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1. ZQ110 Printer Software Development Kit (SDK) for Android™

Overview

1-1 Features

1. Android applications developed with the Android SDK can check the status of the printer.
2. The Android SDK is designed to make mobile printing easier with the ZQ110 using Android applications.

1-2 Functions

1. Print Settings (Alignment / Page Mode)
2. Charter Data Settings (Code Page / Device Font Type)
3. Character Style Settings (Bold / Reverse / Underline)
4. Image Printing (Raster Bit / NV Graphics)
5. One-Dimensional Barcode Printing
6. Two-Dimensional Barcode Printing
7. Printer Command Transmission
8. Printer Response Reception (Printing Result / Printer Status)

2. Operating Environment

2-1 Android Version

1. Printing over Bluetooth or Wireless LAN: Android 2.2 (Froyo) or higher
2. Printing over USB: Android 3.1 (Honeycomb) or higher

2-2 Printer Connectivity

1. Bluetooth
2. Wireless LAN
3. USB
3. Development Environment

3-1 System Requirements

3-1-1 Operating System
- Windows XP (32-bit), Vista (32- or 64-bit), or Windows 7 (32- or 64-bit)
- Mac OS X 10.5.8 or later (x86 only)
- Linux (tested on Ubuntu Linux, Lucid Lynx)
  GNU C Library (glibc) 2.7 or later is required.
  On Ubuntu Linux, version 8.04 or later is required.
  64-bit distributions must be capable of running 32-bit applications.

3-1-2 Eclipse IDE
- Eclipse 3.6.2 (Helios) or greater
- JDK 6 (JRE alone is not sufficient)
- Android SDK
- ADT (Android Development Tools) plugin
3-2 Connecting an Android Device to Your Printer

The following screens were captured from an Android 4.4 smartphone. The screens and field names may be slightly different on other Android operating systems or devices.

3-2-1 Bluetooth

![Image of Bluetooth settings on Android]

NOTE - Make sure Bluetooth is enabled on your printer and make sure the printer power is ON.

1. On your Android device, select **Settings > Bluetooth**.
2. Select **Scan**. The printer performs service discovery and pairing operation.
3. The printer's default PIN code is “0000”. Enter the PIN code on your Android device.
4. Your printer connects directly to your Android device.
3-2-2 Network (WLAN)

NOTE – By factory default, the printer network mode is set to “ad-hoc”, also known as “peer-to-peer” mode. To change the network mode and WLAN configuration on your printer, use the Net Configuration Tool included on the CD. Refer to the Net Configuration Tool Manual also included on the CD for instructions on installing and using the Net Configuration Tool.

1. Print a configuration label on your printer. Refer to the ZQ110 User Manual for instructions. Review the configuration label and make sure WiFi is enabled on your printer and your printer’s Network Mode: Infrastructure (AP).
2. To connect the printer to the network, follow the instructions in the Net Configuration Tool Manual to manually assign an IP address to your printer or obtain an IP address automatically using DHCP (Dynamic Host Configuration Protocol).
3. On your Android device, tap or click Settings.
4. Connect the device to the wireless network. Make sure the printer is connected to the same network.

NOTE - Additional settings are not required to connect the Android device to the TCP/IP port of ZQ110.
3-2-3 USB

1. Android devices can be connected to USB peripheral devices using OS version 3.1 or higher and a USB cable. A mini/micro USB adaptor may be required depending on your specific Android device. Check with the device manufacturers’ user documentation for further information.

2. Drivers or printer software is not necessary on Android devices to allow printing.

3. When the ZQ110 is connected the first time, the following message may appear:
4. The following code should be entered to AndroidManifest.xml and res/xml/device_filter.xml in order to connect USB peripheral devices.

[AndroidManifest.xml]

```xml
<intent-filter>
  <action android:name="android.hardware.usb.action.USBDEVICE ATTACHED" />
</intent-filter>

<meta-data
  android:name="android.hardware.usb.action.USBDEVICE ATTACHED"
  android:resource="@xml/device_filter" />
```

[device_filter.xml]

