BIXOLON

Thermal POS Printer
Command Manual

Ver. 1.00

http://www.bixolon.com

■ Contents

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2. Supported Models

Print Resolution	180dpi	203dpi
Model Name	➢ SRP-380 ➢ SRP-380II ➢ SRP-F310II ➢ SRP-350plusIII ➢ SRP-350plusV ➢ SRP-350III ➢ SRP-350V ➢ SRP-330II ➢ SRP-330III ➢ SRP-E300 ➢ SRP-Q300 ➢ SRP-QE300	➢ SRP-382 ➢ SRP-382II ➢ SRP-F312II ➢ SRP-352plusIII ➢ SRP-352plusV ➢ SRP-352III ➢ SRP-352V ➢ SRP-332II ➢ SRP-332III ➢ SRP-E302 ➢ SRP-B300 ➢ SRP-Q302 ➢ SRP-QE302 ➢ SRP-Q200 ➢ SRP-S300 ➢ SRP-S320 ➢ SRP-S200 ➢ SRP-S3000

3. Control Commands List in Alphanumeric Order

No.	Command	Function
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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
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15	ESC 2	Select default line spacing
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17	ESC =	Select peripheral device
18	ESC ?	Cancel user-defined characters
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No.	Command	Function
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45	GS (L GS 8 L	Select graphics data
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47	GS *	Define downloaded bit image
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49	GS :	Start/end macro definition
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No.	Command	Function
51	**GS H**	Select print position of HRI characters
52	**GS I**	Transmit printer ID
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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

3-1 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**

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.

Remarks :
- The printer is returned to standard mode after completion of printing.
- This command works in page mode enabled by ESC L.
- 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 ≤ n ≤ 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
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 ≤ t ≤ 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 ≤ n ≤ 255

Default: n = 0

Description:
■ This command sets the size of space to right of character.
• Right space = n × [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:
■ **180dpi:** 0.141mm(1/180 inch)
■ **203dpi:** 0.125mm(1/203 inch)

ESC !

Function: **Set print mode**

Code:

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

Range: 0 ≤ n ≤ 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 ≤ (nL + nH x 256) ≤ 65535 (0 ≤ nH ≤ 255, 0 ≤ nL ≤ 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 x 256) x (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 poison 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:
- **180dpi:** 0.141mm(1/180 inch)
- **203dpi:** 0.125mm(1/203 inch)

ESC %

Function: **Select/cancel user-defined character set**

Code:

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

Range: 0 ≤ n ≤ 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 ≤ c1 ≤ c2 ≤ 126
0 ≤ x ≤ 12 (Font A)
0 ≤ x ≤ 9 (Font B)
0 ≤ d ≤ 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 ≤ nL ≤ 255
0 ≤ nH ≤ 3
0 ≤ d ≤ 255
k = nL + nH × 256 [in case of m = 0, 1]
k = (nL + nH × 256) × 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: ■ **180dpi:**

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 x 256
1	8-dot double-density	8	60	180	nL + nH x 256
32	24-dot single-density	24	180	90	(nL + nH x 256) x 3
33	24-dot double-density	24	180	180	(nL + nH x 256) x 3

■ **203dpi:**

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	203/3	203/2	nL + nH x 256
1	8-dot double-density	8	203/3	203	nL + nH x 256
32	24-dot single-density	24	203	203/2	(nL + nH x 256) x 3
33	24-dot double-density	24	203	203	(nL + nH x 256) x 3

ESC –

Function: **Turn underline mode on/off**

Code:

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

Range: 0 ≤ n ≤ 2, 48 ≤ n ≤ 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:
- **180dpi:** 4.23 mm (30 dots)
- **203dpi:** 3.75 mm(30 dots)

ESC 3

Function: **Set line spacing**

Code:

ASCII	ESC	3	n
Hex	1B	33	n
Decimal	27	51	n

Range: 0 ≤ n ≤ 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 x (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 poison 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
180dpi	0.0705mm (1/360 inch)	0.141mm (1/180 inch)	17.98mm
203dpi	0.0625mm (1/406 inches)	0.125mm (1/203 inches)	15.937mm

ESC =

Function: **Select peripheral device**

Code:

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

Range: 1 ≤ n ≤ 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 LSB 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 ≤ n ≤ 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 cooresponding 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 ≤ n ≤ 255 , 0 ≤ k ≤ 32

Default: n = 8, 16, 24, 32, 40,....., 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 form 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 ≤ n ≤ 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 ≤ n ≤ 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 ≤ n ≤ 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 poison 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
180dpi	0.0705mm (1/360 inch)	17.98mm
203dpi	0.0625mm (1/406 inches)	15.937mm

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 (E, 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 ≤ n ≤ 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	8	Japan
2	Germany	9	Norway
3	U.K	10	Denmark II
4	Denmark I	11	Spain II
5	Sweden	12	Latin America
6	Italy	13	Korea

