ZQ220 Plus, ZQ120 Plus, ZR138 CR/CN/EM

ESC/POS

Programming Guide

ZEBRA

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Introduction

This section describes the features and functions of ESC/POS that run on the ZQ220 Plus, ZQ120 Plus, and ZR138 CR/CN/EM printers.

Overview

The ESC/POS features enables the ZQ220 Plus, ZQ120 Plus, and ZR138 CR/CN/EM printers to work with many host systems that use BIXOLON® printers. In most cases, no changes are required to the host application. This feature helps customers make a smooth transition to Zebra printers and saves them the time and expense of having to rewrite their host software.

ESC/POS Features

The ESC/POS features are as follows:

- Offers fonts similar to the original device.
- Supports the Bluetooth® and USB interfaces.
- Provides support of BIXOLON commands (see Supported Commands on page 9).
- Offers many outline fonts, barcodes, and specific commands and features of target printer models (see Supported Fonts on page 75).

Use all other existing features of the ZQ220 Plus, ZQ120 Plus, and ZR138 CR/CN/EM printers, when available.

Supported Printers

The following printers support ESC/POS language:

Printer	Firmware
ZQ120 Plus	V59.01.03
ZQ220 Plus	V59.01.03
ZR138 CR/CN/EM	V59.01.03

For complete printer operation, use this manual in combination with the User Guide for your printer.

Configuring Network Connectivity

Your printer is equipped with Bluetooth. For detailed information on how to connect a Bluetooth device, refer to the ZQ220 Plus, ZQ120 Plus and ZR138 CR/CN/EM User Guide.

NOTES

- CPCL Utility Commands are disabled when running in ESC/POS language mode. However, Set/Get/Do (SGD) commands and file download all operate properly when enabled.
- ESC/POS fonts can be used with CPCL & ESC/POS languages.

Enable ESC/POS mode

To enable ESC/POS on your printer, run the following command:

```
! U1 setvar "device.languages" "esc_pos"
```

To disable ESC/POS mode on your printer and return to normal function, run the following command:

```
! U1 setvar "device.languages" "line_print"
```

IMPORTANT The printer must be power-cycled after switching the device language.

Supported Commands

The following commands are supported by the ZQ220 Plus, ZQ120 Plus and ZR138 CR/CN/EM printers.

Command	Function
EOT on page 11	Transmit status
HT on page 13	Horizontal tab
LF on page 14	Print and line feed
FF on page 14	Form feed (in Page mode)
CAN on page 14	Cancel the print data (in Page mode)
ESC SP on page 15	Set the character right space
ESC ! on page 15	Set print mode
ESC $ on page 16	Set absolute print position
ESC * on page 17	Specify bit image mode
ESC - on page 17	Turn underline mode on/off
ESC 2 on page 18	Select default line spacing
ESC 3 on page 18	Set line spacing
ESC @ on page 18	Initialize printer
ESC D on page 19	Set horizontal tab positions
ESC E on page 19	Turn emphasized mode on/off
ESC G on page 20	Turn double-strike mode on/off
ESC J on page 20	Print and feed paper
ESC L on page 20	Select Page mode
ESC M on page 21	Select character font
ESC R on page 22	Specify an international character set
ESC S on page 22	Select standard mode
ESC T on page 23	Select print direction in page mode
ESC W on page 24	Set print area in page mode
ESC \ on page 25	Set relative print position
ESC a on page 25	Set position alignment
ESC d on page 26	Print and feed n lines

Command	Function
ESC t on page 26	Select character code table
ESC { on page 27	Turn upside-down print mode on/off
FS & on page 27	Select Kanji character GB18030 mode
FS # on page 28	Select Kanji character UTF8 mode
FS . on page 28	Cancel Kanji character mode
GS ! on page 29	Select character size
GS $ on page 30	Set absolute vertical print position in page
GS (A on page 30	Execute test print
GS (F on page 31	Set black mark control functions
GS (k on page 32	Specify and print the symbol
GS (L, GS 8 L on page 55	Select graphics data
GS : on page 61	Start/end macro definition
GS B on page 61	Turn white/black reverse print mode on/off
GS H on page 62	Select print position of HRI characters
GS I on page 62	Transmit printer ID
GS I b on page 63	Transmit battery status
GS L on page 64	Set print position to the beginning of print line
GS T on page 65	Set print area width
GS W on page 65	Set relative vertical print position in page mode
GS \ on page 66	Execute macro
GS ^ on page 66	Enable/disable Automatic Status Back(ASB)
GS a on page 67	Select font for HRI characters
GS f on page 69	Set bar code height
GS h on page 69	Print bar code
GS k on page 70	Transmit status
GS r on page 71	Print raster bit image
GS v 0 on page 72	Set bar code width
GS w on page 73	Execute automatic calibration in black mark mode
BS L A on page 73	Select black mar mode
BS L L on page 74	Select receipt mode
BS L R on page 74	Select device font type
BS M on page 74	Sentinel character set up commands

Command Format

The commands in this section are presented in the following format.

Command

Description Command Function

Syntax Command format in ASCII followed by hexadecimal and decimal equivalents (example below for EOT). Variable values are denoted by *n* (and sometimes other letters).

EOTn

ASCII	EOT	*n*
Hex	04	*n*
Decimal	4	*n*

Range The values that can be used for *n*

Default Initial value of *n* (if any)

Notes In-depth description of the command function

Differences Variations of the command, status, or results (if any)

EOT

Description Transmit Status

Syntax EOT*n*

ASCII	EOT	n
Hex	04	n
Decimal	4	n

Range 1 to 4

Default none

Notes Upon request, the printer status is transmitted to the host, which checks the printer operating conditions and takes appropriate measures.

Based on the value of *n*, the printer transmits the following status information.

n **= 1: Transmit printer status**				
Bit	**Binary**	**Hex**	**Decimal**	**Status**
1	1	02	2	Not used. Fixed to On
2	0	00	0	Not used. Fixed to Off
	1	04	4	Not used. Fixed to Off
3	0	00	0	Not used. Fixed to Off
	1	08	8	Not used. Fixed to Off
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: Transmit offline status**				
Bit	**Binary**	**Hex**	**Decimal**	**Status**
0	Off	00	0	Not used. Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Cover is closed
	On	04	4	Cover is open
3	Off	00	0	Not used. Fixed to Off
	On	08	8	Not used. Fixed to Off
4	On	10	16	Fixed to On
5	Off	00	0	Paper is loaded in the printer.
	On	20	32	The printer is out of paper. (Media out)
6	Off	00	0	Not used. Fixed to Off
	On	40	64	Not used. Fixed to Off
7	Off	00	0	Not used. Fixed to Off

n **= 3: Transmit 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
	1	04	4	Not used. Fixed to Off
3	0	00	0	Not used. Fixed to Off
	1	08	8	Not used. Fixed to Off

n = 3: Transmit error status				
Bit	**Binary**	**Hex**	**Decimal**	**Status**
4	1	10	16	Not used. Fixed to On
5	0	00	0	Not used. Fixed to Off
	1	20	32	Not used. Fixed to Off
6	0	00	0	Not used. Fixed to Off
	1	40	64	Not used. Fixed to Off
7	0	00	0	Not used. Fixed to Off

n = 4: Transmit paper sensor status				
Bit	**Binary**	**Hex**	**Decimal**	**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	Not used. Fixed to Off
	11	0C	12	Not used. Fixed to Off
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

HT

Description Horizontal Tab

Syntax `HT`

ASCII	HT
Hex	09
Decimal	9

This command moves the print position to the next horizontal tab position. If a horizontal tab position was not set using ESC D on page 19, the printer ignores this command.

When in Underline mode, the printer does not underline the space created by this command.

LF

Description Print and Line Feed

Syntax `LF`

ASCII	LF
Hex	0A
Decimal	10

Notes In Standard mode, this command prints the data in the print buffer and feeds one line based on the current set line spacing. In Page mode, the printer does not print, but simply moves the print position to the beginning of the next line.

FF

Description Form Feed (Page mode)

Syntax `FF`

ASCII	LF
Hex	0A
Decimal	10

Notes This command works in Page mode, which is enabled by ESC L on page 20.

When `FF` is executed, the printer prints all data from the print buffer in Page mode, deletes the data, and then returns the print position to the beginning of the next line in Standard mode.

Differences After printing is complete, the printer does not clear the print buffer, and the print position moves to the beginning of the line.

CAN

Description Cancel Print Data (Page mode)

Syntax `CAN`

ASCII	CAN
Hex	18
Decimal	24

Notes `CAN` clears the print buffer.

This command works in Page mode, which is enabled by ESC L on page 20.

ESC SP

Description Set the Character Right Space

Syntax <ESC>SP*n*

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

Range *n* = 0 to 255

Default *n* = 0

Notes This command sets the amount of space to the right of a character.

Right space = n × [horizontal motion units].

In a double-width mode, the right space is doubled.

Differences Horizontal motion unit varies depending on the printhead resolution. For a 203 dpi printer, horizontal motion unit = 0.125 mm (1/203 in)

ESC !

Description Set Print Modes

Syntax <ESC>!*n*

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

Range *n* = 0 to 255

Default *n* = 0

Notes As alternatives to this command, the following commands can be used:

ESC M on page 21 to select character font

ESC E on page 19 to select emphasized mode

ESC - on page 17 to select underline mode. When in underline mode, the printer does not underline the space created by horizontal tabs.

Based on the value of *n*, the printer selects print mode(s) as follows.

