POSX

POINT OF SALE SIMPLIFIED



ION TP5 & ION TP5 Pro

Printer Programing Guide

ESC/POS Commands

v1.2

REVISION RECORDS

Rev.	DATE	DESCRIPTION	F/W
1.0	2016.11.03	Preliminary	V1.00.06.01
1.1	2016.11.11	A.Modify command “ESC p m t1 t2”(P29) B.Modify command “GS I n” (P30) C.Add reference to command “DC2 (S fn n (fn=32)” (P61) D.Modify command “GS F nL nH” (P62) E.Add notes to the command “GS G nL nH”(P63)	V1.00.06.01
1.2	2016.11.16	A.Modify firmware version number and add bootloader version number on ‘Revision Records’ (P2)	V1.00.14 (Bootloader: V1.00.05)

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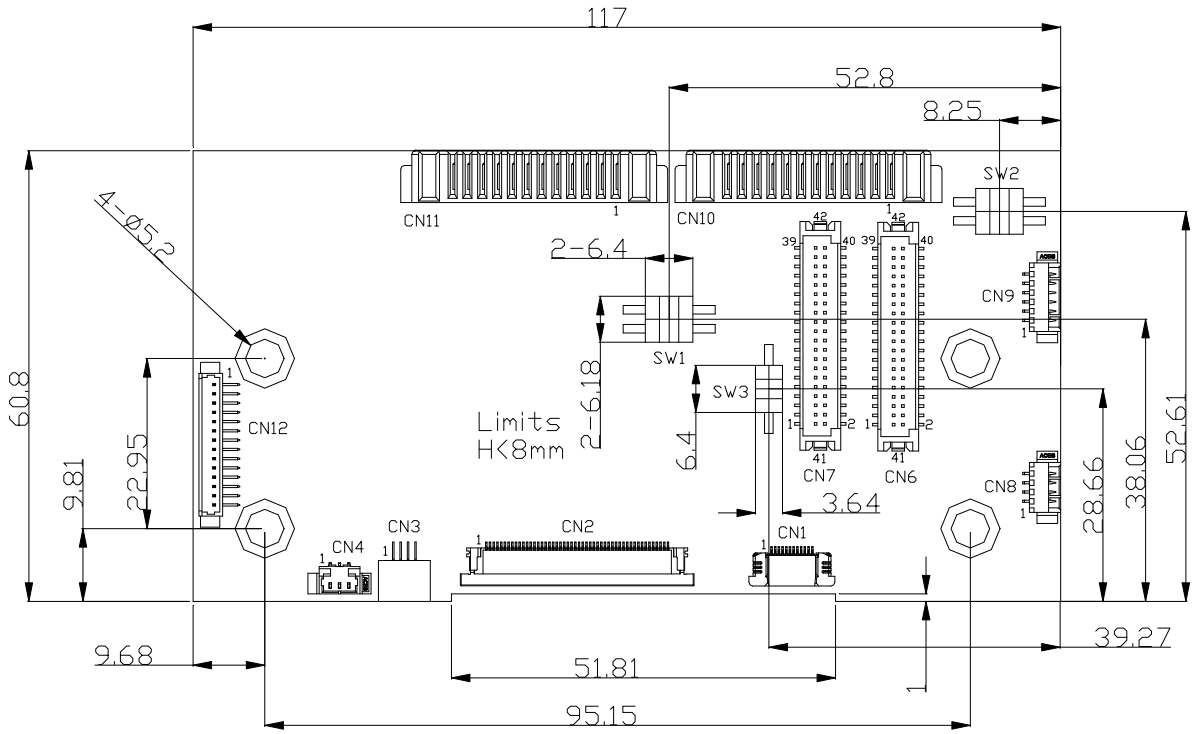
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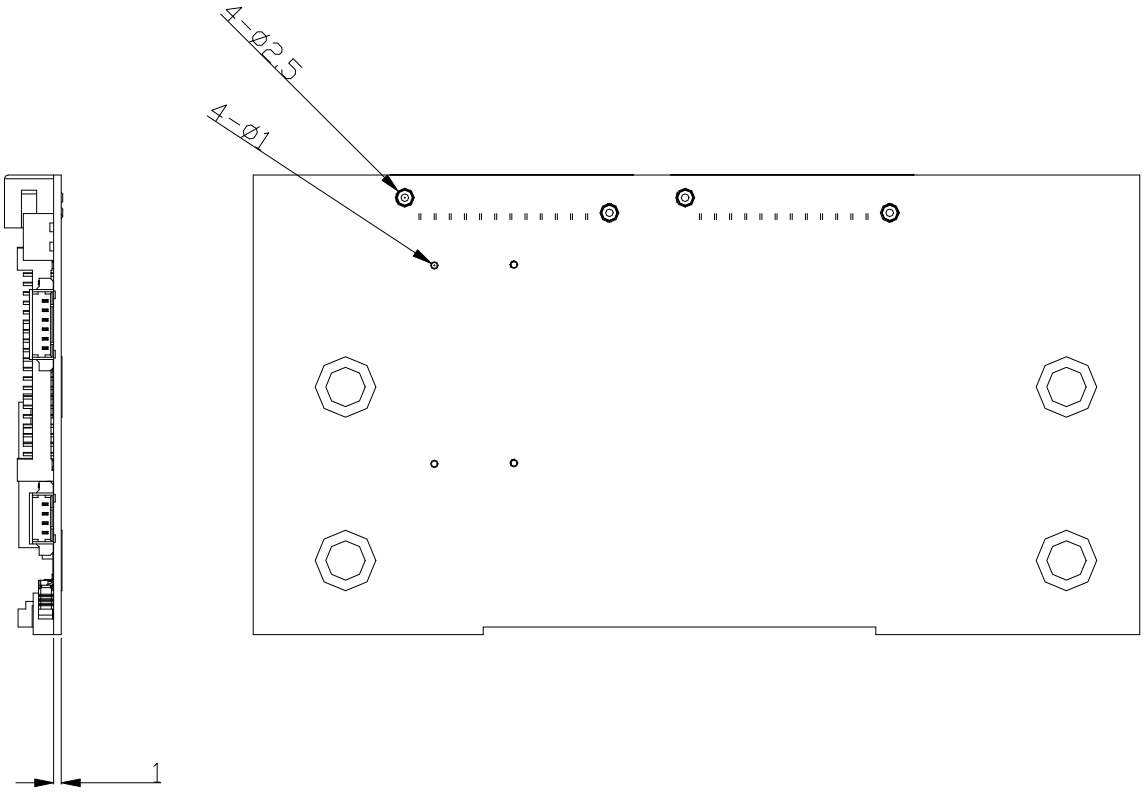
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1. Dimension Chart

