CE421 User’s manual

Date	Version	Remark
19th,July,2023	V1.0	CH410-USE_230719 V1.0

Manual

1 Introduce

①CE421

CE421 is a 4-inch adjustable width desktop thermal printer, supporting label paper, automatic paper cutting function, with high print quality, high stability, etc., can be widely used in commercial POS systems, catering industry, supermarkets and convenience stores need to print labels in real time.

The CE421 can connect to other devices via USB, Bluetooth, and network ports, while providing drivers for WINDOWS and LINUX operating systems and mobile Android systems.

List of supported operating systems:
WINDOWS XP
WINDOWS 7 32/64
WINDOWS 8/10/11
UBUNTU 12.04 32/64
UBUNTU 14.04 32/64
Andriod 4.0 above

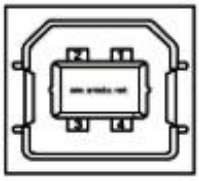
②Main feature

1) The width can be adjusted
2) Low noise, high speed printing
3) Convenient and fast way to feed paper
4) Easy to use and maintain
5) Support label paper and continuous paper printing
6) Support Bluetooth printing
7) Compatible with multiple widths of paper
8)USB, Bluetooth, network port, WIFI interface communication optional

2 Product view and appearance diagram

3 Interface definition

USB interface pin definition (Standard Type B)



Pin numbering	Signal name	Typical wire color
1	VBUS	red
2	D-	white
3	D+	green
4	GND	black

4 Specification

Printing way	Thermal line printing
Paper width	≤108mm
Printing width	110mm
Communication port	Usb ,bluetooth， ethernet， WIFI
Resolution	203DPI/300DPI optional
Dots	864point/1248point
Printing speed	100mm/s
Printinhg content	GBK Chinese character library, ASCII characters, one-dimensional bar code, support different density point map and download bitmap printing. Scalable 2D barcode.
Default fonts	12X24(ASCII),24x24(Chinese)
Printer head bad spot detection	No

5 Tag instruction

Appointment

Name	Appointment
Format	[COMMAND]+[Parameter]
Description	COMMAND: indicates the command header. It is a hexadecimal number in bold blue, for example, 1A 54 00. Parameter: command input parameters. Parameter definition: Single byte parameter: Certain characters represent a single byte, such as Rotate, which takes up one byte. Double-byte parameter: A specific character is combined with _L and _H, representing the low and high bytes of the parameter, in turn. For example, x_L and x_H represent the low and high bytes of the 2-byte parameter X. Unit: point. 1 point = 0.125mm. Scope definition: x Value range: {a, b} : x = a or x = b; [a, b] : a≤x≤b; (a, b) : a < x < b;
Range	
Default	
Support model	
Note	
For example	

Page control instruction

Page start instruction

Name	Page start instruction
Format	Hex ： a： 1A 5B 00 b： 1A 5B 01 x_L x_H y_L y_H Width_L width_H

	Height_L Height_H Rotate
Description	Indicates the start of a Page Page and sets the page size, reference point coordinates, and page rotation Angle. Input parameter: None Returned value: none Note: This instruction sets the page to be 576 points wide and 1200 points high, the reference point coordinates are in the upper left corner of the current position, and the page does not rotate. b: Input parameters: x Page Specifies the X-axis offset from the origin point to the upper left corner of the label. y Page Specifies the Y-axis offset from the origin point to the upper left corner of the label. Width Page Page Width. The value of x+Width ranges from [1,576]. Height Page Page height. The value of Heigth can be [1, 1200]. Rotate Page Page rotation Angle. The value Rotate is {0,1}. If the value Rotate is 0, the page is not rotated. When the Rotate value is 1, the page is rotated 90°. Returned value: None.
Range	
Default	
Support model	
Note	
For example	1A 5B 01 00 00 00 00 80 01 40 01 00

Page finish instruction

Name	Page finish instruction
Format	Hex ： 1A 5D 00
Description	Identifies the end of a Page's page data. Input parameters: None. Return value: None.
Range	

