CSN-A2 Micro panel thermal printer

Version1.1

Content

Chapter1 Introduction

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 , that is biggest paper roll of the same models.
➢ Optional serial interface (RS-232C, TTL) /parallel port
➢ rich of graphics / curves / characters print function
➢ Easy paper loading structure
➢ Support 5V-9V wide power voltage
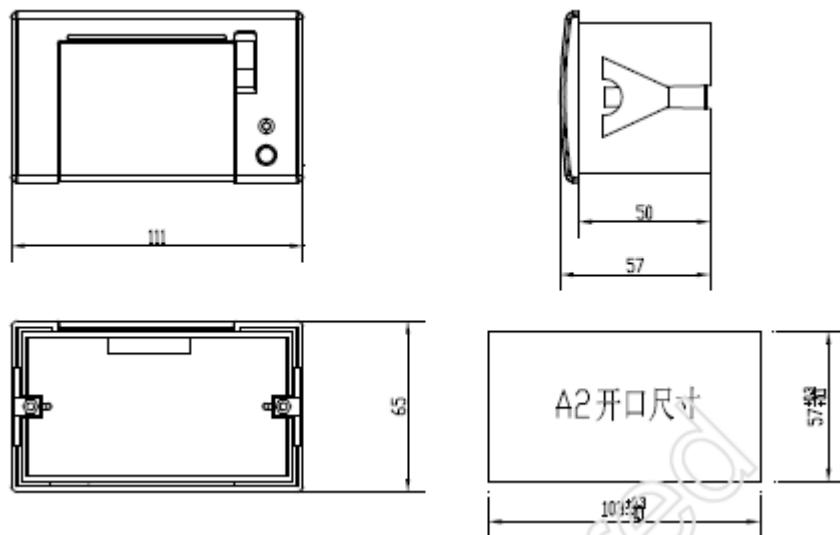
Chapter2 Specifications

2.1 Printer outline and out dimension

◆ outline dimension : 111W*65D*57H mm
◆ Front opening Size: 103 W*57H mm
◆ embedded depth: 50mm
◆ the Max diameter of paper roll :39mm

Outline is as follows:

2.2 specifications

Item	Specifications
PRINT METHOD	thermal direct line printing
Paper loading method	easy paper loading
paper width	57mm
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	12x24dots,or24x24dots
Chinese character fonts	GB18030,12x24dots,or24x24dots
outline dimension（WxHxD mm)	111mmx65mmx57mm
installation(WxH mm)	103mmx57mm
embedded depth	50mm
paper roll specification	(width:57mm;Max. Diameter:39mm)
interface Serial	(RS-232C,TTL)/parallel
input power	DC5V-9V
operating temperature	5°C~50°C
storage temperature	-20°C~60°C
operating humidity	10°C~80°C
storage humidity	10°C~90°C

2.3 printer installation

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.
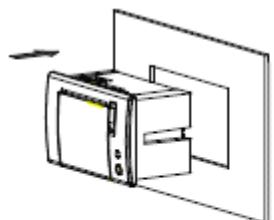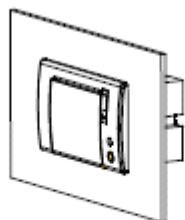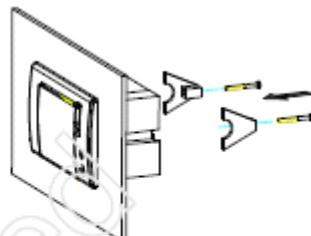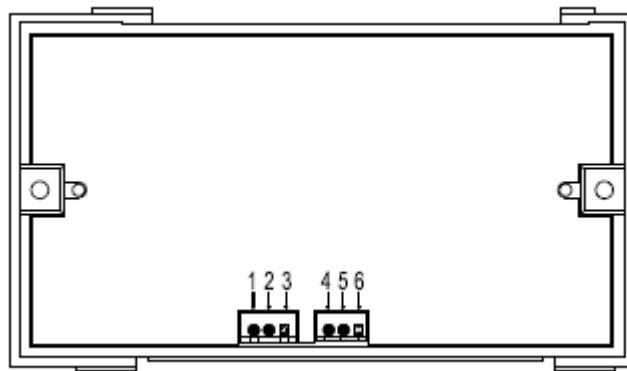
Flg 1   Flg 2   Flg 3