[UNIT:mm]





2. Pin Assignments

2.1 Autocutter Pin Assignment

CN1：FPC/12PIN/0.5MM/90 UP/SMD/DRAWER LOCK

No.	Signal name	No.	Signal name	No.	Signal name
1	NC	5	$\overline{B}$	9	B
2	V_{CS}	6	$\overline{B}$	10	B
3	GND	7	$\overline{A}$	11	A
4	CUTS	8	$\overline{A}$	12	A

2.2 Thermal Print Head Pin Assignment

CN2：FPC/50PIN/0.5MM/90 UP/SMD/DRAWER LOCK

No.	Signal name	No.	Signal name	No.	Signal name
1	VP	18	VDD	35	VP
2	VP	19	TH2	36	VP
3	VP	20	TH2	37	VP
4	VP	21	TH1	38	NC
5	VP	22	NC	39	PS
6	VP	23	$\overline{DST2}$	40	V_{PS}
7	DI	24	$\overline{DST1}$	41	GND
8	CLK	25	GND	42	HS
9	GND	26	GND	43	NC
10	GND	27	GND	44	FG
11	GND	28	GND	45	FG
12	GND	29	GND	46	NC
13	GND	30	GND	47	$\overline{A}$
14	GND	31	$\overline{LAT}$	48	B
15	NC	32	VP	49	A
16	$\overline{DST4}$	33	VP	50	$\overline{B}$
17	$\overline{DST3}$	34	VP	--	--

2.3 Black Mark Connector Pin Assignment

CN3：FPC/4PIN/1.0MM/90 DOUBLE CONTACT/SMD/NO LOCK

No.	Signal name
1	+3.3V
2	MARK_SNS
3	GND
4	NC

2.4 Paper Near End Connector Pin Assignment

CN4：MH/3PIN/1.25MM/180/SMD

No.	Signal name
1	+3.3V
2	PAPER_NEAR_END_SNS
3	GND

2.5 USB, RS232, Power and Drawer Connector Pin Assignment

CN6：MH/2*20PIN/1.25MM/180/SMD

No.	Signal name	No.	Signal name	No.	Signal name
1	NC	15	NC	29	GND
2	+19V	16	GND	30	DCIN_VBAT(1A)
3	RS232_CTS	17	GND	31	SOC_USB0_ID
4	IPAD_CONTROL	18	GND	32	DCIN_VBAT(1A)
5	RS232_TX	19	Print_USB_D-	33	DS#_CN
6	GND	20	GND	34	+3.3V(1A)
7	RS232_TX	21	Print_USB_D+	35	DR
8	GND	22	GND	36	+3.3V(1A)
9	RS232_RX	23	GND	37	TB_DET_5VGND
10	GND	24	GND	38	+24V_VP(1A)
11	GND	25	SOC_USB0_D-	39	+5V_VBUS(1A)
12	GND	26	DCIN_VBAT(1A)	40	+24V_VP(1A)
13	NC	27	SOC_USB0_D+	41	+19V(1A)
14	GND	28	DCIN_VBAT(1A)	42	+24V_VP(1A)

2.6 USB and Power Connector Pin Assignment

CN7：MH/2*20PIN/1.25MM/180/SMD

No.	Signal name	No.	Signal name	No.	Signal name
1	NC	15	NC	29	GND
2	+19V	16	GND	30	DCIN_VBAT(1A)
3	NC	17	GND	31	SOC_USB0_ID
4	IPAD_CONTROL(1A)	18	GND	32	DCIN_VBAT(1A)
5	NC	19	NC	33	NC
6	GND	20	GND	34	+3.3V(1A)
7	NC	21	NC	35	NC
8	GND	22	GND	36	+3.3V(1A)
9	NC	23	GND	37	TB_DET_5VGND
10	GND	24	GND	38	+24V_VP(1A)
11	NC	25	SOC_USB0_D-	39	NC
12	GND	26	DCIN_VBAT(1A)	40	NC
13	NC	27	SOC_USB0_D+	41	GND
14	GND	28	DCIN_VBAT(1A)	42	+24V_VP(1A)

2.7 USB Connector Pin Assignment

CN8：MH/4PIN/1.25MM/90/SMD

No.	Signal name
1	VDD_5V
2	D-
3	D+
4	GND

2.8 Indicator and Key Connector Pin Assignment

CN9：MH/6PIN/1.25MM/90/SMD

No.	Signal name
1	Power LED
2	GND
3	Out of Paper LED
4	Error LED
5	Feed Button
6	GND

2.9 USB and Power Connector Pin Assignment

CN10：VBAT CONNECTOR 12PIN/2MM/180/DIP/CONNER STAND

No.	Signal name	No.	Signal name	No.	Signal name
1	GND	5	NC	9	5V_INPUT(2A)
2	24V_01(2A)	6	NC	10	USB_D-
3	24V_02(2A)	7	NC	11	USB_D+
4	GND	8	NC	12	GND

2.10 USB and Power Connector Pin Assignment

CN11：VBAT CONNECTOR 12PIN/2MM/180/DIP/CONNER STAND

No.	Signal name	No.	Signal name	No.	Signal name
1	GND	5	RS232_RTS	9	GND
2	RS232_RX	6	RS232_DSR	10	DR
3	RS232_TX	7	RS232_DTR	11	DDS#_CN
4	RS232_CTS	8	GND	12	GND

2.11 USB and Power Connector Pin Assignment

CN12：MH/14PIN/1.25MM/180/SMD

No.	Signal name	No.	Signal name	No.	Signal name
1	+3.3V	6	WIFI_MISO	11	WIFI_CTS
2	+3.3V	7	WIFI_SCLK	12	WIFI_RTS
3	GND	8	WIFI_CS	13	WIFI_RXD
4	GND	9	WIFI_MOSI	14	WIFI_TXD
5	WIFI_CLKREQ	10	WIFI_nReload	--	--

3. Switch Setting

SW1:

CD Select(SW1)		
SW1	MOS on Print Board	MOS on I/O Board
1	ON	OFF
2	OFF	ON

SW2:

COM Select(SW2)		
SW2	COM	USB to COM
1	OFF	ON
2	ON	OFF

SW3:

5V Input Select(SW3)		
SW3	40p conn.	12p conn.
1	OFF	ON

4. Electrical Characteristics

1) Supply voltage: 24V

2) Current consumption (at 24V, maximum simultaneously activated dot is 96, 25℃（77℉）)

Six-part energization mode:

Mean: Approximately 0.5A

Peak: Approximately 2.0A

Standby:

Mean: Approximately 0.02A

5. 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 ≤ (nL + nH × 256) ≤ 2047

(0 ≤ nL ≤ 255, 0 ≤ nH ≤ 7)

0 ≤ d ≤ 255

k = nL + nH × 256 [when m = 0, 1]

k = (nL + nH × 256) × 3 [when m = 32, 33]

[Description]

• Stores the bit image data in the print buffer using the bit image mode specified by m.