Default	
Support model	
Note	
For example	

Page print instruction

Name	Page print instruction
Format	Hex ： a： 1A 4F 00 b： 1A 4F 01 PrintNum
Description	Print the contents of the Page to the label paper. a: Input parameters: There is no Returned value: None Note: This command will only print the contents of the page once. b: Input parameters: PrintNum Page Page content will be printed PrintNum times. Return value: None.
Range	
Default	
Support model	
Note	

For example	

Paper feed instruction

Name	Paper feed instruction
Format	Hex ： a: 1A 0C 00 b: 1A 0C 01 StopPosition Offset_L Offset_H
Description	a; Input parameters: None. Return value: None. Note: After receiving this command, the printer runs paper. When the label seam is flush with the cutting edge, the printer stops running paper. At this point, the printer The current cursor position is 8mm below the label header b: Input parameters: StopPosition The value range is {0, 3}. StopType = 0: The paper is stopped when the cutting edge is flush with the label seam.

	StopType = 1: The paper stops when the cursor is flush with the label head. StopType = 2, stop the paper when the cutting edge is flush with the bottom of the black mark; StopType = 3, the cursor is flush with the black mark below to stop the paper; Offset Indicates that the stop position is offset. When the printer detects that the label header or label is, the paper continues to Offset the length of each point. Return value: None.
Range	
Default	
Support model	
Note	
For example	1A 0C 01 00 00 01

Page drawing instruction

In the following instructions, the reference origin of all coordinate points is the reference point defined in the Page start instruction. Page_Width and Page_Height represent the page width and height defined in the directive.

Text drawing instruction

Name	Text drawing instruction
Format	Hex： a. 1A 54 00 x_L x_H y_L y_H String00 b : 1A 54 01 x_L x_H y_L y_H

<table>
<tr><td></td><td>FontHeight_L FontHeight_H
FontType_L FontType_H
String00</td></tr>
<tr><td>Description</td><td>a.
Input parameters:
x
Define the x coordinate of the start position of the text, the value range is: [0, Page_Width-1];
y
Define the start position of the text y coordinate, the value range: [0, Page_Height-1];
String00
A stream of text string data terminated at 0x00 to be printed.
Return value:
There is no
Note: Text is printed truncated when the sum of the text width and the text starting coordinate x is greater than the page width.
b.
Input parameters:
X
Define the x coordinate of the start position of the text, the value range is: [0, Page_Width-1];
y
Define the start position of the text y coordinate, the value range: [0, Page_Height-1];
FontHeight
Text character font height, valid value range is {16, 24, 32, 48, 64, 80, 96}.
FontType

Text character effects are defined as follows:

<table>
<tr><td>Data bits</td><td>Definition</td></tr>
<tr><td>0</td><td>Bold flag bit: Set 1 font bold, clear zero font is not bold.</td></tr>
<tr><td>1</td><td>Underline flag bit: Set 1 text with underline, clear zero without underline.</td></tr>
<tr><td>2</td><td>Anti-white flag bit: set 1 text anti-white (white characters on black background), clear zero not anti-white.</td></tr>
<tr><td>3</td><td>Delete line flag bit: Set 1 text with delete line, clear zero, no delete line.</td></tr>
<tr><td>[5,4]</td><td>Rotation marker: 00 rotation 0° ; 01 Rotate 90° ; 10 Rotation 180° ; 11 Rotate 270° . (When you need to rotate, you need to pay</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td></td><td>attention to the starting point coordinates)</td></tr>
<tr><td>[11,8]</td><td>Font width magnification;</td></tr>
<tr><td>[15,12]</td><td>Font height magnification;</td></tr>
</table>

A stream of text string data terminated at 0x00 to be printed.

Returned value: None.