2.4 Interface connection

The user have option of RS232 ,TTL, and LPT interface
The define of the PIN of the interface for RS232,TTL as the following:
1   GND，   Ground
2   NULL
3   VH，   input voltage，5V-9V
4   GND，   Ground
5   RXD，   receive data
6   TXD，   send data
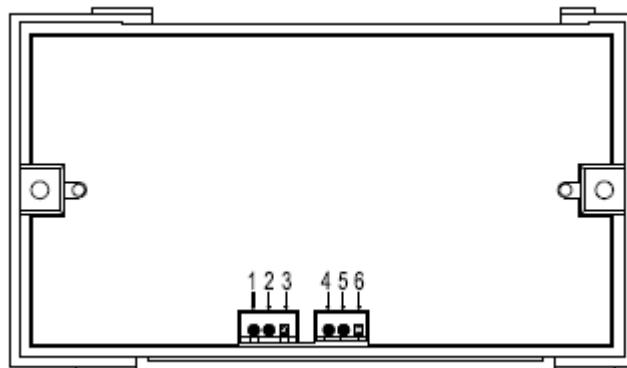
The define of the Pin of LPT interface as below :
1   GND， Ground
2   VH，   input voltage ，5V-9V
3   +5V，   input voltage (general condition,only use +5Vm VH not input)
4   the define of the Pin of LPT interface as below :
            1.   STROBE
            2-9. DATA0-DATA7
            10.   ACKNLG
            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

1 2 3   4 5 6

Chapter3   Operation specifications and print test

3.1 Operation specifications

A.   the instruction of indicator light
Power on, the indicator light will flash 3 time, interval 1sec, it say the startness is OK, and then the instructions for the indicator light as below:

Flash 1 times : At ordinary times during normal working condition
Flash 2 times: Not detect printer
Flash 3 times: lack of paper, and remind users to change new paper roller,
Flash 5 times: Printing machine heating slice overheating

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

3.2 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.

Chapter4 Using attention

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

4.2 For protecting plastic shaft,Don't smear any oil or others on the rubber parts

4.3 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,please using an alcohol cotton stick clean the area between plastic shaft and printer head at once.PS,Don't strike the TPH.

4.4 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 please don't push the paper harder,please do open the cover and re-fill the paper.

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

4.6 Please use the good quality paper,because the sensitive of the paper will influence print effect,meanwhile,rough paper will increase the excessive wear to the printer head, and reduce the life of the printer.

Chapter5   ESC/POS PRINTING COMMAND SET

5.1 Set of Command

Type	Command	Name
Print Command	LF	Print and line feed
	HT	JMPE to the next TAB position
	FF	Print the data in buffer
	ESC FF	Print the data in the buffer and locate to the next black mark
	ESC J n	Print and Feed n dots paper
	ESC d n	Print and Feed n lines
	ESC = n	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 Cancel the double width and height
	ESC E n	Set or Cancel bold font
	ESC SP n	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 ?	Cancel user-defined characters
	ESC R n	Select and international 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 Automatic Status Back(ASB)

Bar Code Command	GS H	Select printing position of human readable characters
	GS h	Set bar code height
	GS x n	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	Select print density
	DC2 T	Printing test page

5.2 Command Detail

TCB thermal printer control board use ESC/POS command set.

The printing command is described 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: 9
	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	
	Align 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,only supported in page mode.	

