HT	JMP to the next TAB position
	ESC D n	Set horizontal tab positions
	ESC J n	Print and Feed n dots paper
	ESC d n	Print and Feed n lines
	ESC = n	Toggle the printer online or offline
Line spacing Command	ESC 2	Select default line spacing
	ESC 3 n	Set line spacing
	ESC a n	Select justification
	ESC SO	Select Double Width mode□
	ESC DC4	Disable Double Width mode
	GS L nLnH	Set the left blank margin with dots
	ESC $ nLnH	Set absolute print position
	ESC B n	Set Left Space
Character Command	ESC ! n	Select print mode(s)
	GS ! n	Set or Cancel the double width and height
	GS B	Turn white/black reverse printing mode
	ESC V n	Turn 90°clockwise rotation mode on/off
	ESC v n	Transmit paper sensor status
	ESC G n	Turn on/off double-strike mode
	ESC E n	Set or Cancel bold font
	ESC SP n	Set the space between chars
	ESC { n	Turn upside-down printing mode on/off
	ESC - n	Set the underline dots(0,1,2)
	ESC % n	Select/Cancel user-defined characters
	FS &	Select Chinese mode
	FS .	□Select character mode
	FS!	Set print mode for Kanji characters
	ESC &	Define user-defined characters
	ESC ? n	Cancel user-defined characters
	ESC R n	Select and internation character set
	ESC t n	Select character code table
Bit Image Command	ESC *	Select bit-image mode
	GS *	Define downloaded bit image
	GS /	Print downloaded bit image
	GS v	Print the bitmap with width and height

	FS p n m	Print NV bitmap
	FS q n	Define NV bitmap
Init Command	ESC @	Initialize printer
Status Command	GS r n	Transmit status
	GS a n	Enable/Disable ASB
Bar Code Command	GS H	Select printing position of human readable characters
	GS h	Set bar code height
	GS w	Set bar code width
	GS k	Print bar code
	GS x	Set barcode printing left space
miscellaneous function commands	ESC 7 n1 n2 n3	Setting Control Parameter Command
	ESC 8 n1 n2	Sleep parameter
	ESC 9 n	Select Chinese code format
	DC2 T	Printing test page
	ESC p	Generate pulse (For drawer)
	ESC u	Transmit peripheral device status (For drawer)
	ESC c 5	Enable/disable panel buttons (For button)

5.2 Commands Descript

1.HT

[Name] Horizontal tab

[Format] ASCII HT

Hex 09

Decimal 9

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

[Notes]

This command is ignored unless the next horizontal tab position has been set.

- If the next horizontal tab position exceeds the printing area, the printer sets theprinting position to [printing area width + 1].
- Horizontal tab positions are set with **ESC D**.

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

[Reference] **ESC D**

2.LF

[Name] Print and line feed

[Format] ASCIILF

Hex 0A

Decimal 10

[Description] Prints the data in the print buffer and feeds one line, based on the current linespacing.

[Note] This command sets the print position to the beginning of the line.

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

3.CR

[Name] Print and carriage return

[Format] ASCII CR

Hex 0D

Decimal 13

[Description] When automatic line feed is enabled, this command functions the same as **LF**; when automatic line feed is disabled, this

command is ignored.

[Notes] • This command line feed is ignored with a serial interface model.

• Sets the print starting position to the beginning of the line.

[Reference] **LF**

4.ESC SP n

[Name] Set right-side character spacing

[Format] ASCII ESC SP n

Hex 1B 20 n

Decimal 27 32 n

[Range] 0 ≤□n ≤□255

[Description] Sets the character spacing for the right side of the character to [n×0.125 mm (n×0.0049")].

[Notes] •The right-side character spacing for double-width mode is twice thenormal value. When characters are enlarged, the right-side characterspacing is n times normal value.

•This command does not affect the setting of Kanji characters

•This command sets values independently in standard mode.

[Default] n = 0

5.ESC !n

[Name] Select print mode(s)

[Format] ASCIIESC ! n

Hex 1B 21 n

Decimal 27 33 n

[Range] 0 ≤□n ≤□255

[Description] Selects print mode(s) using n as follows:

6.ESC $ nLnH

[Name] Set absolute print position

[Format] ASCII ESC $ nLnH

Hex 1B 24 nLnH

Decimal 27 36 nLnH

[Range] 0 ≤□nL≤□255

0 ≤□nH≤□255

[Description] Sets the distance from the beginning of the line to the position at whichsubsequent characters are to be printed.

•The distance from the beginning of the line to the print position is[(nL + nH×256)×0.125 mm].

[Notes] •Settings outside the specified printable area are ignored.

•□In standard mode, the horizontal motion unit (x) is used.

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

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character Font A (12×24).
	On	01	1	Character Font B (9×17).
1	Off	00	0	Turn white/black reverse printing mode not selected.
	On	02	2	Turn white/black reverse printing mode selected.
2	Off	00	0	Turn on/off upside-down printing mode not selected.
	On	04	4	Turn on/off upside-down printing mode selected.

3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	Off	00	0	Turn Deleteline mode on/off not selected.
	On	40	64	Turn Deleteline mode on/off selected.
7	-	-	-	Undefined.

7.ESC Bn

[Name] Set leftspace

[Format] ASCII ESCBn

Hex 1B 42n

Decimal 27 66 n

[Range] Default is 0

0 ≤ n ≤ 47

8.ESC % n

[Name] Select/cancel user-defined character set

[Format] ASCII ESC% n

Hex1B 25 n

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.

[Notes] •When the user-defined character set is canceled, the built-in character set isautomatically selected.

n is available only for the least significant bit.

[Default] n = 0

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

9.ESC &y c1 c2 [x1 d1...d(y x x1)]...[xk d1...d(y x xk)]

[Name] Define user-defined characters

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

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

Decimal27 38 y c1 c2 [x1 d1...d(y xx1)]...[xk d1...d(y x□xk)]

[Range] y = 3

32 ≤□c1 ≤□c2 ≤□126

0 ≤□x ≤□12 (when Font A (12×24) is selected)

0 ≤□d1 ... d(y×xk) ≤□255

[Description] Defines user-defined characters.

•□y specifies the number of bytes in the vertical direction.

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

•□x specifies the number of dots in the horizontal direction.

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

•☐It is possible to define multiple characters for consecutive character codes.If only one character is desired, use c1 = c2. d is the dot data for the characters. The dot pattern is in the horizontal directionfrom the left side. Any remaining dots on the right side are blank.

•The data to define user-defined characters is (y×x) bytes.

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

•☐This command can define different user-defined character patterns for eachfont. To select a font, use **ESC !**

•☐User-defined characters and a downloaded bit image cannot be definedsimultaneously. When this command is executed, the downloaded bit image iscleared.