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <usb-device
    Product-id="275"
    vendor-id="2655" />
</resources>
```
3-2-4 Wi-Fi Direct

Android version should be 4.0 or higher in order to connect with peripheral devices using Wi-Fi Direct.

No special driver or printer software is required on Android device.

1. Tap or click **Settings**.
2. Select **Wi-Fi Direct**.

3. Select the printer from search list. The default PIN for Wi-Fi Direct is “12345678”.

![Wi-Fi Direct Screen](image)

![Invitation to connect](image)
3-2-5 Setting Android Device Developer Options

1. Tap or click **Settings**.
2. Tap or click **Developer options**.
3. Tap or click **USB debugging**.

![Developer options settings](image)

3-3 Importing Library and Running Sample Application

**NOTE** - Android Development Tool (ADT) plug-in should be installed in Eclipse IDE.

ADT (Android Development Tool) plug in should be installed in Eclipse.

3-3-1 How to import an Android project in Eclipse

1. Launch **Eclipse**.
2. Select **File > Import**.
3. Select **General > Existing Project into Workspace**.
4. Select **Browse** and enter the path to the ZQ110Sample file.

3-3-2 How to run/debug the project

1. Select **Project > Run/Debug**.
4. Package Contents

4-1 Package
The following is a list of files in the package:

- libs/ZQ110.jar: Printer library
- sample/ZQ110Sample: Sample program project folder
5. Sample Program

This chapter explains how to use the sample program. (ZQ110Sample)
The sample is provided as an Android application project using Eclipse.

5-1 Functions

- Search printer
- Connect printer
- Disconnect printer
- Print text
- Print image file
- Print one-dimensional bar code
- Print two-dimensional bar code
- Print in the page mode
- Check printer status
- Check printer information

5-2 Environment Configuration

1. Extract the ZQ110 Android SDK package.
2. Copy ZQ110.jar from the downloaded SDK folder to ZQ110Sample library folder.
   For example, copy the ZQ110.jar file from the downloaded SDK folder “ZQ110 Android Printer SDK V1.0.0/lib” into the “ZQ110 Android Printer SDK V1.0.0/sample/ZQ110Sample/libs” folder.
3. Launch Eclipse. Select File > Import from Eclipse.
4. From the following screen, select General > Existing Project into Workspace.
5. Select Browse and select the path where ZQ110Sample is located.
6. Right-click on ZQ110Sample in the Package Explorer and select Properties.
7. In the Java Build Path, select the Libraries tab, then, select Add JARs, then, select lib/ZQ110.jar.
8. Right-click on ZQ110Sample in the Package Explorer and select Run As > Android Application.
9. Install the sample program on the target Android device. Select the ZQ110Sample application and run the program.
5-3 How to Use Sample Program

5-3-1 Search and Connect Printer

1. Launch the sample program on your Android device.
2. Select the **Option** menu and connect your printer using **Bluetooth**, **Network**, or a **USB interface**.
   A. If Bluetooth is selected, a dialog box containing a list of paired printer(s) and their MAC addresses appears.
   B. If Network is selected, a dialog box containing a list of available printers and their IP addresses appears.
   C. If USB is selected, a dialog box containing a list of printers connected through USB connection appears.
3. Select the desired printer from the device list.
4. **Connected to (Printer Model Name or USB Device ID)** appears in the title area when a connection is established.
5. Printer function list is activated when connection is established.
6. API Reference

This chapter describes the API provided by the ZQ110 Android SDK.

6-1 Create printer instance

6-1-1 Constructor
Create an instance of ZQ110 to use the printer. Methods implemented in the ZQ110 class are configured for asynchronous operation. When a response is to be received from the printer, other methods can be executed only after reception of the response is completed. When multiple printers are connected, a separate instance should be created for each printer.

[Syntax]
* public ZQ110(Context context, Handler handler, Looper looper)

[Parameters]
* **context**: is a context instance used to access Wi-Fi service, USB service, and file system of Android.
* **handler**: is application handler to connect and receive print message.
* **Looper**: Set main looper in application to create ZQ110 instance in a separate thread in order to avoid the collision between the handler in the application and the internal handler in the printer library. Set it to null to create a ZQ110 instance from the main thread.
public class MainActivity extends Activity {

    ... 

    private ZQ110 mZQ110; 

    ... 

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public Boolean handleMessage(Message msg) {

            ...

        }

    });
}
6-2 Search Printer

6-2-1 findBluetoothPrinters
This method obtains the information of paired Bluetooth device and passes the MESSAGE_BLUETOOTH_DEVICE_SET message to the application handler. The message includes the information of the paired Bluetooth device. The return value will be null if no paired Bluetooth device is found.

[Syntax]
* public void findBluetoothPrinters()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.findBluetoothPrinters();

        ...
    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_BLUETOOTH_DEVICE_SET:
                    Set<BluetoothDevice> bluetoothDeviceSet =
                        (Set<BluetoothDevice>) msg.obj;
                    
                    ...
            }
        }
    }
```
for (BluetoothDevice device : bluetoothDeviceSet) {
    if (device.getName().equals("ZQ110")) {
        // TODO: Connect printer
        break;
    }
}
break;
return true;
};
6-2-2 findNetworkPrinters
This method searches the printers connected to the same network as Android device that runs the application. It sends the MESSAGE_NETWORK_DEVICE_SET message to the application handler when the search operation is completed. The message includes the IP addresses of the printers that can be connected. The return value will be null if no printer is found.