Note:

When the sum of the text width and the text starting coordinate x is greater than the page width, the text is printed truncated.
</td></tr>
<tr><td>Range</td><td></td></tr>
<tr><td>Default</td><td></td></tr>
<tr><td>Support model</td><td></td></tr>
<tr><td>Note</td><td></td></tr>
<tr><td>For example</td><td>
A:

1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00
1A 54 00 00 00 00 00 B0 AE CE D2 D6 D0 BB AA 00
1a 5d 00
1a 4f 00

B:

1a 5B 01 00 00 00 00 80 01 00 01 00
1A 54 01
00 00
00 00
60 00 00 00
C4E3BAC3 00
1A 54 01
18 00
00 00
60 00 00 00
C4E3BAC3 00
1A 54 01
a0 00
00 00
60 00 10 33
C4E3BAC3 00
</td></tr>
</table>

	1a 5d 00 **1a 4f 00**

Line drawing instruction

Name	Line drawing instruction
Format	Hex ： a. 1A 5C 00 StartX_L StartrX_H StartY_L StartrY_H EndX_L EndX_H EndY_L EndY_L b. 1A 5C 01 StartX_L StartX_H StartY_L StartY_H EndX_L EndX_H EndY_L EndY_H Width_L Width_H Color
Description	Draws a straight line between two specified points on the Page page. a. Input parameters: StartX Start point x coordinate value of the line segment. The value ranges from [0, Page_Width-1]. StartY y coordinate of the start point of the line segment. The value ranges from [0, Page_Height-1]. EndX End point of the line segment x coordinate value, the value range is [0, Page_Width-1]. EndY

	y coordinate value of the end point of the line segment. The value ranges from [0,Page_Height-1]. Return value: None. b. Input parameters: StartX Start point x coordinate value of the line segment. The value ranges from [0, Page_Width-1]. StartY y coordinate of the start point of the line segment. The value ranges from [0, Page_Height-1]. EndX End point of the line segment x coordinate value, the value range is [0, Page_Width-1]. EndY y coordinate value of the end point of the line segment. The value ranges from [0,Page_Height-1]. Width The value is [1, Page_Height-1]. Color The value is {0, 1}. When Color is 1, the line segment is black. When Color is 0, the line segment is white. Output parameters: None.

Range	
Default	
Support model	
Note	
For example	1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00 1A 5C 01 00 00 00 00 00 01 00 00 30 00 01 1a 4f 00

Draw a rectangular box with the line segment instruction:

1B 40 1a 5B 01 00 00 00 00 80 01 00 01 00

1A 5C 01 10 00 10 00 00 01 10 00 04 00 01

1A 5C 01 10 00 10 00 10 00 c0 00 04 00 01

1A 5C 01 10 00 c0 00 00 01 c0 00 04 00 01

1A 5C 01 00 01 10 00 00 01 c0 00 04 00 01

1a 4f 00

Rectangular box drawing instruction

Name	Rectangular box drawing instruction
Format	Hex ： a. 1A 26 00 Left_L Left_H Top_L Top_H Right_L Right_H Bottom_L Bottom_H b. 1A 26 01 Left_L Left_H Top_L Top_H Right_L Right_H Bottom_L Bottom_H Width_L Width_H Color
Description	Draws a rectangular box of the specified size at the specified position on the Page page. a. Input parameters: Left x coordinate value at the upper left corner of the rectangle box. The value ranges from [0, Page_Width-1].

	Top y coordinate value in the upper left corner of the rectangle. The value can be [0, Page_Height-1]. Right x coordinate value in the lower right corner of the rectangle box. The value can be [0, Page_Width-1]. Bottom y coordinate value in the lower right corner of the rectangle box. The value can be [0, Page_Height-1]. Return value: None. b. Input parameters: Left x coordinate value at the upper left corner of the rectangle box. The value ranges from [0, Page_Width-1]. Top y coordinate value in the upper left corner of the rectangle. The value can be [0, Page_Height-1]. Right x coordinate value in the lower right corner of the rectangle box. The value can be [0, Page_Width-1]. Bottom y coordinate value in the lower right corner of the rectangle box. The value can be [0, Page_Height-1]. Width

	Rectangular frame line width. Color Rectangle box line color, curved range {0,1}. When Color = 1, draw the black rectangle width, and when Color = 0, draw the white rectangle box. Return parameters: none
Range	
Default	
Support model	
Note	
For example	1a 5B 01 00 00 00 00 80 01 40 01 00 1a 26 01 10 00 10 00 00 01 00 01 10 00 01 1a 4f 00

