

# **Android-SDK Development Manual**

(V1.7)

**Document information**

File Name	Android-SDK Printer Developing Manual			
Author	Yang Xuezhi,Fu Daohui, Sun Chao			
File name	Android-SDK Printer Developing Manual.doc			
Summary	This file is for Android-SDK 5.7 version. This version is modified on the basis of SDK5.6 version.			
(REVISIONHISTORY)				
Version	Date	Modifier	Reviewers	Summary
1.0	2016-06-22	Fu Daohui	Qin Zhengfeng	Initially created this File
1.1	2016-12-09	Yang Xuezhi		1. Add TSPL instruction label printing method 2. Add the black mark positioning function 3. Add the color bitmap convert to the grayscale print function 4. Modify instruction of sendBytesData method in the document returned value to add a - 3 5. Serial communication add need to call the specified .so instructions. 6. Add all methods to the hyperlink.

1.2	2017-07-26	Fu Daohui		<ol style="list-style-type: none"><li>1. Modify the PDF print in the SDK</li><li>2. Optimize the serial failure problem on non-root device</li><li>3. Add printed language instruction</li><li>4. Optimize the method of printing pictures</li><li>5. In the SDK, I added the print line, dotted line method</li><li>6. Optimize other known bugs</li><li>7. Added a quick reading guide on the document</li></ol>
-----	------------	-----------	--	--

1.3	2017-12-24	Yang Xuezhi		<p>1.Optimize the way to query the status of printer. Adjust the query logic order to ensure the stability. And specify the abnormal return to read abnormal and write abnormal.</p> <p>2.Optimizes the method of querying the completion process of printing. Remove the parameter which display the information of query results.</p> <p>3. Overload the method of printing images with ESC/POS instruction. This method can directly pass color Bitmap object, and can modify the threshold value of image's binarization.</p> <p>4.Modify the method of how to download bitmap to the printer with TSPL instruction, which enable normal bitmapdownload to printer cache.</p> <p>5.Modify the way of reading and writing data under USB communication, improve printer communication speed. Modify the size of single packet date, and delay between the single packet date. Also modify the returned value of read date in order to ensure the reads of returned values are the bytes which are sent successfully. 6. Modify the bugs which limit parameters of bitmap printing under TSPL command.</p> <p>7. Regulate the modulation logs for modifying the interfaces.</p>
-----	------------	-------------	--	---

--	--	--	--	--

1.4	2018-12-07	Sun Chao Yang Xuezhi		<ol style="list-style-type: none"><li>1. Page Mode has been added. Refer to 3.8</li><li>2. Optimize the problem of losing data on the device with USB timeout.</li><li>3. Add print LOG to SD card, refer to 3.9</li><li>4. Capture printing function of Y33 has been added. Refer to 3.10</li><li>5. Modify the instantiation mode of the serial port and add a new parameter ctsrts to select the flow control mode.</li><li>6. Add a function to set whether the Y33 print service is configurable, and whether the Y33 print service can be configured. Refer to 3.12</li></ol>
-----	------------	----------------------------	--	---

--	--	--	--	--

1.5	2019-9-5	Sun Chao Yang Xuezhi		1. Add software flow control configuration. For details, refer to 3.11 Get serial printer instant class object
-----	----------	----------------------------	--	---



1.6	2020-04-16	Sun chao Yang Xuezhi		<ol style="list-style-type: none"><li>1. The zxing package name has conflicts, and multiple users report conflicts, so replace it with com.printer.sdk. zxing package name to solve related problems.</li><li>2. Solve the problem of printing pictures to monochrome images, missing or more problems.</li><li>3. Added an interface for querying the printer's paper travel distance and an interface for resetting the printer's paper travel distance.</li></ol>
-----	------------	----------------------------	--	--

1.7	2021-11-12	Sun chao Yang Xuezhi		<ol style="list-style-type: none"><li>1. Added LZ4Util.java to the sdk to solve the problem of compressed printing.</li><li>2. Overloaded Utils.java zoomImage() method to add parameters for T7 printing.</li><li>3. Update the related interface of Y33 printing, see sdk version description.txt for details.</li><li>4. The demo adds Bluetooth search filter to solve the problem of abnormal connection caused by Android 11 searching for ble Bluetooth.</li><li>5. A new option for T7 printing has been added to the demo setting interface.</li><li>6. Remote upgrade update</li></ol>
-----	------------	----------------------------	--	--

1.7.1	2021-11-12	Sun chao Yang Xuezhi		<p>The version of the standard version of the Demo is V5.7.1, and the version of the standard version of the SDK is V5.7.2.</p> <ol style="list-style-type: none"><li>1. Added aidl interface to sdk (get the version number of print service, add parameters for sending data)</li><li>2. PrinterInstance.java class getCurrentStatus() method array out-of-bounds exception modification and improvement.</li><li>3. PrinterInstance.java class drawQrCode() interface overload.</li><li>4. The demo improves the label printing interface to switch between tspl and cpcl to display exceptions.</li><li>5. The demo improves the problem of out-of-order and garbled characters caused by multi-threaded concurrency when text, labels, etc. are quickly clicked for multiple times to print.</li><li>6. The demo modification import project exception.</li><li>7. Remote upgrade update, update demo version number 5.7.1.</li></ol>
-------	------------	----------------------------	--	--

## Content

Content .....	12
1.Introduction .....	15
2. Nouns Explanation .....	15
2.1 Nouns Explanation .....	15
2.2 Relevant Knowledge.....	16
2.3 This document speed guide.....	16
3. Related Class Explanation.....	17
3.1. Printer Core Class (PrinterInstance) .....	17
3.1.1 Get Printer Instance Class .....	18
3.1.2 Printer Communication Related Method.....	19
3.1.3 Setting Printer Method .....	21
3.1.4 ESC/POS instruction print related methods .....	23
3.1.5 CPCL Command Label Printing Related Method .....	27
3.1.6 TSPL Command Label Printing Related Method .....	33
3.1.7 Method to control printer hardware .....	45
3.1.8 Get the current state of the printer .....	46
3.1.9 The call examples of connecting printers .....	48
3.2 Barcode Printing Class .....	50
3.2.1 constructor function .....	50
3.2.2 Barcode Printing call example .....	51

---

3.3 Table Form Printing Class .....	51
3.3.1 Create Table examples.....	51
3.3.2 Add One Row Data.....	52
3.3.3 Setting the column data alignment in the Table.....	52
3.3.2 Add One Row Data.....	53
3.3.3 Setting the column data alignment in the Table.....	53
3.3.4 Form printing call example.....	53
3.4 Canvas Printing Class .....	53
3.4.1 Initialization canvas .....	54
3.4.2 Set Font Property .....	54
3.4.3 Canvas content related method .....	55
3.4.4 Call sample for canvas printing .....	57
3.5 BitmapConvertor class .....	57
3.5.1 Transfer colorful image to Black&White binary bitmap .....	57
3.6 Correlation Class of Printing PDF file.....	58
3.6.1 Calling example for PDF printing .....	58
3.7、CodePage Printer multilingual code page Print class .....	59
3.8、Printing interfaces of CanvasDrawPrint under Page mode .....	61
3.8.1 Initialization page.....	61
3.8.2 Page content related method.....	62
3.8.3 Page mode interface related example implementation .....	67
3.9、Record Log saved to SD card .....	70

---

3.9.1 Examples .....	70
3.10 Capture printing function of Y33.....	64
4. Appendix .....	71
4.1 Summarize of CODE128 .....	71
4.2 Character Set .....	72

## 1.Introduction

Android-SDK5.7is an Android function interface based on our printer development. This version is modified on the basis of SDK5.6 version. It optimizes the way to query the status of printer and the completion process of printing, print bitmap with ESC/POS command, download bitmap to the printer with TSPL instruction, USB communication and so on, also mudify other known bugs. Note that this version no longer supports SDK4.0 and earlier versions, compatible with 5.0 and above. If there are any software problems with SDK4.0 and earlier versions, please consult our company pre-sales.This SDK supports bluetooth, serial port, WIFI, and USB communication.The related class illustrations are below:

Class Name	Discription
PrinterInstance	Printer Core Class
Barcode	Barcode Printing Class
Table	Table Printing Class
CanvasPrint	Canvas Printing Class
BitmapConvertor	Colorful Bitmap Converting Class
PdfContext,CodecDocument,CodecPage	PDF File Printing Related Class
PrinterConstants	Related Constants Class

## 2. Nouns Explanation

### 2.1 Nouns Explanation

- Printing Width: The maximum horizontal printing range that printer supports, which is decided by printer itself. For example, as for 80mm width printer, the printing width is 72mm(576 dots); while as for 58mm printer, the printing width is 48mm(384 dots).
- Printing Area: Printing area can be set by commands, and it must be less than or equal to printing width;

- Row Height: The height of character row. Row Height = Character Height + Line Space;
- Black Mark Paper: Black mark is black patch pre-printed on the paper. Users can use it to locate printing position;
- Vertical or Horizontal Moving Unit: The default one moving unit is one printing dot. The horizontal distance is 1/8mm and the vertical distance is 1/8mm;

## 2.2 Relevant Knowledge

- Western Characters Printing: Western characters we mentioned including ASCII character and CodePage. The ASCII character range is 0x20~0x7F, the Codepage range is 0x80~0xFF. Western languages(such as German and Spanish) have their own single-byte codepages. Because there is overlapping section for Codepage codes and Chinese characters codes, pls print Codepage under Western Characters Printing mode. Common Western Characters Font are: Font A: 12x24(dots); Font B: 9x17(dots);
- Chinese Printing: The Chinese Characters we mentioned including simplified Chinese and traditional Chinese. The common simplified Chinese characters set we use are GB2312 and GB18030, and the common traditional Chinese characters set we use is BIG5. Common Chinese Characters Font: 24x24 (dots).
- Twice Height Printing: In this printing mode, the height of character is twice of normal height of character;
- Twice Width Printing: In this printing mode, the width of character is twice of normal width of character;

## 2.3 This document speed guide

- Because the printer model is not the same, the instruction is not the same, customer development personnel familiar with the printer have different degree, in order to let the customer developers can more quickly locate to call API method, the following text description will help you.
- No matter what you do, as long as you need under the android via bluetooth, USB, WIFI (or cable), a serial port connection to print, all can read 3.1.1 and 3.1.2 section query entity class for printers, open communication port, reading and writing data, close com API, such as additional 3.1.9 provides bluetooth for example, to initialize the printer, connect printers, print data, close the API calls such as application examples.
- If you want to print a small ticket on ordinary heat sensitive paper, you can read the contents of section 3.1.4. This section API provides printing text, printing one-dimensional code, qr code, printing images and other relevant methods.



- If you want to print the label, and your printer supports CPCL instructions, you can read 3.1.5. This section provides methods for printing lines, rectangles, text, and areas to print text, bar codes, etc.
- If you want to print the tag, and your printer supports TSPL instructions, you can read the 3.1.6 section. This section provides a similar approach to 3.1.5, except in a different way.
- If you have the need to query printer status, read the 3.1.8 section. Another 3.6 section provides a program for PDF file printing. In fact, you may want to print more rich format data, and the canvas printing method may be suitable for you, please read 3.4. Cut paper, control the buzzer, look for black label, read 3.1.7 section.

Note: the printer cannot print the data of the webpage directly, nor can it identify the rich and colorful format in the webpage. The average customer can convert the web data to bitmap, and print out the image by calling the printImage (bitmap bitmap, PAlign alignType, int left, Boolean isCompressed).

## 3. Related Class Explanation

### 3.1. Printer Core Class (PrinterInstance)

Class Explanation: It is the core class for printing, which provide getting printer instance method and printer communication related method, printing data related method, setting printer related method, printing label related method, getting printer status related method and control printer hardware related method.

