



# E19

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## Development Guide

2010-07-13

## REVISION SHEET

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Revision	Date	Draft and Amend	Description
V01	2009-7-29		Enactment
	2009-10-19		Add commands

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## Feature

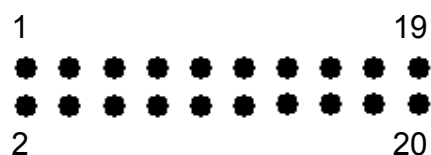
### THE INTERFACE

#### USB

Full compliance with USB2.0 specification (full speed) .

#### TTL/232

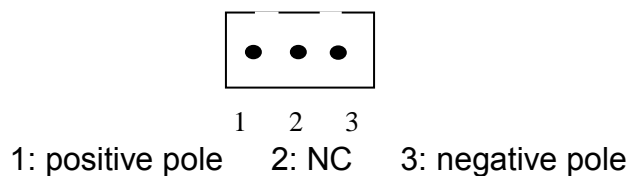
The definition of the interface is show as following:



pin	signal	explanation
1	VBUS	USB VCC
2	D-	USB D-
3	D+	USB D+
4	GND	GND
19	TX	Printer transmits data to PC
20	RX	Receiving data from PC

#### POWER

The input power is DC 5V-8.5V, or 9V-24V, and it is shown as follows:



#### OPERATION

There is two keys and one indicator light, the indicator light is also the LF key, the SET key is in a hole down in the left corner of the back.

Self-check:

Press the LF key, and power on the printer at the same time, then it will print out the self-check scrip.

## Setting:

In the power-off state, press the LF key, then power on the printer, the printer will print the setting menu, as follows:

- 1.Setup Infrared
- 2.Setup 232
- 3.Print Direction
- 4.Gray Adjust
- 5.Poweroff
- 6.Font&Codepage

Then press the SET key, and do not release. When the number of the sound “kada” is the same as the item number, then you can select according item. For example, when the “kada” sound appears 4 times, then you can select Item 4, “Gray Adjust”. In the same way, sound appears 5 times- Item 5, 6 times –Item 6.

New setting will be valid after repowered.

## Control Commands Details

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### Basic control command

#### 【Initialize Printer】

Format: ASCII: ESC @  
Dec: 27 64  
Hex: 1B 40

Explanation:

This command is used to initialize the printer. There are two ways we can initialize the printer :

- (1) use the command ESC @
- (2) re-power the printer

#### 【Carriage return】

Format: ASCII: CR  
Dec: 13  
Hex: 0D

Explanation:

If a "CR" command is sent to printer the total data in the print buffer will be printed out and paper will be fed for one line forwards.

#### 【Print and line feed】

Format: ASCII: LF  
Dec: 10  
Hex: 0A

Explanation:

Content in the buffer will be carried out after this command. The paper feeds in for a new line. The length is the high of one character and the distance rows between.

#### 【n Dot Line Feed】

Format: ASCII: ESC J n  
Dec: 27 74 n  
Hex: 1B 4A n

Explanation:

The printer feeds paper n dot lines. N=0~255. This command sends carriage return and feed line. It won't influence the latter feed line command.

#### 【Print and Feed Page to the BM position】

Format: ASCII: FF  
Dec: 12

Hex:           0c

Explanation:

Print the data of buffer, and feed paper to the position of main black mark.

Notice: The command is used to fix the black mark position, when the printing paper is pre-printed with a black mark, and the setting position will be the printer starting position. If the paper is pre-printed with a black mark, the printer will print the data of buffer, then feed paper to the black mark position. If the black mark is not detected, the printer will feed 4cm.

## Select Character Commands

### 【select character】

Format: ASCII:   ESC   8   n  
          Dec:   27    56   n  
          Hex:   1B    38   n

Explanation:

After the command, it will print out the download Chinese characters set “n”(from zero begin to count). The printer can download any dot matrix character set and Graphical user-defined font. The first address of user-defined font is 0x20. User can find the download character set in self-test.

### 【select Chinese character】

Format: ASCII:   FS   &  
          Dec:   28   38  
          Hex:   1C   26

Explanation:

After the command, it will print out the first download Chinese characters set

(GB2312 or GB18030).Printer accept standard internal code, and base on the code if find the characters, the printer print, otherwise not print. When printer power on, the default printing type is Chinese character.

