

CSN-A2 Micro panel printer's User Manual



Version4.0

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CAUTIONS

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1 General Specifications

ITEM	SPECIFICATION
Print method	thermal direct line printing
Paper loading method	easy paper loading
Paper width	58mm
Print width	48mm
Resolution ration	8dots/mm(384dots/line)
Life of printing head	50km
Printing speed	60mm/sec.; Max.:80MM/sec.(voltage 8.5V)
Character size	ANK: 9x17, 12x24; GBK: 24x24
Chinese character fonts	GB18030: 12x24 or 24x24dots
Outline dimension (WxHxD mm)	111x65x57
Installation(WxH mm):	103x57
Embedded depth	50 mm
Paper roll specification	(width:58mm, Max. diameter:39mm)
Interface	RS232C/TTL/parallel/USB
Input power	DC5-9V or 12V
Operating temperature	5°C~50°C
Storage temperature	-20°C~60°C
Operating humidity	10°C~80°C
Storage humidity	10°C~90°C

2 Features

- Low-noise direct thermal printing method
- Printer control panel built-in ANK character or GB18030 Chinese character, thoroughly remove the uncommon words of anguish
- Fast printing speed, low noise
- Can support Max.39mm (diameter) paper roll, which is biggest paper roll of the same models.
- Optional serial interface (RS232C/TTL)/parallel/USB port
- Rich of graphics / curves / characters print function
- Easy paper loading structure
- Support 5V-9V/12V wide power voltage

3 Printer outline pictures and dimension

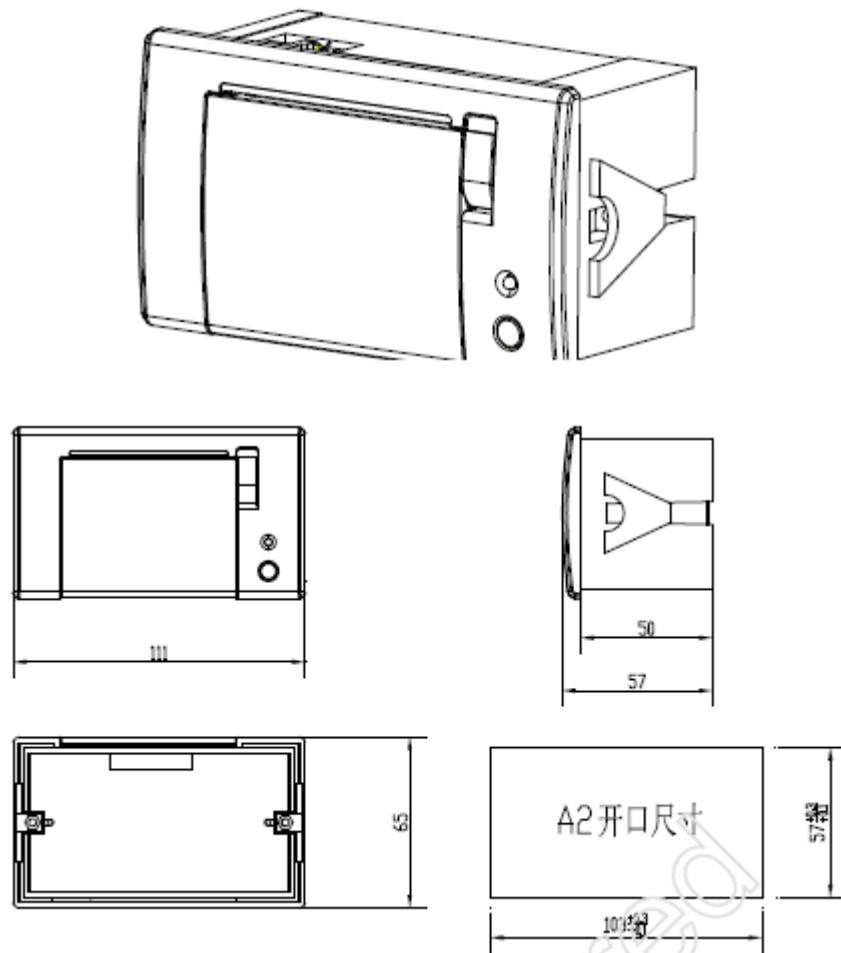
3.1 Outline pictures



- Outline dimension: 111W*65D*57H mm
- Front panel Size: 103 W*57H mm
- Embedded depth: 50 mm
- Max diameter of paper roll: 39 mm

3.2 Dimension

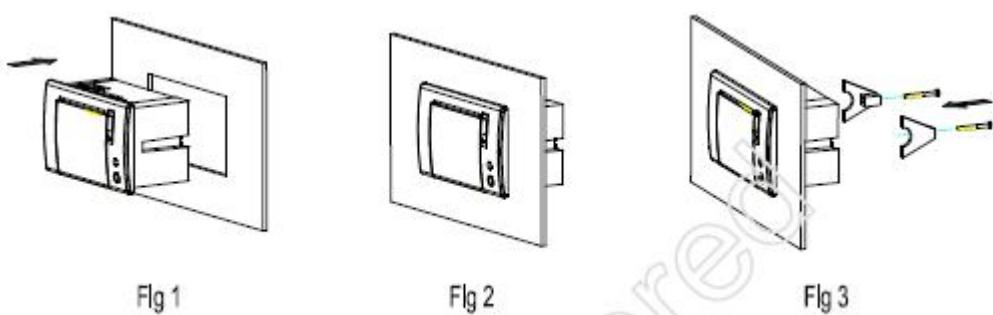
Outline is as follows:



The installation method:

Put the panel printer into the front of the device as per Fig.1 and Fig.2, and then install fixed block and screwing as per Fig.3

Note: have 1 to 6mm variation in thickness.



4 Operation specifications and print test

4.1 Operation specifications

A. the instruction of indicator light

Power on, the indicator light will flash 2 times, interval 1sec, it say the startness is OK, and

then the instructions for the indicator light as below:

- Blink once: Work well (Stay lit for some customized board)
- Blink twice: Printer mechanism is ununited or temperature is too low.
- Blink three times: No paper is detected
- Blink four times: Cutter is wrong (Just for board with cutter)
- Blink five times: Printer mechanism is overheated
- Blink six times: Roller didn't press well. (Just for board with roller detection.)
- Blink ten times: Flash device is wrong for the board

B. key instruction

The key on the panel printer is FEED key

C. how to change new paper roller

Before changing, turn up the switch, and put into the paper roller

4.2 Printing test

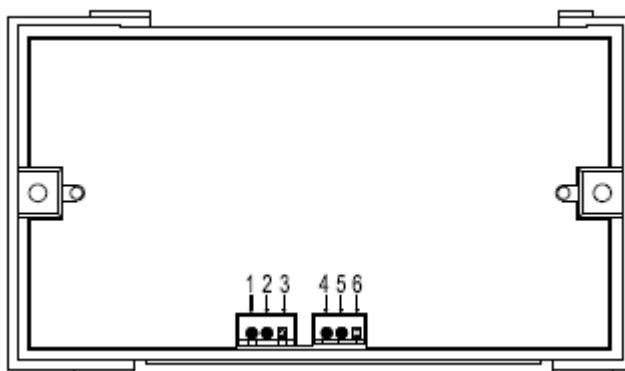
Power on, press the [feed] key, for a while, relax the key, it will print out one testing sample.

Power on, press key per time, it will feed the paper.

5 Connector

The user has option of RS232, TTL, USB and LPT interface.

5.1 TTL or RS232 connector

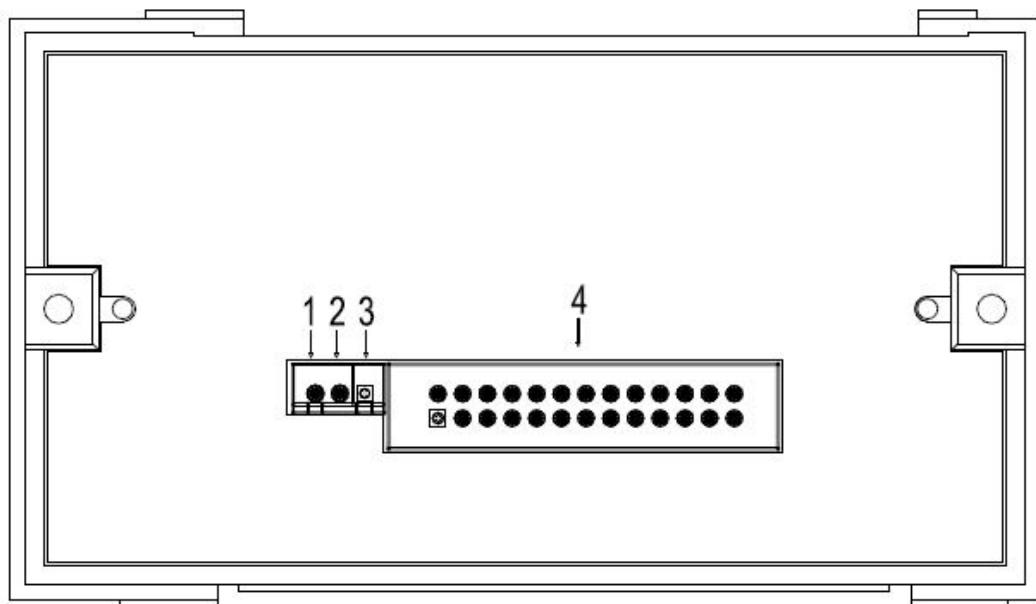


The define of the PIN of the interface for RS232, TTL as the following:

Pin number	Signal name
1	GND(Ground)
2	NULL

3	VH(input voltage , 5V-9V)
4	GND(Ground)
5	RXD(receive data)
6	TXD(send data)

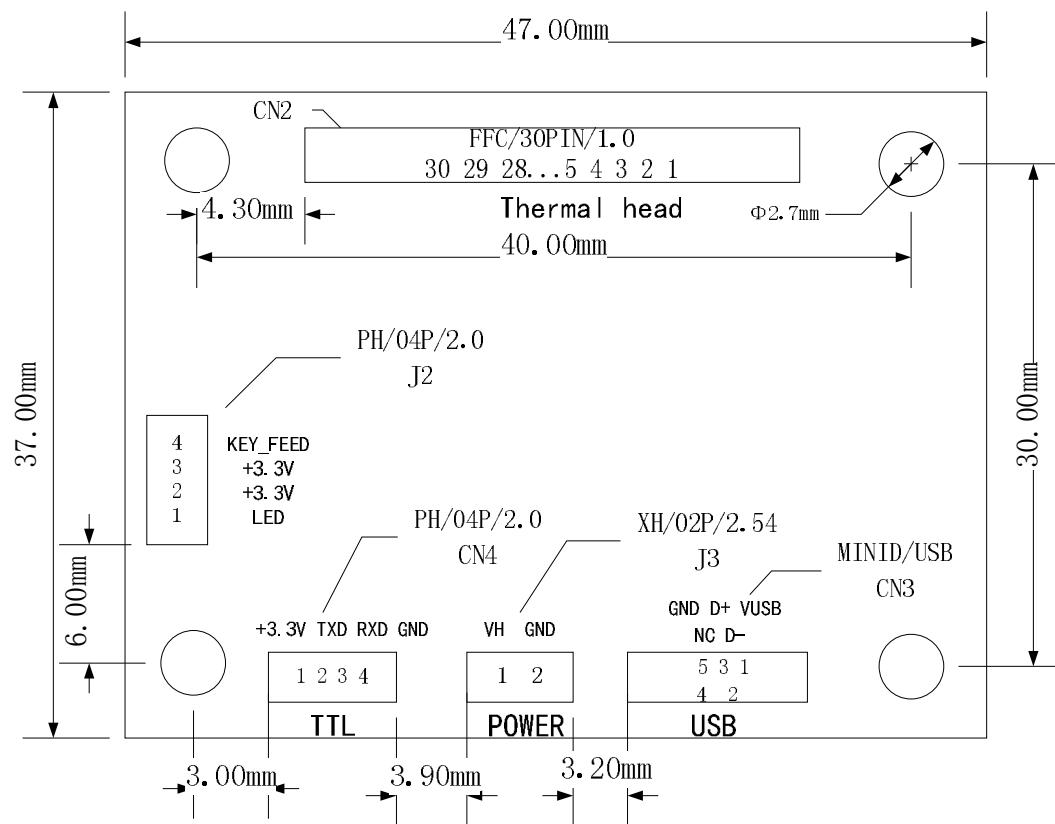
5.2 Parallel connector



The define of the Pin of LPT interface as below:

- 1 GND, Ground
- 2 VH, input voltage, 5V-9V
- 3 +5V, input voltage (general condition, only use +5Vm VH not input)
- 4 the definition of the Pin of LPT interface as below:
 1. STROBE
 - 2-9. DATA0-DATA7
 10. ACKNLG
 11. BUSY
 12. PE paper out
 13. SLCT selection
 14. AUTO FEED auto change line
 15. ERROR
 16. INIT
 17. SLCT IN
 - 18-26. GND

5.3 USB connector



5.3.1 J3 Power supply connector

Pin number	Signal name
1	VH
2	GND

5.3.2 CN4 TTL connector

Pin number	Signal name
1	+3.3V
2	Transmit data (TXD, printer output)
3	Receive data (RXD, printer input)
4	GND

5.3.3 CN3 USB /MINID connector

Pin number	Signal name
1	VUSB
2	D-
3	D+
4	NC
5	GND

5.3.4 J2 Integrated Keyboard functions:

Pin number	Signal name
1	LED
2	+3.3V
3	+3.3V
4	KEY_FEED

6 printer functions

CN1 FPC30/1.0

Pin number	Signal name	Function
1	PHK	Cathode of photo interruptor
2	VSEN	Photo-sensor power
3	PHE	Emitter for photo interruptor
4	MT/B	Step motor excitation signal
5	MT/B ⁻	Step motor excitation signal
6	MT/A	Step motor excitation signal
7	MT/A ⁻	Step motor excitation signal
8	VH	Head driver power
9	VH	Head driver power
10	DI	Data input
11	CLK	Aynchronous clock for communication
12	GND	Ground power supply for thermal head
13	GND	Ground power supply for thermal head
14	STB6	Thermal head energizing control signal
15	STB5	Thermal head energizing control signal
16	STB4	Thermal head energizing control signal
17	VDD	Logic power
18	TM	Thermally sensitive resistor input terminal 1
19	TM	Thermally sensitive resistor input terminal 2
20	STB3	Thermal head energizing control signal
21	STB2	Thermal head energizing control signal
22	STB1	Thermal head energizing control signal
23	GND	Ground power supply for thermal head
24	GND	Ground power supply for thermal head
25	\LAT	Data Latch
26	DO	Data output
27	VH	Power supply for thermal head
28	VH	Power supply for thermal head
29	N.C(101)SW1(103)	Platen release switch
30	N.C(101)SW2(103)	Platen release switch

7 Using attention

7.1 Please notice, the ESD wrist ring and the humidity manufatures ETC, when using the printer, to protect the inner elctrontic parts of the printer from the damage of ESD, because the TPH of the Printer and photoelectric sensor are ESD Sensitive parts.