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

Bit	Off/On	Hex	Decimal	Function
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

Differences Character configuration (Font A, Font B): Font A (12 × 24), Font B (9 × 17)

ESC $

Description Set an Absolute Print Position

Syntax <ESC>$*nLnH*

ASCII	ESC	$	nL	nH
Hex	1B	24	nL	nH
Decimal	27	36	nL	nH

Range *nL* = 0 to 255 *nH* = 0 to 255

Default None

Notes 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* × 256) × (vertical or horizontal motion units)

In Standard mode, the horizontal motion unit is used for the calculation.

In Page mode, the horizontal motion unit is used for the calculation when the print start position is defined to the upper right or lower right of print area (using ESC T on page 23). Otherwise, the vertical motion unit is used.

The printer ignores any setting values that would cause printing outside of the printable area.

Differences Horizontal and vertical motion units vary depending on the printhead resolution. For a 203 dpi printer, horizontal and vertical motion units = 0.125 mm (1/203 in).

ESC *

Description Specify Bit Image Mode

Syntax <ESC>*m*nLnH d1...dk*

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 *nL* = 0 to 255 *nH* = 0 to 3 *d* = 0 to 255

d specifies the bit image data with 1 for printed data and 0 for not printed.

k denotes the number of horizontal dots.

Default None

Notes ESC * specifies the bit image for the mode (*m*) as to the number of dots specified by *nL* and *nH*.

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+nHx256
1	8-dot double-density	8	203/3	203	nL+nHx256
32	24-dot single-density	24	203	203/2	(nL+nHx256)x3
33	24-dot double-density	24	203	203	(nL+nHx256)x3

ESC -

Description Turn Underline Mode On/Off

Syntax <ESC>-*n*

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

Range *n* = 0, 1, 2, 48, 49, 50

Default *n* = 0

Notes This command enables the text following it to be underlined. Using bit 7 of ESC ! on page 15 also activates/deactivates Underline mode.

The underline style varies depending on the value 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

When in Underline mode, the printer does not underline the space created by horizontal tabs.

ESC 2

Description Select Default Line Spacing

Syntax <ESC>2

ASCII	ESC	2
Hex	1B	32
Decimal	27	50

Notes This command changes the default line spacing, which can be set for Standard mode and Page mode independently of each other. The initial default line spacing is 4.125 mm (33 dots).

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC 3

Description Set Line Spacing

Syntax <ESC>3n

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

Range *n* = 0 to 255

Default 4.125 mm (33 dots) or the line spacing defined by ESC 2 on page 18

Notes Line spacing can be set for Standard mode and Page mode independently of each other.

ESC @

Description Initialize Printer

Syntax <ESC>@

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

Notes This command cancels conditions previously set and resets the printer to the conditions that existed at power on:

- The data in the print buffer is cleared.
- The data in the receive buffer is not discarded.
- All settings, such as print mode and line feed, are cleared.
- Nonvolatile graphics and nonvolatile user memory are not cleared.

When the printer receives this command in Page mode, the printer removes the data in print areas, restores the initial settings, and returns to Standard mode.

ESC D

Description Set Horizontal Tab Position

Syntax <ESC>D*n*NUL

ASCII	ESC	D	n1…nk	NUL
Hex	1B	44	n1…nk	00
Decimal	27	68	n1…nk	0

Range *n* = 1 to 255,0 ≤ k ≤ 32

Default *n* = 8

Notes 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.

Tab position is set at the value of **[character width × n]** from the beginning of the line. The character width includes the space to the right of the character. This width is doubled when double width characters are selected.

If the data [n]k is equal to or smaller than the preceding data [n]k-1, then the horizontal tab setting has been completed.

The horizontal tab position remains unchanged if the character width changes.

ESC E

Description Turn Emphasized Mode On/Off

Syntax <ESC>E*n*

ASCII	ESC	E	n
Hex	1B	45	n
Decimal	27	69	n

Range *n* = 0 to 255

Default *n* = 0

Notes ESC E on page 19 turns emphasized mode on or off by toggling the least significant bit (LSB) of *n* as follows:

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

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC G

Description Turn Double-Strike Mode On/Off

Syntax <ESC>G*n*

ASCII	ESC	G	n
Hex	1B	47	n
Decimal	27	71	n

Range *n* = 0 to 255

Default *n* = 0

Notes ESC E turns double-strike mode on or off by toggling the least significant bit (LSB) of n as follows:

- When the LSB of *n* is 0, double-strike mode is turned off.
- When the LSB of *n* is 1, double-strike mode is turned on.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC J

Description Print and Feed Paper

Syntax <ESC>J*n*

ASCII	ESC	J	n
Hex	1B	4A	n
Decimal	27	74	n

Range *n* = 0 to 255 dots

Default None

Notes ESC J prints the data in the print buffer and feeds the paper by the number of dots specified by *n*.

ESC L

Description Select Page Mode

Syntax <ESC>L

ASCII	ESC	L
Hex	1B	4C
Decimal	27	76

Notes This command switches the printer from Standard mode to Page mode. For printing in Page mode, ESC T on page 23 defines the print direction and starting position within the print area specified by ESC W on page 24.

The following commands are defined independently in Standard mode and Page mode:

- ESC SP on page 15

- ESC 2 on page 18
- ESC 3 on page 18

The following commands are inactive in Page mode:

- ESC L on page 20
- GS (A on page 30
- GS T on page 65

The following commands are ignored in Page mode. Any conditions set by these commands in Page mode are available when the printer returns to Standard mode:

- ESC a on page 25
- ESC { on page 27
- GS L on page 64
- GS W on page 65

The printer returns to Standard mode when you use the following commands:

- FF on page 14
- ESC @ on page 18
- ESC S on page 22

In Page mode, the Form Feed command (FF on page 14) prompts printing of data in the print buffer. LF on page 14, ESC D on page 19, and ESC J on page 20 move the print position without actually printing.

ESC M

Description Select Character Font

Syntax <ESC>M*n*

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

Range *n* = 0, 1, 2, 3, 4, 7, 8, 48, 49, 50, 51, 52, 55, 56

Default *n* = 0

Notes This command selects 1-byte character fonts as defined by *n*.

n	Function
0, 48	Character Font A (12 × 24) selected
1, 49	Character Font B (9 × 17) selected
2, 50	Character Font C (9 × 24) selected
3, 51	Character Font D (16 × 16) selected
4, 52	Character Font E (24 × 24) selected
7, 55	Character GT16NF55 (16 × 16) selected
8, 56	Character GT24NF55 (24 × 24) selected

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

Differences Configuration of Fonts A, B, C, D, E: Font A (12 × 24), Font B (9 × 17), Font C (9 × 24), GBUNSG16.CPF, GBUNSG24.CPF

ESC R

Description Specify International Character Set

Syntax <ESC>R*n*

ASCII	ESC	R	n
Hex	1B	52	n
Decimal	27	82	n

Range *n* = 0 to 10

Default *n* = 0

Notes This command specifies international characters.

n	Character Set	n	Character Set
0	U.S.A.	5	Sweden
1	France	6	Italy
2	Germany	7	Spain I
3	U.K	9	Norway
4	Denmark I	10	Denmark II

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC S

Description Select Standard Mode

Syntax <ESC>S

ASCII	ESC	S
Hex	1B	53
Decimal	27	83

Notes This command enables Standard mode.

The data in the print buffer is cleared, and any changes made by ESC W on page 24 return to the default.

The following commands are defined independently in Standard mode and Page mode:

- ESC SP on page 15
- ESC 2 on page 18
- ESC 3 on page 18

The following commands are ignored in Standard mode:

- CAN on page 14
- FF on page 14
- GS $ on page 30
- GS I on page 62

ESC T

Description Select Print Direction (Page mode)

Syntax <ESC>T*n*

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

Range *n* = 0 to 3, 48 to 51

n	Print Direction	Starting Print 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

Default *n* = 0

Notes In Page mode, ESC T on page 23 specifies the print direction and the starting print position. In Standard mode, ESC T specifies the print direction but does not affect the starting print position. If the command is processed in Standard mode, any changes take effect when the printer changes to Page mode.

The starting print position set by this command determines whether the horizontal motion unit or vertical motion unit is used for some commands.

When the starting print position is the...	Horizontal motion unit is used for:	Vertical motion unit is used for:
upper left or lower right of the print area	• ESC SP on page 15 • ESC $ on page 16 • ESC \ on page 25	• ESC 3 on page 18 • ESC J on page 20 • GS $ on page 30 • GS I on page 62
upper right or lower left of the print area	• ESC 3 on page 18 • ESC J on page 20 • GS $ on page 30 • GS I on page 62	• ESC SP on page 15 • ESC $ on page 16 • ESC \ on page 25

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC W

Description Set Print Area (Page mode)

Syntax `<ESC>W xL xH yL yH dxL dxH dyL dyH`

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

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

Default When paper width of 48mm is selected:

$(xL + xH \times 256) = 0\ (xL = 0,\ xH = 0)$
$(yL + yH \times 256) = 0\ (yL = 0,\ yH = 0)$
$(dxL + dxH \times 256) = 384\ (dxL = 80,\ dxH = 1)$
$(dyL + dyH \times 256) = 2400\ (dyL = 60,\ dyH = 9)$

Notes ESC W sets the position and the size of the printing area in Page mode as follows:

- Horizontal starting position = [(*xL* + *xH* × 256) × (horizontal motion units)]
- Vertical starting position = [(*yL* + *yH* × 256) × (vertical motion units)]
- Horizontal printing area width = [(*dxL* + *dxH* × 256) × (horizontal motion units)]
- Vertical printing area width = [(*dyL* + *dyH* × 256) × (vertical motion units)]

If the following condition exists...	Then...
The horizontal and vertical starting positions are out of the printable area	The ESC W command is ignored, and any data that follows is processed normally.
(Horizontal starting position + Horizontal printing area width) is outside of the printable area	The Horizontal printing area width is set to (Horizontal printing area - Horizontal starting position).
(Vertical starting position + Vertical printing area width) is outside of the printable area	The Vertical printing area width is set to (Vertical printing area - Vertical starting position).

