

Printer Developer Documentation

Introduction.....	- 2 -
1 Connect to PrinterService	- 3 -
1.1 AIDL	- 3 -
1.2 Virtual Bluetooth	- 12 -
1.3 JS in HTML.....	- 15 -
2 State feedback.....	- 17 -
2.1 Print status feedback	- 17 -
2.2 Command callback feedback.....	- 18 -
3 Print parameters Introduction	- 19 -
3.1. Printer resolution.....	- 19 -
3.2. Query whether the printer is available	- 20 -
3.3. Font description	- 20 -
3.4. QRCode description	- 20 -
3.5. Bitmap description.....	- 20 -
3.6. Barcode description	- 21 -
3.7. Charater Set	- 22 -
ESC/POS Command List.....	- 23 -

Introduction

The, P1, T1 and T1 Mini built-in thermal printer allows apps to print directly out of the thermal printer. There are two kinds of built-in printers for our Android products:

- 80mm, with auto cutter. Compatible with 58mm, T1 and some versions of the T1 Mini have this printer
- 58mm, without cutter. V1, P1 and some versions of the T1 Mini have this printer.

App developers can communicate with the built-in thermal printer in three ways:

- 1. Connect to the printer via AIDL
 2. Connect to the printer via Bluetooth
 3. Connect to the printer via the JS bridge

1 Connect to PrinterService

1.1 AIDL

1.1.1. AIDL Profile

AIDL is the abbreviation of the Android Interface Definition language, which is a description language for the Android internal process communication interface, through which we can define the communication interface between processes. AIDL provides packaged common print instruction to facilitate developers to quickly access printers, it also supports ESC/POS commands.

1.1.2. AIDL Usage

The establishment of the connection can be divided into the following five steps:

1. Add the AIDL file that came with the resource file in your project:

(1) in src to establish woyou.aidlservice.jiuv5 package

(2) to join IWoyouService.aidl, ICallback.aidl2 files.

2. Implement the ServiceConnection in the code class that controls the printing.

3. Call `ApplicationContext.bindService ()` and pass it in the ServiceConnection implementation.

Note: `bindservice` is a non-blocking call, which means that if the completion of the call is not immediately bound successfully, must be `serviceConnected` prevail.

4. In the `ServiceConnection.onServiceConnected ()` implementation, you will receive an `IBinder` instance (called `Service`). Call `IWoyouService.Stub.asInterface (service)` to convert the parameters to the `IWoyouService` type.

5. Now you can call the `IWoyouService` interface defined in the various methods to print.

Bind service examples

```
private ServiceConnection connService = new ServiceConnection() {  
  
    @Override  
  
    public void onServiceDisconnected(ComponentName name) {  
  
        Toast.makeText(PrinterTestDemoAct.this, "service disconnected",  
        Toast.LENGTH_LONG).show();  
    }  
}
```

```

        setButtonEnable(false);

        woyouService = null;

        try {

            Thread.sleep(2000);

        } catch (InterruptedException e) {

            // TODO Auto-generated catch block

            e.printStackTrace();

        }

        Binding();

    }

    @Override

    public void onServiceConnected(ComponentName name, IBinder service) {

        woyouService = IWoyouService.Stub.asInterface(service);

        setButtonEnable(true);

        try {

            serviceVersion = woyouService.getServiceVersion();

            info.setText("service version :" + serviceVersion + "\n");

        } catch (RemoteException e) {

            // TODO Auto-generated catch block

            e.printStackTrace();

        }

    }

};

private void Binding(){

    Intent intent=new Intent();

    intent.setPackage("woyou.aidlservice.jjuiv5");

    intent.setAction("woyou.aidlservice.jjuiv5.IWoyouService");

    startService(intent);

    bindService(intent, connService,Context.BIND_AUTO_CREATE);

}

```

1.1.3. AIDL Interface Introduction

After the connection is established via AIDL print service, you can call IWoyouService common good package print command interface (aidl only connects before calling IWoyouService interface function).

Fuction	printerInit()
Function Description	Printer initialization
Parameter Description	void
Return value	void
Supplement	Reset the printer's logic program without clearing the cache data, so the unfinished print job will continue after resetting

Fuction	printerSelfChecking()
Function Description	printer(Hardware) checking
Parameter Description	void
Return value	void
Supplement	a bill with print_density will be printed. a QRcode will be printed.The result of scanning QRcode should be "Thank you for using Citaq printer!"

Fuction	getPrinterSerialNo()
Fuction Description	get the printer board serial number
Parameter Description	void
Return value	string Printer Serial number.
Supplement	null

Fuction	getPrinterVersion()
Fuction Description	get the printer firmware version number
Parameter Description	void
Return value	string Printer Firmware Version
Supplement	null

Fuction	getPrintedLength(in ICallback callback)
---------	---

Fuction Description	get Printed Length
Parameter Description	Callback
Return value	void
Supplement	null

Fuction	lineWrap(int n, in ICallback callback)
Fuction Description	paper feed
Parameter Description	int n :rows Callback
Return value	void
Supplement	force a line break, feed n lines

Fuction	sendRAWData(in byte[] data, in ICallback callback)
Fuction Description	print esc/pos instruction
Parameter Description	byte[] data :ESC / POS instruction Callback
Return value	void
Supplement	null

Fuction	setAlignment (int alignment, in ICallback callback)
Fuction Description	Set Alignment
Parameter Description	int alignment:0--left , 1--center, 2--right Callback
Return value	void
Supplement	<u>Global method</u> ,will impact all the print method. printerInit () can reset it.

Fuction	setFontName(String typeface, in ICallback callback)
Fuction Description	set Font
Parameter Description	string typeface: Currently only support “gh”, a monospaced font Callback

Return value	void
Supplement	<u>Global method</u> ,will impact all the print method. printerInit () can reset it.

Fuction	setFontSize(float fontsize, in ICallback callback)
Fuction Description	set Font Size
Parameter Description	Float fontsize Callback
Return value	void
Supplement	<u>Global method</u> ,will impact all the print method. printerInit () can reset it. Fontsize is beyond the standard international directive of the printing method, adjusting the font size will affect the character width and the number of characters on each line.

Fuction	printText(String text, in ICallback callback)
Fuction Description	print Text
Parameter Description	string text Callback
Return value	void
Supplement	Text width full line of default line layout, issues with a whole line will not print unless forced to print.

Fuction	printTextWithFont(String text, String typeface, float fontsize, in ICallback callback)
Fuction Description	print Text With Font
Parameter Description	string text string typeface fontsize Callback
Return value	void

Supplement	null
------------	------

Fuction	printColumnsText(in String[] colsTextArr, in int[] colsWidthArr, in int[] colsAlign, in ICallback callback)
Fuction Description	print a line
Parameter Description	string[] colsTextArr:columns of text strings int[] colsWidthArr:each column of the width of the array, in English characters, each Chinese characters accounted for two English characters, each width is greater than 0 int[] colsAlign:column alignment: 0 left, 1 center, 2 right Callback
Return value	void
Supplement	The length of the array of three parameters should be consistent, if the colsText [i] width is greater than colsWidth [i], the text will wrap.