•The user-defined character definition is cleared when:

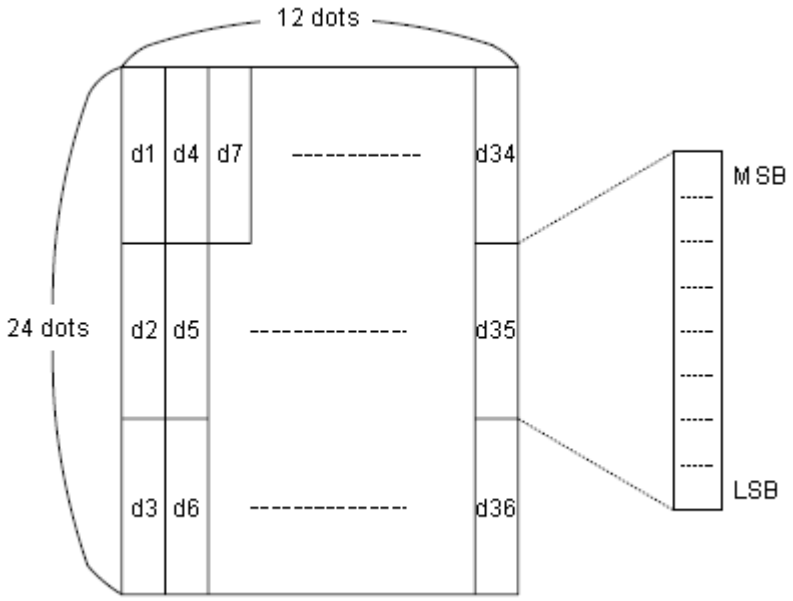
1) **ESC @** is executed.
2) **GS** *☐is executed.
3) **ESC ?** is executed.
4) The power is turned off.

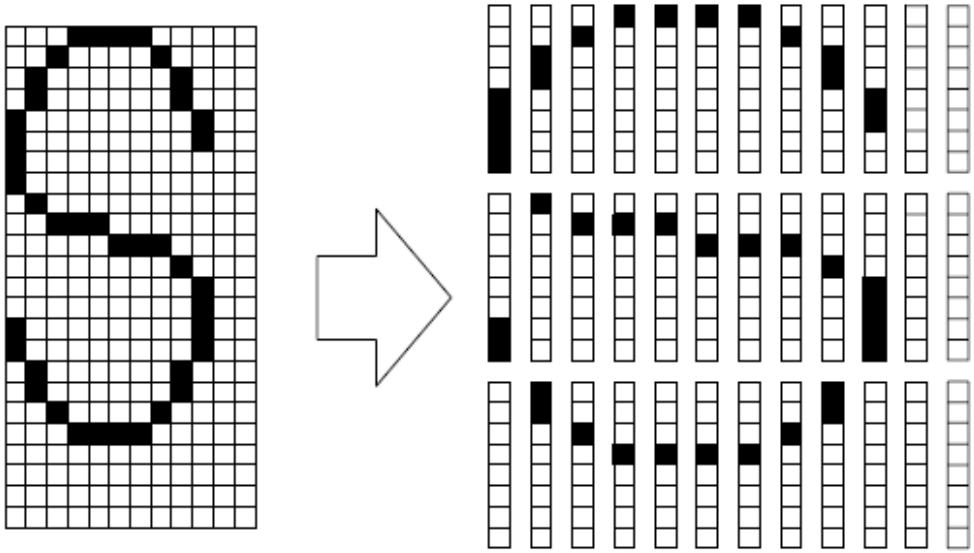
[Default] The internal character set

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

[Example]

•☐When Font A (12×24) is selected.





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

10.ESC* m nLnHd1...dk

[Name] Select bit-image mode

[Format] ASCII ESC*m nLnHd1...dk

Hex 1B 2AmnLnHd1...dk

Decimal 27 42 m nLnHd1...dk

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

0 ≤□nL≤□255

0 ≤□nH≤□3

0 ≤□d ≤□255

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

m	Mode	Vertical Direction		Horizontal Direction	
		Number ofDots	Dot Density	Dot Density	Number of Data (K)
0	8-dot single-density	8	67.7 dpi	101.6 dpi	nL+ nH×256
1	8-dot double-density	8	67.7 dpi	203.2 dpi	nL+ nH× 256
32	24-dot single-density	24	203.2 dpi	101.6 dpi	(nL+ nH× 256) x3
33	24-dot double-density	24	203.2 dpi	203.2 dpi	(nL+ nH× 256) x3

[Notes] If the value of m is out of the specified range, nL and nH the data following areprocessed as normal data.

The nL and nH indicate the number of dots in the bit image in the horizontaldirection. The number of dots is calculated by nL + nHx□256.

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

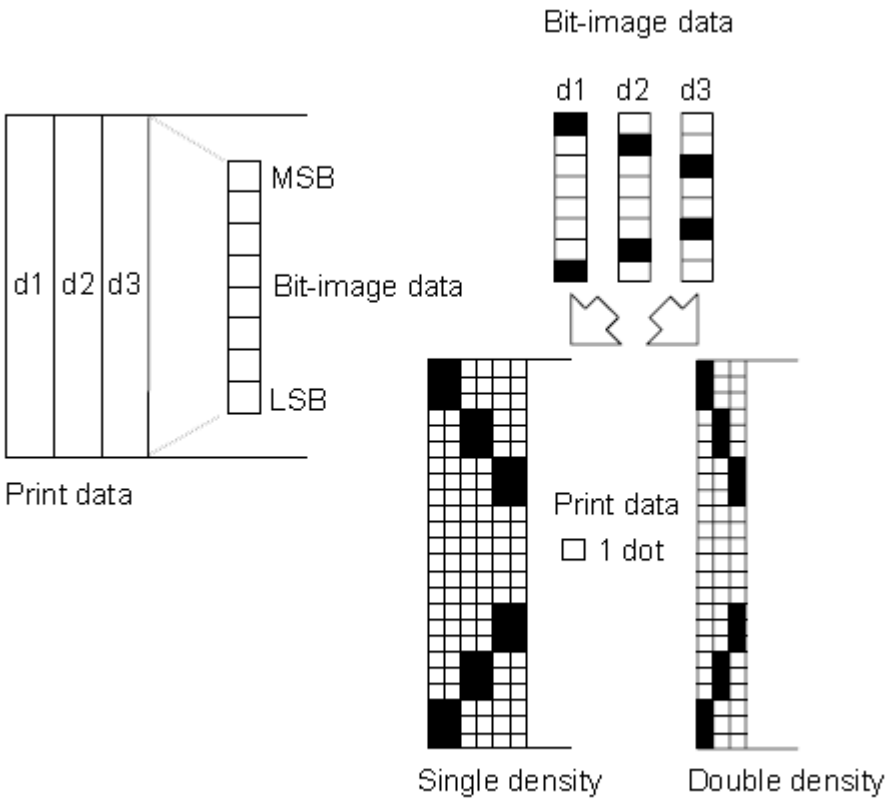
d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0not to print a dot.