7.2 For protecting plastic shaft, don't smear any oil or others on the rubber parts.

7.3 Don't touch the TPH, TPH having the palm oil, will induce the usage of the printer.If any oil or others in the TPH, pls using an alcohol cotton stick clean the area between plastic shaft and printer head at once.PS,Don't strike the TPH.

7.4 Due to the printer is easy-paper structure,you need pick up the rubber stick only push the rubber stick.So,if the paper jam,push harder will cause the rubber stick gearwheel damaged.so pls don't push the paper harder, pls do open the cover and re-fill the paper

7.5 The temperature of the TPH protection must be below 65 °C , if you print continuously,Because the exterior of the temperature of the IC protection & motor can't not over 90°C to protect the motor thread ring.

7.6 Pls use the good quality paper, because the sensetive of the paper will infuence print effect, meanwhile, rough paper will incease the excessive wear to the printer head, and reduce the life of the printer.

8 ESC/POS Printing Command Set

8.1 Command list

Type	Command	Name
Print Commands	<u>LF</u>	Print and line feed
	<u>CR</u>	Print and carriage return
	<u>HT</u>	Horizontal tab
	<u>FF</u>	Print the data in buffer
	<u>ESC D</u>	Set horizontal tab positions
	<u>ESC J n</u>	Print and Feed n dots paper
	<u>ESC d n</u>	Print and Feed n lines
	<u>ESC = n</u>	Set peripheral device
Line spacing setting Commands	<u>ESC 2</u>	Select default line spacing
	<u>ESC 3 n</u>	Set line spacing
	<u>ESC a n</u>	Select justification
	<u>GS L nL nH</u>	Set left margin
	<u>ESC \$ nL nH</u>	Set absolute print position

	<u>ESC B n</u>	Set Left Space
Character Commands	<u>ESC ! n</u>	Select print mode(s)
	<u>GS ! n</u>	Select character size
	<u>GS B n</u>	Turn white/black reverse printing mode
	<u>ESC V n</u>	Turn 90°clockwise rotation mode on/off
	<u>ESC G n</u>	Turn on/off double-strike mode
	<u>ESC E n</u>	Turn emphasized mode on/off
	<u>ESC SP n</u>	Set right-side character spacing
	<u>ESC SO n</u>	Select Double Width mode
	<u>ESC DC4 n</u>	Disable Double Width mode
	<u>ESC { n</u>	Turns on/off upside-down printing mode
	<u>ESC - n</u>	Set the underline dots(0,1,2)
	<u>ESC % n</u>	Select/Cancel user-defined characters
	<u>FS &</u>	Select Kanji character mode
	<u>FS .</u>	Cancel Kanji character mode
	<u>FS ! n</u>	Set print mode for Kanji characters
	<u>ESC &</u>	Define user-defined characters
	<u>ESC ? n</u>	Cancel user-defined characters
	<u>ESC R n</u>	Select and international character set
	<u>ESC t n</u>	Select character code table
Bit Commands	<u>ESC *</u>	Select bit-image mode
	<u>GS *</u>	Define downloaded bit image
	<u>GS / n</u>	Print downloaded bit image
	<u>GS v</u>	Print raster bit image
	<u>DC2 *</u>	Print the bitmap
	<u>DC2 V</u>	Print MSB bitmap
	<u>DC2 v</u>	Print LSB bitmap
	<u>FS p n m</u>	Print NV bitmap
Init Commands	<u>FS q n</u>	Define NV bitmap
	<u>ESC @</u>	Initialize printer
Status Commands	<u>GS r n</u>	Transmit status
	<u>GS a n</u>	Enable/Disable Automatic Status Back(ASB)
	<u>ESC v n</u>	Transmit paper sensor status
	<u>ESC u n</u>	Transmit peripheral device status (For drawer)
Bar Commands	<u>GS H n</u>	Select printing position for HRI characters
	<u>GS h n</u>	Set bar code height
	<u>GS w n</u>	Set bar code width
	<u>GS k</u>	Print bar code
	<u>GS x n</u>	Set barcode printing left space
Miscellaneous function commands	<u>ESC 7 n1 n2 n3</u>	Setting Control Parameter Command
	<u>ESC 8 n1 n2</u>	Select sleeping parameter
	<u>ESC 9 n</u>	Select Chinese code format
	<u>DC2 # n</u>	Set printing density

	<u>DC2 T</u>	Printing test page
	<u>FS t n</u>	Select Time out (for CB105B)
New commands	<u>DC2 E</u>	Feed Paper to Mark
	<u>DC2 m d IL IH</u>	Set Mark paper length
	<u>ESC C n</u>	Set BM Max (For BM)
	<u>GS FF</u>	Feed marked paper to print starting position (For BM)
	<u>ESC i</u>	Cut Paper (For cut)
	<u>ESC m</u>	Partial Cut Paper (For cut)
	<u>GS V</u>	Select cut mode and cut paper (For cut)
	<u>ESC p m</u>	Generate pulse (For drawer)
	<u>ESC c 5</u>	Enable/disable panel buttons (For button)
	<u>GS (F</u>	Set adjustment values(s) (For 701BM)
	<u>FS C</u>	Start receive buffer count (For cb65c)
	<u>FS S</u>	Send receive buffer count(For cb65c)
	<u>FS s</u>	save print parameter (for XBLY)
	<u>FS d</u>	Load default leaving factory set (for XBLY)

8.2 Command Detail

8.2.1 Print Commands

LF

[Name]	Print and line feed	
[Format]	ASCII:	LF
	Decimal:	10
	Hexadecimal:	0A
[Description]	Prints the data in the print buffer and feeds one line, based on the current line spacing.	
[Note]	This command sets the print position to the beginning of the line.	
[Reference]	ESC 2, ESC 3	

CR

[Name]	Print and carriage return	
[Format]	ASCII:	CR
	Decimal:	13
	Hexadecimal:	0D
[Description]	When automatic line feed is enabled, this command functions the same as LF ; when automatic line feed is disabled, this command is ignored.	
[Notes]	<ul style="list-style-type: none"> ● This command line feed is ignored with a serial interface model. ● Sets the print starting position to the beginning of the line. 	
[Reference]	LF	

HT

[Name]	Horizontal tab	
[Format]	ASCII:	HT
	Decimal:	9
	Hexadecimal:	09
[Description]	Moves the print position to the next horizontal tab position.	
[Notes]	<ul style="list-style-type: none"> ● This command is ignored unless the next horizontal tab position has been set. ● If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [printing area width+1]. ● Horizontal tab positions are set with ESC D. ● If this command is received when the printing position is at [printing area width+1], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line. 	
[Reference]	ESC D	

FF

[Name]	Print the data in buffer and locate to the next black mark	
[Format]	ASCII:	FF
	Decimal:	12
	Hexadecimal:	0c
[Description]	<ul style="list-style-type: none"> ● Print the data in the buffer. ● Locate to the black mark. 	
[Note]	Only board with black mark function support this command.	

ESC D n1...nk NUL

[Name]	Set horizontal tab positions	
[Format]	ASCII:	ESC D n1...nk NUL
	Decimal:	27 68 n1...nk 00
	Hexadecimal:	1B 44 n1...nk 00
[Range]	$1 \leq n \leq 255$ $0 \leq k \leq 32$	
[Description]	<p>Set horizontal tab positions.</p> <ul style="list-style-type: none"> ● n specifies the column number for setting a horizontal tab position from the beginning of the line. ● k indicates the total number of horizontal tab positions to be set. 	
[Note]	<ul style="list-style-type: none"> ● The horizontal tab position is stored as a value of [character width×n] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width 	

characters are set with twice the width of normal characters.

- This command cancels the previous horizontal tab settings.
- When setting n = 8, the print position is moved to column 9 by sending **HT**.
- Up to 32 tab positions (k=32) can be set. Data exceeding 32 tab positions is processed as normal data.
- Transmit [n]k in ascending order and place a NUL code 0 at the end.
- When [n]k is less than or equal to the preceding value [n]k-1, tab setting is finished and the following data is processed as normal data.
- **ESC D NUL** cancels all horizontal tab positions.
- The previously specified horizontal tab positions do not change, even if the character width changes.
- The character width is memorized for each standard mode.

[Default] The default tab positions are at intervals of 8 characters (columns 9, 17, 25...) for Font A (12×24).

[Reference] **HT**

ESC J n

[Name]	Print and feed paper
[Format]	ASCII: ESC J n Decimal: 27 74 n Hexadecimal: 1B 4A n
[Range]	0≤n≤255
[Description]	Prints the data in the print buffer and feeds the paper [n×0.125 mm (0.0049")].
[Notes]	<ul style="list-style-type: none"> ● After printing is completed, this command sets the print starting position to the beginning of the line. ● The paper feed amount set by this command does not affect the values set by ESC 2 or ESC 3. ● In standard mode, the printer uses the vertical motion unit (y).

ESC d n

[Name]	Print and feed n lines
[Format]	ASCII: ESC d n Decimal: 27 100 n Hexadecimal: 1B 64 n
[Range]	0≤n≤255
[Description]	Print the data in the buffer and feed paper n lines.

- [Notes]
- This command sets the print starting position to the beginning of the line.
 - This command does not affect the line spacing set by **ESC 2** or **ESC 3**.
 - The maximum paper feed amount is 1016 mm (40 inches). If the paper feed amount ($n \times$ line spacing) of more than 1016 mm (40 inches) is specified, the printer feeds the paper only 1016 mm (40 inches).
- [Reference] **ESC 2, ESC 3**

ESC = n

[Name]	Set peripheral device		
	ASCII:	ESC	= n
[Format]	Decimal:	27	61 n
	Hexadecimal:	1B	3d n

[Description] Set peripheral device:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Printer offline, not receive print data.
	On	01	1	Printer online, receive print data.
1-7	-	-	-	Undefined.

8.2.2 Line spacing setting commands

ESC 2

[Name]	Select default line spacing		
[Format]	ASCII:	ESC 2	
	Decimal:	27 50	
	Hexadecimal:	1B 32	
[Description]	Selects 3.75 mm (30×0.125 mm) line spacing.		
[Note]	The line spacing can be set independently in standard mode.		
[Reference]	ESC 3 n		

ESC 3 n

[Name]	Set line spacing		
[Format]	ASCII:	ESC 3 n	
	Decimal:	27 51 n	
	Hexadecimal:	1B 33 n	
[Range]	0≤n≤255		
[Description]	Sets the line spacing to [n×0.125 mm].		
[Note]	<ul style="list-style-type: none"> ● The line spacing can be set independently in standard mode. ● In standard mode, the vertical motion unit (y) is used. 		

[Default] n=30
 [Reference] **ESC 2**

ESC a n

[Name] Select justification
 [Format] ASCII: ESC a n
 Decimal: 27 97 n
 Hexadecimal: 1B 61 n
 [Range] 0≤n≤2, 48≤n≤50
 [Description] Aligns all the data in one line to the specified position.
 n selects the justification as follows:

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

[Note]

- The command is enabled only when processed at the beginning of the line in standard mode.
- This command executes justification in the printing area.
- This command justifies the space area according to **HT**, **ESC \$**.

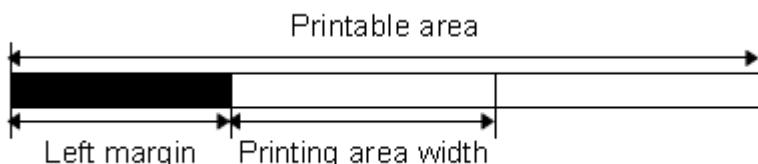
[Default] n=0

[Example]

Left justification	Centering	Right justification
ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE

GS L nL nH

[Name] Set left margin
 [Format] ASCII: GS L nL nH
 Decimal: 29 76 nL nH
 Hexadecimal: 1D 4c nL nH
 [Range] 0≤nL≤255
 0≤nH≤255
 [Description] Sets the left margin using nL and nH.
 The left margin is set to [(nL+nH×256) ×0.125 mm].