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 ≤ n ≤ 3, 48 ≤ n ≤ 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 id 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 ≤ n ≤ 2, 48 ≤ n ≤ 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 ≤ (xL + xH x 256) ≤ 65535 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 255)
0 ≤ (yL + yH x 256) ≤ 65535 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 255)
1 ≤ (dxL + dxH x 256) ≤ 65535 (0 ≤ dxL ≤ 255, 0 ≤ dxH ≤ 255)
1 ≤ (dyL + dyH x 256) ≤ 65535 (0 ≤ dyL ≤ 255, 0 ≤ dyH ≤ 255)

Default:

■ **180dpi:**
- When a paper width of 80mm{3.15"} is selected:
  (xL + xH x 256) = 0 (xL=0, xH=0)
  (yL + yH x 256) = 0 (yL=0, yH=0)
  (dxL + dxH x 256) = 512 (dxL=0, dxH=2)
  (dyL + dyH x 256) = 1662 (dyL=126, dyH=6)

■ **203dpi:**
- When a paper width of 80mm{3.15"} is selected:
  (xL + xH x 256) = 0 (xL=0, xH=0)
  (yL + yH x 256) = 0 (yL=0, yH=0)
  (dxL + dxH x 256) = 576 (dxL=64, dxH=2)
  (dyL + dyH x 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 x 256) x (horizontal motion units)]
- Vertical starting position = [(yL + yH x 256) x (vertical motion units)]
- Horizontal printing area width = [(dxL + dxH x 256) x (horizontal motion units)]
- Vertical printing area width = [(dyL + dyH x 256) x (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
180dpi	72.2mm(512dots)	234.3mm(1662dots)
203dpi	72mm(576dots)	207.75mm(1662dots)

ESC \

Function: **Set relative print position**

Code:

ASCII	ESC	\	nL	nH
Hex	1B	5C	nL	nH
Decimal	27	92	nL	nH

Range: 0 ≤ (nL + nH x 256) ≤ 65535 (0 ≤ nL 255, 0 ≤ nH ≤ 255)

Default: None

Description:

■ This command sets the print starting position based on the current position to [(nL + nH × 256) × horizontal or vertical motion unit].

• The print starting position is moved to (nL + nH x 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 poison 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 ≤ n ≤2, 48 ≤ n ≤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 ≤ n ≤ 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 options can be changed via Unified Utility (MSW 5-1, MSW 5-2).
- Printers not built in auto-cutters cannot carry this command out, and the printer does not work and displays the auto-cutter error signals on 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 options can be changed via Unified Utility (MSW 5-1, MSW 5-2).
- Printers not built in auto-cutters cannot carry this command out, and the printer does not work and displays the auto-cutter error signals on 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 ≤ t1 ≤ 255, 0 ≤ t2 ≤ 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 ≤ n ≤ 5, 16 ≤ n ≤ 19, 21 ≤ n ≤ 31, 33 ≤ n ≤ 42, n=47, 49 ≤ n ≤ 51, n=255

Default: For model not supporting Thai character: n=0

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)
49	Page 49 TCVN-3(Vietnamese1)
50	Page 50 TCVN-3(Vietnamese2)
51	Page 51 VISCII(Vietnamese3)
52	Page 52 CP912(Albania)
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 senor 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 ≤ n ≤ 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

A B C D E F F E D C B A

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 ≤ n ≤ 255
0 ≤ m ≤ 3, 48 ≤ m ≤ 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 misali gnment between the top and bottom parts of the printed pattern.

Differences:

■ **180dpi:**

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

■ **203dpi:**

DPI : Dots per Inch (25.4mm)

Mode	Vertical Dot Density (DPI)	Horizontal Dot Density (DPI)
Normal	203	203
Double-width	203	203/2
Double-height	203/2	203
Quadruple	203/2	203/2

FS q

Function: **Define NV bit image**

Code:

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

Range:

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

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 × 256) x 8] and [(yL + yH × 256) x 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, LSB 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 ≤ n ≤ 255
(1 ≤ Vertical enlargement ≤ 8, 1 ≤ Horizontal enlargement ≤ 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 ≤ (nL + nH x 256) ≤ 65535 (0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255)

Default: None

Description: This command sets the absolute vertical print starting position to [(nL + nH × 256) × (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 x 256) = 2 (pL=2, pH=0)
0 ≤ n ≤ 2, 48 ≤ n ≤ 50
1 ≤ m ≤ 2, 49 ≤ m ≤ 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 1, 49 2, 50	Roll paper

• 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 LSB 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 momory 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 grapics 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 a kc1 kc2 b xL xH yL yH [c d1…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 x 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 LSB 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 x 256) = 1 (pL=2, pH=0)
m=48
fn=0, 48