<a href="#">Get Printer Instance Class</a>
<a href="#">Printer Communication Related Method</a>
<a href="#">Setting Printer Method</a>
<a href="#">Printing Content Related Method</a>
<a href="#">CPCL Command Label Printing Method</a>
<a href="#">TSPL Command Label Printing Method</a>
<a href="#">Control Printer Hardware Related Method</a>
<a href="#">Get Printer Status Related Method</a>
<a href="#">Connect Printing Invocation Example</a>

### 3.1.1 Get Printer Instance Class

Method name	Description
getPrinterInstance	Getting Bluetooth Printer Instance Class
getPrinterInstance	Getting USB Printer Instance Class
getPrinterInstance	Getting WiFi Printer Instance Class
getPrinterInstance	Getting Serial Printer Instance Class
getPrinterInstance	Getting AIDL Instance Class

- Getting Bluetooth Printer Instance Class object
- Parameter:
  - bthDevice BluetoothDevice Device Object
  - handler Handler object can be used to received message of connecting successfully or not
  - Returned Value: PrinterInstance Instance Class
- Getting USB Printer Instance Class
  - PrinterInstance static synchronized getPrinterInstance (Context context,UsbDevice usbDevice, Handler handler)
  - Parameter:
    - context context object
    - usbDevice UsbDevice USB device object
    - handler Handler object can be used to received message of connecting successfully or not
    - Returned Value: PrinterInstance Instance Class
- Getting WiFi Printer Instance Class
  - PrinterInstance static synchronized getPrinterInstance (String ipAddress,int portNumber, Handler handler)
  - PrinterInstance static synchronized getPrinterInstance(String ipAddress,int portNumber, Handler handler)
  - Parameter:
    - ipAddress ip address character string of dotted decimal printer, such as "192.168.0.100"
    - portNumber port number of printer, which is 9100 by default
    - handler Handler object can be used to received message of connecting successfully or not
    - Returned Value: PrinterInstance Instance Class
- Getting Serial Printer Instance Class

PrinterInstance static synchronized getPrinterInstance(File device, int baudrate, in flags, Handler handler)

Parameter

device Serial device object

Baudrate Baudrate of serial port, specific baudrate are subject to self test of printer.

flags The mark position of serial port. Default is 0

handler Handler object can be used to received message of connecting successfully or not

Returned Value:PrinterInstance Instance Class

Note: The handler parameter of all above construction methods are used to received connect states of printer, whose corresponding states are as below:

Note:

1. If use serial port, .so library file and PrintDemo/ libs/ armeabi /libserial\_port.so files must be added in demo.

2. All parameters of construct method are use to receive the connection method of printer, which are below:

PrinterConstants.Connect.SUCCESS; Connecting successfully

PrinterConstants.Connect.FAILED; Connecting unsuccessfully

PrinterConstants.Connect.CLOSED; Close connecting

#### ➤ Getting AIDL Instance Class

PrinterInstance static synchronized getPrinterInstance()

Parameter: None

Returned Value:PrinterInstance Instance Class object

### 3.1.2 Printer Communication Related Method

Method Name	Description
<a href="#">OpenConnection</a>	Connecting To Printer
<a href="#">closeConnection</a>	Close the Connection To Printer
<a href="#">sendBytesData</a>	Sending Hexadecimal Data To Printer
<a href="#">read</a>	Read data returned from printer
<a href="#">isSetAble</a>	Set whether the remote print service is configurable (Only Y33 model)

<a href="#">getSetable</a>	Get the status of the remote print service configurable(Only Y33 model)
----------------------------	---

### ➤ Connecting To Printer

Method Name: public boolean openConnection()

Method Description: Connecting printer, handler object can be used to received message of connecting successful or not

Parameter: None

Returned Value: true          Connecting successfully  
false    Connecting unsuccessfully

### ➤ Close the Connection To Printer

Method Name: public void closeConnection()

Method Description: Close the connection to printer, and handler object can be used to received message of connection closed

Parameter: None

Android-SDK Printer Developing Manual

Returned Value: None

### ➤ Sending Hexadecimal Data To Printer

Method Name: public int sendBytesData(byte[] srcData)

Method Description: Sending hexadecimal data to printer. If the SDK haven't provided function wanted, please refer to instruction manual to use this method to send instruction to printer directly.

For example: If the command for setting printing position in the center checked on the manual is: 0x1B,0x61,0x01, the code can be written as below to achieve setting printing position in the center.

```
byte[] command = new byte[3];
```

```
command[0] = 0x1B;
```

```
command[1] = 0x61;
```

```
command[2] = 0x01;
```

```
sendByteData (command);
```

Parameter: srcData byte array

Returned Value:

> 0 Bytes numbers which are sent to printer successfully;

-1 means no initialize printing,

- 2 means srcData is blank or srcData doesn't have any data.
- 3 Failed to send data to the printer
- Read data returned from printer
 

Method Name: public int read(byte[] buffer)

Method Description: Read data returned from printer

Parameter: Used to receive the array which read bytes

Returned Value:

> 0 Bytes numbers which are sent to printer successfully;

-1 means no initialize printing,

-2 means srcData is blank or srcData doesn't have any data.
- Set whether the remote print service is configurable
 

Method Name: public void setIsSettable(boolean isSettable)

Method Description: Set whether the remote print service is configurable (this method can only be used with the print service on the Y33 printer type. No meaning in other application scenarios.)

Parameters: true means that the remote print service can be configured, false means that the remote print service cannot be configured.

No returned value
- Get the status of the remote print service configurable
 

Method Name: public boolean getSettable()

Method Description: Set whether the remote print service is configurable (this method can only be used with the print service on the Y33 printer type. No meaning in other application scenarios.)

Parameters: Null

Return Value: true indicates that the remote print service is currently in a configurable state, false indicates that the remote print service is currently in an unconfigurable state.

### 3.1.3 Setting Printer Method

Note: the setting method is invalid in the CPCL commands program of label printer.

Method Name	Description
<a href="#">initPrinter</a>	Initialize Printer
<a href="#">setFont</a>	Setting Printer Font
<a href="#">setPrinter</a>	Printer Printing Setting
<a href="#">setLeftMargin</a>	Setting dots numbers which are away from left margin

➤ Initialize Printer

Android-SDK Printer Developing Manual

Method Name: public void initPrinter()

Method Description: Initialize Printer

Parameter: None

Returned Value: None

➤ Setting Printer Font

Method Name: public void setFont(int mCharacterType, int mWidth, int mHeight, int mBold,int mUnderline)

Method Description: Setting printer printing font, including setting boldface, twice height,twice width, underline, standard ASCII Font A(12x24), compressed ASCII Font B(9x17)

Parameter:

mCharacterType: 0 means 12x24 font size, 1 means 9x16 font size, The set font type is temporary effective. Printer do not save this setting, means invalid when printer reset. Need to send 1 do manual setting if printed 9\*16 font.

mWidth: twice width, the range is 0~7

mHeight: twice height, the range is 0~7

mBold: 0 means not bold, 1 means boldface

mUnderline: 0 means no underline, 1 means having underline

Returned Value: None

➤ Printer Printing Setting

Method Name: public void setPrinter(int command, int value)

Android-SDK Printer Developing Manual

Method Description: Setting printer, including printing and feeding paper for n dot line; printing and feeding paper for n character line; setting character align mode, align left, center, align right.

Parameter: command

PrinterConstants.Command.PRINT\_AND\_WAKE\_PAPER\_BY\_LNCH

Printing and feeding value dot line

PrinterConstants.Command.PRINT\_AND\_WAKE\_PAPER\_BY\_LINE

Printing and feeding value character line

PrinterConstants.Command.ALIGN Setting the position of printing content,

Value can be used to appoint specific position of setting, which can be:

PrinterConstants.Command.ALIGN\_LEFT;

PrinterConstants.Command.ALIGN\_CENTER;

PrinterConstants.Command.ALIGN\_RIGHT

### E.g.1: Set the print text to center

```
mPrinter.setPrinter(Command.ALIGN, Command.ALIGN_CENTER);
mPrinter.printText("hello world!\n");
```

### E.g.2: Set the print 1D Bar code center

```
mPrinter.setPrinter(Command.ALIGN, Command.ALIGN_CENTER);
Barcode barcode1 = new Barcode(BarcodeType.CODE128, 2, 150, 2, "123456");
mPrinter.printBarCode(barcode1);
```

### E.g.3: Set the print 2D Bar code center

```
PrinterInstance.mPrinter.setPrinter(Command.ALIGN, Command.ALIGN_CENTER);
Barcode barcode2 = new Barcode(BarcodeType.QRCODE, 2, 3, 6, "123456");
PrinterInstance.mPrinter.printBarCode(barcode2);
```

Note: Above for the print image printImage method is invalid

➤ Setting dots numbers which are away from left margin

Method Name: public void setLeftMargin(in inchs)

Method Description: Setting inchs number which are away from left margin

Parameter: inchs inchs numbers away from left margin

Returned Value: None

### E.g. 1: setLeftMargin8 inchs

```
mPrinter.setLeftMargin(8);
mPrinter.printText("hello world!\n");
```

**This method is valid for printing 1D Bar code, 2D Bar code, and is not valid for print image printImage**

## 3.1.4 ESC/POS instruction print related methods

Note: the setting method is unavailable in the CPCL commands program of label printer.

Method Name	Description
<a href="#">printText</a>	Printing Characters
<a href="#">printImage</a>	Print Black and white binary picture
<a href="#">printImage</a>	Print colorful image
<a href="#">printColorImg2Gray</a>	Print Grayscale color image
<a href="#">printTable</a>	Print Table
<a href="#">printBarCode</a>	Print Barcode
<a href="#">printhorizontalLine</a>	Print line , dotted line

➤ Print text

Method Name: `public void printText(String content)`

Method Description: Print text

Parameter: content Text content needs to be printed

Returned Value: None

Note: Printing data will buffer until data is enough for a line or add "\n" behind content, that is (`printText("hello world\r\n")`), then can print content data.

➤ Print Black and white binary picture

Method name: `public void printImage(Bitmap bitmap, PAlign alignType, int left, boolean isCompressed)`

Method Description: From the left position on the left margin begin to print picture, and please note the printer can only print binary image. If colored bitmap sent, printer will still print black and white binary bitmap, and will cause the serious picture distortion. Bitmap Convertor class provides the method to transfer the colored picture into binary picture, please refer to BitmapConvertor class introduction.

Parameter: bitmap monochrome bitmap will be printed, whose color depth is 1.

alignType: the position of printing picture, `PAlign.START` means the position is on the left, `PAlign.CENTER` means the position is on the center, `PAlign.END` means the position is on the right, `PAlign.NONE` means not appoint the printing position. Please note that when the parameter is `PAlign.NONE`, users can adjust the distance of pictures to left margin according to setting left parameter, other parameter will be invalid when sent into left. When setting the printing position on the center, on the right and on the left, please assign the printing width of printer before use above method, that is Printer Constants paper width=384(for 58mm paper, 576 for 80mm paper, 724 for 100mm paper).

Left: When the alignType is `PAlign.NONE`, sending parameter into Left can refined adjust the position of printing pictures away from the left margin. When the alignType is not `PAlign.NONE`, the parameter is invalid and left must be multiple of 8.

isCompressed: It means whether using compression algorithm or not.

Shows true means using compression algorithm, shows false means not Android-SDK Printer Developing Manual using compression algorithm. Using compression algorithm can improve the printing rate when printer print pictures. Please note using compress mode needs to use customized printer, since normal printer don't support this kind of function.

**E.g.1: The following description sets the print picture center**



Print paper width: 58mm, horizontal effective print points 384 points

```
PrinterConstants.paperWidth = 384;
```

```
mPrinter.printImage(bmp, PAlign.Command.ALIGN_CENTER, 0, false);
```

### **E.g.2: The following description prints the picture from the left side 24 points**

Print paper width: 58mm, horizontal effective print points 384 points

```
PrinterConstants.paperWidth = 384;
```

```
mPrinter.printImage(bmp, PAlign.NONE, 24, false);
```

Returned value: Null

#### ➤ Print colorful binary picture

Method Name: public void printImage(Bitmap bitmap, PAlign alignType, int left, int level)

Method Description: From the left position on the left margin begin to print picture, and please note it's a way of overload the Black and white binary picture printing. It can directly transform uploaded colourful bitmap to binary, and print. What's more, it can open the threshold value of binary picture.

Parameter: bitmap which need to printed

alignType: the position of printing picture, PAlign.START means the position is on the left, PAlign.CENTER means the position is on the center, PAlign.END means the position is on the right, PAlign.NONE means not appoint the printing position. Please note that when the parameter is PAlign.NONE, users can adjust the distance of pictures to left margin according to setting left parameter, other parameter will be null when sent into left. When setting the printing position on the center, on the right or on the left, please assign the printing width of printer before use above method, that is Printer Constants paper width=384(for 58mm paper, 576 for 80mm paper, 724 for 100mm paper)

Left : When the align Type is PAlign.NONE, sending parameter into left can refined adjust the position of printing pictures away from the left margin. When the align type is not PAlign. NONE, the parameter is null and left must be multiple of 8.

Level: The threshold value of binary picture. Range: 0~255. Default is 128. Note: Although the theoretical threshold value can be 255, but when the threshold value reaches or closes to 255, the picture might transform to all black bitmap, and also will damage the printer. So the suggestion data is 128, 160, 192.

