# 200 Series Printer 

## Command

Set

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## 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 $=\mathrm{n}$ | 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 nL nH | Set the left blank margin with dots |
|  | ESC \$ nL nH | Set absolute print position |
|  | ESC B n | Set Left Space |
| Character <br> Command | ESC! $n$ | Select print mode(s) |
|  | GS ! n | Set or Cancle the double width and height |
|  | GS B | Turn white/black reverse printing mode |
|  | ESC V $n$ | Turn $90^{\circ} \mathrm{Clockwise} \mathrm{rotation} \mathrm{mode} \mathrm{on/off}$ |
|  | ESC v n | Transmit paper sensor status |
|  | ESC G $n$ | Turn on/off double-strike mode |
|  | ESC En | Set or Cancle bold font |
|  | ESC SP n | Set the space between chars |
|  | ESC $\{\mathrm{n}$ | 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 | Cancle user-defined characters |
|  | ESC R n | Select and internation character set |
|  | ESCtn | 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 |
|  | FSpnm | Print NV bitmap |
|  | FSqn | Define NV bitmap |

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| Init Command | ESC @ | Initialize printer |
| :---: | :---: | :---: |
| Status <br> Command | GS rn | Transmit status |
|  | GS a n | Enable/Disable ASB |
| Bar Code <br> 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 n 1 n 2 n 3 | Setting Control Parameter Command |
|  | ESC 8 n 1 n 2 | 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) |

## 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 the printing position to [printing area width + 1].
- Horizontal tab positions are set with ESC D.
- If this command is received when the printing position is at [printing area width +1 ], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line.
[Reference] ESC D


## 2.LF

[Name] Print and line feed
[Format] ASCII LF
Hex OA

Decimal 10

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| [Description] | Prints the data in the print buffer and feeds one line, based <br> on the current line spacing. |
| :--- | :--- |
| [Note] | This command sets the print position to the beginning of the <br> line. |
| [Reference] | ESC 2, ESC 3 |

## 3.CR

[Name] [Format]
[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 | $1 B$ | 20 | $n$ |
| Decimal | 27 | 32 | $n$ |

[Range]
[Description] Sets the character spacing for the right side of the character to $[\mathrm{n} \times 0.125 \mathrm{~mm}(\mathrm{n} \times 0.0049$ ") ].
[Notes] - The right-side character spacing for double-width mode is twice the normal value. When characters are enlarged, the right-side character spacing 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

| [Name] | Select print mode(s) |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| [Format] | ASCII | ESC ! | n |  |
|  | Hex | $1 B$ | 21 | $n$ |
|  | Decimal | 27 | 33 | $n$ |
| [Range] | $0 \leq n \leq 255$ |  |  |  |

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

## 6.ESC \$ nL nH

| [Name] | Set absolute print position |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| [Format] | ASCII | ESC | $\$$ | nL | nH |
|  | Hex | 1 B | 24 | nL | nH |
|  | Decimal | 27 | 36 | nL | nH |
| [Range] | $0 \leq n L \leq 255$ |  |  |  |  |
|  | $0 \leq$ | $\mathrm{nH} \leq 255$ |  |  |  |

[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 [ $\mathrm{nL}+\mathrm{nH} \times 256$ ) $\times 0.125 \mathrm{~mm}$ ].
[Notes] - Settings outside the specified printable area are ignored.
- In standard mode, the horizontal motion unit (x) is used.
[Reference] ESC W, GS \$, GS W

| Bit | Off/On | Hex | Decimal | Function |
| :---: | :---: | :---: | :---: | :---: |
| 0 | Off | 00 | 0 | Character Font A (12×24). |
|  | On | 01 | 1 | Character Font B ( $9 \times 17$ ). |
| 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 Delete line mode on/off not selected. |
|  | On | 40 | 64 | Turn Delete line mode on/off selected. |
| 7 | - | - | - | Undefined. |

## 7.ESC B n

[Name]
[Format]
[Range]

Set left space
ASCII ESC B n
Hex 1B 42 n
Decimal 2766 n
Default is 0
$0 \leq n \leq 47$

## 8.ESC \% n

[Name]
[Format]
[Range]
[Description]
[Notes]
[Default]
[Reference]

## 9.ESC \& y c1 c2 [x1 d1...d(y $\times x 1)] \ldots[x k d 1 \ldots d(y \times x k)]$

[Name]
[Format]
[Range]
$y=3$
$32 \leq \mathrm{c} 1 \leq \mathrm{c} 2 \leq 126$
$0 \leq x \leq 12($ when Font $A(12 \times 24)$ is selected)
$0 \leq \mathrm{d} 1 \ldots \mathrm{~d}(\mathrm{y} \times \mathrm{xk}) \leq 255$
[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 the final code.
- $x$ specifies the number of dots in the horizontal direction.
[Notes] The allowable character code range is from ASCII code $<20>H$ to $<7 \mathrm{E}>\mathrm{H}$ (95 characters).
- It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.
$d$ is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.
- The data to define user-defined characters is ( $y \times x$ )


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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 each font. To select a font, use ESC!
- User-defined characters and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.
- 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 $(12 \times 24)$ is selected.