Default:

None

Description :

Tramsmits the total capacityu of the NV bit-image momory (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 decial data, then transmitted from the MSB.
■ The data length is variable.
■ The total capacitu of the NV user memory is selectable as any one of[0, 64K, 128K, 192K, 256K] bytes with GS (E. 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 x 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 x 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 x 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 ≤ kc1 ≤ 126
32 ≤ kc2 ≤ 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 a kc1 kc2 b xL xH yL yH [c d1…dk]1…[c d1…dk]b (fn=67)

Code :

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

Range:

GS (L parameter
3 ≤ (pL + pL x 256) ≤ 65535 (0≤pL≤255, 0≤ pH≤255)

GS (8 parameter
3 ≤ (p1 + p2 x 256) +p3 x 65535+p4 x 16777216) ≤ 4294967295
(0 ≤ p1L ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)

Common parameter
m=48
fn=67
a=48
32 ≤ kc1 ≤ 126
32 ≤ kc2 ≤ 126
b=1,2
1 ≤ (xL + xH x 256) ≤ 8192
1 ≤ (yL + yH x 256) ≤ 2304
c=49
0 ≤ d ≤ 255
k = (int ((xL + xH x 256) + 7) / 8) x (yL + yH x 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 ≤ kc1 ≤ 126
32 ≤ kc2 ≤ 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 ≤ (pL + pL x 256) ≤ 65535 (0≤pL≤255, 0≤ pH≤255)

GS 8 L parameter
11 ≤ (p1 + p2 x 256) +p3 x 65535+p4 x 16777216) ≤ 4294967295
(0 ≤ p1L ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)

Common parameter
m=48
fn=112
a=48
c=49
- When single-color paper secified :
1 ≤ (xL + xH x 256) ≤ 1662 (When by =1)
1 ≤ (xL + xH x 256) ≤ 831 (When by =2)
- When two-color paper secified :
1 ≤ (xL + xH x 256) ≤ 831 (When by =1)
1 ≤ (xL + xH x 256) ≤ 415 (When by =2)
0 ≤ d ≤ 255
k = (int ((xL + xH x 256) + 7) / 8) x (yL + yH x 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 directionas (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
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.

QRCODE 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 x 256) = 3 (pL=3, pH=0)
cn=48, fn=65
0 ≤ n ≤ 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 x 256) = 3 (pL=3, pH=0)
cn=48
fn=67
1 ≤ n ≤ 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):
- **180dpi:** 0.141(1/180 inch)
- **203dpi:** 0.125(1/203 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 x 256) = 3 (pL=3, pH=0)
cn=48
fn=68
2 ≤ n ≤ 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 ≤ (pL + pH x 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)
cn=48
fn=80
m=48
0 ≤ d ≤ 255
k = (pL + pH x 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 x 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 x 256) = 3 (pL=3, pH=0)
cn=49
fn=67
1<=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 x 256) = 3 (pL=3, pH=0)
cn=49
fn=69
48≤n≤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 ≤ (pL + pH x 256) ≤7092 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 27)
cn=49
fn=80
m=48
0 ≤ d ≤ 255
k = (pL + pH x 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 ≤ x ≤ 255
1 ≤ y ≤ 48 (where x x y ≤ 1536)
0 ≤ d ≤ 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 ≤ m ≤ 3, 48 ≤ m ≤ 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:

■ **180dpi:**

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

■ **203dpi:**

DPI : Dots per Inch (25.4mm)

m	Mode	Vertical dot density(DPI)	Horizontal dot density(DPI)
0, 48	Normal	203	203
1, 49	Double-width	203	203/2
2, 50	Double-height	203/2	203
3, 51	Quadruple	203/2	203/2

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 ≤ n ≤ 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 ≤ n ≤ 3, 48 ≤ n ≤ 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 ≤ n ≤ 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-350plusV
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-350plusV**
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

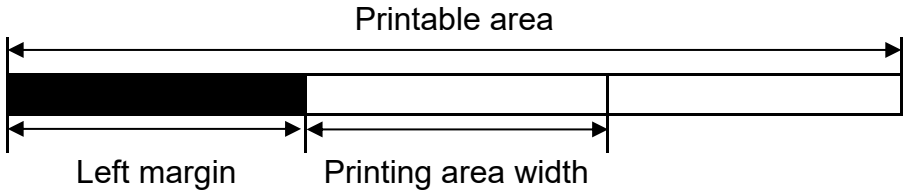
Range: 0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255

Default: (nL + nH x 256)=0 (nL=0, nH=0)

Description: This command sets the left margin specified to [(nL + nH x 256) x (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 ≤ n ≤ 255

Default: None

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

m		Function
①	0,48 1,49	Executes a partial cut (one point left uncut)
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.