- [Note]
 - This command is effective only when processed at the beginning of the line in standard mode.
 - If the setting exceeds the printable area, the maximum value of the printable area is used.
- [Default] nL=0, nH=0

ESC B n

- [Name] Set left blank char numbers
- [Format] ASCII: ESC B n
 Decimal: 27 66 n
 Hexadecimal: 1B 42 n
- [Range] Default is 0
 $0 \leq m \leq 47$

ESC \$ nL nH

- [Name] Set absolute print positions
- [Format] ASCII: ESC \$ nL nH
 Decimal: 27 36 nL nH
 Hexadecimal: 1B 24 nL nH
- [Range] $0 \leq nL \leq 255$
 $0 \leq nH \leq 255$
- [Description] Set the distance from the beginning of the line to the position at which subsequent are to be printed.
 The distance from the beginning of the line to the print position is $[(nL+nH) \times 256] \times 0.125$ mm]
- [Note]
 - Settings outside the specified printable area are ignored.
 - In standard mode, the horizontal motion unit (x) is used.
- [Reference] **ESC \, GS \$, GS **

8.2.3 Character Setting Commands

ESC ! n

- [Name] Select print mode
- [Format] ASCII: ESC ! n
 Decimal: 27 33 n
 Hexadecimal: 1B 21 n
- [Range] $0 \leq n \leq 255$
- [Description] Selects print mode(s) using n as follows:

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Character Font A (12×24).

	On	01	1	Character Font B (9×17).
1	Off	00	0	Turn white/black reverse printing mode not selected.
	On	02	2	Turn white/black reverse printing mode selected.
2	Off	00	0	Turn on/off upside-down printing mode not selected.
	On	04	4	Turn on/off upside-down printing mode selected.
3	Off	00	0	Emphasized mode not selected.
	On	08	8	Emphasized mode selected.
4	Off	00	0	Double-height mode not selected.
	On	10	16	Double-height mode selected.
5	Off	00	0	Double-width mode not selected.
	On	20	32	Double-width mode selected.
6	Off	00	0	Turn Deleteline mode on/off not selected.
	On	40	64	Turn Deleteline mode on/off selected.
7	-	-	-	Undefined.

GS ! n

[Name]	Select character size
[Format]	ASCII: GS ! n
	Decimal: 29 33 n
	Hexadecimal: 1D 21 n
[Range]	0≤n≤255 (1≤vertical number of times≤8, 1≤horizontal number of times≤8)
[Description]	Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:

Bit	Off/On	Hex	Decimal	Function
0	Character height selection. See Table 2.			
1				
2				
3				
4	Character width selection. See Table 1.			
5				
6				
7				

Table 1
Character Width Selection

Hex	Decimal	Width
00	0	1(normal)
10	16	2(double-width)
20	32	3
30	48	4
40	64	5

Table 2
Character Height Selection

Hex	Decimal	Width
00	0	1(normal)
01	1	2(double-height)
02	2	3
03	3	4
04	4	5

50	80	6
60	96	7
70	112	8

05	5	6
06	6	7
07	7	8

- [Note]
- This command is effective for all characters (alphanumeric and Kanji), except for HRI characters.
 - If n is outside the defined range, this command is ignored.
 - In standard mode, the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90° clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.
 - When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.
 - The **ESC !** command can also turn double-width and double-height modes on or off. However, the setting of the last received command is effective.

[Default] n=0

[Reference] **ESC !**

GS B n

[Name] Turn white/black reverse printing mode

[Format] ASCII: GS B n

Decimal: 29 66 n

Hexadecimal: 1D 42 n

[Range] 0≤n≤255

[Description]

- When the LSB of n is 0, white/black reverse mode is turned off.

- When the LSB of n is 1, white/black reverse mode is turned on.

- [Note]
- Only the lowest bit of n is valid.
 - This command is available for built-in characters and user-defined characters.
 - When white/black reverse printing mode is on, it also applies to character spacing set by **ESC SP**.
 - This command does not affect bit images, user-defined bit images, bar codes, HRI characters, and spacing skipped by **HT**, **ESC \$**.
 - This command does not affect the space between lines.
 - White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.

[Default] n=0

ESC V n

[Name]	Turn 90° clockwise rotation mode on/off
[Format]	ASCII: ESC V n
	Decimal: 27 86 n
	Hexadecimal: 1B 56 n
[Range]	0≤n≤1, 48≤n≤49
[Description]	Turns 90° clockwise rotation mode on/off. n is used as follows:

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

- [Note]
- This command affects printing in standard mode. However, the setting is always effective.
 - When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters.
 - Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double-height and double-width commands in normal mode.

[Default] n=0

[Reference] **ESC !, ESC**

ESC G n

[Name]	Turn on/off double-strike mode
[Format]	ASCII: ESC G n
	Decimal: 27 71 n
	Hexadecimal: 1B 47 n
[Range]	0≤n≤255
[Description]	Turns double-strike mode on or off. <ul style="list-style-type: none"> ● When the LSB of n is 0, double-strike mode is turned off. ● When the LSB of n is 1, double-strike mode is turned on.
[Note]	<ul style="list-style-type: none"> ● Only the lowest bit of n is enabled. ● Printer output is the same in double-strike mode and in emphasized mode.
[Default]	n=0
[Reference]	ESC E n

ESC E n

[Name]	Turn emphasized mode on/off
[Format]	ASCII: ESC E n
	Decimal: 27 69 n

	Hexadecimal:	1B 45 n
[Range]	0≤n≤255	
[Description]	Turns emphasized mode on or off	
	● When the LSB of n is 0, emphasized mode is turned off.	
	● When the LSB of n is 1, emphasized mode is turned on.	
[Note]	● Only the least significant bit of n is enabled.	
	● This command and ESC ! turn on and off emphasized mode in the same way. Be careful when this command is used with ESC !	
[Default]	n=0	
[Reference]	ESC !	

ESC SP n

[Name]	Set right-side character spacing	
[Format]	ASCII:	ESC SP n
	Decimal:	27 32 n
	Hexadecimal:	1B 20 n
[Range]	0≤n≤255	
[Description]	Sets the character spacing for the right side of the character to [n×0.125 mm (n×0.0049")].	
[Note]	<ul style="list-style-type: none"> ● The right-side character spacing for double-width mode is twice the normal value. When characters are enlarged, the right-side character spacing is n times normal value. ● This command does not affect the setting of Kanji characters ● This command sets values independently in standard mode. 	
[Default]	n=0	

ESC SO n

[Name]	Select Double Width mode	
[Format]	ASCII:	ESC SO n
	Decimal:	27 14 n
	Hexadecimal:	1B 0E n
[Description]	Select Double Width mode To turn double width off, use LF or DC4 command.	

ESC DC4 n

[Name]	Disable Double Width mode	
[Format]	ASCII:	ESC DC4 n
	Decimal:	27 20 n
	Hexadecimal:	1B 14 n
[Description]	Disable Double Width mode	

ESC { n

[Name]	Turns on/off upside-down printing mode
[Format]	ASCII: ESC { n
	Decimal: 27 123 n
	Hexadecimal: 1B 7B n
[Range]	0≤n≤255
[Description]	Turns upside-down printing mode on or off.
	<ul style="list-style-type: none"> ● When the LSB of n is 0, upside-down printing mode is turned off. ● When the LSB of n is 1, upside-down printing mode is turned on.
[Note]	<ul style="list-style-type: none"> ● Only the lowest bit of n is valid. ● This command is enabled only when processed at the beginning of a line in standard mode. ● In upside-down printing mode, the printer rotates the line to be printed by 180° and then prints it.
[Default]	n=0
[Example]	

When upside-down printing mode is off.



Paper feed direction

When upside-down printing mode is on.

**ESC - n**

[Name]	Turn underline mode on/off
[Format]	ASCII: ESC - n
	Decimal: 27 45 n
	Hexadecimal: 1B 2D n
[Range]	0≤n≤2, 48≤n≤50
[Description]	Turns underline mode on or off, based on the following values n:

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

[Note]	<ul style="list-style-type: none"> ● The printer can underline all characters (including right-side character spacing), but cannot underline the space set by HT.
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- The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
- When underline mode is turned off by setting the value of n to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off does not change. The default underline thickness is 1 dot.
- Changing the character size does not affect the current underline thickness.
- Underline mode can also be turned on or off by using **ESC !**. Note, however, that the last received command is effective.

[Default] n = 0

[Reference] **ESC !**

ESC % n

[Name]	Enable/Disable User-defined Characters
[Format]	ASCII: ESC % n
	Decimal: 27 37 n
	Hexadecimal: 1B 25 n
[Range]	0≤n≤255
[Description]	Selects or cancels the user-defined character set. <ul style="list-style-type: none"> ● 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.
[Note]	When the user-defined character set is canceled, the built-in character set is automatically selected. n is available only for the least significant bit.
[Default]	n=0
[Reference]	ESC &, ESC ?

FS &

[Name]	Select Kanji character mode
[Format]	ASCII: FS &
	Decimal: 28 38
	Hexadecimal: 1C 26
[Description]	Selects Kanji character mode
[Note]	For Kanji model: <ul style="list-style-type: none"> ● When the Kanji character mode is selected, the printer processes all Kanji code as two bytes each. ● Kanji codes are processed in the order of the first byte and second byte. ● Kanji character mode is not selected when the power is turned on.
[Reference]	FS .

FS.

[Name]	Cancel Kanji character mode			
[Format]	ASCII:	FS	.	
	Decimal:	28	46	
	Hexadecimal:	1C	2E	
[Description]	Cancels Kanji character mode.			
[Note]	For Kanji model: <ul style="list-style-type: none"> ● When the Kanji character mode is not selected, all character codes are processed one byte at a time as ASCII code. ● Kanji character mode is not selected when the power is turned on. 			
[Reference]	FS &			

FS ! n

[Name]	Set print mode(s) for Kanji characters			
[Format]	ASCII:	FS	!	n
	Decimal:	28	33	n
	Hexadecimal:	1C	21	n
[Range]	0≤n≤255			
[Description]	Sets the print mode for Kanji 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	0	Double-height mode is OFF.
	On	08		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]	<ul style="list-style-type: none"> ● 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. ● 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 Kanji character using GS I; the setting of the last received command is effective.
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[Default] n=0
 [Reference] **GS !**

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

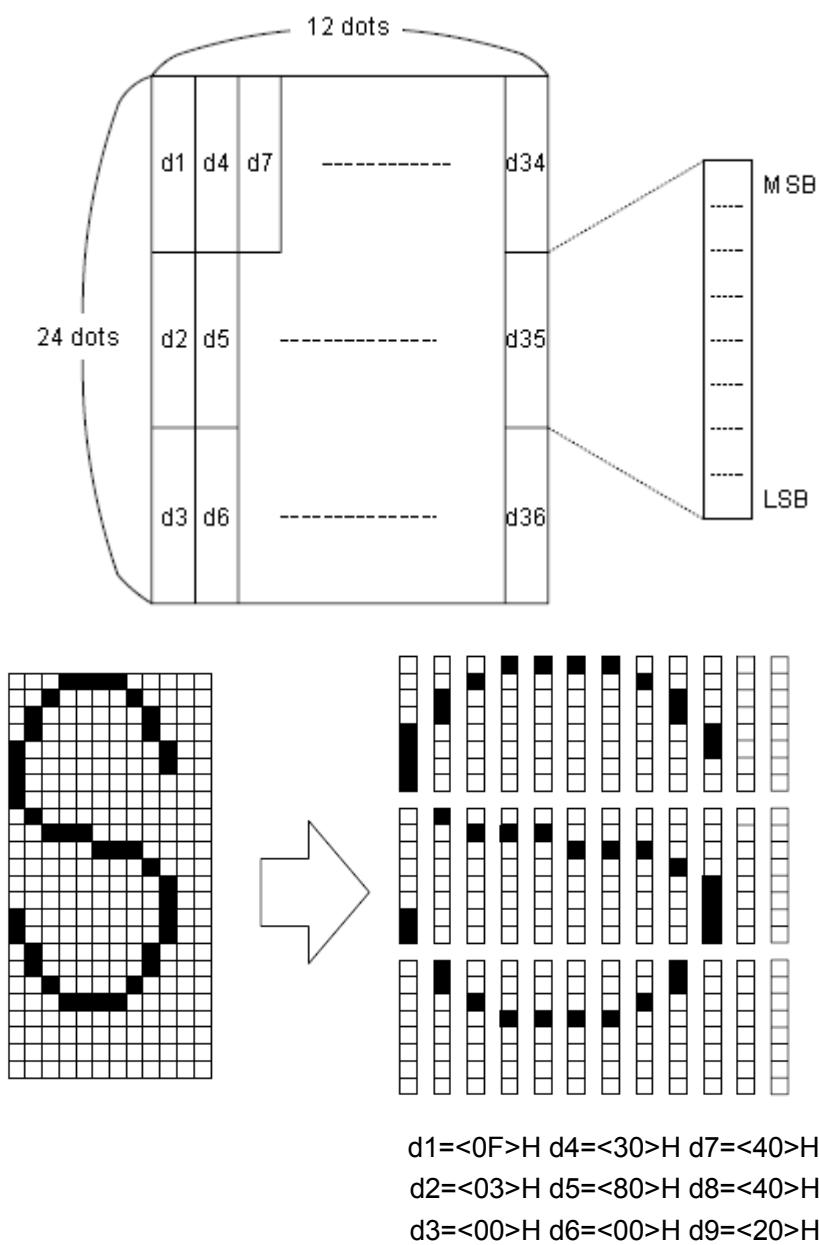
[Name] Define user-defined characters
 [Format] ASCII: ESC & y c1 c2[x1 d1...d(y×x1)]...[xk d1...d(y×xk)]
 Decimal: 27 38 y c1 c2 [x1 d1...d(y×x1)]...[xk d1...d(y×xk)]
 Hexadecimal: 1B 26 y c1 c2 [x1 d1...d(y×x1)]...[xk d1...d(y×xk)]
 [Range] y=3
 32≤c1≤c2≤126
 0≤x≤12 (when Font A (12×24) is selected)
 0≤d1 ... d(y×xk) ≤255
 [Description] Defines user-defined characters.