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$$
\begin{aligned}
& \mathrm{d} 1=<0 \mathrm{~F}>\mathrm{H} \text { d } 4=<30>\mathrm{H} \text { d } 7=<40>\mathrm{H} \ldots \\
& \mathrm{~d} 2=<03>\mathrm{H} \text { d } 5=<80>\mathrm{H} \text { d8 }=<40>\mathrm{H} \ldots \\
& \mathrm{~d} 3=<00>\mathrm{H} \text { d } 6=<00>\mathrm{H} \text { d9 }=<20>\mathrm{H} \ldots
\end{aligned}
$$

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

[Name]
[Format]
[Range]
Select bit-image mode

| ASCII | ESC | $*$ | $m$ | $n L$ | $n H$ | $d 1 \ldots d k$ |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| Hex | $1 B$ | $2 A$ | $m$ | $n L$ | $n H$ | $d 1 \ldots d k$ |
| Decimal | 27 | 42 | $m$ | $n L$ | $n H$ | $d 1 \ldots d k$ |

$\mathrm{m}=0,1,32,33$
$0 \leq \mathrm{nL} \leq 255$
$0 \leq \mathrm{nH} \leq 3$
$0 \leq d \leq 255$
[Description] Selects a bit-image mode using m for the number of dots specified by nL and nH , as follows:

| $\mathbf{m}$ | Mode | Vertical Direction |  | Horizontal Direction |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
|  |  | Number <br> of Dots | Dot <br> Density | Dot <br> Density | Number of Data <br> $(\mathrm{K})$ |
| 0 | 8-dot single-density | 8 | 67.7 dpi | 101.6 dpi | $\mathrm{nL}+\mathrm{nH} \times 256$ |
| 1 | 8-dot double-density | 8 | 67.7 dpi | 203.2 dpi | $\mathrm{nL}+\mathrm{nH} \times 256$ |
| 32 | 24-dot single-density | 24 | 203.2 dpi | 101.6 dpi | $(\mathrm{nL}+\mathrm{nH} \times 256) \times 3$ |
| 33 | 24-dot double-density | 24 | 203.2 dpi | 203.2 dpi | $(\mathrm{nL}+\mathrm{nH} \times 256) \times 3$ |

[Notes] If the value of m is out of the specified range, nL and nH the data following are processed as normal data.
The nL and nH indicate the number of dots in the bit image in the horizontal direction. The number of dots is calculated by $\mathrm{nL}+\mathrm{nH} \times 256$.
If the bit-image data input exceeds the number of dots to

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be printed on a line, the excess data is ignored.
d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 not 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-down printing mode.
The relationship between the image data and the dots to be printed is described in Figure 3.11.3.

- When 8-dot bit image is selected:

Bit-image data


### 3.11. 3

- When 24 -dot bit image is selected:


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## Bit-image data



Print data

3.11. 3

## 11.ESC - $n$

[Name] Turn underline mode on/off
[Format] ASCII ESC - n

| Hex $\quad 1 \mathrm{~B} \quad 2 \mathrm{D} \quad \mathrm{n}$ |  |
| :--- | :--- |
| Decimal |  |
| $0 \leq n \leq 27$ | 45 |
| $0 \leq n \leq 50$ |  |

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

| $\mathbf{n}$ | 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 $90^{\circ}$ clockwise rotated characters and white/black inverted characters.

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


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- 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]
[Reference]
n = 0
ESC!


## 12.ESC 2

[Name] Select default line spacing
[Format] ASCII ESC 2
Hex 1B 32
Decimal 2750
[Description] Selects $3.75 \mathrm{~mm}(30 \times 0.125 \mathrm{~mm})$ line spacing.
[Notes]

- The line spacing can be set independently in standard mode.
[Reference] ESC 3


## 13.ESC 3 n

[Name] Set line spacing
[Format] ASCII ESC 3 n
Hex 1B 33 n
Decimal 27 n
[Range] $\quad 0 \leq n \leq 255$
[Description] Sets the line spacing to [ $\mathrm{n} \times 0.125 \mathrm{~mm}$ ].
[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 3F n

Decimal 2763 n
[Range]
$32 \leq n \leq 126$
[Description]
[Notes]
Cancels user-defined characters.

- This command cancels the patterns defined for the character codes specified by $n$. After the user-defined characters are canceled, the corresponding patterns for the internal characters are printed.
- This command deletes the pattern defined for the


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specified code in the font selected by ESC !.

- If a user-defined characters have not been defined, the printer ignores this command.
[Reference] ESC \& ESC \%


## 15.ESC @

[Name] Initialize printer

| [Format] | ASCII | ESC | @ |
| :--- | :--- | :---: | :--- |
|  | Hex | $1 B$ | 40 |
|  | Decimal | 27 | 64 |

[Description] Clears the data in the print buffer and resets the printer mode to the mode that was in effect when the power was turned on.
[Notes] - The DIP switch settings are not checked again.

- The data in the receive buffer is not cleared.


## 16.ESC D n1...nk NUL

[Name]
[Format]
[Range]
[Description] Sets horizontal tab positions.