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

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

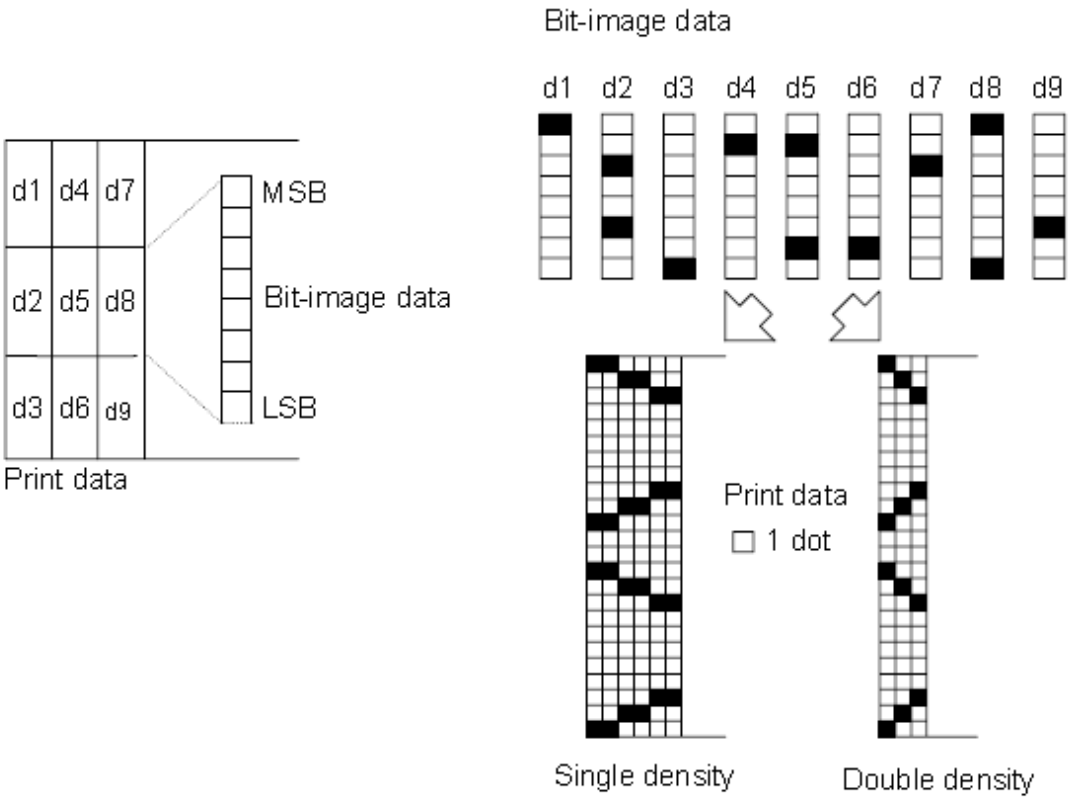
The relationship between the image data and the dots to be printed is describedin Figure 3.11.3.

•When 8-dot bit image is selected:



3.11.3

•□When 24-dot bit image is selected:



3.11.3

11.ESC -n

[Name] Turn underline mode on/off

[Format] ASCII ESC -n

Hex 1B2D n

Decimal 27 45 n

[Range] 0 ≤□n ≤□2, 48 ≤□n ≤□50

[Description] Turns underline mode on or off, based on the following values

n :

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

[Notes] The printer can underline all characters (including right-side

character spacing),but cannot underline the space set by **HT.**

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

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

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

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

[Default] n = 0

[Reference] **ESC !**

12.ESC 2

[Name] Select default line spacing

[Format] ASCII ESC 2

Hex 1B 32

Decimal 27 50

[Description] Selects 3.75 mm (30×□0.125 mm) line spacing.

[Notes] •□The line spacing can be set independently in standard mode.

[Reference] **ESC 3**

13.ESC 3n

[Name] Set line spacing

[Format] ASCIIESC 3 n

Hex 1B 33 n

Decimal 27 51 n

[Range] 0 ≤□n ≤□255

[Description] Sets the line spacing to [n×0.125 mm].

[Notes] •□The line spacing can be set independently in standard mode.

•□In standard mode, the vertical motion unit (y) is used.

[Default] n = 30

[Reference] **ESC 2**

14.ESC ?n

[Name] Cancel user-defined characters

[Format] ASCII ESC ? n

Hex 1B 3Fn

Decimal 2763 n

[Range] 32 ≤□n ≤□126

[Description] Cancels user-defined characters.

[Notes] •□This command cancels the patterns defined for the character codesspecifiedby n. After the user-defined characters are canceled, the correspondingpatterns for the

internal characters are printed.

•☐This command deletes the pattern defined for the specified code inthe fontselected by **ESC !**.

•☐If a user-defined characters have not been defined, the printer ignores thiscommand.

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

15.ESC @

[Name] Initialize printer

[Format] ASCII ESC @

Hex 1B 40

Decimal 27 64

[Description] Clears the data in the print buffer and resets the printer mode to the mode thatwas in effect when the power was turned on.

[Notes] •☐The DIP switch settings are not checked again.

•☐The data in the receive buffer is not cleared.

16.ESC D n1...nkNUL

[Name] Set horizontal tab positions

[Format] ASCII ESCD n1...nk NUL

Hex 1B 44 n1...nk 00

Decimal 27 68 n1...nk 0

[Range] 1 ≤☐n ≤☐255

0 ≤☐k ≤☐32

[Description] Sets horizontal tab positions.

•☐n specifies the column number for setting a horizontal t ab position from thebeginning of the line.

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

[Notes] •☐The horizontal tab position is stored as a value of [character width x☐n]measured from the beginning of the line. The character width includes theright-side character spacing, and double-width characters are set with twice thewidth of normal characters.

•☐This command cancels the previous horizontal tab settings.

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

•☐Up to 32 tab positions (k = 32) can be set. Data exceeding 32 tab positions isprocessed 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 isfinished and the following data is processed as normal data.

•☐**ESC D NUL** cancels all horizontal tab positions.

•☐The previously specified horizontal tab positions do not change, even if thecharacter width changes.

•☐The character width is memorized for each standard mode.

[Default] The default tab positions are at intervals of 8 characters (columns 9, 17, 25,...) forFont A (12×24).

[Reference] **HT**

17.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] Turns emphasized mode on or off

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

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

[Notes] •☐Only the least significant bit of n is enabled.

•☐This command and **ESC !** turn on and off emphasized mode in the same way.Be careful when this command is used with **ESC !**.

[Default] n = 0

[Reference] **ESC !**

18.ESC Gn

[Name] Turn on/off double-strike mode

[Format] ASCII ESCGn

Hex 1B 47 n

Decimal 27 71 n

[Range] 0 ≤□n ≤□255

[Description] Turns double-strike mode on or off.

•□When the LSB of n is 0, double-strike mode is turned off.

•□When the LSB of n is 1, double-strike mode is turned on.

[Notes] •□Only the lowest bit of n is enabled.

•□Printer output is the same in double-strike mode and in emphasized mode.

[Default] n = 0

[Reference] **ESC E**

19.ESC Jn

[Name] Print and feed paper

[Format] ASCII ESC J n

Hex 1B 4A n

Decimal 27 74 n

[Range] 0 ≤□n ≤□255

[Description] Prints the data in the print buffer and feeds the paper [n×□ 0.125 mm (0.0049")].

[Notes] •☐After printing is completed, this command sets the print starting position to thebeginning of the line.

•☐The paper feed amount set by this command does not affect the values set by**ESC 2** or **ESC 3**.

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

20.ESC R n

[Name] Select an international character set

[Format] ASCII ESC R n

Hex 1B 52 n

Decimal 2782 n

[Range] 0 ≤☐n ≤☐15

[Description] Selects international character set n from the following table:

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

[Default] n = 0

21.ESC Vn

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

[Format] ASCII ESC V n

Hex 1B 56 n

Decimal 27 86 n

[Range] 0 ≤☐n ≤☐1, 48 ≤☐n ≤☐49

[Description] Turns 90°☐clockwise rotation mode on/off

n is used as follows:

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

[Notes] •☐This command affects printing in standard mode. However, the setting isalways effective.

•☐When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters.

•☐Double-width and double-height commands in 90°☐rotation mode enlargecharacters in the opposite directions from double-height and double- widthcommands in normal mode.