### **E.g.1: The following description sets the print picture center**

Print paper width: 58mm, horizontal effective print points 384 points

```
PrinterConstants.paperWidth = 384;
```

```
mPrinter.printImage bmp, PAlign.Command.ALIGN_CENTER, 0, 128);
```

**E.g.2: The following description prints the picture from the left side 24 points**

Print paper width: 58mm, horizontal effective print points 384 points

```
PrinterConstants.paperWidth = 384;
```

```
mPrinter.printImage((bmp, PAlign.NONE, 24, 128);
```

Returned value: Null

➤ Print Grayscale color image

Method Name: public void printColorImg2Gray (Bitmap bitmap, PAlign alignType,int left, boolean isCompressed)

Method Description: From the left position on the left margin begin to print the grayscale color image

Parameter:bitmap color bitmap will be printed

alignType:the position of printing picture,PAlign.START means the position is on the left,PAlign.CENTER means the position is on the center,PAlign.END means the position is on the right,PAlign.NONE means not appoint the printing position. Please note that when the parameter is PAlign.NONE, users can adjust the distance of pictures to left margin according to setting left parameter, other parameter will be null when sent into left. When setting the printing position on the center, on the right and on the left, please assign the printing width of printer before use above method, that is Printer Constants paper width=384(for 58mm paper, 576 for 80mm paper, 724 for 100mm paper)

Left : When the align Type is PAlign.NONE,sending parameter into left can refined adjust the position of printing pictures away from the left margin. When the align type is not PAlign. NONE, the parameter is null and left must be multiple of 8.

IsCompressed: It means whether using compression algorithm or not.

True means using compression algorithm, False means not using. Using compression algorithm can improve the printing rate when printer print pictures.

Note: using compress mode needs to use customized printer, since normal printer don't support this kind function .

Returned Value: None

➤ Printing Table

Method Explanation: public void printTable(Table table)

Method Description :Printing table

Parameter: instantiation object of table .Please refer to Table Class 3.34

Returned Value :None

➤ Printing Barcode

Method Explanation:public void printBarCode(Barcode barcode)

Method Description :print 1D , 2D barcode

Parameter: instantiation object of barcode ,Please refer to Barcode Class 3..2.2 for specific instantiation example .

Returned Value: None

➤ Printing Straight line ,dotted line

Method Explanation:public int printhorizontalLine(int lineLength, int lineWith, boolean isSolidline, int interval)

➤ Method Description :Printing Straight line ,dotted line

Parameter:lineLength      Length of   Straight line

                 lineWith      Width of   Straight line

                 isSolidline      true,Straight line,   false,   dotted line

                 interval      Dotted line spacing, optional parameters are 4,8. The larger the value, the larger the spacing

Returned Value: None

### 3.1.5 CPCL Command Label Printing Related Method

Note: below methods are apply for label printer ,which support standard CPCL command set.

Method	Description
<a href="#">pageSetup</a>	Setting the page width and page height of printing area
<a href="#">drawLine</a>	to print straight line
<a href="#">drawBorder</a>	To print border
<a href="#">drawText</a>	To print text
<a href="#">drawText</a>	Print text in area
<a href="#">drawBarCode</a>	Print 1D barcode

<a href="#">drawBarCode</a>	Print 1D barcode in area
<a href="#">drawQrCode</a>	Print 2D barcode
<a href="#">drawGraphic</a>	Print bitmap
<a href="#">drawGraphic</a>	Print bitmap in area
<a href="#">print</a>	To print

- Setting the page width and page height of printing area

Method name: `public void pageSetup(LablePaperType paperWidth,int  
pageWidth, int pageHeight)`

Method description :Setting the page width and page height of printing area

Parameter:

`paperWidth` Set paper type, `LablePaperType.Size_80mm`, 80mmpaper;

`LablePaperType.Size_58mm`, 58mmpaper;

`LablePaperType.Size_100mm`, 100mmpaper;

`pageWidth` Page Width

`pageHeight` Page Width

Returned Value: None

- Print straight line

Method name: `public void drawLine(int lineWidth, int startX, int startY, int  
endX,int endY,boolean isSolidLine)`

Method description :to print straight line

Parameter:

`lineWidth` width of the printing line

`startX` coordinate X of the starting position

`startY` coordinate Y of the starting position

`endX` coordinate X of the ending position

`startY` coordinate Yof the ending position

`isSolidLine`true solid line ;false dotted line

Returned value :Null

- To print border

Method description:`public void drawBorder(int lineWidth, int top_left_x, int  
top_left_y,int bottom_right_x, int bottom_right_y)`

Method description :to print border

Parameter :

lineWidth            Width of the printing line

top\_left\_x            Coordinate X of the left border position

top\_left\_y            Coordinate Y of the left border position

bottom\_right\_x    border bottom right position coordinate X

bottom\_right\_y    border bottom right position coordinate Y

Returned value:Null

➤ Print text

Method description:public void drawText(int text\_x, int text\_y, String text, LableFontSize fontSize,PRotate rotate, int bold, int reverse, int underline)

Method description: To print text at point(text\_x,text\_y)

Parameter description:

text\_x                      Coordinate X of printing started point

text\_y                      Coordinate Y of printing started point

text                        Text content to be printed

fontSize                    font size ,support font as follow:

LableFontSize.Size_16	16dots
LableFontSize.Size_24	24dots
LableFontSize.Size_32	32dots
LableFontSize.Size_48	48dots
LableFontSize.Size_64	64dots
LableFontSize.Size_72	72dots
LableFontSize.Size_96	96dots

rotate                      Rotation angle

PRotate.Rotate_0	Rotation 0 degrees
PRotate.Rotate_90	Rotation 90 degrees
PRotate.Rotate_180	Rotation 180 degrees
PRotate.Rotate_270	Rotation 270degrees

bold	Bold or not	1 Bold	0 Not bold
reverse	reverse or not	1 reverse	0 not reverse
underline	underline or not	1underline	0 not underline

Returned value: Null

➤ Print text in area

Method instruction :public void drawText(int area\_start\_x, int area\_start\_y, int area\_end\_x,int area\_end\_y, PAlign xAlign, PAlign yAlign, String

text,LabelFontSize fontSize, int bold, int reverse, int underline, int deleteline,PRotate rotate)

Method description:to print text in point area

Parameter:

area_start_x	coordinate X of the rectangular region top left corner		
area_start_y	coordinate Y of the rectangular region top left corner		
area_end_x	coordinate X of the rectangular region right bottom corner		
area_end_y	coordinate Y of the rectangular region right bottom corner		
xAlign	Horizontal position,it can be left align PAlin.START; center PAlign.CENTER ;right align PAlign.END		
yAlign	Vertical position,it can be upper align PAlin.START; center PAlign.CENTER ;bottom align PAlign.END		
fontSize	refer to above method description to drawText:		
bold	Bold or not	1 Bold	0 Not bold
reverse	reverse or not	1 reverse	0 not reverse
underline	underline or not	1underline	0 not underline
deleteline	deleteline or not	1deleteline	0 not deleteline
rotate	rotation angle ,pls refer to above method.		

Returned value:Null

#### ➤ Print 1D barcode in area

Method description: drawBarCode(int area\_start\_x, int area\_start\_y, int area\_end\_x,int area\_end\_y, PAlign xAlign, PAlign yAlign, int start\_x,int start\_y, String text, PBarcodeType type, int linewidth,int height, PRotate rotate)

Method description: to Print 1D barcode in area

Parameter:

area_start_x	coordinate X of the rectangular region top left corner		
area_start_y	coordinate Y of the rectangular region top left corner		
area_end_x	coordinate X of the rectangular region right bottom corner		
area_end_y	coordinate Y of the rectangular region right bottom corner		
xAlign	Horizontal position,it can be left align PAlin.START; center PAlign.CENTER ;right align PAlign.END		
yAlign	Vertical position,it can be upper align PAlin.START;		

center PAlign.CENTER ;bottom align PAlign.END

start\_x                      X coordinate of the bar code starting position in the area  
 start\_y                      Ycoordinate of the bar code starting position in the area  
 text                          The barcode data content to be printed  
 type                          1D barcode type: supported type as follow:  
                                 PBarcodeType.CODE128,PBarcodeType. JAN3\_EAN13,PBarcodeType.  
                                 JAN8\_EAN8, PBarcodeType. CODE93,PBarcodeType.  
                                 JAN3\_EAN13,PBarcodeType. UPCAPBarcodeType. ITF, PBarcodeType. UPC\_E  
 linewidth                      Barcode line width  
 height                          Height of barcode  
 rotate                          Rotation angle of  
 barcode ,i.e:PRotate.Rotate\_0,PRotate.Rotate\_90,PRotate.Rotate\_180,PRotate.Rotate\_270

Returned value:Null

➤ Print 2D barcode

Method instruction: public void drawQrCode(int start\_x, int start\_y, String text, PRotate rotate, int ver, int lel)

Method description: to print 2D barcode

Parameter:

start\_x                      2D barcode starting position X  
 start\_y                      2D barcode starting position Y  
 text                          Content data of 2D barcode  
 rotate                          same rotation angel with 1D barcode  
 ver                              magnification times of QrCode is(1-6),six by default  
 lel                              Error correction level ,refer to the commands manual for details  
                                 0,Error correction level L;1,Error correction level M; 2,Error correction level Q,3,  
                                 Error correction level H

Returned value:Null

➤ To print bitmap

Method instruction: public void drawGraphic(int start\_x, int start\_y, int bmp\_size\_x, int bmp\_size\_y, Bitmap bmp)

Method description: Print bitmap in the specified location

Parameter description:

start\_x                      coordinate X of the printed bitmap location

start\_y                coordinate Y of the printed bitmap location  
 bmp\_size\_x          bitmap Width  
 bmp\_size\_y          bitmap Height  
 bmp                  bitmap object

- To print bitmap in area

Method instruction: `public void drawGraphic(int area_start_x, int area_start_y, int area_end_x, int area_end_y, PAlign xAlign, PAlign yAlign, int bmp_size_x, int bmp_size_y, Bitmap bmp)`

Method description: Print bitmap in area

Parameter:

area\_start\_x                coordinate X of the rectangular region top left corner  
 area\_start\_y                coordinate Y of the rectangular region top left corner  
 area\_end\_x                  coordinate X of the rectangular region right bottom corner  
 area\_end\_y                  coordinate Y of the rectangular region right bottom corner  
 xAlign                      Horizontal position, it can be left align PAlign.START;  
                                  center PAlign.CENTER ;right align PAlign.END  
 yAlign                      Vertical position, it can be upper align PAlign.START;  
                                  center PAlign.CENTER ;bottom align PAlign.END  
 bmp\_size\_x                bitmap Width  
 bmp\_size\_y                bitmap Height  
 bmp                        bitmap object

Returned value: Null

- To Print

Method instruction: `public void print(PRotate rotate, int skip)`

Method description: to print label, will not print immediately according to the previous order to print text or straight line, until this method is called .

Parameter description:

rotate 0: to print normally, no rotation 1: to print after the entire page is rotated clockwise 180 degrees.

Skip: 0: after ending the printing ,directly stop without located.

1: located at label gap after ending the printing .stop after feeding paper at max.30mm if no gap .

Returned value: Null



### 3.1.6 TSPL Command Label Printing Related Method

Note: Below methods are apply for label printer ,which support standard TSPL command set.