- n specifies the column number for setting a horizontal t
ab position from the beginning of the line.
- $k$ indicates the total number of horizontal tab positions to be set.
[Notes] - The horizontal tab position is stored as a value of [character width $x \quad n$ ] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are set with twice the width of normal characters.
- This command cancels the previous horizontal tab settings.
- When setting $\mathrm{n}=8$, the print position is moved to column 9 by sending HT.
- Up to 32 tab positions ( $k=32$ ) can be set. Data exceeding 32 tab positions is processed as normal data.
- Transmit [n]k in ascending order and place a NUL code 0 at the end.
When $[n] k$ is less than or equal to the preceding value [ n ] $\mathrm{k}-1$, tab setting is finished and the following data is processed as normal data.


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- ESC D NUL cancels all horizontal tab positions.
- The previously specified horizontal tab positions do not change, even if the character width changes.
- The character width is memorized for each standard mode.
[Default] The default tab positions are at intervals of 8 characters (columns $9,17,25, \ldots$ ) for Font A ( $12 \times 24$ ).
[Reference]
HT


## 17.ESC E n

[Name]
[Format]
[Range]
[Description]
Turn emphasized mode on/off
[Range]
[Description

ASCII ESC E n
Hex 1B 45 n
Decimal 2769 n
[Desciplion
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 G n

| [Name] | Turn on/off double-strike mode |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| [Format] | ASCII | ESC | G | $n$ |
|  | Hex | $1 B$ | 47 | $n$ |
|  | Decimal | 27 | 71 | $n$ |
| [Range] | $0 \leq n \leq$ | 255 |  |  |

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

- When the LSB of n is 0 , double-strike mode is turned off.
- When the LSB of $n$ is 1 , double-strike mode is turned on.
[Notes] - Only the lowest bit of n is enabled.
- Printer output is the same in double-strike mode and in emphasized mode.
[Default] $\mathrm{n}=0$
[Reference]
ESC E


## 19.ESC J n

| [Name] | Print and feed paper |
| :--- | :--- | :--- |
| [Format] | ASCII ESC $J \quad n$ |

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[Range]
Hex 1B 4A n
Decimal $27 \quad 74$ n
[Description] Prints the data in the print buffer and feeds the paper [ $\mathrm{n} \times$ 0.125 mm ( 0.0049 ")].
[Notes]

- After printing is completed, this command sets the print starting position to the beginning 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]
[Format]
[Range]
[Description]

Select an international character set

| ASCII | ESC | $R$ | $n$ |
| :--- | :---: | :---: | :---: |
| Hex | $1 B$ | 52 | $n$ |
| Decimal | 27 | 82 | $n$ |

Decimal 2782 n $0 \leq n \leq 15$
Selects international character set n from the following table:

| $\mathbf{n}$ | 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] | $\mathrm{n}=0$ |

## 21.ESC V n

[Name] Turn $90^{\circ}$ clockwise rotation mode on/off
[Format]
ASCII ESC $V n$

Hex 1B 56 n

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Decimal 2786 n
[Range]
$0 \leq n \leq 1,48 \leq n \leq 49$
[Description] Turns $90^{\circ}$ clockwise rotation mode on/off n is used as follows:

| n | Function |
| :--- | :--- | :--- |
| 0,48 | Turns off $90^{\circ} \quad$ clockwise rotation mode |
| 1,49 | Turns on $90^{\circ} \quad$ clockwise rotation mode |

[Notes] - This command affects printing in standard mode.
However, the setting is always effective.

- When underline mode is turned on, the printer does not underline $90^{\circ}$
clockwise-rotated characters.
- Double-width and double-height commands in
$90^{\circ}$ rotation mode enlarge characters in the opposite directions from double-height and double- width commands in normal mode.
[Default]
[Reference] ESC !, ESC


## 22.ESC v n

[Name]
[Format]

Transmit paper sensor status
ASCII ESC v n
Hex 1B 76 n
Decimal 27118 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. |
|  | Off | 00 | 0 | paper have. |
|  | On | 04 | 4 | paper out. |
| 3 | Off | 00 | 0 | Voltage is normal. |
|  | On | 08 | 8 | Voltage $>9.5 \mathrm{~V}$. |
| 4 | - | - | - | Undefined. |
| 5 | - | - | - | Undefined. |
| 6 | Off | 00 | 0 | Temperature is normal. |
|  | On | 40 | 64 | Temperature $>60^{\circ}$. |
| 7 | - | - | - | Undefined. |

For example : return " $0 \times 04$ " is means paper out.

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## 23.ESC a n

[Name]
Select justification
[Format] ASCII ESC a n
Hex 1B 61 n
Decimal 27 n 9
[Range]
$0 \leq n \leq 2,48 \leq n \leq 50$
[Description] Aligns all the data in one line to the specified position. n selects the justification as follows:

| $\mathbf{n}$ | Justification |
| :--- | :--- |
| 0,48 | Left justification |
| 1,49 | Centering |
| 2,50 | Right justification |

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

- This command executes justification in the printing area.
- This command justifies the space area according to HT, ESC \$ .
[Default] $\mathrm{n}=0$
[Example]

Left justification

## ABC

ABCD
ABCDE

| Centering |
| :---: |
| ABC |
| ABCD |
| ABCDE |

Right justification ABC ABCD ABCDE

## 24.ESC SO n

[Name] Select Double Width mode
[Format]
[Description]

ASCII ESC SO n
Hex 1B 0E n
Decimal 2714 n
Select Double Width mode,
To turn double width off, use LF or DC4 command.