[Default] n = 0

[Reference] **ESC !, ESC** □

22.ESC v n

[Name] Transmit paper sensor status

[Format] ASCII ESC v n

Hex 1B 76 n

Decimal 27 118 n

[Description] The return value is 1 bytes ,It is a different on behalf of the status :

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Offline.
	On	01	1	Online.
1	-	-	-	Undefined.
2	Off	00	0	paper have.
	On	04	4	paper out.
3	Off	00	0	Voltage is normal.
	On	08	8	Voltage ＞9.5V.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	Off	00	0	Temperature is normal.
	On	40	64	Temperature ＞60°.
7	-	-	-	Undefined.

For example：return “0x04” is means paper out.

23.ESC an

[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

[Notes] •□The command is enabled only when processed at the beginning of the line instandard mode.

•□This command executes justification in the printing area.

•□This command justifies the space area according to **HT,** **ESC $** .

[Default] n = 0

[Example]

Left justification	Centering	Right justification
ABC	**ABC**	**ABC**
ABCD	**ABCD**	**ABCD**
ABCDE	**ABCDE**	**ABCDE**

24.ESC SOn

[Name] Select Double Width mode

[Format] ASCII ESCSOn

Hex 1B 0En

Decimal 27 14n

[Description] Select Double Width mode,

To turn double width off, use LF or DC4 command.

25.ESCDC4n

[Name] Disable Double Width mode

[Format] ASCII ESCDC4n

Hex 1B 14n

Decimal 27 20n

[Description] Disable Double Width mode

26.ESC d n

[Name] Print and feed n lines

[Format] ASCII ESC d n

Hex 1B 64 n

Decimal 27 100 n

[Range] 0 ≤□n ≤□255

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

[Notes]•□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 (n x□line spacing) of more than 1016 mm (40 inches) is specified, theprinter feeds the paper only 1016 mm (40 inches).

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

27.ESC t n

[Name] Select character code table

[Format] ASCIIESC t n

Hex 1B 74 n

Decimal 27 116 n

[Range] 0 ≤□n ≤□5, 16 ≤□n ≤□19, n = 255

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

N	Code Page	N	Code Page
0	CP437 [U.S.A., Standard Europe]	26	Thai
1	Katakana	27	CP720[Arabic]
2	CP850 [Multilingual]	28	CP855
3	CP860 [Portuguese]	29	CP857[Turkish]
4	CP863 [Canadian-French]	30	WCP1250[Central Europe]
5	CP865 [Nordic]	31	CP775
6	WCP1251 [Cyrillic]	32	WCP1254[Turkish]
7	CP866 Cyrilliec #2	33	WCP1255[Hebrew]
8	MIK[Cyrillic /Bulgarian]	34	WCP1256[Arabic]
9	CP755 [East Europe，Latvian 2]	35	WCP1258[Vietnam]
10	Iran	36	ISO-8859-2[Latin 2]
11	reserve	37	ISO-8859-3[Latin 3]
12	reserve	38	ISO-8859-4[Baltic]
13	reserve	39	ISO-8859-5[Cyrillic]
14	reserve	40	ISO-8859-6[Arabic]
15	CP862 [Hebrew]	41	ISO-8859-7[Greek]
16	WCP1252 Latin I	42	ISO-8859-8[Hebrew]
17	WCP1253 [Greek]	43	ISO-8859-9[Turkish]
18	CP852 [Latina 2]	44	ISO-8859-15 [Latin 3]
19	CP858 Multilingual Latin I+Euro)	45	Thai2
20	Iran II	46	CP856
21	Latvian	47	Cp874
22	CP864 [Arabic]		
23	ISO-8859-1 [West Europe]		
24	CP737 [Greek]		
25	WCP1257 [Baltic]		

[Default] n = 0

[Reference] Character Code Tables

28.ESC { n

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

[Format] ASCII ESC{ n

Hex 1B 7Bn

Decimal 27 123 n

[Range] 0 ≤□n ≤□255

[Description] Turns upside-down printing mode on or off.

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

•□When the LSBof n is 1, upside-down printing mode is turned on.

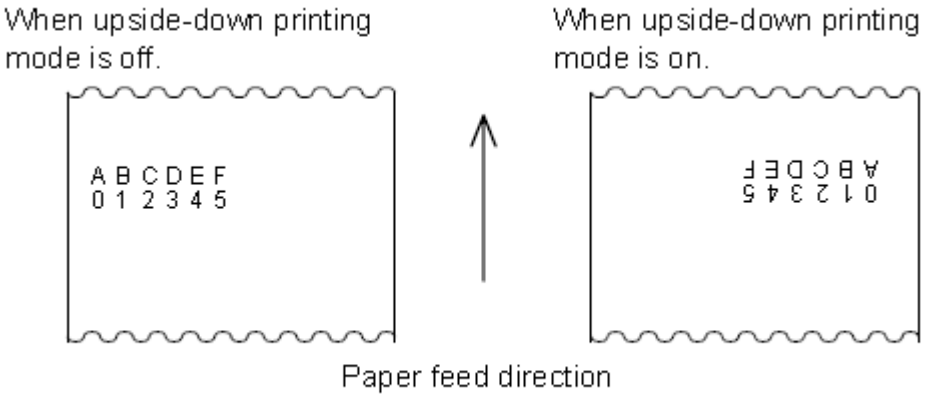
[Notes] •□Only the lowest bit of n is valid.

•□This command is enabled only when processed at the beginning of a line instandard mode.

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

[Default] n = 0

[Example]



29.FS p n m

[Name] Print NV bit image

[Format] ASCII FS p n m

Hex 1C70 n m

Decimal 28 112 n m

[Range] 1 ≤□n ≤□255

0 ≤□m ≤□3 , 48 ≤□m ≤□51

[Description] Prints NV bit image n using the mode specified by m.

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

•□n is the number of the NV bit image (defined using the **FS q** command).

•□m specifies the bit image mode.

[Detail] •□NV bit image is a bit image defined in non-volatile memory by**FS q** and printed by **FS p**.

•☐This command is not effective when the specified NV bit image has not beendefined.

•☐In standard mode, this command is effective only when there is no data in theprint buffer.

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

•☐If the downloaded bit-image to be printed exceeds one line, the excess data isnot printed.

•☐This command feeds dots (for the height n of the NV bit image) in normal anddouble-width modes, and (for the height n x☐2 of the NV bit image) in doubleheightand quadruple modes, regardless of the line spacing specified by **ESC 2**or **ESC 3**.

•☐After printing the bit image, this command sets the print position to the beginningof the line and processes the data that follows as normal data.

[References] **ESC *, FS q, GS /, GS v**

30.FS qn [$x_L x_H y_L y_H$d1...dk]1...[$x_L x_H y_L y_H$d1...dk]n

[Name] Define NV bit image

[Format] ASCII FS q n [xLxHyLyH d1...dk]1...[xLxHyLyH d1...dk]n

Hex 1C 71 n [xLxHyLyH d1...dk]1...[xLxHyLyH d1...dk]n

Decimal28 113 n [xLxHyLyH d1...dk]1...[xLxHyLyH d1...dk]n

[Range] 1 ≤□n ≤□255

0 ≤□xL≤□255

0 ≤□Xh≤□3 (when 1 ≤□(xLxHx□256) ≤□1023

0 ≤□yL≤□255

0 ≤□yL≤□1 (when 1 ≤□(yLyHx□256) ≤□288

0 ≤□d ≤□255

k = (xLxHx□256) x□(yLyHx□256) x□8

Total defined data area = 192K bytes

[Description] Define the NV bit image specified by n.