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

• nL, nH specifies the number of dots of the image data in the horizontal direction as (nL + nH × 256).

• d specifies the bit image data (column format).

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 ≤ x ≤ 255

1 ≤ y ≤ 48 [where 1 ≤ x × y ≤ 1536]

0 ≤ d ≤ 255

k = x × y × 8

[Description]

• Defines the downloaded bit image in the downloaded graphic area.

• x specifies the number of bytes in the horizontal direction as x bytes.

• y specifies the number of bytes in the vertical direction as y bytes.

• d specifies the defined data (column format).

[Note]

•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 ≤ m ≤ 3, 48 ≤ m ≤ 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]

• 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]

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)

[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>.

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 × 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 × 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 × 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 × 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	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

[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	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

32 ≤ kc1 ≤ 126

32 ≤ kc2 ≤ 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 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

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

12 ≤ (p1 + p2 × 256 + p3 × 65536 + p4 × 16777216) ≤ 4294967295

(0 ≤ p1 ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)

Common parameters for GS (L and GS 8 L:

m = 48

fn = 67

a = 48

32 ≤ kc1 ≤ 126

32 ≤ kc2 ≤ 126

b = 1 [when single-color print control is selected]

1 ≤ (xL + xH × 256) ≤ 8192 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 32)

1 ≤ (yL + yH × 256) ≤ 2304 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 9)

c = 49 [when single-color print control is selected]

0 ≤ d ≤ 255

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

The entire capacity size = 256 KB maximum.

[Description]

• 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 × 256).

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

• c specifies the color of the defined data.

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

• d specifies the defined data (raster format).

[Notes]

• In cases where there is sufficient capacity is not available for storing NV graphics data specified by (xL + xH × 256) and (yL + yH × 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.

<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 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

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

11 ≤ (p1 + p2 × 256 + p3 × 65536 + p4 × 16777216) ≤ 4294967295

(0 ≤ p1 ≤ 255, 0 ≤ p2 ≤ 255, 0 ≤ p3 ≤ 255, 0 ≤ p4 ≤ 255)

Common parameters for GS (L and GS 8 L:

m = 48

fn = 112

a = 48

bx = 1, 2; by = 1, 2

c = 49 [when single-color print control is selected]

1 ≤ (xL + xH × 256) ≤ 2047 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 7)

When single-color print control is selected

1 ≤ (yL + yH × 256) ≤ 1662 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 6) [when by=1]

1 ≤ (yL + yH × 256) ≤ 831 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 3) [when by=2]

When two-color print control is selected

1 ≤ (yL + yH × 256) ≤ 831 (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 3) [when by=1]

1 ≤ (yL + yH × 256) ≤ 415 (0 ≤ yL ≤ 255, yH = 0,1) [when by=2]

0 ≤ d ≤ 255

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

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

- 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).

6. 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 ≤ (nL + nH × 256) ≤ 65535
(0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255)

[Description] Moves the print position to [(nL + nH × 256) × (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 ≤ n ≤ 3, 48 ≤ n ≤ 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≤(nL + nH × 256)≤65535 (0≤nL≤255, 0≤nH≤255)

[Description] In page mode, moves the vertical print position to [(nL + nH × 256) × (vertical or horizontal motion unit)] from the starting position set with **ESC T.**

ESC \ nL nH

[Function] Set relative print position

[Format]

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

[Range] -32768 ≤ (nL + nH × 256) ≤ 32767

[Description]
- Moves the print position to [(nL + nH × 256) × (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 ≤ (xL + xH × 256) ≤ 65535; (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 255)
0 ≤ (yL + yH × 256) ≤ 65535; (0 ≤ yL ≤ 255, 0 ≤ yH ≤ 255)
1 ≤ (dxL + dxH × 256) ≤ 65535; (0 ≤ dxL ≤ 255, 0 ≤ dxH ≤ 255)
1 ≤ (dyL + dyH × 256) ≤ 65535; (0 ≤ dyL ≤ 255, 0 ≤ dyH ≤ 255)

[Default]
(xL + xH × 256) = 0 (xL = 0, xH = 0)
(yL + yH × 256) = 0 (yL = 0, yH = 0)
(dxL + dxH × 256) = 576 (dxL = 0, dxH = 2)
[80 mm paper width model]
(dxL + dxH × 256) = 384 (dxL = 104, dxH = 4)
[58 mm paper width model]
(dyL + dyH × 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 × 256) × (horizontal motion unit)] from absolute origin.
- yL, yH specify the vertical logical origin as [(yL + yH × 256) × (vertical motion unit)] from absolute origin.
- dxL, dxH specify the horizontal dimension of print area as [(dxL + dxH × 256) × (horizontal motion unit)].
- dyL, dyH specify the vertical dimension of print area as [(dyL + dyH × 256) × (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 ≤ n ≤ 2, 48 ≤ n ≤ 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 ≤ n1 ≤ n2 ≤ ... ≤ nk ≤ 255

0 ≤ k ≤ 32

[Default] n = 8, 16, 24, 32, 40, ..., 232, 240, 248

[for Font A (12 × 24) in a standard character size width]

[Description]

- 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 ≤ (nL + nH × 256) ≤ 65535 (0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255)

[Default] (nL + nH × 256) = 0 (nL = 0, nH = 0)

[Description] In standard mode, sets the left margin to [(nL + nH × 256) × (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 ≤ (nL + nH × 256) ≤ 65535 (0 ≤ nL ≤ 255, 0 ≤ nH ≤ 255)

[Default] (nL + nH × 256) = 576 (nL = 40, nH = 2) [80 mm paper width model]

(nL + nH × 256) = 406 (nL = 80, nH = 1) [58 mm paper width model]

[Description] In standard mode, sets the print area width to [(nL + nH × 256) × (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 ≤ (nL + nH × 256) ≤ 32767

[Description]

- In page mode, moves the vertical print position to [(nL + nH × 256) × (vertical or horizontal motion unit)] from the current position.
- A positive number specifies downward movement, and a negative number specifies upward movement.