## 25.ESC DC4 n

| [Name] | Disable Double Width mode |  |  |  |
| :--- | :--- | :---: | :---: | :---: |
| [Format] | ASCII | ESC | DC4 | n |
|  | Hex | 1 B | 14 | $n$ |
|  | Decimal | 27 | 20 | $n$ |
| [Description] | Disable Double Width mode |  |  |  |

## 26.ESC d n

[Name]
Print and feed $n$ lines

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[Format] | ASCII | ESC | d | $n$ |  |
| :--- | :--- | :--- | ---: | :--- |
|  | $H e x$ | $1 B$ | 64 | $n$ |

[Description [Notes]
[Reference]
$0 \leq n \leq 255$
Prints the data in the print buffer and feeds $n$ lines.

- 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 ( $n \times$ line spacing) of more than 1016 mm ( 40 inches) is specified, the printer feeds the paper only 1016 mm (40 inches).
ESC 2, ESC 3


## 27.ESC t n

[Name]
[Format]
[Range]
$0 \leq n \leq 5,16 \leq n \leq 19, n=255$

| $\mathbf{N}$ | Code Page | $\mathbf{N}$ | 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 |

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| 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] $\mathrm{n}=0$
[Reference] Character Code Tables

## 28.ESC \{ $n$

| [Name] | Turns on/off upside-down printing mode |  |  |  |
| :--- | :--- | :--- | :---: | :--- |
| [Format] | ASCII | ESC | \& | $n$ |
|  | Hex | $1 B$ | $7 B$ | $n$ |
|  | Decimal | 27 | 123 | $n$ |
| [Range] | $0 \leq n \leq 255$ |  |  |  |

[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 LSB of $n$ is 1 , upside-down printing mode is turned on.
[Notes] - Only the lowest bit of $n$ is valid.
- This command is enabled only when processed at the beginning of a line in standard mode.
- In upside-down printing mode, the printer rotates the line to be printed by $180^{\circ}$ and then prints it.


## [Default] $\mathrm{n}=0$

[Example]


Paper feed direction

## 29.FS p n m

[Name] Print NV bit image
[Format] ASCII FS p n m

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- n is the number of the NV bit image (defined using the FS q command).
[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 been defined.
- In standard mode, this command is effective only when there is no data in the print buffer.
- This command is not affected by print modes (emphasized, underline, character size, white/black reverse printing, or $90^{\circ}$ rotated characters, etc.), except upside-down printing mode.
- If the downloaded bit-image to be printed exceeds one line, the excess data is not printed.
- This command feeds dots (for the height $n$ of the NV bit image) in normal and double-width modes, and (for the height $n \times 2$ of the NV bit image) in double height and 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 beginning of the line and processes the data that follows as normal data.
[References] ESC *, FS q, GS /, GS v


## 30.FS q n [xьхн уцун d1...dk]1...[хьхн уцун d1...dk]n

[Name]
[Format]
[Range]

Define NV bit image
ASCII FS a $n$ [xL $x H y L y H d 1 \ldots d k] 1 \ldots[x L x H y L$ yH d1...dk]n
Hex 1C 71 n [xL xH yL yH d1...dk] $1 \ldots[\mathrm{xL} \mathrm{xH}$ yL yH d1...dk]n
Decimal $28113 \mathrm{n} \quad[\mathrm{xL} x \mathrm{xHL} y \mathrm{y}$ d1...dk]1...[ xL xH yL yH d1...dk]n
$1 \leq n \leq 255$

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|  | $0 \leq x L \leq 255$ |
| :---: | :---: |
|  | $0 \leq \mathrm{Xh} \leq 3($ when $1 \leq(x L \quad x H \times 256) \leq 1023$ |
|  | $0 \leq \mathrm{yL} \leq 255$ |
|  | $0 \leq y L \leq 1($ when $1 \leq(y L \quad y H x \quad 256) \leq 288$ |
|  | $0 \leq \mathrm{d} \leq 255$ |
|  |  |
|  | Total defined data area $=192 \mathrm{~K}$ bytes |
| [Description] | Define the NV bit image specified by $n$. |
|  | - $x L$, xH specifies (xL xH x 256) x 8 dots in the |
|  | horizontal direction for the NV bit image you are defining. <br> - yL , yH specifies (yL yH x 256) $x 8$ dots in the vertical |
|  | direction for the NV bit image 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 image into the NV memory. Therefore, |
|  | user-defined characters, downloaded bit images should be |
|  | defined only after completing this command. The printer |
|  | the mode 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 this command.
- From the beginning of the processing of this command till the finish of hardware reset, mechanical operations (including initializing the position of the print head when the cover is open, paper feeding using the FEED button, etc.) cannot be performed.
- During processing of this command, the printer is BUSY when writing data to the user NV memory and stops receiving data. Therefore it is prohibited to transmit the data, including real-time commands, during the execution of this command.
- NV bit image is a bit image defined in non-volatile memory by FS q and printed by FS p.
- In standard mode, this command is effective only when processed at the beginning of the line.
- This command is effective when 7 bytes <FS $y H>$ of the command are processed normally.
- When the amount of data exceeds the capacity left in the range defined by $x L, x H, y L, y H$, the printer processes $x L, x H$,


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$y L$, $y H$ out of the defined range.

