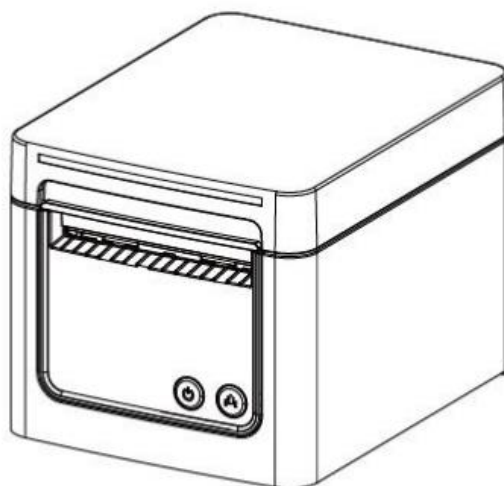




TP809

Programming Manual



[illegible]

About This Manual

Please read this technical manual before programming.

Main description for command as below:

1) Function

This is the first part of command description. Here we propose the command of ASCII code and its function.

2) Format

This part describes the command with ASCII code format, HEX., format, and Decimal format.

3) Range

The range of the variable

The range value is default as decimal digit. For example, $1 \leq n \leq 4$, "1" and "4" are decimal digits.

4) Description

Detailed illustration for the command

5) Note

Different mode must be with different command. This part explains the interaction details in different mode.

6) Reference

Other commands which are interrelated or similar with this.

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1 Bit Image Commands

Select bit-image mode

[Format]	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		
	$1 \leq (nL + nH \times 256) \leq 2047$		
	$(0 \leq nL \leq 255, 0 \leq nH \leq 7)$		
	$0 \leq d \leq 255$		
	k = nL + nH × 256 [when m = 0, 1] k = (nL + nH × 256) × 3 [when m = 32, 33]		
[Description]	<ul style="list-style-type: none"> Stores the bit image data in the print buffer using the bit image mode specified by m. 		
	<ul style="list-style-type: none"> nL, nH specifies the number of dots of the image data in the horizontal direction as (nL + nH × 256). 		
	<ul style="list-style-type: none"> d specifies the bit image data (column format). 		

m	Bit image mode	Vertical direction	Horizontal direction
0	8 dots single-density	68 dpi	101 dpi
1	8 dots dual-density	68 dpi	203 dpi
32	24-dot single-density	203 dpi	101 dpi
33	24-dot double-density	203 dpi	203 dpi

Define downloaded bit image

[Format]	ASCII	GS *	x y d1...dk
	Hex	1D 2A	x y d1...dk
	Decimal	29 42	x y d1...dk
[Range]	$1 \leq x \leq 255$		
	$1 \leq y \leq 48$ [where $1 \leq x \times y \leq 1536$]		
	$0 \leq d \leq 255$		
	$k = x \times y \times 8$		
[Description]	<ul style="list-style-type: none"> Defines the downloaded bit image in the downloaded graphic area. 		
	<ul style="list-style-type: none"> x specifies the number of bytes in the horizontal direction as x bytes. 		
	<ul style="list-style-type: none"> y specifies the number of bytes in the vertical direction as y bytes. 		
	<ul style="list-style-type: none"> d specifies the defined data (column format). 		
[Note]	<ul style="list-style-type: none"> A downloaded bit image and user-defined characters(ESC &) cannot be defined simultaneously.When this command is executed,all user-defined characters are deleted. 		

Print downloaded bit image

[Format]	ASCII	GS	/	m
	Hex	1D	2F	m
	Decimal	29	47	m
[Range]	$0 \leq m \leq 3, 48 \leq m \leq 51$			
[Description]	Prints downloaded bit image defined by GS * and using the mode specified by m.			

m	Mode	Vertical direction	Horizontal direction
0, 48	Normal	203dpi	203dpi
1, 49	Double-width	203dpi	101dpi
2, 50	Double-height	101dpi	203dpi
3, 51i	Quadruple	101dpi	101dpi

Set graphics data

[Format]	ASCII	GS	8	L	p1	p2	p3	p4	m	fn	[parameters]
	Hex	1D	38	4C	p1	p2	p3	p4	m	fn	[parameters]
	Decimal	29	56	76	p1	p2	p3	p4	m	fn	[parameters]
<ul style="list-style-type: none"> • In the description below, only GS (L is used for explanation). • Note that GS (L and GS 8 L have the same function). • If the [parameters] in the Format column in the table below exceed 65533 bytes, use GS 8 L. • The only differences between GS (L and GS 8 L are as listed below. The format for GS 8 L is not provided in the following descriptions; however, [Range], [Default], [Description], and [Notes] for parameters other than those listed in the table below are the same as for GS (L. <Parameters specifying the number of parameters after pH or p4> 											

Command	Parameters	Structure	Maximum value
GS (L	pL, pH	2 bytes	65,535
GS 8 L	p1, p2, p3, p4	4 bytes	4,294,967,295

- Processes graphics data.
- pL, pH specify (pL + pH × 256) as the number of bytes after pH (m, fn, and [parameters]).
- fn specifies the function.
- [parameters] specify the process of each function.

GS (L pL pH m fn [parameters])

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

- [Note]**
- Frequent write command executions by an NV memory write command may damage the NV memory.
Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.
 - If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Be careful not to turn the power off or let the printer be reset via an interface while this command is being executed.
 - While processing this command, the printer is BUSY while writing the data to the NV memory and stops receiving data. Therefore, be sure not to transmit data, including the real-time commands, while the printer is BUSY.
 - When <Function 48, 51, or 64> is transmitted, do not transmit the subsequent data until the status is received. ESC/POS Handshaking Protocol procedures are required when using <Function 64>.

fn	Format	Function No.	Function name
0, 48	GS (L pL pH m fn	48	Transmit the NV graphics memory capacity
2, 50	GS (L pL pH m fn	50	Print the graphics data in the print buffer
3, 51	GS (L pL pH m fn	51	Transmit the remaining capacity of the NV graphics memory
64	GS (L pL pH m fn d1 d2	64	Transmit the key code list for defined NV graphics
65	GS (L pL pH m fn d1 d2 d3	65	Delete all NV graphics data
66	GS (L pL pH m fn kc1 kc2	66	Delete the specified NV 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	67	Define the NV graphics data (raster format)
69	GS (L pL pH m fn kc1 kc2 x y	69	Print the specified NV graphics data
112	GS (L pL pH m fn a bx by c xL xH yL yH d1...dk	112	Store the graphics data in the print buffer (raster format)

Transmit the NV graphics memory capacity

[Format]	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	76	pL	pH	m	fn
[Range]	$(pL + pH \times 256) = 2$ (pL = 2, pH = 0)							
	m = 48							
	fn = 0, 48							
[Description]	Transmit the entire capacity of the NV graphics area (number of bytes in the NV graphics area).							

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

[Function]	Print the graphics data in the print buffer							
[Format]	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	76	pL	pH	m	fn
[Range]	$(pL + pH \times 256) = 2$ (pL = 2, pH = 0)							
	m = 48							
	fn = 2, 50							
[Description]	Prints the buffered graphics data stored by processing of GS (L <Function 112>.							

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

[Function]	Transmit the remaining capacity of the NV graphics memory							
[Format]	ASCII	GS	(	L	pL	pH	m	fn
	Hex	1D	28	4C	pL	pH	m	fn
	Decimal	29	40	76	pL	pH	m	fn
[Range]	$(pL + pH \times 256) = 2$ (pL = 2, pH = 0)							
	m = 48							
	fn = 3, 51							
[Description]	Transmit the number of bytes of remaining memory (unused area) in the NV graphics area.							

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

[Function]	Transmit the key code list for defined NV graphics										
[Format]	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]	$(pL + pH \times 256) = 4$ (pL = 4, pH = 0) m = 48 fn = 64 d1 = 75 d2 = 67										
[Description]	Transmit the key code list for defined NV graphics.										

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

[Function]	Delete all NV graphics data											
[Format]	ASCII	GS	(	L	pL	pH	m	fn	d1	d2	d3	
	Hex	1D	28	4C	05	00	30	41	43	4C	52	
	Decimal	29	40	76	5	0	48	65	67	76	82	
[Range]	$(pL + pH \times 256) = 5$ (pL = 5, pH = 0) m = 48 fn = 65 d1 = 67 d2 = 76 d3 = 82											
[Description]	Delete all NV graphics data.											

