



SRP-330
Command Manual

Rev. 1.01

<http://www.bixelon.com>

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1. Notice

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2. Control Commands List in Alphanumeric Order

| No. | Command | Function |
|-----|------------------|--|
| 1 | HT | Horizontal tab |
| 2 | LF | Print and line feed |
| 3 | FF | Form feed (in page mode) |
| 4 | CR | Print and carriage return |
| 5 | CAN | Cancel the print data in page mode |
| 6 | DLE EOT | Transmit real-time status |
| 7 | DLE DC4 | Generate pulse at real-time |
| 8 | ESC SP | Set the character right space |
| 9 | ESC ! | Set print mode |
| 10 | ESC \$ | Set absolute print position |
| 11 | ESC % | Select/cancel user-defined character set |
| 12 | ESC & | Define user-defined character set |
| 13 | ESC * | Specify bit image mode |
| 14 | ESC - | Turn underline mode on/off |
| 15 | ESC 2 | Select default line spacing |
| 16 | ESC 3 | Set line spacing |
| 17 | ESC = | Select peripheral device |
| 18 | ESC ? | Cancel user-defined characters |
| 19 | ESC @ | Initialize printer |
| 20 | ESC D | Set horizontal tab positions |
| 21 | ESC E | Turn emphasized mode on/off |
| 22 | ESC G | Turn double-strike mode on/off |
| 23 | ESC J | Print and feed paper |
| 24 | ESC L | Select page mode |
| 25 | ESC M | Select character font |

| No. | Command | Function |
|-----|--------------------------------|---|
| 26 | ESC R | Specify an international character set |
| 27 | ESC S | Select standard mode |
| 28 | ESC T | Select print direction in page mode |
| 29 | ESC V | Turn 90° clockwise rotation mode on/off |
| 30 | ESC W | Set print area in page mode |
| 31 | ESC \ | Set relative print position |
| 32 | ESC a | Set position alignment |
| 33 | ESC d | Print and feed n lines |
| 34 | ESC i | Partial cut |
| 35 | ESC m | Partial cut |
| 36 | ESC p | Generate pulse |
| 37 | ESC t | Select character code table |
| 38 | ESC v | Transmit paper sensor status |
| 39 | ESC { | Turn upside-down print mode on/off |
| 40 | FS p | Print NV bit image |
| 41 | FS q | Define NV bit image |
| 42 | GS ! | Select character size |
| 43 | GS \$ | Set absolute vertical print position in page mode |
| 44 | GS (A | Execute test print |
| 45 | GS (L GS 8 L | Select graphics data |
| 46 | GS (k | Specify and print the symbol |
| 47 | GS * | Define downloaded bit image |
| 48 | GS / | Print downloaded bit image |
| 49 | GS : | Start/end macro definition |
| 50 | GS B | Turn white/black reverse print mode on/off |

| No. | Command | Function |
|-----|---------------|---|
| 51 | GS H | Select print position of HRI characters |
| 52 | GS I | Transmit printer ID |
| 53 | GS L | Set left margin |
| 54 | GS V | Select cut mode and executes a partial cut |
| 55 | GS W | Set print area width |
| 56 | GS ^ | Execute macro |
| 57 | GS a | Enable/Disable Automatic Status Back (ASB) |
| 58 | GS f | Select font for HRI characters |
| 59 | GS h | Set bar code height |
| 60 | GS k | Print bar code |
| 61 | GS r | Transmit status |
| 62 | GS v 0 | Print raster bit image |
| 63 | GS w | Set bar code width |
| 64 | BS M | Select device font type |
| 65 | BS V | Select cut mode and executes a partial/full cut |
| 66 | BS ^ P | Set power saving mode |

2-1 Command Description Items

Command

| | |
|---------------------|---|
| Function: | Command function outline |
| Code: | Command format expressed in ASCII, hexadecimal, and decimal codes |
| Range: | Argument value (Setting range) for the command |
| Default: | Initial argument value for the command |
| Description: | Detailed command function description |
| Remarks: | Additional information about using the command |
| Differences: | Variations depending on the printer model |

2-2 Details of Control Commands

HT

Function : Horizontal tab

Code :

| | |
|----------------|----|
| ASCII | HT |
| Hex | 09 |
| Decimal | 9 |

Range: None

Default: None

Description : This command moves the print position to the next horizontal tab position. If the next horizontal tab position is not specified, this command will be void.

Remarks :

- The horizontal tab position is set by <ESC> D.
- With the underline mode turned on, the underline printing is not applied to the tab space created by this command.

Differences: None

LF

Function: Print and line feed

Code:

| | |
|----------------|----|
| ASCII | LF |
| Hex | 0A |
| Decimal | 10 |

Range: None

Default: None

Description: This command prints the data in the print buffer and feeds one line based on the current set line spacing in standard mode.

Remarks: ■ In page mode, the printer does not perform actual printing, but moving only the print position to the next line.

Differences: None

FF

Function : Form feed (in page mode)

| | | |
|---------------|----------------|----|
| Code : | ASCII | FF |
| | Hex | 0C |
| | Decimal | 12 |

Range: None

Default: None

Description : This commands prints all data collected in the printer buffer In page mode. After completion of printing, the printer is returned to standard mode.if the printer receive next data then the printer buffer is evacuated.

Remarks :

- The printer is returned to standard mode after completion of printing.
- After being printed, all of the existing data in the printer buffer is not evacuated and the print position changes to the beginning of the line.
- This command works in page mode enabled by ESC L.
- This command is only effective in standard mode.
- If the paper is positioned at the print starting position, this command is ignored, not performing actual paper feeding operation.

Differences: None

CR

Function: Print and carriage return

| | | |
|--------------|----------------|----|
| Code: | ASCII | CR |
| | Hex | 0D |
| | Decimal | 13 |

Range: None

Default: None

Description: This command prints the data. With auto line feed enabled, it performs printing and one line feeding same as LF.

Differences: None

CAN

Function: Cancel the print data in page mode

Code:

| | |
|----------------|-----|
| ASCII | CAN |
| Hex | 18 |
| Decimal | 24 |

Range: None

Default: None

Description: This command clears the receive buffer and print buffers in page mode.

Remarks: ■ This command is effective only in page mode that is set by ESC L.

Differences: None

DLE EOT

Function: Transmit real-time status

| | | | | |
|--------------|----------------|------------|------------|----------|
| Code: | ASCII | DLE | EOT | n |
| | Hex | 10 | 04 | n |
| | Decimal | 16 | 4 | n |

Range: $1 \leq n \leq 4$

Default: None

Description: This command enables commands to be operable in real-time.
This command transmits the printer-related status specified by n as follows:

| n | Function |
|---|-----------------------------------|
| 1 | Transmit printer status |
| 2 | Transmit off-line status |
| 3 | Transmit error status |
| 4 | Transmit paper roll sensor status |

■ Printer transmits the following status

n=1: Printer status

| Bit | Binary | Hex | Decimal | Status |
|-----|--------|-----|---------|---|
| 0 | 0 | 00 | 0 | Not used. Fixed to Off |
| 1 | 1 | 02 | 2 | Not used. Fixed to On |
| 2 | 0 | 00 | 0 | Drawer kick-out connector pin 3 is LOW |
| | 1 | 04 | 4 | Drawer kick-out connector pin 3 is HIGH |
| 3 | 0 | 00 | 0 | Online |
| | 1 | 08 | 8 | Offline |
| 4 | 1 | 10 | 16 | Not used. Fixed to On |
| 5 | 0 | 00 | 0 | Not used. Fixed to Off |

| Bit | Binary | Hex | Decimal | Status |
|-----|--------|-----|---------|------------------------|
| 6 | 0 | 00 | 0 | Not used. Fixed to Off |
| 7 | 0 | 00 | 0 | Not used. Fixed to Off |

n=2: Off-line status

| Bit | Off/On | Hex | Decimal | Status |
|-----|--------|-----|---------|---|
| 0 | Off | 00 | 0 | Fixed |
| 1 | On | 02 | 2 | Fixed |
| 2 | Off | 00 | 0 | Cover is closed |
| | On | 04 | 4 | Cover is open |
| 3 | Off | 00 | 0 | Paper is not being fed by using the paper FEED button |
| | On | 08 | 8 | Paper is being fed by the paper FEED button |
| 4 | On | 10 | 16 | Fixed |
| 5 | Off | 00 | 0 | No paper-end stop |
| | On | 20 | 32 | Printing is being stopped |
| 6 | Off | 00 | 0 | No error |
| | On | 40 | 64 | Error has occurred |
| 7 | Off | 00 | 0 | Fixed |

n=3: Error status

| Bit | Binary | Hex | Decimal | Status |
|-----|--------|-----|---------|---------------------------|
| 0 | 0 | 00 | 0 | Not used. Fixed to Off |
| 1 | 1 | 02 | 2 | Not used. Fixed to On |
| 2 | 0 | 00 | 0 | Not used. Fixed to Off |
| 3 | 0 | 00 | 0 | No autocutter error |
| | 1 | 08 | 8 | Autocutter error occurred |
| 4 | 1 | 10 | 16 | Not used. Fixed to On |
| 5 | 0 | 00 | 0 | Not used. Fixed to Off |
| 6 | 0 | 00 | 0 | Not used. Fixed to Off |
| 7 | 0 | 00 | 0 | Not used. Fixed to Off |

n=4: paper sensor status

| Bit | Binary | Hex | Decimal | Status |
|-----|--------|-----|---------|---------------------------------------|
| 0 | 0 | 00 | 0 | Not used. Fixed to Off |
| 1 | 1 | 02 | 2 | Not used. Fixed to On |
| 2,3 | 00 | 00 | 0 | Paper near end sensor: paper adequate |
| | 11 | 0C | 12 | Paper near end sensor: paper near end |
| 4 | 1 | 10 | 16 | Not used. Fixed to On |
| 5,6 | 00 | 00 | 0 | Paper end sensor: paper present |
| | 11 | 60 | 96 | Paper end sensor: paper not present |
| 7 | 0 | 00 | 0 | Not used. Fixed to Off |

- Remarks:**
- the status is transmitted to the host upon being requested that can check the printer operational condition with it and takes appropriate measures accordingly.
 - The real time command is stored into the receive buffer and executed with higher priority than other commands.

Differences: None

DLE DC4

Function: Generate pulse at real-time

| | | | | | | |
|--------------|----------------|-----|-----|---|---|---|
| Code: | ASCII | DLE | DC4 | n | m | t |
| | Hex | 10 | 14 | n | m | t |
| | Decimal | 16 | 20 | n | m | t |

Range: $n = 1, m=0,1, 1 \leq t \leq 8$

Default: None

Description: ■ Output the pulse specified by t to connector pin m as following:

| m | Connector pin |
|---|---------------------------------|
| 0 | Drawer kick-out connector pin 2 |
| 1 | Drawer kick-out connector pin 5 |

■ This command generates the drive pulse to connector pin m with pulse width defined by t as following:

- Drawer kick-out connector pin 2 is selected with m=0 while pin 5 chosen for m=1.
- Pulse ON time is [t x100 ms] and OFF time [t x100 ms].

Remarks: ■ Upon receiving this command, the printer outputs the drive pulse to the specified connector pin.
 ■ The real time command is stored into the receive buffer and executed with higher priority than other commands.

Differences: None

ESC SP

Function: Set the character right space

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | SP | n |
| | Hex | 1B | 20 | n |
| | Decimal | 27 | 32 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description:

- This command sets the size of space to right of character.
 - Right space = $n \times [\text{horizontal motion units}]$.

Remarks:

- In a double width mode, the right space will be doubled.
- Horizontal motion unit varies depending the printer model.

Differences: Horizontal motion unit: 0.141mm(1/180 inch)

ESC !

Function: Set print mode

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | ! | n |
| | Hex | 1B | 21 | n |
| | Decimal | 27 | 33 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description: This command selects print mode(s) with bits having following meanings.

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|---------------------------------|
| 0 | Off | 00 | 0 | Character font A selected |
| | On | 01 | 1 | Character font B selected |
| 1,2 | Off | 00 | 0 | Reserved |
| 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 | Reserved |
| 7 | Off | 00 | 0 | Underline mode not selected |
| | On | 80 | 128 | Underline mode selected |

- Remarks:**
- As alternative to this command, ESC M, ESC E and ESC – can be used for the selection for character font, emphasized mode and underline mode respectively.
 - The entire character print width is underlined, but the space skipped by HT is not.
 - If both double width and double height are selected, the characters will be quadrupled.

Differences: None

ESC \$

Function: Set absolute print position

| | | | | | |
|--------------|----------------|-----|----|----|----|
| Code: | ASCII | ESC | \$ | nL | nH |
| | Hex | 1B | 24 | nL | nH |
| | Decimal | 27 | 36 | nL | nH |

Range: $0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nH \leq 255$, $0 \leq nL \leq 255$)

Default: None

Description: This command specifies the next print starting position in reference to the left edge of the print area. The printing start position is calculated using $(nL + nH \times 256) \times$ (vertical or horizontal motion units).