In Standard mode, ESC W is ignored. If the command is processed in Standard mode, any changes take effect when the printer changes to Page mode.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

Differences The maximum printable area varies by printer model.

ESC \

Description Set Relative Print Position

Syntax <ESC>*nLnH*

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

Range *nL* = 0 to 255, *nH* = 0 to 255

0 ≤ (*nL* + *nH* × 256) ≤ 65535

Default None

Notes 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* × 256) in the right direction based on the current position. The printer ignores this command when any setting exceeds the print area.

In Standard mode, the vertical motion unit is used for the calculation.

In Page mode, the horizontal motion unit is used for the calculation when the print start position is defined to the upper right or lower right of the print area (using ESC T on page 23). Otherwise, the vertical motion unit is used.

When in Underline mode, the printer does not underline the space created by this command.

ESC a

Description Set Position Alignment

Syntax <ESC>a*n*

ASCII	ESC	a	n
Hex	1B	61	n
Decimal	27	97	n

Range *n* = 0 to 2, 48 to 50

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

Default *n* = 0

Notes In Standard mode, ESC a specifies position alignment for all data in one line. In Page mode, ESC a is ignored. If the command is processed in Page mode, any changes take effect when the printer changes to Standard mode.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC d

Description Print and Feed a Specified Number of Lines

Syntax <ESC>d*n*

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

Range *n* = 0 to 255

Default None

Notes This command feeds the paper by n lines after printing the data in the print buffer. In Page mode, the printer does not print, but simply moves the print position the specified number of lines. The amount fed for each line is based on the values set by the line spacing commands (ESC 2 on page 18 and ESC 3 on page 18).

If the feed amount is set to a value greater than the maximum feed value of 255 lines, the printer defaults to 255.

ESC t

Description Select a Character Code Table

Syntax <ESC>t*n*

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

Range *n* = one of the following values:

n	Code page	
0	Page 0	437 (USA, Standard Europe)
2	Page 2	850 (Multilingual)

For additional code page support, contact Zebra Support.

Default *n* = 0

Notes This command assigns the code page specified by *n*.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

ESC {

Description Set Upside-Down Printing Mode

Syntax `<ESC>{n`

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

Range *n* = 0 to 255

Default *n* = 0

Notes In Standard mode, this command specifies upside-down printing mode according to the least significant bit (LSB). This command is valid only when entered at the beginning of the line.

In Page mode, `ESC {` is ignored. If the command is processed in Page mode, any changes take effect when the printer changes to Standard mode.

LSB	Upside-down mode	
0	Turned off (characters print right-side-up from left to right)	**Example of non-rotated text**
1	Turned on (characters print upside-down from right to left)	**Example of rotated text**

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

FS &

Description Select Kanji Character Mode

Syntax `FS&`

ASCII	FS	&
Hex	1C	26
Decimal	28	38

Range None

Default None

Notes This command sets Kanji character GB18030 mode.

Kanji codes are comprised of 2 bytes and processed in order of the first and second byte.

FS

Description Select Kanji Character Mode

Syntax `FS#`

ASCII	FS	#
Hex	1C	23
Decimal	28	35

Range None

Default None

Notes This command sets Kanji character UTF8 mode.

Kanji codes are comprised of 2 bytes and processed in order of the first and second byte.

FS .

Description Cancel Kanji Character Mode

Syntax `FS.`

ASCII	FS	.
Hex	1C	2E
Decimal	28	46

Range None

Default None

Notes This command cancels Kanji character mode.

Kanji character mode is enabled using FS& or FS#.

Once Kanji character mode is canceled, the printer processes a character code as 1-byte code of alphanumeric characters.

FS Cn

Description Set SHIFT-JIS code

Syntax `FSCn`

ASCII	FS	C	n
Hex	1C	43	n
Decimal	28	67	n

Range *n* = 0 to 2, 48 to 50

Default None

n	Character Code
0, 48	JIS code
1, 49	SHIFT JIS code
2, 50	Select the Shift_JIS-2004 code system

Notes This command parameter “n” supports 1/'1' at this time, and only supports SHIFT JIS code. 0/'0' and 2/'2' gets the same result as 1/'1'.

GS !

Description Specify Character Size

Syntax `GS ! n`

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

Range *n* = 0 to 255

(Vertical enlargement = 1 to 8, Horizontal enlargement = 1 to 8)

Default *n* = 0

Notes This command specifies the character height and width using bits 0 to 7 as follows:

Bit	Function	Setting		
		Hex	Decimal	Enlargement
0	Specifies the number of times to enlarge the font size vertically	00	0	1 time (standard)
1		01	1	2 times
2		02	2	3 times
3		03	3	4 times
		04	4	5 times
		05	5	6 times
		06	6	7 times
		07	7	8 times
4	Specifies the number of times to enlarge the font size horizontally	00	0	1 time (standard)
5		10	16	2 times
6		20	32	3 times
7		30	48	4 times
		40	64	5 times
		50	80	6 times
		60	96	7 times
		70	112	8 times

The character size set by this command is valid for alphanumeric characters, user defined characters, and multi-byte code characters (such as Chinese, Japanese, and Korean). Double-width and double-height modes can also be set by ESC ! on page 15.

This command remains in effect until ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS $

Description Set Absolute Vertical Print Position (Page Mode)

Syntax `GS$nLnH`

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

Range

nL = 0 to 255, *nH* = 0 to 255
0 ≤ (*nL* + *nH* × 256) ≤ 65535

Default None

Notes `GS $` is ignored in Standard mode. In Page mode, `GS $` sets the absolute vertical print starting position to

[(*nL* + *nH* × 256) × (vertical or horizontal motion unit)]

Depending on the print direction set by ESC T on page 23, the vertical motion unit is used for the calculation when the print start position is defined as the upper left or lower right of the print area (using ESC T on page 23). Otherwise, the horizontal motion unit is used.

The printer ignores any setting values that would cause printing outside of the print area set by ESC W on page 24.

GS (A

Description Execute Test Print

Syntax `GS(ApLpHnm`

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

Range

n = 0 to 2, 48 to 50 *m* = 1 to 3, 49 to 51
(*pL* + *pH* × 256) = 2 (*pL* = 2, *pH* = 0)

Default None

Notes This command prints a specified pattern for testing on a roll paper.

Roll paper is specified by *n*.

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

The type of test print is specified by *m*.

m	Test Print
1, 49	Hexadecimal dump mode (The printer prints all of the data transmitted from the host to the printer.)
2, 50	Printer configuration printing
3, 51	Rolling pattern printing

After completion of this command, a software reset is executed automatically to restore the printer status set during power cycling. If this command is processed while a macro definition is in progress, the printer cancels the macro definition, and the macro becomes invalid.

The real-time command and ASB operations are not executed during the printing of printer configuration (*m* = 2, 50) and rolling pattern (*m* = 3, 51).

GS (F

Description Set Black Mark Control Functions

Notes No action.

GS (k

Description Specify and Print Symbols

Notes This command specifies data for two-dimensional codes.

cn = symbol type
fn = function code

cn	Two-Dimensional Code
48	PDF417
49	QR CODE
50	MAXI CODE
51	DATA MATRIX
52	GS 1 DATABAR
53	AZTEC CODE

cn	fn	Function	
48	65	<Function 065> (fn = 65) on page 35	PDF417: Specify the number of columns
	66	<Function 066> (fn = 66) on page 36	PDF417: Specify the number of rows
	67	<Function 067> (fn = 67) on page 37	PDF417: Specify the width of module
	68	<Function 068> (fn = 68) on page 37	PDF417: Specify the module height
	69	<Function 069> (fn = 69) on page 38	PDF417: Specify the error correction level
	70	<Function 070> (fn = 70) on page 39	PDF417: Specify the option
	80	<Function 080> (fn = 80) on page 39	PDF417: Store the received data in the symbol storage area
	81	<Function 081> (fn = 81) on page 40	PDF417: Print the symbol data in the symbol storage area
49	65	<Function 165> (fn = 65) on page 41	QR CODE: Select the module
	67	<Function 167> (fn = 67) on page 42	QR CODE: Select the size of module
	69	<Function 169> (fn = 69) on page 42	QR CODE: Select the error correction level
	80	<Function 180> (fn = 80) on page 43	QR CODE: Store the data in the symbol storage area
	81	<Function 181> (fn = 81) on page 43	QR CODE: Print the data in the symbol storage area
50	65	<Function 265> (fn = 65) on page 45	MAXI CODE: Select the mode
	80	<Function 280> (fn = 80) on page 45	MAXI CODE: Store the data in the symbol storage area
	81	<Function 281> (fn = 81) on page 46	MAXI CODE: Print the symbol data saved in the symbol storage area

cn	fn	Function	
51	67	<Function 367> (fn = 67) on page 47	DATA MATRIX: Select the size of module
	80	<Function 380> (fn = 80) on page 47	DATA MATRIX: Store the symbol data in the symbol storage area
	81	<Function 381> (fn = 81) on page 48	DATA MATRIX: Print the symbol data in the storage area
52	65	<Function 465> (fn = 65) on page 48	GS1 DATABAR: Select the type of GS1 barcode to generate
	66	<Function 466> (fn = 66) on page 49	GS1 DATABAR: Select the size of module
	68	<Function 468> (fn = 68) on page 50	GS1 DATABAR: Specify the module height
	70	<Function 470> (fn = 70) on page 50	GS1 DATABAR: Specify the height of separator between 2D and 1D barcode symbol
	80	<Function 480> (fn = 80) on page 51	GS1 DATABAR: Store the data in the symbol storage area
	81	<Function 481> (fn = 81) on page 52	GS1 DATABAR: Print the data in the symbol storage area
53	65	<Function 565> (fn = 65) on page 52	AZTEC CODE: module size selection
	66	<Function 566> (fn = 66) on page 53	AZTEC CODE: error level setting
	67	<Function 567> (fn = 67) on page 53	AZTEC CODE: mode selection
	80	<Function 580> (fn = 80) on page 54	AZTEC CODE: saving of symbol data in storage area
	81	<Function 581> (fn = 81) on page 54	AZTEC CODE: Print the data in the symbol storage area

PDF417 Symbol Data (when cn = 48)

The symbol data is defined, stored to the symbol storage area by <Function 080> (fn = 80) on page 39 and printed by the specification of <Function 081> (fn = 81) on page 40. The symbol data in the area remains reserved until one the following processes is executed:

- Performing <Function 080> (fn = 80) on page 39
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The setting values of Functions 065 to 070 are utilized for the processing of <Function 080> (fn = 80) on page 39. The printable area must be large enough to accommodate different-sized symbols. If not, the symbol may not be printed.