- 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.

 [Note] ● The allowable character code range is from ASCII code <20>H to <7E>H (95 characters).
 ● It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1=c2.
 ● d is the dot data for the characters. 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 user-defined characters is (y×x) bytes.
 ● Set a corresponding bit to 1 to print a dot or 0 not to print a dot.
 ● This command can define different user-defined character patterns for each font. To select a font, use **ESC !**
 ● User-defined characters and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared.
 ● The user-defined character definition is cleared when:

- 1) **ESC @** is executed.
- 2) **GS *** is executed.
- 3) **ESC ?** is executed.
- 4) The power is turned off.

 [Default] The internal character set
 [Reference] **ESC %, ESC ?**
 [Example] When Font A (12×24) is selected.



ESC? n

[Name]	Cancel user-defined characters			
[Format]	ASCII:	ESC	?	n
	Decimal:	27	37	n
	Hexadecimal:	1B	3F	n
[Range]	32≤n≤126			
[Description]	Cancels user-defined characters.			

- [Note]
- This command cancels the patterns defined for the character codes specified by n. After the user-defined characters are canceled, the corresponding patterns for the internal characters are printed.
 - This command deletes the pattern defined for the specified code in the font selected by **ESC !**.
 - If user-defined characters have not been defined, the printer ignores this command.

[Reference] **ESC &, ESC %**

ESC R n

[Name] Select an internal character set
 [Format] ASCII: **ESC R n**
 Decimal: 27 82 n
 Hexadecimal: 1B 52 n

[Range] 0≤n≤13

[Description] Select an internal character set n as follows:

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

[Default] n=0

ESC t n

[Name] Select character code table
 [Format] ASCII: **ESC t n**
 Decimal: 27 116 n
 Hexadecimal: 1B 74 n

[Range] 0≤n≤5, 16≤n≤19, n=255

[Description] Select page n from the character code table as follows:

N	Code Page	N	Code Page
0	CP437 [U.S.A., Standard Europe]	24	CP737 [Greek]
1	Katakana	25	WCP1257 [Baltic]
2	CP850 [Multilingual]	26	Thai
3	CP860 [Portuguese]	27	CP720[Arabic]
4	CP863 [Canadian-French]	28	CP855
5	CP865 [Nordic]	29	CP857[Turkish]

6	WCP1251 [Cyrillic]	30	WCP1250[Central Europe]
7	CP866 Cyrillic #2	31	CP775
8	MIK[Cyrillic /Bulgarian]	32	WCP1254[Turkish]
9	CP755 [East Europe, Latvian 2]	33	WCP1255[Hebrew]
10	Iran	34	WCP1256[Arabic]
11	reserve	35	WCP1258[Vietnam]
12	reserve	36	ISO-8859-2[Latin 2]
13	reserve	37	ISO-8859-3[Latin 3]
14	reserve	38	ISO-8859-4[Baltic]
15	CP862 [Hebrew]	39	ISO-8859-5[Cyrillic]
16	WCP1252 Latin I	40	ISO-8859-6[Arabic]
17	WCP1253 [Greek]	41	ISO-8859-7[Greek]
18	CP852 [Latina 2]	42	ISO-8859-8[Hebrew]
19	CP858 Multilingual Latin I +Euro)	43	ISO-8859-9[Turkish]
20	Iran II	44	ISO-8859-15 [Latin 3]
21	Latvian	45	Thai2
22	CP864 [Arabic]	46	CP856
23	ISO-8859-1 [West Europe]	47	Cp874

[Default] n=0

[Reference] Character Code Tables

ESC 9 n

[Name]	Select Chinese code format
[Format]	ASCII: ESC 9 n
	Decimal: 27 57 n
	Hexadecimal: 1B 39 n
[Description]	Select Chinese code format, n from the character code table as follows: 0: GBK code. 1: UTF-8 code. 3: BIG5 code.
[Note]	This version is not support English.
[Reference]	

8.2.4 Bit Image Command

ESC * m n1 n2 d1 d2...dk

[Name]	Select bit-image mode
[Format]	ASCII: ESC * m n1 n2 d1 d2 ... dk
	Decimal: 27 42 m n1 n2 d1 d2 ... dk
	Hexadecimal: 1B 2A m n1 n2 d1 d2 ... dk

[Range] m =0,1,32,33
nL=0-255

$nH=0-3$

$dx=0-255$

[Description] Selects a bit-image mode using m for the number of dots specified by nL and nH, as follows:

m	Mode	Vertical Direction		Horizontal Direction	
		Number of Dots	Dot Density	Dot Density	Number of Data (K)
0	8-dot single-density	8	67.7 dpi	101.6 dpi	$nL+nH \times 256$
1	8-dot double-density	8	67.7 dpi	203.2 dpi	$nL+nH \times 256$
32	24-dot single-density	24	203.2 dpi	101.6 dpi	$(nL+nH \times 256) \times 3$
33	24-dot double-density	24	203.2 dpi	203.2 dpi	$(nL+nH \times 256) \times 3$

- [Note]
- If the value of m is out of the specified range, nL and nH the data following are processed as normal data.
 - The nL and nH indicate the number of dots in the bit image in the horizontal direction. The number of dots is calculated by $nL+nH \times 256$.
 - If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
 - d indicates the bit-image data. Set a corresponding bit to 1 to print a dot or to 0 not to print a dot.
 - After printing a bit image, the printer returns to normal data processing mode.
 - This command is not affected by print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except upside-down printing mode.
 - The relationship between the image data and the dots to be printed is described in Figure 3.11.3.
 - When 8-dot bit image is selected:

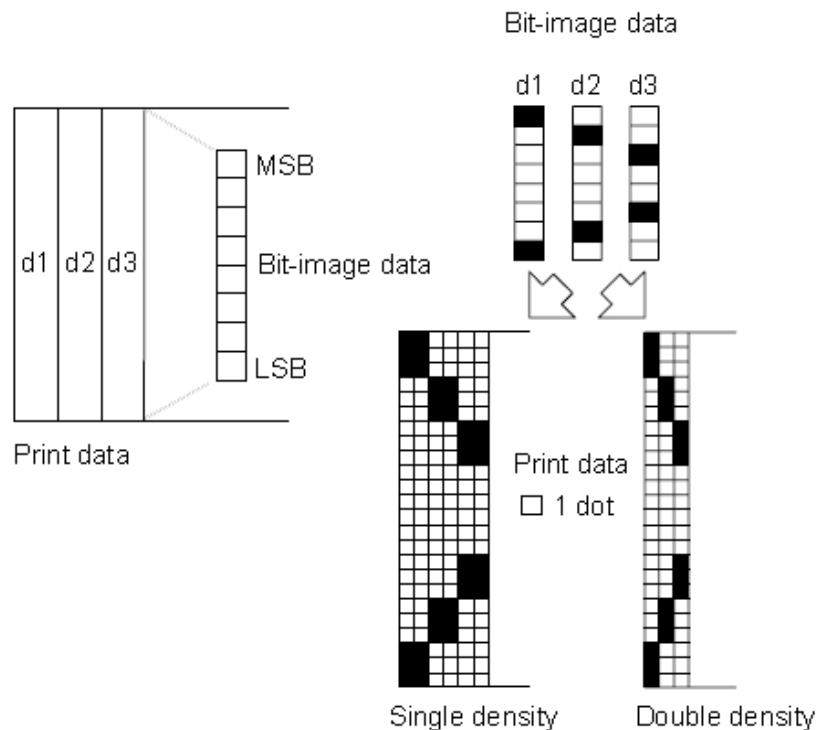


Figure 3.11.3.

- When 24-dot bit image is selected:

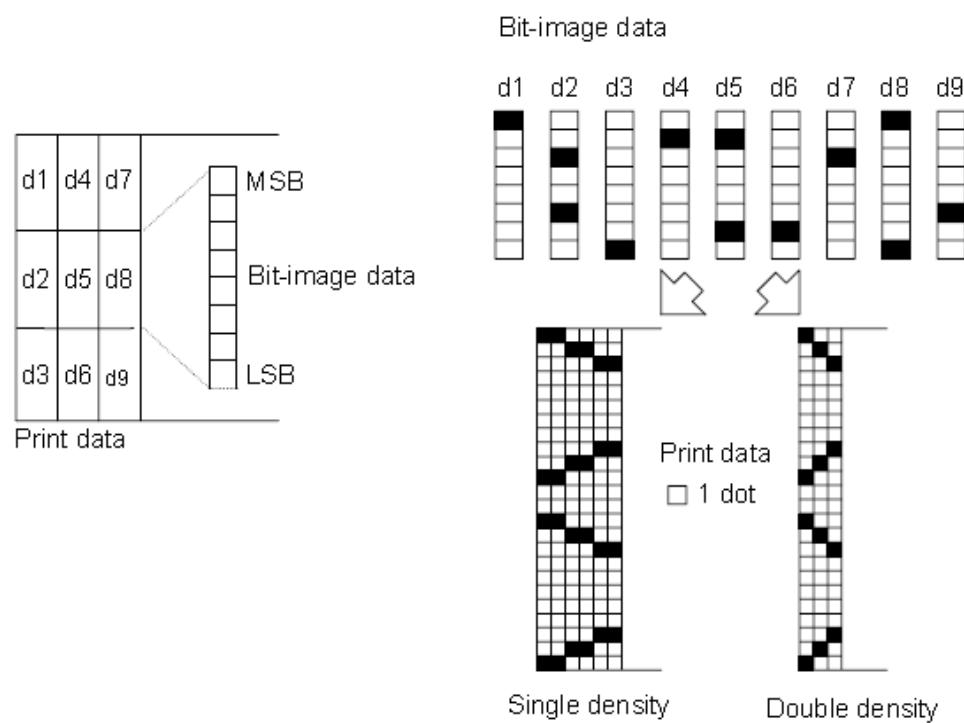
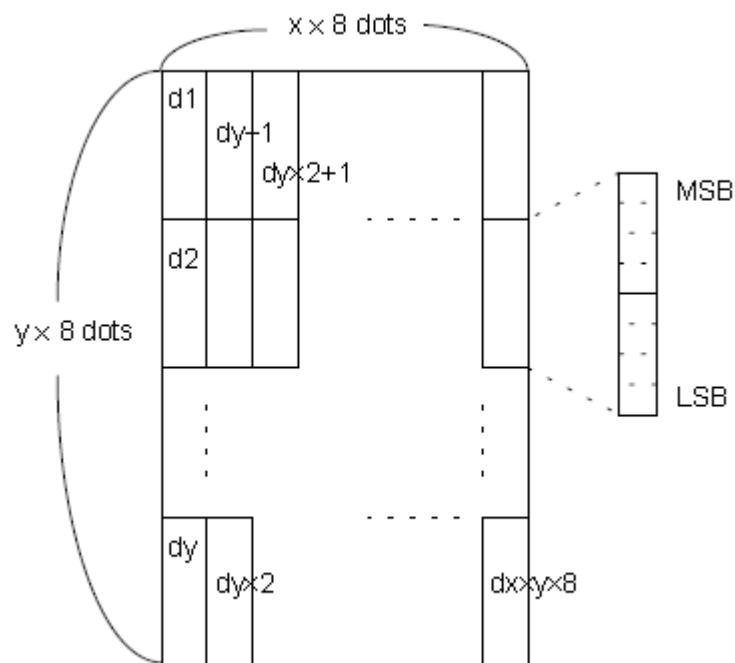


Figure 3.11.3.

GS * x y d1...d(x × y × 8)

[Name]	Define downloaded bit image
[Format]	ASCII: GS * x y d1 ... d(x×y×8) Decimal: 29 42 x y d1 ... d(x×y×8) Hexadecimal: 1D 2A x y d1 ... d(x×y×8)
[Range]	1≤x≤255 1≤y≤48 (where x×y≤1536) 0≤d≤255
[Description]	Defines a downloaded bit image using the number of dots specified by x and y. <ul style="list-style-type: none"> ● x specifies the number of dots in the horizontal direction. ● y specifies the number of dots in the vertical direction. ● The number of dots in the horizontal direction is x×8; in the vertical direction it is y×8. ● If x×y is out of the specified range, this command is disabled. ● The d indicates bit-image data. Data (d) specifies a bit printed as 1 and not printed as 0. ● The downloaded bit image definition is cleared when: <ol style="list-style-type: none"> 1) ESC @ is executed. 2) ESC & is executed. 3) Printer is reset or the power is turned off. ● The following figure shows the relationship between the downloaded bit image and the printed data.
[Note]	



[Reference] **GS /**

GS / n

[Name]	Print downloaded bit image		
[Format]	ASCII:	GS / n	
	Decimal:	29 47 n	
	Hexadecimal:	1D 2F n	
[Range]	0≤n≤3, 48≤n≤51		
[Description]	Prints a downloaded bit image using the mode specified by n. n selects a mode from the table below:		

n	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	203.2 dpi	203.2 dpi
1, 49	Double-width	203.2 dpi	101.6 dpi
2, 50	Double-height	101.6 dpi	203.2 dpi
3, 51	Quadruple	101.6 dpi	101.6 dpi

- [Note]
- This command is ignored if a downloaded bit image has not been defined.
 - In standard mode, this command is effective only when there is no data in the print buffer.
 - This command has no effect in the print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except for upsidedown printing mode.
 - If the downloaded bit-image to be printed exceeds the printable area, the excess data is not printed.