7. 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 ≤n ≤ 255

[Description] Prints the data in the print buffer and feeds the paper [n × (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 ≤n ≤ 255

[Description] Prints the data in the print buffer and feeds the paper [n × (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 × 256) = 2 (pL = 2, pH = 0)

0 ≤ n ≤ 2, 48 ≤ n ≤ 50

1 ≤ m ≤ 3, 49 ≤ m ≤ 51

[Description]

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

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

- m specifies a test pattern.

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

[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.)

GS (K <Function 49>

[Function] Select the print density

[Format]

ASCII	GS	(	K	pL	pH	fn	m
Hex	1D	28	4B	02	00	31	m
Decimal	29	49	75	2	0	49	m

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

fn=49

[Default] m=0

[Description] Selects the print density by m.

m	**Function**
250≤m≤255	Slightly light
m=0	normal
0＜m＜6	Slightly dark
m=6	dark

8. Miscellaneous Function Commands

DLE ENQ n

[Function] Send real-time request to printer

[Format]

ASCII	DLE	ENQ	n
Hex	10	05	n
Decimal	16	5	n

[Range] n = 1, 2

[Description] Respond to a request in real-time from the host computer.

n	Function
1	Recovers from a recoverable error and restarts printing from the line where the error occurred. • This command is ignored unless a recoverable error has occurred.
2	Recovers from a recoverable error after clearing the receive and print buffers. • This command is ignored unless a recoverable error has occurred.

[Note]

• Use this command after removing the cause of the error.

• Take the following into consideration:

• If the received data includes a data string matching this command, the printer performs the 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.

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 = n

[Function] Select peripheral device

[Format]

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

[Range] 0≤ n ≤255

[Default] n = 1

[Description] • Selects the device to which the host computer transmits data.

n	Function
1,3	Enables printer.
2	Disables printer.

• When the printer is disabled (n = 2), all data except this command and the real-time commands are ignored.

ESC S

[Function] Select standard mode

[Format]

ASCII	ESC	S
Hex	1B	53
Decimal	27	83

[Description] Switches from page mode to standard mode

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, 48

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.

• 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.

GS I n

[Function] Transmit printer ID

[Format]

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

[Range] n = 1, 2, 49, 50 [the printer ID]

65 ≤ n ≤ 69 [printer information B]

[Description] • Transmits the printer ID or the information of the printer specified.

• The printer IDs that can be specified are as follows:

n	Type of printer ID	ID
1,49	Printer model ID	Hexadecimal: 20 / Decimal: 32
2,50	Type ID	See table [Type ID].

Type ID

Bit	Off / On	HEX	Decimal	Content
0	Off	00	0	Multi-byte code characters not supported.
	On	01	1	Multi-byte code characters supported
1	On	02	2	Auto cutter Installed. (Fixed)
2,3	____	____	____	Not used.
4	Off	00	0	Fixed.
5	____	____	____	Reserved.
6	____	____	____	Not used.
7	Off	00	0	Fixed.

• The information B that can be specified is as follows:

n	Type of printer information	Content
65	Firmware version	Depends on firmware version.
66	Manufacturer	HPRT
67	Printer name	CAPD347
68	Product ID	Serial number.
69	Type of mounted additional fonts	Japanese model: “KANJI JAPANESE”
		Simplified Chinese model: “CHINA GB18030”
		Traditional Chinese model: “TAIWAN BIG-5”
		Korean model: “KOREA EUC”

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

There are three kinds of font library as follows:

A.Simple Chinese+Traditional Chinese+codepage

B.Japanese+codepage

C.Korean+codepage

The firmware supports the above font libraries and users need to download them accordingly. Please note that codepage in these three font libraries are different.

GS P x y

[Function] Set horizontal and vertical motion units

[Format]

ASCII	GS	P	x y
Hex	1D	50	x y
Decimal	29	80	x y

[Range] 0 ≤ x ≤ 255

0 ≤ y ≤ 255

[Default] x = 203, y = 406

[Description]

• Sets the horizontal and vertical motion units to approximately 25.4/x mm {1/x"} and approximately 25.4/y mm {1/y"}, respectively.

• When x = 0, the default value of the horizontal motion unit is used.

• When y = 0, the default value of the vertical motion unit is used.

GS (E pL pH fn [parameters])

[Function] Set user setup commands

[Description]
- Controls the user setting modes.
- pL, pH specify (pL + pH ×256) as the number of bytes after pH (fn and [parameters]).
- fn specifies the function.
- [parameters] specify the process of each function.

fn	Format	Function No.	Function name
1	GS (E *pL pH fn d1 d2*	1	Change into the user setting mode.
2	GS (E *pL pH fn d1 d2 d3*	2	End the user setting mode session.
5	GS (E *pL pH fn* *[a1 n1L n1H] ... [ak nkL nkH]*	5	Set the customized setting values.
6	GS (E *pL pH fn a*	6	Transmit the customized setting values.

[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 1, 6, or 12> is transmitted, the data following must not be transmitted until the status is received.

<Function 1> GS (E pL pH fn d1 d2 (fn = 1)

[Function] Change into the user setting mode

[Format]

ASCII	GS	(	E	pL	pH	fn	d1	d2
Hex	1D	28	45	pL	pH	fn	d1	d2
Decimal	29	40	69	pL	pH	fn	d1	d2

[Range]
(pL + pH × 256) = 3 (pL = 3, pH = 0)
fn = 1
d1 = 73
d2 = 78

[Description] Enters the user setting mode and transmits a mode change notice.

<Function 2>GS (E pL pH fn d1 d2 d3 (fn = 2)

[Function] End the user setting mode session

[Format]

ASCII	GS	(	E	pL	pH	fn	d1	d2	d3
Hex	1D	28	45	pL	pH	fn	d1	d2	d3
Decimal	29	40	69	pL	pH	fn	d1	d2	d3

[Range] (pL + pH × 256) = 4 (pL = 4, pH = 0)

fn = 2

d1 = 79

d2 = 85

d3 = 84

[Description]
- Ends the user setting mode and performs a software reset.
- Clears 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 are not reset.)

