Table of contents

1 Performance Indicators

1.1 Introduction

WIZARPOS developed the thermal printer module to provide a high-quality, high speed printing, low-noise, high reliability thermal printing solution.

Wide application fields, especially for commercial cash registers, bank POS and all kinds of receipt printing.

Paper width is 58mm, printer area is 48mm, the maximum of paper roll outer diameter is 40mm.

1.2 Key Benefits

- Easy to operate, easy maintenance;
- High speed and low-noise printing;
- Print head with long life, reliable performance;
- Support GB18030-2000 Chinese char set;
- Support ISO8859-(1、2、3、4、5、7、9、13、15) char set;
- Real time detection mode;

1.3 Key technical indicator

1.3.1 Specification

1) Print method: thermal printing line after line

2) print dots: 384 dots/line(default)

3) Resolution: 203DPIx203DPI

4) feed paper method: one way friction into the paper

5) print width: 8dots/mm, 48mm(print area)

6) char size/line:

Foreign(12x24)	Foreign (9x17)	Chinese(24x24)	Chinese(16x16)
32chars/line	42chars/line	16chars/line	24chars/line

7) line space: default 24 点(3mm)

adjust by control command, the increment is 0.125mm;

If the data is out of print area, auto line wrap, and the line space is 0.The maximum line size is 2, if data is larger that 2 lines, the larger part will be discarded.

8) print speed: maximum 80mm/s

the print speed is relate to the data transfer speed;

feed paper speed: maximum is 80mm/s

9) minimum unit of feed paper: 0.125mm

10) Print Format: maximum 32 columns(12x24 character); maximum 42columns(9x17

characters);maximum 16 columns(24x24 Chinese); maximum 24 columns(16x16 Chinese)

11) internal receive buffer: 4K bytes

12) Print interface:

Serial interface: TTL level compatibility, support RTS/CTS handshake protocol, asynchronous communication 115200(fixed)

13) Print paper:

High-quality thermal paper, paper thick is 65-100μm;

Recommend the thermal paper specification: outer diameter 40mm(maximum) paper width 57.5+/-0.5mm

14) Printer Command: EPSON ESC/POS Command list compatibility

1.3.2 Thermal paper roll technical specification

- ✓ Type: high quality sensitivity thermal paper
- ✓ Print widht:57.5+/-0.5mm
- ✓ Print paper thick:65μm~100μm
- ✓ Paper roll outer diameter: maximum is 50 mm
- ✓ Paper curl direction: Outside the printing surface volume
- ✓ Print surface: Paper roll of the lateral

Note: If using paper do not meet above requirement, there will be the possibility of a paper jam.

1.3.3 Printing mechanism reliability

1) print movement

lift:100kilometer, 1 billion pulse

2) mechanism

thermal module

work temperature: -5℃~45℃(No condensation)

work humidity: 20~85%(No condensation)

store temperature: -20℃~60℃(No condensation)

store humidity: 5~95%(40℃,No condensation)

Life:50km feed paper length

Note: If using paper do not meet above requirement, the above life can not guarantee.

1.3.4 Character char set

1) character char set

Chinese:GB18030-2000(backwards compatibility GB2312-1980);

Foreign:ISO8859-(1、2、3、4、5、7、9、13、15)

2) Character size

	normal	Double height	Double width	Double height +Double width
	W*H(mm)			
Foreign(12x24)	1.5x3.0	1.5x6.0	3.0x3.0	3.0x6.0
Foreign(9x17)	1.125x2.125	1.125x4.25	2.25x2.125	2.25x4.25
Chinese(24x24)	3.0x3.0	3.0x6.0	6.0x3.0	6.0x6.0
Chinese(16x16)	2.0x2.0	2.0x3.0	3.0x2.0	3.0x3.0

1.4 other

1.4.1 Power supply

- Supply voltage: DC 6.8-8.4V
- Current consumption:

  Average value: about 2A

1.4.2 Support terminal table list

Terminal type	Outer diameter
Q1	30mm
POS1v2	40mm
Q2	40mm
Q1v2	30mm

2 POS Commands

2.1 Command List

Command	Statement
HT	Horizontal tab
LF	Print and line feed
CR	Carriage return
ESC SP	Set right-side character space
ESC !	Set the font types
ESC $	Set the absolute print position
ESC *	Select bit-image mode
ESC -	Turn underline mode on/off
ESC 2	Set the line space to a default value
ESC 3	Set the line space to n dots
ESC SO	Set character double width
ESC DC4	Set the width normal
ESC @	Initialize the printer
ESC B	Set the left margin
ESC D	Set horizontal tab positions
ESC E	Turn bold mode on/off
ESC G	Turn double-strike mode on/off
ESC J	Print and feed paper for n dots
ESC M	Set the font grayscale
ESC R	Select an international character set
ESC V	Turn 90° clockwise rotation mode on/off
ESC \	Set the relative print position
ESC a	Set the print alignment
ESC d	Print and feed paper for n lines
ESC t	Select character code page
ESC {	Turn upside-down printing mode on/off
GS !	Select character size
GS B	Turn white/black reverse printing mode on/off
GS v 0	Print raster bit image
DC2 * r	Print bitmap
DC2 V	Print MSB bitmap
DC2 v	Print LSB bitmap

DC2 T	Print test page
FS !	Set Chinese character printing mode
FS -	Turn Chinese character underline mode on/off
FS S	Set Chinese character space
FS W	Turn Chinese character printing on/off
ESC C	Check character code table
ESC F	Download character code table
ESC H	MD5 self-inspection
ESC A	Check the printer version
ESC >	Check information of character code table head
GS E	Set print density

2.2 Command Explanations

HT

[Name] Horizontal tab

[Format] ASCII HT
Hex 09
Decimal 9

[Description] Move the print position to the next tab position.
- If no tab position is set (it is default setting), this command will be ignored
- The tab position is set by ESC D
- If the tab position exceeds the print area, printing position will be moved to the starting position of next line (Considering as a line is full, print the data and feed one line).