[Reference] **GS ***

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

[Name]	Print raster bit image		
[Format]	ASCII:	GS v 0 m xL xH yL yH d1...dk	
	Decimal:	29 118 48 m xL xH yL yH d1...dk	
	Hexadecimal:	1D 76 30 m xL xH yL yH d1...dk	
[Range]	0≤m≤3, 48≤m≤51		
	0≤xL≤255		
	0≤xH≤255, where $1 \leq (xL+xH \times 256) \leq 48$		
	0≤yL≤255		
	0≤yH≤8, where $1 \leq (yL+yH \times 256) \leq 4095$		
	0≤d≤255		
	$k = (xL+xH \times 256) \times (yL+yH \times 256)$ ($k \neq 0$)		
[Description]	Selects raster bit-image mode. The value of m selects the mode, as follows:		

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	203.2 dpi	203.2 dpi

1, 49	Double-width	203.2 dpi	101.6 dpi
2, 50	Double-height	101.6 dpi	203.2 dpi
3, 51	Quadruple	101.6 dpi	101.6 dpi

- xL, xH , select the number of data bytes ($xL+xH \times 256$) in the horizontal direction for the bit image.

- yL, yH , select the number of data bits ($yL+yH \times 256$) in the vertical direction for the bit image.

[Note]

- In standard mode, this command is effective only when there is no data in the print buffer.

- This command is not affected by print modes (character size, emphasized, double-strike, upside-down, underline, white/black reverse printing, etc.) for raster bit image.

- Data outside the printing area is read in and discarded on a dot-by-dot basis.

- The position at which subsequent characters are to be printed for raster bit image is specified by **HT** (Horizontal Tab), **ESC \$** (Set absolute print position), and **GS L** (Set left margin). If the position at which subsequent characters are to be printed is a multiple of 8.

- The **ESC a** (Select justification) setting is also effective on raster bit images.

- d indicates the bit-image data. Setting a bit to 1 print a dot and setting it to 0 does not print a dot.

[Example] When $xL+xH \times 256=64$

$\leftarrow (xL+xH \times 256) \times 8\text{dots} = 512\text{dots} \rightarrow$						
1	2	3	**** *	62	63	64
65	66	67	**** *	126	127	128
			**** *			
			**** *	K-2	K-1	K

↑
yL+yH×256dots
↓

7 6 5 4 3 2 1 0
MSB LSB

DC2 * r n [d1...dn]

[Name] Print bitmap

[Format] ASCII: DC2 * r n [d1 ... dn]

Decimal: 18 42 r n [d1 ... dn]

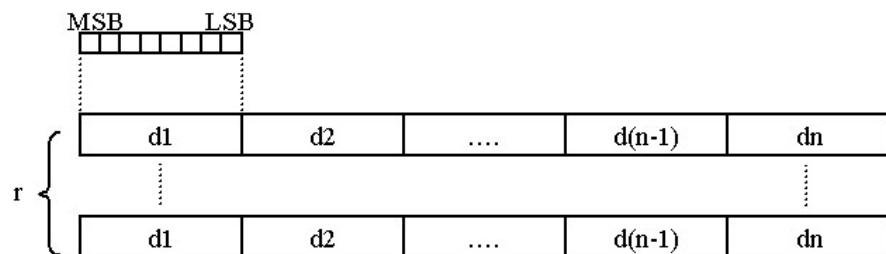
Hexadecimal: 12 2A r n [d1 ... dn]

[Description] Printing bitmap with width & height

r: Bitmap height

n: Bitmap width

Bitmap format:



DC2 V nL nH [d1...dn]

[Name] Print MSB Bitmap

[Format] ASCII: DC2 V nL nH [d1 ... d48]

Decimal: 18 86 nL nH [d1 ... d48]

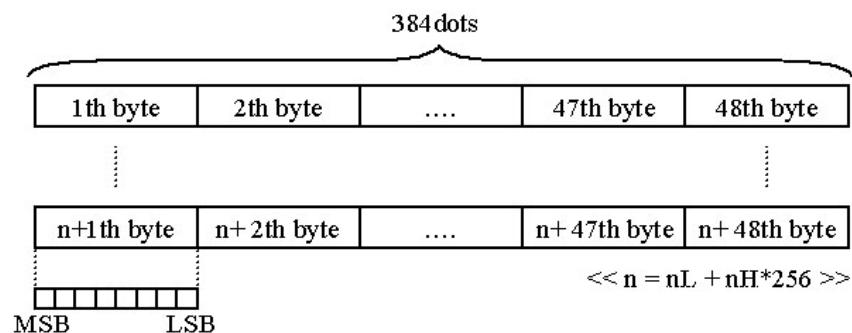
Hexadecimal: 12 56 nL nH [d1 ... d48]

[Description] This command use to print MSB format bitmap,

The width of bitmap must the same as the printer mechanism

Bitmap height: nL+nH*256

Bitmap format:



FS p n m

[Name] Print NV bit image

[Format] ASCII: FS p n m

Decimal: 28 112 n m

Hexadecimal: 1C 70 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 mode specified by m.

m	Mode	Vertical Dot Density	Horizontal Dot Density
0, 48	Normal	203.2 dpi	203.2 dpi

1, 49	Double-width	203.2 dpi	101.6 dpi
2, 50	Double-height	101.6 dpi	203.2 dpi
3, 51	Quadruple	101.6 dpi	101.6 dpi

- [Details]
- n is the number of the NV bit image (defined using the **FS q** command).
 - m specifies the bit image mode.
 - NV bit image is a bit image defined in non-volatile memory by **FS q** and printed by **FS p**.
 - This command is not effective when the specified NV bit image has not been defined.
 - In standard mode, this command is effective only when there is no data in the print buffer.
 - This command is not affected by print modes (emphasized, underline, character size, white/black reverse printing, or 90° rotated characters, etc.), except upside-down printing mode.
 - If the downloaded bit-image to be printed exceeds one line, the excess data is not printed.
 - This command feeds dots (for the height n of the NV bit image) in normal and double-width modes and (for the height $n \times 2$ of the NV bit image) in doubleheight and quadruple modes, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
 - After printing the bit image, this command sets the print position to the beginning of the line and processes the data that follows as normal data.
- [Reference] **ESC *, FS q, GS /, GS v**

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

- [Name] Define NV bit image
- [Format] ASCII: $FS\ q\ n\ [xL\ xH\ yL\ yH\ d1...dk]1...[xL\ xH\ yL\ yH\ d1...dk]n$
 Decimal: $28\ 113\ n\ [xL\ xH\ yL\ yH\ d1...dk]1...[xL\ xH\ yL\ yH\ d1...dk]n$
 Hexadecimal: $1C\ 71\ n\ m\ [xL\ xH\ yL\ yH\ d1...dk]1...[xL\ xH\ yL\ yH\ d1...dk]n$
- [Range] $1 \leq n \leq 255$
 $1 \leq xL \leq 255$
 $1 \leq xH \leq 3$ (when $1 \leq (xL + xH \times 256) \leq 1023$)
 $1 \leq yL \leq 255$
 $1 \leq yH \leq 1$ (when $1 \leq (yL + yH \times 256) \leq 288$)
 $1 \leq d \leq 255$
 $k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$
 Total defined data area=192K bytes.
- [Description] Define the NV bit image specified by n.
- n specifies the number of the defined NV bit image.
 - xL, xH specifies $(xL + xH \times 256) \times 8$ dots in the horizontal direction for the NV bit image you are defining.

[Note]

- yL, yH specifies $(yL+yH \times 256) \times 8$ dots in the vertical direction for the NV bit image you are defining.
- Frequent write command executions may damage the NV memory.
- Therefore, it is recommended to write the NV memory 10 times or less a day.
- The printer performs a hardware reset after the procedure to place the image into the NV memory. Therefore, user-defined characters, downloaded bit images should be defined only after completing this command. The printer clears the receiver and print buffers and resets the mode to the mode that was in effect at power on. (this version is not support hardware reset).
- This command cancels all NV bit images that have already been defined by this command.
- From the beginning of the processing of this command till the finish of hardware reset, mechanical operations (including initializing the position of the print head when the cover is open, paper feeding using the FEED button, etc.) cannot be performed.
- During processing of this command, the printer is BUSY when writing data to the user NV memory and stops receiving data. Therefore it is prohibited to transmit the data, including real-time commands, during the execution of this command.
- NV bit image is a bit image defined in non-volatile memory by **FS q** and printed by **FS p**.
- In standard mode, this command is effective only when processed at the beginning of the line.
- This command is effective when 7 bytes<FS yH> of the command are processed normally.
- When the amount of data exceeds the capacity left in the range defined by xL, xH, yL, yH , the printer processes xL, xH, yL, yH out of the defined range.
- In the first group of NV bit images, when any of the parameters xL, xH, yL, yH is out of the definition range, this command is disabled.
- In groups of NV bit images other than the first one, when the printer encounters xL, xH, yL, yH out of the defined range, it stops processing this command and starts writing into the NV images. At this time, NV bit images that haven't been defined are disabled (undefined), but any NV bit images before that are enabled.
- The d indicates the definition data. In data (d) a 1 bit specifies a dot to be printed and a 0 bit specifies a dot not to be printed.
- This command defines n as the number of a NV bit image. Numbers rise in order from NV bit image 01H. Therefore, the first data group [$xL xH yL yH d1...dk$] is NV bit image 01H, and the last data group [$xL xH yL yH d1...dk$] is NV bit image n . The total agrees with the number of NV bit images specified by the command **FS p**.

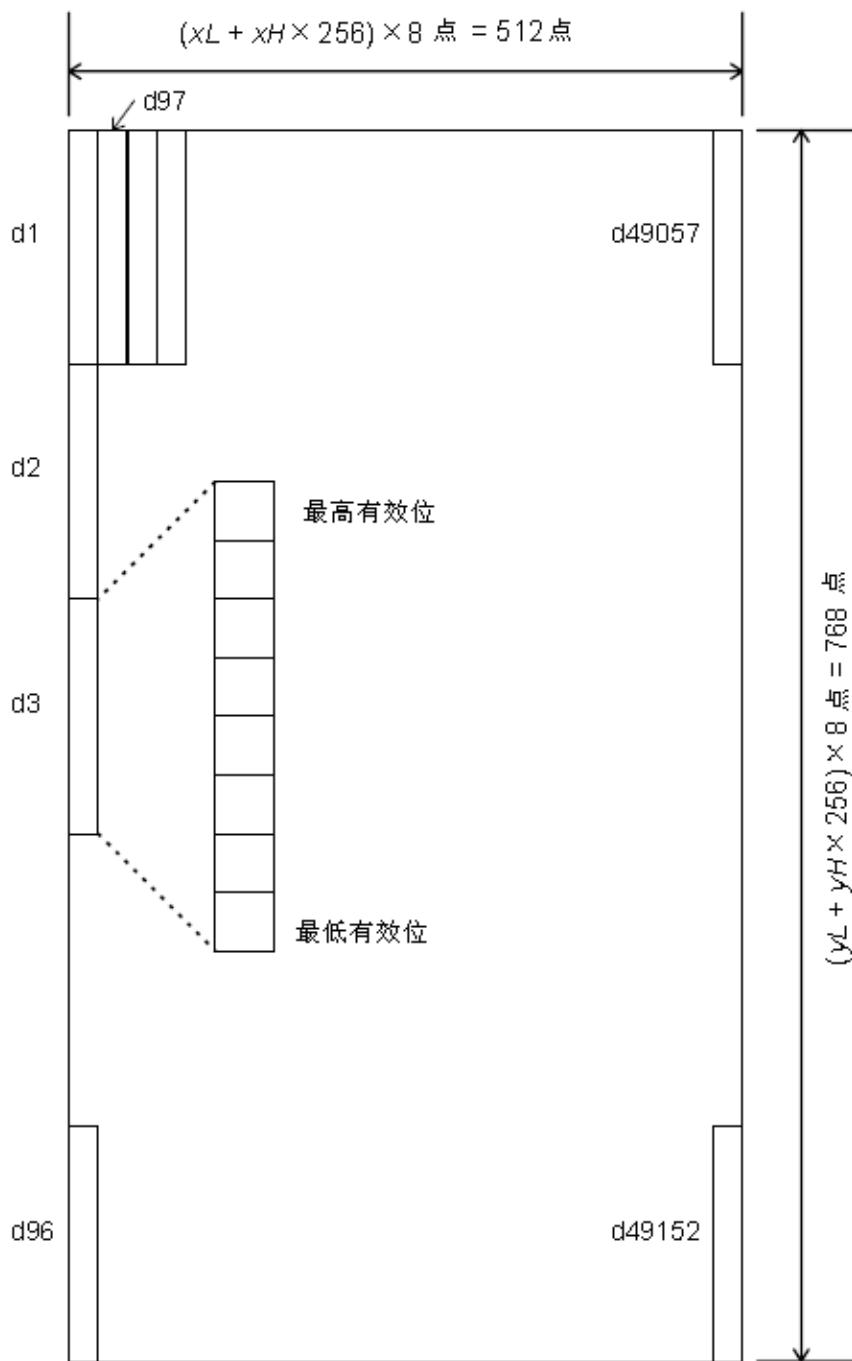
- The definition data for an NV bit image consists of [xL xH yL yH d1...dk]. Therefore, when only one NV bit image is defined n=1, the printer processes a data group [xL xH yL yH d1...dk] once. The printer uses ([data: $(xL+xH\times 256)\times(yL+yH\times 256)\times 8$]+[header: 4]) bytes of NV memory.
- The definition area in this printer is a maximum of 192K bytes. This command can define several NV bit images, but cannot define bit image data whose total capacity [bit image data+header] exceeds 192K bytes.
- The printer does not transmit ASB status or perform status detection during processing of this command even when ASB is specified.
- Once an NV bit image is defined, it is not erased by performing **ESC @**, reset and power off.
- This command performs only definition of an NV bit image and does not perform printing. Printing of the NV bit image is performed by the **FS p** command.