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 numbers

Format:	ASCII:	ESC B n
	Decimal:	27 66 n
	Hexadecimal:	1B 42 n
Description:	Default is 0	
	0 ≤ m ≤ 47	

5.2.3 Character Setting Commands

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:

BIT2:

      00: Font9X8

      01: Font5X7

      02: Font6X12

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:Delete line mode selected

      0:Delete line mode not selected

BIT7: 1:Underline mode selected

      0:Underline mode not selected

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 cancel bold font

Format:	ASCII:	ESC E n
	Decimal:	27 69 n
	Hexadecimal:	1B 45 n

Description:	D0: 0: normal
	1: bold

ESC SP n   Set and cancel 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 mode
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 mode
Format:	ASCII: ESC DC4 Decimal: 27 20 Hexadecimal: 1B 14
Description:	Disable Double Width mode

ESC { n	Set/Cancel Character Updown mode
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 on/off
Format:	ASCII: GS 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 Characters
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 characters

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

	D7
	D 6
	D5
	D4
Dx	D3
	D2
	D1
	D0

ESC ? n   Disable user-defined character

Format:	ASCII:	ESC ? n
	Decimal:	27 37 n
	Hexadecimal:	1B 3F n

Description:

ESC ? n disable user-defined characters, printer will use the internal 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 n1 n2 d1 d2…dk   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

Description:

Attention: The command may clear the user defined char.

This command selects a bit image mode using m for the number of dots specified 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.

Note: This version include a checksum for ESC * command, so if no correct checksum received after bit image data, the image will not printed. Checksum flow as follow:

1. Host sends FS C command as
   0x1C, 0x43
2. Host sends graphics mode setting command as
   0x1B, 0x2A , 0x00 , 0x05, 0x00
3. Host sends data bytes as
   0x01,0x02, 0x44, 0x23, 0xA3
4. Checksum = 0x01 + 0x02 + 0x44 + 0x23 + 0xA3 = 0x010D
5. Now Host sends Checksum byte as only LSB i.e 0x0D

6. Host Sends FS S command
    0x1C, 0x53
If both are matched (that means data received correctly)
   Send ACK(0xDD, 0x55, 0x1A)
   Print the image data
Else
   Send NAK(0xDD, 0x55, 0x3E)
   Do not print the image data

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 defines 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 available 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 height and width

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 3 p wL wH hL hH d1 … dk
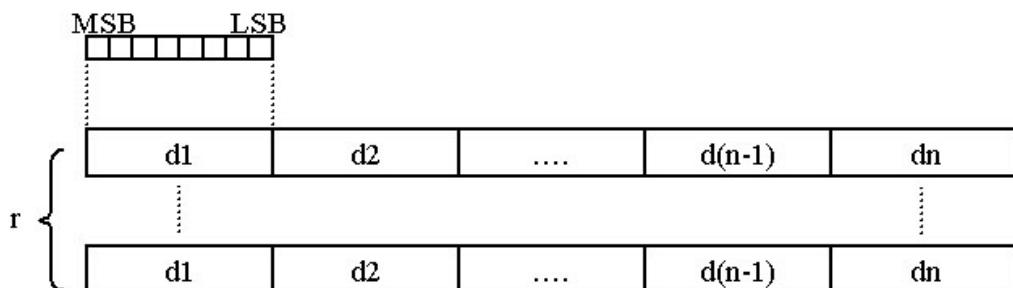
Description: p: bitmap format.
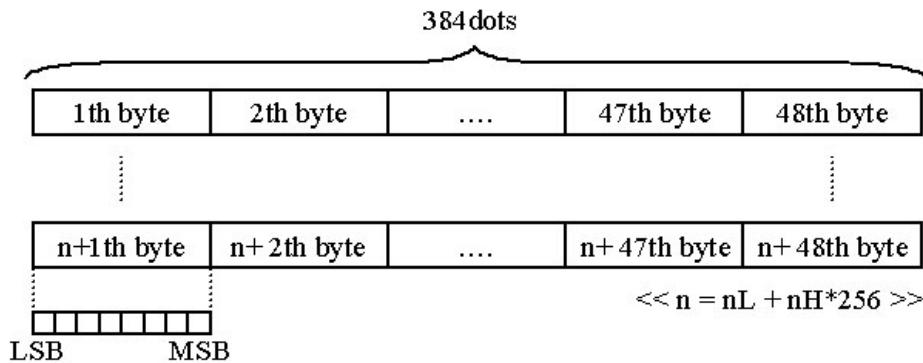
            D0:   1: bitmap need double width

