5 ESC/POS PRINTING COMMAND SET

5.1 Set of Command

Type	Command	Name
Print Command	LF	Print and line feed
	HT	JMP to the next TAB position
	FF	Print the data in the buffer
	ESC FF	Print the data in the buffer
	ESC J	Print and Feed n dots paper
	ESC d	Print and Feed n lines
	ESC =	Toggle the printer online or offline
Line spacing Command	ESC 2	Select default line spacing
	ESC 3 n	Set line spacing
	ESC a n	Select justification
	GS L nL nH	Set the left blank margin with dots
	ESC B n	Set the left blank char number
Character Command	ESC ! n	Select print mode(s)
	GS ! n	Set or Cancle the double width and height
	ESC E n	Set or Cancle bold font
	ESC SP	Set the space between chars
	ESC SO	Turn double width on
	ESC DC4	Turn double width off
	ESC { n	Turn upside-down printing mode on/off
	GS B n	Turn inverting printing mode on/off
	ESC - n	Set the underline dots(0,1,2)
	ESC % n	Select/Cancel user-defined characters
	ESC &	Define user-defined characters
	ESC ?	Cancle user-defined characters
	ESC R n	Select and internation character set
	ESC t n	Select character code table
Bit Image Command	ESC *	Select bit-image mode
	GS *	Define downloaded bit image
	GS /	Print downloaded bit image
	GS v	Print the bitmap with width and height
	DC2 *	Print the bitmap
	DC2 V	Print MSB bitmap
	DC2 v	Print LSB bitmap

Init Command	ESC @	Initialize printer
Status Command	ESC v n	Transmit paper sensor status
	ESC u n	Transmit peripheral device status
	GS a n	Enable/Disable AutomaticStatus Back(ASB)
Bar Code Command	GS H	Select printing position of human readable characters
	GS h	Set bar code height
	GS x	Set bar code left position
	GS w	Set bar code width
	GS k	Print bar code
Board Para Command	ESC 7 n1 n2	Set printing para. Heat & break time, max heat dot
	DC2 # n	Set printing density.
	DC2 T	Printing test page

5.2 Command detail

TCB thermal printer control board use ESC/POS command set.
The printing command is descripted as followed format:

CMD		**Function**
Format	**ASCII**	**List by ASCII characters**
	Decimal	**LIST BY DECIMAL CHARACTERS**
	Hexadecimal	**List by hexadecimal characters**
Description	**Command function description**	
Example	**Command use example**	

5.2.1 Print Commands

LF		**Print and line feed**
Format	**ASCII**	**LF**
	Decimal	**10**
	Hexadecimal	**0A**
Description	**LF prints the data in the print buffer and feeds one line. When the print buffer is empty, LF feeds one line.**	

HT		**Jump to the next TAB position**
Format	**ASCII**	**HT**
	Decimal	**09**
	Hexadecimal	**09**
Description	**TAB position is 8 chars position.**	

FF	Print the data in buffer and locate to the next black mark
Format	ASCII FF
	Decimal 12
	Hexadecimal 0c
Description	Print the data in the buffer. Locate to the black mark NOTE: Only board with black mark function support this command.

ESC J n	Print and feed paper
Format	ASCII ESC J n
	Decimal 27 74 n
	Hexadecimal 1B 4A n
Description	n = 0-255 ESC J prints the data in the print buffer and feeds n dots. The command will not change the setting set by command ESC 2 ESC 3.

ESC FF	Print the data in buffer and locate to the next black mark
Format	ASCII ESC FF
	Decimal 27 12
	Hexadecimal 1b 0c
Description	Print the data in the buffer. Locate to the black mark NOTE: Only board with black mark function support this command.

ESC d n	Print and feed n lines
Format	ASCII ESC d n
	Decimal 27 100 n
	Hexadecimal 1B 64 n
Description	n = 0-255 Print the data in the buffer and feed paper n lines. The lines height is defined by ESC 2,ESC 3.