[Reference] **ESC D**

LF

[Name] Print and feed paper

[Format] ASCII LF
Hex 0A
Decimal 10

[Description] Print the data in the printer buffer, then feed paper for one line according to the current line space settings. After printing, the print position moves to the beginning of the line.

[Reference] **ESC 2, ESC 3**

CR

[Name] Carriage return

[Format] ASCII CR
Hex 0D
Decimal 13

[Description] Adjust the print position to the starting position of this line and line feed.

[Reference] **LF**

ESC SP n

[Name] Set the right-side character space

[Format] ASCII ESC SP n
Hex 1B 20 n
Decimal 27 32 n

[Parameter Range] 0≤n≤255

[Description] Set the right right-side character space is [n×0.125mm]。
- For double width mode, the character right margin is double than normal mode.
- The command will not effective to Chinese character.

[Default] n=0

ESC ! n

[Name] Set the font type

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Set the font type (italic, border, bold, double width, double height, inverse or underline). And the bit definitions of parameter n are shown as follows:

Bit	On/off	Hex	Decimal	Function
0	off	00	0	Character type A (12×24)
	on	01	1	Character type B (9×17)
1	-	-	-	Reserved
2	-	-	-	Reserved
3	-	-	--	Reserved
4	Off	00	0	Double-height mode off
	On	10	16	Double-height mode on
5	Off	00	0	Double-width mode off
	On	20	32	Double-width mode on
6	-	-	--	Reserved
7	Off	00	0	Underline mode off
	on	80	128	Underline mode on

- If set double-width and double-height at the same time, quadrupled the character size.
- Can not underline the blank generated by HT or the rotate 90 character.
- The width of under line set by **ESC -**, have not affected by the character size.
- **ESC M** also can set character type.
- **ESC -** also can turn on/off underline.
- **GS !** also can set character size.

[Default] n=0

[Reference] **ESC -**, **ESC E**, **GS !**

ESC $ nL nH

[Name] Set the absolute print position

[Format]

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

[Parameter Range] 0≤nL≤255

0≤nH≤255

[Description] Moves the print position to a location in a distance of (nL + nH × 256) dots from the starting position for printing.

[Reference] **ESC **

ESC * m nL nH d1...dk

[Name] 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

[Parameter Range] m = 0,1,32,33

0≤nL≤255

0≤nH≤3

0≤d≤255

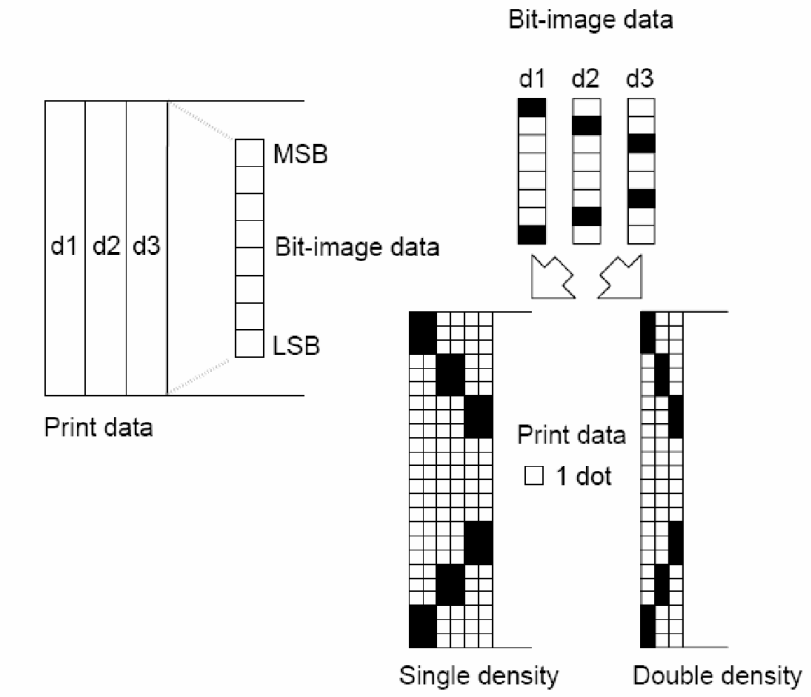
[Description] Stores the bit image data in the print buffer using the mode specified by bit image mode m, nl and nh specifies a bit image in the horizontal direction as(nl+256×nh) dots, [d]k specifies the bit image data (column format) k indicates the amount of bit image data, but it does not need to be transmitted.