[Reference]

FS p

[Example]

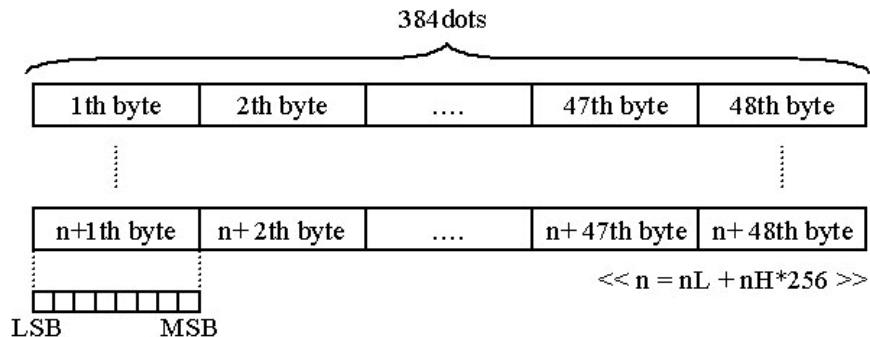
当 xL=64, xH=0, yL=96, yH=0



DC2 v nL nH [d1...dn]

[Name]	Print LSB Bitmap
[Format]	ASCII: DC2 v nL nH [d1 ... d48] Decimal: 18 118 nL nH [d1 ... d48] Hexadecimal: 12 76 nL nH [d1 ... d48]
[Description]	This command use to print LSB format bitmap, The width of bitmap must the same as the printer mechanism Bitmap height: nL+nH*256

Bitmap format:



8.2.5 Init command

ESC @

[Name]	Initialize the printer		
[Format]	ASCII:	ESC @	
	Decimal:	27 64	
	Hexadecimal:	1B 40	
[Description]	Initializes the printer.		
	<ul style="list-style-type: none"> ● The print buffer is cleared. ● Reset the parametric to default value. ● return to standard mode ● Delete user-defined characters 		
[Note]	<ul style="list-style-type: none"> ● The DIP switch settings are not checked again. ● The data in the receive buffer is not cleared. 		

8.2.6 Status Command

ESC v n

[Name]	Transmit paper sensor status		
[Format]	ASCII:	ESC v n	
	Decimal:	27 118 n	
	Hexadecimal:	1B 76 n	
[Description]	The return value is 1 bytes,It is a different on behalf of the status:		

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Offline.
	On	01	1	Online.
1	-	-	-	Undefined.
2	Off	00	0	Paper has.
	On	04	4	Paper out.
3	Off	00	0	Voltage is normal.
	On	08	8	Voltage>9.5V.
4	-	-	-	Undefined.

5	-	-	-	Undefined.
6	Off	00	0	Temperature is normal.
	On	40	64	Temperature > 60°.
7	-	-	-	Undefined.

For example: return "0x04" is means paper out.

GS a n

[Name]	Enable/Disable Automatic Status Back(ASB)		
[Format]	ASCII:	GS a n	
	Decimal:	29 97 n	
	Hexadecimal:	1D 61 n	
[Range]	0≤n≤255		
[Description]	n definition as follows: When ASB is enabled, the printer will send the changed status to PC automatically.		

Bit	Function	Value	
		0	1
0	-	-	-
1	-	-	-
2	Disable/Enable ASB	Disable	Enable
3-4	-	-	-
5	Disable/Enable RTS as flow control	Disable	Enable
6-7	-	-	-

ESC u n (for Drawer)

[Name]	Transmit peripheral devices status		
[Format]	ASCII:	ESC u n	
	Decimal:	27 117 n	
	Hexadecimal:	1B 75 n	
[Range]	0=0, 48		
[Description]	Transmits the status of the drawer kick-out connector pin 3 as 1byte of data when n=0, 48.this allows the host to determine the status of a peripheral device.		

n is used as follows:

Bit	On/off	Hex	Decimal	Function
0	Off	00	0	Drawer kick out connector pin 3 is low
0	On	01	1	Drawer kick out connector pin 3 is high
1-3	-	-	-	Undefined
4	Off	00	0	Not used. Fixed to off
5-6	-	-	-	Undefined
7	Off	00	0	Not used. Fixed to off

GS r n

[Name]	Transmit status
[Format]	ASCII: GS r n
	Decimal: 29 114 n
	Hexadecimal: 1D 72 n
[Range]	n=1, 49

[Description] Transmits the status specified by n as follows:

n	Function
1, 49	Transmits paper sensor status

- [Note]
- When using a serial interface
 - 1) When DTR/DSR control is selected, the printer transmits only 1 byte after confirming the host is ready to receive data (DSR signal is SPACE). If the host computer is not ready to receive data (DSR signal is MARK), the printer waits until the host is ready.
 - 2) When XON/XOFF control is selected, the printer transmits only 1 byte without confirming the condition of the DSR signal.
 - This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
 - When Auto Status Back (ASB) is enabled using GS a, the status transmitted by GS r and the ASB status must be differentiated using.
 - The status types to be transmitted are shown below:

Paper sensor status (n = 1, 49):

Bit	Off/On	Hex	Decimal	Status for ASB
0,1	-	-	-	Undefined.
2,3	Off	00	0	Paper roll end sensor: paper adequate.
	On	(0C)	(12)	Paper roll end sensor: paper near end.
4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

Bits 2 and 3: When the paper end sensor detects a paper end, the printer goes offline and does not execute this command. Therefore, bits 2 and 3 do not transmit the status of paper end.

[Reference] **GS a**

8.2.7 Bar Code Command

GS H n

[Name]	Select printing position for HRI characters
[Format]	ASCII: GS H n

	Decimal:	29 72 n
	Hexadecimal:	1D 48 n
[Range]	0≤n≤3, 48≤n≤51	
[Description]	Selects the printing position of HRI characters when printing a bar code. n selects the printing position as follows:	

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

HRI indicates Human Readable Interpretation.

[Note]	HRI characters are printed using the font specified by GS f .
[Default]	n=0
[Reference]	GS f, GS k

GS h n

[Name]	Set bar code height
[Format]	ASCII: GS h n
	Decimal: 29 104 n
	Hexadecimal: 1D 68 n
[Range]	0≤n≤255
[Description]	Selects the height of the bar code. n specifies the number of dots in the vertical direction.
[Default]	n=162
[Reference]	GS k

GS w n

[Name]	Set bar code width
[Format]	ASCII: GS w n
	Decimal: 29 119 n
	Hexadecimal: 1D 77 n
[Range]	2≤n≤6
[Description]	Sets the horizontal size of the bar code. n specifies the bar code width as follows:

n	Module Width (mm) for Multi-level Bar Code	Binary-level Bar Code	
		Thin Element Width (mm)	Thick Element Width(mm)
2	0.250	0.250	0.625
3	0.375	0.375	1.000
4	0.560	0.500	1.250
5	0.625	0.625	1.625

6	0.750	0.750	2.000
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- Multi-level bar codes are as follows:
UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, CODE128
- Binary-level bar codes are as follows:
CODE39, ITF, CODABAR

[Default] n=3
 [Reference] **GS k**

GS k m d1 d2 ... dk NUL

GS k m n d1 d2 ... dn

[Name] Print bar code
 [Format ①] ASCII: GS k m d1 d2 ... dk NUL
 Decimal: 29 107 m d1 d2 ... dk 0
 Hexadecimal: 1D 6B m d1 d2 ... dk 00
 [Format ②] ASCII: GS k m n d1 d2 ... dn
 Decimal: 29 107 m n d1 d2 ... dn
 Hexadecimal: 1D 6B m n d1 d2 ... dn
 [Range ①] 0≤m≤6(k and d depend on the bar code system used)
 [Range ②] 65≤m≤73(n and d depend on the bar code system used)
 [Description] Selects a bar code system and prints the bar code.
 m selects a bar code system as follows:

m	Bar Code System	Number of Characters	Remarks
①	0	UPC-A	11≤k≤12 48≤d≤57
	1	UPC-E	11≤k≤12 48≤d≤57
	2	JAN13 (EAN13)	12≤k≤13 48≤d≤57
	3	JAN 8 (EAN8)	7≤k≤8 48≤d≤57
	4	CODE39	1≤k' 48≤d≤57, 65≤d≤90, 32, 36, 37, 43, 45, 46, 47
	5	ITF	1≤k (even number) 48≤d≤57
	6	CODABAR	1≤k' 48≤d≤57, 65≤d≤68, 36, 43, 45, 46, 47, 58
②	65	UPC-A	11≤k≤12 48≤d≤57
	66	UPC-E	11≤k≤12 48≤d≤57
	67	JAN13 (EAN13)	12≤k≤13 48≤d≤57
	68	JAN 8 (EAN8)	7≤k≤8 48≤d≤57
	69	CODE39	1≤n≤255 48≤d≤57, 65≤d≤90, 32, 36, 37, 43, 45, 46, 47
	70	ITF	1≤n≤255 (even number) 48≤d≤57
	71	CODABAR	1≤n≤255 48≤d≤57, 65≤d≤68, 36, 43, 45, 46, 47, 58
72	CODE93	1≤n≤255	0≤d≤127

	73	CODE128	2≤n≤255	0≤d≤127
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[Notes for ①]

- This command ends with a NUL code.
- When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes of bar code data and processes the following data as normal data.
- When the bar code system used is JAN13 (EAN13), the printer prints the bar code after receiving 13 bytes of bar code data and processes the following data as normal data.
- When the bar code system used is JAN8 (EAN8), the printer prints the bar code after receiving 8 bytes of bar code data and processes the following data as normal data.
- The number of data for the ITF bar code must be even numbers. When an odd number of bytes of data is input, the printer ignores the last received data.

[Notes for ②]

- n indicates the number of bar code data bytes, and the printer processes n bytes from the next character data as bar code data.
- If n is outside the specified range, the printer stops command processing and processes the following data as normal data.

[Notes in standard mode]

- If d is outside the specified range, the printer only feeds paper and processes the following data as normal data.
- If the horizontal size exceeds printing area, the printer only feeds the paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
- This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.
- After printing the bar code, this command sets the print position to the beginning of the line.
- This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated character, etc.), except for upside-down printing mode.

Control character			HRI character	Control character			HRI character
ASCII	Hex	Decimal		ASCII	Hex	Decimal	
NUL	00	0	■U	DEL	10	16	■P
SOH	01	1	■A	DC1	11	17	■Q
STX	02	2	■B	DC2	12	18	■R
ETX	03	3	■C	DC3	13	19	■S
EOT	04	4	■D	DC4	14	20	■T
ENQ	05	5	■E	NAK	15	21	■U
ACK	06	6	■F	SYN	16	22	■V
BEL	07	7	■G	ETB	17	23	■W
BS	08	8	■H	CAN	18	24	■X

HT	09	9	■I	EM	19	25	■Y
LF	0A	10	■J	SUB	1A	26	■Z
VT	0B	11	■K	ESC	1B	27	■A
FF	0C	12	■L	FS	1C	28	■B
CR	0D	13	■M	GS	1D	29	■C
SO	0E	14	■N	RS	1E	30	■D
SI	0F	15	■O	US	1F	31	■E
				DEL	7F	127	■T

[Example] Printing **GS k 72 7 67 111 100 101 13 57 51**



When CODE128 ($m=73$) is used:

When using CODE128 in this printer, take the following points into account for data transmission:

- ①The top of the bar code data string must be the code set selection character (CODE A, CODE B, or CODE C), which selects the first code set.
- ②Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

Specific character	Transmit data		
	ASCII	Hex	Decimal
SHIFT	{S	7B, 53	123,83
CODE A	{A	7B, 41	123,65
CODE B	{B	7B,42	123,66
CODE C	{C	7B,43	123,67
FNC1	{1	7B,31	123,49
FNC2	{2	7B,32	123,50
FNC3	{3	7B,33	123,51
FNC4	{4	7B,34	123,52
"{"	{{	7B,7B	123,123

[Example] Example data for printing "No. 123456"

In this example, the printer first prints "No." using CODE B, then prints the following numbers using CODE C.

GS k 73 10 123 66 78 111 46 123 67 12 34 56



- If the top of the bar code data is not the code set selection character, the printer stops command processing and processes the following data as normal data.
- If the combination of "{" and the following character does not apply any special character, the printer stops command processing and processes the following data as normal data.
- If the printer receives characters that cannot be used in the special code set, the printer stops command processing and processes the following data as normal data.
- The printer does not print HRI characters that correspond to the shift characters or code set selection characters.
- HRI character for the function character is space.
- HRI characters for the control character (<00>H to <1F>H and <7F>H) are space.

[Others] Be sure to keep spaces on both right and left sides of a bar code.
(Spaces are different depending on the types of the bar code.)