ESC = n	Set print online or offline
Format	ASCII ESC = n
	Decimal 27 61 n
	Hexadecimal 1B 3d n
Description	n = 0,1 1: Online 0: Offline

5.2.2 Line spacing setting command

ESC 2		Select default line spacing
Format	ASCII	ESC 2
	Decimal	27 50
	Hexadecimal	1B 32
Description	ESC 2 sets the line space to default value (32dots)	

ESC 3 n		Set line spacing
Format	ASCII	ESC 3 n
	Decimal	27 51 n
	Hexadecimal	1B 33 n
Description	n = 0-255 ESC 3 n sets the line spacing to n dots. The default value is 32	

ESC a n		Select align mode
Format	ASCII	ESC a n
	Decimal	27 97 n
	Hexadecimal	1B 61 n
Description	Default is 0 0 ≤ m ≤ 2 or 48 ≤ m ≤ 50 Align left: n=0,48 Aligh middle: n=1,49 Align right: n=2,50	

GS L nL nH		Set left space
Format	ASCII	GS L nL nH
	Decimal	29 76 nL nH
	Hexadecimal	1D 4c nL nH
Description	Set the left space with dots Left space is nL+nH*256,unit:0.125mm	

ESC $ nL nH		Set left space
Format	ASCII	ESC $ nL nH
	Decimal	27 36 nL nH
	Hexadecimal	1B 24 nL nH
Description	Set the left space with dots Left space is nL+nH*256,unit:0.125mm	

ESC B n		Set left blank char nums
Format	ASCII	ESC B n
	Decimal	27 66 n
	Hexadecimal	1B 42 n
Description	Default is 0	
	0 ≤ m ≤ 47	

5.2.3 Character command

ESC ! n		Select print mode
Format	ASCII	ESC ! n
	Decimal	27 33 n
	Hexadecimal	1B 21 n

Description

The default value is 0. This command is effective for all characters.

BIT0:

BIT1: 1: Reverse mode selected
0: Reverse mode not selected

BIT2: 1: Updown mode selected
2: Updown mode not selected

BIT3: 1:Emphasized mode selected
0:Emphasized mode not selected

BIT4: 1:Double Height mode selected
0:Double Height mode not selected

BIT5: 1:Double Width mode selected
0:Double Width mode not selected

BIT6: 1:Deleteline mode selected
0:Deleteline mode not selected

BIT7:

GS ! n		Set the font enlarge
Format	ASCII	GS ! n
	Decimal	29 33 n
	Hexadecimal	1D 21 n
Description	D3..0 0: height don't enlarge	
	1: height enlarge	
	D7..4 0: width don't enlarge	
	1: width enlarge	

ESC E n		Set and cancle bold font
Format	ASCII	ESC ! n

	Decimal	27 69 n
	Hexadecimal	1B 45 n
Description	D0: 0: normal	
	1: bold	

ESC SP n — Set and cancle bold font

Format	ASCII	ESC SP n
	Decimal	27 32 n
	Hexadecimal	1B 20 n
Description	D0: 0: normal	
	1: bold	

ESC SO — Select Double Width

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

ESC DC4 — Disable Double Width

Format	ASCII	ESC DC4
	Decimal	27 20
	Hexadecimal	1B 14
Description	Disable Double Width mode	

ESC { n — Set/Cancel Character Updown

Format	ASCII	ESC { n
	Decimal	27 123 N
	Hexadecimal	1B 7B n
Description	n=1:Enable Updown mode	
	n=0:Disable Updown Mode	
	Default value is 0	

GS B n — Turn white/black reverse printing mode o

Format	ASCII	ESC B n
	Decimal	29 66 n
	Hexadecimal	1D 42 n
Description	n=1:Enable white/black reverse mode	
	n=0:Disable white/black reverse mode	
	Default value is 0	

ESC - n — Set the underline height

Format	ASCII	ESC – n

	Decimal	27 45 n
	Hexadecimal	1B 2D n
Description	n=0-2,the underline dots default: 0 — no underline	

ESC % n Enable/Disable User-defined Charac

Format	ASCII	ESC % n
	Decimal	27 37 n
	Hexadecimal	1B 25 n
Description	n=1:Enable User-defined character n=0:Disable User-defined character	

ESC & s n m w Define User-defined characte

Format	ASCII	ESC & s n m w d1 d2 ... dx
	Decimal	27 38 s n w m d1 d2 ... dx
	Hexadecimal	1B 26 s n w m d1 d2 ... dx

Description

The command is used to define user-defined character.Max 64 user chars can be defined.

s= 3,32≤ n ≤ m < 127

s: Character height bytes, =3(24dots)

w: Character width 0 12(s=3)

n: User-defined character starting code

m: User-defined characters ending code

dx:data x=s*w

s=3 dx format:

d1	d4	d7								
d2	d5	d8								
d3	d6	d9								d36

Dx	
	D7
	D6
	D5
	D4
	D3
	D2
	D1
	D0

ESC ? n Disable user-defined character

Format	ASCII	ESC ? n
	Decimal	27 37 N
	Hexadecimal	1B 25 n

Description

ESC ? n disable user-defined characters, printer will use the interal character.