Remarks:

- Any setting values that go beyond the printable area is ignored.
- In standard mode, the horizontal motion unit is used for the calculation.
- In page mode, the horizontal motion unit is applied when printing start position is defined to the upper right or lower right of print area using ESC T, otherwise, the vertical motion unit is used.

Differences: Horizontal motion unit: 0.141mm(1/180 inch)

ESC %

Function: Select/cancel user-defined character set

Code:

| | | | |
|----------------|-----|----|---|
| ASCII | ESC | % | n |
| Hex | 1B | 25 | n |
| Decimal | 27 | 37 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description: ■ This command selects/deselects user-defined character set that is downloaded by user. To make it valid, the least significant bit should be defined like following.

- When $n=0$, the user-defined character set is deselected.
- When $n=1$, the user-defined character set is selected.

Remarks: ■ The resident character set is enabled and used right after canceling the user defined character set.

Differences: None

ESC &

Function: Define user-defined character set

| | | | | | | | | | |
|--------------|----------------|-----|----|---|----|----|-----|--------------------------|-------------------|
| Code: | ASCII | ESC | & | y | c1 | c2 | [x1 | d1 ... d(y × x1)]... [xk | d1 ... d(y × xk)] |
| | Hex | 1B | 26 | y | c1 | c2 | [x1 | d1 ... d(y × x1)]... [xk | d1 ... d(y × xk)] |
| | Decimal | 27 | 38 | y | c1 | c2 | [x1 | d1 ... d(y × x1)]... [xk | d1 ... d(y × xk)] |

Range: $y = 3$
 $32 \leq c1 \leq c2 \leq 126$
 $0 \leq x \leq 12$ (Font A)
 $0 \leq x \leq 9$ (Font B)
 $0 \leq d \leq 255$
 $k = c2 - c1 + 1$

Default: None

Description: ■ This command defines user-defined characters for character codes in a designated range from the start character code, c1 to the end character code, c2.

- y denotes the number of bytes in the vertical direction, x the number of dots in the horizontal direction, and d the dot data for the user-defined characters.

Remarks:

- Alphanumeric characters (20H (decimal 32) to 7EH (decimal 126)) are definable.
- Once user defined characters are defined, they remain available until they are redefined; ESC ? or ESC @ is executed; the printer is reset.
- The following shows the relationship between the definition data and printing result with downloaded character consisting of 9x7 dots.

| | | | | | | | |
|----|----|----|----|-----|-----|-----|-----|
| d1 | d3 | d5 | d7 | d9 | d11 | d13 | MSB |
| | | | | | | | LSB |
| d2 | d4 | d6 | d8 | d10 | d12 | d14 | MSB |
| | | | | | | | LSB |

Differences: None

ESC *

Function: Specify bit image mode

| | | | | | | | |
|--------------|----------------|-----|----|---|----|----|---------|
| Code: | ASCII | ESC | * | m | nL | nH | d1...dk |
| | Hex | 1B | 2A | m | nL | nH | d1...dk |
| | Decimal | 27 | 42 | m | nL | nH | d1...dk |

Range: m = 0, 1, 32, 33
 $0 \leq nL \leq 255$
 $0 \leq nH \leq 3$
 $0 \leq d \leq 255$
 $k = nL + nH \times 256$ [in case of m = 0, 1]
 $k = (nL + nH \times 256) \times 3$ [in case of m = 32, 33]

Default: None

Description: ■ This command specifies the bit image for the mode m as to the number of dots specified by nL and nH.
 • d specifies the bit image data with 1 for printed data and 0 for not printed.
 • k denotes the number of horizontal dots.

Remarks: ■ If the bit image data being entered is beyond the number of dots to be printed, the surplus will be discarded.
 ■ If the value of m is beyond the conditions, the subsequent data after m will be treated as normal data.

Differences:

DPI : Dots per Inch (25.4mm)

| m | Mode | Number of dots in vertical direction | Vertical dot density (DPI) | Horizontal dot density (DPI) | Number of bytes (k) |
|----|-----------------------|--------------------------------------|----------------------------|------------------------------|---------------------------------|
| 0 | 8-dot single-density | 8 | 60 | 90 | $nL + nH \times 256$ |
| 1 | 8-dot double-density | 8 | 60 | 180 | $nL + nH \times 256$ |
| 32 | 24-dot single-density | 24 | 180 | 90 | $(nL + nH \times 256) \times 3$ |
| 33 | 24-dot double-density | 24 | 180 | 180 | $(nL + nH \times 256) \times 3$ |

ESC –

Function: Turn underline mode on/off

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

Range: $0 \leq n \leq 2, 48 \leq n \leq 50$

Default: $n = 0$

Description: ■ This command enables the print data following it to be printer out underlined.
 • The underline mode varied depending on the following values of n:

| n | Function |
|------|---|
| 0,48 | Turns off underline mode |
| 1,49 | Turns on underline mode, set at 1-dot thick |
| 2,50 | Turns on underline mode, set at 2-dot thick |

Remarks: ■ The spaces generated by horizontal tab are not underlined.
 ■ Using bit 7 of ESC !, the underline mode can be activated/deactivated as well.

Differences: None

ESC 2

Function: Select default line spacing

| | | | |
|--------------|----------------|-----|----|
| Code: | ASCII | ESC | 2 |
| | Hex | 1B | 32 |
| | Decimal | 27 | 50 |

Range: None

Default: None

Description: This command sets the default line spacing The default line spacing is approximately 3.75 mm, which is equivalent to 30 dots.

Remarks:

- The line spacing can be set independently in standard mode and in page mode.
- The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: Default line spacing: 4.23 mm (30 dots)

ESC 3

Function: Set line spacing

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | 3 | n |
| | Hex | 1B | 33 | n |
| | Decimal | 27 | 51 | n |

Range: $0 \leq n \leq 255$

Default: Corresponding to the default line spacing defined by ESC 2

Description: ■ This command sets the line spacing using a following rule.
 • Line spacing = $n \times$ (vertical or horizontal motion units)

Remarks: ■ With standard mode selected, the vertical motion unit is used.
 ■ In page mode, the horizontal motion unit is applied when printing start position is defined to the upper right or lower right of print area using ESC T, otherwise, the vertical motion unit is used.
 ■ The line spacing is settable independently for each of standard and page modes.

Differences: Vertical or horizontal motion unit and maximum line spacing settable:

| Model | Vertical unit | Horizontal unit | Max line spacing |
|---------|-----------------------|----------------------|------------------|
| SRP-330 | 0.0705mm (1/360 inch) | 0.141mm (1/180 inch) | 17.98mm |

ESC =

Function: Select peripheral device

Code:

| | | | |
|----------------|-----|----|---|
| ASCII | ESC | = | n |
| Hex | 1B | 3D | n |
| Decimal | 27 | 61 | n |

Range: $1 \leq n \leq 3$

Default: None

Description: This command selects the device to which the host computer communicates according to n as follows:

| n | Function |
|---|----------------------|
| 1 | Enables the printer |
| 2 | Disables the printer |
| 3 | Enables the printer |

Remarks:

- The printer discards all of the received data commands with the exception of ESC = and real-time commands while being disabled.
- The normal operation will be resumed by ESC @, power cycling or printer reset.
- If ASB is activated when the printer is disabled by this command, the status is transmitted to the host at a preset interval.

Differences: None

ESC ?

Function: Cancel user-defined characters

Code:

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

Range: $32 \leq n \leq 126$

Default: None

Description: This command removes user-defined character specified by character code n.

Remarks:

- In place of the deleted user-defined character, the corresponding resident character is printed.
- The user-defined characters for each font can be deleted independently.

Differences: None

ESC @

Function: Initialize printer

Code:

| | | |
|----------------|-----|----|
| ASCII | ESC | @ |
| Hex | 1B | 40 |
| Decimal | 27 | 64 |

Range: None

Default: None

Description: This command cancels conditions previously set and initializes the printer to the conditions having existed at power on.

Remarks:

- The data in the printer buffer is cleared.
- The data in the receive buffer is not discarded.
- All of the settings such as print mode and line feed are cleared.
- NV graphics and NV user memory are not cleared.
- In page mode, this command removes the data in print areas, restores the initial settings and returns to standard mode.

Differences: None

ESC D

Function: Set horizontal tab position

| | | | | | |
|--------------|----------------|-----|----|---------|-----|
| Code: | ASCII | ESC | D | n1...nk | NUL |
| | Hex | 1B | 44 | n1...nk | 00 |
| | Decimal | 27 | 68 | n1...nk | 0 |

Range: $1 \leq n \leq 255$, $0 \leq k \leq 32$

Default: $n = 8, 16, 24, 32, 40, \dots, 232, 240, 248$

Description:

- This command sets the horizontal tab position.
 - n defines the number of columns from the beginning of the line to the horizontal tab setting.
 - k denotes the number of horizontal tab positions to be set.
 - The horizontal tab position is stored as a value of [character width x n] measured from the beginning of the line.

Remarks:

- The data [n]k signifying the set position is transmitted in the ascending order and ends with a NUL code.
- ESC D NUL cancels all horizontal tab positions.
- Tab position is set at the value of [character width x n] from the beginning of the line.
- The character width includes the space to the right of the character, and it will be twice the normal character when the double width characters are selected.
- If the data [n]k is equal to or smaller than the preceding data [n]k-1, the horizontal tab setting has been completed.
- Up to 32 horizontal tabs can be set, the data exceeding this limit is processed as normal ones.
- Even if the character width is changed after setting the horizontal tab positions, the horizontal tab positions remain unchanged.

Differences: None

ESC E

Function: Turn emphasized mode on / off

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | E | n |
| | Hex | 1B | 45 | n |
| | Decimal | 27 | 69 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description: ■ This command turns emphasized mode on or off by toggling the least significant bit of n like following.

- When the LSB of n is 0, emphasized mode is turned off.
- When the LSB of n is 1, emphasized mode is turned on.

Remarks: ■ The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC G

Function: Turn double-strike mode on/off

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | G | n |
| | Hex | 1B | 47 | n |
| | Decimal | 27 | 71 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description: ■ This command turns double-strike mode on or off by toggling the least significant bit of n like following.

- When the LSB of n is 0, emphasized mode is turned off.
- When the LSB of n is 1, emphasized mode is turned on.

Remarks: ■ The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC J

Function: Print and feed paper

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | J | n |
| | Hex | 1B | 4A | n |
| | Decimal | 27 | 74 | n |

Range: $0 \leq n \leq 255$

Default: None

Description: This command prints the data in the print buffer and feeds the paper [n X vertical motion unit].

Remarks:

- The maximum feed amount available varies depending on the printer model.
- With standard mode selected, the vertical motion unit is used.
- In page mode, the horizontal motion unit is applied when printing start position is defined to the upper right or lower right of print area using ESC T, otherwise, the vertical motion unit is used.
- When used in page mode, this command moves only the print position, not executing actual printing.

Differences: Vertical motion unit and maximum feed amount:

| Model | Vertical unit | Max feed amount |
|---------|-----------------------|-----------------|
| SRP-330 | 0.0705mm (1/360 inch) | 17.98mm |

ESC L

Function: Select page mode

| | | | |
|--------------|----------------|-----|----|
| Code: | ASCII | ESC | L |
| | Hex | 1B | 4C |
| | Decimal | 27 | 76 |

Range: None

Default: None

Description: This command switches from standard mode to page mode.

Remarks:

- For printing in page mode, ESC T defines the print direction and starting position that is within the print area specified by ESC W.
- The conditions by the following commands are defined independently in standard mode and page mode.
 - ESC SP, ESC 2, and ESC 3
- The following commands are not activated in page mode.
 - ESC L, FS q, GS (A, GS T
- The following commands are not effective in page mode. The conditions set by these commands in page mode are available when the printer returns to standard mode.
 - ESC V, ESC a, ESC {, GS L, and GS W
- The printer resumes standard mode by the use of ESC S, FF, and ESC@.
- In page mode, the command, FF, prompts printing the data in the printer buffer collectively. LF, CR, ESC J, and ESC d just move the print position, not performing actual printing.

Differences: None

ESC M

Function: Select character font

Code:

| | | | |
|----------------|-----|----|---|
| ASCII | ESC | M | n |
| Hex | 1B | 4D | n |
| Decimal | 27 | 77 | n |

Range: n = 0, 1, 48, 49

Default: n = 0

Description: This command selects only-byte character fonts using n as following.

| n | Function |
|-------|---------------------------|
| 0, 48 | Character font A selected |
| 1, 49 | Character font B selected |

Remarks:

- The printer model has it own configuration of Font A and B.
- The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC R

Function: Specify international character set

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

Range: $0 \leq n \leq 13$

Default: $n = 0$

Description: This command specifies international characters according to n values.

| n | Character set | n | Character set |
|---|---------------|----|---------------|
| 0 | U.S.A | 7 | Spain I |
| 1 | France | 9 | Norway |
| 2 | Germany | 10 | Denmark II |
| 3 | U.K | 11 | Spain II |
| 4 | Denmark I | 12 | Latin America |
| 5 | Sweden | 13 | Korea |
| 6 | Italy | | |

Remarks: ■ The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC S

Function: Select standard mode

| | | | |
|--------------|----------------|-----|----|
| Code: | ASCII | ESC | S |
| | Hex | 1B | 53 |
| | Decimal | 27 | 83 |

Range: None

Default: None

Description: This command enables standard mode.