[Syntax]
* public void findNetworkPrinters(int timeout)

[Parameters]
* timeout: timeout in searching printer (millisecond)

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.findNetworkPrinters(5000);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

                case ZQ110.MESSAGE_NETWORK_DEVICE_SET: 
```
if (msg.obj != null) {
    Set<String> ipAddressSet = (Set<String>) msg.obj;
    for (String ipAddress : ipAddressSet) {
        if (ipAddress.equals("192.168.0.100")) {
            // TODO: Connect printer
            break;
        }
    } break;
}
return true;
6-2-3 findUsbPrinters

This method obtains the information of the printer connected by USB with the Android device that runs the application, and it sends the MESSAGE_USB_DEVICE_SET message to the application handler. The message includes the information of the printer connected by USB. The return value will be null if no USB printer is found.

[Syntax]
* public void findUsbPrinters()

[Example]

public class MainActivity extends Activity {
    ...
    private ZQ110 mZQ110;
    ...
    public void onCreate(Bundle savedInstanceState) {
        ...
        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.findUsbPrinters();
    }
    ...
    private final Handler mHandler = new Handler(new Handler.Callback() {
        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_USB_DEVICE_SET:
                    Set<UsbDevice> usbDeviceSet = (Set<UsbDevice>) msg.obj;
                    for (UsbDevice device : usbDeviceSet) {
                        if (device.getProductId() == 0x0113) {
                            // TODO: Connect printer
                        }
                    }
            }
        }
    });


break;
}
break;
return true;
};
}
6-3 Connect Printer

6-3-1 connect
This method opens the printer port of USB printer and enables communication. It sends the MESSAGE_STATE_CHANGE that includes STATE_CONNECTING in arg1 when connection process is initiated and MESSAGE_STATE_CHANGE with STATE_CONNECTED in arg1 when the connection is completed to the application handler. The messages are transmitted in the following order when this method is called.

* If connection is successful
  1. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTING): Connection is being established.
  2. MESSAGE_DEVICE_NAME: Connection to printer port is successful (USB device name of the printer recognized in Android device is transmitted.)
  3. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTED): Communication with the printer is enabled.

* If connection fails
  1. MESSAGE_TOAST: “Unable to connect device” message is sent.
  2. MESSAGE_STATE_CHANGE (arg1: STATE_NONE): Printer is not connected.

[Syntax]
* public void connect()
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect();

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

                case ZQ110.MESSAGE_STATE_CHANGE:
                    switch (msg.arg1) {
                        case ZQ110.STATE_CONNECTING:
                            // TODO: Processing when connection to printer is being tried
                            break;
                        case ZQ110.STATE_CONNECTED:
                            // TODO: Processing when printer connection is completed
                            break;
                        case ZQ110.STATE_NONE:
                            // TODO: Processing when printer is not connected
                            break;

                    }
            }

        }

    });
break;

case ZQ110.MESSAGE_DEVICE_NAME:
    String connectedDeviceName =
        msg.getData().getString(
            ZQ110.KEY_STRING_DEVICE_NAME);
    break;

case ZQ110.MESSAGE_TOAST:
    Toast.makeText(getApplicationContext(),
        msg.getData().getString(ZQ110.KEY_STRING_TOAST),
        Toast.LENGTH_SHORT).show();
    break;
};

return true;
6-3-2 connect
This method opens the port of paired Bluetooth printer and enables communication.
It sends the MESSAGE_STATE_CHANGE message with STATE_CONNECTING in arg1 when connection process is initiated and MESSAGE_STATE_CHANGE with STATE_CONNECTED in arg1 when connection is completed to the application handler. Messages are transmitted in the following order when this method is called.

* If connection is successful
  1. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTING): Connection is being established.
  2. MESSAGE_DEVICE_NAME: Connection to printer port is successful. (Bluetooth device name of the printer recognized by Android device is transmitted.)
  3. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTED): Communication with printer is enabled.

* If connection fails
  1. MESSAGE_TOAST: “Unable to connect device” message is sent.
  2. MESSAGE_STATE_CHANGE (arg1: STATE_NONE): Printer is not connected.

[Syntax]
* public void connect(String address)

[Parameters]
* address: Bluetooth MAC address of the printer to connect (it can also be checked with Self-Test function.) If this parameter is set to null, then connection will be tried with the first searched printer among all paired printers.
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        String address = "01:23:45:67:89:ab";
        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(address);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_STATE_CHANGE:
                    switch (msg.arg1) {
                        case ZQ110.STATE_CONNECTING:
                            // TODO: Processing when connection to printer is being tried
                            break;
                        case ZQ110.STATE_CONNECTED:
                            // TODO: Processing when printer connection is completed
                            break;
                        case ZQ110.STATE_NONE:
                            // TODO: Processing when printer is not connected
                            break;
                    }

            }

        }

    });
case ZQ110.MESSAGE_DEVICE_NAME:
    String connectedDeviceName =
        msg.getData().getString(
            ZQ110.KEY_STRING_DEVICE_NAME);
    break;

case ZQ110.MESSAGE_TOAST:
    Toast.makeText(getApplicationContext(),
        msg.getData().getString(ZQ110.KEY_STRING_TOAST),
        Toast.LENGTH_SHORT).show();
    break;

return true;
6-3-3 connect
This method opens the port of printer connected with Wireless LAN and enables communication. It sends the MESSAGE_STATE_CHANGE message with STATE_CONNECTING in arg1 when connection process is initiated and MESSAGE_STATE_CHANGE with STATE_CONNECTED in arg1 when connection is completed to the application handler.
Messages are transmitted in the following order when this method is called.

* If connection is successful
  1. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTING): Connection is being established
  2. MESSAGE_DEVICE_NAME: Connection to printer port is successful. (Device name of the printer recognized by Android device is transmitted.)
  3. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTED): Communication with printer is enabled.

* If connection fails
  1. MESSAGE_TOAST: “Unable to connect device” message is sent.
  2. MESSAGE_STATE_CHANGE (arg1: STATE_NONE): Printer is not connected.

[Syntax]
* public void connect(String host, int port, int timeout)

[Parameters]
* host: IP address of the printer to connect
* port: Port number of the printer to connect (only 9100 is allowed.)
* timeout: Timeout in connecting printer (millisecond)
[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect("192.168.0.100", 9100, 5000);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

                case ZQ110.MESSAGE_STATE_CHANGE:
                    switch (msg.arg1) {
                        case ZQ110.STATE_CONNECTING:
                            // TODO: Processing when connection to printer is being tried
                            break;
                        case ZQ110.STATE_CONNECTED:
                            // TODO: Processing when printer connection is completed
                            break;
                        case ZQ110.STATE_NONE:
                            // TODO: Processing when printer is not connected
                            break;
                    }

                case ZQ110.STATE_CONNECTED:
                    // TODO: Processing when printer connection is completed
                    break;

            }
        }
    }