- In the first group of NV bit images, when any of the parameters $x L, x H, y L, y H$ is out of the definition range, this command is disabled.
- In groups of NV bit images other than the first one, when the printer encounters $\mathrm{xL}, \mathrm{xH}, \mathrm{yL}, \mathrm{yH}$ out of the defined range, it stops processing this command and starts writing into the NV images. At this time, NV bit images that haven't been defined are disabled (undefined), but any NV bit images before that are enabled.
- The d indicates the definition data. In data (d) a 1 bit specifies a dot to be printed 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 in order from NV bit image 01H. Therefore, the first data group [xL xH yL yH d1...dk] is NV bit image 01 H , and the last data group [ $\mathrm{xL} \mathrm{xH} \mathrm{yL} \mathrm{yH} \mathrm{d} 1 \ldots \mathrm{dk}$ ] is NV bit image $n$. The total agrees with the number of NV bit images specified by the command FS p.
- The definition data for an NV bit image consists of [xL xH $y L y H d 1 \ldots d k]$. Therefore, when only one NV bit image is defined $\mathrm{n}=1$, the printer processes a data group [ $\mathrm{xL} \times \mathrm{H} \mathrm{yL}$ $\mathrm{yH} \mathrm{d} 1 \ldots \mathrm{dk}]$ once. The printer uses ([data: ( $\mathrm{xL} \mathrm{xH} \times$ 256) $\times(\mathrm{yL} \mathrm{yH} \times 256) \times 8$ ] [header :4]) bytes of NV memory.
- The definition area in this printer is a maximum of 192 K
bytes. This command can define several NV bit images, but cannot define bit image data whose total capacity [bit image data header] exceeds 192K bytes.
- The printer does not transmit ASB status or perform status detection during processing 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 not perform printing. Printing of the NV bit image is performed by the FS p command.
[Reference] FS p
[Example] 当 $x L=64, x H=0, y L=96, y H=0$


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31.GS ! n
[Name] Select character size
[Format] ASCII GS ! n
Hex 1D 21 n

Decimal 2933 n
[Range]
$0 \leq n \leq 255$
( $1 \leq$ vertical number of times $\leq 8,1 \leq$ horizontal number of times $\leq 8$ )

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## [Description] <br> Selects the character height using bits 0 to 2 and selects the character <br> width using bits 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), except for 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 the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in $90^{\circ}$ clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.
- 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] $\mathrm{n}=0$
[Reference]
ESC!


## 32.GS * $x$ y d1...d( $x \times y \times 8$ ) <br> [Name] Define downloaded bit image

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[Format] ASCII GS * $x$ y d1...d $(x \times y \times 8)$
[Range]
Decimal $2942 \times$ y d1 ...d( $x \times y \times 8$ )
$1 \leq x \leq 255$
$1 \leq y \leq 48$ (where $x \times y \leq 1536$ )
$0 \leq d \leq 255$
[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.
- The number of dots in the horizontal direction is $x \times 8$; in the vertical direction it is $y \times 8$.
- If $x \times y$ is out of the specified range, this command is disabled.
- The d indicates bit-image data. Data (d) specifies a bit printed as 1 and not printed 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 image and the printed data.

[Reference] GS /


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## 33.GS / m

| [Name] | Print downloaded bit image |
| :--- | :--- |
| [Format] | ASCII GS $/ \mathrm{m}$ |
|  | Hex $1 \mathrm{D} \quad 2 \mathrm{~F} \quad \mathrm{~m}$ |
| [Range] | Decimal $29 \quad 47 \mathrm{~m}$ |
| [Description] | $0 \leq \mathrm{m} \leq 3,48 \leq \mathrm{m} \leq 51$ |
|  | Prints a downloaded bit image using the mode specified by |
|  | m. |
|  | m selects a mode from the table below: |


| $\mathbf{m}$ | 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 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 downloaded bit-image to be printed exceeds the printable area, the excess 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 2966 n
[Range] $0 \leq n \leq 255$
[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 character spacing set by ESC SP.
- This command does not affect bit images, user-defined


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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 if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.
[Default] $n=0$


## 35.GS H n

[Name] Select printing position for HRI characters
[Format] ASCII GS H n
Hex 1D 48 n

Decimal 29 n
[Range] $\quad 0 \leq \mathrm{n} \leq 3,48 \leq \mathrm{n} \leq 51$
[Description] Selects the printing position of HRI characters when printing a bar code. n selects the printing position as follows:

| $\mathbf{n}$ | 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 nL nH

[Name] Set left margin
[Format] ASCII GS $\mathrm{L} \quad \mathrm{nL} \mathrm{nH}$
Hex 1D 4C nL nH

Decimal 2976 nL nH
[Range] $0 \leq \mathrm{nL} \leq 255$
$0 \leq n H \leq 255$
[Description] Sets the left margin using $n \mathrm{~L}$ and nH .