- Print the same symbol data repeatedly by executing <Function 081> (fn = 81) on page 40 after performing Function 080.
- The same symbol data is printed differently by executing <Function 081> (fn = 81) on page 40 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> (fn = 80) on page 43 and printed by the specification of <Function 181> (fn = 81) on page 43. The symbol data in the area remains reserved until one the following processes is executed:

- Performing Function 180
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The setting values of Functions 165 to 169 are utilized for the processing of <Function 180> (fn = 80) on page 43. The printable area must be large enough to accommodate different-sized symbols. If not, the symbol may not be printed.

Print the symbol data repeatedly by executing Figure after performing <Function 180> (fn = 80) on page 43.

The same symbol data is printed differently by executing <Function 181> (fn = 81) on page 43 after setting the feature of the symbol by using Functions 165 through 169.

MaxiCode Symbol Data (cn = 50)

The symbol data is defined, stored to the symbol storage area by <Function 280> (fn = 80) on page 45 and printed by the specification of <Function 281> (fn = 81) on page 46. The symbol data in the area remains reserved until one the following processes is executed:

- Performing <Function 280> (fn = 80) on page 45
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The setting value of <Function 265> (fn = 65) on page 45 is utilized for the processing of <Function 281> (fn = 81) on page 46. The printable area must be large enough to accommodate different-sized symbols. If not, the symbol may not be printed.

The same symbol data is repeatedly printed by executing <Function 281> (fn = 81) on page 46 after performing <Function 280> (fn = 80) on page 45.

The same symbol data is printed differently by executing <Function 281> (fn = 81) on page 46 after setting the mode by using <Function 265> (fn = 65) on page 45.

Data Matrix Symbol Data (cn = 51)

The symbol data is defined, stored to the symbol storage area by <Function 380> (fn = 80) on page 47 and printed by the specification of <Function 381> (fn = 81) on page 48. The symbol data in the area remains reserved until the following processes are executed:

- Performing <Function 380> (fn = 80) on page 47
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The setting value of <Function 367> (fn = 67) on page 47 is utilized for the processing of <Function 381> (fn = 81) on page 48. 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 381> (fn = 81) on page 48 after performing <Function 380> (fn = 80) on page 47.

The same symbol data is printed differently by executing <Function 381> (fn = 81) on page 48 after setting the mode by using <Function 367> (fn = 67) on page 47.

GS 1 DATABAR Symbol Data (cn = 52)

The symbol data is defined, stored to the symbol storage area by <Function 480> (fn = 80) on page 51 and printed by the specification of <Function 481> (fn = 81) on page 52. The symbol data in the area remains reserved until the following processes are executed:

- Performing <Function 480> (fn = 80) on page 51
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The same symbol data is repeatedly printed by executing <Function 481> (fn = 81) on page 52 after performing <Function 480> (fn = 80) on page 51.

AZTEC CODE Symbol Data (cn = 53)

The symbol data is defined, stored to the symbol storage area by <Function 580> (fn = 80) on page 54 and printed by the specification of <Function 581> (fn = 81) on page 54. The symbol data in the area remains reserved until the following processes are executed:

- Performing <Function 580> (fn = 80) on page 54
- Performing ESC @ on page 18
- Resetting the printer defaults or power cycling the printer

The setting value of <Function 567> (fn = 67) on page 53 is utilized for the processing of <Function 581> (fn = 81) on page 54. 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 581> (fn = 81) on page 54 after performing <Function 580> (fn = 80) on page 54.

The same symbol data is printed differently by executing <Function 581> (fn = 81) on page 54 after setting the mode by using <Function 567> (fn = 67) on page 53.

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

Description Specify Number of Columns for PDF417

Syntax `GS ( k pL pH cn fn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48, *fn* = 65 *n* = 0 to 30

Default *n* = 0

Notes This command specifies the number of columns in the data area of PDF417:

- When *n* = 0, automatic processing is set.
- When *n* does not equal 0, the number of columns of the data area is set to *n*.

The settings of this function affect the processing of <Function 081> (fn = 81) on page 40.

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 maximum number of columns in the data area is set to 30 columns. The actual number of columns is calculated using the following information:

- Print area when processing <Function 081> (fn = 81) on page 40
- Module width (<Function 067> (fn = 67) on page 37)
- Option setting (<Function 070> (fn = 70) on page 39)

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Specify Number of Rows for PDF417

Syntax GS (k *pL pH cn fn n*

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 66 *n* = 0, 3 to 90

Default *n* = 0

Notes This command specifies the number of rows in the data area of PDF417.

- When *n* = 0, automatic processing is set
- When *n* does not equal 0, the number of rows is set to n rows.

The settings of this function affect the processing of <Function 081> (fn = 81) on page 40

With auto processing (*n* = 0) specified, the maximum number of rows is set to 90. The actual number of rows is calculated by using the following information:

- Print area when processing <Function 081> (fn = 81) on page 40.
- Module height (<Function 068> (fn = 68) on page 37)

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Specify Width of Module for PDF417

Syntax `GS ( k pL pH cn fn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 67 *n* = 2, 3

Default *n* = 3

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

The settings of this function affect the processing of <Function 081> (fn = 81) on page 40.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Specify Module Height for PDF417

Syntax `GS ( k pL pH cn fn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 68 *n* = 2 to 8

Default *n* = 3

Notes This command sets the module height of PDF417 to [the module width × *n*].

The settings of this function affect the processing of <Function 081> (fn = 81) on page 40.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Specify Error Correction Level for PDF417

Syntax GS (k *pL pH cn fn m n*

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* × 256) = 4 (*pL* = 4, *pH* = 0) *cn* = 48 *fn* = 69 m = 48 *n* = 0 to 8, 48 to 56

Default None

Notes This command specifies the error correction level for PDF417. The settings of this function affect the processing of <Function 081> (fn = 81) on page 40.

Error correction level specified by “level” (*m* = 48) is as follows:

- The number of the error correction codeword is unchanged regardless of the codeword number 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

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Select the PDF417 Option

Syntax GS (k *pL pH cn fn m*

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 70 *m* = 0, 1

Default *m* = 0

Notes This command selects the option for PDF417.

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

The settings of this function affect the processing of <Function 081> (fn = 81) on page 40.

When the simplified PDF417 symbol is canceled, the printer defaults to standard PDF417.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Store PDF417 Symbol Data

Syntax GS (k *pL pH cn fn m d1...dk*

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* × 256) ≤ 65535 (*pL* = 0 to 255, *pH* = 0 to 255) *cn* = 48 *fn* = 80 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) - 3

Default None

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

The data stored in the symbol storage area by this command remains reserved after processing <Function 081> (fn = 81) on page 40.

The following data should not be included in the symbol data (*d1...dk*) because 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

This command remains in effect until the following processing is performed:

- Executing <Function 080> (fn = 80) on page 39
- Executing ESC @ on page 18
- The printer defaults are reset, or the printer is power cycled.

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

Description Encode and Print PDF417 Symbol Data

Syntax `GS ( k pL pH cn fn m`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 81 *m* = 48

Default None

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

In Standard mode, this command is available only when the printer is at the beginning of a line or when the print buffer is empty. 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 printing.

The printer cannot print a symbol that exceeds the printing area in size. Print modes (such as emphasized or double-strike) do not affect the printing of a symbol. Exceptions are the character size and upside-down printing.

Printing operation is not processed under the following conditions:

- There is no data (<Function 080> (fn = 80) on page 39 and is not processed).
- The (number of columns × number of rows) is less than the number of codewords when automatic processing is specified for the number of columns and number of rows.
- More than 928 codewords exist in the data area.

The following data is added automatically by the encode processing:

- Start pattern and stop pattern
- Indicator codeword of left or right
- The descriptor of symbol length (the first codeword in the data area)
- The error correction codeword that was calculated by modulus 929
- A pad codeword

The data area includes the following codewords:

- Data specified by <Function 080> (fn = 80) on page 39
- The descriptor of symbol length (the first codeword in the data area)
- The error correction codeword that was calculated by modulus 929
- A pad codeword

When automatic processing (<Function 065> (fn = 65) on page 35) is specified, the printer calculates the number of columns (maximum of 30) using the following information:

- The current printing area
- The module width (<Function 067> (fn = 67) on page 37)
- The option setting (<Function 070> (fn = 70) on page 39)
- The codeword in the data area

When automatic processing (<Function 066> (fn = 66) on page 36) is specified in Page mode, the printer calculates the number of rows (maximum of 90) using the following information:

- Current printing area
- Module height (<Function 068> (fn = 68) on page 37)
- Codeword in the data area

A quiet zone (the spaces surrounding the symbol such as upper, lower, left, and right spaces) is not included in the printing data. Make sure to include an adequate quiet zone for execution of this command.