Remarks:

- The data in the printer buffer is cleared and the setting by ESC W returns to the default.
- The conditions by the following commands are defined independently in standard mode and page mode.
 - ESC SP, ESC 2, and ESC 3
- In standard mode, CAN and GS \$ are ignored.

Differences: None

ESC T

Function: Select print direction in page mode

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | T | n |
| | Hex | 1B | 54 | n |
| | Decimal | 27 | 84 | n |

Range: $0 \leq n \leq 3$, $48 \leq n \leq 51$

Default: $n = 0$

Description: This command selects the print direction and starting position in page mode.

| n | Print Direction | Starting Position |
|------|-----------------|-------------------|
| 0,48 | Left right | Upper left |
| 1,49 | Bottom to top | Lower left |
| 2,50 | Right left | Lower right |
| 3,51 | Top bottom | Upper right |

- Remarks:**
- The print direction set by this command is not effective in standard mode.
 - If this command is processed in standard mode, the setting by this command is effective when the printer changes to page mode.
 - Depending on the print starting position set by this command, the horizontal motion unit or vertical motion unit is used for the following commands.
 - When the starting position is the upper left or lower right of the print area; ESC SP, ESC \$, ESC \ use the horizontal motion unit and ESC 3, ESC J, GS \$ the vertical motion unit.
 - When the starting position is the upper right or lower left of the print area; ; ESC SP, ESC \$, ESC \ use the vertical motion unit and ESC 3, ESC J, GS \$ the horizontal motion unit.
 - The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC V

Function: Turn 90°clockwise rotation mode on/off

Code:

| | | | |
|----------------|-----|----|---|
| ASCII | ESC | V | n |
| Hex | 1B | 56 | n |
| Decimal | 27 | 86 | n |

Range: $0 \leq n \leq 2$, $48 \leq n \leq 50$

Default: $n = 0$

Description:

- This command turns 90° clockwise rotation mode on/off in standard mode according to the value of n as following
 - When the value of n is equal to 0 or 48, 90°clockwise rotation mode is turned off.
 - When the value of n is equal to 1, 2, 48, or 50, 90°clockwise rotation mode is turned on.

Remarks:

- In underline mode, the underline printing for 90° clockwise rotated characters does not work, and the relationship between vertical and horizontal directions is reversed.
- The 90° clockwise rotation mode is not effective in page mode.
- If set in page mode, the 90° clockwise rotation mode has effect after the printer returns to standard mode.
- The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC W

Function: Set print area in page mode

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

Range: $0 \leq (xL + xH \times 256) \leq 65535$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 255$)
 $0 \leq (yL + yH \times 256) \leq 65535$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 255$)
 $1 \leq (dxL + dxH \times 256) \leq 65535$ ($0 \leq dxL \leq 255$, $0 \leq dxH \leq 255$)
 $1 \leq (dyL + dyH \times 256) \leq 65535$ ($0 \leq dyL \leq 255$, $0 \leq dyH \leq 255$)

Default:

- When a paper width of 80mm{3.15"} is selected:
 $(xL + xH \times 256) = 0$ ($xL=0$, $xH=0$)
 $(yL + yH \times 256) = 0$ ($yL=0$, $yH=0$)
 $(dxL + dxH \times 256) = 512$ ($dxL=0$, $dxH=2$)
 $(dyL + dyH \times 256) = 1662$ ($dyL=126$, $dyH=6$)

Description:

- This command set the position and the size of the printing area in page mode as following.
 - Horizontal starting position = $[(xL + xH \times 256) \times (\text{horizontal motion units})]$
 - Vertical starting position = $[(yL + yH \times 256) \times (\text{vertical motion units})]$
 - Horizontal printing area width = $[(dxL + dxH \times 256) \times (\text{horizontal motion units})]$
 - Vertical printing area width = $[(dyL + dyH \times 256) \times (\text{vertical motion units})]$

Remarks:

- The horizontal and vertical starting positions are out of the printable area, this command is canceled and the following data is processed as normal data.
- If (Horizontal starting position + Horizontal printing area width) is beyond the printable area, the Horizontal printing area width is set to (Horizontal printing area - Horizontal starting position).
- If (Vertical starting position + Vertical printing area width) is beyond the printable area, the Vertical printing area width is set to (Vertical printing area - Vertical starting position).
- This command is not effective in standard mode. If this command is processed in standard mode, the setting by this command is effective when the printer returns to page mode.
- The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences:

The maximum printable area(Max horizontal printable area, Max vertical printable area):

| Model | Max horizontal printable area | Max vertical printable area |
|---------|-------------------------------|-----------------------------|
| SRP-330 | 72.2mm(512dots) | 234.3mm(1662dots) |

ESC \

Function: Set relative print position

| | | | | | |
|--------------|----------------|-----|----|----|----|
| Code: | ASCII | ESC | \ | nL | nH |
| | Hex | 1B | 5C | nL | nH |
| | Decimal | 27 | 92 | nL | nH |

Range: $0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255$, $0 \leq nH \leq 255$)

Default: None

Description:

- This command sets the print starting position based on the current position to $[(nL + nH \times 256) \times \text{horizontal or vertical motion unit}]$.
 - The print starting position is moved to $(nL + nH \times 256)$ in the right direction based on the current position.

Remarks:

- The printer ignores any setting that exceeds the print area.
- When the print area has been exceeded, this command is ignored.
- With standard mode selected, the vertical motion unit is used.
- In page mode, the horizontal motion unit is applied when printing start position is defined to the upper right or lower right of print area using ESC T, otherwise, the vertical motion unit is used.
- Even if the underline mode is turned on, the space skipped by this command is not printed underlined.

Differences: None

ESC a

Function: Set position alignment

| | | | | |
|--------------|----------------|-----|----|---|
| Code: | ASCII | ESC | a | n |
| | Hex | 1B | 61 | n |
| | Decimal | 27 | 97 | n |

Range: $0 \leq n \leq 2$, $48 \leq n \leq 50$

Default: $n = 0$

Description: This command specifies position alignment for all data in one line in standard mode, using n as follows:

| n | Alignment |
|-------|------------------|
| 0, 48 | Left alignment |
| 1, 49 | Center alignment |
| 2, 50 | Right alignment |

Remarks:

- This command is not effective in page mode. If this command is processed in page mode, the setting by this command becomes effective when the printer returns to standard mode.
- The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC d

Function: Print and feed n lines

Code:

| | | | |
|----------------|-----|-----|---|
| ASCII | ESC | d | n |
| Hex | 1B | 64 | n |
| Decimal | 27 | 100 | n |

Range: $0 \leq n \leq 255$

Default: None

Description: This command feeds the paper by n lines after printing the data in the print buffer.

Remarks:

- The per-line paper feed amount is based on the value set by the line spacing related commands, ESC 2 and ESC 3.
- In page mode, this command moves only the print position, not performing actual print.
- If the feed amount set is beyond the maximum feed amount, the feed amount will be set to the maximum feed amount automatically.

Differences: None

ESC i**Function:** Partial cut**Code:**

| | | |
|----------------|-----|-----|
| ASCII | ESC | i |
| Hex | 1B | 69 |
| Decimal | 27 | 105 |

Range: None**Default:** None**Description:** This command executes a partial cut of the paper with one point left uncut.**Remarks:** ■ The same partial cut as this command is executed using ESC m and GS V.

Differences:

- This command is effective for the printer equipped with an autocutter.
- Autocutter operation should be enabled by setting the autocutter control DIP switch.
- If the autocutter control DIP switch of the printer not equipped with autocutter is set, the printer does not operate, displaying the error signal by LED.

ESC m

Function: Partial cut

Code:

| | | |
|----------------|-----|-----|
| ASCII | ESC | m |
| Hex | 1B | 6D |
| Decimal | 27 | 109 |

Range: None

Default: None

Description: This command executes a partial cut of the paper with one point left uncut.

Remarks: ■ The same partial cut as this command is executed using ESC i and GS V.

Differences:

- This command is effective for the printer equipped with an autocutter.
- Autocutter operation should be enabled by setting the autocutter control DIP switch.
- If the autocutter control DIP switch of the printer not equipped with autocutter is set, the printer does not operate, displaying the error signal by LED.

ESC p

Function: Generate pulse

| | | | | | | |
|--------------|----------------|-----|-----|---|----|----|
| Code: | ASCII | ESC | p | m | t1 | t2 |
| | Hex | 1B | 70 | m | t1 | t2 |
| | Decimal | 27 | 112 | m | t1 | t2 |

Range: m = 0, 1, 48, 49
 $0 \leq t1 \leq 255, 0 \leq t2 \leq 255$

Default: None

Description: This command outputs the signals specified with t1 and t2 to the connector pins defined by m.

| m | Connector pin |
|-------|---------------------------------|
| 0, 48 | Drawer kick-out connector pin 2 |
| 1, 49 | Drawer kick-out connector pin 5 |

Remarks: ■ The ON time is [t1 x 2ms], and the OFF time is as [t2 x 2ms].
 • If t2 is smaller than t1, OFF time is set to [t1 x 2ms].

Differences: None

ESC t

Function: Select character code table

| | | | | |
|--------------|----------------|-----|-----|---|
| Code: | ASCII | ESC | t | n |
| | Hex | 1B | 74 | n |
| | Decimal | 27 | 116 | n |

Range: $0 \leq n \leq 5$, $16 \leq n \leq 19$, $21 \leq n \leq 31$, $33 \leq n \leq 41$, $n=255$

Default: For model not supporting Thai character: $n=0$
For model supporting Thai character support : $n = 20$

Description: This command specifies code page according to the value of n as follows:

| n | Code page |
|----|-----------------------------------|
| 0 | Page 0 437 (USA, Standard Europe) |
| 1 | Page 1 Katakana |
| 2 | Page 2 850 (Multilingual) |
| 3 | Page 3 860 (Portuguese) |
| 4 | Page 4 863 (Canadian-French) |
| 5 | Page 5 865 (Nordic) |
| 16 | Page 16 1252 (Latin I) |
| 17 | Page 17 866 (Cyrillic #2) |
| 18 | Page 18 852 (Latin 2) |
| 19 | Page 19 858 (Euro) |
| 21 | Page 21 862 (Hebrew DOS code) |
| 22 | Page 22 864 (Arabic) |
| 23 | Page 23 Thai42 |
| 24 | Page 24 1253 (Greek) |
| 25 | Page 25 1254 (Turkish) |

| n | Code page |
|-----|--------------------------------|
| 26 | Page 26 1257 (Baltic) |
| 27 | Page 27 Farsi |
| 28 | Page 28 1251 (Cyrillic) |
| 29 | Page 29 737 (Greek) |
| 30 | Page 30 775 (Baltic) |
| 31 | Page 31 Thai14 |
| 33 | Page 33 1255 (Hebrew New code) |
| 34 | Page 34 Thai 11 |
| 35 | Page 35 Thai 18 |
| 36 | Page 36 855 (Cyrillic) |
| 37 | Page 37 857 (Turkish) |
| 38 | Page 38 928 (Greek) |
| 39 | Page 39 Thai 16 |
| 40 | Page 40 1256 (Arabic) |
| 41 | Page 41 1258 (Vietnam) |
| 42 | Page 42 Khmer (Cambodia) |
| 47 | Page 47 1250 (Czech) |
| 255 | User Code Page (Space) |

Remarks : ■ The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

ESC v

Function : Transmit paper sensor status

| | | | |
|---------------|----------------|-----|-----|
| Code : | ASCII | ESC | v |
| | Hex | 1B | 76 |
| | Decimal | 27 | 118 |

Range: None

Default: None

Description :

- This command transmits a byte of data specifying the paper sensor status.
- The status of paper near end and paper end sensors is sent to the host as follows:
 - When paper near end is detected, 0x03 is transmitted.
 - When paper end is detected, 0xC is transmitted.

Remarks :

- The paper sensor status can be transmitted using GS r.
- The near end sensor is optional while paper end sensor required.
- If the printer is not equipped with a near end sensor, the paper near end sensor is considered as normal condition.

Differences: None

ESC {

Function : Turns upside-down printing mode on/off

| | | | | |
|---------------|----------------|-----|-----|---|
| Code : | ASCII | ESC | { | n |
| | Hex | 1B | 7B | n |
| | Decimal | 27 | 123 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description : This command selects/deselects upside-down printing mode according to the least significant bit as follows.

| LSB | Upside-down mode |
|-----|------------------|
| 0 | Turned off |
| 1 | Turned on |

- Remarks :**
- This command is valid only when entered at the beginning of the line.
 - The upside-down print mode has no effect in page mode. If this command is processed in page mode, upside-down printing mode is enabled when the printer returns to standard mode.
 - 180 rotated characters are printed from right to left in upside-down print mode.
 - The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

| Example | |
|---------|-------------------|
| Normal | Upside- down Mode |
| ABCDEF | FEDCBA |

Differences: None

FS p

Function : Print NV bit image

| | | | | | |
|---------------|----------------|----|-----|---|---|
| Code : | ASCII | FS | p | n | m |
| | Hex | 1C | 70 | n | m |
| | Decimal | 28 | 112 | n | m |

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

Default: None

Description : This command prints NV bit image n using the mode specified by m as follows:

| m | Mode |
|-------|---------------|
| 0, 48 | Normal |
| 1, 49 | Double-width |
| 2, 50 | Double-height |
| 3, 51 | Quadruple |

- Remarks :**
- GS (L and GS (8 can be used for printing NV bit image.
 - The NV bit image is defined by FS q.
 - n is assigned to each NV bit image to be stored in download order by FS q.
 - This command has no effect with NV bit image not defined in advance.
 - In page mode, the NV bit image is saved without being printed.
 - The printer does not print the NV bit image that is beyond one line of print area.
 - When using unidirectional print mode, there will be no vertical misalignment between the top and bottom parts of the printed pattern.