1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00
1a 26 01 10 00 10 00 00 01 00 01 10 00 01
1A 54 00 50 00 50 00 B0 AE CE D2 D6 D0 BB AA 0X00
1a 4f 00

（Draw table）
1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00
1a 26 01 10 00 10 00 00 01 C0 00 04 00 01
1A 5C 01 10 00 40 00 00 01 40 00 04 00 01
1A 5C 01 10 00 80 00 00 01 80 00 04 00 01
1A 5C 01 40 00 10 00 40 00 c0 00 04 00 01
1A 54 00 50 00 50 00 B0 AE CE D2 D6 D0 BB AA 00
1a 4f 00

Draw rectangular block instruction

Name	Draw rectangular block instruction
Format	Hex ： 1A 2A 00 Left_L Left_H Top_L Top_H Right_L Right_H Bottom_L Bottom_H Color
Description	Draws a rectangular block at the specified position on the Page page.

	Input parameters: Left x coordinate value at the upper left corner of the rectangle block. The value ranges from [0, Page_Width-1]. Top y coordinate value of the upper left corner of the rectangle block. The value can be [0, Page_Height-1]. Right Rectangle block lower right corner x coordinate value. The value can be [0, Page_Width-1]. Bottom The y coordinate value in the lower right corner of the rectangle block. The value can be [0, Page_Height-1]. Color Color of the rectangle block. Value range: {0, 1}. When Color is 1, the rectangle block is black. When Color is 0 When the rectangular block is white. Return value: None.
Range	
Default	
Support model	
Note	
For example	1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00 1A 2A 00 00 00 00 00 60 00 60 00 01 1a 4f 00

One-dimensional bar code instruction

Name	One-dimensional bar code instruction

<table>
<tr><td>Format</td><td>Hex ：

1A 30 00 x_L x_H
y_L y_H
BarcodeType
BarcodeHeight
UnitWidth
Rotate
String00</td></tr>
<tr><td>Description</td><td>Draws a one-dimensional bar code at the specified position on the Page page.
Input parameters:

x
x coordinate value in the upper left corner of the bar code. The value range is [0, Page_Width-1].

y
y coordinate value in the upper left corner of the bar code. The value ranges from 0 to Page_Height-1.

BarcodeType

Identifier Bar code type. Value range: 0,29. The values are defined as follows:
<table>
<tr><th>No.</th><th>Type</th><th>length</th><th>Bar code value range</th><th>Remark</th></tr>
<tr><td>0</td><td>UPC-A</td><td>11</td><td>48-57</td><td></td></tr>
<tr><td>1</td><td>UPC-E</td><td>6</td><td>48-57</td><td></td></tr>
<tr><td>2</td><td>EAN13</td><td>12</td><td>48-57</td><td></td></tr>
<tr><td>3</td><td>EAN8</td><td>7</td><td>48-57</td><td></td></tr>
<tr><td>4</td><td>CODE39</td><td>1-</td><td>48-57,65-90,32,36,37,43,45,46,47</td><td></td></tr>
<tr><td>5</td><td>I25</td><td>1-</td><td>even number 48-57</td><td></td></tr>
<tr><td>6</td><td>CODABAR</td><td>1-</td><td>48-57,65-68,36,43,45,46,47,58</td><td></td></tr>
<tr><td>7</td><td>CODE93</td><td>1-255</td><td>0-127</td><td></td></tr>
<tr><td>8</td><td>CODE128</td><td>2-255</td><td>0-127</td><td></td></tr>
<tr><td>9</td><td>CODE11</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>MSI</td><td></td><td></td><td></td></tr>
<tr><td>11</td><td>128M</td><td></td><td></td><td>The encoding mode can be switched according to</td></tr>
</table>
</td></tr>
</table>