- The left margin is set to $[(\mathrm{nL}+\mathrm{nH} \times 256) \times 0.125$ mm ].



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[Notes]
[Default]

## 37.GS a n

[Name]
[Format]

- This command is effective only when processed at the beginning of the line in standard mode.
- If the setting exceeds the printable area, the maximum value of the printable area is used.

$$
\mathrm{nL}=0, \mathrm{nH}=0
$$

| [Format] | ASCII | GS | a | $n$ |
| :--- | :--- | :---: | :--- | :--- |
|  | Hex | $1 D$ | 61 | $n$ |
|  | Decimal | 29 | 97 | $n$ |
| [Range] | $0 \leq n \leq$ | 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]
[Range]
ASCII
GS h n
Hex 1D 68 n
Decimal 29104 n
[Description]
$1 \leq n \leq 255$
Selects the height of the bar code.
n specifies the number of dots in the vertical direction.
[Default]
$\mathrm{n}=162$
[Reference]
GS k

## 39.GS $k$ m d1...dk NUL/GS $k \quad m \quad n \quad d 1 \ldots d n$

[Name]
[Format]
[Range]

| Print bar code |  |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
| (1)ASCII | GS | $k$ | $m$ | $d 1 \ldots \mathrm{dk}$ | NUL |
| Hex | $1 D$ | $6 B$ | $m$ | $\mathrm{~d} 1 \ldots \mathrm{dk}$ | 00 |
| Decimal | 29 | 107 | m | $\mathrm{~d} 1 \ldots \mathrm{dk}$ | 0 |
| (2)ASCII | GS | k | m | n | $\mathrm{d} 1 \ldots \mathrm{dn}$ |
| Hex | 1 D | 6 B | m | n | $\mathrm{d} 1 \ldots \mathrm{dn}$ |
| Decimal | 29 | 107 | m | n | $\mathrm{d} 1 \ldots \mathrm{dn}$ |

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used)
(2) $65 \leq m \leq 73$ ( $n$ 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 UPC-A | Number of Characters$11 \leq k \leq 12$ | Remarks$48 \leq d \leq 57$ |
| :---: | :---: | :---: | :---: | :---: |
| (1) | 0 |  |  |  |
|  | 1 | UPC-E | $11 \leq k \leq 12$ | $48 \leq \mathrm{d} \leq 57$ |
|  | 2 | JAN13 (EAN13) | $12 \leq \mathrm{k} \leq 13$ | $48 \leq \mathrm{d} \leq 57$ |
|  | 3 | JAN 8 (EAN8) | $7 \leq \mathrm{k} \leq 8$ | $48 \leq \mathrm{d} \leq 57$ |
|  | 4 | CODE39 | $1 \leq k^{\prime}$ | $\begin{aligned} & 48 \leq d \leq 57,65 \leq d \\ & \leq 90,32,36,37,43,45,46 \\ & 47 \end{aligned}$ |
|  | 5 | ITF | $1 \leq \mathrm{k}$ (even number) | $48 \leq \mathrm{d} \leq 57$ |
|  | 6 | CODABAR | $1 \leq k^{\prime}$ | $\begin{aligned} & 48 \leq d \leq 57,65 \leq d \\ & \leq 68,36,43,45,46,47,58 \end{aligned}$ |
| (2) | 65 | UPC-A | $11 \leq \mathrm{n} \leq 12$ | $48 \leq \mathrm{d} \leq 57$ |
|  | 66 | UPC-E | $11 \leq \mathrm{n} \leq 12$ | $48 \leq d \leq 57$ |
|  | 67 | JAN13 (EAN13) | $12 \leq \mathrm{n} \leq 13$ | $48 \leq \mathrm{d} \leq 57$ |
|  | 68 | JAN 8 (EAN8) | $7 \leq n \leq 8$ | $48 \leq d \leq 57$ |
|  | 69 | CODE39 | $1 \leq \mathrm{n} \leq 255$ | $\begin{aligned} & 48 \leq d \leq 57,65 \leq d \\ & \leq 90,32,36,37,43,45,46 \\ & 47 \end{aligned}$ |
|  | 70 | ITF | $\begin{aligned} & 1 \leq \mathrm{n} \leq 255 \text { (even } \\ & \text { number) } \end{aligned}$ | $48 \leq d \leq 57$ |
|  | 71 | CODABAR | $1 \leq \mathrm{n} \leq 255$ | $\begin{aligned} & 48 \leq d \leq 57,65 \leq d \\ & \leq 68,36,43,45,46,47,58 \end{aligned}$ |
|  | 72 | CODE93 | $1 \leq \mathrm{n} \leq 255$ | $0 \leq d \leq 127$ |
|  | 73 | CODE128 | $2 \leq \mathrm{n} \leq 255$ | $0 \leq d \leq 127$ |

[Notes for (1)]

- This command ends with a NUL code.
- When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes of 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 of 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 of bar code data and processes the following data as normal data.
- The number of data for the ITF bar code must be even numbers. When an odd number of bytes of data is input, the


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printer ignores the last received data.
[Notes for (2)]