Fuction	printBitmap(in Bitmap bitmap, in ICallback callback)
Fuction Description	print Bitmap
Parameter Description	bitmap Callback
Return value	void
Supplement	Maximum width of 384 pixels , more than can not print and callback exception function

Fuction	printBarCode(String data, int symbology, int height, int width, int textposition, in ICallback callback)
Fuction Description	print bar code
Parameter Description	string data :barcode data int symbology :barcode type * 0 -- UPC-A, * 1 -- UPC-E, * 2 -- JAN13(EAN13),

	<ul style="list-style-type: none"> * 3 -- JAN8(EAN8), * 4 -- CODE39, * 5 -- ITF, * 6 -- CODABAR, * 7 -- CODE93, * 8 -- CODE128 <p>int height:Barcode height, 1 to 255, default 162</p> <p>int width: Barcode width, 2 to 6, default 2</p> <p>int text position: Text position 0 - do not print text, 1 - text above the barcode, 2 - text below the barcode, 3 – text above and below the bar code</p> <p>Callback</p>
Return value	void
Supplement	The maximum number of prints for each encoding

Fuction	printQRCode(String data, int modulesize, int errorlevel, in ICallback callback)
Fuction Description	print QRCode
Parameter Description	<p>string data:QRcode data</p> <p>int modulesize:block size, Unit: point, value of 1 to 16</p> <p>int Errorlevel:QRcode error correction level (0 to 3)</p> <p>0 -- Error correction level L (7%),</p> <p>1 -- Error correction level M (15%),</p> <p>2 -- Error correction level Q (25%),</p> <p>3 -- Error correction level H (30%)</p> <p>Callback</p>
Return value	void
Supplement	null

Fuction	printOriginalText (String text, in ICallback callback)
Fuction Description	print Original Text
Parameter Description	string text: print content

	Callback
Return value	void
Supplement	<p>Print text, text width full line of default line layout, issues with a whole line does not print unless forced to print.</p> <p>Text by vector text width as output, that is, each character is not equal width</p>

Fuction	commitPrint(in TransBean[] transbean, in ICallback callback)
Fuction Description	lib package transaction printing dedicated interface
Parameter Description	TransBean[] transbean: Print the task list Callback
Return value	void
Supplement	A user using lib calls this interface to open transaction printing

Fuction	commitPrinterBuffer()
Fuction Description	print the contents of the buffer
Parameter Description	void
Return value	void
Supplement	event print

Fuction	enterPrinterBuffer(in boolean clean)
Fuction Description	Enter the buffer mode
Parameter Description	<p>boolean clean: Whether to clear the contents of the buffer</p> <p>true clear</p> <p>false not clear</p>
Return value	void
Supplement	<p>event print</p> <p>all calls will be cached, call commitPrinterBuffe () Print</p>

Fuction	exitPrinterBuffer(in boolean commit)
Fuction Description	exit buffer mode

Parameter Description	boolean commit:Whether to print out the contents of the buffer true print false not print
Return value	void
Supplement	event print

Fuction	cutPaper(in ICallback callback)
Fuction Description	cut Paper
Parameter Description	Callback
Return value	void
Supplement	null

Fuction	getCutPaperTimes()
Fuction Description	get Cut Paper Times
Parameter Description	void
Return value	int :cut times
Supplement	null

Fuction	openDrawer(in ICallback callback)
Fuction Description	Open Drawer
Parameter Description	Callback
Return value	void
Supplement	null

Fuction	getOpenDrawerTimes()
Fuction Description	get Open Drawer Times
Parameter Description	void
Return value	void
Supplement	null

1.2 Virtual Bluetooth

1.2.1 Virtual Bluetooth Profile

There is a permanent device named "InnerPrinter" In Bluetooth equipment list, which has already been paired. It is a virtual Bluetooth device for the built-in printer. However it can be communicated with as a normal Bluetooth printer using the [ESC/POS](#) protocol. The purpose is to allow developers who have already developed for Bluetooth printers to implement the printer easily.

There are a few special custom instructions such as:

openDrawer	byte [5] : 0x10 0x14 0x00 0x00 0x00
cutpaper(full cut)	byte [4] : 0x1d 0x56 0x42 0x00
cutpaper(partial cut)	byte [4] : 0x1d 0x56 0x41 0x00

1.2.2 Virtual Bluetooth Usage

The steps to use "InnerPrinter" virtual printer :

- 1.Connect 'InnerPrinter'
- 2.Convert command and content into bytes
- 3.Send the bytes to InnerPrinter
- 4.Driver will printer the contents

Regarding 'How to connect InnerPrinter', Google has introduced how to connect Bluetooth equipment in the Android Developer Guide. For your convenience and better understanding, we will give some example codes of how to make a connection.

Tools BluetoothUtil, the standard Bluetooth connectivity tool class

```
public class BluetoothUtil {  
  
    private static final UUID PRINTER_UUID = UUID.fromString("00001101-0000-1000-8000-00805F9B34FB");  
  
    private static final String Innerprinter_Address = "00:11:22:33:44:55";  
  
    public static BluetoothAdapter getBTAdapter() {  
  
        return BluetoothAdapter.getDefaultAdapter();  
  
    }  
}
```

```

public static BluetoothDevice getDevice(BluetoothAdapter bluetoothAdapter) {

    BluetoothDevice innerprinter_device = null;

    Set<BluetoothDevice> devices = bluetoothAdapter.getBondedDevices();

    for (BluetoothDevice device : devices) {

        if (device.getAddress().equals(Innerprinter_Address)) {

            innerprinter_device = device;

            break;

        }

    }

    return innerprinter_device;

}

public static BluetoothSocket getSocket(BluetoothDevice device) throws IOException {

    BluetoothSocket socket = device.createRfcommSocketToServiceRecord(PRINTER_UUID);

    socket.connect();

    return socket;

}

public static void sendData(byte[] bytes, BluetoothSocket socket) throws IOException {

    OutputStream out = socket.getOutputStream();

    out.write(bytes, 0, bytes.length);

    out.close();

}

}

```

Bluetooth connection print service example

// 1: Get BluetoothAdapter

```
BluetoothAdapter btAdapter = BluetoothUtil.getBTAdapter();

    if (btAdapter == null) {

        Toast.makeText(getApplicationContext(),"Please Open Bluetooth!", Toast.LENGTH_LONG)

                                .show();

        return;

    }

```

// 2: Get the InnerPrinter BluetoothDevice

```
BluetoothDevice device = BluetoothUtil.getDevice(btAdapter);

    if (device == null) {

        Toast.makeText(getApplicationContext(),"Please Make Sure Bluetooth have InnerPrinter!",

        Toast.LENGTH_LONG).show();

        return;

    }

```

// 3: Generate order data, user adds data here

```
byte[] data = null;
```

// 4: Using the InnerPrinter print data

```
BluetoothSocket socket = null;

socket = BluetoothUtil.getSocket(device);

BluetoothUtil.sendData(data, socket);

```

Note: you will need to add a Bluetooth permission statement to the App project to use the Bluetooth device.

```
<manifest>
```

```
    <uses-permission android:name="android.permission.BLUETOOTH"> </uses-
permission>
```

```
    <uses-permission
```

```
android:name="android.permission.BLUETOOTH_ADMIN"> </uses-permission>
```

```
</manifest>
```

1.3 JS in HTML

1.3.1 JS Profile

Calling the printer through JS is essentially using the JS bridge in the HTML android native code to print, through the Bluetooth printer or AIDL to achieve printing. (The printer itself is not a network printer and web applications can not communicate directly with the printer, you need to accept data on the android app)

1.3.1 HTML Usage

The following is a specific call flow:

1. In the definition of HTML android to use the method.

```
Document.getElementsByTagName ('a') [0] .addEventListener ('click', function () {  
    Var a = "hello world";  
    Javascript: lee.funAndroid (a);  
    Return false  
}, False);
```

2. Initialize WebView.

```
WebView mWebView = (WebView) findViewById (R.id.wv_view);  
// Set the encoding  
MWebView.getSettings (). SetDefaultTextEncodingName ("utf-8");  
// Support js  
MWebView.getSettings (). SetJavaScriptEnabled (true);  
MWebView.setWebChromeClient (new WebChromeClient ());
```

Initialize the print service

```
Intent intent = new Intent ();  
Intention.setPackage ("woyou.aidlservice.jiui5");  
Intent.setAction ("woyou.aidlservice.jiui5.IwooyService");  
StartService (intent); // Start printer service  
BindService (intent, connService, Context.BIND_AUTO_CREATE);
```

3. To add a listener to the WebView, call the `WebView.addJavascriptInterface (new JsObject (), 'lee')` in the `onPageFinished` callback method; in the `JsObject` class, define

the method to be manipulated in the HTML by @JavascriptInterface, by calling AIDL to print a small ticket.

```
mWebView.setWebViewClient (new WebViewClientDemo ()); // add a listener
```

corresponding page class

```
Class WebViewClientDemo extends WebViewClient {
    @Override
    Public boolean shouldOverrideUrlLoading (WebView view, String url) {
        // When you open a new link, use the current WebView, the system does not use a
        different browser
        View.loadUrl (url);
        Return true;
    }
    @Override
    Public void onPageFinished (WebView view, String url) {
        Super.onPageFinished (view, url);
        / **
        * Register JavascriptInterface, where "lee" easily take the name, if you use
        the "lee", then in html as long as lee. Method name ()
        * Of the same name can be called MyJavascriptInterface methods, parameters, but
        also consistent
        * /
        MWebView.addJavascriptInterface (new JsObject (), "lee");
    }
}
Class JsObject {
    @JavascriptInterface
    Public void funAndroid (final String i) {
        Toast.makeText (getApplicationContext (), "calling the local method funAndroid by
        JS." + I,
        Toast.LENGTH_SHORT) .show ();
        Try {
            WoyouService.printerSelfChecking (callback); // Using AIDL to print something.
        } Catch (RemoteException e) {
```



```

E.printStackTrace ();
}
}
}

```

4. Load the HTML file, click on the button in the HTML when it will print a small ticket

```

// Load the html contains js
MWebView.loadData ("", "text / html", null);
mWebView.loadUrl ( "file: ///android_asset/test.html") ; // This is the page
where your    //business html

```

2 State feedback

2.1 Print status feedback

Through the form of broadcasting

The user needs to set up a broadcast receiver to listen to the broadcast.