■ Autocutter options can be changed via Unified Utility (MSW 5-1, MSW 5-2).

Differences: None

GS W

Function: **Set printing area width**

Code:

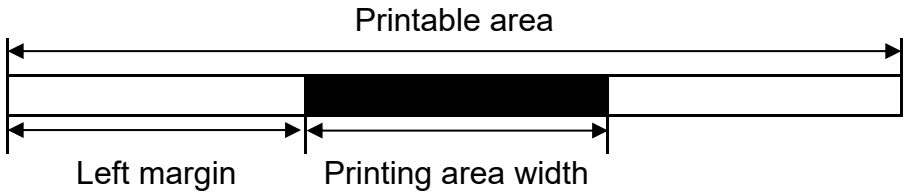
ASCII	GS	W	nL	nH
Hex	1D	57	nL	nH
Decimal	29	87	nL	nH

Range: 0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255

Default:
■ **180dpi:**
(nL + nH x 256)=512 (nL=0, nH=2) (When 80mm width of paper used)
■ **203dpi:**
(nL + nH x 256)=576 (nL=64, nH=2) (When 80mm width of paper used)

Description: This command sets the printing area width to [(nL + nH x 256) x (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 ≤ r ≤ 255
0 ≤ t ≤ 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 ≤ n ≤ 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 mechanical error (bit 2) or auto-cutter error (bit 3) occurs due to paper jams or the like, it is possible to recover by correcting a cause of the error and executing ENQ in real time mode.
- 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 ≤ n ≤ 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:
- **180dpi:** 0.141mm(1/180 inch)
- **203dpi:** 0.125mm(1/203 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 $0 \le m \le 6$ ② $65 \le m \le 73$
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	$11 \le k \le 12$	$48 \le d \le 57$
1	UPC-E	$11 \le k \le 12$	$48 \le d \le 57$
2	JAN13(EAN)	$12 \le k \le 13$	$48 \le d \le 57$
3	JAN8(EAN)	$7 \le k \le 8$	$48 \le d \le 57$
4	CODE39	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 90$, d=32,36,37,43,45,46,47
5	ITF	$1 \le k$ (even number)	$48 \le d \le 57$
6	CODABAR	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 68$, d=36,43,45,46,47,58

For range ②

m	Bar Code System	Range of k	Range of d
65	UPC-A	11 ≤ n ≤ 12	48 ≤ d ≤ 57
66	UPC-E	11 ≤ n ≤ 12	48 ≤ d ≤ 57
67	JAN13(EAN)	12 ≤ n ≤ 13	48 ≤ d ≤ 57
68	JAN8(EAN)	7 ≤ n ≤ 8	48 ≤ d ≤ 57
69	CODE39	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 90, d=32,36,37,43,45,46,47
70	ITF	1 ≤ n ≤ 255 (even number)	48 ≤ d ≤ 57
71	CODABAR	1 ≤ n ≤ 255	48 ≤ d ≤ 57, 65 ≤ d ≤ 68, d=36,43,45,46,47,58
72	CODE93	1 ≤ n ≤ 255	0 ≤ d ≤ 127
73	CODE128	2 ≤ n ≤ 255	0 ≤ d ≤ 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 ≤ m ≤ 3, 48 ≤ m ≤ 51
1 ≤ (xL + xH x 256) ≤ 128 (0 ≤ xL ≤ 128, xh=0)
1 ≤ (yL + yH x 256) ≤ 4095 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 15)
0 ≤ d ≤ 255
k = (xL + xH x 256) x (yL + yH x 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 x 256) byte(s) in the horizontal direction for the bit image.
- yL, yH specifies (yL + yH x 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:

■ **180dpi:**

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

■ **203dpi:**

DPI : Dots per Inch (25.4mm)

m	Mode	Vertical dot density (DPI)	Horizontal dot density (DPI)
0, 48	Normal	203	203
1, 49	Double-width	203	203/2
2, 50	Double-height	203/2	203
3, 51	Quadruple	203/2	203/2

GS w

Function: **Set bar code width**

Code:

ASCII	GS	w	n
Hex	1D	77	n
Decimal	29	119	n

Range: 2 ≤ n ≤ 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:

■ **180dpi:**

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

■ **203dpi:**

n	Multi-level bar code module width (mm)	Binary-level bar code	
		Thin element width (mm)	Thick element width (mm)
2	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.500	0.500	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2.000

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 ≤ m ≤ 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 ≤ n ≤ 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 × vertical motion unit) and executes a partial cut (one point left uncut)
	66	Feeds paper to (cutting position + n × 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 ≤ m ≤ 1
5 ≤ t ≤ 255

Default: m = 1, t = 20

Description : ■ Set the power saving mode and time to change the sataus 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 defaut [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 satatus 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