ESC R n Select an internal character set

Format	**ASCII**	**ESC R n**
	Decimal	**27 82 N**
	Hexadecimal	**1B 52 n**

Description

Select an internal character set n as follows:

0:USA	**5:Sweden**	**10:Denmark II**
1:France	**6:Italy**	**11:Spain II**
2:Germany	**7:Spain1**	**12:Latin America**
3:U.K.	**8:Japan**	**13:Korea**
4:Denmark 1	**9:Norway**	

ESC t n **Select character code table**

Format	**ASCII**	**ESC t n**
	Decimal	**27 116 N**
	Hexadecimal	**1B 74 n**

Description

Select a page n from the character code table as follows:

0:437	**1:850**

5.2.4 Bit Image Command

ESC * m nL nH d1 d2...dk **Select bit-image mode**

Format	**ASCII**	**ESC * m nL nH d1 d2 ... dk**
	Decimal	**27 42 m nL nH d1 d2 ... dk**
	Hexadecimal	**1B 2A m nL nH d1 d2 ... dk**

Description

Attention: The command may clear the user defined char.

This command selects a bit image mode using m for the number of dots specifed by (nL+nH*256)

m =0,1,32,33

NL=0-255

nH=0-3

dx=0-255

k = nL+256*nH (m=0,1)

k = (nL+256*nH)*3 (m=32,33)

The modes selected by m are as follows:

0 8dots single density 102dpi

1: 8dots double density 203dpi

31:24 dots single density,102dpi

32:24 dots double density,203dpi

The bit image format is the same as user-defined character.

GS / n **Print downloaded bit image**

Format	**ASCII**	**GS / n**
	Decimal	**29 47 n**
	Hexadecimal	**1D 2F n**

Description

This command prints a downloaded bit image using the mode specified by n as specified in the chart. In standard mode, this command is effective only when there is data in the print buffer. This command is ignored if a downloaded bit image has not been defined.

n=0-3 48-51: Specify bit image mode

n	Pattern Mode	Vertical DPI	Horizontal DPI
0,48	Normal	203DPI	203DPI
1,49	Double width	203DPI	101DPI
2,50	Double height	101DPI	203DPI
3,51	Quadruple	101DPI	101DPI

GS * x y d1...dk **Define downloaded bit image**

Format	**ASCII**	**GS * x y d1 … dk**
	Decimal	**29 42 x y d1 … dk**
	Hexadecimal	**1D 2A x y d1 … dk**

Description **This command defineds a downloaded bit image by using x*8 dots in the horizontal direction and y*8 dots in the vertical direction. Once a downloaded bit image has been define, it is avaiable until**

- **Another definition is made**
- **ESC & or ESC @ is executed**
- **The power is turned off**
- **The printer is reset**

x=1 48(width) y 1 255(height) x×y < 1200, k=x×y×8

GS v 0 p wL wH hL hH **Print bitmap**

Format	**ASCII**	**GS v 0 p wL wH hL hH d1 … dk**
	Decimal	**29 118 0 p wL wH hL hH d1 … dk**
	Hexadecimal	**1D 76 0 p wL wH hL hH d1 … dk**

Description **p: bitmap format**

D0: 1: bitmap need double width
0: bitmap don't need double width
D1: 1: bitmap need double height
0: bitmap don't need double height

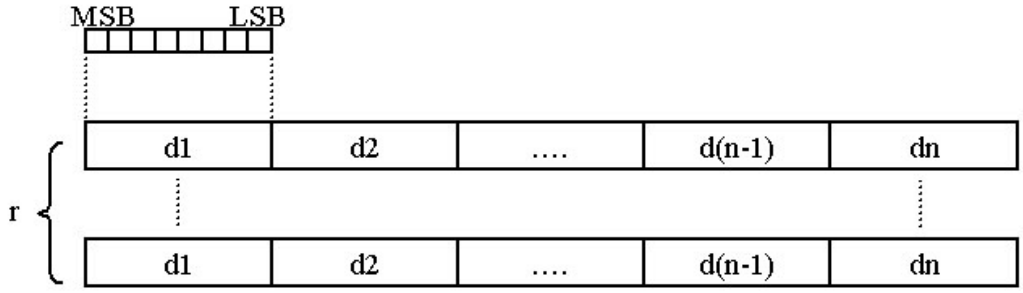
W=wL+wH*256 mean horital bytes

H=wL+wH*256 mean vertical dots.