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

[Function]	Delete the specified NV graphics data										
[Format]	ASCII	GS	(	L	pL	pH	m	fn	kc1	kc2	
	Hex	1D	28	4C	04	00	30	42	kc1	kc2	
	Decimal	29	40	76	4	0	48	66	kc1	kc2	
[Range]	$(pL + pH \times 256) = 4$ (pL = 4, pH = 0) m = 48 fn = 66 $32 \leq kc1 \leq 126$ $32 \leq kc2 \leq 126$										
[Description]	Delete the NV graphics data defined by the key codes (kc1 and kc2).										

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

[Function]	Define the NV graphics data (raster format)
[Format]	ASCII GS (L pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1...[c d1...dk]b Hex 1D 28 4C pL pH m fn a kc1 kc2 b xL xH yL yH [c d1...dk]1...[c 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
[Range]	(pL, pH) for GS (L: $12 \leq (pL + pH \times 256) \leq 65535$ ($0 \leq pL \leq 255, 0 \leq pH \leq 255$) (p1, p2, p3, p4) for GS 8 L: $12 \leq (p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) \leq 4294967295$ ($0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255$) Common parameters for GS (L and GS 8 L: m = 48 fn = 67 a = 48 $32 \leq kc1 \leq 126$ $32 \leq kc2 \leq 126$ b = 1 [when single-color print control is selected] $1 \leq (xL + xH \times 256) \leq 8192$ ($0 \leq xL \leq 255, 0 \leq xH \leq 32$) $1 \leq (yL + yH \times 256) \leq 2304$ ($0 \leq yL \leq 255, 0 \leq yH \leq 9$) c = 49 [when single-color print control is selected] $0 \leq d \leq 255$ $k = (\text{int}((xL + xH \times 256) + 7) / 8) \times (yL + yH \times 256)$ The entire capacity size = 256 KB maximum.
[Description]	<ul style="list-style-type: none"> Defines the NV graphics data (raster format) as a record specified by the key codes (kc1, kc2) in the NV graphics area. b specifies the number of the color of the defined data. xL, xH specify the number of dots in the horizontal direction as $(xL + xH \times 256)$. yL, yH specify the number of dots in the vertical direction as $(yL + yH \times 256)$. c specifies the color of the defined data. d specifies the defined data (raster format).
[Notes]	<ul style="list-style-type: none"> In cases where there is sufficient capacity is not available for storing NV graphics data specified by $(xL + xH \times 256)$ and $(yL + yH \times 256)$, this function is ignored. The [data value (k) + control information data value (24 bytes)] area of the NV graphics data domain is used when this function is executed. NV graphics and NV bit image (FS q) cannot be defined simultaneously. When this function is executed, all NV bit images are deleted.

c	Defined data color (*)
49	Color 1
50	Color 2

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

[Function] Print the specified NV graphics data

[Format]

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

32 ≤ kc1 ≤ 126

32 ≤ kc2 ≤ 126

x = 1, 2

y = 1, 2

[Description]

- Prints the NV 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.

x, y	Vertical direction	Horizontal direction
1	203 dpi	203 dpi
2	101 dpi	101 dpi

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

[Function] Store the graphics data in the print buffer (raster format)

[Format] 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] (pL, pH) for GS (L:

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

(p1, p2, p3, p4) for GS 8 L:

$$11 \leq (p1 + p2 \times 256 + p3 \times 65536 + p4 \times 16777216) \leq 4294967295$$

$$(0 \leq p1 \leq 255, 0 \leq p2 \leq 255, 0 \leq p3 \leq 255, 0 \leq p4 \leq 255)$$

Common parameters for GS (L and GS 8 L:

$$m = 48$$

$$fn = 112$$

$$a = 48$$

$$bx = 1, 2; by = 1, 2$$

$$c = 49 \quad [\text{when single-color print control is selected}]$$

$$1 \leq (xL + xH \times 256) \leq 2047 \quad (0 \leq xL \leq 255, 0 \leq xH \leq 7)$$

When single-color print control is selected

$$1 \leq (yL + yH \times 256) \leq 1662 \quad (0 \leq yL \leq 255, 0 \leq yH \leq 6) \quad [\text{when } by=1]$$

$$1 \leq (yL + yH \times 256) \leq 831 \quad (0 \leq yL \leq 255, 0 \leq yH \leq 3) \quad [\text{when } by=2]$$

When two-color print control is selected

$$1 \leq (yL + yH \times 256) \leq 831 \quad (0 \leq yL \leq 255, 0 \leq yH \leq 3) \quad [\text{when } by=1]$$

$$1 \leq (yL + yH \times 256) \leq 415 \quad (0 \leq yL \leq 255, yH = 0,1) \quad [\text{when } by=2]$$

$$0 \leq d \leq 255$$

$$k = (\text{int}((xL + xH \times 256) / 8) \times (yL + yH \times 256))$$

[Description]

- Stores the graphics data (raster format) in the print buffer.
- The graphics data is enlarged by bx and by in the horizontal and vertical directions.
- c specifies the color for the stored data.
- xL, xH specify the number of dots in the horizontal direction as (xL + xH × 256).
- yL, yH specify the number of dots in the vertical direction as (yL + yH × 256).
- d specifies the stored data (raster format).

bx, by	Vertical direction	Horizontal direction
1	203 dpi	203 dpi
2	101 dpi	101 dpi

2 Print Position Commands

HT

[Function]	Horizontal Tabs		
[Format]	ASCII	HT	
	Hex	09	
	Decimal	9	
[Description]	Moves the print position to the next horizontal tab position.		

ESC \$ nL nH

[Function]	Set absolute print position				
[Format]	ASCII	ESC	\$	nL	nH
	Hex	1B	24	nL	nH
	Decimal	27	36	nL	nH
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ $(0 \leq nL \leq 255, 0 \leq nH \leq 255)$				
[Description]	Moves the print position to $[(nL + nH \times 256) \times (\text{horizontal or vertical motion unit})]$ from the left edge of the print area.				

ESC T n

[Function]	Select print direction in page mode				
[Format]	ASCII	ESC	T	n	
	Hex	1B	54	n	
	Decimal	27	84	n	
[Range]	$0 \leq n \leq 3, 48 \leq n \leq 51$				
[Default]	n = 0				
[Description]	In page mode, selects the print direction and starting position.				

n	Print direction	Starting position
0, 48	Left to right	Upper left
1, 49	Bottom to top	Lower left
2, 50	Right to left L	Lower right
3, 51	Top to bottom	Upper right

GS \$ nL nH

[Function]	Set absolute vertical print position in page mode				
[Format]	ASCII	GS	\$	nL	nH
	Hex	1D	24	nL	nH
	Decimal	29	36	nL	nH
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)				
[Description]	In page mode, moves the vertical print position to $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$ from the starting position set with ESC T .				

ESC \ nL nH

[Function]	Set horizontal relative print position				
[Format]	ASCII	ESC	\	nL	nH
	Hex	1B	5C	nL	nH
	Decimal	27	92	nL	nH
[Range]	$-32768 \leq (nL + nH \times 256) \leq 32767$				
[Description]	<ul style="list-style-type: none"> Moves the print position to $[(nL + nH \times 256) \times (\text{horizontal or vertical motion unit})]$ from the current position. A positive number specifies movement to the right, and a negative number specifies movement to the left. 				

ESC W xL xH yL yH dxL dxH dyL dyH

[Function] Set print area in page mode

[Format] ASCII ESC W xL xH yL yH dxL dxH dyL dyH
Hex 1B 57 xL xH yL yH dxL dxH dyL dyH
Decimal 27 87 xL xH yL yH dxL dxH dyL dyH

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

[Default] $(xL + xH \times 256) = 0$ ($xL = 0$, $xH = 0$)
 $(yL + yH \times 256) = 0$ ($yL = 0$, $yH = 0$)
 $(dxL + dxH \times 256) = 576$ ($dxL = 0$, $dxH = 2$)
[80 mm paper width model]
 $(dxL + dxH \times 256) = 384$ ($dxL = 104$, $dxH = 4$)
[58 mm paper width model]
 $(dyL + dyH \times 256) = 1662$ ($dyL = 126$, $dyH = 6$)

[Description]

- In page mode, sets the size and the logical origin of the print area.
- xL, xH specify the horizontal logical origin as $[(xL + xH \times 256) \times (\text{horizontal motion unit})]$ from absolute origin.
- yL, yH specify the vertical logical origin as $[(yL + yH \times 256) \times (\text{vertical motion unit})]$ from absolute origin.
- dxL, dxH specify the horizontal dimension of print area as $[(dxL + dxH \times 256) \times (\text{horizontal motion unit})]$.
- dyL, dyH specify the vertical dimension of print area as $[(dyL + dyH \times 256) \times (\text{vertical motion unit})]$.