<pre> // Exception out of paper Public final static String OUT_OF_PAPER_ACTION = "woyou.aidlservice.jiuv5.OUT_OF_PAPER_ACTION"; </pre>
<pre> // Print error Public final static String ERROR_ACTION = "woyou.aidlservice.jiuv5.ERROR_ACTION"; </pre>
<pre> // Print Public final static String NORMAL_ACTION = "woyou.aidlservice.jiuv5.NORMAL_ACTION"; </pre>
<pre> // Open the lid Public final static String COVER_OPEN_ACTION = "woyou.aidlservice.jiuv5.COVER_OPEN_ACTION"; </pre>
<pre> // Close the lid Public final static String COVER_ERROR_ACTION = "woyou.aidlservice.jiuv5.COVER_ERROR_ACTION"; </pre>

<pre>// Exception 1- Cutter knife abnormal Public final static String KNIFE_ERROR_1_ACTION = "woyou.aidlservice.jiuv5.KNIFE_ERROR_ACTION_1";</pre>
<pre>// Cutter knife abnormal 2 Public final static String KNIFE_ERROR_2_ACTION = "woyou.aidlservice.jiuv5.KNIFE_ERROR_ACTION_2";</pre>
<pre>// Print head is overheated exception Public final static String OVER_HEATING_ACITON = "woyou.aidlservice.jiuv5.OVER_HEATING_ACITON";</pre>
<pre>// Printer firmware upgrade start Public final static String FIRMWARE_UPDATING_ACITON = "woyou.aidlservice.jiuv5.FIRMWARE_UPDATING_ACITON";</pre>

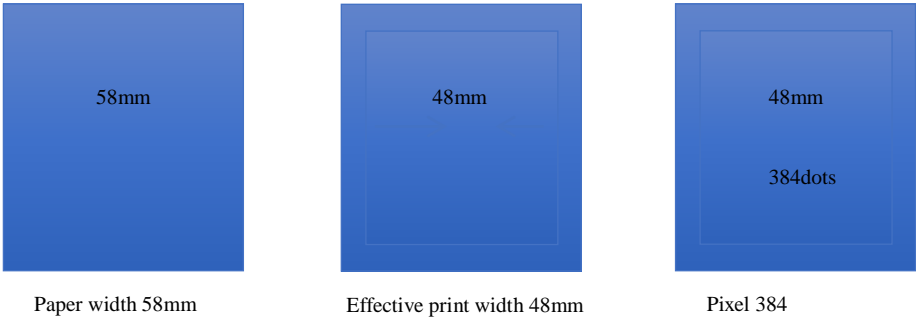
2.2 Command callback feedback

Interface method callback provide 3 feedback results:

Feedback function return	return	
onRunResult	Instruction execution result boolean isSuccess	true executed successfully, false fails
onReturnString	Instruction execution result final String result result: Results	result: Results
onRaiseException	abnormal information int code, String msg code: exception code msg: exception description	public static final int UNSUPPORT = -1; public static final String UNSUPPORT_MSG = "command is not support,index #"; // # NO. # byte error
		public static final int UNSUPPORTENCODING = -2; public static final String UNSUPPORTUNSUPPORTENCODING_MSG = "# encoding is not support";
		public static final int ADDTASKFAILED = -3; public static final String ADDTASKFAILED_MSG = "oops,add task failed (the buffer of the task queue is 10M),please try later";
		public static final int CODEFAILED = -4; public static final String CODEFAILED_MSG = "create command failed";

		<pre>public static final int IllegalParameter = -5; public static final String IllegalParameter_MSG = "Illegal parameter";</pre>

3 Print parameters Introduction



Note: printer supports 58mm, 80mm printing paper, this document to 58mm paper as a case to illustrate the printer support parameters, 80mm print paper specifications similar.

A 58 print paper width of 58mm, effective print width of 48mm. Valid print width of a line of 384 pixels. V1 paper slot depth of 40mm, can put up to 40mm diameter paper, you can print 57 * 40mm

3.1. Printer resolution

The printer resolution is 205DPI, the formula is as follows

$$\text{DPI} = 384 \text{ dots} / 48 \text{ mm} = 8 \text{ dots} / 1 \text{ mm} = 205 \text{ dots} / \text{in} = 205$$

3.2. Query whether the printer is available

Some models do not have built in printers, the user can query the interface from the printer to determine the if one is available.

interface	return
Settings.Global.getInt(getContentResolver(), "hasPrinter", 0);	Type int content : 0 NoPrinter 1 Has a Printer - 1 Being queried

3.3. Font description

The default font 24, the Chinese 24 * 24 matrix, the English is 12 * 24 matrix.

3.4. QRCode description

The printer prints two-dimensional code, each two-dimensional code block is 4 pixels. Maximum support version 19 (93 * 93) mode.

3.5. Bitmap description

The printer supports maximum print size of 1M, the maximum support width of 384 pixels. If you need to print more than 1M or more than 384 pixels wide, you need to manually compress the picture.

```
if( mBitmap == null ){  
    / * * * * 1M * * * * * /  
    mBitmap = BitmapFactory.decodeResource(getResources(), R.raw.sunmi);
```

```

    / * * * * over1M * * * * * * * * * * /
    mBitmap1 = BitmapFactory.decodeResource(getResources(), R.raw.sunmi1);
    }
    / * * * * * * * * * * * * * * * * /
    double gh=(double)mBitmap.getWidth()/384;
    if( mBitmap1 == null ){
mBitmap2 = BitmapUtils.zoomBitmap(mBitmap1, 384,
(int)(mBitmap.getHeight()/gh)); }
    / * * * * * * * * * * * * * * * * /
try {
    woyouService.setAlignment(1, callback);
    woyouService.printBitmap(mBitmap, callback);
//    woyouService.printBitmap(mBitmap2, callback);
    woyouService.lineWrap(3, null); }
catch (RemoteException e) {
    // TODO Auto-generated catch block
    e.printStackTrace();}

```

3.6. Barcode description

Code39 prints up to 13 digits
 Code93 prints up to 17 digits
 Code128 prints up to 15 digits
 Ean8 8digits
 Ean13 13digits
 ITF must be even
 Codebar prints up to 18 digits

3.7. Charater Set

By default , V1's multibyte (fit east asia etc) is on and the default character set is simple Chinese.

command list and parameter listed below:

close multibyte(single byte fit for europe area) : 0x1C 0x2E

open multibyte(fit for east asia) : 0x1C 0x26

Set Single byte character set : 0x1B 0x74 [parameter]

Single byte character set parameter list:

[para] [character set] [area]

0 "CP437";

2 "CP850";

3 "CP860";

4 "CP863";

5 "CP865";

13 "CP857";

14 "CP737";

15 "CP928";

16 "Windows-1252";

17 "CP866";

18 "CP852";

19 "CP858";

21 "CP874";

33 "Windows-775";

34 "CP855";

36 "CP862";

37 "CP864";

254 "CP855";

Set multibyte character set : 1C 43 [parameter]

multibyte character set parameter list:

[para] [character set]

0x00 || 0x48 "GB18030";

//0x01 || 0x49 "BIG5";

0x02 || 0x50 "KSC5601";

(byte) 0xff "utf-8";

ESC/POS Commands

HT

[Name]	Horizontal tab	
[Format]	ASCII	HT
	Hex	09
	Decimal	9
[Description] 1	Move the current position to the next tab position	
[Note]	<ul style="list-style-type: none"> ● If the next tab position is not set, this order should be ignored ● If the next horizontal tab position is beyond the printing area, the current position should be set as [Printing width+1] ● Use ESC D to set the horizontal tab position. ● If current position is in [Printing width+1] when receiving this order, the printer runs the current buffer full actions and then moves the printing position to the beginning of the next line. ● The default tab position is to tab by 8 standard ASCII characters(12x24) ● When the current buffer area is full, printer runs these actions: printer prints contents of current line and moves the print position to the beginning of the next line. 	
[Reference]	ESC D	

LF

[Name]	Print and line feed	
[Format]	ASCII	LF
	Hex	0A
	Decimal	10
[Description] 1	Prints the data in buffer and line feeds	
[Note]	<ul style="list-style-type: none"> ● This order puts current position to the beginning of a line. 	
[Reference]	ESC 2, ESC 3	

ESC SP n

[Name]	Set right-side character spacing			
[Format]	ASCII	ESC	SP	n
	Hex	1B	20	n
	Decimal	27	32	n
[Range]	0n255			
[Description] 1	Set the right-side character interspaces as N point			
[Note]	<ul style="list-style-type: none"> ● This setting is only valid to characters instead of Chinese. ● When characters enlarge the interspaces enlarge the corresponding amount. 			
[Default]	n=0			
[Reference]	ESC 2, ESC 3			

ESC ! n

[Name]	Select print mode(s)			
[Format]	ASCII	ESC	!	n
	Hex	1B	21	n
	Decimal	27	33	n
[Range]	0n255			
[Description] 1	Set the character print mode by the N value			
		1/0	HEX	Decima l
	0,1,2			undefined
	3	0	00	0
		1	08	8
	4	0	00	0
		1	10	16
	5	0	00	0
		1	20	32
	6			undefined
	7	0	00	0
		1	80	128
				select underline mode
[Note]	<ul style="list-style-type: none"> ● When selecting the multi-high and multi-wide mode at the same time, the characters double in both horizontal and vertical size. ● When underline mode is on, all characters will print with an underline except the spaces set by HT and rotated characters. ● ESC - defines the underline but not the characters. ● When some characters within one line are multi-high, all characters align to the bottom. ● ESC E can select or cancel bold mode. The last sent command is used. ● ESC - can also select or cancel underline mode. The last sent command is used. ● GS ! can also set the character size. The last sent command is used. 			
[Default]	n=0			
[Reference]	ESC -, ESC E, GS !			

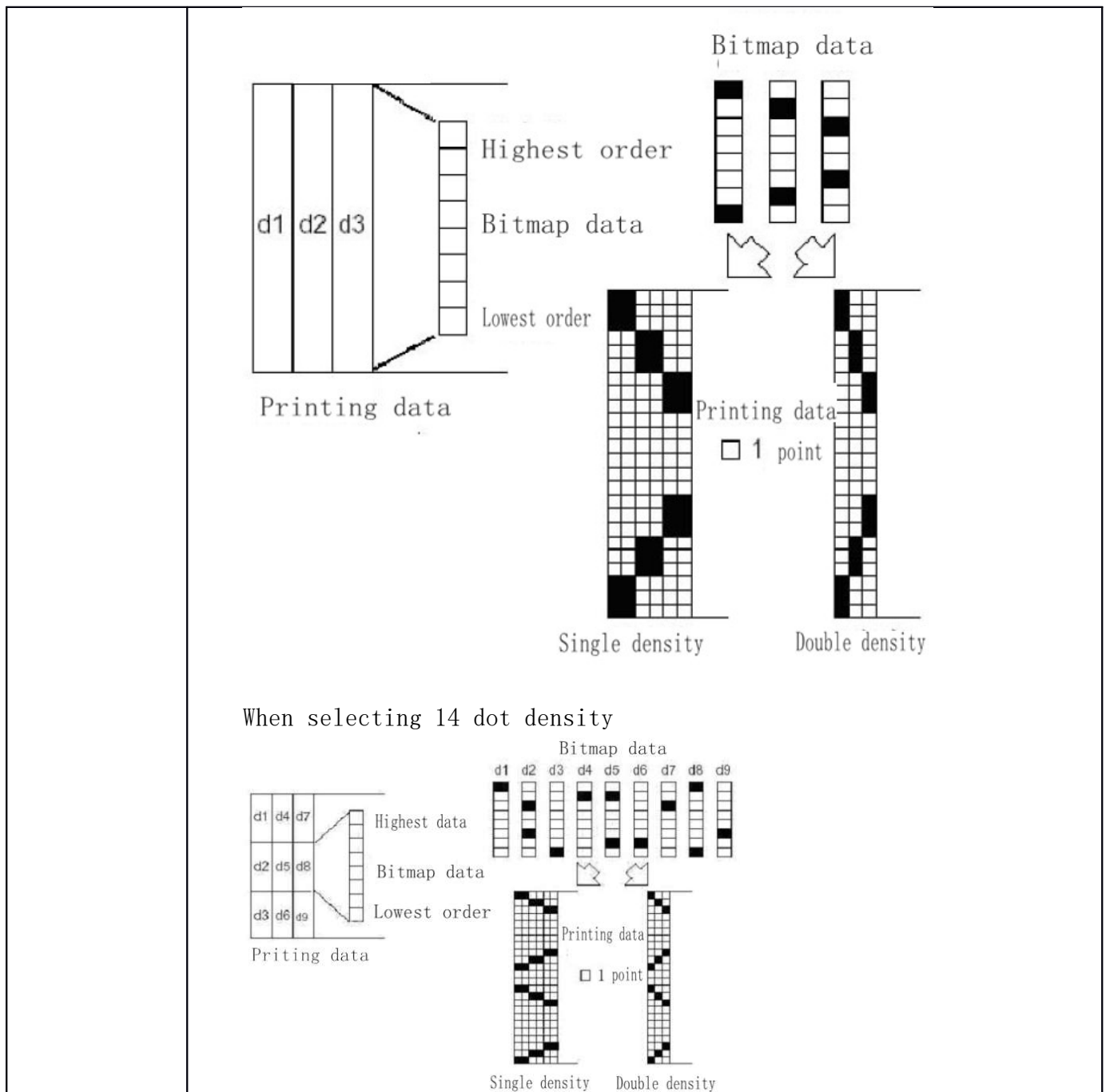
ESC \$ nL nH

[Name]	Set absolute print position			
[Format]	ASCII	ESC	\$	nL nH
	Hex	1B	24	nL nH
	Decimal	27	36	nL nH
[Range]	0nL2550nH2			
[Description] 1	Set the current position to (nL+nHx256) dots from the beginning of a line.			
[Note]	<ul style="list-style-type: none"> ● If the preset position is out of the print area, this order will be ignored. ● Both horizontal and vertical units are set by GS P ● Use horizontal units when using standard mode. ● Under Page mode, we should select horizontal or vertical units according to the direction and beginning point of the print area as follows: 1. When the beginning point is set too the upper left or bottom right by ESC T, use horizontal. 2. When the beginning point is set at bottom left or upper right corner by ESC T, then use vertical. 			