m	Mode	Vertical		Horizontal	
		point	density	density	Data count(K)
0	8 dots single density	8	67.7 dpi	101.6 dpi	nL+nH×256
1	8 dots double density	8	67.7 dpi	203.2 dpi	nL+nH×256
32	24 dots single density	24	203.2 dpi	101.6 dpi	(nL+nH×256)×3
33	24 dots double density	24	203.2 dpi	203.2 dpi	(nL+nH×256)×3

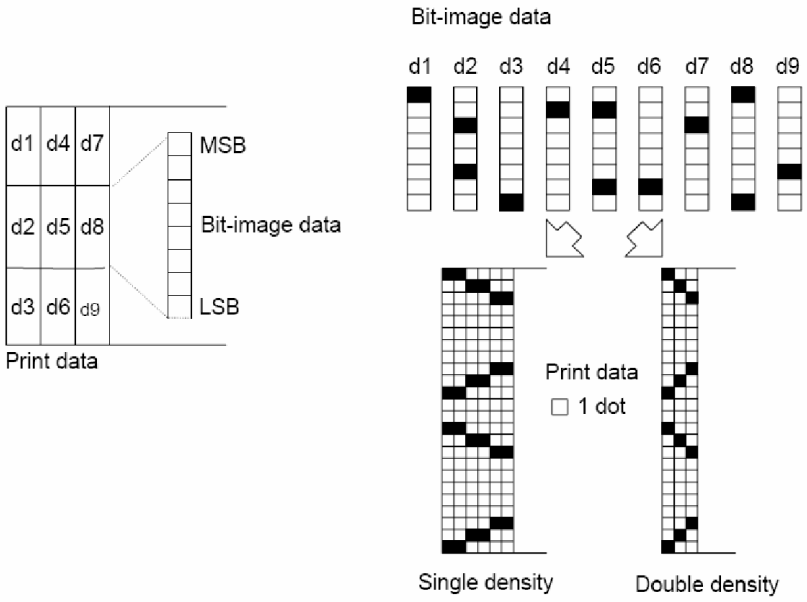
[Note]

- If m is out of Parameter Range, the nL and the other data will regard as the normal data.
- If the bit image exceeds one line of print area, the excess part will be
- Ignored.
- data [d]k specifies a bit printed to 1 and not printed to 0.
- Bold, double-strike, underline, character size, upside-down, black/white command will not affect to the command.
- The print result as follows:

  If select 8-dots bitmap:



If select 24 dots bitmap:



ESC - n

[Name] Turn underline mode on/off

[Format]

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

[Parameter Range] 0≤n≤2

48≤n≤50

[Description] Turns underline mode on or off using n as follows:

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] • Can not underline the blank generated by HT or the rotate 90 character.
• Default width is 1-dot thick.
• The thick is not affected by the character size.
• **ESC !** can also turn on/off underline.

[Default] n=0

[Reference] **ESC !**

ESC 2

[Name] Set the line space to a default value 3mm

[Format] ASCII ESC 2
Hex 1B 32
Decimal 27 50

[Description] Set the line space to a default value 3mm(24×0.125mm)。

[Reference] **ESC 3**

ESC 3 n

[Name] Set the line space to n dots

[Format] ASCII ESC 3 n
Hex 1B 33 n
Decimal 27 51 n

[Description] Set the line space to n dots.

[Default] n=24

[Reference] **ESC 2**

ESC SO n

[Name] Turn on double width mode

[Format] ASCII ESC SO n
Hex 1B 0E n
Decimal 27 14 n

[Parameter Range] 0≤n≤255

[Description] Turn on double width mode.

[Note] • Use **LF** or **ESC DC4** to turn off.

[Default] n=2

ESC DC4 n

[Name] Turn off double width mode

[Format] ASCII ESC DC4 n
Hex 1B 14 n
Decimal 27 20 n

[Parameter Range] 0≤n≤255

[Description] Turn off double width mode.

[Note] • The value of n is same with the n in turn on command.

[Default] n=2

ESC @

[Name]	Initialize the printer
[Format]	ASCII ESC @
	Hex 1B 40
	Decimal 27 64
[Description]	Reset the printer, the print mode reset to the default setting.
[Note]	• Can not clear the data in receive buffer.

ESC B n

[Name]	Set the left margin
[Format]	ASCII ESC B n
	Hex 1B 42 n
	Decimal 27 66 n
[Parameter Range]	0≤n≤47
[Description]	Set the left margin.
[Note]	• This command just affects the character, doesn’t affect the Chinese .
[Default]	n=0

ESC D n1...nk NUL

[Name]	Set horizontal tab positions
[Format]	ASCII ESC D n1...nk NUL
	Hex 1B 44 n1...nk 00
	Decimal 27 68 n1...nk 0
[Parameter Range]	1≤n≤255
	0≤k≤32
[Description]	Set the horizontal tab positions, the meanings of parameters are as follows: n1..nk are horizontal tab position (Unit: 8 dots), NULL is a stop character
[Note]	• Horizontal tab position stored as a data, the data value is [character width ×n] measured from the line begin. • When this command is used, any previous horizontal tab settings will be canceled. • The tab position can be switched by HT command • The max set value is 32(k=32), larger than 32, the larger data will regard as normal data. • Transmit [d]k in ascending order and place a NULL code at the end. • When dk is less than or equal to dk-1, horizontal tab setting is finished, and the following data will be processed as normal data. • **ESC D NUL** will cancel the horizontal tab position. • Even the character width change, the set tab position will not change.
[Default]	Default tab position is character type A(12×24), the eight character space (column 9, 17, 25 ...)。
[Reference]	**HT**

ESC E n

[Name] Turn bold mode on/off

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Turns bold mode on or off using n as follows:

If n = 0, turn off the bold, if n = 1, turn on the bold.