[Note] When single-color print control is selected, the vertical dimension of the print area can be set to 207.95 mm {3324/360"} maximum.

ESC a n

[Function]	Select justification		
[Format]	ASCII	ESC a	n
	Hex	1B 61	n
	Decimal	27 97	n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$		
[Default]	n = 0		
[Description]	In standard mode, aligns all the data in one line to the selected layout.		

n	Justification
0, 48	Left justification
1, 49	Centering
2, 50	Right justification

ESC D n1...nk NUL

[Function]	Setting horizontal tab position				
[Format]	ASCII	ESC D	n1	...nk	NUL
	Hex	1B 44	n1	...nk	00
	Decimal	27 68	n1	...nk	0
[Range]	$1 \leq n1 \leq n2 \leq \dots \leq nk \leq 255$ $0 \leq k \leq 32$				
[Default]	n = 8, 16, 24, 32, 40, ..., 232, 240, 248 [for Font A (12 × 24) in a standard character size width]				
[Description]	<ul style="list-style-type: none"> Sets horizontal tab positions. n specifies the number of digits from the setting position to the left edge of the print area. k is used to indicate the number of bytes set for the horizontal tab position. 				

GS L nL nH

[Function]	Set left margin			
[Format]	ASCII	GS	L	nL nH
	Hex	1D	4C	nL nH
	Decimal	29	76	nL nH
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)			
[Default]	$(nL + nH \times 256) = 0$ ($nL = 0, nH = 0$)			
[Description]	In standard mode, sets the left margin to $[(nL + nH \times 256) \times (\text{horizontal motion unit})]$.			

GS W nL nH

[Function]	Set print area width				
[Format]	ASCII	GS	W	nL	nH
	Hex	1D	57	nL	nH
	Decimal	29	87	nL	nH
[Range]	$0 \leq (nL + nH \times 256) \leq 65535$ ($0 \leq nL \leq 255, 0 \leq nH \leq 255$)				
[Default]	$(nL + nH \times 256) = 576$ ($nL = 40, nH = 2$) [80 mm paper width model]				
	$(nL + nH \times 256) = 406$ ($nL = 80, nH = 1$) [58 mm paper width model]				
[Description]	In standard mode, sets the print area width to $[(nL + nH \times 256) \times (\text{horizontal motion unit})]$.				

GS \ nL nH

[Function]	Set relative vertical print position in page mode				
[Format]	ASCII	GS	\	nL	nH
	Hex	1D	5C	nL	nH
	Decimal	29	92	nL	nH
[Range]	$-32768 \leq (nL + nH \times 256) \leq 32767$				
[Description]	<ul style="list-style-type: none"> In page mode, moves the vertical print position to $[(nL + nH \times 256) \times (\text{vertical or horizontal motion unit})]$ from the current position. A positive number specifies downward movement, and a negative number specifies upward movement. 				

3 Print Commands

LF

[Function]	Print and line feed	
[Format]	ASCII	LF
	Hex	0A
	Decimal	10
[Description]	Prints the data in the print buffer and feeds one line, based on the current line spacing.	

FF (In page mode)

[Function]	Print and return to standard mode (in page mode)		
[Format]	ASCII	FF	
	Hex	0C	
	Decimal	12	
[Description]	Prints all the data in the print buffer collectively and switches from page mode to standard mode.		

ESC FF

[Function]	Print data in page mode		
[Format]	ASCII	ESC	FF
	Hex	1B	0C
	Decimal	27	12
[Description]	In page mode, prints all the data in the print buffer collectively.		

ESC J n

[Function]	Print and feed paper			
[Format]	ASCII	ESC J	n	
	Hex	1B 4A	n	
	Decimal	27 74	n	
[Range]	$0 \leq n \leq 255$			
[Description]	Prints the data in the print buffer and feeds the paper [$n \times$ (vertical or horizontal motion unit)].			
[Note]	The maximum paper feed amount is 1016 mm {40"}.			

ESC d n

[Function]	Print and feed n lines			
[Format]	ASCII	ESC d	n	
	Hex	1B 64	n	
	Decimal	27 100	n	
[Range]	$0 \leq n \leq 255$			
[Description]	Prints the data in the print buffer and feeds the paper [$n \times$ (current line spacing)].			
[Note]	The maximum paper feed amount is 1016 mm {40"}.			

GS (A pL pH n m

[Function] Execute test print

[Format]

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

[Range]

$(pL + pH \times 256) = 2$ ($pL = 2, pH = 0$)

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

$1 \leq m \leq 3, 49 \leq m \leq 51$

[Description]

- Executes a specified test print.
- pL, pH specify $(pL + pH \times 256)$ as the number of bytes after pH (n and m).
- n specifies the paper used for the test print.
- m specifies a test pattern.

[Note]

- The printer executes software reset after processing this command.
- Clear the receive and print buffers.
- Resets all setting values in RAM (the print area, the character styles, and others) that were in effect at power on. (The data in the NV memory is not reset.)

n	Paper source
0, 48	Basic sheet (roll paper)
1, 49	Roll paper
2, 50	

M	Test pattern
1,49	Hexadecimal dump print
2,50	Printer status print
3,51	Rolling pattern print

4 Miscellaneous Function Commands

ESC @

[Function] Initialize printer

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

[Description] • Clears the data in the print buffer and resets the printer modes to the modes that were in effect when the power was turned on.

Keeps the following data:

- Macro definition data.
- Contents stored in the NV user memory.
- Contents defined for the NV graphics (NV bit image).
- Maintenance counter value.
- Setting value specified with GS (E).

ESC L

[Function] Select page mode

[Format]

ASCII	ESC	L
Hex	1B	4C
Decimal	27	76

[Description] Switches from standard mode to page mode

ESC p m t1 t2

[Function] Generate pulse

[Format]

ASCII	ESC	p	m	t1	t2
Hex	1B	70	m	t1	t2
Decimal	27	112	m	t1	t2

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

0 ≤ t1 ≤ 255

0 ≤ t2 ≤ 255

[Description] • Outputs the pulse specified by t1 and t2 to connector pin m.

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

• t1 specifies the pulse on time as [t1 × 2 ms].

• t2 specifies the pulse off time as [t2 × 2 ms].

[Note] Specify a value (t1 < t2) so that the off time is longer than the on time.

5 Character Control Commands

ESC ! n

[Function]	Select print mode(s)		
[Format]	ASCII	ESC !	n
	Hex	1B 21	n
	Decimal	27 33	n
[Range]	$0 \leq n \leq 255$		
[Default]	n = 0		
[Description]	Select the character font and styles (emphasized, double-height, double-width, and underlined) together.		

(n)Bit	Off/On	HEX	Decimal	Function
0	Off	00	0	Character font A (12 × 24) selected.
	On	01	1	Character font B (9 × 17) selected.
1,2	Off	00	0	Reserved.
3	Off	00	0	Emphasized mode is turned off.
	On	08	8	Emphasized mode is turned on.
4	Off	00	0	Double-height canceled.
	On	10	16	Double-height selected.
5	Off	00	0	Double-width canceled.
	On	20	32	Double-width selected.
6	Off	00	0	Reserved.
7	Off	00	0	Underline mode is turned off.
	On	80	128	Underline mode is turned on.

ESC % n

[Function]	Select/cancel user-defined character set		
[Format]	ASCII	ESC %	n
	Hex	1B 25	n
	Decimal	27 37	n
[Range]	$0 \leq n \leq 255$		
[Default]	n = 0		
[Description]	<ul style="list-style-type: none"> • Select or cancel the user-defined character set. • When the LSB of n is 0, the user-defined character set is canceled. • When the LSB of n is 1, the user-defined character set is selected. 		

ESC ? n

[Function]	Cancel user-defined characters		
[Format]	ASCII	ESC ?	n
	Hex	1B 3F	n
	Decimal	27 63	n
[Range]	$32 \leq n \leq 126$		
[Description]	• Deletes the user-defined character pattern specified by character code n.		

ESC SP n

[Function]	Set right-side character spacing		
[Format]	ASCII	ESC SP	n
	Hex	1B 20	n
	Decimal	27 32	n
[Range]	$0 \leq n \leq 255$		
[Default]	n = 0		
[Description]	Set the right-side character spacing to [n × (horizontal or vertical motion unit)].		
[Note]	The maximum right-side spacing is 31.875 mm {255/203"}.		