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

Description Set the QR Code Model

Syntax GS (k *pL pH cn fn n1 n2*

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 49 *fn* = 65 *n1* = 49, 50 *n2* = 0

Default *n1* = 50 *n2* = 0

Notes This command sets the QR Code model as follows:

n	Function
49	Model 1
50	Model 2

The settings of this function affect the processing of <Function 181> (fn = 81) on page 43.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Set the Size of the QR Code Module

Syntax `GS ( k pL pH cn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 49 *fn* = 67 *n* = 0 to 9

Default *n* = 3

Notes This command sets the size of the QR Code module to *n* dots. Because a QR Code module is square, *n* = both the module width and the module height.

The settings of this function affect the processing of <Function 181> (fn = 81) on page 43.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Set the Error Correction Level for QR Code

Syntax `GS ( k pL pH cn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 49 *fn* = 69 *n* = 48 to 51

Default *n* = 48

Notes This command sets the error correction level for the QR Code. The printer uses Reed-Solomon correction to generate a series of error correction codewords.

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

The settings of this function affect the processing of <Function 181> (fn = 81) on page 43.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

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

Description Save QR Code Symbol Data

Syntax GS (k *pL pH cn fn m d1...dk*

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* × 256) ≤ 7092 (*pL* = 0 to 255, *pH* = 0 to 27) *cn* = 49 *fn* = 8 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) – 3

Default None

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

This function defines and stores the symbol data to the symbol storage area. <Function 181> (fn = 81) on page 43 prints that symbol data. The data remains reserved after completion of printing.

The following shows the data available for encoding a 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

This command remains in effect until the following processing is performed:

- Executing <Function 180> (fn = 80) on page 43
- Executing ESC @ on page 18
- The printer defaults are reset, or the printer is power cycled

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

Description Encode and Print QR Code Symbol Data

Syntax GS (k *pL pH cn fn m*

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 49 *fn* = 81 *m* = 48

Default None

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

In Standard mode, this command is available only when the printer is at the beginning of a line or when the print buffer is empty. 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 printing.

The printer cannot print a symbol that exceeds the printing area in size. Print modes (such as emphasized or double-strike) do not affect the printing of a symbol. Exceptions are the character size and upside-down printing.

Printing operation is not processed under the following conditions:

- There is no data. (<Function 180> (fn = 80) on page 43 is not executed)
- If (number of columns × number of rows) is less than the number of codewords, the numbers of columns and rows are automatically processed.

Based on the symbol data in the data storage area, the printer automatically selects the best compression mode from these four types:

- Numeric Data Code
- Alphanumeric Data mode
- Kanji Data mode
- 8 bit Data mode

The following data is added automatically 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)

A quiet zone (the spaces surrounding the symbol such as upper, lower, left, and right spaces) is not included in the printing data. Make sure to include an adequate quiet zone for command execution.

<Function 265> (fn = 65) — GS (k *pL pH cn fn n1 n2*

Description Set the Mode for MaxiCode

Syntax `GS ( k pL pH cn fn n1 n2`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	32	41	n
Decimal	29	40	107	3	0	50	65	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 50 *fn* = 65 *n* = 50 to 52

Default *n* = 50

Notes This command selects the mode for MaxiCode:

n	Function
50	Mode 2 setting
51	Mode 3 setting
52	Mode 4 setting

The settings of this function affect the processing of <Function 281> (fn = 81) on page 46.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 280> (fn = 80) — GS (k *pL pH cn fn m d1...dk*

Description Store the MaxiCode Symbol Data

Syntax `GS ( k pL pH cn fn m d1...dk`

ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
Hex	1D	28	6B	pL	pH	32	50	30	d1...dk
Decimal	29	40	107	pL	pH	50	80	48	d1...dk

Range 4 ≤ (*pL* + *pH* × 256) ≤ 141 (*pL* = 4 to 141, *pH* = 0) *cn* = 50 *fn* = 80 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) – 3

Default None

Notes This command stores Maxi Code symbol data in the symbol storage area.

The data stored in the symbol storage area by this command is processed by <Function 281> (fn = 81) on page 46. The data remains reserved in the storage.

This command remains in effect until the following processing is performed:

- Executing <Function 280> (fn = 80) on page 45
- Executing ESC @ on page 18
- The printer defaults are reset, or the printer is power cycled.

<Function 281> (fn = 81) — GS (k *pL pH cn fn m*

Description Encode and Print MaxiCode Symbol Data

Syntax GS (k *pL pH cn fn m*

ASCII	GS	(	k	pL	pH	cn	fn	m
Hex	1D	28	6B	03	00	32	51	m
Decimal	29	40	107	3	0	50	81	m

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 50 *fn* = 81 *m* = 48

Default None

Notes This command encodes and prints the Maxi Code symbol data that was saved in the storage area. The printer uses Reed-Solomon correction to generate a series of error correction codewords.

In Standard mode, this command is available only when the printer is at the beginning of a line or when the print buffer is empty. 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 printing.

The printer cannot print a symbol that exceeds the printing area in size.

Printing operation is not processed under the following conditions:

- There is no data. (<Function 280> (fn = 80) on page 45 is not executed)
- The number of numeric characters exceeds 138
- The number of alphanumeric characters exceeds 93

When mode 2 is selected, the primary message does not include the following:

Primary Message	Data Number	Character
Postal code	1~6	Setting Code A
ISO country code	1~3	Numeric
Service type code	1~3	Numeric

When mode 3 is selected, the primary message does not include the following:

- Modes 2 and 3 are executed according to the following.
- 9-byte data including [)>, RS, 01, GS, and yy are regarded as the Header. (RS and GS indicate MAXI CODE control code while *y* indicates the 2-byte numeric data.)
- The data that immediately follows the Header is the Primary Message.
- When printing, the Header is placed at the beginning of the Secondary Message.
- When Header data is absent, the data are regarded as Primary Message.
- In the Primary Message, GS is used as the separator that divides message into Postal code, ISO country code, and Class of service. This GS is ignored.
- All data of the Secondary Message is regarded as symbol data.

In modes 4, 5, and 6, the printer regards all data in the symbol storage area as Primary Message and Secondary Message.

The following data is automatically added during the encoding process:

- Position sensor pattern

- Position pattern
- Error correction code text
- Mode separator
- Pad code text

A quiet zone (the spaces surrounding the symbol such as upper, lower, left, and right spaces) is not included in the printing data. Make sure to include an adequate quiet zone for command execution.

<Function 367> (fn = 67) — GS (k *pL pH cn n*

Description Set the Data Matrix Code Size

Syntax `GS ( k pL pH cn n`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	33	43	n
Decimal	29	40	107	3	0	51	67	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 51 *fn* = 67 *n* = 2 to 3

Default *n* = 3

Notes This command sets the Data Matrix Code size. Because a Data Matrix Code module is square, *n* = both the module width and the module height.

The settings of this function affect the processing of <Function 381> (fn = 81) on page 48.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 380> (fn = 80) — GS (k *pL pH cn fn m d1...dk*

Description Store the Data Matrix Symbol Data

Syntax `GS ( k pL pH cn fn m d1...dk`

ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
Hex	1D	28	6B	pL	pH	33	50	30	d1...dk
Decimal	29	40	107	pL	pH	51	80	48	d1...dk

Range 0 ≤ (*pL* + *pH* × 256) ≤ 3116 (*pL* = 0 to 255, *pH* = 0 to 13) *cn* = 51 *fn* = 80 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) - 3

Default None

Notes This command stores the Data Matrix symbol data in the symbol storage area.

The data stored to the symbol storage area by this command is executed by <Function 381> (fn = 81) on page 48. The data remains reserved in the symbol storage area.

This command remains in effect until the following processing is performed:

- Executing <Function 380> (fn = 80) on page 47
- Executing ESC @ on page 18
- The printer defaults are reset, or the printer is power cycled.

<Function 381> (fn = 81) — GS (k *pL pH cn fn m*

Description Encode and Print Data Matrix Symbol Data

Syntax GS (k *pL pH cn fn m*

ASCII	GS	(	k	pL	pH	cn	fn	m
Hex	1D	28	6B	03	00	33	51	m
Decimal	29	40	107	3	0	51	81	m

Range *pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 51 *fn* = 81 *m* = 48

Default None

Notes This command encodes and prints the Data Matrix symbol data saved in the storage area. The printer uses Reed-Solomon correction to generate a series of error correction codewords.

In Standard mode, this command is available only when the printer is at the beginning of a line or when the print 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 380> (fn = 80) on page 47 can not be executed)
- The number of alphanumeric characters exceeds 2334.
- The number of 8 bit byte characters exceeds 1558.
- The number of numeric characters exceeds 3116.

Data Matrix uses ECC 200 symbols.

The following data is automatically added during the encoding process:

- Position pattern
- Error correction code text
- Mode separator
- Pad code text

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.

A quiet zone (the spaces surrounding the symbol such as upper, lower, left, and right spaces) is not included in the printing data. Make sure to include an adequate quiet zone for command execution.