[Default] n=0

[Reference] **ESC !**

ESC G n

[Name] Turn double-strike mode on/off

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Turn double-strike mode on/off:

0 turn off double-strike

1 turn on double-strike。

[Note] • The double-strike has the same print with bold print.

[Default] n=0

[Reference] **ESC E**

ESC J n

[Name] Print and feed paper for n dots

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Print the data in the printer buffer and feed paper for n dots(0.125mm per dot).

[Note] • After printing, the print position moves to the beginning of the line.

• This has not affected the set value by **ESC 2** or **ESC 3**.

ESC M n

[Name] Select the character type

[Format]

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

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

[Description] Select character type:

n	Function
0, 48	Character type A(12×24)

1, 49	Character type B (9×17)

[Reference] **ESC !**

ESC R n

[Name] Select international character

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Selects an international character set n as follows::

n	international character
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
16	Vietnam
17	Arabia
101	ISO-8859-1
102	ISO-8859-2
103	ISO-8859-3
104	ISO-8859-4
105	ISO-8859-5
107	ISO-8859-7
109	ISO-8859-9
113	ISO-8859-13
115	ISO-8859-15
130	GB13030-2000

[Default] n=0

Suggest to use n=8,n = 15, n >100

ESC V n

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

[Format]

ASCII	ESC	V	n
Hex	1B	56	n
Decimal	27	86	n

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

[Description] Turn 90° clockwise rotation mode on/off using n as follows:

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

[Note] • Underline is not effective for the rotation characters.

[Default] n=0

[Reference] **ESC !, ESC -**

ESC \ nL nH

[Name] Set the relative print position

[Format]

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

[Parameter Range] 0≤nL≤255

0≤nH≤255

[Description] Moves the print position to a location in a distance of (nL + nH × 256) dots from the current position.

[Note]
- If the position is not in print area, the set will be ignored.
- If the set position is in right of the current position, the distance N is nL+nH ×256=N
- If the set position is in left of the current position, the distance N is: nL+nH ×256=65536-N

[Reference] **ESC $**

ESC a n

[Name] Set the print alignment mode(left, center or right)

[Format]

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

[Parameter Range] 0≤n≤2

48≤n≤50

[Description] Align all data in a line, the meanings of n value are as follows:

n	Mode
0, 48	Left
1, 49	Center
2, 50	Right

[Note] • The settings by this command are effective at the line begin.

[Default] n=0

ESC d n

[Name] Print and feed paper for n lines

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Print the data in the printer buffer and feed paper for n lines.

[Note]
- After printing, the print position moves to the beginning of theline.
- The line space is set by ESC 2 or ESC 3.

[Reference] **ESC 2, ESC 3**

ESC t n

[Name] Select character code table

[Format]

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

[Parameter Range] 0≤n≤255

[Description] Selects an code n from the character code table as follows:

n	Character code table
0	PC437: USA, Standard Europe
1	Katakana
2	PC850: Multilingual
3	PC860: Portuguese
4	PC863: Canadian-French
5	PC865: Nordic
11	PC851: Greek
12	PC853: Turkish
13	PC857: Turkish
14	PC737: Greek
15	ISO8859-7: Greek
16	WPC1252
17	PC866: Cyrillic #2
18	PC852: Latin2
19	PC858: Euro
20	KU42: Thai
21	TIS11: Thai
26	TIS18: Thai
30	TCVN-3: Vietnamese I
31	TCVN-3: Vietnamese II
32	PC720: Arabic
33	WPC775: Baltic Rim
34	PC855: Cylillic
35	PC861: Icelandic
36	PC862: Hebrew

37	PC864: Arabic
38	PC869: Greek
39	ISO8859-2: Latin2
40	ISO8859-15: Latin9
41	PC1098: Farsi
42	PC1118: Lithuanian
43	PC1119: Lithuanian
44	PC1125: Ukrainian
45	WPC1250: Latin 2
46	WPC1251: Cyrillic
47	WPC1253: Greek
48	WPC1254: Turkish
49	WPC1255: Hebrew
50	WPC1256: Arabic
51	WPC1257: Baltic Rim
52	WPC1258: Vietnamese
53	KZ1048: Kazakhstan

[Default] n=0

Suggest to use ESC R command to replace this command.

ESC { n

[Name] Turn upside-down printing mode on/off

[Format]

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

[Parameter Range] 0≤n≤255

[Description] turns upside-down print mode on or off:

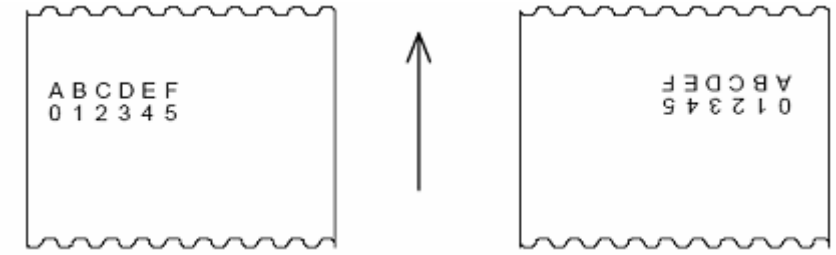
0 Upside-down print mode is turned off

1 Upside-down print mode is turned on

[Note] • The settings by this command are effective at the line begin.