					the data-> !096 - !105
		12	EAN128		Automatic switching of encoding modes
		13	25C		25C Check use mod 10-> Odd numbers are preceded by 0, multiples of 10- [(sum of odd numbers < from left to right)+(sum of even numbers)*3]
		14	39C		The check code of 39 code must be matched with the "check code relative value comparison table", as shown in the table, the detected relative value is added up and then divided by 43, and the remaining number obtained is then detected the relative encoding character, that is, the check code character.
		15	39		Full ASCII 39 Code, special characters are represented by two representable words, 39C also contains Full ASCII, pay attention to the width ratio processing
		16	EAN13+2		The interval between the extra code and the main code is 7-12 units, starting at 1011 and the interval is 01, (_0*10+_1) Mod 4-> 0--AA 1--AB 2--BA 3--BB
		17	EAN13+5		Same as above with extra code, pattern((_0+_2+_4)*3+(_1+_3)*9) mod 10 ->"bbaaa", "babaa",

				"baaba", "baaab", "abbaa", "aabba", "aaabb", "ababa", "abaab", "aabab
18	EAN8+2			Same as EAN13+2
19	EAN8+5			Same as EAN13+5
20	POST			See the specifications for details. It is high and low bar code, not wide and narrow bar code
21	UPCA+2			See EAN for extra code
22	UPCA+5			See EAN for extra code
23	UPCE+2			See EAN for extra code
24	UPCE+5			See EAN for extra code
25	CPOST			
26	MSIC			The check code is calculated again as data
27	PLESSEY			
28	ITF14			25C variant, the first number before the 0, check code calculation need to deduct the last number, but still fill as the end
29	EAN14			

BarcodeHeight :
Define the bar code height.

UnitWidth :
Define the barcode code width. Value range: [1, 4]. The values are defined as follows:

Width value	Multilevel bar code unit width（mm）	Binary bar code narrow line width	Binary bar code wide line width
1	0.125	0.125	0.25
2	0.25	0.25	0.50
3	0.375	0.375	0.75
4	0.50	0.50	1.0

Rotate:
Indicates the bar code rotation Angle. Value range: [0, 3]. The values are defined as follows:

	<table><tr><td>Rotate value</td><td>definition</td></tr><tr><td>0</td><td>Bar codes are not drawn by rotation.</td></tr><tr><td>1</td><td>Bar code rotated 90° to draw.</td></tr><tr><td>2</td><td>Bar code rotated 180° to draw.</td></tr><tr><td>3</td><td>Bar code rotated 270° to draw.</td></tr></table> String00: A stream of text characters ending in 0x00. Return value: None.
Range	
Default	
Support model	
Note	
For example	（2inch label paper） 1b 40 1a 5B 01 00 00 00 00 80 01 00 01 00 1a 30 00 20 00 40 00 0f 55 02 00 31 30 31 30 30 00 1a 5d 00 1a 4f 00

QRCode Indicates the barcode command

Name	QRCode Indicates the barcode command
Format	Hex ： 1A 31 00 version ECC x_L x_H y_L y_H UnitWidth Rotate String00
Description	Input parameters: version Specifies the character version. Value range: 0,20. When version is 0, the printer depends on the string length

<table>
<tr><td></td><td>
Automatically calculate the version number.
ECC
Specify the error correction level. Value range: [1, 4]. The values are defined as follows:
<table>
<tr><td>ECC</td><td>Error correction level</td></tr>
<tr><td>1</td><td>L： 7%, low error correction, high data.</td></tr>
<tr><td>2</td><td>M：15%, error correction</td></tr>
<tr><td>3</td><td>Q：Optimization error correction</td></tr>
<tr><td>4</td><td>H：30%, maximum error correction, little data.</td></tr>
</table>
QRCode x coordinates in the upper left corner of the code. The value ranges from [0, Page_Width-1].
y
QRCode y coordinates in the upper left corner of the code. The value ranges from 0 to Page_Height-1.
UnitWidth
QRCode Code block. The value range is [1, 4]. Each value is defined with the instruction input parameter UniWidth
Same.
Rotate
QRCode Code rotation Angle. Value range: [0, 3]. Each value is defined with the instruction input parameter
Rotate the same.
String00
QRCode text character data stream terminated at 0x00.
Return value:
None.
</td></tr>
<tr><td>Range</td><td></td></tr>
<tr><td>Default</td><td></td></tr>
<tr><td>Support model</td><td></td></tr>
<tr><td>Note</td><td></td></tr>
<tr><td>For example</td><td>1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00
1A 31 00 03 03 60 00 20 00 04 00 B0 AE CE D2 D6 D0 BB AA 00
1a 5d 00
1a 4f 00</td></tr>
</table>