Method	Description
<a href="#">pageSetupTSPL</a>	Set page width and height
<a href="#">drawLineTSPL</a>	Draw line
<a href="#">drawBorderTSPL</a>	To print border
<a href="#">drawTextTSPL</a>	To print text
<a href="#">drawTextTSPL</a>	To print text in area
<a href="#">drawBarCodeTSPL</a>	To print 1D barcode
<a href="#">draw2DBarCodeTSPL</a>	To print 2D barcode(TL21type not support DMATRIX command)
<a href="#">drawBitmapTSPL</a>	To print bitmap
<a href="#">drawBitmapTSPL</a>	To print bitmap in area
<a href="#">printTSPL</a>	Print images content in buffer
<a href="#">getPrinterStatusTSPL</a>	To get printer status
<a href="#">setCharsetNameTSPL</a>	Set the character set encoding format
<a href="#">setPaperbackOrPaperFeedTSPL</a>	Control the paper feeding or back
<a href="#">reverseAreaTSPL</a>	reverse Print in area
<a href="#">eraseAreaTSPL</a>	Clear image buffer data
<a href="#">setPrinterTSPL</a>	Setting printer related function(TL21printer not support SPEED, BLINE, SHIFT, REPRINT command, TL51not support PEEL command)
<a href="#">openCashBoxTSPL</a>	Open cash drawer
<a href="#">getPrinterNameTSPL</a>	Checking the printer model
<a href="#">setGAPTSPL</a>	setting the vertical spacing between labels
<a href="#">selectCodePageTSPL</a>	select codePage
<a href="#">selectCountryTSPL</a>	Select International character set(TL21model not support this method)
<a href="#">beepTSPL</a>	Control buzzer beep one sound
<a href="#">downloadBitmap2PrinterTSPL</a>	Download bitmap to printer(TL21model not support this method)

<a href="#">putBitmapTSPL</a>	Put downloaded bitmap into printer buffer(TL21does not support shi method)
<a href="#">printSelfTestTSPL</a>	Print selftest paper(TL21does not support this method)
<a href="#">setLabelReferenceTSPL</a>	Set reference origin of the label content
<a href="#">sendStrToPrinterTSPL</a>	Send string in command format to printer(TL21does not support SET COUNTER Commands)

All exports below are made by throwing the abnormal way. The main exceptions are as follows:

Write exception      WriteException

Read exception      ReadException

PrinterPort null exception.    PrinterPortNullException

Parameter error exception      ParameterErrorException

➤ Set page width and height

Method instruction: public void pageSetupTSPL(int paperSizeType, int pageWidth, int pageHeight)

throws WriteException ,PrinterPorNullException, ParameterErrorException

Method description: Set page width and page height, users pass specified value to paperSizeType based on paper width 2 inch, 3 inch or 4 inch, The code maintains a static variable based on the paperSizeType size, when printing line, the border need to judge whether exceed paper width according to passed coordinate and paperSizeType.

Parameter description:

paperSizeType                      Paper size type

0 means choosing 2 inch printed paper (20mm~56mm)

1 means choosing 3 inch printed paper (20mm~80mm)

2 means choosing 4 inch printed paper (20mm~108mm)

pageWidth Page width, i.e. Printed content area width(dot), will print error if beyond area width

pageHeight Page height, i.e printed content area height(dot), will print error if beyond area height;

Returned value: Null

➤ Draw line

public void drawLineTSPL(int startX, int startY, int lineLength, int lineWidth)  
throws WriteException, PrinterPortNullException, PrinterPortNullException,  
Exception

public void drawLineTSPL(int startX, int startY, int lineLength, int lineWidth)  
throws WriteException, PrinterPortNullException, PrinterPortNullException, Exception

Method description: draw line from specified coordinate

Parameter description:

startX        Starting position on horizontal direction of left corner, in dots(no exceed  
label width)

startY        Starting position on vertical direction of left corner, in dots(no exceed  
label height)

lineHeight, in dots

lineWidth, in dots

Returned value: Null

➤ To print border

public void drawBorderTSPL(int lineWidth, int top\_left\_x, int top\_left\_y, int  
bottom\_right\_x, int bottom\_right\_y)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: print border

Parameter description:

lineWidth        line width of border, in dots

top\_left\_x        X starting position of left up corner in horizontal direction on  
left corner, in dots

top\_left\_y        Y starting position of left up corner in vertical direction on left  
corner, in dots

bottom\_right\_x    X starting position of right bottom corner in horizontal  
direction on left corner, in dots

bottom\_right\_y    X ending position of right bottom corner in vertical direction on  
right bottom corner, in dots

Returned value: Null

➤ Print text

`public void drawTextTSPL(int start_x, int start_y, boolean isSimplifiedChinese, int xMultiplication, int yMultiplication, PRotate rotate, String content)`  
 throws `WriteException`, `PrinterPortNullException`, `ParameterErrorException`  
 Method description: Print text  
 Parameter description:  
 start\_x                    starting position coordinate in X direction of text, in dots  
 start\_y                    starting position coordinate in Y direction of text, in dots  
 isSimplifiedChinese        true Simplified Chinese 24x24Font(GB); false Traditional Chinese 24x24Font(BIG5), note English and numbers both 12\*24.  
 isSimplifiedChinese is false, it must be traditional Chinese for the content, and set character to BIG5, otherwise it will print out mess code.  
 xMultiplication            the multiplication times of text width, range 1~4  
 yMultiplication            the multiplication times of text height, range 1~4  
 Note: use xMultiplication, yMultiplication can set font size  
 rotate                    clockwise direction rotate, `PRotate.Rotate_0` no rotate.  
`PRotate.Rotate_90` rotate 90degree; `PRotate.Rotate_180` rotate 180 degree;  
`PRotate.Rotate_270` rotate 270 degree  
 content                    Text content to be printed

➤ Print text in area

`public void drawTextTSPL(int area_start_x, int area_start_y, int area_end_x, int area_end_y, PAlign xAlign, PAlign yAlign, boolean isSimplifiedChinese, int xMultiplication, int yMultiplication, PRotate rotate, String content)`  
 throws `WriteException`, `PrinterPortNullException`,  
`ParameterErrorException`  
 Method description: print text in area, it could be specified horizontal direction and vertical direction position. Horizontal direction: left align, center, right align; Vertical direction: above align, center, below align;  
 Parameter description:  
 lineWidth                    Border line width(dot)  
 top\_left\_x                    X coordinate on top left corner of area(dot)  
 top\_left\_y                    X coordinate on top left corner of area(dot)  
 bottom\_right\_x                X coordinate on bottom corner of area(dot)  
 bottom\_right\_y                Y coordinate on bottom right corner of area(dot)  
 xAlign                        Position setting in X direction, left align, `PAlign.START`;  
 Center, `PAlign.CENTER`; Right align, `PAlign.END`

yAlign        Position setting on Y direction, Top align, PAlign.START; Center, PAlign.CENTER; Below align, PAlign.END

Note: PAlign is self-defined Enum type. Including START, CENTER, END, NONE.

Print according to real coordinate when it is NONE, no calculation to deal with. Same for below.

isSimplifiedChinese true Simplified Chinese 24x24Font(GB);false traditional Chinese 24x24Font,when isSimplifiedChinese is false, it has to be traditional Chinese in content, and set character to BIG5, otherwise it will printed mess code Chinese.

xMultiplication        Multiplication times for text width, range 1~4

yMultiplication        Multiplication times for text width, range 1~4

Note: Use xMultiplication, yMultiplication can set font size

rotate                clockwise rotate, PRotate.Rotate\_0 no rotate;

PRotate.Rotate\_90 rotate 90 degree;PRotate.Rotate\_180 rotate180 degree;

PRotate.Rotate\_90 rotate 270 degree

content        text content to be printed

#### ➤ Print 1D barcode

public void drawBarCodeTSPL(int start\_x, int start\_y, PBarcodeType type, int height, boolean isReadable, int narrowWidth , int wideWidth, PRotate rotate, String content)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: Print 1D barcode

Parameter description:

start\_x                Starting position coordinate on X direction (dot)

start\_y                Starting position coordinate on Y direction(dot)

type                Barcode type, support below type:

PPBarcodeType. 128                128 code

PPBarcodeType. EAN128                EAN128

PPBarcodeType. 39                39 code

PPBarcodeType. 93                93 code

PPBarcodeType. EAN13                EAN13 code

PPBarcodeType. EAN8                EAN8 code

PPBarcodeType. CODA                CODA

PPBarcodeType. UPCA                UPCA code

PPBarcodeType. UPCE5                UPCE+5 code

height                Barcode height, in dots

isReadable                0, not readable by human eyes; 1, readable

narrowWidth                narrow strip width [0~5]

wideWidth                wide strip width  $0 \leq \text{wideWidth} / (\text{narrowWidth} + 1) < 5$

$$20 \leq \text{wideWidth} / (\text{narrowWidth} + 1) \leq 30$$

Note: narrow strip and wide strip width could be set by narrowWidth and wideWidth, to enlarge barcode width.

rotate                      clockwise rotate, PRotate.Rotate\_0 no rotate;  
 PRotate.Rotate\_90 rotate 90degree; PRotate.Rotate\_180 rotate 180degree;  
 PRotate.Rotate\_270 rotate 270 degree  
 content                      barcode content

Returned value: Null

➤ Print 2D barcode

public void draw2DBarCodeTSPL(int start\_x, int start\_y, TwoDarCodeType type , int param1, int param2, PRotate rotate, String content)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: Print 2D Barcode

Parameter description:

start\_x                      X direction starting point coordinate(dot)

start\_y                      Y direction starting point coordinate(dot)

type                      2D Barcode type (QRCode, DataMatrix)

TwoDarCodeType.QR                      QRcode

TwoDarCodeType. DataMatrix                      DataMatrix

param1                      when the bar code type is DataMatrix, this parameter is invalid;When barcode type is QRCode, this parameter represents the error correction level of the QR code, 0 represents L 7%, 1 represents M 15%, and 2 represents Q 25%, and 3 represents H 30%.

param2                      parameter represents 2D Barcode block width (1~6)

rotate                      The rotation angle of the bar code, clockwise. 0, not rotate;90,rotate 90 degree; 180, clockwise rotate 180 degree; 270, clockwise rotate 180 degree. Note: When barcode type is DataMatrix, this parameter is invalid, pass freely.

content                      Barcode content

Returned value: Null

➤ Print bitmap

public void drawBitmapTSPL(int start\_x, int start\_y, int mode, Bitmap bmp)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: Print bitmap

Parameter description:

start\_x                      horizontal starting position in dots image(dot)

start\_y                      vertical starting position in dots image(dot)

mode                      image drawing mode 0 OVERWRITE ;1 OR ;2 XOR

bmp                      bitmap objective(single color bitmap)

Returned value: Null

➤ Print bitmap in area

public void drawBitmapTSPL(int area\_start\_x, int area\_start\_y, int area\_end\_x, int area\_end\_y, PAlign xAlign, PAlign yAlign, int mode, Bitmap bmp)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: print text in border area, could set center, right align, left align on horizontal direction; Top align, center, below align on vertical direction.

Parameter description:

area\_start\_x              x coordinate of top left corner in area(dot)

area\_start\_y              y coordinate of top left corner in area(dot)

area\_end\_x                x coordinate of bottom right corner in area(dot)

area\_end\_y                y coordinate of bottom right corner in area(dot)

xAlign                    position in horizontal direction

yAlign                    position in vertical direction

mode                      bitmap drawing mode 0 OVERWRITE;1 OR; 2 XOR

bmp                        bitmap to be printed(single color bitmap)

Returned value: Null

➤ Print content in image buffer

public void printTSPL(int mSets, int mCopys)

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: print image butter, call print line, print text, barcode etc, printer will download the printed content into buffer, then print out by calling this method, specify how much pieces to be printed via mSets parameter, and how much pieces label to be printed in every piece of content via mCopus.

Parameter description:

mSets                    Printed pieces quantity

mCopys                  Printed label quantity in every piece

Returned value: Null

➤ Get printer status

public int getPrinterStatusTSPL()

throws WriteException, PrinterPortNullException,ReadExcetion,

ParameterErrorException

Method description: check printer status, including paper out, cover opened, and other error status which influence normal printing.

Parameter: Null

Returned value:

0 normal status

-1 paper out

-2 paper house cover opened

-3 other error

➤ Set character set code format

public void setCharsetNameTSPL(String charsetName)

throws ParameterErrorException

Method description: Set character set code format, note: this method is only applicable to ESC/POS, CPCL, TSPL command set.

Parameter:

charsetName Character set name; Simplified Chinese, "GBK"; Traditional Chinese, "BIG5"

Note: When using drawTextTSPL method to print traditional Chinese, call this method to set character set to "BIG5"

Returned value: Null

➤ To control feed paper or back

public void setPaperbackOrPaperFeedTSPL(boolean isFeedBack, int mDot)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: control feed paper or back

Parameter:

isFeedBack back paper or not, true: back paper; false: feed one piece of paper

mDot dots of back paper; When choosing feeding paper, this parameter is invalid.

Returned value: Null

➤ Reverse printing in specified area

public void reverseAreaTSPL(int start\_x, int start\_y, int width, int height)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: reverse printing in specified area

Parameter:

start\_x X coordinate of top left corner in area (dot)

start\_y Y coordinate of top left corner in area (dot)

width area width(dot)

height area height(dot)

Returned value: Null

➤ Clear data in image buffer

public void eraseAreaTSPL(int start\_x, int start\_y, int width, int height)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: clear data in this image buffer area

Parameter:



start\_x      X coordinate of left corner in area (dot)

start\_y      Y coordinate of left corner in area (dot)

width        Area width (dot)

height       Area height (dot)

Returned value: None

- To set related function of printer

public void setPrinterTSPL(CommandTSPL command,int value)

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: set related function of printer

Parameter:

command

CommandTSPL .DIRECTION    Set print direction; same as font when value is 0, opposite when value is 1.