CAN

[Function]	Cancel print data in page mode	
[Format]	ASCII	CAN
	Hex	18
	Decimal	24
[Description]	In page mode, deletes all the print data in the current print area.	

ESC – n

[Function]	Turn underline mode on/off			
[Format]	ASCII	ESC	-	n
	Hex	1B	2D	n
	Decimal	27	45	n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$			
[Default]	n = 0			
[Description]	Turns underline mode on or off.			

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

ESC E n

[Function]	Turn emphasized mode on/off		
[Format]	ASCII	ESC E n	
	Hex	1B 45 n	
	Decimal	27 69 n	
[Range]	$0 \leq n \leq 255$		
[Default]	$n = 0$		
[Description]	<ul style="list-style-type: none"> • Turns emphasized mode on or off. • When the LSB of n is 0, turns off emphasized mode. • When the LSB of n is 1, turns on emphasized mode. 		

ESC R n

[Function]	Select an international character set		
[Format]	ASCII	ESC R n	
	Hex	1B 52 n	
	Decimal	27 82 n	
[Range]	$0 \leq n \leq 15$		
[Default]	$n = 0$ [Other than the following models]		
	$n = 15$ [Simplified Chinese model]		
[Description]	Selects an international character set		

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

ESC M n

[Function] Select character font

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

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

[Default] n = 0

[Description] • Selects a character font.

n	Character font
0,48	Character font A (12 × 24)
1,49	Character font B (9 × 17)

ESC V n

[Function] Turn 90° clockwise rotation mode on/off

[Format] ASCII ESC V n
Hex 1B 56 n
Decimal 27 86 n

[Range] $0 \leq n \leq 2$, $48 \leq n \leq 50$

[Default] n = 0

[Description] • In standard mode, turns 90° clockwise rotation mode on or off for characters.

n	Function
0, 48	Turns off 90° clockwise rotation mode.
1, 49 2, 50	Turns on 90° clockwise rotation mode.

ESC { n

[Function] Selecting upside-down printing mode

[Format] ASCII ESC { n
Hex 1B 7B n
Decimal 27 123 n

[Range] $0 \leq n \leq 255$

[Default] n = 0

[Description] • In standard mode, turns upside-down print mode on or off.
• When the LSB of n is 0, turns off upside-down print mode.
• When the LSB of n is 1, turns on upside-down print mode.

ESC G n

[Function]	Turn double-strike mode on/off		
[Format]	ASCII	ESC G n	
	Hex	1B 47 n	
	Decimal	27 71 n	
[Range]	$0 \leq n \leq 255$		
[Default]	$n = 0$		
[Description]	<ul style="list-style-type: none"> • Turns double-strike mode on or off. 		
	<ul style="list-style-type: none"> • When the LSB of n is 0, turns off double-strike mode. 		
	<ul style="list-style-type: none"> • When the LSB of n is 1, turns on double-strike mode. 		

GS B n

[Function]	Turn white/black reverse print mode on/off		
[Format]	ASCII	GS B n	
	Hex	1D 42 n	
	Decimal	29 66 n	
[Range]	$0 \leq n \leq 255$		
[Default]	$n = 0$		
[Description]	<ul style="list-style-type: none"> • Turns white/black reverse print mode on or off. 		
	<ul style="list-style-type: none"> • When the LSB of n is 0, turns off white/black reverse mode. 		
	<ul style="list-style-type: none"> • When the LSB of, n is 1, turns on white/black reverse mode. 		

GS ! n

[Function] Select character size

[Format] ASCII GS ! n
Hex 1D 21 n
Decimal 29 33 n

[Range] $0 \leq n \leq 7$, $16 \leq n \leq 23$, $32 \leq n \leq 39$, $48 \leq n \leq 55$, $64 \leq n \leq 71$,
 $80 \leq n \leq 87$, $96 \leq n \leq 103$, $112 \leq n \leq 119$
($1 \leq \text{Enlargement in vertical direction} \leq 8$, $1 \leq \text{Enlargement in horizontal direction} \leq 8$)

[Default] n = 0

[Description] Selects character size (height magnification and width magnification).

(n) Bit	Off/On	Hex	Decimal	Function
0 - 2	See table [Height magnification]			Selects the height magnification.
3	Off	00	0	Reserved.
4 - 6	See table [Width magnification].			Selects the width magnification.
7	Off	00	0	Reserved.

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

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

ESC t n

[Function] Select character code table

[Format] ASCII ESC t n
Hex 1B 74 n
Decimal 27 116 n

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

[Default] $n = 0$

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

[Note] Page 0/page 2/page 3/page 4/page 5/ page 14/page 17/ page 18/ page 19/ page 20/
page 21/ page 26/ page 32 /page 47 They are support both 12×24 font and 9×17 font.

n	Character Code table	n	Character Code table
0	[PC437 (USA: Standard Europe)]	40	[ISO8859-15 (Latin9)]
1	[Katakana]	45	[WPC1250]
2	[PC850 (Multilingual)]	46	[WPC1251(Cyrillic)]
3	[PC860 (Portuguese)]	47	[WPC1253]
4	[PC863 (Canadian-French)]	48	[WPC1254]
5	[PC865 (Nordic)]	49	[WPC1255]
13	[PC857 (Turkish)]	50	[WPC1256]
14	[PC737 (Greek)]	51	[WPC1257]
15	[ISO8859-7 (Greek)]	52	[WPC1258]
16	[WPC1252]	54	[MIK(Cyrillic /Bulgarian)]
17	[PC866 (Cyrillic #2)]	55	[CP755 (East Europe, Latvian 2)]
18	[PC852 (Latin 2)]	56	[Iran]
19	[PC858 (Euro)]	57	[Iran II]
20	[KU42]	58	[Latvian]
21	[TIS11 (Thai)]	59	[ISO-8859-1 (West Europe)]
26	[TIS18 (Thai)]	60	[ISO-8859-3(Latin 3)]
32	[PC720]	61	[ISO-8859-4(Baltic)]
33	[WPC775]	62	[ISO-8859-5(Cyrillic)]
34	[PC855 (Cyrillic)]	63	[ISO-8859-6(Arabic)]
36	[PC862 (Hebrew)]	64	[ISO-8859-8(Hebrew)]
37	[PC864 (Arabic)]	65	[ISO-8859-9(Turkish)]
39	[ISO8859-2 (Latin2)]	66	[PC856]
		67	[ABICOMP]

ESC &

[Function] Define user-defined characters

[Format] ASCII ESC & **y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**
Hex 1B 26 **y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**
Decimal 27 38 **y c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**

[Range] y = 3
 $32 \leq c1 \leq c2 \leq 126$
 $0 \leq x \leq 12$ (Font A (12 × 24))
 $0 \leq x \leq 9$ (Font B (9 × 17))
 $0 \leq d \leq 255$
 $k = c2 - c1 + 1$

[Default]

[Description] Defines the user-defined character pattern for the specified character codes.

- y specifies the number of bytes in the vertical direction.
- c1 specifies the beginning character code for the definition, and c2 specifies the final code.
- x specifies the number of dots in the horizontal direction from the left.
- d specifies the defined data (column format).
- k indicates the number of defined data. k is an explanation parameter; therefore it does not need to be transmitted.

[Notes] ■ Character codes from the alphanumeric characters in Hexadecimal: 20H to 7EH / in Decimal: 32 to 126 can be defined.

■ Data (d) specifies a bit printed to 1 and not printed to 0. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.

■ The data to define a user-defined character is (y × x) bytes.

■ When the value of y, c1, c2, or x is out of the range, this command is canceled, and the following data is processed as normal data.

■ This command can define user-defined characters for each font independently. To select a font, use ESC ! or ESC M.

■ A user-defined character, downloaded graphics, and downloaded bit image cannot be defined simultaneously on some printer models.

• When this command is executed, the downloaded bit image is cleared.

• When GS (L <Function 83> <Function 84> or GS * is executed, the user-defined character data is cleared.

■ Once the user-defined characters have been defined, they are available until ESC ?, GS *, or ESC @ is executed; the user-defined characters are redefined; the power is turned off; or the printer is reset.

■ The user-defined characters are not defined at the default, and the resident characters are printed.

■ The relationship between the definition data and printing result is as follows.

Example: Downloaded character definition consists of 9 × 7 dots.