[Reference]	ESC \, GS \

ESC * m nL nH d1...dk

[Name]	Select bit-image mode					
[Format]	ASCII	ESC	*	m	nL	nH d1...dk
	Hex	1B	2A	m	nL	nH d1...dk
	Decimal	27	42	m	nL	nH d1...dk
[Range]	m = 0, 1, 32, 330 nL 2550 nH 30 d 255					
[Description]	Select one of the bit-image modes designated by M. The bits are determined by nL and nH					
	m	Mode	Vertical		Horizontal	
			Dot	Resolution	Resolution	Data k
	0	8 Dot single density	8	67DPI	100DPI	nL+nH256
	1	8 Dot double density	8	67DPI	200DPI	nL+nH256
	32	24 Dot single density	24	200DPI	100DPI	(nL+nH256) 3
	330	24 Dot double density	24	200DPI	200DPI	(nL+nH256) 3
[Note]	<ul style="list-style-type: none"> ● If the value of M exceeds the range, nL and data after it will be executed as common data. ● The horizontal printer dots are determined by nL and nH. The total dots are nL+nHx256 ● Bit-image which exceeds current area will be cut off. ● D is data of bit-image. When the unit of data is 1 then it prints a dot, and when it is 0 it will not print a dot. ● After sending bit-image data, the printer returns to common data mode. ● ()This order wont be affected by other printing mode(bold, double printing, underline, zoom in) except the revert mode. ● The relation between data and dots to print is as below: When selecting 8 dot density 					



ESC n /

[Name]	Select/cancel user-defined character set			
[Format]	ASCII	ESC	-	n
	Hex	1B	2D	n
	Decimal	27	45	n
[Range]	0n248n50			
[Description]	Select or cancel underline mode according to value of n			
	n	Function		
	0,48	Cancel underline mode		
	1,49	Select underline mode(1 dot width)		
	2,50	Select underline mode(2 dot width)		
[Note]	● The underline can be put under all characters(including right GAP) but			

	not spaces set by HT <ul style="list-style-type: none"> ● Underline can not be add to characters printed with rotating mode or revert display ● When canceling underline mode, the following characters are without underlines and underline width unchanged. Default width is one dot. ● Changing the character size will not affect current underline width. ● Underline mode can also be canceled by ESC !. The command sent last is valid.
[Default]	n=0
[Reference]	ESC !

ESC 2

[Name]	Select default line spacing		
[Format]	ASCII	ESC	2
	Hex	1B	32
	Decimal	27	50
[Description 1]	Select 30 dots height.		
[Note]			
[Reference]	ESC 3		

ESC 3 n

[Name]	Set line spacing		
[Format]	ASCII	ESC	3 n
	Hex	1B	33 n
	Decimal	27	51 n
[Range]	0n255		
[Description]	Set the height of line to be n dot		
[Note]			
[Default Value]	The default value of height of line is 30 dots.		
[Reference]	ESC 2		

ESC @

[Name]	Initialize printer		
[Format]	ASCII	ESC	@
	Hex	1B	40
	Decimal	27	64
[Description 1]	Delete the data in the print buffer area. It is the default printing mode when powered on.		
[Note]	<ul style="list-style-type: none"> ● Save contents in order buffer area. 		

ESC D n1...nk NUL

[Name]	Set horizontal tab positions			
[Format]	ASCII	ESC	D	n1...nk NUL
	Hex	1B	44	n1...nk 00

	Decimal	27	68	n1...nk	0
[Range]	1 n 255 0 k 32				
[Description]	Set horizontal tab position. <ul style="list-style-type: none"> ● Set a tab position at the No.n line from beginning of the line. ● In total there are k pcs of tab position. 				
[Note]	<ul style="list-style-type: none"> ● The horizontal tab position is calculated by this formula: character width x n. Character width includes right GAP. If character is multi-wide, then the tab position multiplies correspondingly. ● This order cancels the previous tab position ● When n=8, current tab position is No.9. ● Max 32(k=32) tab positions can be set. Data exceeding 32 will be regarded as common data. ● NULTab position is aligned by ascending order, the finished mark is NUL. ● When [n]k is less than or equivalent to previous [n]k-1 value, the tab position ends. Following data is treated as common data. ● ESC D NUL cancels all tab position setting. ● Changing the character width won't change the designated tab position. ● Character width under standard mode and page mode is independent. 				
[Default]	Default tab position is 8 standard ASCII characters(12x24) with one tab position.				
[Reference]	HT				

ESC E n

[Name]	Turn emphasized mode on/off				
[Format]	ASCII	ESC	E	n	
	Hex	1B	45	n	
	Decimal	27	69	n	
[Range]	0n255				
[Description]	Select or cancel bold mode When n is 0, bold mode is canceled. When n is 1, bold mode is selected.				
[Note]	<ul style="list-style-type: none"> ● N validates only at last sent command ● /ESC ! can also select/cancel bold mode. The command sent last is valid. 				
[Default]	n = 0				
[Reference]	ESC !				

ESC G n

[Name]	Turn on/off double-strike mode				
[Format]	ASCII	ESC	G	n	
	Hex	1B	47	n	
	Decimal	27	71	n	
[Range]	0n255				
[Description]	Turn on/off double-strike mode When n is 0, double strike mode is canceled. When n is 1, double strike mode is selected.				
[Note]	<ul style="list-style-type: none"> ● N validates only the last sent command 				

	● This order has the same effect as bold printing.
[Default]	n = 0
[Reference]	ESC E

ESC J n

[Name]	Print and feed paper		
[Format]	ASCII	ESC	J n
	Hex	1B	4A n
	Decimal	27	74 n
[Range]	0n255		
[Description]	Prints the data in buffer area and feed paper for n dots line.		
[Note]	<ul style="list-style-type: none"> ● When printing is finished, puts the current print position at beginning of line. ● ESC 2 ESC 3 feeding of paper will not be affected by the order of ESC 2 or ESC 3. ● The max paper feed is 1016mm(40). If the given distance exceeds it, the max value (1014mm) is fed. 		
[Reference]	GS P		

ESC V n

[Name]	Select rotation mode			
[Format]	ASCII	ESC	V	n
	Hex	1B	56	n
	Decimal	27	86	n
[Range]	0 n 348 n 51			
[Description]				
	n	Function		
	0,48	Cancel rotated printing mode, print characters normal		
	1,49	Print characters rotated clockwise by 90 degrees		
	2,50	Print characters rotated clockwise by 180 degrees		
	3,51	Print characters rotated clockwise by 270 degrees		
[Reference]	<ul style="list-style-type: none">● This command takes affect to all character, including Chinese● While using underline mode ,the underline of the word which has been rotated will not print.● When in rotation mode and rotating 180 degrees ,double high and double width will be the same as normal mode, when rotate clockwise 90 degrees or 270 degrees, double high and double width will be swapped.			
[Default]	n = 0			
[Reference]	ESC !, ESC -			

ESC \ nL nH

[Name]	Set relative print position				
[Format]	ASCII	ESC	\	nL	nH
	Hex	1B	5C	nL	nH
	Decimal	27	92	nL	nH
[Range]	0 nL 2550 nH 255				
[Description]	Set relative print position by horizontal or vertical moving unit. <ul style="list-style-type: none"> ● This order sets the print position to (nL+nHx256) dot from current position. 				
[Note]	<ul style="list-style-type: none"> ● Settings exceeding printable area are ignored. ● When print position moves right: nL+nHx256=N ● When print position moves left, nL+nH256=65536N ● The print beginning point moves from current position to N dot. 				
[Reference]	ESC \$				

ESC a n

[Name]	Select justification			
[Format]	ASCII	ESC	a	n
	Hex	1B	61	n
	Decimal	27	97	n
[Range]	0 n 248 n 50			
[Description]	Keep all the printing data aligned by a certain side. Relation between alignment and Value of N			
	n		Alignment	
	0,48		Left Align	
	1, 49		Middle Align	
	2, 50		Right Align	
[Note]	<ul style="list-style-type: none">● This only works for the beginning of the line under standard mode.● This only changes the internal bit zone under page mode.● This order adjusts space area according to HT, ESC \$ or ESC \.			
[Default value]	n = 0			
[Example]	<div><div>Align left<div>ABC ABCD ABCDE</div></div><div>Align center<div>ABC ABCD ABCDE</div></div><div>Align right<div>ABC ABCD ABCDE</div></div></div>			

ESC d n

[Name]	Print and feed n lines				
[Format]	ASCII	ESC	d	n	
	Hex	1B	64	n	
	Decimal	27	100	n	
[Range]	0 n 255				
[Description]	Prints contents in buffer area and feed n lines(character line)				
[Note]	<ul style="list-style-type: none"> ● This command sets the start position of the printer at the beginning of line. ● This command doesn't affect the line distance set by ESC2 or ESC3 				