CommandTSPL .FEED        Control paper feeding set;  $1 \leq \text{value} \leq 1000$  means dots.

CommandTSPL .REPRINT    Run reprinting order when error; Close this funtion when value is 1, open when value is 1.

CommandTSPL .SPEED      Specify printing speed; value is the inch value the paper feed every second.

CommandTSPL .DENSITY    Specify printing density;  $0 \leq \text{value} \leq 15$ , the bigger the number is, the bigger density is.

CommandTSPL .SHIFT      Paper feed offset value; value >0, paper feed direction is same with printing direction; Opposite when it is <0;

CommandTSPL .FORMFEED    Control the printer feed one piece of paper; Value transmit freely.

CommandTSPL .HOME        Search starting position, make the gap align paper manual cutter; value transmit freely.

CommandTSPL . PRINTKEY    Set printing by button order(forbidden, allowed, automatically set unction of printing by button)

CommandTSPL . KEY1        Command of open function to preset KEY1 (this function is pause or feed paper)

CommandTSPL . KEY2        Command of open function to preset KEY2 (this function is pause or feed paper)

CommandTSPL . TEAR        Enable of close command of feeding paper to manual cutting position(gap align to manual cutting position)

CommandTSPL.PEEL        Enable peeler mode

Value        Detail meaning corresponds to command

Returned value: None

## ➤ Open cash drawer

```
public void openCashBoxTSPL()
```

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: open cash drawer

Parameter: None

Returned value: None

## ➤ Check printer model No.

```
public String getPrinterNameTSPL()
```

throws WriteException, PrinterPortNullException,

ParameterErrorException,ReadException

Method description: check printer model NO.

Parameter: None

Returned value: Printer detail model No.

## ➤ Set vertical spacing between labels

```
public void setGAPTSPL(int value)
```

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: Set vertical spacing between labels

Parameter:

value                                      vertical spacing between labels(unit: mm),  
mm( $0 \leq m \leq 1$ (inch),  $0 \leq m \leq 25.4$ (mm))

Returned value: None

## ➤ Select codepage

```
public void selectCodePageTSPL(int value)
```

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: Select codepage

Parameter:

Value	437: United States
	850: Multilingual
	852: Slavic
	860: Portuguese
	863: Canadian/French
	865: Nordic
	857: Turkish
	1250: Central Europe
	1252: Latin I

1253: Greek

1254: Turkish

Transmit other value: default by 437

Returned value: None

- Select international Character set

public void selectCountryTSPL(int value)

throws WriteException, PrinterPortNullException,

ParameterErrorException

- Method description: Select international Character set

Parameter:

Value

1: USA

2: Canadian-French

3: Spanish (Latin America)

33: French (France)

34: Spanish (Spain)

39: Italian

42: Slovak

44: United Kingdom

45: Danish

46: Swedish

47: Norwegian

49: German

61: English (International)

Pass other value: 1 by default

Returned value: None

- Control buzzer beep one sound

public void beepTSPL(int level,int interval)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: Set the sound level and interval of buzzer, need to send BEEP after set, then buzzer will sound

Parameter:

Level

Level of buzzer sound

Interval

Interval of buzzer sound

Returned value: None

- Download bitmap in printer

public void downloadBitmap2PrinterTSPL(boolean isMove2Flash, InputStream in, String fileName)

throws WriteException, PrinterPortNullException,

### ParameterErrorException

Method description: download bitmap in printer

Parameter:

isMove2Flash false download bitmap to printer RAM(the data in RAM will lost if lose power); true download to Flash(enter in RAM data and move to FLASH by MOVE command)

in input stream of bitmap under the downloaded raw content.

filename download into RAM or printer FLASH, and specify filename, 8 characters longest.

Returned value: None

Note: Bitmap data dots as per BITMAP command rule.

- Put downloaded bitmap into printer buffer

public void putBitmapTSPL(String fileName,int start\_x, int start\_y)

throws WriteException, PrinterPortNullException, ParameterErrorException

Method description: Put downloaded bitmap data in printer flash RAM or FLASH into printing buffer area coordinate(start\_x,int start\_y)

Parameter:

filename the bitmap name which has downloaded into printer, have to be same with Bitmap name in printer RAM or FLASH, otherwise it possibly cannot be printed out, i.e, downloadBitmap2Printer method download bitmap into printer, put Bitmap in printing buffer area.

start\_x Bitmap data Horizontal X coordinate

start\_y Bitmap data Horizontal Y coordinate

Returned value: None

- Print selftest paper

public void printSelfTestTSPL()

throws WriteException, PrinterPortNullException,

ParameterErrorException

Method description: printer send command to print selftest paper

Parameter: None

Returned value: None

- Set reference coordinate origin of label content

public void setLabelReferenceTSPL(int left,int top)

throws PrinterPortNullException,ParameterErrorException

Method description: Set reference coordinate origin of label, adjust the label content position on label.

Parameter: left left margin of label content to label paper(mm)

top top margin of label content to label paper(mm)

Returned value: None

- Send string in format of command to printer

Method description: public void sendStrToPrinterTSPL(String str)

throws PrinterPorNullException,WriteException,

ParameterErrorException

Method description: send TSPL command in SDK to printer

Parameter description: str conform to TSPL command format

Returned value: None

### 3.1.7 Method to control printer hardware

Method	Description
<a href="#">cutPaper</a>	Cut paper
<a href="#">ringBuzzer</a>	Control buzzer beep
<a href="#">blackLableFind</a>	Black mark location
<a href="#">resetFeedDistance</a>	Reset printer paper travel distance

- To cut paper

Method instruction: public void cutPaper(int cutterType, int n)

Method description: cut paper, full cut or partial cut

Parameter description: cutterType

48 full cut directly

49 partial cut directly

65 feed paper to (paper cutting position+[n ×(Vertical moving unit) ]) and full cut

66 feed paper to (paper cutting position+[n×( Vertical moving unit) ])and partial cut

Note: vertical moving unit is one unit

Android-SDK Printer Developing Manual

n: Longitudinal movement points, valid when cutterType is 65

Returned value: Null

- To control buzzer beep

Method instruction: public void ringBuzzer(int time)

Method description: to control the time buzzer will beep(seconds)

Parameter description: time: seconds which buzzer will beep

Returned value: Null

- Black mark location

Method description: public void blackLableFind()

Method description: printer feed paper to black mark position(printer need to support black mark location function, with black mark sensor). Meanwhile black mark location function is only valid under black mark mode, if could not find black mark, then printer will stop after feed paper 30cm. (How to open black mark location function, please contact our pre-sales technique to ask setting tool, set related function enable.)

Parameter: Null

Returned value: Null

➤ Reset printer paper travel distance

Method instruction: public void resetFeedDistance()

Method description: Reset the printer paper travel distance (supported by certain models)

Parameter description: NULL

Returned value: 0 Reset successfully

-1 Reset failed

### 3.1.8 Get the current state of the printer

Method	Description
<a href="#">getCurrentStatus</a>	Get printer current status
<a href="#">getPrintingStatus</a>	Printing finished or not
<a href="#">isPaperOut</a>	Tell paper out or not
<a href="#">isPaperWillOut</a>	Tell printer paper near end or not
<a href="#">getFeedDistance</a>	Get the total paper travel distance of the printer

➤ Get the current state of the printer

Method name: public int getCurrentStatus ()

Method description: to get the current status of the printer, including printer status normal, lack of paper, cover opening, paper near end, communication abnormal. All printers are with paper near end test function except EU seriez printer, which function need to be manual opened to test paper near end. (How to open paper near end function, please contact our pre-sale technique to get setting tool, set related function enable)

Parameter description: Null

Returned value:

0 Printer status normal

- 1 Printer communication abnormal
- 2 Paper out
- 3 Paper near end
- 4 Paper house cover opened

➤ Printing finished or not

Method description: `public int getPrintingStatus(String BufferMsg, int timeout)`

Method description: Get whether the printer completes printing

Parameter Description: Msg, Receive information of whether printing is completed, specific value and the significance of the method's returned Android-SDK Printer Developing Manual value corresponds. that is, the "current printing has been completed," "unknown anomaly", "Printing is not completed, out of paper" and so on.

Timeout :estimate requiring time of printing one order

Returned value:

- 0 Printing completed
- 1 Unknown abnormal
- 2 The current printer is printing
- 3 Printing is not completed, out of paper
- 4 Printing is not completed, printer paper cover opens
- 5 Printing is not completed, fail to communicate with the printer
- 6 data transmission failure, abnormal communication
- 7 receiving data format is incorrect

Principle: printer single-chip microcomputer CPU execution data is sequential, send print data first, after sending the query whether print complete instructions, according to the principle of performing data after the "junior", execute commands to print complete judgment, must be performed to print data.

Example 1: query printing is completed

// 1. Judge the current status of the printer before sending the data to print

```
If (getCurrentStatus ()!= 0) {
```

```
Return;
```

```
}
```

// 2, send print data

```
MPrinter. PrinterText (" hello world!");
```

```
StringBuffer STR = new StringBuffer (" ");
```

```
Int timeout = 2000;// expected to print the time of the above text
```

// 3, determine whether the printing is finished

```
Int ret = mPrinter. GetPrintingStatus (STR, timeout);
```

```
If (ret == 0) {
```

```
Log. I (xyz"" , " text print finished!");
```

---

```
}
```

- Judge whether the printer is out of paper
  - Method Name: public boolean isPaperOut ()
  - Method Description: judge whether the printer is out of paper
  - Parameters: None
  - Return Value: true is out of paper, false is not out of paper
- Judge whether printer is out of paper
  - Method name: public boolean isPaperWillOut()
  - Method description: Judge printer is paper out or not, only some model have paper near end sensor, need to open paper near end function before getting paper near end status.
  - Parameter description: Null
  - Returned value: true paper near end, false paper enough.
- Get the total paper travel distance of the printer
  - Method name: public int getFeedDistance()
  - Method description: Query the total paper travel distance of the current printer (supported by specific printers)
  - Parameter description: Null
  - Returned value: The current total paper travel distance of the printer (unit: mm), the return value < 0 means the query is abnormal.

### 3.1.9 The call examples of connecting printers

//1、 handler created by n is for receiving message of connection success or failure

```
privateHandlermHandler = newHandler() {
    @Override
    publicvoidhandleMessage(Messagemsg) {
        switch (msg.what) {
            caseConnect.SUCCESS:
                isConnected = true;//connect successfully
                break;
            caseConnect.FAILED:
                isConnected = false;
                Toast.makeText(mContext, R.string.conn_failed,Toast.LENGTH_SHORT).show();
                Log.i(TAG, "connect fail!");
                break;
            caseConnect.CLOSED:
```



```

        isConnected = false;
        Toast.makeText(mContext, R.string.conn_closed, Toast.LENGTH_SHORT).show();
        Log.i(TAG, "connection closed!");
        break;
    case Connect.NODEVICE:
        isConnected = false;
        Toast.makeText(mContext, R.string.conn_no, Toast.LENGTH_SHORT).show();
        break;
    default:
        break;
}

//2、 Instantiate printers, other communication mode instantiate this object, please refer to
demo
BluetoothDevice mDevice =
BluetoothAdapter.getDefaultAdapter().getRemoteDevice(devicesAddress); // devicesAddress
is mac address of Bluetooth
PrinterInstance mPrinter = PrinterInstance.getPrinterInstance(mDevice, mHandler);

//3、 Open connection
mPrinter.openConnection();

//4、 Start to print data
//Judge whether connection is normal before printing, and printer is sufficient of paper, and
paper
cover is closed
if (mPrinter != null && mPrinter.getCurrentStatus() == 0) {
    mPrinter.setFont(0, 1, 1, 1, 1); // Set the font, double height, double width, bold, underline
    mPrinter.setPrinter(Command.ALIGN, Command.ALIGN_CENTER); // Set font center
    mPrinter.printText("printTest!" + "\r\n"); // Print text printTest!
    mPrinter.setPrinter(Command.PRINT_AND_WAKE_PAPER_BY_LINE, 2);
    mPrinter.setFont(1, 1, 1, 1, 1); // Set font 9*17, double height, double width, bold, underline
    mPrinter.printText("printTest!" + "\r\n"); // Print text printTest!
} else {
    //Printer status is abnormal: connection error, out of paper, paper cover is opening, near-
    end
    paper
    Toast.makeText(mContext, "printer status is not normal!", 1).show();
}

//5、 close printer connection

```

```
mPrinter.closeConnection();//close connection
```

Below use Bluetooth communication method calls for example ,other connect call please refer "PrintDemoV5.3".