[Default] n=0

[Sample]



GS ! n

[Name] Select character size

[Format]

ASCII	GS	!	n
Hex	1D	21	n

Decimal 29 33 n

[Parameter Range] 0≤n≤255

[Description] Function description Character height is set by the bit0~bit3 of n, and character width is set by bit4~bit7 of n.

Bit	On/off	Hex	Decimal	Function
0				
1				
2				Table2
3				
4				
5				
6				Table1
7				

Table1 Set Character width

Hex	Decimal	Width
00	00	1 (normal)
10	16	2 (double-width)
20	32	3
30	48	4
40	64	5
50	80	6
60	96	7
70	112	8

Table2 Set character height

Hex	Decimal	Height
00	00	1 (normal)
01	1	2 (double-height)
02	2	3
03	3	4
04	4	5
05	5	6
06	6	7
07	7	8

[Note]
- If n is our of range, the command will be ignored.
- Use **ESC !** also can turn on/off double-width and double height.

[Default] n=0

[Reference] **ESC !**

GS B n

[Name] Turn black/white inverse printing mode on/off

[Format] ASCII GS B n

Hex 1D 42 n

Decimal 29 66 n

[Parameter Range] 0≤n≤255

[Description] turns upside-down print mode on or off.

0 Black/white inverse printing mode is turned off

1 Black/white inverse printing mode is turned on

[Note]
- Also effective the blank set by **ESC SP**.
- Not effective the blank set by **HT**、**ESC $** and **ESC **.
- Not effective the line space.
- This command prior to the underline mode, but can not cancel the underline mode.

[Default] n=0

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

[Name] 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

[Parameter Range]

0≤m≤3

48≤m≤51

0≤xL≤255

0≤xH≤255 ,1≤(xL+xH×256)≤128

0≤yL≤255

0≤yH≤8 ,1≤(yL+yH×256)≤4095

0≤d≤255

k=(xL+xH×256)×(yL+yH×256)(k>0)

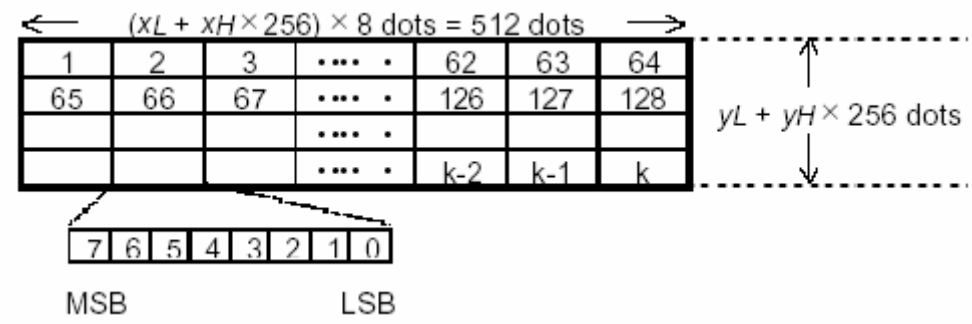
[Description] Print raster bit image, the meanings of parameter m are as follows:

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	Double width +double height	101.6 dpi	101.6 dpi

[Note]

- xL, xH specifies (xL + xH × 256) bytes in horizontal direction for
- the bit image.
- yL, yH specifies (yL + yH × 256) dots in vertical direction for the bit image.
- [d]k specifies the bit image data (raster format). k indicates the number of bit image data. k is an explanation parameter; therefore, it does not need to be transmitted
- The print mode command will not affect the command.
- The data out print are will be ignored.
- The print position can be set by **HT**, **ESC $**, **ESC **, **GS L**.
- **ESC a** can affect the raster image.

[Sample] If xL+xH×256=64



DC2 * r n d1...dn

[Name] Bitmap print

[Format]

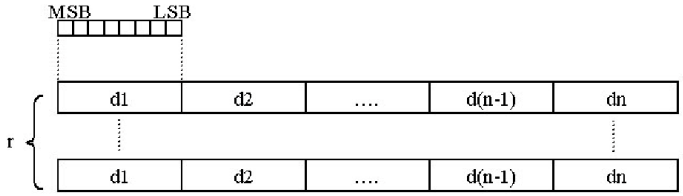
ASCII	DC2	*	r	n	d1...dn

	Hex	12	2A	r	n	d1...dn
	Decimal	18	42	r	n	d1...dn

[Parameter Range] 0＜n≤255

0＜r≤255

[Description]
- Print the assigned height bitmap.
- r:height
- n:width
- only effective when no data in print buffer
- the print mode command will not affect this bitmap.
- The data out of print area will be decrypted.
- Dn is the print data, 1 will print, 0 will not print.
- Bitmap Format as follows:



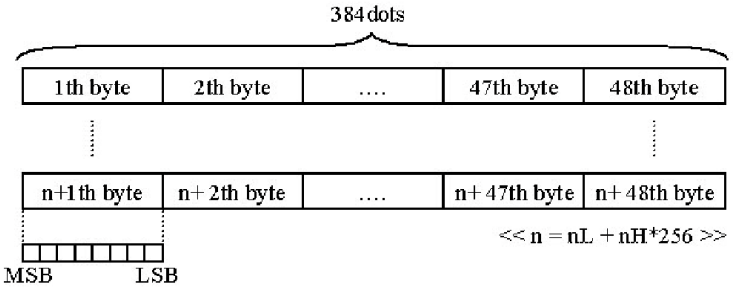
DC2 V nL nH d1...d48

[Name] MSB Bitmap print

[Format]	ASCII	DC2	V	nL	nH	d1...d48
	Hex	12	56	nL	nH	d1...d48
	Decimal	18	86	nL	nH	d1...d48

[Parameter Range] 0＜nL+nH×256

[Description]
- Print the MSB bitmap, the width is 384.
- The height of the bitmap is nL+nH×256.
- only effective when no data in print buffer
- the print mode command will not affect this bitmap.
- The data out of print area will be decrypted.
- Dn is the print data, 1 will print, 0 will not print.
- MSB bitmap Format as follows:



DC2 v nL nH d1...d48

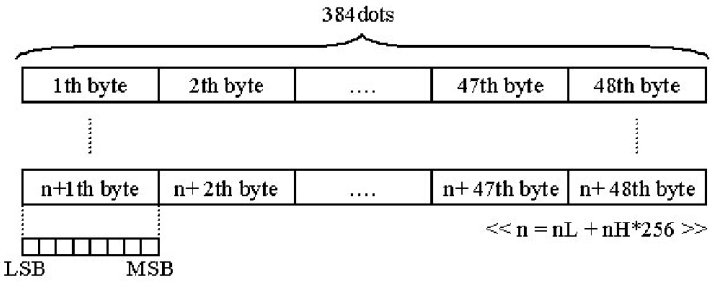
[Name] LSB Bitmap print

[Format]	ASCII	DC2	v	nL	nH	d1...d48
	Hex	12	76	nL	nH	d1...d48

	Decimal	18	118	nL	nH	d1...d48

[Parameter Range] 0＜nL+nH×256

[Description]
- Print the LSB bitmap, the width is 384.
- The height of the bitmap is nL+nH×256.
- only effective when no data in print buffer.
- the print mode command will not affect this bitmap.
- The data out of print area will be decrypted.
- Dn is the print data, 1 will print, 0 will not print.
- LSB bitmap Format as follows:



DC2 T

[Name] Print test page

[Format]	ASCII	DC2	T
	Hex	12	54
	Decimal	18	84

[Description]
- Print test page.

ESC A

[Name] Check print module version

[Format]	ASCII	ESC	A
	Hex	1B	41
	Decimal	27	65

[Description] Send the check command, then read the return value. The return value is 32 bytes.
- char[32]

ESC >

[Name] Check the font library head info

[Format]	ASCII	ESC	>
	Hex	1B	3E
	Decimal	27	62

[Description] Send the check command, then read the return value. The return value is 128 bytes.
- char magic[8];
- int version;
- int size;
- int offset;
- char md5[16]
- char time[24];

- char reserve[2];
- char describe[64];
- char unuse;
- char checksum

GS E n

[Name] Set print density

[Format]

ASCII	GS	E	n
Hex	1D	45	n
Decimal	29	69	n

[Parameter Range] 0≤n≤3

[Description]

n	description
0	lighter
1	light
2	dark
3	darker

[Notice]
- This setting will effect all the time until power off the printer or reset the command;

[Default] n=1

①GS k m d1...dk NUL ②GS k m n d1...dn

[Name] Print Barcode

[Format]

①ASCII	GS	k	m	d1...dk	NUL
Hex	1D	6B	m	d1...dk	00
Decimal	29	107	m	d1...dk	0
②ASCII	GS	k	m	n	d1...dn
Hex	1D	6B	m	n	d1...dn
Decimal	29	107	m	n	d1...dn

[Parameter Range] The meanings of parameters are as follows:

m is the encoding method

n is the encoding data length. It is only suitable for②, the differences between ① and ② are the data segment of ① ends with a NULL and ② is used to indicate the length of data.

k indicates the length of Barcode data, but it does not need to be transmitted.

①0≤m≤8

②65≤m≤75

[Description]

m	m		length	Legal character
①	0	UPC-A	11≤k≤12	48≤d≤57
	1	UPC-E	6≤k≤8, 11≤k≤12	48≤d≤57
	2	JAN13(EAN13)	12≤k≤13	48≤d≤57
	3	JAN8(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(k is even number)	48≤d≤57
		6	CODABAR	1≤k	48≤d≤57, 65≤d≤68, 36, 43, 45, 46, 47, 58
		7	EAN13	12≤k≤13	48≤d≤57
		8	EAN8	7≤k≤8	48≤d≤57
	②	65	UPC-A	11≤n≤12	48≤d≤57
		66	UPC-E	6≤n≤8, 11≤n≤12	48≤d≤57
		67	JAN13(EAN13)	12≤n≤13	48≤d≤57
		68	JAN8(EAN8)	7≤n≤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(n is 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	1≤n≤255	0≤d≤127
		74	EAN13	12≤n≤13	48≤d≤57
		75	EAN8	7≤n≤8	48≤d≤57

[Comment①] • End with NUL.