<Function 5>GS (E pL pH fn [a1 n1L n1H]...[ak nkL nkH] (fn = 5)

[Function] Set the customized setting values

[Format]

ASCII	GS	(	E	pL	pH	fn	[a1	n1L	n1H] ...	[ak	nkL	nkH]
Hex	1D	28	45	pL	pH	fn	[a1	n1L	n1H] ...	[ak	nkL	nkH]
Decimal	29	40	69	pL	pH	fn	[a1	n1L	n1H] ...	[ak	nkL	nkH]

[Range] 4≤(pL + pH×256)≤65533 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

fn = 5; a = 8, 9

0 ≤ (nL+nH×256) ≤ 5, 13 ≤ (nL+nH×256) ≤ 21, (nL+nH×256) = 26, 32 ≤ (nL+nH×256) ≤ 34, (nL+nH×256) = 36, 37, 39, 40, 45 ≤ (nL+nH×256) ≤ 52, 54 ≤ (nL+nH×256) ≤ 63 (nL+nH×256) = 1257 [a=8]

0 ≤ (nL+nH×256) ≤ 15 [a=9]

[Description]
- Sets the customized value specified by a to the values specified by (nL + nH × 256).

a	Type of customized value
8	Default character code table
9	Default international character

<Function 6> GS (E pL pH fn a (fn = 6)

[Function] Transmit the customized setting values

[Format]

ASCII	GS	(	E	pL	pH	fn	a
Hex	1D	28	45	pL	pH	fn	a
Decimal	29	40	69	pL	pH	fn	a

[Range] (pL + pH × 256) = 2 (pL = 2, pH = 0)

fn = 6

a = 8, 9

[Description] Transmits the customized value specified by a.

a	Type of customized value
8	Default character code table
9	Default international character

9. Character Control Commands

ESC ! n

[Function] Select print mode(s)

[Format]

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

[Range] 0 ≤ n ≤ 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 (8 × 16) 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 ≤ n ≤255

[Default] n = 0

[Description]
- 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 & y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]

[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 ≤ c1 ≤ c2 ≤ 126

0 ≤ x ≤ 12 [when Font A (12 × 24) is selected]

0 ≤ x ≤ 9 [when Font B (8 × 16) is selected]

0 ≤ d ≤ 255

k = c2 – c1 +1

[Description]

- Define the user-defined character pattern for the specified character code
- 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 edge.
- d specifies the defined data(column format).

[Note]

- User-defined characters and a downloaded bit image cannot be defined simultaneously.when this command is executed,the download bit image is deleted.

ESC ? n

[Function] Cancel user-defined characters

[Format]

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

[Range] 32 ≤n ≤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 ≤ n≤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 ≤ n ≤2, 48 ≤n ≤ 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 ≤ n ≤ 255

[Default] n = 0

[Description]
- 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 ≤ n ≤ 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 (8 × 16)

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 ≤ n ≤ 2, 48 ≤ n ≤ 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 ≤ n ≤ 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 ≤ n ≤ 255

[Default] n = 0

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

• When the LSB of n is 0, turns off double-strike mode.

• 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 ≤ n ≤ 255

[Default] n = 0

[Description]
- Turns white/black reverse print mode on or off.
- When the LSB of n is 0, turns off white/black reverse mode.
- 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≤n≤7, 16≤n≤23, 32≤n≤39, 48≤n≤55, 64≤n≤71,
80 ≤ n ≤ 87, 96 ≤ n ≤ 103, 112 ≤ n ≤ 119
(1≤Enlargement in vertical direction≤8, 1≤Enlargement in horizontal direction≤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.

[Height magnification]

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

[Width magnification]

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 ≤ n ≤ 5, 13 ≤ n ≤ 21, n = 26, 32 ≤ n ≤ 34, n = 36, 37, 39, 40, 45 ≤ n ≤ 52, 54 ≤ n ≤ 63

[Default] n = 0

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

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]

[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 and8×16 font.

FS ! n

[Function] Select character size

[Format]

ASCII	FS	!	n
Hex	1C	21	n
Decimal	28	33	n

[Range] 0≤n≤255

[Default] n = 0

[Description] Sets the print mode for characters, using n as follows:

Bit	Off/On	Hex	Decimal	Function
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	Off	00	0	Double-width mode is OFF.
	On	04	4	Double-width mode is ON.
3	Off	00	-	Double-height mode is OFF.
	On	08	8	Double-height mode is ON.
4	-	-	-	Undefined.
5	-	-	-	Undefined.
6	-	-	-	Undefined.
7	Off	00	0	Underline mode is OFF.
	On	80	128	Underline mode is ON.

[Note] When both double-width and double-height modes are set (including right- and left-side character spacing), quadruple-size characters are printed.

The printer can underline all characters (including right- and left-side character spacing), but cannot underline the space set by **HT** and 90° clockwise-rotated characters.

The thickness of the underline is that specified by **FS –**, regardless of the character size.

When some of the characters in a line are double or more height, all the characters on the line are aligned at the baseline.

It is possible to emphasize the Korean character using **FS W** or **GS !**; the setting of the last received command is effective.

It is possible to turn underline mode on or off using **FS –**, and the setting of the last received command is effective.

This command is effective for Chinese, Japanese and Korean characters, but ineffective for English characters and code page.

10. Macro Function Commands

GS :

[Function] Start/end macro definition

[Format]

ASCII	GS	:
Hex	1D	3A
Decimal	29	58

[Description] Starts or ends macro definition.

[Note] The contents of the macro can be defined up to 2048 bytes.

GS ^ r t m

[Function] Execute macro

[Format]

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

[Range] 1 ≤ r ≤ 255

0 ≤ t ≤ 255

m = 0, 1

[Description] Executes the macro that was defined with GS :.

m	Operation
0	Executes the macro r times continuously at an interval of [t × 100 ms].
1	After waiting for [t × 100 ms], flashes the LED indicator and waits for the FEED button to be pressed. After the button is pressed, executes the macro once. Then repeats the operation r times.

11. Status Commands

GS a n

[Function] Enable/disable Automatic Status Back (ASB)

[Format]

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

[Range] 0 ≤ n ≤ 255

[Default] n = 0

[Description] • Enables or disables basic ASB (Automatic Status Back).

(n)Bit	Off / On	Hex	Decimal	Function
0	Off	00	0	Drawer kick-out connector status disabled.
	On	01	1	Drawer kick-out connector status enabled.
1	Off	00	0	Online/offline status disabled.
	On	02	2	Online/offline status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Paper sensor status disabled.
	On	08	8	Paper sensor status enabled.
4-7	Off	00	0	Reserved.

• While basic ASB is active, the selected enabled basic ASB status is transmitted whenever the status changes.