## 3.2 Barcode Printing Class

[constructor function](#)

[Barcode Printing call example](#)

### 3.2.1 constructor function

Method	Description
<a href="#">Barcode</a>	Create Barcode example

#### ➤ Create Barcode examples

Method name: Barcode(byte barcodeType, int param1, int param2, in param3, String content);

Method description: create Barcode examples

Parameter description:

barcodeType is barcode type, the Type constants begin with Printer Constants

1D Barcode: UPC\_A, UPC\_E, JAN13, JAN8, CODE39, ITF, CODABAR, CODE93, CODE128.

2D barcode: PDF417,DATAMATRIX,QRCODE.

param1,param2,param3 are specific barcode parameters:

When code type is 1D barcode, expressed by three parameters:

param1: barcode transverse width,  $2 \leq n \leq 6$ , default is 2

param2: barcode height  $1 \leq n \leq 255$ , default is 162

param3: barcode note location, 0--No print, 1--Above, 2--Below, 3--Above and below, both print . Barcode type is 2-D barcodes, the three parameters shows different meanings:

#### 1. PDF417

param1: indicates the number of characters per line,  $1 \leq n \leq 30$ .

param2: indicates Error Correction Level,  $0 \leq n \leq 8$   $0 \leq n \leq 8$ .

param3: indicates longitudinal magnification.

#### 2. DATAMATRIX

param1: indicate graph height,  $0 \leq n \leq 144$  (0:automatic selection).

param2: indicate graph width,  $8 \leq n \leq 144$  (param1 is 0, invalid).

param3: indicates Longitudinal magnification.

### 3. QR CODE

param1: indicates graphic version NO.,  $1 \leq n \leq 30$  (0:automatic selection).

param2: indicates Error Correction Level,  $n = 76, 77, 81, 72$  (L: 7%, M:15%, Q:25%, H:30%).

param3: indicates Longitudinal magnification.

Content is barcode data.

## 3.2.2 Barcode Printing call example

- Print 1-D barcode call examples, for example code128

```
Barcodebarcode1 = newBarcode(BarcodeType.CODE128, 2, 150, 2, "123456");
mPrinter.printBarCode(barcode1); //mPrinter Printer Instance, and the printer is
connected
```

- Print 2-D barcode call examples, for example QRCode

```
Barcodebarcode2 = newBarcode(BarcodeType.QR CODE, 2, 3, 6, "123456");
mPrinter.printBarCode(barcode1); //mPrinter Printer Instance, and the printer is
connected
```

NOTE: For more barcode printing calls, pls See BarcoePrintActivity.java

## 3.3 Table Form Printing Class

[Create Table examples](#)

[Add One Row Data](#)

[Setting the column data alignment in the Table](#)

[Form printing call example](#)

### 3.3.1 Create Table examples

Method	Description
<a href="#">Table</a>	Create Table examples

```
public Table(String column, String regularExpression, int columnWidth[])
```

Method description: Create Table examples

Parameter: column parameter, column is the header which separated with regular.

Example: "serial number, unit price, quantity, amount "

regularExpression is the string delimiter. For example the above ","

columnWidth is character width of each column in the table. The  
Calculation of default font size is two Chinese, one English,  
and then added together, such as the width of " Serial  
number" width is 4

Returned Value: Table examples

### 3.3.2 Add One Row Data

Method	Description
<a href="#">addRow</a>	Add One Row Data

public void addRow(String row)

Method Description: Add one row data

Parameters Description: A row

The data format is consistent with the header format. If the data in one table cell is beyond the limited character width, it will change line to print, if manually changing, it can add "\ n" on the position to change line.

Returned Value: No

### 3.3.3 Setting the column data alignment in the Table

Method	Description
<a href="#">setColumnAlignLeft</a>	Setting the column data alignment in the Table

Method description: setColumnAlignLeft(boolean left);

Method Description: Setting the column data alignment in the Table, default is right alignment.

Parameter Description: left Setting the column data align left in the Table.

Returned Value: Null

### 3.3.2 Add One Row Data

Method	Description
<a href="#">addRow</a>	Add One Row Data

public void addRow(String row)

Method Description: Add one row data

Parameters Description: A row

The data format is consistent with the header format. If the data in one table cell is beyond the limited character width, it will change line to print, if manually changing, it can add "\ n" on the position to change line.

Returned Value: No

### 3.3.3 Setting the column data alignment in the Table

Method	Description
<a href="#">setColumnAlignLeft</a>	Setting the column data alignment in the Table

Method description: setColumnAlignLeft(boolean left);

Method Description: Setting the column data alignment in the Table, default is right alignment.

Parameter Description: left Setting the column data align left in the Table.

Returned Value: Null

### 3.3.4 Form printing call example

```
String column ="Name, unit price, quantity, amount ";
```

```
Tabletable = newTable(column, ";", newint[] { 14, 6, 6, 6 });
```

```
table.addRow("Storage bags"+ ";10.00;1;10.00");
```

```
table.addRow("wire hook" + ";5.00;2;10.00");
```

```
table.addRow("Umbrella"+ ";5.00;3;15.00");
```

```
mPrinter.printTable(table);// mPrinteris is the real example object o f PrinterInstance, and printer is connected.
```

NOTE: More details about pdf printing calls, pls refer to print\_note click ticket printing example in TextPrintActivity.java

## 3.4 Canvas Printing Class

Brief Description: Canvas print is the layout of printing the uncommon language or

custom by graphic type. Text can be drawn on the canvas; users can call a third-party font file to set the font, draw bar codes, graphics and so on, then Eventually convert the bitmap. please call printImage in 2.1.4 to complete canvas printing. The main methods are as follows:

Initialization canvas
Set Font Property
Canvas contextual method
Call sample for canvas printing

### 3.4.1 Initialization canvas

Method	Description
<a href="#">init</a>	Initialization canvas

Method Name:public void init(PrinterType printerType)

Method Description: Initialization canvas

Parameters Description: Parameter is printer type .T9 designated canvas is 80mm paper width, PrinterType . TIII specified canvas 58mm paper width

Return Value: Null

### 3.4.2 Set Font Property

Method	Description
<a href="#">setFontProperty</a>	set Font Property

Method Name:public void setFontProperty(FontProperty fp)

Method Description: set Font Property. Parameters is FontProperty type, FontProperty is a collection of font properties, including bold, italic, and so on.

Parameters Description: FontProperty examples

Returned Value: No

Note: Calling this method requires to explicit instantiation FontProperty , then call FontProperty Class

setFont( boolean bBold,boolean bItalic,boolean bUnderLine,boolean bStrikeout,int iSize,Typefaces Face)

setFont the order method parameters:

bBold                true Bold; false normal font, Note: if Set Chines is Bold separately,it will not print.

sFace	font type (generally set to null, means using the system default font)
-------	--

Return Value: Null

Method	Description
<a href="#"><u>drawText</u></a>	Draw string
<a href="#"><u>drawLine</u></a>	Draw Line
<a href="#"><u>drawRectangle</u></a>	Draw Rectangle
<a href="#"><u>drawEllips</u></a>	Draw ellipse
<a href="#"><u>drawImage</u></a>	Draw image
<a href="#"><u>getCanvasImage</u></a>	Getting the image drew on canvas and sending to the printer to print.
<a href="#"><u>setTextAlignRight</u></a>	Set whether the text is right align
<a href="#"><u>setTextExceedNewLine</u></a>	Set whether entering new line when text exceeds.
<a href="#"><u>setUseSplit</u></a>	Set whether to use split string when changing the new line because of text exceeds, to avoid one word is split. The default is to split by Space.
<a href="#"><u>setUseSplitAndString</u></a>	If the text is beyond the line, use a delimited string or not to avoid a single word split. Break up with the specified symbol.

➤ Draw string

Method Name:public void drawText(String nStr);

public void drawText(float x, String nStr);

public void drawText(float x, float y, String nStr);

Parameters Description: x, y is the lower left corner coordinates of the string, nStr is the string to be drawn

Return Value: No

➤ Draw Line

Method Name:publi void drawLine(float startX, float startY, float stopX, float stopY);

Parameters Description: startX,startY is Start coordinates, stopX, stopY is end coodinates

Returned Value: Null

➤ Draw Rectangle

Method Name:drawRectangle(float left, float top, float right, float bottom);

Parameters Description:The parameter is the upper left corner, the bottom right corner

Returned Value: Null

➤ Drawing ellips,The parameter is the upper left corner of the ellipse, and the bottom right corner

drawEllips(float left, float top, float right, float bottom);

➤ Drawing image,The left and top parameters of the parameter are the top left coordinates of the image. Bitmap is the image file.

drawImage(Bitmapimage);

drawImage(float left, Bitmap image);

drawImage(float left, float top, Bitmap image);

➤ Getting the image drew on canvas and sending to the printer to print.

getCanvasImage();

➤ Set whether the text is on the right. For some special characters, such as Arabic language.

setTextAlignRight(boolean alignRight);

➤ Set whether to change one new line when text exceeds.

setTextExceedNewLine(boolean newLine);

➤ Set whether to use split string when changing the new line because of text exceeds, to avoid one word is split. The default is to split by Space.

setUseSplit(boolean useSplit);

setUseSplitAndString(boolean useSplit, String splitStr);



### 3.4.4 Call sample for canvas printing

```

CanvasPrintcp=newCanvasPrint();//Create canvas
BitmapbitmapCODE39 = createBitmapQR_CODE("123456789", 270, 270);//Create
two-dimension bar code
cp.init(PrinterType.T9);
// Draw two-dimension bar code on the position of canvas with coordinate (0,0)
cp.drawImage(0, 0, bitmapCODE39);
cp.drawImage(0, 0, bitmapCODE39);
//Create Font
FontPropertyfp=newFontProperty();
// Set value of font property. Here the parameter number will be a little different
according to the different version of SDK.
fp.setFont(true, false, false, false, 40, null);
// Set Font
cp.setFontProperty(fp);
//Draw text on the appointed coordinate position of canva
cp.drawText(250,80,"scan upgrade");
cp.drawText(250, 120, "your intelligent car life");
cp.drawText(250,180,"service telephone number");
cp.drawText(250, 220, "4008317317");
//Draw text on the appointed coordinate position of canvas.
mPrinter.printImage(cp.getCanvasImage(), PAlign.NONE, 0);

```

Remark: About more detailed about canvas calling and printing, pls refer to

btn\_canvas\_print in PicturePrintActivity.java

## 3.5 BitmapConvertor class

Class explanation: This class is mainly used to transfer colorful image to Black&White binary bitmap.

[Transfer colorful image to Black&White binary bitmap](#)

### 3.5.1Transfer colorful image to Black&White binary bitmap

Method	Description
<a href="#">convertBitmap</a>	Transfer colorful image to Black&White binary bitmap

Name:public Bitmap convertBitmap(Bitmap inputBitmap)

Method description: Transfer colorful image to Black&White binary bitmap.

Support the common colorful image, including JPG, PNG, Bitmap, etc.

Parameter explanation:

inputBitmap : colorful bitmap, BitmapFactory.decodeResource can be used to transfer the common colorful image JPG, PNG, Bitmap, etc to inputBitmap , inputBitmap should be accord with printer printing width. Exceeding the printing width will cause incomplete printed image. If inputBitmap is too big, it will cause very slow transfer. So the compressing should be arranged firstly.

Returned value: null

Remark:Colorful image is 24, 32 bit depth. There will be different degree distortion when it is transferred Black&White binary bitmap with 1 bit depth. If need to print more clear picture, the user needs to make the clear Black&White binary bitmap. Calling printImage(Bitmap bitmap) in Printer Instance to Complete.

## 3.6 Correlation Class of Printing PDF file

Class explanation: The correlation classes are mainly

PdfContext,CodecDocument,CodecPage , these classes transfer PDF file to be bitmap, call printImage in PrinterInstance to let printer be able to print PDF file normally.

The PDF file should be black&white PDF file. If printing colorful PDF file, there will be different degree distortion.