	<ul style="list-style-type: none"> ● The max feeding distance is 1016mm. When the value is larger than 1016mm, the max distance will be fed.
[Reference]	ESC 2, ESC 3

ESC { n /

[Name]	Turns on/off upside-down printing mode			
[Name]	ASCII	ESC	{	n
	Hex	1B	7B	n
	Decimal	27	123	n
[Name]	0 n 255			
[Name]	Turn on or off invert printing mode: When n is 0, invert printing mode is off. When n is 1, invert printing mode is on.			
[Name]	<ul style="list-style-type: none"> ● Only the last value for N will take affect. ● This command take affect on the beginning of a line. ● In invert printing mode, the printer will print all content rotated 180 degrees. 			
[Reference]	n = 0			
[Instance]	<div> <div> <div>A B C D E F</div> <div>0 1 2 3 4 5</div> </div> <div>↑</div> <div> <div>F E D C B A</div> <div>5 4 3 2 1 0</div> </div> </div> <div>Paper feed direction</div>			

GS ! n

[Name]	Select character size																																																										
[Format]	ASCII	GS	!	n																																																							
	Hex	1D	21	n																																																							
	Decimal	29	33	n																																																							
[Range]	0 n 255, 1-8 Vertical magnification, 1-8 Horizontal magnification																																																										
[Description n]	Use 0 to 3 to select character height, 4 to 7 to select character width. Reference charts below.																																																										
	Digit	0/1	Hex	Decimal	Function																																																						
	0	Character height selection see chart 2																																																									
	1																																																										
	2																																																										
	3																																																										
	4	Character width selection see chart 1																																																									
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	7																																																										
	<div><div>Chart 1 Width selection</div><table><tr><th>Hex</th><th>Decimal</th><th>Horizontal Magnification</th></tr><tr><td>00</td><td>0</td><td>1 (Normal)</td></tr><tr><td>10</td><td>16</td><td>2 (2 times width)</td></tr><tr><td>20</td><td>32</td><td>3</td></tr><tr><td>30</td><td>48</td><td>4</td></tr><tr><td>40</td><td>64</td><td>5</td></tr><tr><td>50</td><td>80</td><td>6</td></tr><tr><td>60</td><td>96</td><td>7</td></tr><tr><td>70</td><td>112</td><td>8</td></tr></table></div> <div><div>Chart 2 Height selection</div><table><tr><th>Hex</th><th>Decimal</th><th>Vertical Magnification</th></tr><tr><td>00</td><td>0</td><td>1 (Normal)</td></tr><tr><td>01</td><td>1</td><td>2 (2 times height)</td></tr><tr><td>02</td><td>2</td><td>3</td></tr><tr><td>03</td><td>3</td><td>4</td></tr><tr><td>04</td><td>4</td><td>5</td></tr><tr><td>05</td><td>5</td><td>6</td></tr><tr><td>06</td><td>6</td><td>7</td></tr><tr><td>07</td><td>7</td><td>8</td></tr></table></div>					Hex	Decimal	Horizontal Magnification	00	0	1 (Normal)	10	16	2 (2 times width)	20	32	3	30	48	4	40	64	5	50	80	6	60	96	7	70	112	8	Hex	Decimal	Vertical Magnification	00	0	1 (Normal)	01	1	2 (2 times height)	02	2	3	03	3	4	04	4	5	05	5	6	06	6	7	07	7	8
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04	4	5																																																									
05	5	6																																																									
06	6	7																																																									
07	7	8																																																									
[Note]	<ul style="list-style-type: none">● This command works with all characters (ASCII and Chinese characters) except for HRI Characters.● If n exceeds regular range, this command will be ignored.● If a single line of characters have different sizes all characters align to the bottom.● ESC ! commend can also select or cancel character width or height. The last received commend is valid.																																																										
[Default value]	n = 0																																																										
[Reference]	ESC !																																																										

GS B n

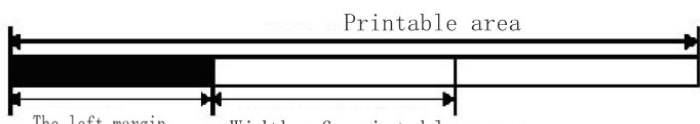
[Name]	Turn on/off white/black reverse printing mode		
[Format]	ASCII	GS	B n

[Range]	Hex	1D	42	n
	Decimal	29	66	n
	0 n 255			
[Description]	Select or cancel white/black reverse printing mode <ul style="list-style-type: none"> ● When n is 0, reverse printing mode is off. ● When n is 1, reverse printing mode is on. 			
[Note]	<ul style="list-style-type: none"> ● Only the last value for N will be used. ● This command is effective to all characters (except the HRI character) ● By selecting reverse printing, character distance set by ESC SP reverses too. ● HRI HT,ESC \$,ESC \ - This command won't affect bmp, customized bmp, barcode HRI character or spaces set by HT,ESC \$,ESC \ ● This command won't affect spaces between lines. ● White black reverse printing mode has higher priority than underline mode. When selecting reverse mode, the underline mode turns off. It won't print until the reverse mode is canceled. 			
[Default]	n = 0			

GS H n

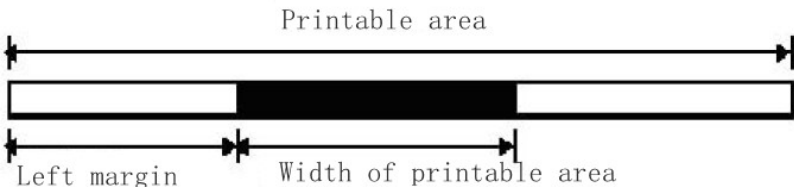
[Name]	Select printing position for HRI characters			
[Format]	ASCII	GS	H	n
	Hex	1D	48	n
	Decimal	29	72	n
[Range]	0 n3 , 48 n51			
[Description]	Select printing position for HRI characters when printing barcodes. N defines the HRI printing position			
	n		Printing Position	
	0,48		Do not print	
	1,49		Above barcode	
	2,50		Below barcode	
	3,51		Both above and below the barcode	
	● HRI is a string to show barcode content			
[Note]				
[Default value]	n = 0			
[Reference]	GS f, GS k			

GS LnL nH

[Name]	Set left margin			
[Format]	ASCII	GS	L	nL nH
	Hex	1D	4C	nL nH
	Decimal	29	76	nL nH
[Range]	0 nL255 , 0nH255			
[Description]	<ul style="list-style-type: none"> ● Set the left margin by nL and nH ● Set the left margin as [(nL+nH256) Horizontal units] inches 			
				

[Note]	<ul style="list-style-type: none"> ● This command only effects the beginning of the line ● If setting exceeds max usable printing width, then the max usable printing width is used.
[Default]	nL = 0, nH = 0
[Reference]	GS W

GS W nL nH

[Name]	Set printing area width				
[Format]	ASCII	GS	W	nL	nH
	Hex	1D	57	nL	nH
	Decimal	29	87	nL	nH
[Range]	0 nL255 , 0nH255				
[Description]	<ul style="list-style-type: none"> ● Set the printing area width by nL and nH ● Set the printing area width as (nL+nH256) dots 				
[Note]	<ul style="list-style-type: none"> ● This command only effects the beginning of the line ● If (left margin+printing area width) exceeds printable area, then the printing area width is the printable width minus the left margin. 				
[Default value]	nL = 76, nH = 2				
[Reference]	GS L				