Differences:

DPI : Dots per Inch (25.4mm)

| Mode | Vertical Dot Density (DPI) | Horizontal Dot Density (DPI) |
|---------------|----------------------------|------------------------------|
| Normal | 180 | 180 |
| Double-width | 180 | 90 |
| Double-height | 90 | 180 |
| Quadruple | 90 | 90 |

FS q

Function: Define NV bit image

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

Range: $1 \leq n \leq 255$
 $1 \leq (xL + xH \times 256) \leq 1023$ ($0 \leq xL \leq 255$, $0 \leq xH \leq 3$)
 $1 \leq (yL + yH \times 256) \leq 288$ ($0 \leq yL \leq 255$, $yH=0,1$)
 $0 \leq d \leq 255$
 $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$

Default: None

Description: ■ This command defines the NV bit image in the NV memory.

- n denotes the number of the NV being defined.
- (xL, xH) and (yL, yH) set the number of dots in the horizontal and vertical directions to $[(xL + xH \times 256) \times 8]$ and $[(yL + yH \times 256) \times 8]$ respectively for the NV bit image.

Remarks: ■ GS (L and GS (8 can be used for defining NV bit image.
 ■ When this command is entered, all NV bit images previously defined are removed from the NV memory.
 ■ After completion of this command, the printer executes a software reset to restore the settings as when turned on.
 ■ The NV bit image is printed by FS p.

- During the execution of this command, paper feed button, ASB and real time functions will not operate.

- Bit image data and print result are as follows:

| | | | | |
|----|--------|-----|------|-----|
| d1 | dY+1 | ... | . | MSB |
| | | | . | LSB |
| | | | . | |
| d2 | dY+2 | ... | dk-2 | MSB |
| | | | | LSB |
| . | . | ... | dk-1 | MSB |
| . | . | | | LSB |
| . | . | | | |
| dY | dY x 2 | ... | dk | MSB |
| | | | | LSB |

- The capacity of NV memory area is 256KB.

Differences: None

GS !

Function: Select character size

Code:

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

Range: $0 \leq n \leq 255$
 $(1 \leq \text{Vertical enlargement} \leq 8, 1 \leq \text{Horizontal enlargement} \leq 8)$

Default: $n = 0$

Description: ■ This command selects the character height and width using bits 0 to 3, and bits 4 to 7 respectively as follows:

| Bit | Function | Setting |
|-----|--|--|
| 0 | Specifies the number of times normal font size in the vertical direction | Refer to Table 2 [Enlarged in vertical direction] |
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | Specifies the number of times normal font size in the horizontal direction | Refer to Table 1 [Enlarged in horizontal direction] |
| 5 | | |
| 6 | | |
| 7 | | |

- Table 1 [Enlarged in horizontal direction]

| Hex | Decimal | Enlargement |
|-----|---------|-------------------|
| 00 | 0 | 1 time (standard) |
| 10 | 16 | 2 times |
| 20 | 32 | 3 times |
| 30 | 48 | 4 times |
| 40 | 64 | 5 times |
| 50 | 80 | 6 times |
| 60 | 96 | 7 times |
| 70 | 112 | 8 times |

- Table 2 [Enlarged in vertical direction]

| Hex | Decimal | Enlargement |
|-----|---------|-------------------|
| 00 | 0 | 1 time (standard) |
| 01 | 1 | 2 times |
| 02 | 2 | 3 times |
| 03 | 3 | 4 times |
| 04 | 4 | 5 times |
| 05 | 5 | 6 times |
| 06 | 6 | 7 times |
| 07 | 7 | 8 times |

Remarks:

- The character size set by this command is valid for alphanumeric, user-defined characters, multi-byte code characters such as Chinese, Japanese, and Korean.
- Double width and double height modes can be set by ESC !.
- Multi-byte code characters are specified only by this command.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences: None

GS \$

Function: Set absolute vertical print position in page mode

| | | | | | |
|--------------|----------------|----|----|----|----|
| Code: | ASCII | GS | \$ | nL | nH |
| | Hex | 1D | 24 | nL | nH |
| | Decimal | 29 | 36 | nL | nH |

Range: $0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255$, $0 \leq nH \leq 255$)

Default: None

Description: This command sets the absolute vertical print starting position to $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$.

Remarks:

- This command is activated only in page mode and ignored in standard mode.
- Either vertical or horizontal motion unit is used according to the print direction set by ESC T as follows:
 - With the starting position of the upper left or lower right on the print area, the vertical motion unit is used.
 - In other cases, the horizontal motion unit is used.
- The configuration beyond the print area set by ESC W is ignored.

Differences: None

GS (A

Function: Execute test print

| | | | | | | | | |
|--------------|----------------|----|----|----|----|----|---|---|
| Code: | ASCII | GS | (| A | pL | pH | n | m |
| | Hex | 1D | 28 | 41 | pL | pH | n | m |
| | Decimal | 29 | 40 | 65 | pL | pH | n | m |

Range: $(pL + pH \times 256) = 2$ ($pL=2, pH=0$)
 $0 \leq n \leq 2, 48 \leq n \leq 50$
 $1 \leq m \leq 2, 49 \leq m \leq 50$

Default: None

Description: ■ This command prints a specified pattern for testing on a roll paper.
 • Roll paper is selected with n specified as follows:

| n | Paper type |
|-------|------------|
| 0, 48 | Roll paper |
| 1, 49 | |
| 2, 50 | |

• Different kinds of test patterns are selected according to m as follows:

| m | Test pattern |
|-------|--|
| 1, 49 | Hexadecimal dump mode |
| 2, 50 | Self-test printing(configuration+default codepage) |
| 3, 51 | Not operated |

Remarks: ■ The printer cancels a macro definition in progress If this command is processed. The macro becomes invalid.
 ■ After completion of this command, a software reset is executed automatically to restore the printer status set during power cycling.
 ■ All of the data transmitted from the host to the printer is printed and identified in hexadecimal dump mode.
 ■ The real time command and ASB operations are not executed during the printing of printer configuration ($m=2, 50$).

Differences: None

GS (L, GS 8 L

Function : Select graphics data

Code :

| | | | | | | | | |
|----------------|----|----|----|----|----|---|----|-------------|
| ASCII | GS | (| L | pL | pH | m | fn | [parameter] |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | [parameter] |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | [parameter] |

| | | | | | | | | | | |
|----------------|----|----|----|----|----|----|----|---|----|-------------|
| ASCII | GS | 8 | L | p1 | p2 | p3 | p4 | m | fn | [parameter] |
| Hex | 1D | 38 | 4C | p1 | p2 | p3 | p4 | m | fn | [parameter] |
| Decimal | 29 | 56 | 76 | p1 | p2 | p3 | p4 | m | fn | [parameter] |

Range: None

Default: None

Description : This command processes graphics data according to the function code (fn).

| fn | No. | Format | Function |
|-------|-----|--|--|
| 0, 48 | 48 | GS (L pL pH m fn | Transmits the NV graphics memory capacity |
| 2, 50 | 50 | GS (L pL pH m fn | Prints the graphics data in the print buffer |
| 3, 51 | 51 | GS (L pL pH m fn | Transmits the remaining capacity of the NV graphics memory |
| 64 | 64 | GS (L pL pH m fn d1 d2 | Transmits the defined NV graphics key code list |
| 65 | 65 | GS (L pL pH m fn d1 d2 d3 | Deletes all NV graphics data |
| 66 | 66 | GS (L pL pH m fn kc1 kc2 | Deletes the specified NV graphics data |
| 67 | 67 | GS (L pL pH m fn kc1 kc2 b xL xH yL yH [cd1...dk]1...[c d1...dk]b | Defines the graphics data in the non-volatile memory |
| 69 | 69 | GS (L pL pH m fn kc1 kc2 x y | Prints the specified NV graphics data |
| 112 | 112 | GS (L pL pH m fn a bx by c xL xH yL yH d1...dk | Stores the graphics data in the print buffer memory |

Remarks :

- This command is adapted to print image data.
- pL, pH specifies the number of bytes following pH using $(pL + pH \times 256)$.
- Since frequent writing operation could cause the damage to the NV memory, it is recommended to write only when being required.
- While storing data by this command, the printer is in BUSY state where receiving of data is not available. Therefore, it is not recommended to send data during this process.
- The real time commands and ASB operations are not allowed during NV memory operation process.

Differences: None

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

Code :

| | | | | | | | |
|----------------|----|----|----|----|----|---|----|
| ASCII | GS | (| L | pL | pH | m | fn |
| Hex | 1D | 28 | 4C | pL | pH | m | fn |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn |

Range:

$(pL + pH \times 256) = 1$ (pL=2, pH=0)
 m=48
 fn=0, 48

Default:

None

Description :

Transmits the total capacity of the NV bit-image memory (number of bytes in the memory area).

Remarks :

| | Hexadecimal | Decimal | Amount of Data |
|---------------|-------------|----------|----------------|
| Header | 37H | 55 | 1 byte |
| Identifier | 21H | 33 | 1 byte |
| Setting value | 30H or 31H | 48 or 49 | 8 bytes |
| NUL | 00H | 0 | 1 byte |

- The total capacity data is converted to character codes corresponding to decimal data, then transmitted from the MSB.
- The data length is variable.
- The total capacity of the NV user memory is selectable as any one of [0, 64K, 128K, 192K, 256K] bytes.
The default value is 256K.

Differences:

None

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

Code :

| | | | | | | | |
|----------------|----|----|----|----|----|---|----|
| ASCII | GS | (| L | pL | pH | m | fn |
| Hex | 1D | 28 | 4C | pL | pH | m | fn |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn |

Range:

$(pL + pH \times 256) = 1$ (pL=2, pH=0)
 m=48
 fn=2, 50

Default:

None

Description :

This command prints the graphics data defined by the process of Function 112.

Remarks :

- The graphics data stored in the printer buffer is printed.
- This command is available in standard mode, not in page mode.
- The graphics data is defined by Function 112.
- The required amount of line feed pitch is used for printing graphics data, regardless of the existing setting value of the pitch.

Differences:

None

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

Code:

| | | | | | | | |
|----------------|----|----|----|----|----|---|----|
| ASCII | GS | (| L | pL | pH | m | fn |
| Hex | 1D | 28 | 4C | pL | pH | m | fn |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn |

Range:

$(pL + pH \times 256) = 2$ (pL=2, pH=0)
 m=48
 fn=3, 51

Default:

None

Description:

This command transmits the setting value of the memory switch corresponding to a.

| | Hexadecimal | Decimal | Amount of Data |
|---------------|-------------|---------|----------------|
| Header | 37H | 55 | 1 byte |
| Identifier | 21H | 33 | 1 byte |
| Setting value | 30H – 39H | 48 - 57 | 1 - 8 bytes |
| NUL | 00H | 0 | 1 byte |

■ The setting value is sent from bit 8 to bit 1, consisting of 8 bytes in total.

- Off: Hexadecimal = 30H / Decimal = 48
- On: Hexadecimal = 31H / Decimal = 49

Remarks:

None

Differences:

None

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

Code:

| | | | | | | | | | |
|----------------|----|----|----|----|----|---|----|----|----|
| ASCII | GS | (| L | pL | pH | m | fn | d1 | d2 |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | d1 | d2 |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | d1 | d2 |

Range:

(pL + pH x 256) = 4 (pL=4, pH=0)

m=48

fn=64

d1=75, d2=67

Default:

None

Description:

■ Transmits the defined NV graphics key code list.

| | Hexadecimal | Decimal | Amount of Data |
|--------|-------------|----------|----------------|
| Header | 37H | 55 | 1 byte |
| Flag | 72H | 114 | 1 byte |
| Status | 40H or 41H | 64 or 65 | 1 byte |
| Data | 30H – 39H | 48 - 57 | 2 - 80 bytes |
| NUL | 00H | 0 | 1 byte |

■ When the key code is not present :

| | Hexadecimal | Decimal | Amount of Data |
|--------|-------------|---------|----------------|
| Header | 37H | 55 | 1 byte |
| Flag | 72H | 114 | 1 byte |
| Status | 40H | 64 | 1 byte |
| NUL | 00H | 0 | 1 byte |

Remarks:

- If the number of the key code exceed 40, the key code is transmitted dividing up to 40.
 - The status if the continuous transmission data block is present is 41H.
 - The status if the continuous transmission data block is not present is 40H.
- After the [Header-NULL] is transmitted, the printer receives a response from the hosg; then it performs the process defined by the response.(See the tables below.)
 - When the status (existence of the next data block) is Hexadecimal = 41H / Decimal = 65)

| Response | | Process performed |
|----------|---------|-----------------------------------|
| ASCII | Decimal | |
| ACK | 6 | Transmits the next data |
| NAK | 21 | Transmits the previous data again |
| CAN | 24 | Ends the process. |

- When the status (for the last data block) is Hexadecimal = 40H / Decimal = 64)

| Response | | Process performed |
|----------|---------|-----------------------------------|
| ASCII | Decimal | |
| ACK | 6 | Ends the process |
| NAK | 21 | Transmits the previous data again |
| CAN | 24 | Cancels the process. |

Differences: None

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

Code :

| | | | | | | | | | | |
|----------------|----|----|----|----|----|---|----|----|----|----|
| ASCII | GS | (| L | pL | pH | m | fn | d1 | d2 | d3 |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | d1 | d2 | d3 |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | d1 | d2 | d3 |

Range:

$(pL + pH \times 256) = 5$ (pL=5, pH=0)
 fn=65
 d1=67, d2=76, d3=82

Default:

None

Description :

This command removes all defined NV graphics data.