                    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]   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]   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:

384 dots

1th byte	2th byte	....	47th byte	48th byte

n+1th byte	n+2th byte	....	n+47th byte	n+48th byte

<< n = nL + nH*256 >>

LSB   MSB

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:

384 dots

1th byte	2th byte	....	47th byte	48th byte

n+1th byte	n+2th byte	....	n+47th byte	n+48th byte

<< n = nL + nH*256 >>

LSB   MSB

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 affection.
              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 parametric to default value.
	➢ return to standard mode
	➢ Delete user-defined characters

5.2.7 Status Command

ESC v n	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 definition:
	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 bar code. 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 Position
	0,48: not print HRI
	1,49: Above the bar code
	2,50: Below the bar code
	3,51:Both Above and below the bar code

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 bar code. n specifies the number of dots in the vertical direction. The default value is 50
	1 ≤ n ≤ 255

GS x n	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

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 bar code.
	n = 2,3
	The default value is 3

GS k m d1 d2 ... dk NUL	Print bar code
GS k m n d1 d2 ... dn	

Format1:	ASCII: GS k m d1 d2 ... dk NUL
	Decimal: 29 107 m d1 d2 ... dk 0

	Hexadecimal:	1D 6B	m		d1 d2 … dk 00
Format2:	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: bar code type
                Format 1:   0 ≤ m ≤ 10
                Format 2:   65 ≤ m ≤ 75
                        n: bar code 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	125	>1(even number)	48-57
6,71	CODABAR	>1	36,43,45-58,65-68
7,72	CODE93	>1	
8,73	CODE128	>1	0-127
9,74	CODE11	>1	0-127
10,75	MSI	>1	48-57

5.2.9 Control Parameter Command

ESC 7 n1 n2 n3   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 more clear,but the slower printing
                speed.

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)
	D7..D5 of n is used to set the printing break time
	Break time is n(D7-D5)*250us

DC2 E	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	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 ≤ ll ≤ 255
	0 ≤ lh ≤ 255
	Paper length is (ll+lh*256) steps,means (ll+lh*256)/8 mm

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

FS C	Start Checksum
Format:	ASCII: FS C
	Decimal: 28 67
	Hexadecimal: 1C 43
Description：	Start Checksum for ESC * command

FS S	Check if ESC * command received correct
Format:	ASCII: FS S
	Decimal: 28 83
	Hexadecimal: 1C 53
Description：	If ESC * data checksum received correctly,it return(HEX): 0xDD,0x55,0x1A Else it return(HEX): 0xDD,0x55,0x3E

FS C	Start Checksum

APPENDIXA   CODE PAGE

PC437

	_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	¢	£	¥	Pts	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	■	

APPENDIXB   International characters

	County	ASCII Code(Hex)											
		23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0	U.S.A.	#	$	@	[	\	]	^	`	{	|	}	~
1	France	#	$	à	°	ç	§	^	`	é	ù	è	¨
2	Germany	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
3	U.K.	£	$	@	[	\	]	^	`	{	|	}	~
4	Denmark Ⅰ	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
5	Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
6	Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
7	Spain Ⅰ	Pt	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
8	Japan	#	$	@	[	¥	]	^	`	{	|	}	~
9	Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10	Denmark Ⅱ	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
11	Spain Ⅱ	#	$	á	¡	Ñ	¿	é	`	í	ñ	ó	ú
12	Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú
13	Korea	#	$	@	[	W	]	^	`	{	|	}	~