•□n specifies the number of the defined NV bit image.

•□xL, xH specifies (xLxHx□256) x□8 dots in the horizontal direction for the NV bitimage you are defining.

•□yL, yH specifies (yLyHx□256) x□8 dots in the vertical direction for the NV bitimage you are defining.

[Notes] •□Frequent write command executions may damage the NV memory.

Therefore, it is recommended to write the NV memory 10 times or less a day.

•□The printer performs a hardware reset after the procedure to place the imageinto the NV memory. Therefore, user-defined characters, downloaded bitimages should be

defined only after completing this command.The printer clears the receive and print buffers and resets the mode to themode that was in effect at power on. (this version is not support hardware reset)

•☐This command cancels all NV bit images that have already been defined by thiscommand.

•☐From the beginning of the processing of this command till the finish of hardwarereset, mechanical operations (including initializing the position of the print headwhen the cover is open, paper feeding using the FEED button, etc.) cannot beperformed.

•☐During processing of this command, the printer is BUSY when writing data tothe user NV memory and stops receiving data. Therefore it is prohibited totransmit the data, including real-time commands, during the execution of thiscommand.

•☐NV bit image is a bit image defined in non-volatile memory by **FS q** and printedby **FS p**.

•☐In standard mode, this command is effective only when processed at thebeginning of the line.

•☐This command is effective when 7 bytes <FS☐yH> of the command areprocessed normally.

•☐When the amount of data exceeds the capacity left in the

range defined by xL,xH, yL, yH, the printer processes xL, xH, yL, yH out of the defined range.

•☐In the first group of NV bit images, when any of the parameters xL, xH, yL, yH isout of the definition range, this command is disabled.

•☐In groups of NV bit images other than the first one, when the printer encountersxL, xH, yL, yH out of the defined range, it stops processing this command andstarts writing into the NV images. At this time, NV bit images that haven't beendefined are disabled (undefined), but any NV bit images before that areenabled.

•☐The dindicates the definition data. In data (d) a 1 bit specifies a dot to beprinted and a 0 bit specifies a dot not to be printed.

•☐This command defines n as the number of a NV bit image. Numbers rise inorder from NV bit image 01H. Therefore, the first data group [xLxHyLyHd1...dk] is NV bit image 01H, and the last data group [xLxHyLyH d1...dk] is NVbit image n. The total agrees with the number of NV bit images specified by thecommand **FS p**.

•☐The definition data for an NV bit image consists of [xLxHyLyH d1...dk].Therefore, when only one NV bit image is

defined n=1, the printer processes adata group [xLxHyLyH d1...dk] once. The printer uses ([data: (xLxH×□256)×(yLyH×□256)×8] □□[header :4]) bytes of NV memory.

•□The definition area in this printer is a maximum of 192K bytes. This commandcan define several NV bit images, but cannot define bit image data whose totalcapacity [bit image data □□header] exceeds 192K bytes.

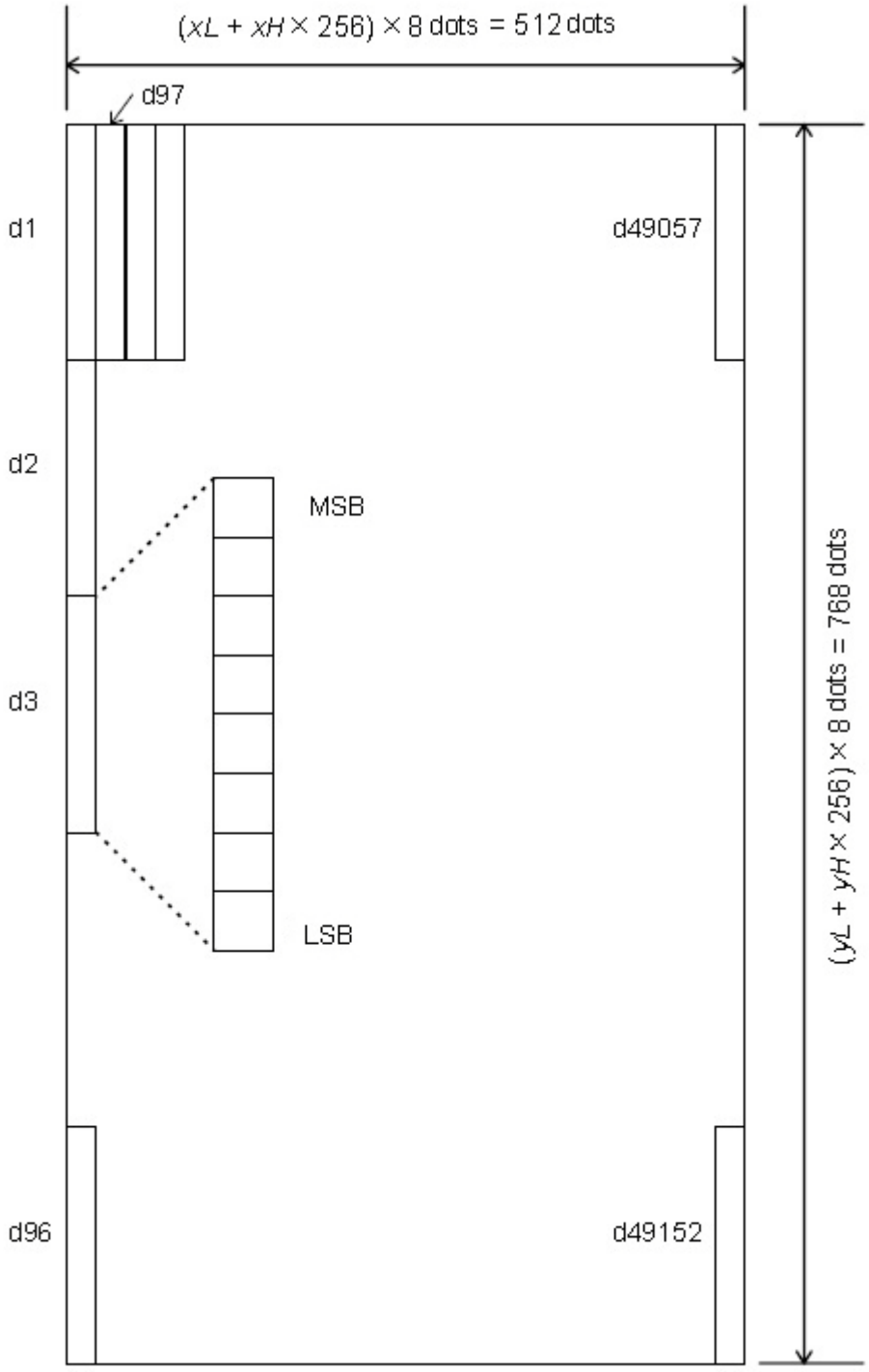
•□The printer does not transmit ASB status or perform status detection duringprocessing of this command even when ASB is specified.

•□Once an NV bit image is defined, it is not erased by performing **ESC @**, reset,and power off.

•□This command performs only definition of an NV bit image and does notperform printing. Printing of the NV bit image is performed by the **FS p**command.