[Comment②] • n barcode data byte count;

• if n is out of Parameter Range, the printer will not process the command;

[Notice] • ITF barcode count should be even number, when set odd number, the printer will ignore the last data byte;

• If d is out of Parameter Range, the printer will not process the command;

• If width is out of printer area, the printer only feed paper;

• This command will ignore the line space command **ESC 2** or **ESC 3**;

• After print barcode, the position of printer is at the begin of one line;

• This command will ignore the print mode command **ESC !**;

• UPC-E can change from UPC-A, transformational rule refer to **Appendix B**。

[Sample] For CODE93:

Print a HRI char(□) at the beginning of the HRI string.

Print a HRI char(□) at the end of the HRI string.

Print a HRI char(■ + char) as control char, from 00(H) to 1F(H), 7F(H).

Control char			HRI char	Control char			HRIchar
ASCII	Hex	Decimal		ASCII	Hex	Decimal	
NUL	00	0	□U	DLE	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	EN	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

Print GS k 72 7 67 111 100 101 13 57 51

For CODE128:

See **Appendix A**.

Special char transformational rule:

Special char	Data		
	ASCII	Hex	Decimal
CODE A	{A	7B,41	123，65
CODE B	{B	7B,42	123，66
CODE C	{C	7B,43	123，67
“{”	{{	7B,7B	123，123

Print sample data “No.123456”.

Firstly, using CODE B to print “No.”, then using CODE C to print the numbers.

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

[Reference to] **GS H, GS f, GS h, GS w, GS x, ESC a,** 附录

GS h n

[Name] Set height of one-dimension

[Format]

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

[Parameter Range] 1≤n≤255

[Description] Set height of one-dimension

n Points in the vertical direction

[Default] n = 96

[Reference to] **GS k**

GS w n

[Name] Set width of one-dimension

[Format]

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

[Parameter Range] 2≤n≤6

[Description] Set width of one-dimension.

n:

n	Multiple barcode unit widths (millimeter)	Binary barcode	
		Narrow strip width (millimeter)	Wide strip width (millimeter)
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

Multiple barcode: UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, CODE128

Binary barcode: CODE39, ITF, CODABAR

[Default] n = 3

[Reference to] **GS k**

GS x n

[Name] Set left margin of one-dimension

[Format]

ASCII	GS	x	n
Hex	1D	78	n
Decimal	29	120	n

[Parameter Range] 0≤n≤255

[Description] Set left margin of one-dimension.

[Default] n = 0

[Reference to] **GS k**

GS H n

[Name] select print position of one-dimension HRI

[Format]

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

[Parameter Range] 0≤n≤3,48≤n≤51

[Description] Set the print position of one-dimension HRI, the meanings of parameter n are as follows:

n	print position
0,48	not print
1,49	above the barcode
2,50	below the barcode
3,51	above and below the barcode

HRI(Human Readable Interpretation).

[Default] n = 2

[Reference to] **GS f, GS k**

GS f n

[Name] Set barcode HRI font type

[Format]

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

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

[Description] When print barcode, select the font type.

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

HRI(Human Readable Interpretation)

[Default] n = 0

[Reference to] **GS H, GS k**

Appendix A: CODE128 barcode

Red character has not supported now.

Character set A:

Char	data		Char	data		Char	data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
NUL	0	0	(	28	40	P	50	80
SOH	1	1	)	29	41	Q	51	81
STX	2	2	*	2A	42	R	52	82
ETX	3	3	+	2B	43	S	53	83
EOT	4	4	,	2C	44	T	54	84
ENQ	5	5	-	2D	45	U	55	85
ACK	6	6	.	2E	46	V	56	86
BEL	7	7	/	2F	47	W	57	87
BS	8	8	0	30	48	X	58	88
T	9	9	1	31	49	Y	59	89
LF	0A	10	2	32	50	Z	5A	90
VT	0B	11	3	33	51	[	5B	91
FF	0C	12	4	34	52	\	5C	92
CR	0D	13	5	35	53	]	5D	93
SO	0E	14	6	36	54	^	5E	94
SI	0F	15	7	37	55	_	5F	95
DLE	10	16	8	38	56	FNC1	7B, 31	123, 49
DC1	11	17	9	39	57	FNC2	7B, 32	123, 50
DC2	12	18	:	3A	58	FNC3	7B, 33	123, 51
DC3	13	19	;	3B	59	FNC4	7B, 34	123, 52
DC4	14	20	<	3C	60	SHIFT	7B, 53	123, 83
NAK	15	21	=	3D	61	CODEB	7B, 42	123, 66
SYN	16	22	>	3E	62	CODEC	7B, 43	123, 67
ETB	17	23	?	3F	63			
CAN	18	24	@	40	64			
EM	19	25	A	41	65			
SUB	1A	26	B	42	66			
ESC	1B	27	C	43	67			
FS	1C	28	D	44	68			
GS	1D	29	E	45	69			
RS	1E	30	F	46	70			
US	1F	31	G	47	71			
SP	20	32	H	48	72			
!	21	33	I	49	73			
″	22	34	J	4A	74			
#	23	35	K	4B	75			
$	24	36	L	4C	76			
%	25	37	M	4D	77			
&	26	38	N	4E	78			
’	27	39	O	4F	79			