[Reference] **GS H, GS h, GS w**

GS x n

[Name]	Set bar code printing left space
[Format]	ASCII: GS x n
	Decimal: 29 120 n
	Hexadecimal: 1D 78 n
[Description]	The print bar code staring positions is: 0→255

8.2.8 Miscellaneous Function Command

ESC 7 n1 n2 n3

[Name]	Setting Control Parameter Command
[Format]	ASCII: ESC 7 n1 n2 n3
	Decimal: 27 55 n1 n2 n3
	Hexadecimal: 1B 37 n1 n2 n3

- [Description] ● Set “max heating dots”, “heating time”, “heating interval”
 n1=0-255 Max printing dots, Unit(8dots),Default:7(64 dots)
 n2=3-255 Heating time, Unit(10us),Default:80(800us)
 n3=0-255 Heating interval, Unit(10us),Default:2(20us)
- The more max heating dots, the more peak current will cost when printing, the faster printing speed. The max heating dots is $8*(n1+1)$
 - The more heating time, the more density, but the slower printing speed. If heating time is too short, blank page may occur.
 - The more heating interval, the clearer, but the slower printing speed.

ESC 8 n1 n2

[Name]	Sleep parameter
[Format]	ASCII: ESC 8 n1 n2 Decimal: 27 56 n1 n2 Hexadecimal: 1B 38 n1 n2
[Description]	Setting the time for control board to enter sleep mode. n1+n2*256 The time waiting for sleep after printing finished, Unit (Second), Default: 0 (don't sleep). When control board is in sleep mode, host must send one byte (0xff) to wake up control board. And waiting 50ms, then send printing command and data.
[Note]	The command is useful when the system is powered by battery.

DC2 # n

[Name]	Set printing density
[Format]	ASCII: DC2 # n Decimal: 18 35 n Hexadecimal: 12 23 n
[Description]	D4..D0 of n is used to set the printing density Density is $50\% + 5\% * n(D4-D0)$ D7..D5 of n is used to set the printing break time Break time is $n(D7-D5)*250\mu s$

DC2 T

[Name]	Printing test page
[Format]	ASCII: DC2 T Decimal: 18 84 Hexadecimal: 12 54
[Description]	Printing the test page

FS t n (for CB105B)

[Name]	Select Timeout	
[Format]	ASCII:	FS t n
	Decimal:	28 116 n
	Hexadecimal:	1C 74 n
[Description]	Set Timeout for one byte, t= n×10 ms; so if There are 100 bytes needed for a command, the printer will wait 1000×n ms, when n=0, the printer will wait until all chars needed have received.	

8.2.9 New commands**DC2 E**

[Name]	Feed paper to mark	
[Format]	ASCII:	DC2 E
	Decimal:	18 69
	Hexadecimal:	12 45
[Description]	Feed paper to the Mark position	

DC2 m d 1l 1h

[Name]	Set mark paper length	
[Format]	ASCII:	DC2 m d 1l 1h
	Decimal:	18 109 d 1l 1h
	Hexadecimal:	12 6d d 1l 1h
[Description]	d = 0,1 1:stop at mark position 0:go on 3 steps after mark position detected $0 \leq l \leq 255$ $0 \leq lh \leq 255$ Paper length is (ll+lh*256) steps, means (ll+lh*256)/8 mm	

ESC C n (for BM)

[Name]	Set BM Max	
[Format]	ASCII:	ESC C n
	Decimal:	27 67 n
	Hexadecimal:	1B 43 n
[Description]	With the current row spacing of unit, the line number to define the scope of testing black mark, the default value is 4 inches.	

GS FF (for BM)

[Name]	Feed marked paper to print starting position
[Format]	ASCII: GS FF
	Decimal: 29 12
	Hexadecimal: 1D 0C
[Description]	Feeds the marked paper to the print starting position. Locate to the black mark.
[Note]	<ul style="list-style-type: none"> ● This command sets the next print position to the beginning of the line. ● Even if this command is executed at the print starting position of the marked paper, the printer does not feed the marked paper to the next print starting position.
[Reference]	GS (F

ESC i (for cut)

[Name]	full cut paper
[Format]	ASCII: ESC i
	Decimal: 27 105
	Hexadecimal: 1B 69
[Description]	ESC i select a paper cutting mode and then full cut the paper.

ESC m (for cut)

[Name]	partial cut paper
[Format]	ASCII: ESC i
	Decimal: 27 105
	Hexadecimal: 1B 69
[Description]	ESC m selects a paper cutting mode and then partial cut the paper.

①GS V m ② GS V m n(for cut)

[Name]	Select cut mode and cut paper
[Format]	①ASCII: GS V m Decimal: 29 86 m Hexadecimal: 1D 56 m ②ASCII: GS V m n Decimal: 29 86 m n Hexadecimal: 1D 56 m n
[Range]	① m=1, 49 ② m=66, 0≤n≤255
[Description]	Selects a mode for cutting paper and executes paper cutting. The value of m selects the mode as follows:

m	Print mode
1, 49	Partial cut (one point left uncut)
66	Feeds paper (cutting position + [n × 0.125 mm]), and cuts the paper partially (one point left uncut).

[Notes for ① and ②]

- Cutting status is different, depending on the installed autocutter type.
- This command is effective only when processed at the beginning of a line.

[Note for ①] Only the partial cut is available; there is no full cut.

[Notes for ②]

- When n=0, the printer feeds the paper to the cutting position and cuts it.
- When n≠0, the printer feeds the paper to (cutting position+[n×0.125 mm (0.0049")]) and cuts it.

ESC P m t1 t2 (for Drawer)

[Name] Generate pulse

[Format] ASCII: ESC p m t1 t2

Decimal: 27 112 m t1 t2

Hexadecimal: 1B 70 m t1 t2

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

0≤t1≤255, 0≤t2≤255

[Description] Outputs the pulse specified by t1 to connector pin m as follows:

m	Function
0,48	Drawer kick-out connector pin2.
1,49	Drawer kick-out connector pin5.

[Note]

- The pulse ON time is [t1×2ms] and the OFF time is [t2×2ms].
- If t2<t1, the OFF time is [t1×2ms].

ESC c 5 n(for buttons)

[Name] Enable/disable panel buttons

[Format] ASCII: ESC c 5 n

Decimal: 27 99 53 n

Hexadecimal: 1B 03 35 n

[Range] 0≤n≤255

[Description] Enable/disable panel buttons (support 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.

[Default] n=0

GS (F pL pH a m nL nH (for 701BM)

[Name]

[Format] ASCII: GS (F pL pH a m nL nH

Decimal: 29 40 70 pL pH a m nL nH

Hexadecimal: 1D 28 46 pL pH a m nL nH

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

1≤a≤2

m = 0, 48 or 1, 49

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

[Description] This command is effective only when the BM sensor is enabled.

Sets adjustment values(s) for the printer operations specified by a.

- pL and pH specifies the number of the parameter such as a to (pL+(pH×256))bytes.
- a specifies setting values for the positions to start printing and cutting

a	Function
1	Setting value for the positions to start the printing.
2	Setting value for the positions to start the cutting.

- m specifies the direction of the adjustment.

m	Function
0,48	Specifies a forward paper feeding direction
1,49	Specifies a backward paper feeding direction.

- nL and nH specifies the setting value to [(nL+nH×256)×0.125 mm].
- The adjustment value for the print starting position (a=1) is affected with the following commands: **GS FF**
- The adjustment value for the paper cutting position (a=2) is affected with the following commands:**GS V m n**

[Default] All adjustment values are set to "0".

(At the factory setting, the print starting position and the cutting position are set to the head position and the cutter position respectively when the BM sensor detects the BM.)

[Reference] **GS FF, GS V****FS C (for CB65C)**

[Name] Start receive buffer count

[Format] ASCII: FS C

Decimal: 28 67

Hexadecimal: 1C 43

[Description] Start receiving buffer count.

FS S (for CB65C)

[Name] Start send buffer count

[Format]	ASCII:	FS S
	Decimal:	28 83
	Hexadecimal:	1C 53
[Description]	Send count of receive buffer, include this command's 2 bytes.	

FS s (for XBLY)

[Name]	Save print parater	
[Format]	ASCII:	FS s
	Decimal:	28 115
	Hexadecimal:	1C 73
[Description]	Save print parater. (only for XBLY)	

FS d (for XBLY)

[Name]	Load default leaving factory set	
[Format]	ASCII:	FS d
	Decimal:	28 100
	Hexadecimal:	1C 64
[Description]	Load default leaving factory set .(only for XBLY)	

Appendix 1 Code page

Page0 PC437 Page3 CP860 [Portuguese]

Page 1 Katakana

一	-	-	■	■	■	■	□	□	□	□	□	□	□	+
上	ト	土	ト	口	-	ト	ト	ロ	ト	レ	ト	ロ	ト	ノ
下	。	ト	」	、	・	ヲ	ア	イ	ウ	エ	オ	ヤ	ユ	ヨ
左	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	シ	ス	ソ
右	チ	ツ	テ	ト	ナ	ニ	ヌ	ネ	ノ	ハ	ヒ	フ	ヘ	マ
ミ	ム	メ	モ	ヤ	エ	ヨ	ラ	リ	ル	レ	ロ	ワ	ン	。
二	ト	主	北	▲	▲	▲	▲	♠	♥	♦	♣	●	○	/
×	円	年	月	日	時	分	秒	元	市	区	町	村	人	

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Page6 pc1251 [Cyrillic]

Code page 1251																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	А	В	С	Д	Е	Ф
8_	Ђ	Ѓ	,	ѓ	„	…	†	‡	€	%о	Љ	ќ	Њ	Ќ	Ћ	Џ
9_	Ђ	‘	’	“	”	•	—	—		™	љ	›	њ	ќ	ћ	Џ
A_	<u>NBSP</u>	ў	ў	Ј	¤	Ѓ	:	§	Ё	©	Є	«	‐	<u>SHY</u>	®	ї
B_	°	±	I	i	ѓ	﹍	¶	.	ё	<u>№</u>	є	»	ј	S	s	ї
C_A	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П	
D_P	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Њ	Ы	Ь	Э	Ю	Я	
E_a	а	б	в	г	д	е	ж	з	и	й	л	м	н	о	п	
F_p	р	с	т	у	ф	х	ц	ч	ш	щ	њ	ы	ь	э	ю	я

Page7 pc866 Cyrillic #2

Page8 MIK [Cyrillic /Bulgarian]

Code page MIK																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
9_	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
A_	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
B_	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я
C_	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л
D_	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л
E_	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
F_	≡	±	≤	≥	†	‡	÷	≈	°	·	·	·	·	·	·	NBSP

Page9 CP755

Code page 755																
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8_	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
9_	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
A_	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
B_	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
C_	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л	Л
D_	š	¶	ć	ć	đ	đ	á	í	é	í	ñ	ñ	ü	ó	ú	—
E_	п	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я
F_	Ё	ё	Ѓ	ѓ	Ќ	ќ	Љ	љ	Њ	њ	Џ	Ѡ	Ѽ	Ѽ	Ѽ	NBSP

Page10 Iran

Code page Iran																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	.	۱	۲	۳	۴	۵	۶	۷	۸	۹	,	-	۹۶	۰	۹۷	۹۸
9_	۰	۱	۲	۳	۴	۵	۶	۷	۸	۹	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵
A_	خ	ش	ز	ذ	ر	ن	س	ه	ش	ش	۹۶	۹۷	۹۸	۹۹	۹۰	۹۱
B_	■	■	■	■	■	■	■	■	■	■	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵
C_	ل	ل	ت	ت	ـ	ـ	ـ	ـ	ـ	ـ	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵
D_	ۼ	۽	ۻ	ۻ	ۺ	ۺ	ۺ	ۺ	ۺ	ۺ	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵
E_	ظ	ع	خ	خ	غ	غ	غ	غ	غ	غ	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵
F_	گ	ل	ل	ل	م	م	ن	ن	و	و	۹۰	۹۱	۹۲	۹۳	۹۴	۹۵

Page15 CP862 [Hebrew]

Page 16 PC1252 Latin 1

Code page 1252																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	€	,	f	„	…	±	‡	^	%	Š	š	œ	ž			
9_	,	“	”	”	•	=	=	~	™	š	›	æ	ž	ÿ		
A_	NBSP	ƒ	£	¤	¥	₩	₪	ػ	߱	߳	ߵ	߶	߷	߸	߹	
B_	°	±	²	³	‘	µ	¶	·	۠	ۡ	ۢ	ۣ	ۤ	ۥ	ۼ	
C_	À	Á	Â	Ã	Ä	Å	Æ	Ҫ	È	É	Ê	Ӭ	ڶ	ڶ	ڶ	
D_	Đ	Ñ	Ò	Ó	Ô	Õ	Ö	Ӯ	Ӱ	Ӳ	Ӵ	Ӷ	ӷ	Ӹ	ӹ	
E_	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	ï	
F_	ő	ñ	ò	ó	ô	õ	ö	÷	ø	ú	û	ü	ý	þ	ÿ	

Page 17 WCP1253 [Greek]

Page18 PC852

Page19 PC858 (Multilingual Latin I+Euro)

Page20 Iran II

Code page Iran II															
	۰	۱	۲	۳	۴	۵	۶	۷	۸	۹	۹	۹	۹	۹	۹
۸	.	۱	۲	۳	۴	۵	۶	۷	۸	۹	,	-	?F	آ	ئ
۹	۱	۲	۳	۴	۵	۶	۷	۸	۹	۹	*	ج	چ	ه	ه
A	خ	ذ	ز	ت	ر	ز	ز	ش	ش	ش	ص	ض	هـ	طـ	طـ
B	بـ														
C	لـ	تـ													
D	مـ														
E	ظـ	عـ	عـ	عـ	غـ	غـ	غـ	غـ	غـ	غـ	فـ	قـ	قـ	كـ	كـ
F	ئـ	هـ	يـ	يـ	دـ	دـ									