• The basic ASB status to be transmitted is the four bytes that follow:

• First byte (printer information)

Bit	Off / On	Hex	Decimal	Status
0,1	Off	00	0	Fixed
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	Fixed
5	Off	00	00	Cover is closed.
	On	20	32	Cover is open.
6	Off	00	0	Paper is not being fed with the paper FEED button.
	On	40	64	Paper is being fed with the paper FEED button
7	Off	00	0	Fixed

• Second byte (printer information)

Bit	Off / On	Hex	Decimal	Status
0	—	—	—	Reserved.
1	On	02	2	Paper is not being fed with the paper FEED button.
	Off	00	0	Paper is being fed with the paper FEED button.
2	—	—	—	Reserved.
3	Off	00	0	No auto cutter error.
	On	08	8	Auto cutter error occurred.
4	Off	00	0	Fixed.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6	Off	00	00	No automatically recoverable error.
	On	40	64	Automatically recoverable error occurred.
7	Off	00	00	Fixed.

• Third byte (paper sensor information)

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	00	Fixed
5,6	—	—	—	Reserved.
7	Off	00	00	Fixed

• Fourth byte (paper sensor information)

Bit	Off / On	Hex	Decimal	Status
0-3	—	—	—	Reserved.
4	Off	00	00	Fixed
5,6	—	—	—	Reserved.
7	Off	00	00	Fixed

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

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

• This printer transmits the following status. :

• Paper sensor status (n = 1, 49)

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.

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

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.

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

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:

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.

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

DLE EOT n

[Function] Transmit real-time status

[Format]

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

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

[Description] Transmit the real-time status.

n	Function
1	Transmits printer status.
2	Transmits offline cause status.
3	Transmits error cause status.
4	Transmits roll paper sensor status.

• This printer transmits the following status in real time.

• Printer status (n = 1)

Bit	Off/On	Hex	Decimal	Status
0	Off	00	0	Fix as 0.
1	On	02	2	Fix as 1.
2	On	04	4	Reserved.
3	Off	00	0	Online
	On	08	8	Offline.
4	On	10	16	Fix as 1.
5	--	--	--	Reserved.
6	On	40	64	Paper is not being fed with the paper FEED button.
	Off	00	0	Paper is being fed with the paper FEED button.
7	Off	00	0	Fix as 0.

• Offline cause status (n = 2)

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.

• Error cause status (n = 3)

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.

• Roll paper sensor status (n = 4)

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

[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.

12. 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 ≤ n ≤ 255

[Default] n = 162

[Description] • 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 (8 × 16)

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 ≤ n ≤ 3, 48 ≤ n ≤ 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
<B> ASCII	GS	k	m	n	d1...dn
Hex	1D	6B	m	n	d1...dn
Decimal	29	107	m	n	d1...dn

[Range] <A> 0 ≤ m ≤ 6 (For the range of k and d, see [Description].)

<B> 65 ≤ m ≤ 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>

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

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

For <Function B>

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

[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.

GS w n

[Function] Set bar code width

[Format]

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

[Range] 1 ≤ n ≤ 6

[Range] n = 3

[Description]
- Sets the horizontal size of the bar code.

n	Multi-level bar code	Binary-level bar code	
	Module width (mm)	Thin element width (mm)	Thick element width (mm)
1	0.125	0.125	0.313
2	0.25	0.25	0.625
3	0.375	0.375	0.938
4	0.5	0.5	1.250
5	0.625	0.625	1.625
6	0.750	0.750	2

- 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

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.

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

cn	fn	Format	Function No.	Function name
48	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.
49	67	GS (k pL pH cn fn n	167	QR Code: Set the size of module.
	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.

[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.

<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	pL	pH	cn	fn	n
Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)

cn = 48

fn = 67

2 ≤ n ≤ 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	pL	pH	cn	fn	n
Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)

cn = 48

fn = 68

2 ≤ n ≤ 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	n
Hex	1D	28	6B	pL	pH	cn	fn	n
Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 4 (pL = 4, pH = 0)

cn = 48

fn = 69

m = 48, 49

48 ≤ n ≤ 56 [when m = 48]

1 ≤ n ≤ 40 [when m = 49]

[Default] m = 49, n= 1

[Description] •Sets the error correction level for PDF417.

•When m = 48, the error correction level is se t by the “Level Setting” and the error correction level set by “Ratio Setting” is canceled. The number of error correction codewords are as follows:

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

• 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%].

The error correction levels in the following table are determined by the calculation [Data codeword × n × 0.1 = (A)] (Fractions of 0.5 and over are rounded up, and others are truncated.)

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	cn	fn	m	d1…dk
Decimal	29	40	107	pL	pH	cn	fn	m	d1…dk

[Range] 4 ≤ (pL + pH × 256) ≤ 65535 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 255)

cn = 48

fn = 80

m = 48

0 ≤ d ≤ 255

k = (pL + pH × 256) – 3

[Description] 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	pL	pH	cn	fn	m
Decimal	29	40	107	pL	pH	cn	fn	m

[Range] (pL + pH × 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]
• 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	pL	pH	cn	fn	m
Decimal	29	40	107	pL	pH	cn	fn	m

[Range] (pL + pH × 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]
• 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	pL	pH	cn	fn	n
Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)
cn = 49
fn = 67
1 ≤ n ≤ 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	pL	pH	cn	fn	n
Decimal	29	40	107	pL	pH	cn	fn	n

[Range] (pL + pH × 256) = 3 (pL = 3, pH = 0)

cn = 49

fn = 69

48 ≤ n ≤ 51

[Default] n = 48

[Description] • 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	cn	fn	m	d1…dk
Decimal	29	40	107	pL	pH	cn	fn	m	d1…dk

[Range] 4 ≤ (pL + pH × 256) ≤ 7092 (0 ≤ pL ≤ 255, 0 ≤ pH ≤ 27)

cn = 49

fn = 80

m = 48

0 ≤ d ≤ 255

k = (pL + pH × 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	pL	pH	cn	fn	m
Decimal	29	40	107	pL	pH	cn	fn	m

[Range] (pL + pH × 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	pL	pH	cn	fn	m
Decimal	29	40	107	pL	pH	cn	fn	m

[Range] (pL + pH × 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).

13. 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	
<B>	ASCII	GS	V	m	n
	Hex	1D	56	m	n
	Decimal	29	86	m	n

[Range] <A> m = 0, 1, 48, 49

<B> m = 65, 66, 0 <n ≤ 255

[Description] Executes paper cutting specified by m.

m		Function
＜A>	0，48 1，49	Cuts paper.
＜B>	65，66	Feeds paper to (cutting position + [n × (vertical motion unit)]) and cuts the paper.

[Note] This printer executes a partial cut (one point left uncut).