<Function 465> (fn = 65) — GS (k *pL pH cn fn n*

Description Selects the GS1 Databar

Syntax GS (k *pL pH cn fn n*

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	34	41	n
Decimal	29	40	107	3	0	52	65	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 52, *fn* = 65 , 50 ≤ *n* ≤ 60

Default *n* = 50

Notes This command selects the mode for GS1 Databar

n	Function
50	RSS14 (GS1 DataBar Omnidirectional)
51	RSS14 Truncated (GS1 DataBar Truncated)
52	RSS14 Stacked (GS1 DataBar Stacked)
53	RSS14 Stacked Omnidirectional (GS1 DataBar Stacked Omnidirectional)
56	UPC-A
57	UPC-E
58	EAN-13
59	EAN-8
60	UCC/EAN-128&CC-A/B
61	UCC/EAN-128&CC-C

The settings of this function affects the processing of <Function 480> (fn = 80) on page 51 and <Function 481> (fn = 81) on page 52.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 466> (fn = 66) — GS (k *pL pH cn fn n*

Description Set the size of the GS1 DataBar module height to n1, width to n2 dots.

Syntax `GS ( k pL pH cn fn n`

ASCII	GS	(	k	pL	pH	cn	fn	n1	n2
Hex	1D	28	6B	03	00	34	42	n1	n2
Decimal	29	40	107	3	0	52	66	n1	n2

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 52 *fn* = 66

1 ≤ n1 ≤8, 1 ≤ n2 ≤8

Default *n1* = 2 , *n2* = 2

Notes The setting of this command affects <Function 480> (fn = 80) on page 51 and <Function 481> (fn = 81) on page 52.

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

<Function 468> (fn = 68) — GS (k *pL pH cn fn n*

Description Set the module segment height of UCC/EAN-128 barcode type.

Syntax `GS ( k pL pH cn fn n`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	34	44	n
Decimal	29	40	107	3	0	52	68	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 52 *fn* = 68 *n* = 1 to 255

Default *n* = 32

Notes This command sets the module segment height of UCC/EAN-128 barcode type.

This setting will be effective only on the UCC/EAN-128 barcode type.

The setting of this function affects the processing of <Function 480> (fn = 80) on page 51 and <Function 481> (fn = 81) on page 52.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 470> (fn = 70) — GS (k *pL pH cn fn m*

Description Specify the height of separator between 2D and 1D barcode symbol

Syntax `GS ( k pL pH cn fn m`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	34	46	n
Decimal	29	40	107	3	0	52	70	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 52 *fn* = 70 1 ≤ *n* ≤ 2

Default *n* = 2

Notes The setting of this command affects <Function 480> (fn = 80) on page 51 and <Function 481> (fn = 81) on page 52.

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 480> (fn = 80) — GS (k *pL pH cn fn m d1...dk*

Description Store GS1 DataBar symbol data in the symbol storage area.

Syntax `GS ( k pL pH cn fn m d1...dk`

ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
Hex	1D	28	6B	pL	pH	34	50	30	d1...dk
Decimal	29	40	107	pL	pH	52	80	48	d1...dk

Range 4 ≤ (*pL* + *pH* × 256) ≤ 65535 (*pL* = 0 to 255, *pH* = 0 to 255) *cn* = 52 *fn* = 80 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) – 3

Default None

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

The data stored in the symbol storage area by this command remains reserved after processing <Function 481> (fn = 81) on page 52.

GS1 DataBar holds a 14-digit number.

GS1 DataBar can carry GTIN-12, GTIN-13 & GTIN-14.

Numeric character (0-9) – No alpha numeric, no special characters.

Flex data length – 14digits (encodes 13 with an implied check digit) AI(01) is implied.

Limited to GTIN-12, 13 and GTIN-14 with indicator digit 1 only (no other number can be used as an indicator digit).

This command remains in effect until the following processing is performed:

- Executing ESC @ on page 18
- The printer defaults are reset, or the printer is power cycled

<Function 481> (fn = 81) — GS (k *pL pH cn fn m*

Description Encode and Print GS1 DataBar Symbol Data

Syntax `GS ( k pL pH cn fn m`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 48 *fn* = 81 *m* = 48

Default None

Notes This function encodes and prints the GS1 DataBar symbol data in the symbol save area.

- In Standard mode, this command is available only when the 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.
- 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.

<Function 565> (fn = 65) — GS (k *pL pH cn fn n*

Description Set the size of the Aztec barcode module to n dots.

Syntax `GS ( k pL pH cn fn n`

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* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 53, *fn* = 65 *n* = 1 to 8

Default *n* = 2

Notes The setting of this command affects <Function 580> (fn = 80) on page 54 and <Function 581> (fn = 81) on page 54.

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

<Function 566> (fn = 66) — GS (k *pL pH cn fn m n*

Description Specify Error Correction Level for AZTEC code

Syntax `GS ( k pL pH cn fn n`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	35	42	n
Decimal	29	40	107	3	0	53	66	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 53 *fn* = 66 *n* = 48 to 56

Default None

Notes This command specifies the error correction level for AZTEC. The settings of this function affect the processing of <Function 581> (fn = 81) on page 54.

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	Recovery Amount (%)
48	Error correction level L	10
49	Error correction level M	23
50	Error correction level Q	36
51	Error correction level H	50

This command remains in effect until one of the following occurs: ESC ! on page 15 or ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

<Function 567> (fn = 67) — GS (k *pL pH cn fn n*

Description Set the mode of the Aztec barcode module.

Syntax `GS ( k pL pH cn fn n`

ASCII	GS	(	k	pL	pH	cn	fn	n
Hex	1D	28	6B	03	00	30	43	n
Decimal	29	40	107	3	0	53	67	n

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 53 *fn* = 67 *n* = 0 to 2

Default *n* = 0

Notes

- n=0 : data mode, n=1 : gs1 mode, n=2 : unicode mode.
- ZQ120 Plus, ZQ220 Plus, and ZR138 CR/CN/EM only support the default data mode.
- The setting of this command affects <Function 580> (fn = 80) on page 54 and <Function 581> (fn = 81) on page 54
- The setting of this command remains effective until ESC @, printer reset or power cycling is executed.

<Function 580> (fn = 80) — GS (k *pL pH cn fn m d1...dk*

Description Store Aztec barcode symbol data in the symbol storage area.

Syntax GS (k *pL pH cn fn m d1...dk*

ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
Hex	1D	28	6B	pL	pH	35	50	30	d1...dk
Decimal	29	40	107	pL	pH	53	80	48	d1...dk

Range 3 ≤ (*pL* + *pH* × 256) ≤ 3803 (*pL* = 0 to 255, *pH* = 0 to 14) *cn* = 48 *fn* = 80 *m* = 48 *d* = 0 to 255 *k* = (*pL* + *pH* × 256) – 3

Default None

Notes This command stores the Aztec symbol data (*d1...dk*) in the symbol storage area.

The data stored in the symbol storage area by this command remains reserved after processing <Function 581> (fn = 81) on page 54.

- Digits only : maximum capacity 3800 digits
- Alphanumeric text : maximum capacity 300 characters
- Byte values : maximum capacity 1900 bytes

<Function 581> (fn = 81) — GS (k *pL pH cn fn m*

Description Encode and Print Aztec Symbol Data

Syntax GS (k *pL pH cn fn m*

ASCII	GS	(	k	pL	pH	cn	fn	m
Hex	1D	28	6B	03	00	35	51	m
Decimal	29	40	107	3	0	53	81	m

Range (*pL* + *pH* × 256) = 3 (*pL* = 3, *pH* = 0) *cn* = 53 *fn* = 81 *m* = 48

Default None

Notes

- In Standard mode, this command is available only when the 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.
- 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.

GS (L, GS 8 L

Description Process Graphics Data

Syntax `GS(L`

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]

GS8L

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]

Notes These commands process graphics data according to the function code (`fn`). They are adapted to print image data.

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

pL and *pH* specify the number of bytes following *pH* using (*pL* + *pH* × 256).

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

Description Transmit the Capacity of the Nonvolatile Bit Image Memory

Syntax `GS ( L pL pH m fn`

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* × 256) = 2 (*pL* = 2, *pH* = 0) *m* = 48 *fn* = 0, 48

Default None

Notes Transmits the total capacity of the nonvolatile bit image memory (number of bytes in the memory area). The total capacity data is converted to character codes that correspond to decimal data, and is then transmitted from the Most Significant Bit (MSB).

This command is available in Standard mode and Page mode.

	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Flag	30H	48	1 byte
Data	30H - 39H	48 - 57	1 - 8 bytes
NUL	00H	0	1 byte

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

Description Print the Graphics Data

Syntax `GS ( L pL pH m fn`

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* × 256) = 2 (*pL* = 2, *pH* = 0) *m* = 48 *fn* = 2, 50

Default None

Notes This command prints the graphics data that is stored in the print buffer. The graphics data are defined by <Function 112> (fn = 112) on page 60.

The printer uses the required amount of line feed pitch for printing graphics data, regardless of the existing setting value for the line feed pitch.

This command is available in Standard mode and Page mode.

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

Description Transmit Amount of Unused Nonvolatile User Memory

Syntax GS (L *pL pH m fn*

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* × 256) = 2 (pL = 2, pH = 0) *m* = 48 *fn* = 3, 51

Default None

Notes Transmits the amount of unused memory (in bytes) in the nonvolatile user memory. The number of bytes of remaining memory is converted to character codes that correspond to decimal data, which is then transmitted from the MSB. The data length is variable.

	Hexadecimal	Decimal	Amount of Data
Header	37H	55	1 byte
Flag	31H	49	1 byte
Data	30H – 39H	48 - 57	1 - 8 bytes
NUL	00H	0	1 byte

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

Description Transmit the Nonvolatile Graphics Key Code List

Syntax GS (L *pL pH m fn d1 d2*

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* × 256) = 4 (*pL* = 4, *pH* = 0) *m* = 48 *fn* = 64 *d1* = 75 *d2* = 67

Default None

Notes Transmits the defined nonvolatile graphics key code list.