[Reference] **FS p**

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



31.GS ! n

[Name] Select character size

[Format] ASCII GS !n

Hex1D 21 n

Decimal 29 33 n

[Range] 0 ≤□n ≤□255

(1 ≤□vertical number of times ≤□8, 1 ≤□horizontal number of times ≤□8)

[Description] Selects the character height using bits 0 to 2 and selects the character

width usingbits 4 to 7, as follows:

Bit	Off/On	Hex	Decimal	Function
0	Character height selection. See Table 2.			
1				
2				
3				
4	Character width selection. See Table 1.			
5				
6				
7				

Table 1

Character Width Selection

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

Table 2

Character Height Selection

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

[Notes] •□This command is effective for all characters (alphanumeric and Kanji), exceptfor HRI characters.

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

•□In standard mode, the vertical direction is the paper feed

direction, and thehorizontal direction is perpendicular to the paper feed direction. However,when character orientation changes in 90°□clockwise-rotation mode, therelationship between vertical and horizontal directions is reversed.

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

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

[Default] n = 0

[Reference] **ESC !**

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

[Name] Define downloaded bit image

[Format] ASCIIGS *□x y d1...d(x×y×8)

Hex 1D 2A xy d1...d(x×y ×8)

Decimal 29 42 x y d1 ...d(x×y×8)

[Range] 1 ≤□x ≤□255

1 ≤□y ≤□48 (where x×y ≤□1536)

0 ≤□d ≤□255

[Description] Defines a downloaded bit image using the number of dots specified by x and y.

•□x specifies the number of dots in the horizontal direction.

•☐y specifies the number of dots in the vertical direction.

[Notes] •☐The number of dots in the horizontal direction is x×8; in the vertical direction itis y×8.

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

•☐The d indicates bit-image data. Data (d) specifies a bit printed as 1 and notprinted as 0.

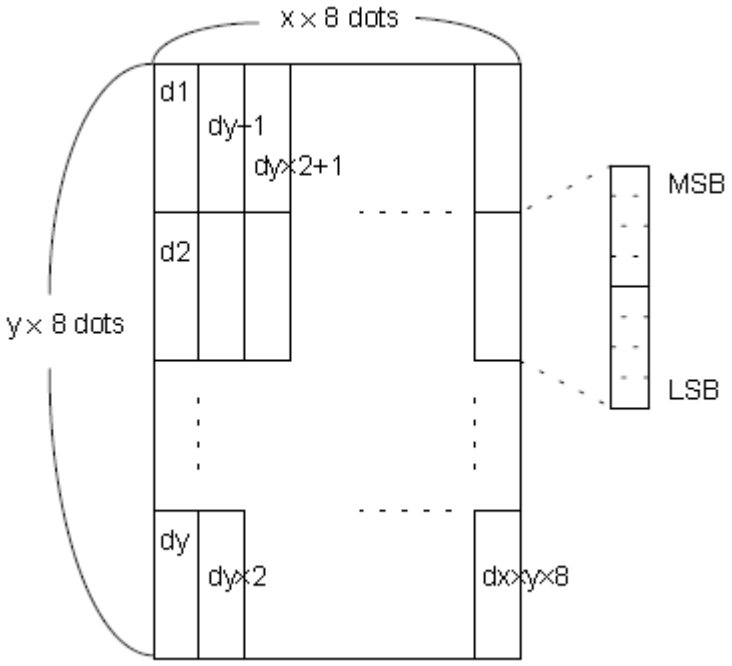
•☐The downloaded bit image definition is cleared when:

1) **ESC @** is executed.

2) **ESC &**is executed.

3)Printer is reset or the power is turned off.

•☐The following figure shows the relationship between the downloaded bit imageand the printed data.



[Reference] **GS /**

33.GS /m

[Name] Print downloaded bit image

[Format] ASCII GS / m

Hex 1D 2F m

Decimal 29 47 m

[Range] 0 ≤□m ≤□3, 48 ≤□m ≤□51

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

m selects a mode from the table below:

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

[Notes] •□This command is ignored if a downloaded bit image has not been defined.

•□In standard mode, this command is effective only when there is no data in theprint buffer.

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

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

[Reference] **GS** *

34.GS B n

[Name] Turn white/black reverse printing mode

[Format] ASCII GS B n

Hex 1D 42 n

Decimal 2966n

[Range] 0 ≤□n ≤□255

[Description] Turns on or off white/black reverse printing mode.

•□When the LSB of n is 0, white/black reverse mode is turned off.

•□When the LSB of n is 1, white/black reverse mode is turned on.

[Notes] •□Only the lowest bit of n is valid.

•□This command is available for built-in characters and user-defined characters.

•□When white/black reverse printing mode is on, it also applies to characterspacing set by **ESC SP**.

•□This command does not affect bit images, user-defined bit images, bar codes,HRI characters, and spacing skipped by **HT**, **ESC $**.

•□This command does not affect the space between lines.

•□White/black reverse mode has a higher priority than

underline mode. Even ifunderline mode is on, it is disabled

(but not canceled) when white/black reversemode is selected.

[Default] n = 0

35.GS Hn

[Name] Select printing position for HRI characters

[Format] ASCII GSH n

Hex 1D 48n

Decimal29 72 n

[Range] 0 ≤□n ≤□3, 48 ≤□n ≤□51

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

bar code.n selects the printing position as follows:

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

•□HRI indicates Human Readable Interpretation.

[Notes] •□HRI characters are printed using the font specified by **GS f**.

[Default] n = 0

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

36.GS L nLnH

[Name] Set left margin

[Format] ASCII GS LnLnH

Hex 1D 4C nLnH

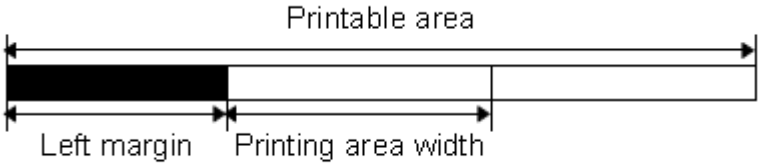
Decimal 29 76 nLnH

[Range] 0 ≤☐nL≤☐255

0 ≤☐nH≤☐255

[Description] Sets the left margin using nL and nH.

•☐The left margin is set to [(nL + nH×256) ×☐0.125 mm].



[Notes] •☐This command is effective only when processed at the beginning of the line instandard mode.

•☐If the setting exceeds the printable area, the maximum value of the printablearea is used.

[Default] nL = 0, nH = 0

37.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 ≤☐n ≤☐255

Bit	Function	Value	
		0	1
0	-	-	-
1	-	-	-
2	Disable/Enable ASB	Disable	Enable
3-4	-	-	-

5	Disable/Enable RTS as flow control	Disable	Enable
6-7	-	-	-

[Description] When ASB is enabled, the printer will send the changed status to PC automatically.

38.GS h n

[Name] Select bar code height

[Format] ASCII GS h n

Hex 1D 68 n

Decimal 29 104 n

[Range] 1 ≤□n ≤□255

[Description] Selects the height of the bar code.

n specifies the number of dots in the vertical direction.