Page21 Latvian

Code page Latvian																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	А	В	С	Д	Е	Ф
8_	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
9_	Р	С	Т	Ү	Ф	Х	Ц	Ч	Ш	Щ	Ь	Ы	Ь	Э	Ю	Я
A_	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
B_					А		н							Ӯ		
C_						ā										
D_	š		č	ć	ī	ȝ	ǵ	í	í					ū	ū	
E_	ę	c	t	у	ф	х	ц	ч	ш	щ	ь	ы	ь	э	ю	я
F_	Ё	ē	G	К	К	Ѓ	Ѓ	ž	ž	ö			N	š		NBSP

Page22 CP864 [Arabic]

Code page 864																
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8_	°
9_	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؛	؜	؝	؞	؞	؞
A_	NBSP	SHY	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞
B_	ؐ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞	؞
C_	ؑ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞	؞
D_	ؑ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞	؞
E_	ؑ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞	؞
F_	ؑ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؜	؝	؞	؞	؞

Page23 ISO-8859-1 [West Europe]

Code page 8859-1																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_																
9_																
A_	NBSP	í	¢	£	¤	¥	½	§	º	©	ª	«	»	SHY	®	—
B_	°	±	²	³	‘	’	™	·	„	°	º	»	¼	½	¾	¿
C_	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Ï	Í
D_	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ý	Þ	Þ	
E_	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	ï	
F_	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ý	þ	ÿ	

Page24 CP737 [Greek]

Page25 WCP1257 [Baltic]

Page26 Thai

Page27 CP720 [Arabic]

Page28 CP855

Code page 855																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	ହ	ବ୍ୟ	ି	ଶ୍ରୀ	ୟେ	ୟେ	ୟେ	ୟେ	ସ୍ରୀ	ସ୍ରୀ	ି	ି	ି	ି	ି	
9_	ଲ୍ୟ	ଲ୍ୟ	ନ୍ୟ	ନ୍ୟ	ହ୍ୟ	ହ୍ୟ	କ୍ୟ	କ୍ୟ	ୟୁ	ୟୁ	ଙ୍ୟ	ଙ୍ୟ	ଯୁ	ଯୁ	ନ୍ୟ	
A_	ା	ା	ବ୍ର	ବ୍ର	ଚ୍ର	ଚ୍ର	ଦ୍ର	ଦ୍ର	୧େ	୧େ	ଫ୍ରୋ	ଫ୍ରୋ	ଗ୍ରୋ	ଗ୍ରୋ	ୱୋ	
B_	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	ପ୍ରୋ	
C_	ଲ୍ୟ	ଲ୍ୟ	ନ୍ୟ	ନ୍ୟ	ତ୍ରେ	ତ୍ରେ	କ୍ରେ	କ୍ରେ	ର୍ରେ	ର୍ରେ	ର୍ରେ	ର୍ରେ	ର୍ରେ	ର୍ରେ	ର୍ରେ	
D_	ଲ୍ୟ	ଲ୍ୟ	ମ୍ର	ମ୍ର	ନ୍ତ୍ର	ନ୍ତ୍ର	ଓୟ	ଓୟ	ପ୍ରୋ	ପ୍ରୋ	ନ୍ତ୍ରେ	ନ୍ତ୍ରେ	ନ୍ତ୍ରେ	ନ୍ତ୍ରେ	ନ୍ତ୍ରେ	

E_	Я	р	Р	с	С	т	Т	у	У	ж	Ж	в	В	ь	ѣ	№
F_	SHY	ы	ы	з	з	ш	ш	э	Э	ш	ш	ч	ч	§	■	NBSP

Page29 PC857 [Turkish]

Page30 WCP1250 [Central Europe]

Page31 CP775

F_ SHY ± “ $\frac{3}{4}$ ¶ § ÷ „ ° . · 1 3 2 ■ NBSP

Page32 WCP1254 [Turkish]

Page33 WCP1255 [Hebrew]

Code page-1255																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8_	€	,	ƒ	„	…	±	±		%	ػ						
9_	,	,	“	”	•	=	=	~	-	TM		ؼ				
A_	NBSP	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؛	؜	SHY	؝	؞
B_	؀	؁	؂	؃	؄	؅	؆	؇	؈	؉	؊	؋	،	؍	؎	؏
C_	ؐ	ؑ	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؛	؜	؝	؞	؞
D_	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ						
E_	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ
F_	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	ؑ	LRM	RLM	

Page34 WCP1256 [Arabic]

Code page-1256															
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9_گ	‘	’	“	”	•	-	-	ڪ	TM	ڙ	’	œ	ZWNJ	ZWJ	ڻ
A_NBSP	‘	¢	£	¤	¥	፤	§	..	©	۾	«	ـ	SHY	®	-
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C_؎	؏	ؑ	؋	؊	؍	؈	؉	ا	ٻ	ة	ت	ث	ج	ح	خ
D_ذ	ر	ز	س	ش	ص	ض	x	ط	ڻ	ع	غ	-	ف	ق	ك
E_à	ل	â	م	ن	ه	و	ç	è	é	ê	ë	ى	ي	ا	آ
F_				ô	ُ	○	÷	ُ	ù	ُ	û	ü	LRM	RLM	ـ

Page35 WCP1258 [Vietnam]

Code page-1258																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	€		ƒ	„	„	±	‡	^	%		ؐ	ؑ	ؓ			
9_	,	‘	”	”	•	=	=	~	™		ؔ	ؕ	ؖ		ؘ	
A_	NBSP	ؒ	ؓ	ؔ	ؕ	ؖ	ؗ	ؘ	ؙ	ؚ	؛	؜	؞	؟	ؠ	
B_	؎	؏	ؐ	ؑ	ؒ	ؔ	ؕ	ؖ	ؗ	ؘ	؛	؜	؞	؟	ؠ	
C_	؀	؁	؂	؃	؄	؅	؆	؇	؈	؉	؊	؋	،	؍	؏	
D_	؎	؁	؂	؃	؄	؅	؆	؇	؈	؉	؊	؋	،	؍	؏	
E_	à	á	â	ă	ä	å	æ	ç	è	é	ê	ë		í	ï	
F_	đ	ñ	ó	ô	ö	ö	÷	ø	ú	ú	ú	ü	ü	d	ÿ	

Page36 ISO-8859-2[Latin 2]

Page37 ISO-8859-3[Latin 3]

Code page-8859-3																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_																
9_																
A_	NBSP	H	ȝ	£	¤			§								
B_	°	ñ	²	³	‘	µ		·	·	·				½		
C_	À	Á	Â		Ä	Ç	Ç	Ç	È	É	Ê	Ë	Ì	Í	Ï	
D_		Ñ	Ò	Ó	Ô	Ğ	Ö	x	Ğ	Ù	Ú	Û	Ü	Ş	Þ	
E_	à	á	â		ä	ç	ç	ç	è	é	ê	ë	ì	í	ï	
F_		ñ	ò	ó	ô	ğ	ö	÷	ğ	ù	ú	û	ü	ş	þ	

Page38 ISO-8859-4[Baltic]

Code page-8859-4																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_																
9_																
A_	NBSP	Ā	Ķ	Ŗ	Ŗ	Ī	Ļ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ
B_	°	ā	ķ	ŗ	ŗ	ī	ļ	ŗ	ŗ	ŗ	š	ē	ā	ķ	Ŗ	Ŗ
C_	Ā	Ā	Ā	Ā	Ā	Ā	Ā	Ā	Ā	Ā	Č	Ē	Ē	Ē	Ē	Ē
D_	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ	Ŗ
E_	ā	ā	ā	ā	ā	ā	ā	ā	ā	ā	č	ē	ē	ē	ē	ē
F_	đ	ñ	õ	k	ô	õ	ö	÷	ø	ú	ú	ú	ú	ú	ú	ú

Page39 ISO-8859-5[Cyrillic]

Code page-8859-5																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_																
9_																
A_	NBSP	Ё	Ђ	Ѓ	Ը	Ծ	Ը	Ը	Ը	Ը	Ը	Ը	Ը	Ը	Ը	Ը
B_	Ӑ	Ӗ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	ڶ	ԡ	ԡ	ԡ	ԡ	ԡ
C_	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ
D_	Ӑ	Ӗ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ	Ҫ
E_	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ	ӫ
F_	№	ӓ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ	Ӯ

Page40 ISO-8859-6[Arabic]

Code page-8859-6																
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_																
9_																
A_	NBSP				ڒ								,	SHY		
B_													ۼ			ۼ
C_		ء	ا	أ	ؤ	إ	ئ	ا	ب	ة	ت	ث	ج	ح	خ	د
D_	ذ	ر	ز	ر	ش	س	ص	ض	ط	ظ	ع	غ				
E_	ـ	ف	ق	ك	ل	م	ن	و	ي	ي	ـ	ـ	ـ	ـ	ـ	ـ

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Page41 ISO-8859-7[Greek]

Code page-8859-7																		
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9																		
A	NBSP	‘	’	£	€	Ђ	ߵ	߷	߸	߹	ߺ	߻	߼	߽	߾	߿	߿	߿
B	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߋ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
C	ߑ	ߒ	ߓ	ߔ	ߕ	ߖ	ߗ	ߘ	ߙ	ߚ	ߛ	ߜ	ߝ	ߞ	ߞ	ߞ	ߞ	ߞ
D	ߑ	ߒ	ߓ	ߔ	ߕ	ߖ	ߗ	ߘ	ߙ	ߚ	ߛ	ߜ	ߝ	ߞ	ߞ	ߞ	ߞ	ߞ
E	߁	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
F	ߑ	ߒ	ߓ	ߔ	ߕ	ߖ	ߗ	ߘ	ߙ	ߚ	ߛ	ߜ	ߝ	ߞ	ߞ	ߞ	ߞ	ߞ

Page42 ISO-8859-8[Hebrew]

Code page-8859-8																		
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F		
8																		
9																		
A	NBSP	₪	£	¤	¥	ߵ	߷	߸	߹	߹	ߺ	߻	߼	߽	߿	߿	߿	߿
B	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߋ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
C																		
D																		
E	߁	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
F	߁	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
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Page43 ISO-8859-9[Turkish]

Code page-8859-9																		
	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F		
8																		
9																		
A	NBSP	‘	’	£	¤	¥	ߵ	߷	߸	߹	ߺ	߻	߼	߽	߿	߿	߿	߿
B	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߋ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
C	ߑ	ߒ	ߓ	ߔ	ߕ	ߖ	ߗ	ߘ	ߙ	ߚ	ߛ	ߜ	ߝ	ߞ	ߞ	ߞ	ߞ	ߞ
D	ߑ	ߒ	ߓ	ߔ	ߕ	ߖ	ߗ	ߘ	ߙ	ߚ	ߛ	ߜ	ߝ	ߞ	ߞ	ߞ	ߞ	ߞ
E	߁	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ
F	߁	߂	߃	߄	߅	߆	߇	߈	߉	ߊ	ߌ	ߍ	ߎ	ߏ	ߐ	ߑ	ߒ	ߒ

E_	æ	ß	Γ	π	Σ	σ	μ	ι	Φ	Θ	Ω	δ	ø	φ	ε	Ω
F_	≡	±	≥	≤	⊤	⊥	÷	≈	°	⋮	⋮	⋮	√	ₙ	²	NBSP

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	_0	_1	_2	_3	_4	_5	_6	_7	_8	_9	_A	_B	_C	_D	_E	_F
8_	€					...										
9_	‘	,	“	”	•	—	—									
A_	ଗ	ୟ	ୢ	ଡ	କ	ଖ	ଣ	ଜ	ଳ	ଞ	ଶ	ଷ	ବ	ଲ୍ୟ	ମ୍ୟ	ମ୍ୟ
B_	କ୍ରି	ଥ	ତ୍ରି	ଲା	ଦ	ତ	ପି	ଥି	ଶି	ନା	ବ	ପ	ମ	ଫ	ଫ	ଫ
C_	ଙ୍ଗ	ମ	ୟ	ର୍ଜ	ଣି	ଲି	ଗି	ବି	କି	ଚି	ଲି	ହି	ଫି	ଓ	ଏ	ୟ
D_	ଙ୍ଙ		ର୍ତ୍ତ	ସଂ												ବ୍ରି
E_	ଇ	ୱୁ	ରୀ	ରୀ	ୱୀ	ୱୀ	ୱୀ							୦		୦
F_	ଠୋ	ଠେ	ଠ୍ରୀ	ଠୀ	ଠୀ	ଠୀ	ଠୀ									NBSP

Appendix 2 International character set:

Country	ASCII Code(Hex)														
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E			
U.S.A.	#	\$	@	[\]	^	`	{		}	~			
France	#	\$	à	°	ç	§	^	`	é	ù	è	“			
Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß			
U.K.	£	\$	@	[\]	^	`	{		}	~			
Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~			
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü			
Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì			
Spain I	Pt	\$	@	i	Ñ	¿	^	`	ñ						
Japan	#	\$	@	[¥]	^	`	{		}	~			
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü			
Denmark II	#	\$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü			
Spain II	#	\$	á	i	Ñ	¿	é	`	í	ñ	ó	ú			
Latin	#	\$	á	i	Ñ	¿	é	ü	í	ñ	ó	ú			
Korea	#	\$	@	[₩]	^	`	{		}	~			
Slovenia/Croatia	#	\$	ž	š	đ	ć	č	ž	š	đ	ć	č			
China	#	¥	@	[\]	^	`	{		}	~			