Remarks :

- The graphics data is define by Function 67 into the NV graphics memory with the sector dedicated for storing NV graphics data.

Differences:

None

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

| | | | | | | | | | |
|----------------|----|----|----|----|----|---|----|-----|-----|
| ASCII | GS | (| L | pL | pH | m | fn | kc1 | kc2 |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | kc1 | kc2 |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | kc1 | kc2 |

Range:

(pL + pH x 256) = 4 (pL=4, pH=0)

m=48

fn=66

 $32 \leq kc1 \leq 126$ $32 \leq kc2 \leq 126$ **Default:**

None

Description :

Deletes the NV graphics data defined by the codes kc1 and kc2.

Remarks :

■ The graphics data is define by Function 67.

Differences:

None

<Function 67> GS (L pL pH m fn kc1 kc2 b xL xH yL yH [cd1...dk]1...[c d1...dk]b (fn=67)**Code :**

| | | | | | | | | |
|----------------|----|----|----|----|----|---|----|--|
| ASCII | GS | (| L | pL | pH | m | fn | kc1 kc2 b xL xH yL yH [cd1...dk]1...[c d1...dk]b |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | kc1 kc2 b xL xH yL yH [cd1...dk]1...[c d1...dk]b |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | kc1 kc2 b xL xH yL yH [cd1...dk]1...[c d1...dk]b |

Range:

GS (L parameter

 $3 \leq (pL + pL \times 256) \leq 65535$ ($0 \leq pL \leq 255$, $0 \leq pH \leq 255$)

GS (8 parameter

 $3 \leq (p1 + p2 \times 256) + p3 \times 65535 + p4 \times 16777216 \leq 4294967295$ $(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$

Common parameter

m=48

fn=67

a=48

 $32 \leq kc1 \leq 126$ $32 \leq kc2 \leq 126$

b=1,2

 $1 \leq (xL + xH \times 256) \leq 8192$ $1 \leq (yL + yH \times 256) \leq 2304$

c=49

 $0 \leq d \leq 255$ $k = (\text{int}((xL + xH \times 256) + 7) / 8) \times (yL + yH \times 256)$ **Default:**

None

- Description :** ■ The following parameters are used to define the raster graphics data.
- b specifies the number of colors for the defined data.
 - xL and xH specify the number of dots in horizontal direction to (xL + xH x 256).
 - yL and yH specify the number of dots in horizontal direction to (yL + yH x 256) dots.
- Remarks :** ■ If new NV graphics data is saved or the existing data is modified, all of the existing data in NV graphics memory are flushed and updated using this command. The rest of NV graphics data groups having no change should be redefined along with the new group stored.
- When NV graphics data groups are saved, each of the groups is allocated with N in the order of download.
- Differences:** None

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

| | | | | | | | | | | | |
|----------------|----|----|----|----|----|---|----|-----|-----|---|---|
| ASCII | GS | (| L | pL | pH | m | fn | kc1 | kc2 | x | y |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | kc1 | kc2 | x | y |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | kc1 | kc2 | x | y |

Range:

(pL + pH x 256) = 6 (pL=6, pH=0)

m=48, fn=69

 $32 \leq kc1 \leq 126$ $32 \leq kc2 \leq 126$

x=1, 2

y=1, 2

Default:

None

Description :

- Prints the NV graphics data defined by the codes kc1 and kc2.
 - The graphics data is enlarged by x and y in the horizontal and vertical directions.

Remarks :

- This command prints the NV graphics data defined by Function 67.
- In page mode, this command is not effective.
- NV graphics data beyond the print area for one line is not printed.

Differences:

None

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

| | | | | | | | | |
|----------------|----|----|----|----|----|---|----|-------------------------------|
| ASCII | GS | (| L | pL | pH | m | fn | a bx by c xL xH yL yH d1...dk |
| Hex | 1D | 28 | 4C | pL | pH | m | fn | a bx by c xL xH yL yH d1...dk |
| Decimal | 29 | 40 | 76 | pL | pH | m | fn | a bx by c xL xH yL yH d1...dk |

Range:

GS (L parameter

 $11 \leq (pL + pL \times 256) \leq 65535 \quad (0 \leq pL \leq 255, 0 \leq pH \leq 255)$

GS 8 L parameter

 $11 \leq (p1 + p2 \times 256) + p3 \times 65535 + p4 \times 16777216 \leq 4294967295$
 $(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$

Common parameter

m=48

fn=112

a=48

c=49

- When single-color paper specified :

 $1 \leq (xL + xH \times 256) \leq 1662 \quad (\text{When } by = 1)$
 $1 \leq (xL + xH \times 256) \leq 831 \quad (\text{When } by = 2)$

- When two-color paper specified :

 $1 \leq (xL + xH \times 256) \leq 831 \quad (\text{When } by = 1)$
 $1 \leq (xL + xH \times 256) \leq 415 \quad (\text{When } by = 2)$
 $0 \leq d \leq 255$
 $k = (\text{int}((xL + xH \times 256) + 7) / 8) \times (yL + yH \times 256)$
Default:

None

- Description :**
- This command stores the raster graphics data in the print buffer, enlarged by bx and by in the horizontal and vertical directions.
 - xL, xH specifies the raster graphics data in the horizontal direction as (xL + xH x 256) dots.
 - yL, yH specifies the raster graphics data in the vertical direction to (yL + yH x 256) dots.
 - d denotes the stored data (raster format).
 - k denotes the number of the graphics data.
 - c specifies the color of the defined data.
- Remarks :**
- The graphics data is stored in the printer buffer directly.
 - NV graphics data beyond the print area for one line is not printed.
 - Real time command is not effective during processing of this command.
- Differences:** None

GS (k

Function: Specify and print the symbol

Code: None

Range: None

Default: None

Description: ■ This command processes the data concerning two-dimensional code.

- Symbol type is specified by cn.
- Function code is specified by fn.

| cn | Type of Symbol |
|----|------------------------------|
| 48 | PDF417 (2-dimensional code) |
| 49 | QR CODE (2-dimensional code) |

| cn | fn | Function | |
|----|----|--------------|--|
| 48 | 65 | Function 065 | PDF417: Specify the number of columns |
| | 66 | Function 066 | PDF417: Specify the number of rows |
| | 67 | Function 067 | PDF417: Specify the width of module |
| | 68 | Function 068 | PDF417: Specify the module height |
| | 69 | Function 069 | PDF417: Specify the error correction level |
| | 70 | Function 070 | PDF417: Specify the option |
| | 80 | Function 080 | PDF417: Store the received data in the symbol storage area |
| | 81 | Function 081 | PDF417: Print the symbol data in the symbol storage area |

| cn | fn | Function | |
|----|----|--------------|--|
| 49 | 65 | Function 165 | QR CODE: Select the module |
| | 67 | Function 167 | QR CODE: Select the size of module |
| | 69 | Function 169 | QR CODE: Select the error correction level |
| | 80 | Function 180 | QR CODE: Store the data in the symbol storage area |
| | 81 | Function 181 | QR CODE: Print the data in the symbol storage area |

Remarks: PDF417 symbol data (when cn=48)

- The symbol data is defined, stored to the symbol storage area by Function 080 and printed by the specification of Function 081. The symbol data in the area remains reserved until the following processes are executed:
 - Performing Function 080
 - Performing ESC @
 - Performing the printer reset and power-off
- The setting values of Functions 065 to 070 are utilized for the processing of Function 080. The printable area must be large enough to accommodate different-size symbols. If not, the symbol may not be printed.
- The same symbol data is repeatedly printed by executing Function 081 after performing Function 080.
- The same symbol data is printed differently by executing Function 081 after setting the feature of the symbol by using Functions 065 through 070.

QR CODE Symbol Data (cn = 49)

- The symbol data is defined, stored to the symbol storage area by Function 180 and printed by the specification of Function 181. The symbol data in the area remains reserved until the following processes are executed:
 - Performing Function 180
 - Performing ESC @
 - Performing the printer reset and power-off
- The setting values of Functions 165 to 169 are utilized for the processing of Function 180. The printable area must be large enough to accommodate different-size symbols. If not, the symbol may not be printed.
- The same symbol data is repeatedly printed by executing Function 181 after performing Function 180.
- The same symbol data is printed differently by executing Function 181 after setting the feature of the symbol by using Functions 165 through 169.

Differences: None

<Function 065> GS (k pL pH cn fn n (fn=65)
Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 41 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 65 | n |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=48, fn=65
 $0 \leq n \leq 30$

Default:

n = 0

Description:

- This command specifies the number of columns in the data area of PDF417.
 - When n=0, automatic processing is set
 - When n is not 0, the number of columns of the data area is set to n code word.

Remarks:

- Settings of this command affect the processing of Functions 081.
- With auto processing (n=0) specified, the maximum number of columns in the data area is set to 30 columns.
- The following data is excluded from the number of columns:
 - Start and stop patterns
 - Indicator code word of left and right
- With auto processing (n=0) specified, the number of columns is calculated using the following information.
 - Printing area when processing Functions 081
 - Module width (Function 067)
 - Option setting (Function 070)
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 42 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 66 | n |

Range:

(pL + pH x 256) = 3 (pL=3, pH=0)
 cn=48, fn=66
 n=0, 3 ≤ n ≤ 90

Default:

n = 0

Description:

- This command specifies the number of rows in the data area of PDF417.
 - When n=0, automatic processing is set
 - When n is not 0, the number of rows is set to n rows.

Remarks:

- Settings of this function affect the processing of Functions 081.
- With auto processing (n=0) specified, the maximum number of rows is set to 90.
- With auto processing (n=0) specified, the number of rows is calculated by using the following information:
 - Printing area when processing Functions 081
 - Module height (Function 068)
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 43 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 67 | n |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=48
 fn=67
 $1 \leq n \leq 4$

Default:

n = 3

Description:

This command sets the width of the module of PDF417 symbol to n dots.

Remarks:

- Settings of this command affect the processing of Functions 081.
- The setting unit for printer models varies.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

- Setting unit(1 dot): 0.141(1/180 inch)

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

Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 44 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 68 | n |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=48
 fn=68
 $2 \leq n \leq 8$

Default:

n = 3

Description:

This command sets the module height of PDF417 to [the module width x n].

Remarks:

- Settings of this command affect the processing of Functions 081.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

Code:

| | | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|---|
| ASCII | GS | (| k | pL | pH | cn | fn | m | n |
| Hex | 1D | 28 | 6B | 04 | 00 | 30 | 45 | m | n |
| Decimal | 29 | 40 | 107 | 4 | 0 | 48 | 69 | m | n |

Range:

(pL + pH x 256) = 4 (pL=4, pH=0)

cn=48

fn=69

m=48

48 ≤ n ≤ 56

Default:

None

Description:

- This command specifies the error correction level for PDF417.
 - The error correction level is set by “level”.

Remarks:

- Settings of this function affect the processing of Functions 081.
- Error correction level specified by “level” (m=48) is as follows:
The number of the error correction codeword is unchanged regardless of the number of codeword in the data area.

| n | Function | Number of error correction codeword |
|----|--------------------------|-------------------------------------|
| 48 | Error correction level 0 | 2 |
| 49 | Error correction level 1 | 4 |
| 50 | Error correction level 2 | 8 |
| 51 | Error correction level 3 | 16 |
| 52 | Error correction level 4 | 32 |
| 53 | Error correction level 5 | 64 |
| 54 | Error correction level 6 | 128 |
| 55 | Error correction level 7 | 256 |
| 56 | Error correction level 8 | 512 |

- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | m |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 46 | m |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 70 | m |

Range:

(pL + pH x 256) = 3 (pL=3, pH=0)
 cn=48
 fn=70
 m=0,1

Default:

m = 0

Description:

This command selects the option for PDF417.

| m | Function |
|---|------------------------------|
| 0 | Select the standard PDF417 |
| 1 | Select the simplified PDF417 |

Remarks:

- Settings of this function affect the processing of Functions 081.
- When simplified PDF417 symbol is canceled, standard PDF417 symbol is automatically selected.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

<Function 080> GS (k pL pH cn fn m d1...dk (fn=80)**Code:**

| | | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|----|---------|
| ASCII | GS | (| k | pL | pH | cn | fn | m | d1...dk |
| Hex | 1D | 28 | 6B | pL | pH | 30 | 50 | 30 | d1...dk |
| Decimal | 29 | 40 | 107 | pL | pH | 48 | 80 | 48 | d1...dk |

Range:
 $4 \leq (pL + pH \times 256) \leq 65535$ ($0 \leq pL \leq 255$, $0 \leq pH \leq 255$)

cn=48

fn=80

m=48

 $0 \leq d \leq 255$ $k = (pL + pH \times 256) - 3$ **Default:**

None

Description:

This command stores the PDF417 symbol data (d1...dk) in the symbol storage area.