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

6 Status Commands

GS r n

[Function] Transmit status

[Format] ASCII GS r n
Hex 1D 72 n
Decimal 29 114 n

[Range] n = 1, 2, 49, 50

[Description]

- Transmits the status
- This printer transmits the following status.
- Paper sensor status (n = 1, 49)
- Drawer kick-out connector status (n = 2, 50)

[Note] • When this command is transmitted, do not transmit the subsequent data until this status is received.

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Roll paper near-end sensor:paper adequate.
	On	03	3	Roll paper near-end sensor:paper near end.
2, 3	Off	00	0	Roll paper end sensor(Paper sensor):paper present.
	On	0c	12	Roll paper end sensor(Paper sensor):paper not present.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Drawer kick-out connector pin3 is LOW.
	On	01	1	Drawer kick-out connector pin3 is HIGH.
1-3	--	--	--	Reserved.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

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

ESC v

[Function] Transmit paper sensor status

[Format] ASCII ESC v
 Hex 1B 76
 Decimal 27 118

[Description] • Transmits the status of paper sensor(s) as 1 byte of data,as follows:

[Note] • This command is only valid for serial model.

Bit	Off/On	Hex	Decimal	Status
0, 1	Off	00	0	Roll paper near-end sensor:paper adequate.
	On	03	3	Roll paper near-end sensor:paper near end.
2, 3	Off	00	0	Roll paper end sensor(Paper sensor):paper present.
	On	0c	12	Roll paper end sensor(Paper sensor):paper not present.
4	Off	00	0	Fixed.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fixed.

DLE EOT n

[Function] Transmit real-time status

[Format]

ASCII	DLE	EOT	n
Hex	10	04	n
Decimal	16	4	n

[Range] $1 \leq n \leq 4$

[Description] Transmit the real-time status.

- This printer transmits the following status in real time.
- Printer status (n = 1)
- Offline cause status (n = 2)
- Roll paper sensor status (n = 4)

[Note]

- Take the following into consideration:
 - If the received data includes a data string matching this command, the printer performs this command. Users must consider this.
Example: Graphic data might accidentally include a data string matching this command.
 - Do not embed this command within another command.
Example: Graphic data might include this command.
 - Transmit this command using the following method:
 - When this command is transmitted, the subsequent data must not be transmitted until the status is received.
 - However, if this command must be transmitted continuously, it is possible to transmit up to 4 commands at once.
In this case, the subsequent data must not be transmitted until the all status is received.
If this command is transmitted without using the above method, the status may not be received.

• Error cause status (n = 3)	
n	Function
1	Transmits printer status.
2	Transmits offline cause status.
3	Transmits error cause status.
4	Transmits roll paper sensor status.

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fix as 0.
1	On	02	2	Fix as 1.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	On	04	4	Drawer kick-out connector pin 3 is HIGH.
3	Off	00	0	Online
	On	08	8	Offline.
4	On	10	16	Fix as 1.
5, 6	--	--	--	Reserved.
7	Off	00	0	Fix as 0.

Bit	Off/On	HEX	Decimal	Status
0	Off	00	0	Fix as 0
1	On	02	2	Fix as 1
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open.
3	Off	00	0	Paper is not being fed with the paper FEED button.
	On	08	8	Paper is being fed with the paper FEED button.
4	On	10	16	Fixed.
5	Off	00	0	No paper end stop.
	On	20	32	Printing stopped due to paper end.
6	Off	00	0	No error.
	On	40	64	Error occurred.
7	Off	00	0	Fixed.

Bit	Off/On	HEX	Decimal	Status
0	Off	00	0	Fixed.
1	On	02	2	Fixed.
2	--	--	--	Reserved.
3	Off	00	0	No auto cutter error.
	On	08	8	Auto cutter error occurred.
4	On	10	16	Fixed.
5	Off	00	0	No unrecoverable error
	On	20	32	Unrecoverable error occurred.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurred
7	Off	00	0	Fixed.

Bit	Off/On	HEX	Decimal	Status
0	Off	00	0	Fixed
1	On	02	2	Fixed
2,3	Off	00	0	Roll paper near-end sensor: paper adequate.
	On	0C	12	Roll paper near-end sensor: paper near end.
4	On	10	16	Fixed
5,6	Off	00	0	Roll paper end sensor (paper sensor): paper present.
	On	60	96	Roll paper end sensor (paper sensor): paper not present.
7	Off	00	0	Fixed

7 Barcode Commands

GS h n

[Function]	Set bar code height		
[Format]	ASCII	GS	h n
	Hex	1D	68 n
	Decimal	29	104 n
[Range]	$1 \leq n \leq 255$		
[Default]	$n = 162$		
[Description]	<ul style="list-style-type: none"> Sets the height of the bar code to n dots. 		

GS f n

[Function]	Select font for HRI characters		
[Format]	ASCII	GS	f n
	Hex	1D	66 n
	Decimal	29	102 n
[Range]	$n = 0, 1, 48, 49$		
[Default]	$n = 0$		
[Description]	Select a font for the HRI characters when printing a bar code.		

n	Font for the HRI characters
0,48	Character font A (12 × 24)
1,49	Character font B (9 × 17)

GS H n

[Function]	Select print position of HRI characters		
[Format]	ASCII	GS	H n
	Hex	1D	48 n
	Decimal	29	72 n
[Range]	$0 \leq n \leq 3, 48 \leq n \leq 51$		
[Range]	$n = 0$		
[Description]	Select the print position of HRI characters when printing a bar code.		

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

GS k

[Function] Print barcode

[Format]

<A> ASCII	GS	k	m	d1...dk	NUL
Hex	1D	6B	m	d1...dk	00
Decimal	29	107	m	d1...dk	0
 ASCII	GS	k	m	n	d1...dn
Hex	1D	6B	m	n	d1...dn
Decimal	29	107	m	n	d1...dn

[Range] <A> $0 \leq m \leq 6$ (For the range of k and d, see [Description].)
 $65 \leq m \leq 73$ (For the range of n and d, see [Description].)

[Description] Print the bar code using the bar code system specified by m.

For <Function A>

- k of <Function A> indicates the number of bytes of bar code data.
- d specifies the bar code data.

For <Function B>

- [Note]**
- n of <Function B> specifies the number of bytes of bar code data.
 - d specifies the bar code data.
 - Users must secure the quiet zone (left or right side space area defined by the bar code standard) for bar code printing.

m	Bar code system	Range of k	Range of d
0	UPC-A	k = 11, 12	$48 \leq d \leq 57$
1	UPC-E	k = 11, 12	$48 \leq d \leq 57$ [where d1 = 48]
2	JAN13 / EAN13	k = 12, 13	$48 \leq d \leq 57$
3	JAN8 / EAN8	k = 7, 8	$48 \leq d \leq 57$
4	CODE39	$1 \leq k$	$48 \leq d \leq 57$, $65 \leq d \leq 90$, d = 32, 36, 37, 42, 43, 45, 46, 47
5	ITF	$2 \leq k$ (even number)	$48 \leq d \leq 57$
6	CODABAR (NW-7)	$2 \leq k$	$48 \leq d \leq 57$, $65 \leq d \leq 68$, $97 \leq d \leq 100$, d = 36, 43, 45, 46, 47, 58 [where $65 \leq d1 \leq 68$, $65 \leq dk \leq 68$, $97 \leq d1 \leq 100$, $97 \leq dk \leq 100$]

m	Bar code system	Range of n	Range of d
65	UPC-A	$n = 11, 12$	$48 \leq d \leq 57$
66	UPC-E	$n = 11, 12$	$48 \leq d \leq 57$ [where $d1 = 48$]
67	JAN13 / EAN13	$n = 12, 13$	$48 \leq d \leq 57$
68	JAN8 / EAN8	$n = 7, 8$	$48 \leq d \leq 57$
69	CODE39	$1 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 90,$ $d = 32, 36, 37, 42, 43, 45, 46,$ 47
70	ITF	$2 \leq n \leq 254$ (even number)	$48 \leq d \leq 57$
71	CODABAR (NW-7)	$2 \leq n \leq 255$	$48 \leq d \leq 57, 65 \leq d \leq 68,$ $97 \leq d \leq 100,$ $d = 36, 43, 45, 46, 47, 58$ [where $65 \leq d1 \leq 68, 65 \leq dn \leq 68,$ $97 \leq d1 \leq 100, 97 \leq dn \leq 100$]
72	CODE93	$1 \leq n \leq 255$	$0 \leq d \leq 127$
73	CODE128	$2 \leq n \leq 255$	$0 \leq d \leq 127$ [where $d1 = 123, 65 \leq d2 \leq 67$]

GS w n

[Function] Set bar code width

[Format]

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

[Range] $2 \leq n \leq 6$

[Range] $n = 3$

[Description]

- Sets the horizontal size of the bar code.
- Multi-level bar codes are as follows: UPC-A, UPC-E, JAN13 / EAN13, JAN8 / EAN8, CODE93, and CODE128
- Binary-level bar codes are as follows: CODE39, ITF, and CODABAR

n	Multi-level bar code	Binary-level bar code	
	Module width (mm)	Thin element width (mm)	Thick element width (mm)
2	0.25	0.25	0.625
3	0.375	0.375	2.303
4	0.5	0.5	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2

GS (k pL pH cn fn [parameters])

[Function] Set up and print symbol

- [Description]**
- Processes the data for symbols.
 - pL, pH specify (pL + pH × 256) as the number of bytes after pH (cn, fn, and [parameters]).
 - cn specifies the type of symbol.
 - fn specifies the function.
 - [parameters] specify the process of each function.