### 【exit the Chinese character】

Format: ASCII:   FS       & .  
          Dec:   28       46  
          Hex:   1C       2E

Explanation:

After the command, it will exit the Chinese character, and it will select the first ASCII set in ASCII sets. If user want to select other character, use the command

【select character】 ..

。

## Character Setting Commands

### 【set the gray degree】

Format: ASCII:   ESC   m   n



Dec:	27	109	n
Hex:	1B	6D	n

Explanation:

N ranges from 1 to 12 the larger of the n value, the darker the dot it is . The initial n=7. It is used to modify the final expression of different thermal paper roll.

#### 【Enlarge Width】

Format:	ASCII:	ESC	U	n
	Dec:	27	85	n
	Hex:	1B	55	n

Explanation:

The characters and graphics following this command are printed at n times of normal width, n=1~4, default n=,that means normal width, no width enlarging.

#### 【Enlarge Height】

Format:	ASCII:	ESC	V	n
	Dec:	27	86	n
	Hex:	1B	56	n

Explanation:

The characters and graphics following this command are printed at n times of normal height, n= 1~4, default n=1.

#### 【Enlarge Width and Height】

Format:	ASCII:	ESC	W	n
	Dec:	27	87	n
	Hex:	1B	57	n

Explanation:

The characters and graphics following this command are printed at n times of normal width and height, n=1~4, default n=1.

#### 【Select/cancel Underline Print】

Format:	ASCII:	ESC	-	n
	Dec:	27	45	n
	Hex:	1B	2D	n

Explanation:

When n=1, select underline print; when n=0, cancel underline print.

All characters including spaces will be printed out with underline after selecting underline print command. Default n=0.

#### 【Select/cancel Up-line Print】

Format:	ASCII:	ESC	+	n
	Dec:	27	43	n
	Hex:	1B	2B	n

Explanation:

When n=1, select up-line print ; when n=0, cancel up-line after selecting up-line print command, unless cancel the up-line print command. Default n=0.

**【Turn emphasized mode on / off】**

Format: ASCII: ESC I n  
Dec: 27 105 n  
Hex: 1B 69 n

Explanation:

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

**【Select/cancel Reverse Print】**

Format: ASCII: ESC c n  
Dec: 27 99 n  
Hex: 1B 63 n

Explanation:

When n=0, select reverse print, printing from right to left. When n=1, cancel reverse print, printing from left to right.

When the printer is assembled vertically, it is convenient to read the word reversely so its initial value is 1.

**【Set Character Rotational Print】**

Format: ASCII: FS I n  
Dec: 28 73 n  
Hex: 1C 49 n

Explanation:

This command is to rotate characters, the values of n are as following:

n	Characters rotated widdershins
0	0°
1	90°
2	180°
3	270°

**Parameter setting Command for print typeset**

**【Set n Dot-line Spacing】**

Format: ASCII: ESC 1 n  
Dec: 27 49 n  
Hex: 1B 31 n

Explanation:

The space between lines are n dots after this command (The dot

number is unconditional and can't be affected by enlarging command.)  $1 \leq n \leq 255$ . The original setting:  $n=3$ .

#### 【set the space between characters】

Format: ASCII: ESC p n  
 Dec: 27 112 n  
 Hex: 1B 70 n

Explanation:

This command sets the space between characters n dots (The dot number is unconditional and can't be affected by enlarging command.)  $1 \leq n \leq 255$ . The original setting:  $n=0$ .

#### 1.1.1.1 【Select justification】

Format: ASCII: ESC a n  
 Dec: 27 97 n  
 Hex: 1B 61 n

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

Aligns all the data in one line to the specified position.:

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

#### 【Set Vertical Tab Value】

Format: ASCII: ESC B n1 n2...NUL  
 Dec: 27 66 n1 n2...0  
 Hex: 1B 42 n1 n2...00

Explanation:

The vertical tab positions are entered as n1, n2 and so on, The total number of position is 8, all of these should be within the page length set by ESC C command.