Remarks:

- The data stored in the symbol storage area by this command remains reserved after processing Function 081.
- The following data should not be included in the symbol data d1..dk since this information is automatically added by the printer:
 - Start pattern and stop pattern.
 - Indicator codeword of left and right.
 - The descriptor of symbol length (the first code word in the data area).
 - The error correction codeword calculated by modulus 929.
- The setting of this command remains effective until the following processing is performed:
 - Executing Function 080
 - Executing ESC @
 - Executing printer reset or power-off

Differences:

None

<Function 081> GS (k pL pH cn fn m (fn=81)
Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | m |
| Hex | 1D | 28 | 6B | 03 | 00 | 30 | 51 | m |
| Decimal | 29 | 40 | 107 | 3 | 0 | 48 | 81 | m |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=48
 fn=81
 m=48

Default:

None

Description:

This command encodes and prints the PDF417 symbol data in the symbol save area.

Remarks:

- In standard mode, this command is available only when printer is at the beginning of a line or the printer buffer is empty.
- A symbol exceeding the printing area in size can not be printed.
- Printing operation is not processed under the following conditions:
 - There is no data (Function 080 is not processed).
 - If [(number of columns x number of rows) < number of code word] when automatic processing is specified for number of columns and number of rows.
 - Number of code word exceeds 928 in the data area.
- The following data is added automatically by the encode processing:
 - Start pattern and stop pattern.
 - Indicator code word of left and right.
 - The descriptor of symbol length (the first code word in the data area).
 - The error correction code word calculated by modulus 929.
 - Pad codeword.
- The data area includes the following codewords:
 - Data specified by Function 080.
 - The descriptor of symbol length (the first code word in the data area).

- The error correction code word calculated by modulus 929.
- Pad codeword.
- When automatic processing (Function 065) is specified, the number of columns is calculated using the following information:
 - Current printing area
 - Module width (Function 067)
 - Option setting (Function 070)
 - Codeword in the data area
 - The maximum number of columns is 30.
- When auto processing (Function 066) is specified in page mode, the number of rows is calculated using the following information:
 - Current printing area
 - Module height (Function 068)
 - Codeword in the data area
 - The maximum number of rows is 90.
- Except for character size and upside-down printing mode, none of print mode such as emphasized, double-strike, etc, affects the printing of the symbol.
- In standard mode, the paper feed amount set by the paper feed setting command does not affect printing of the symbol. The printing position returns to the left side of the printable area after printing the symbol.
- In page mode, the printer stores the symbol data in the print buffer without executing actual printing.
- The quiet zone is not included in the printing data. Be sure to include the adequate quiet zone for executing of this command.
 - The quiet zone means the spaces surrounding the symbol such as upper, lower, left, and right spaces.

Differences: None

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

| | | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|----|----|
| ASCII | GS | (| k | pL | pH | cn | fn | n1 | n2 |
| Hex | 1D | 28 | 6B | 04 | 00 | 31 | 41 | n1 | n2 |
| Decimal | 29 | 40 | 107 | 4 | 0 | 49 | 65 | n1 | n2 |

Range:

(pL + pH x 256) = 3 (pL=3, pH=0)

cn=49

fn=65

n1 = 49, 50

n2 =0

Default:

n1 = 50, n2 = 0

Description:

This command sets the QR Code model as follows:

| n1 | Function |
|-----------|-----------------|
| 49 | Model 1 |
| 50 | Model 2 |

Remarks:

- The setting of this command affects <Function 181>.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

Code:

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 31 | 43 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 49 | 67 | n |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=49
 fn=67
 $1 \leq n < 8$

Default:

n = 3

Description:

This command sets the size of the QR Code module to n dots.

Remarks:

- The setting of this command affects the processing of <Function 181>.
- Since the QR CODE module is square, n = module width = module height.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

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

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | n |
| Hex | 1D | 28 | 6B | 03 | 00 | 31 | 45 | n |
| Decimal | 29 | 40 | 107 | 3 | 0 | 49 | 69 | n |

Range:

$(pL + pH \times 256) = 3$ (pL=3, pH=0)
 cn=49
 fn=69
 $48 \leq n \leq 51$

Default:

n = 48

Description:

This command sets the error correction level for QR Code.

| n | Function | Recovery Amount (%) |
|----|--------------------------|---------------------|
| 48 | Error Correction Level L | 7 |
| 49 | Error Correction Level M | 15 |
| 50 | Error Correction Level Q | 25 |
| 51 | Error Correction Level H | 30 |

Remarks:

- The setting of this command affects the processing of <Function 181>.
- Reed-Solomon correction is employed to generate a series of error correction codewords.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

None

<Function 180> GS (k pL pH cn fn m d1...dk (fn=80)

Code:

| | | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|----|---------|
| ASCII | GS | (| k | pL | pH | cn | fn | m | d1...dk |
| Hex | 1D | 28 | 6B | pL | pH | 31 | 50 | 30 | d1...dk |
| Decimal | 29 | 40 | 107 | pL | pH | 49 | 80 | 48 | d1...dk |

Range:
 $4 \leq (pL + pH \times 256) \leq 7092$ ($0 \leq pL \leq 255$, $0 \leq pH \leq 27$)

cn=49

fn=80

m=48

 $0 \leq d \leq 255$ $k = (pL + pH \times 256) - 3$ **Default:**

None

Description:

This command saves symbol data of the QR Code to the symbol storage area.

Remarks:

- The symbol data is defined, stored to the symbol storage area by Function 180 and printed by the specification of Function 181. The data remains reserved after completion of printing.
- The following shows the data available for encoding of QR code.

| Character Type | Usable Characters |
|-------------------|---|
| Numeric Data | "0" ~ "9" |
| Alphanumeric Data | "0" ~ "9", "A" ~ "Z", SP, \$, %, *, +, -, ., /, : |
| Kanji Data | Shift JIS value |
| 8bit Byte Data | 00H ~ FFH |

- The setting of this command remains effective until the following processing is performed:
 - Performing Function 180
 - Performing ESC @
 - Performing the printer reset or power-off

Differences:

None

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

| | | | | | | | | |
|----------------|----|----|-----|----|----|----|----|---|
| ASCII | GS | (| k | pL | pH | cn | fn | m |
| Hex | 1D | 28 | 6B | 03 | 00 | 31 | 51 | m |
| Decimal | 29 | 40 | 107 | 3 | 0 | 49 | 81 | m |

Range:

(pL + pH x 256) = 3 (pL=3, pH=0)
 cn=49
 fn=81
 m=48

Default:

None

Description:

This command encodes and prints QR Code symbol data saved in the symbol storage area.

Remarks:

- In standard mode, this command is available only when printer is at the beginning of a line or the printer buffer is empty.
- A symbol exceeding the printing area in size can not be printed.
- Printing operation is not processed under the following conditions:
 - There is no data. (Function 180 is not executed)
 - If [(number of columns x number of rows) < number of code words], the numbers of columns and rows are automatically processed.
 - The four types of data compression modes are listed below. According to the symbol data in the data storage area, automatically selects the best suitable compression mode.
 - *Numeric Data Code
 - *Alphanumeric Data mode
 - *Kanji Data mode
 - *8 bit Data mode

- The following data is automatically added by the encoding processing:
 - Position sensor pattern
 - Segregator for the position sensor pattern
 - Timing pattern
 - Format information
 - Version information
 - Error correction code text
 - Pad code text
 - Indicator for counting bits of bytes
 - Mode indicator
 - Concluder
 - Queue pattern (when model 2 is selected)
 - Expansion pattern (when model 1 is selected)
- Except for character size and upside-down printing mode, none of print mode such as emphasized, double-strike, etc, affects the printing of the symbol.
- In standard mode, the paper feed amount set by the paper feed setting command does not affect printing of the symbol. The printing position returns to the left side of the printable area after printing the symbol.
- In page mode, the printer stores the symbol data in the print buffer without executing actual printing.
- The quiet zone is not included in the printing data. Be sure to include the adequate quiet zone for executing of this command.

Differences: None

GS *

Function: Define downloaded bit image

| | | | | | | |
|--------------|----------------|----|----|---|---|---------------------|
| Code: | ASCII | GS | * | x | y | [d1...d(x x y x 8)] |
| | Hex | 1D | 2A | x | y | [d1...d(x x y x 8)] |
| | Decimal | 29 | 42 | x | y | [d1...d(x x y x 8)] |

Range: $1 \leq x \leq 255$
 $1 \leq y \leq 48$ (where $x \times y \leq 1536$)
 $0 \leq d \leq 255$

Default: None

Description: ■ This command defines the downloaded bit image using the number of dots specified by x and y.

- x and y specify the number of dots in the horizontal and vertical directions respectively.
- D defines the bit image data.
- K denotes the number of the definition data.

Remarks: ■ The bit image can be printed by downloaded graphics function, GS (8).

■ The downloaded bit image is available until ESC @, printer reset or power cycling is executed.

■ The user-defined character and the downloaded bit image cannot be defined simultaneously.

- The user-defined character is cleared preceding the execution of this command.
- The downloaded bit image data is cleared with ESC & executed.

Differences: None

GS /

Function: Print downloaded bit image

| | | | | |
|--------------|----------------|----|----|---|
| Code: | ASCII | GS | / | m |
| | Hex | 1D | 2F | m |
| | Decimal | 29 | 47 | m |

Range: $0 \leq m \leq 3$, $48 \leq m \leq 51$

Default: None

Description: This command prints the downloaded bit image defined by GS * according to the mode denoted by m.

DPI : Dots per Inch (25.4mm)

| m | Mode | Vertical dot density(DPI) | Horizontal dot density(DPI) |
|-------|---------------|---------------------------|-----------------------------|
| 0, 48 | Normal | 180 | 180 |
| 1, 49 | Double-width | 180 | 90 |
| 2, 50 | Double-height | 90 | 180 |
| 3, 51 | Quadruple | 90 | 90 |

- Remarks:**
- The download bit image is defined by GS *.
 - This command is ignored when if a downloaded bit image is not defined.
 - In standard mode, this command works only when the print buffer is empty and the printer is in the start of the line. m is treated as normal data if the print buffer has data.
 - In page mode, the bit image data is accumulated in the print buffer, but does not perform the actual printing.
 - Except for character size and upside-down printing mode, none of print mode such as emphasized, double-strike, etc, affects the printing of the downloaded bit image.
 - The default dot density set by GS L is applied to printing of the downloaded bit image.

Differences:

DPI : Dots per Inch (25.4mm)

| m | Mode | Vertical dot density(DPI) | Horizontal dot density(DPI) |
|-------|---------------|---------------------------|-----------------------------|
| 0, 48 | Normal | 180 | 180 |
| 1, 49 | Double-width | 180 | 90 |
| 2, 50 | Double-height | 90 | 180 |
| 3, 51 | Quadruple | 90 | 90 |

GS :

Function: Start/end macro definition

Code:

| | | |
|----------------|----|----|
| ASCII | GS | : |
| Hex | 1D | 3A |
| Decimal | 29 | 58 |

Range: None

Default: None

Description: ■ This command starts or ends macro definition.

Remarks:

- The printer starts macro definition during normal operation and finishes it during macro definition upon receiving this command.
- The printer performs printing during macro definition.
- The macro is executed by GS ^.
- The maximum number of macro data to be defined varies with respect to printer models. The data exceeding this limit is not stored.
- ESC @ does not clear the existing defined macro. The macro remains effective until the printer reset and power cycling are executed.

Differences: None

GS B

Function: Turns white/black reverse printing mode on / off

| | | | | |
|--------------|----------------|----|----|---|
| Code: | ASCII | GS | B | n |
| | Hex | 1D | 42 | n |
| | Decimal | 29 | 66 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description:

- This command selects white/black reverse printing mode by setting the least significant bit of n.
 - 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.

Remarks:

- This command does not affect multi-byte characters such as Kanji, Japanese and Korean.
- The right space defined by ESC SP is affected by this command.
- In white/black reverse mode, the underline mode is not effective.
- This mode remains effective until ESC @, printer reset or power cycling is executed.

Differences: None

GS H

Function: Selects print position of HRI characters

| | | | | |
|--------------|----------------|----|----|---|
| Code: | ASCII | GS | H | n |
| | Hex | 1D | 48 | n |
| | Decimal | 29 | 72 | n |

Range: $0 \leq n \leq 3$, $48 \leq n \leq 51$

Default: $n = 0$

Description: ■ This command selects the printing position of HRI (Human Readable Interpretation) characters when printing a bar code.