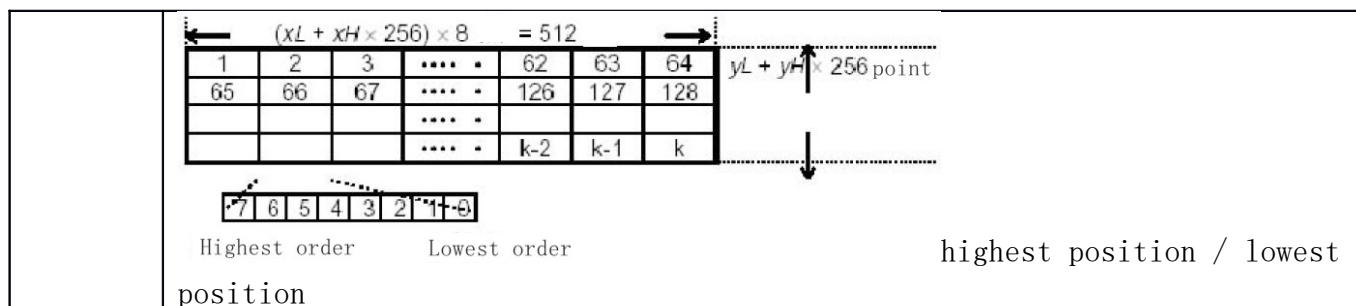
GS h n

[Name]	Select barcode height			
[Format]	ASCII	GS	h	n
	Hex	1D	68	n
	Decimal	29	104	n
[Range]	1 n 255			
[Description]	Selecting the barcodes height			
[Default]	n = 162			
[Reference]	GS k			

GS k m d1...dk NULGS k m n d1...dn

[Name]	Print bar code					
[Format]	1 ASCII	GS	k	m	d1...dk	NUL
	Hex	1D	6B	m	d1...dk	00
	Decimal	29	107	m	d1...dk	0
	2 ASCII	GS	k	m	n	d1...dn
	Hex	1D	6B	m	n	d1...dn
	Decimal	29	107	m	n	d1...dn
[Range]	1 0 m 6 Value range of K and D is defined by barcode type					

	2 65 m 73 Value range of K and D is defined by barcode type																																																																																									
[Description]	Select a barcode type to print barcodes. M is used for selecting barcode type, as shown below:																																																																																									
	<table><tr><td>m</td><td>Barcode type</td><td>Character No.</td><td>d</td><td>Remark</td></tr><tr><td>0</td><td>UPC-A</td><td>11 k 12</td><td>48 d 57</td><td>12th digit is check digit</td></tr><tr><td>1</td><td>UPC-E</td><td>11 k 12</td><td>48 d 57</td><td></td></tr><tr><td>2</td><td>EAN13</td><td>12 k 13</td><td>48 d 57</td><td>13th digit is check digit</td></tr><tr><td>3</td><td>EAN8</td><td>7 k 8</td><td>48 d 57</td><td>8th digit is check digit</td></tr><tr><td>4</td><td>CODE39</td><td>1 k 255</td><td>45 d 57, 65 d 90, d = 32,36, 37,43</td><td></td></tr><tr><td>5</td><td>ITF</td><td>1 k 255 (even Number)</td><td>48 d 57</td><td></td></tr><tr><td>6</td><td>CODABAR</td><td>1 k 255</td><td>48 d 57, 65 d 68, d = 36,43,45,46,47,58</td><td></td></tr><tr><td>6 5</td><td>UPC-A</td><td>11 n 12</td><td>48 d 57</td><td>12th digit is check digit</td></tr><tr><td>6 6</td><td>UPC-E</td><td>11 n 12</td><td>48 d 57</td><td></td></tr><tr><td>6 7</td><td>EAN13</td><td>12 n 13</td><td>48 d 57</td><td>13th digit is check digit</td></tr><tr><td>6 8</td><td>EAN8</td><td>7 n 8</td><td>48 d 57</td><td>8th digit is check digit</td></tr><tr><td>6 9</td><td>CODE39</td><td>1 n 255</td><td>45 d 57, 65 d 90, d = 32,36, 37,43 d1 = dk = 42</td><td>Must be less than 12 digits</td></tr><tr><td>7 0</td><td>ITF</td><td>1 n 255 (Even Number)</td><td>48 d 57</td><td></td></tr><tr><td>7 1</td><td>CODABAR</td><td>1 n 255</td><td>48 d 57 65 d 68, d = 36,43,45,46,47 58</td><td></td></tr><tr><td>7 2</td><td>CODE93</td><td>1 n 255</td><td>0 d 127</td><td></td></tr><tr><td>7 3</td><td>CODE128</td><td>2 n 255</td><td>0 d 127</td><td></td></tr></table>					m	Barcode type	Character No.	d	Remark	0	UPC-A	11 k 12	48 d 57	12th digit is check digit	1	UPC-E	11 k 12	48 d 57		2	EAN13	12 k 13	48 d 57	13th digit is check digit	3	EAN8	7 k 8	48 d 57	8th digit is check digit	4	CODE39	1 k 255	45 d 57, 65 d 90, d = 32,36, 37,43		5	ITF	1 k 255 (even Number)	48 d 57		6	CODABAR	1 k 255	48 d 57, 65 d 68, d = 36,43,45,46,47,58		6 5	UPC-A	11 n 12	48 d 57	12th digit is check digit	6 6	UPC-E	11 n 12	48 d 57		6 7	EAN13	12 n 13	48 d 57	13th digit is check digit	6 8	EAN8	7 n 8	48 d 57	8th digit is check digit	6 9	CODE39	1 n 255	45 d 57, 65 d 90, d = 32,36, 37,43 d1 = dk = 42	Must be less than 12 digits	7 0	ITF	1 n 255 (Even Number)	48 d 57		7 1	CODABAR	1 n 255	48 d 57 65 d 68, d = 36,43,45,46,47 58		7 2	CODE93	1 n 255	0 d 127		7 3	CODE128	2 n 255	0 d 127	
	m	Barcode type	Character No.	d	Remark																																																																																					
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	6 7	EAN13	12 n 13	48 d 57	13th digit is check digit																																																																																					
	6 8	EAN8	7 n 8	48 d 57	8th digit is check digit																																																																																					
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	7 0	ITF	1 n 255 (Even Number)	48 d 57																																																																																						
	7 1	CODABAR	1 n 255	48 d 57 65 d 68, d = 36,43,45,46,47 58																																																																																						
	7 2	CODE93	1 n 255	0 d 127																																																																																						
7 3	CODE128	2 n 255	0 d 127																																																																																							
[Note]	<ul style="list-style-type: none">● This command ends with NULL under such format● When selecting UPC-A or UPC-E code, the rest of the characters will be processed as common characters after printer receives 12 byte barcode data.● When selecting EAN13 type barcodes, the rest of the characters will be processed as common characters after printer receives 13 byte barcode data.● When selecting EAN8 type barcodes, the rest of characters will be processed as common characters after printer receives 8 byte barcode data.● The data for ITF barcodes should be an even length string. If an odd length is entered, then the last digit will be ignored.																																																																																									
[Note]	<ul style="list-style-type: none">● N is used for instructing the numbers in the barcode. The printer processes data after the N byte as barcode data.● If n exceeds regular range, the printer does not process																																																																																									



GS w n

[Name]	Set barcode width			
[Format]	ASCII	GS	w	n
	Hex	1D	77	n
	Decimal	29	119	n
[Range]	2n6			
[Description]	Set the horizontal width of barcode. Use n to designate the width			
	n	Single standard mode width(mm)	Dual standard mode width	
			Narrow standard mode(mm)	Wide standard mode(mm)
	2	0.25	0.25	0.625
	3	0.375	0.375	1.0
	4	0.5	0.5	1.25
	5	0.625	0.625	1.625
	6	0.75	0.75	1.875
	<ul style="list-style-type: none"> Single standard mode code is as follows UPC-A, UPC-E, EAN13, EAN8, CODE93, CODE128 Wide standard mode code is as follows CODE39, ITF, CODABAR 			
[Default]	n = 2			
[Reference]	GS k			

GS (k pL pH cn fn [parameters]

[Name]	Set up and print symbol			
[Description]	<ul style="list-style-type: none"> Handle QR-Code data $(pL + pH \times 256)$ determine the total account of cn, fn and parameters. Cn assign QR-Code type, fixed to 49. Fn assign command Parameters was assigned by different command 			
	fn	format	No	Function name
	65	GS (k pL pH cn fn n1 n2	165	QR-code:select mode (Invalid)
	67	GS (k pL pH cn fn n	167	QR-code: setting the qr-code size
	69	GS (k pL pH cn fn n	169	QR-code: select the error correction level
	80	GS (k pL pH cn fn m d1...dk	180	QR-code: .storage the qr-code data
	8	GS (k pL pH cn fn m	181	QR-code: print the qr-code which