- n indicates the number of bar code data bytes, and the printer processes $n$ bytes from the next character data as bar code data.
- If n is outside the specified range, the printer stops command processing and processes the following data as normal data.
[Notes in standard mode]
- If $d$ is outside the specified range, the printer only feeds paper and processes the following data as normal data.
- If the horizontal size exceeds printing area, the printer only feeds the paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by ESC 2 or ESC 3.
- This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.
- After printing the 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 $90^{\circ}$ 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 | $\square$ | 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 | - $\times$ |
| HT | 09 | 9 | $\cdots$ | EM | 19 | 25 | - Y |
| LF | OA | 10 | - J | SUB | 1A | 26 | - |
| VT | OB | 11 | -K | ESC | 1B | 27 | -A |
| FF | OC | 12 | -L | FS | 1C | 28 | -B |
| CR | OD | 13 | -M | GS | 1D | 29 | - ${ }^{\text {C }}$ |
| SO | OE | 14 | -N | RS | 1E | 30 | -D |
| SI | OF | 15 | - 0 | US | 1F | 31 | -E |
|  |  |  |  | DEL | 7F | 127 | - T |

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[Example] Printing GS k 72767111100101135751


When CODE128 ( $\mathrm{m}=73$ ) is used:

- When using CODE128 in this printer, take the following points into account for data 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 one character. The ASCII character "\{" is defined by transmitting "\{" twice consecutively.

|  | Transmit data |  |  |
| :--- | :--- | :--- | :--- |
| Specific character | ASCII | Hex | Decimal |
| SHIFT | $\{\mathrm{S}$ | $7 \mathrm{~B}, 53$ | 123,83 |
| CODE A | \{A | $7 \mathrm{~B}, 41$ | 123,65 |
| CODE B | $\{\mathrm{B}$ | $7 \mathrm{~B}, 42$ | 123,66 |
| CODE C | $\{\mathrm{C}$ | $7 \mathrm{~B}, 43$ | 123,67 |
| FNC1 | $\{1$ | $7 \mathrm{~B}, 31$ | 123,49 |
| FNC2 | $\{2$ | $7 \mathrm{~B}, 32$ | 123,50 |
| FNC3 | $\{3$ | $7 \mathrm{~B}, 33$ | 123,51 |
| FNC4 | $\{4$ | $7 \mathrm{~B}, 34$ | 123,52 |
| "\{" | $\{\mathrm{C}$ | $7 \mathrm{~B}, 7 \mathrm{~B}$ | 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 731012366781114612367123456


No. 123456

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


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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 h, GS w


## 40.GS x n

[Name] [Format]

Set barcode printing left space

| ASCII | GS | $n$  <br> Hex $1 D$ <br>  78 <br> $n$  <br> Decimal 29 <br>  120 | $n$ |
| :--- | ---: | ---: | ---: |

## 41.GS r n

| [Name] | Transmit status |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| [Format] | ASCII | GS | r |  |
|  | Hex | $1 D$ | 72 | $n$ |
|  | Decimal | 29 | 114 | $n$ |
| [Range] | $n=1,49$ |  |  |  |

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

| $\mathbf{n}$ | Function |
| :--- | :--- |
| 1,49 | Transmits paper sensor status |
| [Notes] | When using a serial interface |

[Notes] - When using a serial interface
When DTR/DSR control is selected, the printer transmits only 1 byte after confirming the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready.
When XON/XOFF control is selected, the printer transmits only 1 byte without confirming 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 and transmitting 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


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differentiated using.

- The status types to be transmitted are shown below:

Paper sensor status ( $\mathrm{n}=1,49$ ):

| Bit | Off/On | Hex | Decimal | Status for ASB |
| :--- | :--- | :--- | :--- | :--- |
| 0,1 | - | - | - | Undefined. |
| 2,3 | Off | 00 | 0 | Paper roll end sensor: paper adequate. |
|  | On | $(0 C)$ | $(12)$ | 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 does not execute this command.
Therefore, bits 2 and 3 do not transmit the status of paper end.
[Reference] GS a
42.GS $\quad$ v $0 \quad x L x H y L y H \quad d 1 \ldots . . d k$
[Name] Print raster bit image
[Format] ASCII GS v 0 m xL xH yL yH
d1...dk
$\begin{array}{lllllllll}\text { Hex 1D } & 76 & 30 & m & x L & x H & y L & y H\end{array}$
d1...dk
Decimal $\begin{array}{lllllll}29 & 118 & 48 & m & x L & x H & y L\end{array} y^{\prime}$
d1...dk
[Range] $0 \leq m \leq 3,48 \leq m \leq 51$
$0 \leq x L \leq 255$
$0 \leq \mathrm{xH} \leq 255$ where $1 \leq(x L+\mathrm{xH} \times 256) \leq 48$
$0 \leq \mathrm{yL} \leq 255$
$0 \leq y H \leq 8$ where $1 \leq(y L+y H \times 256) \leq 4095$
$0 \leq \mathrm{d} \leq 255$
$\mathrm{k}=(\mathrm{xL}+\mathrm{xH} \times 256) \times(\mathrm{yL}+\mathrm{yH} \times 256)(\mathrm{k} \neq 0)$
[Description] Selects raster bit-image mode. The value of $m$ selects the mode, as follows:

| $\mathbf{m}$ | Mode | Vertical <br> Dot Density | Horizontal <br> 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 |

- $\mathrm{xL}, \mathrm{xH}$, select the number of data bytes ( $\mathrm{xL}+\mathrm{xH} \times 256$ ) in
the horizontal direction for the bit image.
- $y L$, $y H$, select the number of data bits $(y L+y H \times 256)$ in the vertical direction for the bit image.