For example, when  $n1 = 3$ ,  $n2=6$ , the printer executes "VT" command and paper will feed in to the 3rd and print, then the printer executes "VT" command again and paper will feed in to the 6th. The height of unit line is the sum of 8 dots add dots characters between, and is unconditional. Command NUL added at the end indicates the command is over.

All vertical tab positions that input can be deleted by using this command in ESC B NUL format. VT command is to carry out vertical tab, the paper fed to the next vertical position.

#### 【Carry out Vertical Tab Value】

Format: ASCII: VT  
 Dec: 11

Hex: 0B

Explanation:

Feed paper to the next vertical tab position which is set by ESC B command.

Notice: if there is no vertical tab value setting, or the current position equals or is beyond the last vertical tab position, VT command is to feed paper one line only(same to LF command).

#### 【Set Horizontal Tab Value】

Format: ASCII: ESC D n1 n2...NUL

Dec: 27 68 n1 n2...0

Hex: 1B 44 n1 n2...00

Explanation:

The tab positions are entered as n1,n2 and so on, the total number of position is 8, and all of these should be within the line width of this model printer.

For example, when n1 = 3, the printer executes "HT" command paper will feed in to the 3<sup>rd</sup> unit length (unit length:0.25mm) then print. The width of each step is the sum of width of character matrix and dots characters between horizontal. Command NUL added at the end indicates the command is over.

All horizontal tab positions that set can be deleted by using this command in ESC D NUL format.

#### 【Carry out Horizontal Tab Value】

Format: ASCII: HT

Dec: 9

Hex: 09

Explanation:

The print position is advanced to the next horizontal tab position which is set by ESC D command.

If there is no horizontal tab value setting, or the current position equals or is beyond the last horizontal tab position, HT command won't be carried out.

#### 【Set Right Margin】

Format: ASCII: ESC Q n

Dec: 27 81 n

Hex: 1B 51 n

Explanation:

N value means n-characters blank space on the right side will be left. Each character space is the sum of width of the character matrix and the horizontal space between. The value of n should be in the range from 0 to the line width of this model printer.

Default n = 0, that means no right margin.

#### 【Set Left Margin】

Format: ASCII: ESC 1 n

Dec: 27 108 n  
Hex: 1B 6C n

Explanation:

N value means n-characters blank space on the left side will be left. Each character space is the sum of width of the character matrix and the horizontal space between. The command is relative to the enlarging command.

Default n = 0, that means no left margin.

## Graphic/image printing command

### 【Print bit-map graphics】

Format: ASCII: ESC K ml mh n1 n2...ni...

Dec: 27 75 ml mh n1 n2...ni...

Hex: 1B 4B ml mh n1 n2...ni...

Explanation:

ml mh stand for a 16 bits binary datum . ml is the low 8 bits and mh is the high 8 bits. The number of graph data is  $mh \times 256 + ml$ . The size of graph depends on the enlarging command.

The command will print a iX8 dots graph unit for the 16X16 dots type printer. Its width is i dots and height is 8 dots. A 8-bit binary datum express row structure and the high bit is on the top.

If your graph is larger than one graph unit, you can divide the graph to different unit, set and print them separately.

		1	2	3	4	5	6	7	8	9	10	11	12
High bit D7:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low bit D0:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		02H	c0H	44H	44H								

### 【dot line print】

Format: ASCII: FS K n1 n2 data.1~data.n2

Dec: 28 75 n1 n2 data.1~data.n2

Hex: 1C 4B n1 n2 data.1~data.n2

n1:

when n1.0=1, print graph twice in height

n1.0=0时, print graph in original height

n1.1=1时, print graph twice in width

n1.1=0时, print graph in original width

n2: the large number of the byte of one line. The max is 48(one line is 384 in dot,

one byte is 8 dot 8\*48), when print in twice width is 24.

Data.1~data.n2: n2 graph data

The command is used to print one line graph data

### 6.3 print curving 1

Format: ASCII: ESC ' ml mh l1 h1. l2 h2. li hi ...CR

Dec: 27 39 ml mh l1 h1. l2 h2. li hi ...13

Hex: 1B 27 ml mh l1 h1. l2 h2. li hi ...0D

Note: Both the number and the position of the dots are expressed by double byte data. ml and l1 are the low byte and mh hi are the high byte.