14. Other Commands

FS p n m

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 ≤ n ≤ 255

0 ≤ m ≤ 3, 48 ≤ m ≤ 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

FS q n [xL xH yL yH d1...dk]1 ... [xL xH yL yH d1...dk]n

GS (L <Function 67>, which is the upward-compatible command replacing FS q, is recommended to use, since FS q is an obsolete command in the ESC/POS command system.

[Function] Define NV bit image

[Format]

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

[Range] 1 ≤ n ≤ 255

1 ≤ (xL + xH × 256) ≤ 1023 (0 ≤ xL ≤ 255, 0 ≤ xH ≤ 3)

1 ≤ (yL + yH × 256) ≤ 288 (0 ≤ yL ≤ 255, yH = 0,1)

0 ≤ d ≤ 255

k = (xL + xH × 256) × (yL + yH × 256) × 8

The entire capacity size = 256 KB.

[Description]

- Defines the NV bit image in the NV graphics area.
- n specifies the number of defined NV bit images.
- xL, xH specify the number of bytes in the horizontal direction as (xL+xH ×256).
- yL, yH specify the number of bytes in the vertical direction as (yL + yH × 256).
- d specifies the defined data (column 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 data to the NV memory and stops receiving data. Therefore, do not to transmit data from the host computer while the printer is BUSY.

• The printer executes a software reset after processing this command.

• Clear the receiver and print buffers.

• Resets all setting values in RAM (the print area, the character styles, user-defined characters, and others) that were in effect at power on. (The data in the NV memory are not reset.)

• NV bit image and NV graphics (GS (L/ GS 8 L) cannot be defined simultaneously. When this command is executed, all NV graphics are deleted.

GS v 0 m xL xH yL yH d1...dk

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]

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

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

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

$0 \le d \le 255$

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

[Description] • Prints a raster bit image 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
3,51	Quadruple	101dpi	101dpi

• xL, xH specify the number of bytes 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 defined data (raster format)

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 3.75 mm {30×0.125mm}

ESC 3 n

[Type] Line spacing

[Function] Set line spacing

[Format]

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

[Range] 0 ≤ n ≤ 255

[Default] Equivalent to approximately 3.75 mm n=30 {30×0.125mm}

[Description] Sets the line spacing to [n × (vertical or horizontal motion unit)]

[Note] The maximum is 1016 mm {40"}.

ESC c 4 n

[Type] Paper sensor

[Function] Selecting paper sensor to stop printing

[Format]

ASCII	ESC	c	4	n
Hex	1B	63	34	n
Decimal	27	99	52	n

[Range] 0 ≤ n ≤ 255

[Default] n = 0

[Description] Select the paper sensor(s) whether to use to stop printing or not when a paper end is detected.

(n)Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Roll paper near-end sensor disabled
	On	01	1	Roll paper near-end sensor enabled.
1	Off	00	0	Roll paper near-end sensor disabled
	On	02	2	Roll paper near-end sensor enabled.
2-7	Off	00	0	Reserved.

ESC c 5 n

[Type] Panel button

[Function] Enable/disable panel buttons

[Format]

ASCII	ESC	c	5	n
Hex	1B	63	35	n
Decimal	27	99	53	n

[Range] 0 ≤ n ≤ 255

[Default] n = 0

[Description]
- Enables or disables the panel buttons.
- When the LSB of n is 0, the panel buttons are enabled.
- When the LSB of n is 1, the panel buttons are disabled.

[Note]
- This command affects the FEED button.
- The FEED button is disabled regardless of the settings with this command, when the cover is open.

DC2 (S fn

[Function] User-defined commands

[Format]

ASCII	DC2	(	S	fn
Hex	12	28	53	fn
Decimal	18	40	83	fn

DC2 (S fn n (fn=32)

[Function] Select code mode

[Format]

ASCII	DC2	(	S	fn	n
Hex	12	28	53	fn	n
Decimal	18	40	83	fn	n

[Range] n = 0, 1. fn=32

[Description]

n	Character set
0	GBK
1	BIG5

[Note]
- When n=0, the printer will see the received characters as GBK code.
- When n=1, the printer will see the received characters as BIG5 code.

[Reference] **GS G nL nH**

GS F nL nH

[Function] SW Setting 1

[Format]

ASCII	GS	F	nL	nH
Hex	1d	46	nL	nH

[Description] nL corresponds to bit0—bit7

nH corresponds to bit8—bit15

Bit0—bit15 corresponding original dial switch 1-16

Corresponding relationship is showed as follow:

Analogy according to the following form：

Table 3.3.2.1 DIP SW1(DSW1)

Bit	SW No.	Function	On	off	Factory setting
0	1	BM sensor	Enable	Disable	Off
1, 2	2, 3	Interface selection	Reserved		Off
3	4	Serial interface Handshaking	XON/XOFF	DTR/DSR or CTS/RTS	Off(*)
4	5	Serial interface parity check	Yes	No	Off(*)
5	6	Serial interface parity selection	Even	odd	Off(*)
6-8	7-9	Serial interface baud rate selection	Refer to Table 3.3.2.1		115200
9-15	10-16	Reserved			Off

(*) Effective only when the serial interface is selected.

This is for **soft DIP** which supports baud rate setting.

Table 3.3.2.3 Baud Rate Selection

Transmission speed(BPS)	Bit 6	Bit7	Bit8
4800	High	High	Low
9600	Low	High	Low
19200	High	Low	Low
38400	Low	Low	Low
57600	low	Low	High
115200	high	Low	High
BPS : Bit Per Second			

GS G nL nH

[Function] SW Setting 2

[Format] ASCII GS 'G' nL nH

Hex 1d 47 nL nH

[Description] Bit0—bit15 corresponding original dial switch 1-16.

Corresponding relation：

Bit	SW No.	Function	ON	OFF	Factory setting
0, 1	1, 2	Reserved	Reserved		Off
2, 3	3, 4	Print density selection	Refer to Table 3.3.2.6		Off
4	5	Reserved	Reserved		Off
5	6	Paper near end detection	Enabled	Disabled	Off
6, 7	7, 8	Reserved	Reserved		Off
8	**9**	**Language**	**Multi-byte characters/codepage**		**Off**
9	10	Bell control	Disabled	Enabled	Off
10	11	Led control	Disabled	Enabled	Off
11-15	12-16	Reserved	Reserved		Off

*1: Fixed to off

*2: Effective only when the serial interface is selection.

*3: Multi-byte characters include three languages: Chinese, Japanese and Korean.

There are two kinds of Chinese fonts: simple Chinese and traditional Chinese.