```
break;

case ZQ110.MESSAGE_DEVICE_NAME:
    String connectedDeviceName =
        msg.getData().getString(
            ZQ110.KEY_STRING_DEVICE_NAME);
    break;

case ZQ110.MESSAGE_TOAST:
    Toast.makeText(getApplicationContext(),
        msg.getData().getString(ZQ110.KEY_STRING_TOAST),
        Toast.LENGTH_SHORT).show();
    break;
};
    return true;
6-3-4 connect
This method opens the port of printer connected over USB and enables communication. It sends the MESSAGE_STATE_CHANGE message with STATE_CONNECTING in arg1 when connection process is initiated and MESSAGE_STATE_CHANGE with STATE_CONNECTED in arg1 when connection is completed to the application handler. Messages are transmitted in the following order when this method is called.

* If connection is successful
  1. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTING): Connection is being established
  2. MESSAGE_DEVICE_NAME: Connection to printer port is successful. (Device name of the printer recognized by Android device is transmitted.)
  3. MESSAGE_STATE_CHANGE (arg1: STATE_CONNECTED): Communication with printer is enabled.

* If connection fails
  1. MESSAGE_TOAST: “Unable to connect device” message is sent.
  2. MESSAGE_STATE_CHANGE (arg1: STATE_NONE): Printer is not connected.

[Syntax]
* public void connect(UsbDevice device)

[Parameters]
* device: UsbDevice instance of the device to connect. It can be received through the message received as a response to findUsbPrinters().
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.findUsbPrinters();

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

                case ZQ110.MESSAGE_USB_DEVICE_SET:
                    Set<UsbDevice> usbDeviceSet = (Set<UsbDevice>) msg.obj;
                    for (UsbDevice device : usbDeviceSet) {
                        if (device.getProductId() == 0x0113) {
                            mZQ110.connect(device);
                            break;
                        }
                    }
                break;

                default:
                    return true;
            }

            return true;