PDF417 Barcode instruction

Name	PDF417 Barcode instruction

Format	Hex ： 1A 31 01 ColNum ECC LWRatio x_L x_H y_L y_H UnitWidth Rotate String00
Description	Word Page page specifies the position to draw the PDF417 barcode. Input parameters: ColNum ColNum is the number of columns, representing how many code words each row contains. A code word is 17*UnitWidth points. The number of lines is automatically generated by the printer, and the range of lines is limited to 3 to 90. The value of ColNum can be [1,30]. ECC Error correction level. Value range: [0.8]. PDF417 upper-left x coordinate value, the value range: [0, Page_Width-1]. y Specifies the y coordinate in the upper left corner of the PDF417 code. The value ranges from 0 to Page_Height-1. UnitWidth PDF417 code wide, value range: [1, 3]. Each value is defined with the instruction input parameter UniWidth Same. Rotate PDF417 yards rotation Angle, value range: [0, 3]. Each value is defined with the instruction input parameter Rotate the same. String00 A PDF417 text character data stream terminated at 0x00. Return value: None.
Range	
Default	
Support model	
Note	
For example	1B 40 1a 5B 01 00 00 00 00 80 01 40 01 00 1A 31 01 10 02 02 50 00 20 00 03 00 B0 AE CE D2 D6 D0 BB AA 0X00 1a 4f 00

Bitmap instruction

Name	Bitmap instruction
Format	Hex ： a：1A 21 00 x_L x_H y_L y_H Width_L Width_H Height_L Height_L Data b： 1A 21 01 x_L x_H y_L y_H Width_L Width_H Height_L Height_L ShowType Data
Description	Draws a bitmap at the specified location on the Page page. a : Input parameters: x x coordinate value in the upper left corner of the bitmap. The value range is [0, Page_Width]. y y coordinate value in the upper left corner of the bitmap. The value ranges from 0 to Page_Height. Width The pixel width of the bitmap. Height The pixel height of the bitmap. Data Bitmap dot matrix data. Returned value: None. b : Input parameters: x x coordinate value in the upper left corner of the bitmap. The value range is [0, Page_Width]. y

<table>
<tr><td></td><td>y coordinate value in the upper left corner of the bitmap. The value ranges from 0 to Page_Height.
Width
The pixel width of the bitmap.
Height
The pixel height of the bitmap.
ShowType
Bitmap printing effects, ShowType values are defined as follows:

<table><tr><td>Bit</td><td>Definition</td></tr><tr><td>0</td><td>Anti-white flag bit, set 1 bitmap anti-white printing, clear zero normal printing.</td></tr><tr><td>[2:1]</td><td>Rotation marker: 00 rotation 0° ; 01 Rotate 90° ; 10 Rotation 180° ; 11 Rotate 270°</td></tr><tr><td>[7:3]</td><td>Remain</td></tr><tr><td>[11:8]</td><td>Bitmap width magnification.</td></tr><tr><td>[15:12]</td><td>Bitmap height magnification.</td></tr></table>
Data
Bitmap dot matrix data.
Returned value: None.</td></tr>
<tr><td>Range</td><td></td></tr>
<tr><td>Default</td><td></td></tr>
<tr><td>Support model</td><td></td></tr>
<tr><td>Note</td><td></td></tr>
<tr><td>For example</td><td>1a 5B 01 00 00 00 00 80 01 40 01 00
1a 21 01 40 00 40 00 18 00 18 00 07 22
0820800E38E00C30C80C34FC0DFF980E31102D32242DFDFE2CB58C6CB58C6CB5AC4CB5AC0CFDAC0C31AC0C71AC0C71AC0CB9AC0CB5280D34400E30580C308C0C31060C3204082400
1A 5D 00
1a 4f 00</td></tr>
</table>