The command is used to set and print the curving graph along the paper-feeding orientation. The value of ml mh indicates the number of dots you need in this current line. It should be not bigger than 384.

The value of li hi sets the position of the dot i .It should be not bigger than 384  
imax = ml mh .

0D is to execute this command.

## One dimension barcode

### 【Print bar code】

Format: ASCII: GS k n m [d]

Dec: 29 107 n m [d]

Hex: 1D 6B n m [d]

Explanation:

n is used to choose the bar code system.

n	Bar Code System
65	UPC_A
66	UPC_E
67	EAN-8
68	EAN-13
69	CODE_39
70	INTERLEAVED 25(ITF)
71	CODABAR
72	Code93
73	CODE128

[d] =the data of barcode.

M: the length of the barcode data

Print barcode

### 【NOTICE】

- Notice the numbers of each barcode .EAN-13、EAN\_128、CODE\_39、Code93、

UPC\_A and EAN-8 barcode can generate parity bit automatically, user doesn't

need to transmit that data.

- The received data must be in the standard bar code set, if exceeding the set ,the command is in vain.。
- CODE39 and CODE93 do not include extend code (EXTERN CODE 39、EXTERN CODE 93) 。
- The head of CODE128 barcode data link must be CODE A, CODE B, or CODE C, inside of barcode, also user can switch to another coding. combination „{“ and one character to define a new function. And transfer two „{“ to define ASCII „{“ . as following:

ASCII	HEX	Function
{A	7B, 41	Select coding A
{B	7B, 42	Select coding B
{C	7B, 43	Select coding C
{S	7B, 53	SHIFT }
{1	7B, 31	FNC1
{2	7B, 32	FNC2
{3	7B, 33	FNC3
{4	7B, 34	FNC4

If the length of INTERLEAVED 25(ITF) barcode data is even number, then the “n” is even number, if it is odd number, then add 0 on the left of data to make the barcode data is even number. (such as :123 change to 0123)

#### 【Permit /forbid printing HRI character】

Format: ASCII: GS H n  
 Dec: 29 72 n  
 Hex: 1D 48 n

Explanation:

When n=0,HRI character will not be printed out and it is the initial value. When n=1,HRI character will be printed out under the bar code.

When print HRI character is affected by command of character setting command

#### 【Set the height of the bar code】

Format: ASCII: GS h n  
 Dec: 29 104 n  
 Hex: 1D 68 n

Explanation:

n=0~255,when n=0,the height is 256 dot.

Default : n=60.

#### 【Set the landscape orientation size of the bar code】

Format: ASCII: GS w n  
 Dec: 29 119 n  
 Hex: 1D 77 n

Explanation:

n=1~4, the size of the bar code be different when the n is different. Default: n=3.

n	narrow bar	wide bar
1	1	3
2	2	5
3	3	7
4	4	9

n=1~4, the size of the bar code be different when the n is different. Default: n=3.

The example of the One dimension barcode:

- UPC-A: 1d 6b 41 0b 30 31 32 33 34 35 37 35 36 38 34
- UPC-E: 1d 6b 42 07 30 31 32 33 34 35 37
- EAN-8: 1d 6b 43 08 30 31 32 33 34 35 37
- EAN-13: 1d 6b 44 0d 30 31 32 33 34 35 37 32 33 33 37 36
- CODE39: 1d 6b 45 06 25 34 35 36 32 2b
- INTERLEAVED25: 1d 6b 46 05 30 34 35 36 32
- CODABAR: 1d 6b 47 06 42 30 34 35 36 41
- CODE93: 1d 6b 48 08 30 34 35 36 32 25 35 37
- CODE128: 1d 6b 49 09 43 30 34 35 36 32 35 37 35

## Pinter PDF417

【print PDF417 bar code】

Format: ASCII: GS ( k R C r [L 1 H1].....[L n Hn]  
 Dec: 29 40 107 R C r [L 1 H1].....[L n Hn]  
 Hex: 1D 28 6b R C r [L 1 H1].....[L n Hn]

Explanation:

R=PDF417 the rows of barcode data matrix

C= PDF417 the columns of barcode data matrix

R=PDF417 the check grade of barcode ( $0 \leq R \leq 8$ )

[L n Hn]: the low byte and high byte of PDF417barcode data matrix  $n = R * C$

【NOTICE】

- The command of 【Set the height of the bar code】 effect the PDF417 barcode printing. The width of PDF417 barcode is the same with the strip width of one dimension barcode. The height of PDF417 barcode is four times in strip width of one dimension barcode.