        }

    });

    public boolean handleMessage(Message msg) {

        switch (msg.what) {

            case ZQ110.MESSAGE_USB_DEVICE_SET:
                Set<UsbDevice> usbDeviceSet = (Set<UsbDevice>) msg.obj;
                for (UsbDevice device : usbDeviceSet) {
                    if (device.getProductId() == 0x0113) {
                        mZQ110.connect(device);
                        break;
                    }
                }
            break;

            default:
                return true;
        }

        return true;

    }

    case ZQ110.MESSAGE_STATE_CHANGE:
        switch (msg.arg1) {
            case ZQ110.STATE_CONNECTING:
                // TODO: Processing when connection to printer is being tried
                break;
        }

    }

);
break;

    case ZQ110.STATE_CONNECTED:
        // TODO: Processing when printer connection is completed
        break;

    case ZQ110.STATE_NONE:
        // TODO: Processing when printer is not connected
        break;
    }
break;

    case ZQ110.MESSAGE_DEVICE_NAME:
        String connectedDeviceName =
            msg.getData().getString(ZQ110.KEY_STRING_DEVICE_NAME);
break;

    case ZQ110.MESSAGE_TOAST:
        Toast.makeText(getApplicationContext(),
            msg.getData().getString(ZQ110.KEY_STRING_TOAST),
            Toast.LENGTH_SHORT).show();
break;
    }
return true;
};
6-3-5 disconnect
The method closes the port of connected printer and terminates the connection.
When connection is terminated, it sends the MESSAGE_STATE_CHANGE message (arg1: STATE_NONE) to application handler.

[Syntax]
* public void disconnect()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...
    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_STATE_CHANGE:
                    switch (msg.arg1) {
                        case ZQ110.STATE_CONNECTING:
                            // TODO: Processing when connection to printer is being tried
                            break;
                    }
            }
        }
    });
```
case ZQ110.STATE_CONNECTED:
    mZQ110.disconnect();
    break;

    case ZQ110.STATE_NONE:
        Toast.makeText(getApplicationContext(), "Printer is disconnected",
                        Toast.LENGTH_SHORT).show();
        break;
    }
    break;
}

    return true;
};
6-4 Print

6-4-1 form Feed
This method performs paper feeding in the page mode or label mode.

[Syntax]
* public void formFeed(boolean getResponse)

[Parameters]
* getResponse: A message is sent to the application handler upon completion of feeding if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == STATE_CONNECTED) {
                    ...
                }
            }

        }

    }

    }
```
// TODO: Printing processing
mZQ110.formFeed(true);
}
break;

case MESSAGE_PRINT_COMPLETE:
mZQ110.disconnect();
break;
}
return true;
};
6-4-2 lineFeed
This method feeds the paper by the specified number of lines.

[Syntax]
* public void lineFeed(int lines, boolean getResponse)

[Parameters]
* lines: number of lines to feed
* getResponse: A message is sent to the application handler upon completion of feeding
  if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case MESSAGE_STATE_CHANGE:
                    if (msg.arg1 == STATE_CONNECTED) {
                        mZQ110.lineFeed(5, true);
                    }
            }
        }

```
case MESSAGE_PRINT_COMPLETE:
    mZQ110.disconnect();
    break;
}
return true;

};
6-4-3 print1dBarcode

This method prints one dimensional barcode.

[Syntax]
* public void print1dBarcode(
  String data, int barCodeSystem, int alignment, int width, int height,
  int characterPosition, boolean getResponse)

[Parameters]
* data: barcode data to print
* barCodeSystem: barcode system

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR_CODE_UPC_A</td>
<td>65</td>
<td>UPC-A</td>
</tr>
<tr>
<td>BAR_CODE_UPC_E</td>
<td>66</td>
<td>UPC-E</td>
</tr>
<tr>
<td>BAR_CODE_EAN13</td>
<td>67</td>
<td>EAN13</td>
</tr>
<tr>
<td>BAR_CODE_EAN8</td>
<td>68</td>
<td>EAN8</td>
</tr>
<tr>
<td>BAR_CODE_CODE39</td>
<td>69</td>
<td>CODE93</td>
</tr>
<tr>
<td>BAR_CODE_ITF</td>
<td>70</td>
<td>ITF</td>
</tr>
<tr>
<td>BAR_CODE_CODABAR</td>
<td>71</td>
<td>CODABAR</td>
</tr>
<tr>
<td>BAR_CODE_CODE128</td>
<td>73</td>
<td>CODE128</td>
</tr>
</tbody>
</table>

* alignment: barcode alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* width: width of barcode (1 ~ 6)
* height: height of barcode (1 ~ 255)
* characterPosition: position to print barcode data string

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRI_CHARACTER_NOT_PRINTED</td>
<td>0</td>
<td>Character string is not printed</td>
</tr>
<tr>
<td>HRI_CHARACTER_ABOVE_BAR_CODE</td>
<td>1</td>
<td>Character string is printed above barcode</td>
</tr>
<tr>
<td>HRI_CHARACTER_BELOW_BAR_CODE</td>
<td>2</td>
<td>Character string is printed below barcode</td>
</tr>
<tr>
<td>HRI_CHARACTER_ABOVE_AND_BELOW_BAR_CODE</td>
<td>3</td>
<td>Character string is printed above and below barcode</td>
</tr>
</tbody>
</table>
getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;  

    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...
    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.print1dBarcode("012345678905",
                                            ZQ110.BAR_CODE_UPC_A,
                                            ZQ110.ALIGNMENT_LEFT, 3, 162,
                                            ZQ110.HRI_CHARACTER_ABOVE_BAR_CODE,
                                            true);
                }
                break;
            case ZQ110.MESSAGE_PRINT_COMPLETE:
                break;
            }
        }
    }

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.print1dBarcode("012345678905",
                                            ZQ110.BAR_CODE_UPC_A,
                                            ZQ110.ALIGNMENT_LEFT, 3, 162,
                                            ZQ110.HRI_CHARACTER_ABOVE_BAR_CODE,
                                            true);
                }
                break;
            case ZQ110.MESSAGE_PRINT_COMPLETE:
                break;
            }
        }
```
```java
mZQ110.disconnect();
break;
return true;
};
```
6-4-4 printAztec
This method prints Aztec.