Bitmap use MSB format, the MSB is printed at the left. And data sent first is printed at the left.

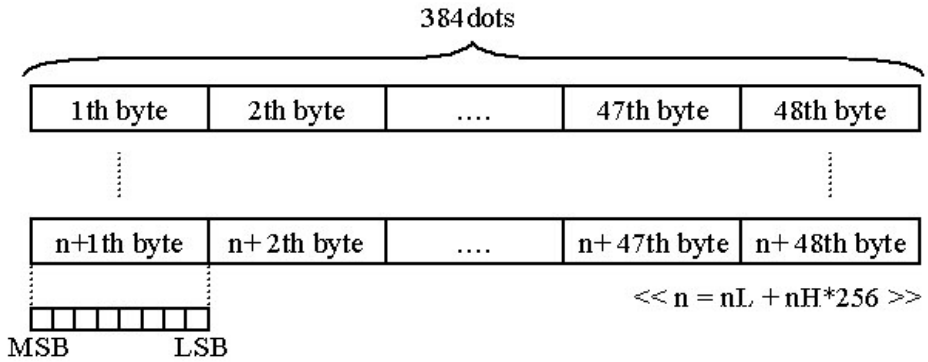
DC2 * r n [d1…dn]

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] **Print MSB Bitmap**

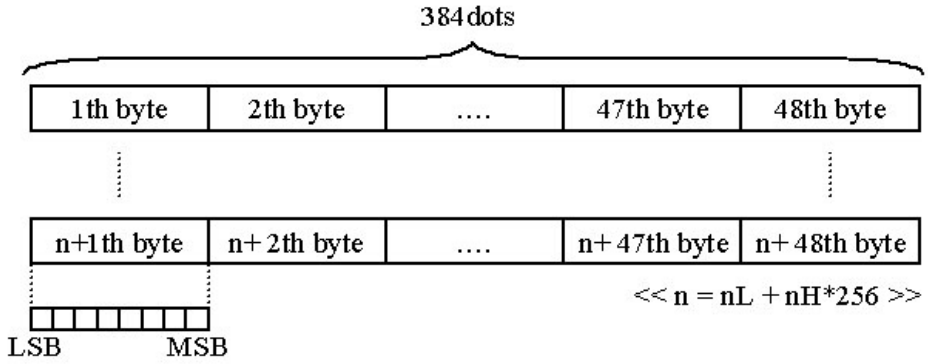
Format	**ASCII**	**DC2 V nL nH [d1 … d48]**
	Decimal	**18 86 nL nH [d1 … d48]**
	Hexadecimal	**12 56 nL nH [d1 … d48]**
Description	**This command use to print MSB format bitmap,**	
	The width of bitmap must the same as the printer mechanism	
	Bitmap height: nL+nH*256	
	Bitmap format:	



DC2 v nL nH [d1…dn] **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:**



5.2.5 Key control command

ESC c 5 n	**Enable/Disable the panel key**
Format	**ASCII ESC c 5 n** **Decimal 27 99 53 n** **Hexadecimal 1B 63 35 n**
Description	**This command has no effection.** **n=1 Disable the panel key** **n=0 Enable the panel key(Default)**

5.2.6 Init command

ESC @	**Initialize the printer**
Format	**ASCII ESC @** **Decimal 27 64** **Hexadecimal 1B 40**
Description	**Initializes the printer.** ➢ **The print buffer is cleared.** ➢ **Reset the param to default value.** ➢ **return to standard mode** ➢ **Delete user-defined characters**

5.2.7 Status Command

ESC v — **Transmit paper sensor status**

Format	**ASCII**	**ESC v n**
	Decimal	**27 118 N**
	Hexadecimal	**1B 76 n**

Description:Transmit board status to host

Return:

P<Paper>V<Voltage>T<Degree>

Example: P1V72T30 Mean:Paper Ready,Current voltage 7.2V,Printer degree:30

GS a n — **Enable/Disable Automatic Status Back(ASB)**

Format	**ASCII**	**GS a n**
	Decimal	**29 97 n**
	Hexadecimal	**1D 61 n**

Description **n definition as follows:**

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

When ASB is enabled, the printer will send the changed status to PC automatically.

ESC u n — **Transmit peripheral devices status**

Format	**ASCII**	**ESC u n**
	Decimal	**27 117**
	Hexadecimal	**1B 75**

Description **This command is not supported.**

Return status bytes definetion:

bit0: Drawer status.

bit4: 0

Always return 0 back.