Character B:

Char	data		Char	data		Char	data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
SP	20	32	H	48	72	p	70	112
!	21	33	I	49	73	q	71	113
″	22	34	J	4A	74	r	72	114
#	23	35	K	4B	75	s	73	115
$	24	36	L	4C	76	t	74	116
%	25	37	M	4D	77	u	75	117
&	26	38	N	4E	78	V	76	118
’	27	39	O	4F	79	w	77	119

(	28	40	P	50	80	x	78	120
)	29	41	Q	51	81	y	79	121
*	2A	42	R	52	82	z	7A	122
+	2B	43	S	53	83	{	7B, 7B	123, 123
,	2C	44	T	54	84	|	7C	124
_	2D	45	U	55	85	}	7D	125
.	2E	46	V	56	86	—	7E	126
/	2F	47	W	57	87	DEL	7F	127
0	30	48	X	58	88	FNC1	7B, 31	123, 49
1	31	49	Y	59	89	FNC2	7B, 32	123, 50
2	32	50	Z	5A	90	FNC3	7B, 33	123, 51
3	33	51	[	5B	91	FNC4	7B, 34	123, 52
4	34	52	\	5C	92	SHIFT	7B, 53	123, 83
5	35	53	]	5D	93	CODEA	7B, 41	123, 66
6	36	54	^	5E	94	CODEC	7B, 43	123, 67
7	37	55	_	5F	95			
8	38	56	`	60	96			
9	39	57	a	61	97			
:	3A	58	b	62	98			
;	3B	59	c	63	99			
<	3C	60	d	64	100			
=	3D	61	e	65	101			
>	3E	62	f	66	102			
?	3F	63	g	67	103			
@	40	64	h	68	104			
A	41	65	i	69	105			
B	42	66	j	6A	106			
C	43	67	k	6B	107			
D	44	68	l	6C	108			
E	45	69	m	6D	109			
F	46	70	n	6E	110			
G	47	71	o	6F	111			

Character C:

Char	data		Char	data		Char	data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
0	0	0	40	28	40	80	50	80
1	1	1	41	29	41	81	51	81
2	2	2	42	2A	42	82	52	82
3	3	3	43	2B	43	83	53	83
4	4	4	44	2C	44	84	54	84
5	5	5	45	2D	45	85	55	85
6	6	6	46	2E	46	86	56	86
7	7	7	47	2F	47	87	57	87
8	8	8	48	30	48	88	58	88
9	9	9	49	31	49	89	59	89
10	0A	10	50	32	50	90	5A	90
11	0B	11	51	33	51	91	5B	91
12	0C	12	52	34	52	92	5C	92
13	0D	13	53	35	53	93	5D	93
14	0E	14	54	36	54	94	5E	94
15	0F	15	55	37	55	95	5F	95
16	10	16	56	38	56	96	60	96
17	11	17	57	39	57	97	61	97
18	12	18	58	3A	58	98	62	98
19	13	19	59	3B	59	99	63	99
20	14	20	60	3C	60	FNC1	7B, 31	123, 49
21	15	21	61	3D	61	CODEA	7B, 41	123, 65
22	16	22	62	3E	62	CODEB	7B, 42	123, 66

23	17	23	63	3F	63			
24	18	24	64	40	64			
25	19	25	65	41	65			
26	1A	26	66	42	66			
27	1B	27	67	43	67			
28	1C	28	68	44	68			
29	1D	29	69	45	69			
30	1E	30	70	46	70			
31	1F	31	71	47	71			
32	20	32	72	48	72			
33	21	33	73	49	73			
34	22	34	74	4A	74			
35	23	35	75	4B	75			
36	24	36	76	4C	76			
37	25	37	77	4D	77			
38	26	38	78	4E	78			
39	27	39	79	4F	79			

Appendix B: UPC barcode A->E transformational rule

Format		Format	
UPC-A	Change to UPC-E	UPC-A	Change to UPC-E
AB000-00HIJ	ABHIJ0	12000-00789	127890
AB100-00HIJ	ABHIJ1	12100-00789	127891
AB200-00HIJ	ABHIJ2	12200-00789	127892
AB300-000IJ	AB3IJ3	12300-00089	123893
AB400-000IJ	AB4IJ3	12400-00089	124893
AB500-000IJ	AB5IJ3	12500-00089	125893
AB600-000IJ	AB6IJ3	12600-00089	126893
AB700-000IJ	AB7IJ3	12700-00089	127893
AB800-000IJ	AB8IJ3	12800-00089	128893
AB900-000IJ	AB9IJ3	12900-00089	129893
ABCD0-0000J	ABCDJ4	12910-00009	129194
ABCDE-00005	ABCDE5	12911-00005	129115
ABCDE-00006	ABCDE6	12911-00006	129116
ABCDE-00007	ABCDE7	12911-00007	129117
ABCDE-00008	ABCDE8	12911-00008	129118
ABCDE-00009	ABCDE9	12911-00009	129119