- The printing position is set according to the value of 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 |

Remarks: ■ The font of the HRI characters is defined by GS f.
 ■ The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences: None

GS I

Function: Transmits printer ID

| | | | | |
|--------------|----------------|----|----|---|
| Code: | ASCII | GS | I | n |
| | Hex | 1D | 49 | n |
| | Decimal | 29 | 73 | n |

Range: $1 \leq n \leq 69$

Default: None

Description: ■ This command transmits the printer ID or information.

- Transmits 1 byte of printer ID, using n as follows:

| n | Printer ID | Specification |
|------|--------------------|----------------------------------|
| 1,49 | Printer model ID | Printer model |
| 2,50 | Type ID | Printer type |
| 3,51 | Printer feature ID | Printing method and Printer size |

- Transmits specified printer information, using n as follows:

| n | Printer ID type | Specification |
|----|------------------|-----------------------------|
| 65 | Firmware version | Firmware version |
| 66 | Manufacturer | BIXOLON |
| 67 | Printer model | Printer model |
| 69 | Code page | Currently enabled code page |

Remarks: ■ Printer information (When n = 65, 66, 67, 69) consist of [Header ~ NULL] data as shown below:

| Transmitted data | Hex | Decimal | Amount of data |
|---------------------|----------------------|----------------------|----------------|
| Header | 5FH | 95 | 1byte |
| Printer information | Depends on the model | Depends on the model | 0-15 bytes |
| NUL | 00H | 0 | 1byte |

- The firmware version can be confirmed by self test printing.

Differences: ■ The printer ID is shown according to printer models as follows:

| Printer ID | SRP-330 |
|-----------------------|--|
| 1(Printer model ID) | 0x20 |
| 2(Type ID) | Type ID varies depending on functions the printer supports as follows: - 0x01 (Multi-byte character) - 0x02 (Autocutter) - 0x03 (Autocutter + Multi-byte character) |
| 3(Printer feature ID) | 0x63(when 3inch),0x62(when 2inch) |
| 65(Firmware Version) | Depend on firmware version information |
| 66(Manufacturer) | BIXOLON |
| 67(Printer model) | SRP-330 |
| 69(Language of Font) | Code page currently being used. Refer to cod page setting command, ESC t. |

GS L

Function: Set left margin

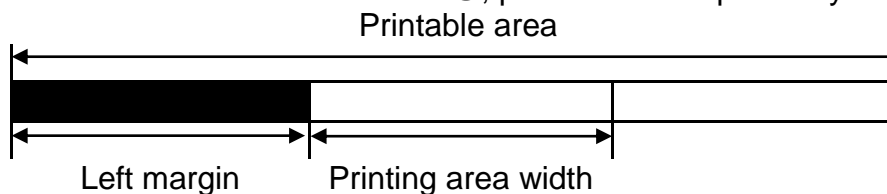
| | | | | | |
|--------------|----------------|----|----|----|----|
| Code: | ASCII | GS | L | nL | nH |
| | Hex | 1D | 4C | nL | nH |
| | Decimal | 29 | 76 | nL | nH |

Range: $0 \leq nL \leq 255, 0 \leq nH \leq 255$

Default: $(nL + nH \times 256) = 0$ ($nL=0, nH=0$)

Description: This command sets the left margin specified to $[(nL + nH \times 256) \times (\text{horizontal motion units})]$.

- Remarks:**
- The left margin is not effective in page mode. If the left margin is enabled in page mode, the setting is available when the printer returns to standard mode.
 - When the setting is beyond the printable area, the left margin is automatically set to the maximum value of the printable area.
 - Since the left margin is the same as the leftmost side of the printable area, the left side of the printable area is changed according to the left margin specified.
 - The setting of this command remains effective until ESC @, printer reset or power cycling is executed.



Differences: None

GS V

Function: Select cut mode and cut paper

Code:

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

Range: ① m=0, 1, 48, 49 ② m=65, 66, $0 \leq n \leq 255$

Default: None

Description: This command cuts paper in the specified mode as follows.

| m | | Function |
|---|------|---|
| ① | 0,48 | Executes a partial cut (one point left uncut) |
| | 1,49 | |
| ② | 65 | Feeds paper to (cutting position + n × vertical motion unit) and executes a partial cut(one point left uncut) |

Remarks:

For ①

■ If an auto cutter is not provided, this command is ignored command is executed.

For ②

■ When n = 0, the printer feeds the paper to the cutting position and cuts it.

■ If an auto cutter is not provided, the printer only feeds the paper for specified amount.

■ Vertical motion unit is used for calculating a paper feed amount.

■ Cutting mode is changed only by setting MSW5-1.

Differences: None

GS W

Function: Set printing area width

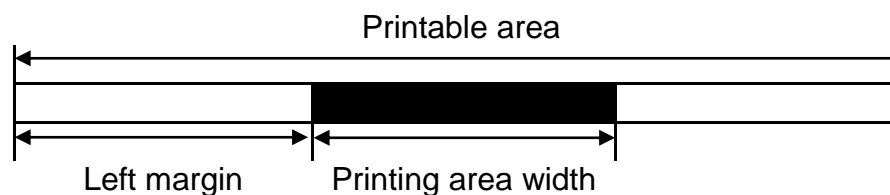
| | | | | | |
|--------------|----------------|----|----|----|----|
| Code: | ASCII | GS | W | nL | nH |
| | Hex | 1D | 57 | nL | nH |
| | Decimal | 29 | 87 | nL | nH |

Range: $0 \leq nL \leq 255, 0 \leq nH \leq 255$

Default: $(nL + nH \times 256) = 512$ ($nL=0, nH=2$) (When 80mm width of paper used)

Description: This command sets the printing area width to $[(nL + nH \times 256) \times (\text{horizontal motion units})]$.

- Remarks:**
- The printing area width is not effective in page mode. If the printing area width is enabled in page mode, the setting is available when the printer returns to standard mode.
 - When (left margin + printing area width) exceeds the printable area, the printing area width is automatically set to (printing area width - left margin).
 - The setting of this command remains effective until ESC @, printer reset or power cycling is executed.



Differences: None

GS ^

Function: Execute macro

| | | | | | | |
|--------------|----------------|----|----|---|---|---|
| Code: | ASCII | GS | ^ | r | t | m |
| | Hex | 1D | 5E | r | t | m |
| | Decimal | 29 | 94 | r | t | m |

Range: $0 \leq r \leq 255$
 $0 \leq t \leq 255$
 $m=0, 1$

Default: None

Description: ■ This command executes a macro using parameters as following:

- r specifies the number of times to execute the macro.
- t specifies the waiting time before the macro is executed.
- m specifies macro executing mode as shown below.

| m | Function |
|---|---|
| 0 | Executes the macro r times continuously at the interval specified by t. |
| 1 | The printer waits for the paper FEED button to be pressed for the time specified by t. The macro is executed once when the button is pressed. This operation is repeated r times. |

Remarks: ■ The macro is defined by GS:
 ■ If the macro is not defined or $r = 0$, the command is ignored.
 ■ The macro function is useful to print the same data repeatedly.

Differences: None

GS a

Function: Enable/Disable Automatic Status Back (ASB)

| | | | | |
|--------------|----------------|----|----|---|
| Code: | ASCII | GS | a | n |
| | Hex | 1D | 61 | n |
| | Decimal | 29 | 97 | n |

Range: $0 \leq n \leq 255$

Default: $n = 0$

Description:

- This enables or disables ASB (Automatic Status Back) according to n.
 - ASB is enabled when $n > 0$.

Remarks:

- ASB is the function that transmit the printer status such as cover open/close and Online/Offline] continuously at the time interval specified regardless of the status change if ASB is enabled. Using this ASB function, the host can check to see if the printer is running properly.
- Once ASB has been enabled, the printer continues to transmit the current printer status at the specified interval until ASB is disabled.
- When $n = 0$, ASB is disabled. The printer stops transmitting the status.
- With parallel and USB interface, the printer status is transmitted whenever the host computer changes to the reverse mode regardless of the printer status change. It is recommended that the periodic time interval at which the host changes to reverse mode is more than 500ms in order to receive the correct status.
- With serial interface, ASB status is transmitted continuously at the interval of 1 sec even if the status is not changed.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

■ The printer information transmitted is comprised of 4 bytes as follows:

• First byte(printer information)

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|---|
| 0 | Off | 00 | 0 | Not used. Fixed to Off |
| 1 | Off | 00 | 0 | Not used. Fixed to Off |
| 2 | Off | 00 | 0 | Drawer kick-out connector pin 3 is LOW |
| | On | 04 | 4 | Drawer kick-out connector pin 3 is HIGH |
| 3 | Off | 00 | 0 | On-line |
| | On | 08 | 8 | Off-line |
| 4 | On | 10 | 16 | Not used. Fixed to On |
| 5 | Off | 00 | 0 | Cover is close |
| | On | 20 | 32 | Cover is open |
| 6 | Off | 00 | 0 | Paper is not being fed by the paper feed button |
| | On | 40 | 64 | Paper is being fed by the paper feed butto |
| 7 | Off | 00 | 0 | Not used. Fixed to Off |

• Second byte(printer information)

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|--|
| 0 | Off | 00 | 0 | Not used. Fixed to Off |
| 1 | Off | 00 | 0 | Not used. Fixed to Off |
| 2 | Off | 00 | 0 | No mechanical error |
| | On | 04 | 4 | Mechanical error |
| 3 | Off | 00 | 0 | No auto cutter error |
| | On | 08 | 8 | Auto cutter error occurred |
| 4 | Off | 00 | 0 | Not used. Fixed to Off |
| 5 | Off | 00 | 0 | No unrecoverable error |
| | On | 20 | 32 | Unrecoverable error |
| 6 | Off | 00 | 0 | No automatically recoverable error |
| | On | 40 | 64 | Automatically recoverable error occurred |
| 7 | Off | 00 | 0 | Not used. Fixed to Off |

– If an unrecoverable error (bit 5) occurs, turn off the power as soon as possible.

- Third byte (paper sensor information)

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|---------------------------------------|
| 0,1 | Off | 00 | 0 | Paper near end sensor: paper adequate |
| | On | 03 | 3 | Paper near end sensor: paper near end |
| 2,3 | Off | 00 | 0 | Paper end sensor: paper present |
| | On | 0C | 12 | Paper end sensor: no paper present |
| 4 | Off | 00 | 0 | Not used. Fixed to Off |
| 5 | Off | 00 | 0 | Not used. Fixed to Off |
| 6 | Off | 00 | 0 | Not used. Fixed to Off |
| 7 | Off | 00 | 0 | Not used. Fixed to Off |

- Fourth byte (paper sensor information)

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|------------------------|
| 0 | On | 01 | 1 | Not used. Fixed to On |
| 1 | On | 02 | 2 | Not used. Fixed to On |
| 2 | On | 04 | 4 | Not used. Fixed to On |
| 3 | On | 08 | 8 | Not used. Fixed to On |
| 4 | Off | 00 | 0 | Not used. Fixed to Off |
| 5 | Off | 00 | 0 | Not used. Fixed to Off |
| 6 | Off | 00 | 0 | Not used. Fixed to Off |
| 7 | Off | 00 | 0 | Not used. Fixed to Off |

Differences: None

GS f

Function: Select font for HRI characters

| | | | | |
|--------------|----------------|----|-----|---|
| Code: | ASCII | GS | f | n |
| | Hex | 1D | 66 | n |
| | Decimal | 29 | 102 | n |

Range: n = 0, 1, 48, 49

Default: n = 0

Description: This command selects a font for the HRI(Human Readable Interpretation) characters used when printing a bar code, using n as follows:

| n | Font |
|-------|--------|
| 0, 48 | Font A |
| 1, 49 | Font B |

Remarks:

- The setting of this command is applied to only HRI characters.
- The printing position of HRI characters are specified by GS H.
- The configurations of Font A and B vary depending on the printer model.

Differences: None

GS h

Function: Selects bar code height

| | | | | |
|--------------|----------------|----|-----|---|
| Code: | ASCII | GS | h | n |
| | Hex | 1D | 68 | n |
| | Decimal | 29 | 104 | n |

Range: $1 \leq n \leq 255$

Default: $n = 162$

Description: This command sets the height of the bar code to n dots.

Remarks:

- The unit of n depends on the printer model.
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences: Unit of one dot: 0.141mm(1/180 inch)

GS k

Function: Print bar code

Code:

| | | | | | | |
|---|----------------|----|-----|---|---------|---------|
| ① | ASCII | GS | k | m | d1...dk | NUL |
| | Hex | 1D | 6B | m | d1...dk | NUL |
| | Decimal | 29 | 107 | m | d1...dk | NUL |
| ② | ASCII | GS | k | m | n | d1...dn |
| | Hex | 1D | 6B | m | n | d1...dn |
| | Decimal | 29 | 107 | m | n | d1...dn |

Range: ① $0 \leq m \leq 6$ ② $65 \leq m \leq 73$
K, m, n depend on the barcode system

Default: None

Description: ■ This command selects a bar code system and prints the bar code.