- [Note]**
- "Symbol data" means the data received with <Function 080 or 180> before encoding.
 - "Symbol storage area" means the area where the data received with <Function 080 or 180> before encoding is stored.
 - When <Function 082 or 182> is transmitted, do not transmit the subsequent data until the status is received.
 - PDF417 (cn=48) is supported in ANK model.

cn	Type of Symbol
48	PDF417 (two-dimensional codes)
49	QR Code (two-dimensional codes)

cn	fn	Format	Function No.	Function name
48	65	GS (k pL pH cn fn n	065	PDF417: Set the number of columns in the data region.
	66	GS (k pL pH cn fn n	066	PDF417: Set the number of rows.
	67	GS (k pL pH cn fn n	067	PDF417: Set the width of the module.
	68	GS (k pL pH cn fn n	068	PDF417: Set the row height.
	69	GS (k pL pH cn fn m n	069	PDF417: Set the error correction level.
	80	GS (k pL pH cn fn m d1...dk	080	PDF417: Store the data in the symbol storage area.
	81	GS (k pL pH cn fn m	081	PDF417: Print the symbol data in the symbol storage area.
	82	GS (k pL pH cn fn m	082	PDF417: Transmit the size information of the symbol data in the symbol storage area.
	67	GS (k pL pH cn fn n	167	QR Code: Set the size of module.
49	69	GS (k pL pH cn fn n	169	QR Code: Select the error correction level.
	80	GS (k pL pH cn fn m d1...dk	180	QR Code: Store the data into the symbol storage area.
	81	GS (k pL pH cn fn m	181	QR Code: Print the symbol data in the symbol storage area.
	82	GS (k pL pH cn fn m	182	QR Code: Transmit the size information of the symbol data in the symbol storage area.

<Function 065> GS (k pL pH cn fn n (cn = 48, fn = 65)

[Function]	PDF417: Set the number of columns in the data region
[Format]	ASCII GS (k pL pH cn fn n
	Hex 1D 28 6B 03 00 30 41 n
	Decimal 29 40 107 3 0 48 65 n
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)
	cn = 48
	fn = 65
	$0 \leq n \leq 30$
[Default]	n = 0
[Description]	Sets the number of columns in the data region for PDF417.

<Function 066> GS (k pL pH cn fn n (cn = 48, fn = 66)

[Function]	PDF417: Set the number of rows
[Format]	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]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)
	cn = 48
	fn = 66
	n=0, $3 \leq n \leq 90$
[Default]	n = 0
[Description]	Sets the number of rows for PDF417.

<Function 067> GS (k pL pH cn fn n (cn = 48, fn = 67)

[Function]	PDF417: Set the width of the module
[Format]	ASCII GS (k pL pH cn fn n
	Hex 1D 28 6B 03 00 30 43 n
	Decimal 29 40 107 3 0 48 67 n
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)
	cn = 48
	fn = 67
	$2 \leq n \leq 8$
[Default]	n = 3
[Description]	Sets the width of the module for PDF417 to n dots

<Function 068> GS (k pL pH cn fn n (cn = 48, fn = 68)

[Function]	PDF417: Set the row height
[Format]	ASCII GS (k pL pH cn fn n Hex 1D 28 6B 03 00 30 44 n Decimal 29 40 107 3 0 48 68 n
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0) cn = 48 fn = 68 $2 \leq n \leq 8$
[Default]	n = 3
[Description]	Set the row height for PDF417 to [n × (the width of the module)]

<Function 069> GS (k pL pH cn fn n (cn = 48, fn = 69)

[Function]	PDF417: Set the error correction level
[Format]	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]	$(pL + pH \times 256) = 4$ (pL = 4, pH = 0) cn = 48 fn = 69 m = 48, 49 $48 \leq n \leq 56$ [when m = 48] $1 \leq n \leq 40$ [when m = 49]
[Default]	m = 49, n = 1
[Description]	<ul style="list-style-type: none"> •Sets the error correction level for PDF417. •When m = 48, the error correction level is set by the “Level Setting” and the error correction level set by “Ratio Setting” is canceled. The number of error correction codewords are as follows: <ul style="list-style-type: none"> • When m = 49, the error correction level is set by the “Ratio Setting” to the level indicated by the number for encoded data, and the error correction level set by the “Level Setting” is canceled. The rate is set to [n × 10%]. <p>The error correction levels in the following table are determined by the calculation $[Data\ codeword \times n \times 0.1 = (A)]$ (Fractions of 0.5 and over are rounded up, and others are truncated.)</p>

n	Function	number of error correction codewords
48	Select error correction level0	2
49	Select error correction level1	4
50	Select error correction level2	8
51	Select error correction level3	16
52	Select error correction level4	32
53	Select error correction level5	64
54	Select error correction level6	128
55	Select error correction level7	256
56	Select error correction level8	512

Result(A)	Use the error correction level	number of error correction codewords
0~3	Error correction level1	4
4~10	Error correction level2	8
11~20	Error correction level3	16
21~45	Error correction level4	32
46~100	Error correction level5	64
101~200	Error correction level6	128
201~400	Error correction level7	256
401 or more	Error correction level8	512

<Function 080> GS (k pL pH cn fn m d1...dk (cn = 48, fn = 80)

[Function]	PDF417: Store the data in the symbol storage area									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
	Hex	1D	28	6B	pL	pH	30	50	30	d1...dk
	Decimal	29	40	107	pL	pH	48	80	48	d1...dk
[Range]	$4 \leq (pL + pH \times 256) \leq 65535$ ($0 \leq pL \leq 255, 0 \leq pH \leq 255$)									
	cn = 48									
	fn = 80									
	m = 48									
	$0 \leq d \leq 255$									
[Description]	$k = (pL + pH \times 256) - 3$									
	Stores the PDF417 symbol data (d1...dk) in the symbol storage area									

<Function 081> GS (k pL pH cn fn m (cn = 48, fn = 81)

[Function]	PDF417: Print the symbol data in the symbol storage area
[Format]	ASCII GS (k pL pH cn fn m
	Hex 1D 28 6B 03 00 30 51 m
	Decimal 29 40 107 3 0 48 81 m
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)
	cn = 48
	fn = 81
	m = 48
[Description]	Encodes and prints the PDF417 symbol data in the symbol storage area with GS (k <Function 080>.
[Note]	<ul style="list-style-type: none"> • User must secure the quiet zone (left, right, upward, and downward space areas defined by the PDF417 symbol specifications) for PDF417 printing. • In standard mode, symbols higher than 831 dots cannot be printed with this printer.

<Function 082> GS (k pL pH cn fn m (cn = 48, fn = 82)

[Function]	PDF417: Transmit the size information of the symbol data in the symbol storage area
[Format]	ASCII GS (k pL pH cn fn m
	Hex 1D 28 6B 03 00 30 52 m
	Decimal 29 40 107 3 0 48 82 m
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)
	cn = 48
	fn = 82
	m = 48
[Description]	Transmit the size information for the encoded PDF417 symbol data in the symbol storage area with GS (k <Function 080>.
[Note]	<ul style="list-style-type: none"> • This function does not print. • The size information does not include the quiet zone (left, right, upward, and downward space areas defined by the PDF417 symbol specifications).