<a href="#">Open PDF file</a>
<a href="#">Getting one page object of PDF file</a>
<a href="#">PDF is transferred to Bitmap</a>
<a href="#">Calling example for PDF printing</a>

### 3.6.1 Calling example for PDF printing

1、 Add processing PDF files to code projects so bank , which is: libmupdf.so

2、 Code processing flow

//1、 Instantiation PDF files process core class

```
MuPDFCore core = new MuPDFCore(this, filePath);
```

//2、 Get the page number of PDF files

```
int count = core.countPages();
```

//3、 Get the width and height of PDF files

```

PointF pageSize = core.getPageSize(0);//Get the width and height of page 1 currently
float pageW = pageSize.x;
float pageH = pageSize.y;
//4 、 Transfer PDF files to bitmap
Bitmap bitmap = Bitmap.createBitmap((int)pageW, (int)pageH,
Bitmap.Config.ARGB_8888);
core.drawPage(0, bitmap, (int) pageW, (int) pageH, 0, 0, (int)pageW, (int)pageH);
//5、 Zoom abovePDF files
Bitmap zoomImage = Utils.zoomImage(bitmap, 500);//Scale by 500 pixels wide
//6、 bitmaptransfer monochrome bitmap When bitmap is large and the operation is slow,
please call processing in the threading.
//The bitmap might have a certain degree distortion because of the zoom and rotation.
Bitmap monoChromeBitmap = convertor.convertBitmap(zoomImage);
//7、 Print Bitmap
mPrinter.printImage(monoChromeBitmap, PAlign.START, 0, false);
Remark: About more details of calling PDF printing, pls refer to
PdfPrintActivity.java calling.

```

### 3.7、 CodePage Printer multilingual code page Print class

Multilingual code page print examples are defined in this class, which support part of languages in the world. Users should know the codepage of the language in advance and print by invoking the specified codepage. Some codepage might not be supported by part of printer, if users need, please contact us for customization services.

Remark: Traditional Chinese, which can be print by printText directly, such as:

```
mPrinter.printText("Print text!\n");
```

Method	Description
CodePagePrinter(PrinterInstance mprinter)	Construction Method
printTextInCP437	Print Codepage CP437 font(American and European standard)
printTextInCP850	Print multi-language (Multilingual)
printTextInCP932	Print CodepageCP932 font (Katakana) font
printTextInCP860	Print CodepageCP860 Portuguese font
printTextInCP863	Print CodepageCP863 Canadian French font
printTextInCP865	Print CodepageCP863 Northern Europe language font

printTextInWCP1251	Print Codepage WCP1251 Slavic font
printTextInMIK	Print Codepage MIK Slavic/Bulgarian font
printTextInCP862	Print Codepage CP862 Hebrew font
printTextInWCP1252	Print Codepage WCP1252, Latin1 font
printTextInWCP1253	Print Codepage WCP1252
printTextInCP852	Print Codepage CP852 Latin2 font
printTextInCP858	Print Codepage CP858multi-language Latin1+Euro font
printTextInCP720	Print Codepage CP720 Arabic font
printTextInCP864	Print Codepage CP864 Arabic font
printTextInISO_8859_1	Print Codepage ISO-8859-1 Western Europe language font
printTextInCP737	Print Codepage CP737 Greek language font
printTextInWCP1257	Print Codepage CP737 Baltic language font
printTextInCP855	Print Codepage CP855Slavic font
printTextInCP857	Print Codepage CP857 Turkish font
printTextInWCP1250	Print Codepage WCP1250 Middle Europe language font
printTextInCP775	Print Codepage CP775 font
printTextInWCP1254	Print Codepage WCP1254 Turkish font
printTextInWCP1255	Print Codepage WCP1255 Hebrew font
printTextInWCP1256	Print Codepage WCP1256 Arabic font
printTextInWCP1258	Print Codepage WCP1258 Vietnamese font
printTextInISO_8859_2	Print Codepage ISO_8859_2 Latin2 font
printTextInISO_8859_3	Print Codepage ISO_8859_2Latin3 font
printTextInISO_8859_4	Print Codepage ISO_8859_4 Baltic language font
printTextInISO_8859_5	Print Codepage ISO_8859_5 Slavic font
printTextInISO_8859_6	Print Codepage ISO_8859_6 Latin font
printTextInISO_8859_7	Print Codepage ISO_8859_7 Turkish font
printTextInISO_8859_8	Print Codepage ISO_8859_8 Hebrew font
printTextInISO_8859_9	Print Codepage ISO_8859_9 Turkish font
printTextInISO_8859_15	Print Codepage ISO_8859_15 Latin9 font
printTextInCP874	Print Codepage CP874 font

## 3.8、 Printing interfaces of CanvasDrawPrint under Page mode

Brief description: The main definition page mode print interface is implemented by the host computer platform software. The way is to build a bitmap in the memory, the user completes the page layout through the interface, and finally calls the print interface when it is in memory. The bitmap data is constructed, and the data is sent to the printer by means of driving printing to complete the printing of the page. The failure of constructing the bitmap will be prompted in the interface return of the setCanvasDrawBack. For details, please see setCanvasDrawBack, and the drawing unit of the canvas is dot ( point).

Call printImage in 2.1.4 to finish printing the canvasdraw. The main methods are as follows:

Initialization page
Page content related method
Page mode interface related example implementation

### 3.8.1 Initialization page

Method	Description
<a href="#">CanvasSetPageMode</a>	initialize canvasdraw

Method Name: public void CanvasSetPageMode(int width, int height)

Description: initialize the page

Parameters specification: width is the page width

Height is the page height

Returned data: Null

Exception: The establishment of the page mode is subject to the test device memory size limit. If the drawing is too large, you need to capture the exception yourself.

### 3.8.2 Page content related method

Method	Description
<a href="#">CanvasPrintLine</a>	Draw straight lines
<a href="#">CanvasPrintBox</a>	Draw rectangle
<a href="#">CanvasPrintText</a>	Draw text
<a href="#">CanvasPrintPDFCode</a>	Draw professional edition PDF417 2D barcode
<a href="#">CanvasPrintPDFCode</a>	Draw ordinary edition PDF417 2D barcode
<a href="#">CanvasPrintQRCode</a>	Draw professional edition QRCode 2D barcode
<a href="#">CanvasPrintQRCode</a>	Draw ordinary edition QRCode 2D barcode
<a href="#">CanvasPrintCode</a>	Draw 1D code
<a href="#">CanvasPrintPicture</a>	Draw Bitmap
<a href="#">getCanvasImage</a>	Get the image drawn on the page and send it to the printer to print
<a href="#">setPaintStyle</a>	Set the brush hollow or solid Default: solid
<a href="#">setTextExceedNewLine</a>	Whether the text exceeds the line break
<a href="#">setTextAlignRight</a>	Set whether the text is right
<a href="#">setUseSplit</a>	Whether the line breaks after the text exceeds the use of a separator string prevents a word from being split. Split by space (separator = space).
<a href="#">setCanvasDrawBack</a>	Check failure of drawing
<a href="#">getLength</a>	Returns the remaining height of the current page drawing, which is convenient for calculating the coordinates of the next element. For details, please see the 3.83 page mode interface code example.

- Draw straight line. Method name: CanvasPrintLine(int X\_Start, int Y\_Start, int X\_End, int Y\_End, int L\_Width)

Description:

- 1 X\_Start X the coordinate value of the starting point of the print line
- 2 Y\_Start Y the coordinate value of the starting point of the print line
- 3 X\_End X the coordinate value of the starting point of the print line
- 4 Y\_End Y the coordinate value of the starting point of the print line
- 5 L\_Width Line width

Returned value: Null

Abnormal: None

- Draw rectangle. Mehtod name: public void CanvasPrintBox(int X\_Start, int Y\_Start, int X\_End, int Y\_End, int L\_Width);

Description:

- 1 X\_Start the coordinate value of the starting point of the print line
- 2 Y\_Start the coordinate value of the starting point of the print line
- 3 X\_End the coordinate value of the starting point of the print line
- 4 Y\_End the coordinate value of the starting point of the print line
- 5 L\_Width Line width

Returned value: Null

Abnormal: None

- Draw text. Mehtod name: public void CanvasPrintText(int xPos, int yPos, String font, int font\_size, boolean bold, boolean underline, float italic, String content, Context mContext)

Description:

- 1 xPos The X coordinate vale of the string
- 2 yPos The Y coordinate vale of the string
- 3 font The font used, for example: "heiti.ttf" (the font file must be placed in the assets directory) Default: Pass null as the default font
- 4 font\_size size of font
- 5 bold bold or not boolean
- 6 underline underline or not boolean
- 7 italic Whether italic (positive number indicates tilt to the left, negative number indicates tilt to the right, normal between -1~1)
- 8 content Content of the string
- 9 mContext context

Returned value: Null

Abnormal: None

- Draw professional edition PDF417 2D barcode. Mehtod name: public void CanvasPrintPDFCode(int xPos, int yPos, int unit\_width, int unit\_height, int rows, int columns, int err\_level, String content)

Description:

- 1 xPos The starting x coordinate of the QR code
- 2 yPos The starting Y coordinate of the QR code
- 3 unit\_width width (the width of the 2D QR code, related to rows, columns, err\_level which can affect the value)
- 4 unit\_height Height(the width of the 2D QR code, related to rows, columns, err\_level which can affect the value)
- 5 rows barcode lines, range 1-90
- 6 columns column number of columns, range 1-30, if rows are specified, then columns must also be specified
- 7 err\_level Error correction level, range 1-8
- 8 content context of barcode

Returned value: Null

Abnormal: None

- Draw ordinary edition PDF417 2D barcode. Mehtod name: public void  
CanvasPrintPDFCode(int xPos, int yPos, int width, int height, String content)

Description:

- 1 xPos The starting x coordinate of the QR code
- 2 yPos The starting Y coordinate of the QR code
- 3 width
- 4 height (Most of the PDF417 is rectangular, and is scaled to fit the aspect ratio.)
- 5 content context of barcode

Returned value: Null

Abnormal: None

- Draw professional edition QRCode 2D barcode. Mehtod name: public void  
CanvasPrintQRCode(int xPos, int yPos, int module\_width, int module\_height, int white\_space, int version, int err\_level, String content)

Description:

- 1 xPos The starting x coordinate of the QR code
- 2 yPos The starting Y coordinate of the QR code
- 3 module\_width Width (the width of the QR code, related to the version, err\_level parameters can affect the value)
- 4 module\_height Height (the width of the QR code, related to the version, err\_level parameters can affect the value)
- 5 white\_space The width of the blank area around the QR code
- 6 version QR version, range 1-40
- 7 err\_level Error correction level, range 0-3



8    content    context of barcode

Returned value: Null

Abnormal: None

- Draw ordinary edition QRCode 2D barcode. Method name: public void  
CanvasPrintQRCode(int xPos, int yPos, int width, int height, String content)

Description:

- 1    xPos The starting x coordinate of the QR code
- 2    yPos The starting x coordinate of the QR code
- 3    width
- 4    height
- 5    content context of barcode

Returned value: Null

Abnormal: None

- Draw 1D code . Method name: public void CanvasPrintCode(int codeType, int xPos,  
int yPos, int width, int height, boolean show\_text, String content)

Description:

- 1    codeType    The type of one-dimensional code, currently supports the  
following bar code class (such as : BarcodeCreator.CODE39)
  - 1、ITF
  - 2、CODE39 Max data length 75
  - 3、CODE128 Max data length 108
  - 4、EAN13
  - 5、EAN8
  - 6、UPC-A
  - 7、UPC-E
  - 8、CODABAR
  - 9、CODE\_93
- 2    xPos The starting x coordinate of the one-dimensional code
- 3    yPos The starting Y coordinate of the one-dimensional code
- 4    width
- 5    height
- 6    show\_text show text or not
- 7    content data of 1D code

Returned value: Null

Abnormal: None

- Draw Bitmap. Method name: `public void CanvasPrintPicture(int xPos, int yPos, Bitmap bitmap)`

Description:

- 1 xPos Starting x coordinate
- 2 yPos Starting Y coordinate
- 3 Bitmap content

Returned value: Null

Abnormal: None

- Check failure of drawing. Method name: `public void setCanvasDrawBack(CanvasDrawBack mCanvasDrawBack)`

CanvasDrawPrint returned data specification:

- `int LINE = 1;` Line drawing failed
- `int BOX = 2;` Rectangle drawing failed
- `int TEXT = 3;` Text drawing failed
- `int PDF417_PROFESSIONAL = 4;` PDF417 professional edition drawing failed
- `int PDF417_ORDINARY = 5;` PDF417 ordinary edition drawing failed
- `int QRCODE_PROFESSIONAL = 6;` QRCode professional edition drawing failed
- `int QRCODE_ORDINARY = 7;` QRCode ordinary edition drawing failed
- `int ONE_DIMENSION_CODE = 8;` 1D code drawing failed
- `int IMG = 9;` bitmap drawing failed

For detailed error information, please check the related LOG.