When the key code is present:

	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

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

Description Delete All Defined Nonvolatile Graphics Data

Syntax `GS ( L pL pH m fn d1 d2 d3`

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* × 256) = 5 (*pL* = 5, *pH* = 0) *m* = 48 *fn* = 65*d1* = 67 *d2* = 76 *d3* = 82

Default None

Notes This command removes all defined nonvolatile graphics data. The graphics data is defined by <Function 67> (fn = 67) on page 59 into the nonvolatile graphics memory with a sector dedicated for storing nonvolatile graphics data.

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

Description Delete Nonvolatile Graphics Data *kc1* and *kc2*

Syntax `GS ( L pL pH m fn kc1 kc2`

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* × 256) = 4 (*pL* = 4, *pH* = 0) *m* = 48 *fn* = 66 *kc1* = 32 to 126 *kc2* = 32 to 126

Default None

Notes This command deletes the nonvolatile graphics data corresponding to *kc1* and *kc2*. *kc1* and *kc2* exist in each of the graphics data groups to be stored into the nonvolatile graphics memory in the order of download.

The graphics data is defined by <Function 67> (fn = 67) on page 59.

<Function 67> (fn = 67) — GS (L *pL pH m fn a kc1 kc2 b xL xH yL yH*

[c d1...dk]1...[c d1...dk]b

Description Define Raster Graphics Data in the Nonvolatile Graphics Area

Syntax `GS ( L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1... [c d1...dk]b`

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

Range

- *b* specifies the number of the color of the defined data.
- *xL*, *xH* specifies the defined data in the horizontal direction to (*xL* + *xH* × 256) dots.
- *yL*, *yH* specifies the defined data in the vertical direction to (*yL* + *yH* × 256) dots.
- *c* specifies the color of the defined data.

c	Defined data color
49	Color 1 (black)

When using GS (L:

3 ≤ (*pL* + *pH* × 256) ≤ 65535 (*pL* = 0 to 255, *pH* = 0 to 255)

When using GS 8 L:

12 ≤ (*p1* + *p2* ≤ 256 + *p3* ≤ 65536 + *p4* ≤ 16777216) ≤ 253119

m = 48 *fn* = 67 *a* = 48 *kc1* = 32 to 126 *kc2* = 32 to 126 *b* = 1, 2

1 ≤ (*xL* + *xH* × 256) ≤ 576

1 ≤ (*yL* + *yH* × 256) ≤ 1108

c = 49 *d* = 0 to 255

k = (int ((*xL* + *xH* × 256) + 7) / 8) × (*yL* + *yH* × 256)

Default None

Notes This command defines the raster graphics data in the nonvolatile graphics area. The total capacity of the nonvolatile graphic memory is 256 K bytes.

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

Description Print Nonvolatile Graphics Data *kc1* and *kc2*

Syntax GS (L *pL pH m fn kc1 kc2 x y*

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* × 256) = 6 (*pL* = 6, *pH* = 0) *m* = 48 *fn* = 69 *kc1* = 32 to 126 *kc2* = 32 to 126 *x* = 1, 2 *y* = 1, 2

Default None

Notes Prints the nonvolatile graphics data defined by the key codes *kc1* and *kc2*. The graphics data is enlarged by *x* and *y* in the horizontal and vertical directions. This command prints the nonvolatile graphics data defined by <Function 67> (fn = 67) on page 59.

The printer does not print nonvolatile graphics data beyond the print area for one line.

This command is available in Standard mode and Page mode.

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

Description Store the Raster Graphics Data in the Print Buffer

Syntax GS (L *pL pH m fn a bx by c xL xH yL yH d1...dk*

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 11 ≤ (*pL* + *pH* × 256) ≤ 65535 (*pL* = 0 to 255, *pH* = 0 to 255)

Common settings:

m = 48 *fn* = 112

a = 48 *bx* = 1, 2

by = 1, 2 *c* = 49

1 ≤ (*xL* + *xH* × 256) ≤ 576

1 ≤ (*yL* + *yH* × 256) ≤ 1108 (when *by* = 1) *k* = (int

((*xL* + *xH* × 256) + 7) / 8) × (*yL* + *yH* × 256)

Default None

Notes 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* × 256) dots.
- *yL*, *yH* specifies the raster graphics data in the vertical direction to (*yL* + *yH* × 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.

c	Defined data color
49	Color 1 (black)

Real-time commands are not processed during processing of this command.

GS :

Description Start/End Macro Definition

Syntax `GS :`

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

Notes This command starts or ends macro definition. The macro is executed by GS ^ on page 66.

The printer starts macro definition during normal operation and finishes it upon receiving this command. The printer can continue to print during macro definition.

The maximum amount of macro data that can be defined varies based on the printer model. Any data that exceeds the printer's limit is not stored.

ESC @ on page 18 does not clear an existing defined macro. The macro remains effective until the printer is reset or power cycled.

GS B

Description Turn Reverse Printing Mode On/off.

Syntax `GSBn`

ASCII	GS	B	n
Hex	1D	42	n
Decimal	29	66	n

Range *n* = 0 to 255

Default *n* = 0

Notes This command selects white/black reverse printing mode by setting the least significant bit (LSB) 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.

Multi-byte characters such as Kanji, Japanese, and Korean are not reversed by this command, and Underline mode is not effective. The right space defined by ESC SP on page 15 is included in the area reversed by this command.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS H

Description Selects Print Position of HRI Characters

Syntax `GSHn`

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

Range *n* = 0 to 3, 48 to 51

Default *n* = 0

Notes `GS H` specifies where Human Readable Interpretation (HRI) characters are positioned when printing a barcode. The print position is set according to the value of *n*:

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

The font of the HRI characters is defined by GS f on page 69.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS I

Description Transmit Printer ID

Syntax `GSIn`

ASCII	GS	I	n
Hex	1D	49	n
Decimal	29	73	n

Range *n* = 1 to 69

Default None

Notes `GS I` transmits the printer ID or specified information.

Transmits 1 byte of printer ID or information, 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
65	Firmware version	Firmware version
66	Manufacturer	ZEBRA TECHNOLOGIES
67	Printer model	Printer model
69	Code page	Currently enabled code page

Transmits specified printer information, using *n* as follows:

Printer information (when *n* = 65, 66, 67, or 69) consists of [Header ~ NULL] data:

Transmitted data	Hex	Decimal	Amount of data
Header	5FH	95	1 byte
Printer information	Varies by printer model	Varies by printer model	0 to 15 bytes
NUL	00H	0	1 byte

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

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

Printer	Definition
1 (printer model ID)	0x41
2 (type ID)	Type ID varies depending on functions the printer supports as follows: - 0x01 (Multi-byte character)
3 (printer feature ID)	0x69
66 (manufacturer)	Zebra Technologies
67 (printer model)	Printer model name
69 (language of font)	Code page currently being used. Refer to code page setting command, ESC t.

GS I b

Description Transmit Battery Status

Syntax `GSIb`

ASCII	GS	I	b
Hex	1D	49	62
Decimal	29	73	98

Notes `GS I` transmits the battery power status of the printer.

The [Header ~ NUL] data is transmitted as follows:

Transmitted data	Hex	Decimal	Amount of data
Header	37H	55	1byte
Identifier	45H	69	1byte
Remaining battery power	30h to 34H	48-52	1byte
NUL	00H	0	1byte

The printer indicates the remaining battery power as follows:

Hex	Decimal	Remaining battery power level
30H	48	Full (F)
31H	49	High (H)
32H	50	Middle (M)
33H	51	Low (L)

GS L

Description Set Left Margin

Syntax `GSLnLnH`

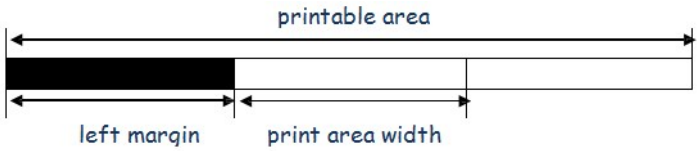
ASCII	GS	L	nL	nH
Hex	1D	4C	nL	nH
Decimal	29	76	nL	nH

Range *nL* = 0 to 255 *nH* = 0 to 255

Default (*nL* + *nH* × 256) = 0 (*nL* = 0, *nH* = 0)

Notes `GS L` adjusts the size of the left margin according to the following:

[(*nL* + *nH* × 256) × (horizontal motion units)]



Use GS W on page 65 to adjust the print area width. If the adjustment value specified exceeds the printable area for the left margin, the printer defaults the left margin to the maximum value allowed.

This command is ineffective in Page mode. If the left margin is enabled in Page mode, the setting takes effect when the printer returns to Standard mode.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS T

Description Set Print Position to Beginning of Print Line

Syntax `GSTn`

ASCII	GS	T	n
Hex	1D	54	n
Decimal	29	84	n

Range *n* = 0, 1, 48, 49

- When *n* = 1, 49, the printer prints the data in the print buffer and executes a line feed, based on the line feed amount specified.
- When *n* = 0, 48, the printer removes the print data in the print buffer.

Default None

Notes This command sets the print position to the beginning of the print line. *n* specifies when this command is executed relative to when the data in the print buffer is processed as follows:

n	Function
0, 48	Sets the print position after the data in the print buffer is deleted.
1, 49	Sets the print position after the data in the print buffer is printed.

This command is effective only in Standard mode and is ignored in Page mode.

After the printer processes this command, the print buffer is empty and the printer moves the print position to the left of the print area. The printer ignores this command if the print position is already at the beginning of the line.