<Function 167> GS (k pL pH cn fn n (cn = 49, fn = 67)

[Function]	QR Code: Set the size of module									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n	
	Hex	1D	28	6B	03	00	31	43	n	
	Decimal	29	40	107	3	0	49	67	n	
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0) cn = 49 fn = 67 $1 \leq n \leq 16$									
[Default]	n = 3									
[Description]	Set the size of the module for QR Code to n dots									

<Function 169> GS (k pL pH cn fn n (cn = 49, fn = 69)

[Function]	QR Code: Select the error correction level									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n	
	Hex	1D	28	6B	03	00	31	45	n	
	Decimal	29	40	107	3	0	49	69	n	
[Range]	$(pL + pH \times 256) = 3$ (pL = 3, pH = 0) cn = 49 fn = 69 $48 \leq n \leq 51$									
[Default]	n = 48									
[Description]	<ul style="list-style-type: none"> Selects the error correction level for QR Code. 									

n	Function	Reference: Approx. figure of recovery
48	Select error correction level L	7 %
49	Select error correction level M 1	15 %
50	Select error correction level Q 2	25 %
51	Select error correction level H 3	30 %

<Function 180> GS (k pL pH cn fn m d1...dk (cn = 49, fn = 80)

[Function]	QR Code: Store the data in the symbol storage area									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	m	d1...dk
	Hex	1D	28	6B	pL	pH	31	50	30	d1...dk
	Decimal	29	40	107	pL	pH	49	80	48	d1...dk
[Range]	$4 \leq (pL + pH \times 256) \leq 7092$ ($0 \leq pL \leq 255$, $0 \leq pH \leq 27$) cn = 49 fn = 80 m = 48 $0 \leq d \leq 255$ $k = (pL + pH \times 256) - 3$									
[Description]	Store the QR Code symbol data (d1...dk) into the symbol storage area									

<Function 181> GS (k pL pH cn fn m (cn = 49, fn = 81)

[Function]	QR Code: Print the symbol data in the symbol storage area									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	m	
	Hex	1D	28	6B	03	00	31	51	m	
	Decimal	29	40	107	pL	pH	cn	fn	m	
[Range]	$(pL + pH \times 256) = 3$ ($pL = 3$, $pH = 0$) cn = 49 fn = 81 m = 48									
[Description]	Encodes and prints the QR Code symbol data in the symbol storage area with GS (k <Function 180>.									
[Note]	User must secure the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications) for QR Code printing.									

<Function 182> GS (k pL pH cn fn m (cn = 49, fn = 82)

[Function] QR Code: Transmit the size information of the symbol data in the symbol storage area

[Format]

ASCII	GS	(	k	pL	pH	cn	fn	m
Hex	1D	28	6B	03	00	31	52	m
Decimal	29	40	107	3	0	49	82	m

[Range]

$(pL + pH \times 256) = 3$ (pL = 3, pH = 0)

cn = 49

fn = 82

m = 48

[Description] •Transmits the size information for the encoded QR Code symbol data in the symbol storage area with GS (k <Function 180>.

[Note]

- This function does not print data.
- The size information does not include the quiet zone (left, right, upward, and downward space areas defined by the QR Code symbol specifications).

8 Mechanical Control Commands

GS V

[Function] Select cut mode and cut paper

[Format]

<A> ASCII	GS	V	m
Hex	1D	56	m
Decimal	29	86	m
 ASCII	GS	V	m n
Hex	1D	56	m n
Decimal	29	86	m n

[Range]

<A> m = 0, 1, 48, 49

 m = 65, 66, 0 < n ≤ 255

[Description] Executes paper cutting specified by m.

[Note] This printer executes a partial cut (one point left uncut), as follows:

m	Function	
<A>	0, 48	Executes a full cut (cuts the paper completely).
	1,49	Executes a partial cut (one point left uncut).
	65, 66	Feeds paper to (cutting position + [n × (vertical motion unit)]) and cuts the paper.

ESC i

[Function] Partial cut (one point left uncut)

[Format]

ASCII	ESC	i
Hex	1B	69
Decimal	27	105

[Range] None

[Default] None

[Description] Executes a partial cut of the roll paper.

[Notes]

- See [GS V <Function A>](#) for details.
- The cutting shape depends on the specification of the mounted auto cutter.

ESC m

[Function]	Partial cut (three points left uncut)		
[Format]	ASCII	ESC	m
	Hex	1B	6D
	Decimal	27	109
[Range]	None		
[Default]	None		
[Description]	Executes a partial cut of the roll paper.		
[Notes]	■ See GS V <Function A> for details.		
	■ The cutting shape depends on the specification of the mounted auto cutter.		

ESC u

[Function]	Transmit peripheral device status
[Format]	ASCII ESC u n Hex 1B 75 n Decimal 27 117 n
[Range]	n = 0, 48
[Description]	Transmits the peripheral device status as 1 byte of data.
[Recommended Functions]	This command is supported only by some printer models but will not be supported by future models. It is recommended to use GS r 2 to check the status and GS r to transmit the peripheral device status.
[Note]	■ ESC u is not a recommended command. ESC u will not be included in future products. ■ The peripheral device status to be transmitted is as follows:

Bit	Binary	Hex	Decimal	Status
0	0	00	0	Drawer kick-out connector pin 3 is LOW.
	1	01	1	Drawer kick-out connector pin 3 is HIGH.
1-3	—	—	—	Undefined.
4	0	00	0	Not used. Fixed to Off.
5, 6	—	—	—	Undefined.
7	0	00	0	Not used. Fixed to Off.

9 Line Spacing Commands

ESC 3

[Function]	Set line spacing		
[Format]	ASCII	ESC 3	n
	Hex	1B 33	n
	Decimal	27 51	n
[Range]	$0 \leq n \leq 255$		
[Default]	In case of 203dpi $n = 34$		
	In case of 180dpi $n = 30$		
[Description]	Sets the line spacing to $n \times$ (vertical or horizontal motion unit).		
[Notes]	<ul style="list-style-type: none"> ■ The maximum line spacing is 1016 mm {40 inches}. If the specified amount exceeds 1016 mm {40 inches}, the line spacing is automatically set to 1016 mm {40 inches}. ■ When standard mode is selected, the vertical motion unit is used. ■ When page mode is selected, the vertical or horizontal motion unit is used for the print direction set by ESC T. • When the starting position is set to the upper left or lower right of the print area using ESC T, the vertical motion unit is used. • When the starting position is set to the upper right or lower left of the print area using ESC T, the horizontal motion unit is used. ■ The line spacing can be set independently in standard mode and in page mode. • In standard mode this command sets the line spacing of standard mode. • In page mode this command sets the line spacing of page mode. ■ When the motion unit is changed after the line spacing is set, the line spacing setting does not change. ■ Selected line spacing is effective until ESC 2 is executed, ESC @ is executed, the printer is reset, or the power is turned off. 		

10. Miscellaneous Commands

ESC S

[Function] Select standard mode

[Format]

ASCII	ESC S
Hex	1B 53
Decimal	27 83

[Range] None

[Default] None

[Description] Switches from page mode to standard mode.

- [Notes]**
- This command is enabled only in page mode. Page mode can be selected by **ESC L**.
 - When this command is executed, data in all the print areas is cleared, the print area set by **ESC W** returns to the default value, but the value set by **ESC T** is maintained.
 - The following commands switch the settings for standard mode because these commands can be set independently in standard mode and in page mode:
 - **ESC SP, ESC 2, ESC 3, ESC U, and FS S.**
 - In standard mode, **CAN, ESC FF, GS \$, GS Q** and **GS ** are ignored.
 - The settings of **ESC T** and **ESC W, GS (P** do not affect printing in standard mode.
 - The printer selects page mode with **ESC L**.
 - Standard mode is selected as the default.

11.KANJI Commands

FS !