	1			has been storage.
	8	GS (k pL pH cn fn m	182	QR-code: Getting the information
	2			of data which has been storated.
[Note]				
[Reference]				

<Function 167> GS (k pL pH cn fn n(cn = 49, fn = 67)

[Name]	QR Code: Set the size of module								
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n
	Hex	1D	28	6B	pL	pH	cn	fn	n
	Decimal	29	40	107	pL	pH	cn	fn	n
[Range]	$(pL+(pH+256))=3$ (pL=3, pH=0) cn = 49 fn = 67 1 n 16								
[Description]	<ul style="list-style-type: none"> Setting the QR-Code size to n point 								
[Default value]	n = 4								
[Reference]									

<Function 169> GS (k pL pH cn fn n(cn = 49, fn = 69)

[Name]	QR Code: Select the error correction level									
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	n	
	Hex	1D	28	6B	pL	pH	cn	fn	n	
	Decimal	29	40	107	pL	pH	cn	fn	n	
[Range]	(pL+(pH+256))=3 (pL=3, pH=0) cn = 49 fn = 69 48 n 51									
[Description]	● Selecting QR-Code Error correctionlevel									
	N	Function					Portion of area to be covered			
	48	Error correction level L					7%			
	49	Error correction level M					15%			
	50	Error correction level Q					25%			
	51	Error correction level H					30%			
[Default]	n = 48									
[Reference]										

<Function 180> GS (k pL pH cn fn m d1dk (cn = 49, fn = 80)

[Name]	QR Code: Store the data in the symbol storage area								
[Format]	ASCII	GS	(	k	pL	pH	cn	fn	m d1dk
	Hex	1D	28	6B	pL	pH	cn	fn	m d1dk
	Decimal	29	40	107	pL	pH	cn	fn	m d1dk

Chinese character control order

FS ! n Set print mode for Chinese characters.

[Name]	Set print mode(s) for Chinese characters																																													
[Format]	ASCII	FS	!	n																																										
	Hex	1C	21	n																																										
	Decimal	28	33	n																																										
[Range]	0n255																																													
[Description]	<table border="1"> <thead> <tr> <th></th><th>1/0</th><th>HEX</th><th>Decimal</th><th></th></tr> </thead> <tbody> <tr> <td>0,1</td><td>-</td><td>-</td><td>-</td><td>.not defined</td></tr> <tr> <td rowspan="2">2</td><td>0</td><td>00</td><td>0</td><td>.cancel quadruple-size width mode</td></tr> <tr> <td>1</td><td>04</td><td>4</td><td>.select quadruple-size width mode</td></tr> <tr> <td rowspan="2">3</td><td>0</td><td>00</td><td>0</td><td>.cancel quadruple-size height mode</td></tr> <tr> <td>1</td><td>08</td><td>8</td><td>select quadruple-size height mode</td></tr> <tr> <td>4-6</td><td>-</td><td>-</td><td>-</td><td>not defined</td></tr> <tr> <td rowspan="2">7</td><td>0</td><td>00</td><td>0</td><td>cancel underline mode</td></tr> <tr> <td>1</td><td>80</td><td>128</td><td>select underline mode</td></tr> </tbody> </table>					1/0	HEX	Decimal		0,1	-	-	-	.not defined	2	0	00	0	.cancel quadruple-size width mode	1	04	4	.select quadruple-size width mode	3	0	00	0	.cancel quadruple-size height mode	1	08	8	select quadruple-size height mode	4-6	-	-	-	not defined	7	0	00	0	cancel underline mode	1	80	128	select underline mode
	1/0	HEX	Decimal																																											
0,1	-	-	-	.not defined																																										
2	0	00	0	.cancel quadruple-size width mode																																										
	1	04	4	.select quadruple-size width mode																																										
3	0	00	0	.cancel quadruple-size height mode																																										
	1	08	8	select quadruple-size height mode																																										
4-6	-	-	-	not defined																																										
7	0	00	0	cancel underline mode																																										
	1	80	128	select underline mode																																										
[Note]	<ul style="list-style-type: none"> While the quadruple-size height and width has been set, the character will be twice the size. The printer will add an underline to each character, including left and right spaces, but not blanks from HT commands, or characters that have been rotated 90 degrees. You can bold font by using FS W or GS, the last command sent will take affect. You can turn the underline mode on/off by using FS -,the last command sent will take affect. 																																													
[Default value]	n=0																																													
[Reference]	FS , FS W, GS !																																													

FS &

[Name]	Select Chinese character mode		
[Format]	ASCII	FS	&
	Hex	1C	26
	Decimal	28	38
[Description]	Select Chinese character mode		
[Note]	<ul style="list-style-type: none"> While Chinese character mode is chosen, the printer will judge if the Chinese character is an internal code. Handling the first character and then judging the if the next character is internal code as well. The printer will automatic select Chinese mode when the printer is powered on. 		
[Reference]	FS .		

FS - n

[Name]	Turn underline mode on/off for Chinese characters
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[Format]	ASCII	FS	-	n
	Hex	1C	2D	n
	Decimal	28	45	n
[Range]	0n248n50			
[Description]	Select or Cancel the underline mode by the value of n			
	n	Function		
	0,48	Cancel the Chinese characters underline		
	1,49	Select the Chinese characters underline(1 point in width)		
	2,50	Select the Chinese characters underline(2 point in width)		
[Note]	<p>The printer will underline each character ,including left and right spaces, but not characters from an HT command or characters rotated by 90 degrees.</p> <ul style="list-style-type: none">● The printer will not execute the underline print, but the line width of underline you set previously. The default line width is 1 point.● Even if you change the size of the character, the underline you set will not be changed.● You can cancel the underline mode by using FS!, the last command sent will take affect.			
[Default value]	n=0			
[Reference]	FS !			

FS .

[Name]	Cancel Chinese character mode			
[Format]	ASCII	FS	.	
	Hex	1C	2E	
	Decimal	28	46	
[Description]	Cancel Chinese character mode			
[Note]	<ul style="list-style-type: none"> ● When Chinese character has been canceled ,all those characters will be regard as ASCII, the system will handle only one character at a time. ● When powered on Chinese character mode will be selected by default. 			
[Reference]	FS&			

FS C n

[Name]	Select Kanji character code system			
[Format]	ASCII	FS	C	n
	Hex	1C	43	n
	Decimal	28	67	n
[Range]	0n248n50			
[Description]				
	n	Encoding system		
	0,48	GBK simple Chinese		
	1,49	BIG5 traditional Chinese		
	2,50	KSC5601 korean		

[Default value]	n=0
[Reference]	

FS S n1 n2

[Name]	Set left- and right-side Chinese character spacing				
[Format]	ASCII	FS	S	n1	n2
	Hex	1C	53	n1	n2
	Decimal	28	83	n1	n2
[Range]	0 n1 255 , 0 n2 255				
[Description]	Setting the right and left space to n1 and n2				
[Note]					
[Default value]	n1 = 0 n2 = 0				

FS W n

[Name]	Turn quadruple-size mode on/off for Chinese characters			
[Format]	ASCII	FS	W	n
	Hex	1C	57	n
	Decimal	28	87	n
[Range]	0n255			
[Description]	<p>Select or cancel Chinese quadruple-size mode on/off for Chinese characters.</p> <ul style="list-style-type: none">● While n is 0, quadruple-size mode is off.● While n is 1, quadruple-size height mode is on.			
[Note]	<ul style="list-style-type: none">● Only the last sent command will take affect.● While the quadruple-size mode for Chinese characters is on, all Chinese characters will print the same.● While the quadruple-size mode for Chinese characters is off, all Chinese characters will print the same.● When the height of each character is different on a single line, all the characters will align to the bottom line.● You can also select or cancel Chinese quadruple-size height and width, the last command sent will take affect.			
[Default value]	n=0			
[Reference]	FS !GS !			

[Name]	Cut Paper				
[Format]	byte [4]	: 0x1d 0x56 0x42 0x00			
	byte [4]	: 0x1d 0x56 0x41 0x00			

[Name]	Open Cash Drawer				
[Format]	byte [5]	: 0x10 0x14 0x00 0x00 0x00			