[Default] n = 162

[Reference] **GS k**

39.GS k m d1...dk NUL/GS k m n d1...dn

[Name] Print bar code

[Format] ①ASCII GS km d1...dk NUL

Hex 1D 6B m d1...dk00

Decimal 29 107m d1...dk 0

②ASCII GS k m n d1...dn

Hex 1D 6Bm n d1...dn

Decimal29 107m n d1...dn

[Range] ①0 ≤□m ≤□6 (k and d depend on the bar code system used)

②65 ≤m ≤□73 (n and d depend 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 System	Number of Characters	Remarks
①	0	UPC-A	11 ≤□k ≤□12	48 ≤□d ≤□57
	1	UPC-E	11 ≤□k ≤□12	48 ≤□d ≤□57
	2	JAN13 (EAN13)	12 ≤□k ≤□13	48 ≤□d ≤□57
	3	JAN 8 (EAN8)	7 ≤□k ≤□8	48 ≤□d ≤□57
	4	CODE39	1 ≤□k′	48 ≤□d ≤□57, 65 ≤□d ≤□90, 32, 36, 37,43, 45, 46, 47
	5	ITF	1 ≤□k (even number)	48 ≤□d ≤□57
	6	CODABAR	1 ≤□k′	48 ≤□d ≤□57, 65 ≤□d ≤□68 , 36, 43, 45,46, 47, 58
②	65	UPC-A	11 ≤□n≤□12	48 ≤□d ≤□57
	66	UPC-E	11 ≤ n≤□12	48 ≤□d ≤□57
	67	JAN13 (EAN13)	12 ≤ n□≤□13	48 ≤□d ≤□57
	68	JAN 8 (EAN8)	7 ≤□n≤□8	48 ≤□d ≤□57
	69	CODE39	1 ≤□n ≤□255	48 ≤□d ≤□57, 65 ≤□d ≤□90, 32, 36, 37,43, 45, 46, 47
	70	ITF	1 ≤□n ≤□255 (even number)	48 ≤□d ≤□57
	71	CODABAR	1 ≤□n ≤□255	48 ≤□d ≤□57, 65 ≤□d ≤□68 ,

				36, 43, 45,46, 47, 58
	72	CODE93	1 ≤□n ≤□255	0 ≤□d ≤□127
	73	CODE128	2 ≤□n ≤□255	0 ≤□d ≤□127

[Notes for ①]

•□This command ends with a NUL code.

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

•□When the bar code system used is JAN13 (EAN13), the printer prints the barcode after receiving 13 bytes of bar code data and processes the following dataas normal data.

•□When the bar code system used is JAN8 (EAN8), the printer prints the bar codeafter receiving 8 bytes of bar code data and processes the following data asnormal data.

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

[Notes for ②]

•□n indicates the number of bar code data bytes, and the printer processes nbytes from the next character data as bar code data.

•□If n is outside the specified range, the printer stops

command processing andprocesses the following data as normal data.

[Notes in standard mode]

•☐If d is outside the specified range, the printer only feeds paper and processesthe following data as normal data.

•☐If the horizontal size exceeds printing area, the printer only feeds the paper.

•☐This command feeds as much paper as is required to print the bar code,regardless of the line spacing specified by **ESC 2** or **ESC 3**.

•☐This command is enabled only when no data exists in the print buffer.Whendata exists in the print buffer, the printer processes the datafollowing m asnormal data.

•☐After printing the bar code, this command sets the print position to thebeginning 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.

Control character			HRI character	Control character			HRI character
ASCII	**Hex**	**Decimal**		**ASCII**	**Hex**	**Decimal**	
NUL	00	0	■U	DEL	10	16	■P
SOH	01	1	■A	DC1	11	17	■Q
STX	02	2	■B	DC2	12	18	■R
ETX	03	3	■C	DC3	13	19	■S

EOT	04	4	■D	DC4	14	20	■T
ENQ	05	5	■E	NAK	15	21	■U
ACK	06	6	■F	SYN	16	22	■V
BEL	07	7	■G	ETB	17	23	■W
BS	08	8	■H	CAN	18	24	■X
HT	09	9	■I	EM	19	25	■Y
LF	0A	10	■J	SUB	1A	26	■Z
VT	0B	11	■K	ESC	1B	27	■A
FF	0C	12	■L	FS	1C	28	■B
CR	0D	13	■M	GS	1D	29	■C
SO	0E	14	■N	RS	1E	30	■D
SI	0F	15	■O	US	1F	31	■E
				DEL	7F	127	■T

[Example] Printing **GS k** 72 7 67 111 100 101 13 57 51

When CODE128 (m = 73) is used:

•☐When using CODE128 in this printer, take the following points into account fordata transmission:

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

② Special characters are defined by combining two characters "{" and onecharacter. The ASCII character "{" is defined by transmitting "{" twiceconsecutively.

Specific character	Transmit data		
	ASCII	**Hex**	**Decimal**
SHIFT	{S	7B, 53	123,83
CODE A	{A	7B, 41	123,65
CODE B	{B	7B,42	123,66

CODE C	{C	7B,43	123,67
FNC1	{1	7B,31	123,49
FNC2	{2	7B,32	123,50
FNC3	{3	7B,33	123,51
FNC4	{4	7B,34	123,52
"{"	{{	7B,7B	123,123

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

In this example, the printer first prints "No." using CODE B, then prints thefollowing 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 printerstops command processing and processes the following data as normal data.

•☐If the combination of "{" and the following character does not apply any specialcharacter, the printer stops command processing and processes the followingdata 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 asnormal data.

•☐The printer does not print HRI characters that correspond to the shift charactersor 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) arespace.

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

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

40.GS xn

[Name] Set barcode printing left space

[Format] ASCIIGSx n

Hex 1D 78n

Decimal 29 120n

[Description] The print bar code staring positions is: 0→255

41.GS r n

[Name] Transmit status

[Format] ASCII GS r n

Hex 1D 72 n

Decimal 29 114 n

[Range] n = 1, 49

[Description] Transmits the status specified by n as follows:

n	Function
1, 49	Transmits paper sensor status

[Notes] •□When using a serial interface

When DTR/DSR control is selected, the printer transmits only 1 byte afterconfirming the host is ready to receive data (DSR signal is SPACE). If the hostcomputer is not ready to receive

data (DSR signal is MARK), the printer waitsuntil the host is ready.

When XON/XOFF control is selected, the printer transmits only 1 byte withoutconfirming the condition of the DSR signal.

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

•☐When Auto Status Back (ASB) is enabled using **GS a**, the status transmitted by**GS r** and the ASB status must be differentiated using.

•☐The status types to be transmitted are shown below:

Paper sensor status (n = 1, 49):

Bit	Off/On	Hex	Decimal	Status for ASB
0,1	-	-	-	Undefined.
2,3	Off	00	0	Paper roll end sensor: paper adequate.
	On	(0C)	(12)	Paper roll end sensor: paper near end.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bits 2 and 3: When the paper end sensor detects a paper end, the printer goes offline and doesnot execute this command. Therefore, bits 2 and 3 do not transmit the status ofpaper end.

[Reference] **GS a**

42.GS v 0 m xLxHyLyHd1....dk

[Name] Print raster bit image

[Format] ASCII GS v 0 mxLxHyLyHd1...dk

Hex 1D 76 30 mxLxHyLyHd1...dk

Decimal 29 118 48 m xLxHyLyHd1...dk

[Range] 0 ≤m ≤□3, 48 ≤m ≤□51

0 ≤□xL≤□255

0 ≤□xH≤□255 where 1 ≤□(xL + xH×256) ≤□48

0 ≤□yL≤□255

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

0 ≤□d ≤255

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

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

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

•□xL, xH, select the number of data bytes (xL+xH×256) in the horizontal direction for thebit image.

•□yL, yH, select the number of data bits (yL+yH×256) in the vertical direction for the bitimage.

[Notes] •□In standard mode, this command is effective only when

there is no data in theprint buffer.

•☐This command is not affected by print modes (character size, emphasized,double-strike, upside-down, underline, white/black reverse printing, etc.) forraster bit image.