**[Syntax]**

* public void printAztec(
  String data, int alignment, int size, int mode, boolean getResponse)

**[Parameters]**

* data: barcode data to print
* alignment: barcode printing alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* size: size of barcode to print (1 ~ 8)
* mode: mode of barcode to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZTEC_DATA_MODE</td>
<td>0</td>
<td>All character is supported.</td>
</tr>
<tr>
<td>AZTEC_GS1_MODE</td>
<td>1</td>
<td>Extended ASCII characters and control characters are not supported. Data should start with an AI</td>
</tr>
<tr>
<td>AZTEC_UNICODE_MODE</td>
<td>2</td>
<td>Only latin-1 characters are supported</td>
</tr>
</tbody>
</table>

* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

**[Example]**

```java
public class MainActivity extends Activity {

...

private ZQ110 mZQ110;

...

public void onCreate(Bundle savedInstanceState) {

...

mZQ110 = new ZQ110(this, mHandler, null);
```
mZQ110.connect(null);

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printAztec("www.zebra.com",
                        ZQ110.ALIGNMENT_LEFT, 2,
                        ZQ110.AZTEC_DATA_MODE, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }

});
6-4-5 printBitmap
This method converts Bitmap instance to black and white image and prints the image.

[Syntax]
* public void printBitmap(
    Bitmap bitmap, int alignment, int width, int level, boolean getResponse)

[Parameters]
* bitmap: Bitmap instance to print
* alignment: Image alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* width: width of image to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITMAP_WIDTH_FULL</td>
<td>-1</td>
<td>Image is enlarged or reduced to the maximum printing width and printed.</td>
</tr>
<tr>
<td>BITMAP_WIDTH_NONE</td>
<td>0</td>
<td>Image is printed without resizing or reduced to the maximum printing width if the image is wider than the maximum width.</td>
</tr>
</tbody>
</table>

* level: brightness level of the image to print (13 ~ 88)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        printBitmap(bitmap, ALIGNMENT_LEFT, 200, 25, false);

        ...
```
mZQ110 = new ZQ110(this, mHandler, null);
mZQ110.connect(null);

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    BitmapDrawable drawable =
                        (BitmapDrawable)
                        getResources().getDrawable(R.drawable.logo);
                    Bitmap bitmap = drawable.getBitmap();
                    mZQ110.printBitmap(bitmap,
                        ZQ110.ALIGNMENT_LEFT,
                        ZQ110.BITMAP_WIDTH_FULL, 50, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }

});
6-4-6 printBitmap
This method prints black and white image data.

[Syntax]
* public void printBitmap(
    byte[] pixels, int alignment, int width, int height, boolean getResponse)

[Parameters]
* pixels: image data to print
* alignment: Image alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* width: width of image to print
* height: height of image to print
* getResponse: A message is sent to the application handler upon completion of printing
  if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }
```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    BitmapDrawable drawable =
                        (BitmapDrawable)
                        getResources().getDrawable(R.drawable.logo);
                    Bitmap bitmap = drawable.getBitmap();
                    mZQ110.getMonoPixels(bitmap,
                        ZQ110.BITMAP_WIDTH_FULL, 50);
                }
                break;

            case ZQ110.MESSAGE_COMPLETE_PROCESS_BITMAP:
                Bundle data = msg.getData();
                byte[] pixels = data.getByteArray(ZQ110.KEY_STRING_MONO_PIXELS);
                if (array != null) {
                    int width = msg.arg1;
                    int height = msg.arg2;
                    mZQ110.printBitmap(pixels, ZQ110.ALIGNMENT_LEFT,
                        width, height, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }
});
6-4-7 printBitmap
This method converts the image file located in the specified path to black and white image and prints the image.