[Function]	Select print mode(s) for Kanji characters		
[Format]	ASCII	FS	S n
	Hex	1C	21 n
	Decimal	28	33 n
[Range]	$0 \leq n \leq 255$		
[Default]	n = 0		
[Description]	Selects the character styles (double-height, double-width, and Kanji-underlined) together for multi-byte code character as follows:		
[Notes]	<ul style="list-style-type: none"> ■ Settings of this command affect multilingual characters and user-defined characters. ■ Settings of this command are effective until any of the following commands are executed, ESC @ is executed, the printer is, or the power is turned off. <ul style="list-style-type: none"> • Character size (bits 2 and 3): FS W, GS ! • Underline (bit 7): FS – ■ When a double-height mode is specified, a character is enlarged based on a baseline of the character. ■ When a double-width mode is specified, a character is enlarged based on the left side of the character. ■ When both double-width and double-height modes are specified, quadruple-size characters are printed. ■ When double-height mode is selected in standard mode, a character is enlarged in the paper feed direction and when double-width mode is selected, a character is enlarged in the direction which is perpendicular to the paper feed direction. Therefore, when 90° clockwise-rotation is selected, the relationship between directions of enlargement of double-height and double-width is opposite from normal direction. ■ When double-height mode is selected in page mode, height size is enlarged and when double-width mode is selected in page mode, width size is enlarged. ■ When Kanji underline mode is specified, the width of the underline set by FS – is added. Even if the character size is changed, the width is not changed. The underline has the same color as the characters. The color can be selected by Function 48 of GS (N. ■ Even if Kanji underline mode is specified, 90° clockwise-rotated characters, white/black reverse characters, and spaces skipped by HT, ESC \$, or ESC \ are not underlined. 		

n: Bit	Function	Binary	Hexadecimal	Decimal
0	Reserved	Off	00	0
1	Reserved	Off	00	0
2	Double-width canceled	Off	00	0
	Double-width selected	On	04	4
3	Double-height canceled	Off	00	0
	Double-height selected	On	08	8
4~6	Reserved	Off	00	0
7	Kanji underline mode is turned off	Off	00	0
	Kanji underline mode is turned on	On	80	128

FS &

[Function] Select Kanji character mode

[Format] ASCII FS &
Hex 1C 26
Decimal 28 38

[Description] Selects Kanji character mode.

[Notes]

- This command can be used only for the Japanese, Hangeul, Simplified Chinese, and Traditional Chinese models.
- Settings of this command are effective until **FS .** is executed, **ESC @** is executed, the printer is reset, or the power is turned off.

FS -

[Function]	Select print mode(s) for Kanji characters
[Format]	ASCII FS - n Hex 1C 2D n Decimal 28 45 n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$
[Default]	n = 0
[Description]	Turns on or off underline mode for multi-byte code character (Kanji-underline), using n as follows:
[Notes]	<ul style="list-style-type: none"> Settings of this command affect multilingual characters and user-defined characters. The underline has the same color as the characters. Even if Kanji underline mode is specified, 90° clockwise-rotation characters, white/black reverse characters, and spaces skipped by HT, ESC \$, or ESC \ are not underlined. When a character size is changed, an underline width is not changed. When underline mode is canceled, the following characters are not underlined; however, an underline width set right before the mode is canceled remains. Settings of this command are effective until FS ! is executed, ESC @ is executed, the printer is reset, or the power is turned off.

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

FS .

[Function] Cancel Kanji character mode

[Format]

ASCII	FS .
Hex	1C 2E
Decimal	28 46

[Description] Cancels Kanji character mode.

[Notes]

- This command can be used only for the Japanese, Hangeul, Simplified Chinese, and Traditional Chinese models.
- Settings of this command are effective until **FS &** is executed, **ESC @** is executed, the printer is reset, or the power is turned off.

FS 2

- [Function]** Define user-defined Kanji characters
- [Format]**
- | | | | | | |
|---------|----|----|-----------|-----------|----------------|
| ASCII | FS | 2 | c1 | c2 | d1...dk |
| Hex | 1C | 32 | c1 | c2 | d1...dk |
| Decimal | 28 | 50 | c1 | c2 | d1...dk |
- [Range]** The ranges of c1 and c2 differ, depending on models and the character code system used. The ranges of c1 and c2 for each model are as follows.
 $0 \leq d \leq 255$
- [Description]** Defines the user-defined Kanji character pattern specified by the character codes (c1 and c2) of the currently selected Kanji font.
- c1 specifies the first byte of a character code for a user-defined Kanji character.
 - c2 specifies the second byte of a character code for a user-defined Kanji character.
 - d specifies the defined data (column format).
 - k indicates the number of defined data. k is an explanation parameter; therefore, it does not need to be transmitted.
- [Notes]**
- This command is effective only for the Japanese, Simplified Chinese, Traditional Chinese, and Korean models.
 - The printer processes **k** byte data of **d1...dk** as defined data. The defined data (**d**) sets a corresponding bit to 1 to print a dot or to 0 not to print a dot.
 - The number of characters to be defined differ, depending on the printer models.
 - Different user-defined characters can be defined for each Kanji character. Kanji fonts can be specified by function 48 of **FS (A)**.
 - Defined data is effective until it is redefined, **ESC @** is executed, the printer is reset, or the power is turned off.
 - User-defined characters are not defined and space is printed at the default.

Models	c1	c2
Japanese model (JIScode)	c1 = 77H	21H ≤ c2 ≤ 7EH
Japanese model (SHIFT JIS code)	c1 = ECH	40H ≤ c2 ≤ 7EH, 80H ≤ c2 ≤ 9EH
Simplified Chinese model	c1 = FEH	A1H ≤ c2 ≤ FEH
Traditional Chinese model	c1 = FEH	A1H ≤ c2 ≤ FEH
Korean model	c1 = FEH	A1H ≤ c2 ≤ FEH

FS W

[Function]	Turn quadruple-size mode on/off for Kanji characters			
[Format]	ASCII	FS	W	n
	Hex	1C	57	n
	Decimal	28	87	n
[Range]	$0 \leq n \leq 255$			
[Default]	$n = 0$			
[Description]	Turns quadruple-size mode on or off for multi-byte code character. <ul style="list-style-type: none"> • When the LSB of n is 0, quadruple-size mode is turned off and normal size is specified. • When the LSB of n is 1, quadruple-size mode is turned on. 			
[Notes]	<ul style="list-style-type: none"> ■ Settings of this command affect multilingual characters and user-defined characters. ■ When a double-height mode is specified, a character is enlarged based on a baseline of the character and when a double-width mode is specified, a character is enlarged based on the left side of the character. ■ Settings of this command are effective until FS ! is executed, GS ! is executed, ESC @ is executed, the printer is reset, or the power is turned off. 			

12. Other Commands

FS q n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n & FS p n m [obsolete command]

GS (L <Function 69>, which is the upward-compatible command replacing FS p, is recommended to use, since FS p is an obsolete command in the ESC/POS command system.

[Function] Print NV bit image

[Format]

ASCII	FS	p	n	m
Hex	1C	70	n	m
Decimal	28	112	n	m

[Range] $1 \leq n \leq 255$

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

[Description] Prints NV bit image n using the process of FS q and using the mode specified by m.

m	Mode	Vertical direction	Horizontal direction
0,48	Normal 1	203dpi	203dpi
1,49	Double-width 1	203dpi	101dpi
2,50	Double-height 9	101dpi	203dpi
3,51	Quadruple 9	101dpi	101dpi

GS v 0 m xL xH yL yH d1...dk [obsolete command]

GS (L <Function 112 and 50>, which is the upward-compatible command replacing GS v 0, is recommended to use, since GS v 0 is an obsolete command in the ESC/POS command system.

[Function] Print raster bit image

[Format]

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

[Range] $0 \leq m \leq 3, 48 \leq m \leq 51$

$1 \leq (xL + xH \times 256) \leq 65535 \quad (0 \leq xL \leq 255, 0 \leq xH \leq 255)$

$1 \leq (yL + yH \times 256) \leq 2303 \quad (0 \leq yL \leq 255, 0 \leq yH \leq 8)$

$0 \leq d \leq 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256)$

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

• xL, xH specify the number of bytes in the horizontal direction as $(xL + xH \times 256)$.

• yL, yH specify the number of dots in the vertical direction as $(yL + yH \times 256)$.

• d specifies the defined data (raster format)

[Note] • Frequent write command executions by an NV memory write command may damage the NV memory. Therefore, it is recommended to limit writing the commands into the NV memory to less than 10 times a day.

- If the power is turned off or the printer is reset via an interface while this command is being executed, the printer may go into an abnormal condition. Do not turn the power off or do not reset the printer via an interface while this command is being executed.
- While processing this command, the printer may become BUSY while writing the data to the NV memory and stops receiving data. Therefore, do not transmit data from the host computer while the printer is BUSY.

m	Mode	Vertical direction	Horizontal direction
0,48	Normal	203dpi	203dpi
1,49	Double-width	203dpi	101dpi
2,50	Double-height	101dpi	203dpi
3,51	Quadruple	101dpi	101dpi

(nL + nH × 256)		Maintenance counter [Units]
Hex	Decimal	
14	20	Number of lines fed. [Lines]
15	21	Number of head energization. [Times]
32	50	Number of auto cutter operations. [Times].
46	70	Duration of printer operation. [Hours].

ESC 2

[Type]	Line spacing		
[Function]	Select default line spacing		
[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50
[Description]	Sets the line spacing to approximately 4.23 mm {30×0.125mm}		