- This command doesn't calculate data coding and validation on the user's input text, but our company's Windows dynamic library will do.



## Appendix

### 1. International escape character set

The character after 0x80 code in this set can print only after using the command[exit Chinese character], About Chinese characters ,user can refer to GB-2312 and CP936.

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	<u>NUL</u> 0000	<u>STX</u> 0001	<u>SOT</u> 0002	<u>ETX</u> 0003	<u>EOT</u> 0004	<u>ENO</u> 0005	<u>ACK</u> 0006	<u>BEL</u> 0007	<u>BS</u> 0008	<u>HT</u> 0009	<u>LF</u> 000A	<u>VT</u> 000B	<u>FF</u> 000C	<u>CR</u> 000D	<u>SO</u> 000E	<u>SI</u> 000F
10	<u>DLE</u> 0010	<u>DC1</u> 0011	<u>DC2</u> 0012	<u>DC3</u> 0013	<u>DC4</u> 0014	<u>NAK</u> 0015	<u>SYN</u> 0016	<u>ETB</u> 0017	<u>CAN</u> 0018	<u>EM</u> 0019	<u>SUB</u> 001A	<u>ESC</u> 001B	<u>FS</u> 001C	<u>GS</u> 001D	<u>RS</u> 001E	<u>US</u> 001F
20	<u>SP</u> 0020	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	<u>DEL</u> 007F
80	€ 20AC		/	f	"	...	†	‡	~	%	Š	<	œ		Ž	
90		\	/	"	"	•	—	—	~	™	Š	>	œ		Ž	Ÿ
A0	<u>MBSP</u> 00A0	ı	ć	£	¤	¥	ı	Š	™	©	ª	«	¬	—	®	—
B0	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
C0	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D0	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E0	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F0	ø	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

## 2. The barcode rule

- UPC-A: UPC-A coding must accord with the standard of UCC organization (<http://www.ucnet.org>).
- UPC-E: UPC-E coding must accord with the standard of UCC organization (<http://www.ucnet.org>).
- EAN8: EAN8 coding must accord with the standard of EAN organization (<http://www.ean-int.org>).
- EAN13: EAN13 coding must accord with the standard of EAN organization (<http://www.ean-int.org>).
- CODE39: the beginning bit and the stop bit must be '\*' , among that must not contain '\*' , amount the data can contain check code or not. The check code has its regular arithmetic. With our printer, user do not need input '\*' and check code .
- ITF: (INTERLEAVED) 25, INTERLEAVED 2 of 5, The length of data must be eleven number, The data will be include check code or not . The printer will check computation automatically.
- CODABAR: Start bit and end bit must be A, B, C, D four characters in a , Starting a character that without the same character space, can contain data can also check code includes the check code, check code by coding people custom.

## 3. The length of barcode set

Barcode type	length	character(ASCII)
UPC-A	12	0~9
UPC-E	8	0~9
EAN8	8	0~9
EAN13	13	0~9
CODE 39	No limit	0~9 A~Z - . SP \$ / + % *
INTERLEAVED 25	Even number	0~9
CODABAR	No limit	0~9 - : / % . A~D
CODE 93	No limit	0~9 A~Z - . SP \$ / + % *

## 4. Character format setting command

Character format setting is

1. [【select character】](#)
2. [【select Chinese character】](#)
3. [【exit Chinese character】](#)
4. [【 Enlarge Width】](#)
5. [【 Enlarge Height】](#)
6. [【 Enlarge Width and Height】](#)
7. [【 Select/cancel Underline Print】](#)
8. [【 Select/cancel Up-line Print】](#)
9. [【 Select/cancel Reverse Print】](#)
10. [【 Set Character Rotational Print】](#)
11. [【 Set n Dot-line Spacing】](#)

## 5. Contact us

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