[Syntax]
* public void printBitmap(
    String pathName, int alignment, int width, int level, boolean getResponse)

[Parameters]
* pathName: absolute path of the image file to print
* alignment: Image alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* width: width of image to print. Height of the image is automatically adjusted in proportion to the width.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITMAP_WIDTH_FULL</td>
<td>-1</td>
<td>Image is enlarged or reduced to the maximum printing width and printed.</td>
</tr>
<tr>
<td>BITMAP_WIDTH_NONE</td>
<td>0</td>
<td>Image is printed without resizing or reduced to the maximum printing width if the image is wider than the maximum width.</td>
</tr>
</tbody>
</table>

Integer
Enter integer number directly

* level: brightness level of the image to print (13 ~ 88)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

```
mZQ110 = new ZQ110(this, mHandler, null);

mZQ110.connect(null);

private final Handler mHandler = new Handler(new Handler.Callback() { 

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    String pathName =
                        Environment.getExternalStorageDirectory().getAbsolutePath() +
                        "logo.png";
                    mZQ110.printBitmap(pathName,
                        ZQ110.ALIGNMENT_LEFT,
                        ZQ110.BITMAP_WIDTH_FULL, 50, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }
});
6-4-8 printDataMatrix
This method prints Data Matrix.

[Syntax]
* public void printDataMatrix(String data, int alignment, int size, boolean getResponse)

[Parameters]
* data: DataMatrix barcode data to print
* alignment: alignment of print data

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* size: size of barcode data to print (2 ~ 3)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

```
public boolean handleMessage(Message msg) {
    switch (msg.what) {
    case ZQ110.MESSAGE_STATE_CHANGE:
        if (msg.arg1 == ZQ110.STATE_CONNECTED) {
            mZQ110.printDataMatrix("www.zebra.com",
                ZQ110.ALIGNMENT_LEFT, 3, true);
        }
        break;
    case ZQ110.MESSAGE_PRINT_COMPLETE:
        mZQ110.disconnect();
        break;
    }
    return true;
}
6-4-9 printGs1Databar
This method prints GS1 Databar.

[Syntax]
* public void printGs1Databar(
    String data, int alignment, int function, int width, int height, boolean getResponse)

[Parameters]
* data: barcode data to print
* alignment: barcode printing alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* function: function of barcode to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS1_DATABAR_RSS14</td>
<td>50</td>
<td>RSS14 (GS1 DataBar Omnidirectional)</td>
</tr>
<tr>
<td>GS1_DATABAR_RSS14_TRUNCATED</td>
<td>51</td>
<td>RSS14 Truncated (GS1 DataBar Truncated)</td>
</tr>
<tr>
<td>GS1_DATABAR_RSS14_STACKED</td>
<td>52</td>
<td>RSS14 Stacked (GS1 DataBar Stacked)</td>
</tr>
<tr>
<td>GS1_DATABAR_RSS14_STACKED_OMNI</td>
<td>53</td>
<td>RSS14 Stacked Omnidirectional (GS1 DataBar Stacked Omnidirectional)</td>
</tr>
<tr>
<td>GS1_DATABAR_UPC_A</td>
<td>56</td>
<td>UPC-A</td>
</tr>
<tr>
<td>GS1_DATABAR_UPC_E</td>
<td>57</td>
<td>UPC-E</td>
</tr>
<tr>
<td>GS1_DATABAR_EAN13</td>
<td>58</td>
<td>EAN-13</td>
</tr>
<tr>
<td>GS1_DATABAR_EAN8</td>
<td>59</td>
<td>EAN-8</td>
</tr>
<tr>
<td>GS1_DATABAR_UCC_EAN128_CC_A_B</td>
<td>60</td>
<td>UCC/EAN-128&amp;CC-A/B</td>
</tr>
<tr>
<td>GS1_DATABAR_UCC_EAN128_CC_C</td>
<td>61</td>
<td>UCC/EAN-128&amp;CC-C</td>
</tr>
</tbody>
</table>

* width: width of barcode to print (1 ~ 8)
* height: height of barcode to print (1 ~ 8)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {  

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printGs1Databar("12345678901\this is composite info",
                    ZQ110.ALIGNMENT_LEFT,
                    ZQ110.GS1_DATABAR_RSS14
                    2, 2, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
            }

        }

    });
return true;

};

}
6-4-10 printPdf417
This method prints PDF417.