- k indicates the number of bytes of bar code data.
- n specifies the number of bytes of bar code data.
- d specifies the character code data of the bar code data to be printed.

For range ①

| m | Bar Code System | Range of k | Range of d |
|---|-----------------|--------------------------|---|
| 0 | UPC-A | $11 \leq k \leq 12$ | $48 \leq d \leq 57$ |
| 1 | UPC-E | $11 \leq k \leq 12$ | $48 \leq d \leq 57$ |
| 2 | JAN13(EAN) | $12 \leq k \leq 13$ | $48 \leq d \leq 57$ |
| 3 | JAN8(EAN) | $7 \leq k \leq 8$ | $48 \leq d \leq 57$ |
| 4 | CODE39 | $1 \leq k$ | $48 \leq d \leq 57, 65 \leq d \leq 90,$ $d=32,36,37,43,45,46,47$ |
| 5 | ITF | $1 \leq k$ (even number) | $48 \leq d \leq 57$ |
| 6 | CODABAR | $1 \leq k$ | $48 \leq d \leq 57, 65 \leq d \leq 68,$ $d=36,43,45,46,47,58$ |

For range ②

| m | Bar Code System | Range of k | Range of d |
|----|-----------------|-----------------------------------|---|
| 65 | UPC-A | $11 \leq n \leq 12$ | $48 \leq d \leq 57$ |
| 66 | UPC-E | $11 \leq n \leq 12$ | $48 \leq d \leq 57$ |
| 67 | JAN13(EAN) | $12 \leq n \leq 13$ | $48 \leq d \leq 57$ |
| 68 | JAN8(EAN) | $7 \leq n \leq 8$ | $48 \leq d \leq 57$ |
| 69 | CODE39 | $1 \leq n \leq 255$ | $48 \leq d \leq 57, 65 \leq d \leq 90,$ $d=32,36,37,43,45,46,47$ |
| 70 | ITF | $1 \leq n \leq 255$ (even number) | $48 \leq d \leq 57$ |
| 71 | CODABAR | $1 \leq n \leq 255$ | $48 \leq d \leq 57, 65 \leq d \leq 68,$ $d=36,43,45,46,47,58$ |
| 72 | CODE93 | $1 \leq n \leq 255$ | $0 \leq d \leq 127$ |
| 73 | CODE128 | $2 \leq n \leq 255$ | $0 \leq d \leq 127$ |

Remarks:

- The bar code width exceeding the print area can not be specified.
- Except for character size and upside-down printing mode, none of print mode such as emphasized, double-strike, etc, affects the printing of the barcode.
- The quiet zone of the bar code (left and right spaces of the bar code) should be considered when using this command.

Differences:

None

GS r

Function: Transmit status

| | | | | |
|--------------|----------------|----|-----|---|
| Code: | ASCII | GS | r | n |
| | Hex | 1D | 72 | n |
| | Decimal | 29 | 114 | n |

Range: n = 1, 2, 49, 50

Default: None

Description: The command transmits the status specified by n as follows:

| n | Function |
|-------|--|
| 1, 49 | Transmits paper sensor status |
| 2, 50 | Transmits drawer kick-out connector status |

Remarks:

- The status is one byte.
- The status to be transmitted is as follows:
 - Paper sensor status (n=1, 49):

| Bit | Off/On | Hex | Decimal | Function |
|------|--------|-----|---------|---------------------------------------|
| 0, 1 | Off | 00 | 0 | Paper near-end sensor: Paper adequate |
| | On | 03 | 3 | Paper near-end sensor: Paper near end |
| 2, 3 | Off | 00 | 0 | Paper end sensor: Paper present |
| | On | 0C | 12 | Paper end sensor: Paper not present |
| 4 | Off | 00 | 0 | Fixed |
| 5 | Off | 00 | 0 | Reserved |
| 6 | Off | 00 | 0 | Reserved |
| 7 | Off | 00 | 0 | Fixed |

Bits 2 and 3: This command can not be executed when the printer is offline due to the lack of paper. Therefore, the status of bit 2 (1) and bit 3 (1) is not transmitted.

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

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|---|
| 0 | Off | 00 | 0 | Drawer kick-out connector pin 3 is LOW |
| | On | 01 | 1 | Drawer kick-out connector pin 3 is HIGH |
| 1 | Off | 00 | 0 | Reserved |
| 2 | Off | 00 | 0 | Reserved |
| 3 | Off | 00 | 0 | Reserved |
| 4 | Off | 00 | 0 | Fixed |
| 5 | Off | 00 | 0 | Reserved |
| 6 | Off | 00 | 0 | Reserved |
| 7 | Off | 00 | 0 | Fixed |

- This command can be executed in real-time mode using DLE.

Differences: None

GS v 0

Function: Print raster bit image

| | | | | | | | | | | |
|--------------|----------------|----|-----|----|---|----|----|----|----|---------|
| Code: | ASCII | GS | v | 0 | m | xL | xH | yL | yH | d1...dk |
| | Hex | 1D | 76 | 30 | m | xL | xH | yL | yH | d1...dk |
| | Decimal | 29 | 118 | 48 | m | xL | xH | yL | yH | d1...dk |

Range: $0 \leq m \leq 3$, $48 \leq m \leq 51$
 $1 \leq (xL + xH \times 256) \leq 128$ ($0 \leq xL \leq 128$, $xH=0$)
 $1 \leq (yL + yH \times 256) \leq 4095$ ($0 \leq yL \leq 255$, $0 \leq yH \leq 15$)
 $0 \leq d \leq 255$
 $k = (xL + xH \times 256) \times (yL + yH \times 256)$

Default: None

Description: ■ This command prints a raster bit image according to the mode defined by m.

DPI : Dots per Inch (25.4mm)

| m | Mode | Vertical dot density (DPI) | Horizontal dot density (DPI) |
|-------|---------------|----------------------------|------------------------------|
| 0, 48 | Normal | 180 | 180 |
| 1, 49 | Double-width | 180 | 90 |
| 2, 50 | Double-height | 90 | 180 |
| 3, 51 | Quadruple | 90 | 90 |

- xL, xH specifies $(xL + xH \times 256)$ byte(s) in the horizontal direction for the bit image.
- yL, yH specifies $(yL + yH \times 256)$ dot(s) in the vertical direction for the bit image.
- d specifies the definition data of the bit image data.

Remarks:

- In standard mode, this command is effective when the printer buffer is empty and the printer is in the beginning of the line. If the buffer is not empty, after processing m, the printer treats the following data as normal data.
- In page mode, the bit image is stored in the print buffer, not being printed.
- None of the print modes such as emphasized, double-strike, etc, affects the printing of the bit image.
- The default dot density set by GS L is applied to printing of the bit image.

Differences:

DPI : Dots per Inch (25.4mm)

| m | Mode | Vertical dot density (DPI) | Horizontal dot density (DPI) |
|----------|---------------|-----------------------------------|-------------------------------------|
| 0, 48 | Normal | 180 | 180 |
| 1, 49 | Double-width | 180 | 90 |
| 2, 50 | Double-height | 90 | 180 |
| 3, 51 | Quadruple | 90 | 90 |

GS w

Function: Set bar code width

| | | | | |
|--------------|----------------|----|-----|---|
| Code: | ASCII | GS | w | n |
| | Hex | 1D | 77 | n |
| | Decimal | 29 | 119 | n |

Range: $2 \leq n \leq 6$

Default: $n = 3$

Description: ■ This command sets the horizontal size of the bar code, using n as follows:

| n | Multi-level bar code module width (mm) | Binary-level bar code | |
|---|--|-------------------------|--------------------------|
| | | Thin element width (mm) | Thick element width (mm) |
| 2 | 0.282 | 0.282 | 0.706 |
| 3 | 0.423 | 0.423 | 1.129 |
| 4 | 0.564 | 0.564 | 1.411 |
| 5 | 0.706 | 0.706 | 1.834 |
| 6 | 0.847 | 0.847 | 2.258 |

- n specifies the bar code module width.

Remarks:

- The setting of this command is effective for the following bar codes:
 - Multi-level bar codes (UPC-A, UPC-E, JAN13, HAN8, CODE93, CODE128)
 - Binary-level bar codes (CODE39, ITF, CODABAR)
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

Differences:

| n | Multi-level bar code module width (mm) | Binary-level bar code | |
|---|---|-------------------------|--------------------------|
| | | Thin element width (mm) | Thick element width (mm) |
| 2 | 0.282 | 0.282 | 0.706 |
| 3 | 0.423 | 0.423 | 1.129 |
| 4 | 0.564 | 0.564 | 1.411 |
| 5 | 0.706 | 0.706 | 1.834 |
| 6 | 0.847 | 0.847 | 2.258 |

BS M

Function: Select device font type

| | | | | | |
|--------------|----------------|----|----|---|---|
| Code: | ASCII | BS | M | n | m |
| | Hex | 08 | 4D | n | m |
| | Decimal | 08 | 77 | n | m |

Range: $65 \leq m \leq 67$ ($m = 65, 66, 67$)

Default: $n = 0$

Description: ■ This command selects print mode(s) with bits having following meanings:

| Bit | Off/On | Hex | Decimal | Function |
|-----|--------|-----|---------|------------------------------------|
| 0 | Off | 00 | 0 | Resident ASCII font selected |
| | On | 01 | 1 | Customized ASCII font selected |
| 1 | Off | 00 | 0 | Resident codepage font selected |
| | On | 02 | 2 | Customized character font selected |

| m | Function (Select font type) |
|----|-------------------------------|
| 65 | Font A (12x24) |
| 66 | Font B (9x17) |
| 67 | Font C (9x24) |

■ The printer supports 3 font types by selecting m function.

Remarks: ■ The setting of this command remains effective until ESC !, ESC @, printer reset or power cycling is executed.

Differences: None

BS V

Function : Select cut mode and cut paper

Code :

| | | | | | |
|---|----------------|----|----|---|---|
| ① | ASCII | BS | V | m | |
| | Hex | 08 | 56 | m | |
| | Decimal | 08 | 86 | m | |
| ② | ASCII | BS | V | m | n |
| | Hex | 08 | 56 | m | n |
| | Decimal | 08 | 86 | m | n |

Range: ① m=0, 1, 48, 49 ② m=65, 66, $0 \leq n \leq 255$

Default: None

Description : This command cuts paper in the specified mode as follows.

Remarks :

For ①

■ If an auto cutter is not provided, this command is ignored command is executed.

For ②

■ When $n = 0$, the mechanism feeds the paper to the cutting position and cuts it.

■ If an auto cutter is not provided, the mechanism only feeds the paper for specified amount.

■ Vertical motion unit is used for calculating a paper feed amount.

| m | | Function |
|---|------|---|
| ① | 0,48 | Executes a partial cut (one point left uncut) |
| | 1,49 | Executes a full cut (cuts the paper completely) |
| ② | 65 | Feeds paper to (cutting position + $n \times$ vertical motion unit) and executes a partial cut (one point left uncut) |
| | 66 | Feeds paper to (cutting position + $n \times$ vertical motion unit) and executes a full cut (cuts the paper completely) |

Differences: None

BS ^ P

Function: Set power saving mode

| | | | | | |
|--------------|----------------|----|----|----|----|
| Code: | ASCII | BS | ^ | P | fn |
| | Hex | 08 | 5E | 50 | fn |
| | Decimal | 08 | 94 | 84 | fn |

Range: None

Default: None

Description:

- Set the power saving mode for low power consumption.
- When the printer is entered power saving mode, printer is wait external interrupt.

Remarks:

- If external interrupt is occurred, printer is wake up.
 - Communication(Serial, Parallel, USB), Cover sensor, Feed switch.

Differences: None

<Function 48> BS ^ P fn (fn=0,48)

Code :

| | | | | | | |
|----------------|----|----|----|----|---|---|
| ASCII | BS | ^ | P | fn | m | t |
| Hex | 08 | 5E | 50 | fn | m | t |
| Decimal | 08 | 94 | 84 | fn | m | t |

Range:

fn=0,48, $0 \leq m \leq 1$
 $5 \leq t \leq 255$

Default:

m = 1, t = 20

Description :

■ Set the power saving mode and time to change the status of printer.

Remarks :

- The m=0 : power saving mode disable.
- The m=1 : power saving mode enable.
- The power saving set time is [t x 1s] and the default time is 20 sec.
 - If n is smaller than 5 the power saving time is set to default [20 x 1s].

Differences:

None

<Function 49> BS ^ P fn (fn=1,49)**Code:**

| | | | | |
|----------------|----|----|----|----|
| ASCII | BS | ^ | P | fn |
| Hex | 08 | 5E | 50 | fn |
| Decimal | 08 | 94 | 84 | fn |

Range:

fn=1,49

Default:

None

Description:

■ Read the power saving mode status and sleep time.

Remarks:

■ Power saving data is consist of [Header ~ NULL] data as shown below:

| Transmitted data | Hex | Decimal | Amount of data |
|-------------------|------------------------|------------------------|----------------|
| Header | 5FH | 95 | 1byte |
| Power saving mode | Depends on the setting | Depends on the setting | 1byte |
| Power saving time | Depends on the setting | Depends on the setting | 1byte |
| NUL | 00H | 0 | 1byte |

Differences:

None