5.2.8 Bar Code Command

GS H n		Select printing position of human readable characters
Format	ASCII	GS H N
	Decimal	29 72 n
	Hexadecimal	1D 48 n
Description	0 ≤ n ≤3 48 ≤ n ≤51 This command selects the printing position for human readable characters when printing a barcode. The default is n=0. Human readable characters are printed using the font specified by GS fn. Select the printing position as follows: n Printing Positioin 0,48: Not printed 1,49: Above the barcode 2,50: Below the barcode 3,51: Both above and below the barcode	

GS h n		Set bar code height
Format	ASCII	GS h n
	Decimal	29 104 n
	Hexadecimal	1D 68 n
Description	This command selects the height of a barcode. n specifies the number of dots in the vertical direction. The default value is 50 1 ≤ n ≤ 255	

GS x n		Set barcode printing left space
Format	ASCII	GS x n
	Decimal	29 120 n
	Hexadecimal	1D 78 n
Description	Set the barcode printing left space	

GS w n		Set bar code width
Format	ASCII	GS w n
	Decimal	29 119 N
	Hexadecimal	1D 77 n
Description	This command selects the horizontal size of a barcode. n = 2,3 The default value is 3	

GS k m d1 d2 ... dk NUL GS k m n d1 d2 ... dn			Print barcode symbology
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	

DESCRIPTION **M BARCODE TYPE**

FORMAT 1 0 ≤ M ≤ 10

FORMAT 2 65 ≤ M ≤ 75

N BARCODE LENGTH

m	Bar code system	Number of characters	Remarks
0,65	UPC-A	11,12	48-57
1,66	UPC-E	11,12	48-57
2,67	EAN13	12,13	48-57
3,68	EAN8	7,8	48-57
4,69	CODE39	>1	32,36,37,43,45-57,65-90
5,70	I25	>1 even number	48-57
6,71	CODEBAR	>1	36,43,45-58,65-68
7,72	CODE93	>1	0-127
8,73	CODE128	>1	0-127
9,74	CODE11	>1	48-57
10,75	MSI	>1	48-57

5.2.9 Control Parameter Command

ESC 7 n1 n2			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 heting dots, the more peak current will cost whenprinting, 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 more clear, but the slower printingspeed.

ESC 8 n1 — **Sleep parameter**

Format	ASCII	ESC 8 n1
	Decimal	27 56 n1
	Hexadecimal	1B 38 n1

Description	Setting the time for control board to enter sleep mode. n1 = 0-255 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 — **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) printing density D7..D5 of n is used to set the printing break time Break time is n(D7-D5)*250us

DC2 T — **Printing test page**

Format:	ASCII	DC2 T
	Decimal	18 84
	Hexadecimal	12 54

Description	Printing the test page

APPENDIXA CODE PAGE

PC437

	0	0	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	₧	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	⌐	¬	½	¼	¡	«	»
B	░	▒	▓	│	┤	╡	╢	╖	╕	╣	║	╗	╝	╜	╛	┐
C	└	┴	┬	├	─	┼	╞	╟	╚	╔	╩	╦	╠	═	╬	╧
D	╨	╤	╥	╙	╘	╒	╓	╫	╪	┘	┌	█	▄	▌	▐	▀
E	α	ß	Γ	π	Σ	σ	µ	τ	Φ	Θ	Ω	δ	∞	φ	ε	∩
F	≡	±	≥	≤	⌠	⌡	÷	≈	°	∙	·	√	ⁿ	²	■	

PC850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8	Ç	ü	é	â	ä	à	å	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	æ	Æ	ô	ö	ò	û	ù	ÿ	Ö	Ü	ø	£	Ø	×	ƒ
A	á	í	ó	ú	ñ	Ñ	ª	º	¿	®	¬	½	¼	¡	«	»
B	░	▒	▓	│	┤	Á	Â	À	©	╣	║	╗	╝	¢	¥	┐
C	└	┴	┬	├	─	┼	ã	Ã	╚	╔	╩	╦	╠	═	╬	¤
D	ð	Ð	Ê	Ë	È	ı	Í	Î	Ï	┘	┌	█	▄	¦	Ì	▀
E	Ó	ß	Ô	Ò	õ	Õ	µ	þ	Þ	Ú	Û	Ù	ý	Ý	¯	´
F		±	‗	¾	¶	§	÷	¸	°	¨	·	¹	³	²	■	