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[Notes]
[Example] When $x L+x H \times 256=64$

| $\leftarrow$ | $(x L+x H \times 256) \times 8$ dots $=512$ dots |  |  |  |  |  | $\rightarrow$ |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 3 | **** | * | 62 | 63 | 64 |  |
| 65 | 66 | 67 | **** | * | 126 | 127 | 128 | $\mathrm{yL}+\mathrm{yH} \xi 256 \mathrm{dots}$ |
|  |  |  | **** | * |  |  |  |  |
|  |  |  | **** | * | K-2 | K-1 | K | $\downarrow$ |


| 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| MSB |  |  |  | LSB |  |  |  |

## 43.GS w n

[Name] Set bar code width
[Format] ASCII GS w n
Hex 1D 77 n

Decimal 29119 n
[Range]
[Description]
$2 \leq n \leq 6$
Sets the horizontal size of the bar code.
n specifies the bar code width as follows:

| $\mathbf{n}$ | Module Width (mm) for <br>  <br> Multi-level Bar Code | Binary-level Bar Code |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | 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 |  |

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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 = 3
[Reference]
GS k

## 44.FS ! n

[Name] Set print mode(s) for Kanji characters
[Format]
ASCII FS ! n
Hex 1C 21 n
Decimal 2833 n
[Range]
$0 \leq n \leq 255$
[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. |
|  | - | - | - | Undefined. |
| 5 | - | - | - | Undefined. |
| 6 | - | - | - | Undefined. |
| 7 | Off | 00 | 0 | Underline mode is OFF. |
|  | On | 80 | 128 | Underline mode is ON. |
|  | 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 rightand left-side character spacing), but cannot underline the space set by HT and $90^{\circ}$ clockwise-rotated characters.
- When some of the characters in a line are double or more height, all the characters on the line are aligned at the baseline.
- It is possible to emphasize the Kanji character using GS !; the setting of the last received command is effective.
[Default] $n=0$
[Reference] GS!


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## 45.FS \&

| [Name] | Select Kanji character mode |  |  |
| :--- | :--- | :---: | :---: |
| [Format] | ASCII | FS | $\&$ |
|  | Hex | 1 C | 26 |
|  | Decimal | 28 | 38 |
| [Description] | Selects Kanji character mode. |  |  |
| [Notes] | For Kanji model: |  |  |

- When the Kanji character mode is selected, the printer processes all Kanji code as 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 | $1 C$ | $2 E$ |
|  | 28 | 46 |

[Description] Cancels Kanji character mode.
[Notes]
For Kanji model:

- When the Kanji character mode is not selected, all
character codes are processed 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 2761 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.ESC 7 n1 n2 n3

[Name] Setting Control Parameter Command

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[Format] ASCII ESC 7 n1 n2 n3
Hex 1B 37 n1 n2 n3

Decimal 27 n5 n1 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 when printing, the faster printing speed. The max heating dots is $8 *(n 1+1)$;
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 printing speed.

## 49.ESC 8 n1 n2

[Name] Sleep parameter
[Format] ASCII ESC 8 n1 n2
Hex 1B 38 n1 n2

Decimal $27 \quad 56$ 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 9 n

[Name] Select Chinese code format
[Format] ASCII ESC 9 n
Hex 1B 39 n

Decimal 27 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 p m t1 t2(for Drawer)

[Name]
[Format]
[Range]
Generate pulse
ASCII ESC p m t1 t2
Hex 1B 70 m t1 t2
Decimal 27112 m t1 t2
$m=0,1,48,49$
$0 \leq \mathrm{t} 1 \leq 255,0 \leq \mathrm{t} 2 \leq 255$
[Description] Outputs the pulse specified by t1 to connector pin m as follows:

| $\mathbf{m}$ | Function |
| :--- | :--- |
| 0,48 | Drawer kick-out connector pin2. |
| 1,49 | Drawer kick-out connector pin5. |

[Notes] - The pulse ON time is [t1 $\times 2 \mathrm{~ms}$ ] and the OFF time is [t $2 \times$ 2 ms ].

- If $\mathrm{t} 2<\mathrm{t} 1$, the OFF time is [ $\mathrm{t} 1 \times 2 \mathrm{~ms}$ ].


## 53.ESC u n (for Drawer)

[Name]
[Format]
[Range]
[Description] transmits the status of the drawer kick-out connector pin 3 as 1 byte of data when $\mathrm{n}=0,48$.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 |

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54.ESC c 5 n(for buttons)
[Name] Enable/disable panel buttons
[Format] ASCII ESC c 5 n
Hex 1B $63 \quad 35$ n
Decimal $2799 \quad 53$ n
[Range] $0 \leq n \leq 255$
[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] $\mathrm{n}=0$