Returned value: Null

- Set the brush hollow or solid Default: Solid

`setPaintStyle(Paint.Style style)`

Exception: If the page is not initialized, it will cause a null pointer exception (initialization can be ignored), you need to catch the exception yourself.

- Get the image drawn on the page and send it to the printer for printing.

`getCanvasImage();`

- Set whether the text on the page is right

`setTextAlignRight(boolean alignRight);`

- The text exceeds whether or not to wrap.  
`setTextExceedNewLine(boolean newLine);`  
 Note: More than one line break or start drawing the next line based on the X axis
- If the page text exceeds the line break, use a separator string to prevent a word from being split. Split by space. (separated string = space)  
`mCanvasDrawPrint.setUseSplit(boolean useSplit)`
- Returns the remaining height drawn by the current page.  
`getLength();`  
 Note: This function returns the lower position of the highest bit currently drawn, which is convenient for level drawing.

### 3.8.3 Page mode interface related example implementation

```
// Create a canvas

CanvasDrawPrint mCanvasDrawPrint = new CanvasDrawPrint();

// Define drawing failure listeners
mCanvasDrawPrint.setCanvasDrawBack(mCanvasDrawBack);

// Initialize the canvas width, height mCanvasDrawPrint.CanvasSetPageMode(500, 800);
mCanvasDrawPrint.setTextAlignRight(true);//Set alignment the way
mCanvasDrawPrint.setUseSplit(true); Whether the line breaks after the text on the page
exceeds the delimited string//

// Draw text
mCanvasDrawPrint.CanvasPrintText(0, 0, null, 60, true, true, 0.5f, "Test font multi-text
test text wrap problem", mContext);
mCanvasDrawPrint.CanvasPrintText(0, mCanvasDrawPrint.getLength(), "kaiti.ttf", 60,
false, false, 0, "Carcass text", mContext);

//Draw straight lines
mCanvasDrawPrint.CanvasPrintLine(0, mCanvasDrawPrint.getLength(), 450,
mCanvasDrawPrint.getLength(), 10);
```

```
//Set brush style
mCanvasDrawPrint.setPaintStyle(Paint.Style.STROKE);

//Draw professional edition PDF417
mCanvasDrawPrint.CanvasPrintPDFCode(0, mCanvasDrawPrint.getLength(), 500, 500,
23, 8, 3, "123456789");

//Draw professional editionQRCode
mCanvasDrawPrint.CanvasPrintQRCode(0, mCanvasDrawPrint.getLength(), 200, 200,
10, 10, 4, "123456");

// Draw 1D code
mCanvasDrawPrint.CanvasPrintCode(BarcodeCreator.CODE_128, 0,
mCanvasDrawPrint.getLength(),300,200, true, "123456");

//Save the canvas as a picture and print it
mPrinter.printImage(mCanvasDrawPrint.getCanvasImage(), PAlign.NONE, 0);

CanvasDrawPrint.CanvasDrawBack mCanvasDrawBack = new
CanvasDrawPrint.CanvasDrawBack() {
    @Override
    public void resultsBack(int i) {
        String str = "";
        if (i == CanvasDrawPrint.LINE) {
            str = ("Straight line drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.BOX) {
            str = ("rectangle drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.TEXT) {
            str = ("Text drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.PDF417_PROFESSIONAL) {
            str = ("professional edition PDF417 drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.PDF417_ORDINARY) {
            str = ("Regular edition PDF417 drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.QRCODE_PROFESSIONAL) {
            str = ("professional edition 2D barcode drawing erro refer to related log");
        } else if (i == CanvasDrawPrint.QRCODE_ORDINARY) {
            str = ("Regular edition 2D barcode drawing erro refer to related log");
        }
    }
}
```

```
        } else if (i == CanvasDrawPrint.ONE_DIMENSION_CODE) {  
            str = ("1D code drawing erro refer to related log");  
        } else if (i == CanvasDrawPrint.IMG) {  
            str = ("bitmap drawing erro refer to related log");  
        }  
  
        Toast.makeText(mContext, str, 0).show();  
    }  
};
```

Note: For more detailed page mode print calls, see the `btn_page_mode_printing` print page mode click event in `PicturePrintActivity.java`.

### 3.9、Record Log saved to SD card

Brief description: It is mainly convenient for debugging and finding bugs. Users can export the log files in the SD card to facilitate the analysis of our technicians. Remember that the bugs provided at the time can provide relevant logs to solve the bugs efficiently. Need to call `ZLog.Init ()`; to initialize, the default is open after the initialization is completed, the method is a constant mark, each time you need to reset the switch, each log file saved is up to 2Mb, more than 2Mb file name is accumulated 1, A total of 9 files are generated, and when the 9 files are full, the previous files are replaced in sequence. If you encounter problems, you can send the set folder directly to us.

Method	Description
<a href="#">ZLog.Init();</a>	Register the log tool class and pass in the path
<a href="#">ZLog.openSaveToFile()</a>	Open log record
<a href="#">ZLog.closeSaveToFile ()</a>	Close log record

- Register the log tool. Mehtod name: `public static synchronized void Init(String logDir)`  
 Description:  
 logDir saves the log path  
 Returned value: Null  
 Abnormal: None
- Open log record. Mehtod name: `public static synchronized void openSaveToFile()`  
 Description: Null  
 Returned value: Null  
 Abnormal: None
- Close log record. Mehtod name: `public static synchronized void closeSaveToFile()`  
 Description:Null  
 Returned value: Null  
 Abnormal: None

#### 3.9.1 Examples

```
//Initialize ZldLog should call the next method before use
ZLog.Init(Environment.getExternalStorageDirectory()
            .getAbsolutePath() + "/LOGS/");

// open the record
```

```
ZLog.openSaveToFile()  
// close the record  
ZLog.closeSaveToFile ()
```

## 4. Appendix

### 4.1 Summarize of CODE128

In CODE 128, through using Character Set A, Character Set B and Character Set C alternatively to encode 128pcs ASCII characters, 100pcs 00~99 numbers and some special characters. For each Character Set, encoded characters are as below,

- Character A: ASCII characters 00H to 5FH
- Character B: ASCII characters 20H to 7FH
- Character C: 100pcs numbers 00~99

Code128 can also encode the below special characters:

- SHIFT characters

"SHIFT" can transfer the first character after SHIFT character from Character Set A to Character Set B, or from Character Set B to Character Set A. From the second character, it will recover to the previous character set of SHIFT. "SHIFT" characters can only transfer between Character Set A and Character Set B, but can not make the current encoding character enter or quit the status of Character Set C.

- Characters to choose Character Set (CODE A、CODE B、CODE C)

These characters can transfer the next encoding characters to Character Set A, B or C.

- Function Character(FNC1、FNC2、FNC3、FNC4)

The function of these function characters depends on the application software.

In Character Set C, only FNC1 can be used.

## 4.2 Character Set

Character	Send data		Character	Send data		Character	Send data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal



NULL	00	0	&	26	38	L	4C	76
SOH	01	1	'	27	39	M	4D	77
STX	02	2	(	28	40	N	4E	78
ETX	03	3	)	29	41	O	4F	49
EOT	04	4	*	2A	42	P	50	80
ENQ	05	5	+	2B	43	Q	51	81
ACK	06	6	,	2C	44	R	52	82
BEL	07	7	-	2D	45	S	53	83
BS	08	8	.	2E	46	T	54	84
HT	09	9	/	2F	47	U	55	85
LF	0A	10	0	30	48	V	56	86
VT	0B	11	1	31	49	W	57	87
FF	0C	12	2	32	50	X	58	88
CR	0D	13	3	33	51	Y	59	89
SO	0E	14	4	34	52	Z	5A	90
SI	0F	15	5	35	53	[	5B	91
DLE	10	16	6	36	54	\	5C	92
DC1	11	17	7	37	55	]	5D	93
DC2	12	18	8	38	56	^	5E	94
DC3	13	19	9	39	57	_	5F	95
DC4	14	20	:	3A	58	FNC1	7B,31	123,49
NAK	15	21	;	3B	59	FNC2	7B,32	123,50
SYN	16	22	<	3C	60	FNC3	7B,33	123,51
ETB	17	23	=	3D	61	FNC4	7B,34	123,52
CAN	18	24	>	3E	62	SHIFT	7B,53	123,83
EM	19	25	?	3F	63	CODEB	7B,42	123,66
SUB	1A	26	@	40	64	CODEC	7B,43	123,67
ESC	1B	27	A	41	65			
FS	1C	28	B	42	66			
GS	1D	29	C	43	67			
RS	1E	30	D	44	68			
US	1F	31	E	45	69			
SP	20	32	F	46	70			
!	21	33	G	47	71			
"	22	34	H	48	72			
#	23	35	I	49	73			
\$	24	36	J	4A	74			
%	25	37	K	4B	75			

Character Set A

Character Set B

character	Send data		character	Send data		character	Send data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal

SP	20	32	F	46	70	l	6C	108
!	21	33	G	47	71	m	6D	109
"	22	34	H	48	72	n	6E	110
#	23	35	I	49	73	o	6F	111
\$	24	36	J	4A	74	p	70	112
%	25	37	K	4B	75	q	71	113
&	26	38	L	4C	76	r	72	114
'	27	39	M	4D	77	s	73	115
(	28	40	N	4E	78	t	74	116
)	29	41	O	4F	79	u	75	117
*	2A	42	P	50	80	v	76	118
+	2B	43	Q	51	81	w	77	119
,	2C	44	R	52	82	x	78	120
-	2D	45	S	53	83	y	79	121
.	2E	46	T	54	84	z	7A	122
/	2F	47	U	55	85	{	7B,7B	123,123
0	30	48	V	56	86		7C	124
1	31	49	W	57	87	}	7D	125
2	32	50	X	58	88	—	7E	126
3	33	51	Y	59	89	DEL	7F	127
4	34	52	Z	5A	90	FNC1	7B,31	123,49
5	35	53	[	5B	91	FNC2	7B,32	123,50
6	36	54	\	5C	92	FNC3	7B,33	123,51
7	37	55	]	5D	93	FNC4	7B,34	123,52
8	38	56	^	5E	94	SHIFT	7B,53	123,83
9	39	57	_	5F	95	CODEA	7B,41	123,65
:	3A	58	`	60	96	CODEC	7B,43	123,67
;	3B	59	a	61	97			
<	3C	60	b	62	98			
=	3D	61	c	63	99			
>	3E	62	d	64	100			
?	3F	63	e	65	101			
@	40	64	f	66	102			
A	41	65	g	67	103			
B	42	66	h	68	104			
C	43	67	i	69	105			
D	44	68	j	6A	106			
E	45	69	k	6B	107			

#### CharacterC

Character	Send data		character	Send data		character	Send data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal

0	00	0	38	26	38	76	4C	76
1	01	1	39	27	39	77	4D	77
2	02	2	40	28	40	78	4E	78
3	03	3	41	29	41	79	4F	79
4	04	4	42	2A	42	80	50	80
5	05	5	43	2B	43	81	51	81
6	06	6	44	2C	44	82	52	82
7	07	7	45	2D	45	83	53	83
8	08	8	46	2E	46	84	54	84
9	09	9	47	2F	47	85	55	85
10	0A	10	48	30	48	86	56	86
11	0B	11	49	31	49	87	57	87
12	0C	12	50	32	50	88	58	88
13	0D	13	51	33	51	89	59	89
14	0E	14	52	34	52	90	5A	90
15	0F	15	53	35	53	91	5B	91
16	10	16	54	36	54	92	5C	92
17	11	17	55	37	55	93	5D	93
18	12	18	56	38	56	94	5E	94
19	13	19	57	39	57	95	5F	95
20	14	20	58	3A	58	96	60	96
21	15	21	59	3B	59	97	61	97
22	16	22	60	3C	60	98	62	98
23	17	23	61	3D	61	99	63	99
24	18	24	62	3E	62	FNC1	7B,31	123,49
25	19	25	63	3F	63	CODEA	7B,41	123,65
26	1A	26	64	40	64	CODEB	7B,42	123,66
27	1B	27	65	41	65			
28	1C	28	66	42	66			
29	1D	29	67	43	67			
30	1E	30	68	44	68			
31	1F	31	69	45	69			
32	20	32	70	46	70			
33	21	33	71	47	71			
34	22	34	72	48	72			
35	23	35	73	49	73			
36	24	36	74	4A	74			
37	25	37	75	4B	75			