When it comes to Chinese, users should choose multi-byte characters or codepage at first and then can choose what kind of Chinese font to use.

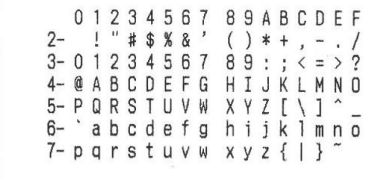
When it comes to Janpanese or Korean, users can choose directly.

Table 3.3.2.6 Print Density Selection

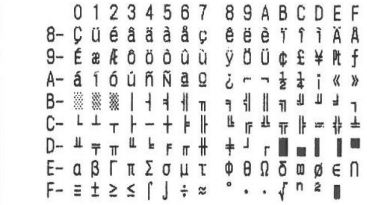
Level	Print Density	Bit	
		2	3
1	Slightly Light	On	On
2	Normal	Off	Off
3	Slightly dark	On	Off
4	Dark	Off	On

APPENDIX

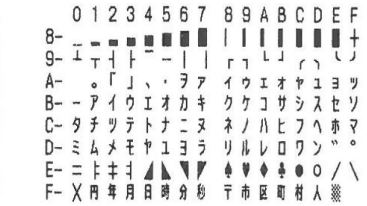
ASCII



PC437,USA



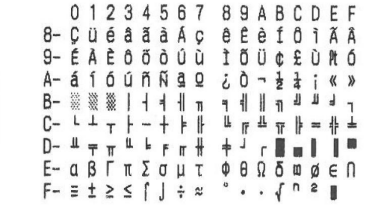
Katakana



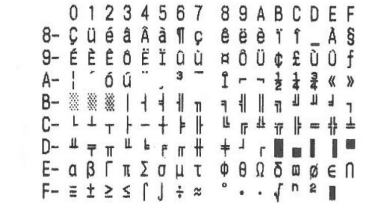
PC850,Multilingual



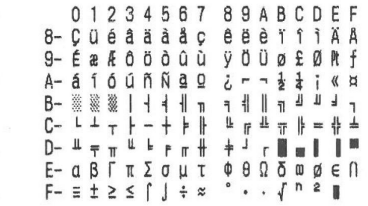
PC860,Portuguese



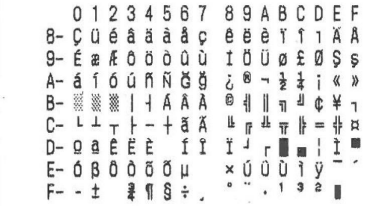
PC863,Canadian-French



PC865,Nordic



PC857,Turkish



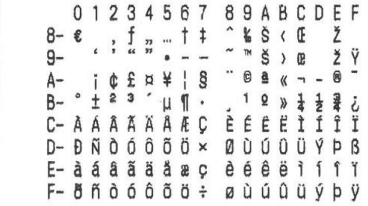
PC737,Greek



ISO8859-7,Greek



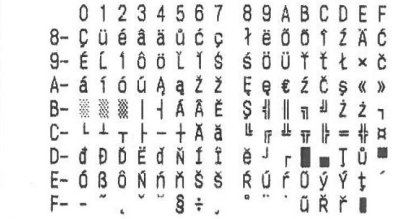
WPC1252



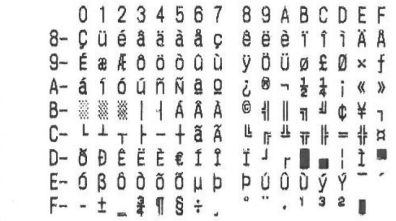
PC866,Russian



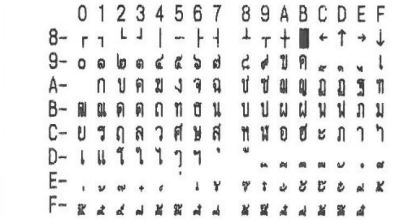
PC852,Latin 2



PC858,Euro



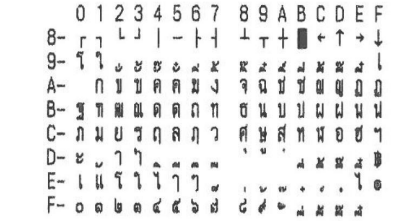
KU42,Thai



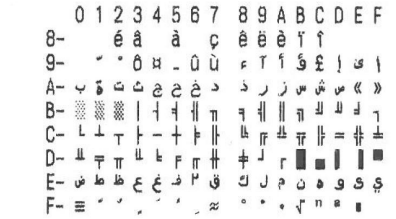
TIS11,Thai



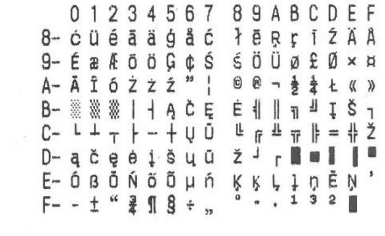
TIS18,Thai



PC720,Arabic



WPC775,Baltic Rim



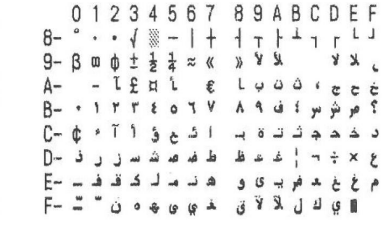
PC855,Cyrillic



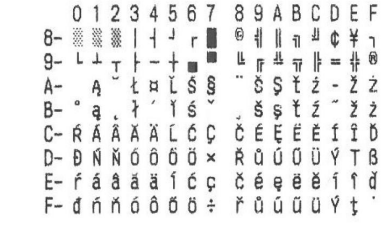
PC862,Hebrew



PC864,Arabic



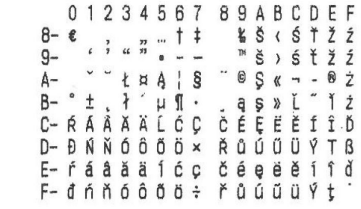
ISO8859-2,Latin2



ISO8859-15,Latin9



WPC1250,Latin 2



WPC1251,Cyrillic



WPC1253,Greek



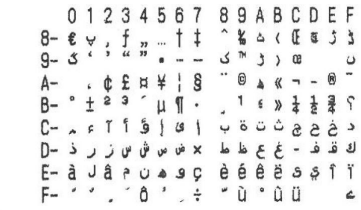
WPC1254,Turkish



WPC1255,Hebrew



WPC1256,Arabic



WPC1257,Baltic Rim



WPC1258,Vietnamese