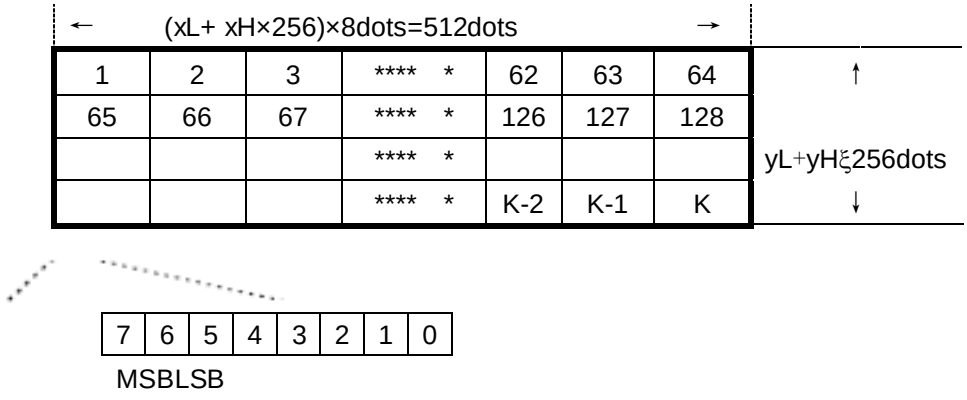
•☐Data outside the printing area is read in and discarded on a dot-by-dot basis.

•☐The position at which subsequent characters are to be printed for raster bitimage is specified by **HT** (Horizontal Tab), **ESC $** (Set absolute print position), and **GS L** (Set left margin). If the position atwhich subsequent characters are to be printed is a multiple of 8.

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

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

[Example] When xL+xH×256=64



43.GS w n

[Name] Set bar code width

[Format] ASCII GS w n

Hex 1D 77 n

Decimal 29 119 n

[Range] 2 ≤□n ≤□6

[Description] Sets 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	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.560	0.500	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2.000

•□Multi-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 = 3

[Reference] **GS k**

44.FS ! n

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

[Format] ASCII FS ! n

Hex 1C 21 n

Decimal 28 33 n

[Range] 0 ≤□n ≤□255

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

Bit	Off/On	Hex	Decimal	Function
0	—	—	—	Undefined.
1	—	—	—	Undefined.
2	Off	00	0	Double-width mode is OFF.
	On	04	4	Double-width mode is ON.
3	Off	00	0	Double-height mode is OFF.
	On	08		Double-height mode is ON.
4	—	—	—	Undefined.
5	—	—	—	Undefined.
6	—	—	—	Undefined.
7	Off	00	0	Underline mode is OFF.
	On	80	128	Underline mode is ON.

[Notes] •□When both double-width and double-height modes are set (including right- andleft-side character spacing), quadruple-size characters areprinted.

•The printer can underline all characters (including right- and left-side characterspacing), but cannot underline the space set by **HT** and 90° clockwise-rotatedcharacters.

•□When some of the characters in a line are double or more height, all thecharacters on the line are aligned at the baseline.

•□It is possible to emphasize the Kanji character using **GS !**; the settingof the last received command is effective.

[Default] n = 0

[Reference] **GS !**

45.FS &

[Name] Select Kanji character mode

[Format] ASCII FS &

Hex 1C 26

Decimal 28 38

[Description] Selects Kanji character mode.

[Notes] For Kanji model:

•☐When the Kanji character mode is selected, the printer processes all Kanjicodeas two bytes each.

•☐Kanji codes are processed in the order of the first byte and second byte.

•☐Kanji character mode is not selected when the power is turned on.

[Reference] **FS .**

46.FS .

[Name] Cancel Kanji character mode

[Format] ASCII FS .

Hex 1C 2E

Decimal 28 46

[Description] Cancels Kanji character mode.

[Notes] For Kanji model:

•□When the Kanji character mode is not selected, all character codes areprocessed one byte at a time as ASCII code.

•□Kanji character mode is not selected when the power is turned on.

[Reference] **FS &**

47.ESC = n

[Name] Set peripheral device

[Format] ASCII ESC = n

Hex 1b 3d n

Decimal 27 61 n

[Description] Set peripheral device :

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer offline，not receive print data.
	On	01	1	Printer online， receive print data.
1-7	-	-	-	Undefined.

48.ESC7n1n2n3

[Name] Setting Control Parameter Command

[Format] ASCII ESC7 n1n2 n3

Hex 1B 37 n1 n2 n3

Decimal 27 55n1 n2 n3

[Description] Set “max heating dots”,”heating time”, “heating interval” ;

n1 = 0-255 Max printing dots，Unit(8dots)，Default:9(80 dots);

n2 = 3-255 Heating time，Unit(10us),Default:80(800us);

n3 = 0-255 Heating interval,Unit(10us)，Default:2(20us);

The more max heting dots, the more peak current will cost whenprinting, the faster printing speed. The max heating dots is 8*(n1+1);

The more heating time, the more density , but the slower printing speed. If heating time is too short, blank page may occur.

The more heating interval, the more clear, but the slower printingspeed.

49.ESC 8n1n2

[Name] Sleep parameter

[Format] ASCII ESC8n1 n2

Hex 1B 38 n1 n2

Decimal 27 56 n1 n2

[Description] Setting the time for control board to enter sleep mode.

n1+n2*256 The time waiting for sleep after printing finished，Unit(Second)，Default:0(don't sleep)

When control board is in sleep mode, host must send one byte(0xff) to wake up control board. And waiting 50ms, then send printing command and data.

NOTE：The command is useful when the system is powered by battery.

50.ESC 9n

[Name] Select Chinese code format

[Format] ASCII ESC9 n

Hex 1B 39 n

Decimal 27 57 n

[Description] Select Chinese code format, n from the character code table as follows：

0:GBK code

1:UTF-8 code

3:BIG5 code

NOTE： This version is not support English.

51.DC2 T

[Name] Printing test page

[Format] ASCII DC2 T

Hex 12 54

Decimal 18 94

[Description] Printing test page

52.ESC pm t1 t2(for Drawer)

[Name] Generate pulse

[Format] ASCII ESC p m t1 t2

Hex 1B 70 m t1 t2

Decimal 27 112 m t1 t2

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

0 ≤□t1≤□255, 0≤□t2≤□255

[Description] Outputs the pulse specified by t1 to connector pin m as follows:

m	Function
0,48	Drawer kick-out connector pin2.
1,49	Drawer kick-out connector pin5.

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

•If t2<t1,the OFF time is [t1×2ms].

53.ESC un (for Drawer)

[Name] Transmit peripheral device status

[Format] ASCII ESC u n

Hex 1B 75 n

Decimal 27 117 n

[Range] 0□□□□□

[Description] transmits the status of the drawer kick-out connector pin 3 as 1byte of data when n=0,48.this allows the host to determine the status of a peripheral device.

n is used as follows:

Bit	On/off	Hex	Decimal	Function
0	Off	00	0	Drawer kick out connector pin 3 is low
0	On	01	1	Drawer kick out connector pin 3 is high
1-3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to off
5-6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to off

54.ESC c 5 n(for buttons)

[Name] Enable/disable panel buttons

[Format] ASCII ESC c 5 n

Hex 1B 63 35 n

Decimal 27 9953 n

[Range] 0 ≤□n ≤□255

[Description] Enables or disables the panel buttons.

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

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

[Default] n = 0