GS W

Description Set Printing Area Width

Syntax `GSWnLnH`

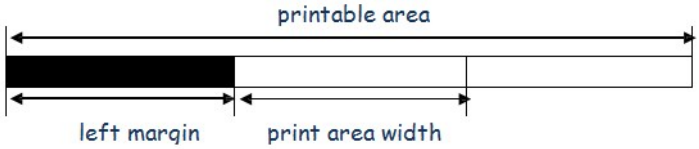
ASCII	GS	W	nL	nH
Hex	1D	57	nL	nH
Decimal	29	87	nL	nH

Range 0 ≤ *nL* ≤ 255, 0 ≤ *nH* ≤ 255

Default (*nL* + *nH* × 256) = 384 (*nL* = 80, *nH* = 1)

Notes `GS W` adjusts the width of the print area according to the following:

[(*nL* + *nH* × 256) × (horizontal motion units)]



Use GS L on page 64 to adjust the print area width. If the adjustment value specified exceeds the printable area for the print area, the printer defaults the print area to (printable area – left margin)

This command is ineffective in Page mode. If the print area width is enabled in Page mode, the setting takes effect when the printer returns to Standard mode.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS \

Description Set Relative Vertical Print Position (Page Mode)

Syntax `GS\`

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

Range *nL* = 0 to 255 *nH* = 0 to 255

Default None

Notes In Page mode, `GS \` moves the vertical print position to a position relative to the current one according to the following:

[(*nL* + *nH* × 256) × (vertical or horizontal motion units)]

The command is ignored in Standard mode. The printer ignores any setting that exceeds the print area set by ESC W on page 24.

The horizontal motion unit is used for the calculation when the print start position is defined to the upper right or lower right of print area (using ESC T on page 23). Otherwise, the vertical motion unit is used.

GS ^

Description Execute Macro

Syntax `GS^rtm`

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

Range *r* = 0 to 255 *t* = 0 to 255 *m* = 0, 1

Default None

Notes A macro can be used to print the same data repeatedly. This command executes a macro using parameters as following:

r = the number of times to execute the macro.

t = the waiting time before the macro is executed.

m = macro executing mode.

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.

The macro is defined by GS : on page 61. If the macro is not defined or if *r* = 0, the command is ignored.

GS a

Description Enable/Disable Automatic Status Back

Syntax `GSan`

ASCII	GS	a	n
Hex	1D	61	n
Decimal	29	97	n

Range *n* = 0 to 255

Default *n* = 0

Notes This enables or disables Automatic Status Back (ASB). ASB is enabled when *n* is a value other than 0. After you enable ASB, the printer transmits its status at the specified interval until ASB is disabled. ASB is disabled when *n* = 0, at which point the printer stops transmitting its status.

ASB is the function that transmits the printer status (such as printer cover open/closed and online/offline) continuously at the specified time interval, even if the printer status did not change. Using this function, the host can check if the printer is running properly.

For the parallel and USB interfaces, printer status is transmitted whenever the host computer changes to Reverse mode, regardless whether the printer changed status. Set the time interval - at which the host changes to Reverse mode - to more than 500 ms so you receive the correct status. For the serial interface, status is transmitted continuously at a 1 sec interval, even if the status is not changed.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

The 4 bytes of printer information transmitted are in the following format:

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	Not used. Fixed to Off

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 closed
	On	20	32	Cover is open

Byte 1—Printer Information

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 button
7	Off	00	0	Not used. Fixed to Off

Byte 2—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	Not used. Fixed to Off
3	Off	00	0	Not used. Fixed to Off
4	Off	00	0	Not used. Fixed to Off
5	Off	00	0	No unrecoverable error
	On	20	32	Unrecoverable error (Turn off the power as soon as possible if this occurs.)
6	Off	00	0	No automatically recoverable error
	On	40	64	Automatically recoverable error occurred
7	Off	00	0	Not used. Fixed to Off

Byte 3—Paper Sensor Information

Bit	Off/On	Hex	Decimal	Function
0,1	Off	00	0	Not used. Fixed to Off
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

Byte 4—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

GS f

Description Select font for HRI characters

Syntax `GSfn`

ASCII	GS	f	n
Hex	1D	66	n
Decimal	29	102	n

Range *n* = 0, 1, 48, 49

Default *n* = 0

Notes This command selects a font for the HRI (Human Readable Interpretation) characters used when printing a barcode, using *n* as follows:

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

Use GS H on page 62 to specify the print position of HRI characters.

Differences Configuration of font: Font A (12 × 24), Font B (9 × 24)

GS h

Description Specify Barcode Height

Syntax `GShn`

ASCII	GS	h	n
Hex	1D	68	n
Decimal	29	104	n

Range *n* = 1 to 255

Default *n* = 162

Notes GS h specifies the height of the barcode to *n* dots.

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

GS k

Description Print Barcode

Syntax

GSk*m d1...d*kNUL

GSk*mn d1...dn*

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

The range of the variables depend on the barcode system.

m = 0 to 6

k = the number of bytes of barcode data.

d = the character code data of the barcode data to be printed.

m = 65 to 73

n = the number of bytes of barcode data.

d = the character code data of the barcode data to be printed.

1

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

2

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

Default None

Notes This command selects a barcode system and prints the barcode.

The printer ignores any setting that exceeds the print area set by ESC W on page 24. Print modes (such as emphasized or double-strike) do not affect the printing of a symbol. Exceptions are the character size and upside-down printing.

A quiet zone (the spaces surrounding the symbol such as upper, lower, left, and right spaces) should be taken into account when using this command.

GS r

Description Transmit Status

Syntax `GSrn`

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

Range *n* = 1, 49

n	Function
1, 49	Transmit the paper sensor status

Default None

Notes The command transmits the one-byte status specified by *n*. The status is transmitted 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.

GS v 0

Print Raster Bit Image

GSv0*mxLxHyLyHd1...dk*

ASCII	GS	v	0	m	xLxHyLyHd1...dk
Hex	1D	76	30	m	xLxHyLyHd1...dk
Decimal	29	118	48	m	xLxHyLyHd1...dk

Range *m* = 0 to 3, 48 to 51

1 ≤ (*xL* + *xH* × 256) ≤ 72 (*xL* = 0 to 72, *xH* = 0) 1 ≤ (*yL* + *yH* × 256) ≤ 1108 (*yL* = 0 to 255, *yH* = 0 to 255) *d* = 0 to 255 = the definition data of the bit image data. *k* = 1 to 79776

xL, *xH* = (*xL* + *xH* × 256) byte(s) in the horizontal direction for the bit image

yL, *yH* = (*yL* + *yH* × 256) dot(s) in the vertical direction for the bit image

Default None

Notes This command prints a raster bit image according to the mode defined by *m*.

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

In Standard mode, this command is effective when the print buffer is empty and the printer is at the beginning of the line. If the print 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 without being printed.

None of the available print modes (such as emphasized, underlined, or double-strike) affects the printing of the bit image.

The default dot density set by GS L on page 64 is applied to printing of the bit image.

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

Set Barcode Width

GSw*n*

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

Range *n* = 2 to 6 = the barcode module width

Default *n* = 3

Notes `GS w` sets the horizontal width of a barcode, using *n* as follows:

n	Multi-level barcode module width (mm)	Binary-level barcode	
		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

This command is effective for the following barcodes:

Multi-level barcodes: UPC-A, UPC-E, JAN13, HAN8, CODE93, CODE128

Binary-level barcodes: CODE39, ITF, CODABAR

This command remains in effect until one of the following occurs: ESC @ on page 18 is run, the printer defaults are reset, or the printer is power cycled.

BS L A

Description Execute Automatic Calibration in Label Mode

Syntax BSLA

ASCII	BS	L	A
Hex	08	4C	41
Decimal	8	76	65

Notes No Action.

BS L L

Description Select Label Mode

Syntax BSLL

ASCII	BS	L	L
Hex	08	4C	4C
Decimal	8	76	76

Notes BS L L specifies Label mode, which must be used for the printer to print on labels or black mark paper.

This command can activate Label mode even if Receipt mode is predefined by the memory switch (Msw 8-5). However, because the memory switch (Msw 8-5) is set to enable the default mode, Receipt mode goes into effect after the printer defaults are reset or the printer is power cycled. The memory switch (Msw 8-5) should be enabled to maintain Label mode after the printer defaults are reset or the printer is power cycled.

After the printer has entered Label mode, do the following to ensure proper operation:

Readjust the print position by pressing the Feed button or opening and then closing the printer cover.

BS L R

Description Select Receipt Mode

ASCII	BS	L	R
Hex	08	4C	52
Decimal	8	76	82

Notes This command selects Receipt mode, which must be set for printing on continuous roll paper. This command is enabled only in Label mode.

This command can activate Receipt mode even if Label mode is predefined by the memory switch (Msw 8-5). However, because the memory switch (Msw 8-5) is set to enable the default mode, Label mode goes into effect after the printer defaults are reset or the printer is power cycled. The memory switch (Msw 8-5) should be set to disable Receipt mode after the printer defaults are reset or the printer is power cycled.

BS M

Description Specify Font Type

Syntax BSM*nm*

ASCII	BS	M	n	m
Hex	08	4D	n	m
Decimal	08	77	n	m

Range *m* = 65 to 67 *n* = 0

Default *n* = 0

Notes BS M specifies the font type by *m* as follows:

m	Function (Select font type)
65	Font A (12 × 24)
66	Font B (9 × 17)
67	Font C (9 × 24)

This command remains in effect until one of the following occurs: ESC ! on page 15, ESC @ on page 18, or ESC M on page 21 is run; the printer defaults are reset; or the printer is power cycled.

Supported Fonts

This section provides you with available fonts on the ESC/POS.

Primary Message	Data Number	Character
Postal code	1~9	Numeric
ISO country code	1~3	Numeric
Service type code	1~3	Numeric