[Syntax]
* public void printPdf417(
    String data, int alignment, int width, int height, boolean getResponse)

[Parameters]
* data: barcode data to print
* alignment: barcode printing alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* width: width of barcode to print (2 ~ 3)
* height: height of barcode to print (2 ~ 8)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printPdf417("www.zebra.com", ZQ110.ALIGNMENT_LEFT, 3, 8, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }

        return true;
    }

});
6-4-11 printQrCode
This method prints QR Code.

[Syntax]
* public void printQrCode(
       String data, int alignment, int model, int size, boolean getResponse)

[Parameters]
* data: barcode data to print
* alignment: barcode printing alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* model: QR Code model to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QR_CODE_MODEL1</td>
<td>48</td>
<td>QR Code model 1</td>
</tr>
<tr>
<td>QR_CODE_MODEL1</td>
<td>49</td>
<td>QR Code model 2</td>
</tr>
</tbody>
</table>

* size: size of barcode to print (1 ~ 8)
* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

public class MainActivity extends Activity {
  
  ...  
  
  private ZQ110 mZQ110;
  
  ...
  
  public void onCreate(Bundle savedInstanceState) {
    ...
    
    mZQ110 = new ZQ110(this, mHandler, null);
    mZQ110.connect(null);
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printQrCode("www.zebra.com",
                        ZQ110.ALIGNMENT_LEFT,
                        ZQ110.QR_CODE_MODEL2, 8, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }
});
6-4-12 printQrCode
This method prints QR Code.

[Syntax]
* public void printQrCode(
    String data, int alignment, int model, int size, int errorCorrectionLevel,
    boolean getResponse)

[Parameters]
* data: barcode data to print
  * alignment: barcode printing alignment
  
<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* model: QR Code model to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QR_CODE_MODEL1</td>
<td>48</td>
<td>QR Code model 1</td>
</tr>
<tr>
<td>QR_CODE_MODEL1</td>
<td>49</td>
<td>QR Code model 2</td>
</tr>
</tbody>
</table>

* size: size of barcode to print (1 ~ 8)
  * errorCorrectionLevel: error correction level of barcode to print

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QR_CODE_ERROR_CORRECTION_LEVEL_L</td>
<td>48</td>
<td>Error correction level L</td>
</tr>
<tr>
<td>QR_CODE_ERROR_CORRECTION_LEVEL_M</td>
<td>49</td>
<td>Error correction level M</td>
</tr>
<tr>
<td>QR_CODE_ERROR_CORRECTION_LEVEL_Q</td>
<td>50</td>
<td>Error correction level Q</td>
</tr>
<tr>
<td>QR_CODE_ERROR_CORRECTION_LEVEL_H</td>
<td>51</td>
<td>Error correction level H</td>
</tr>
</tbody>
</table>

* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...
    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

                case ZQ110.MESSAGE_STATE_CHANGE:
                    if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                        mZQ110.printQrCode("www.zebra.com",
                                ZQ110.ALIGNMENT_LEFT,
                                ZQ110.QR_CODE_MODEL2, 8,
                                ZQ110.QR_CODE_ERROR_CORRECTION_LEVEL_L,
                                true);
                    }
                    break;

                case ZQ110.MESSAGE_PRINT_COMPLETE:
                    mZQ110.disconnect();
                    break;

            }

        }

    })

    public boolean handleMessage(Message msg) {

        switch (msg.what) {

            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printQrCode("www.zebra.com",
                            ZQ110.ALIGNMENT_LEFT,
                            ZQ110.QR_CODE_MODEL2, 8,
                            ZQ110.QR_CODE_ERROR_CORRECTION_LEVEL_L,
                            true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;

        }

    }

}
return true;
}

};
}


6-4-13 printSelfTest
This page prints Self-Test page. Printer settings and current code page are printed.

[Syntax]
* public void printSelfTest(boolean getResponse)

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_STATE_CHANGE:
                    if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                        mZQ110.printSelfTest(true);
                    }
                    break;

                case ZQ110.MESSAGE_PRINT_COMPLETE:
                    mZQ110.disconnect();
            }
        }
    });
```
break;
}
return true;

};
6-4-14 printText
This method prints character string.

[Syntax]
* public void printText(String text, int alignment, int attribute, int size,
  boolean getResponse)

[Parameters]
* text: character string to print
* alignment: character string alignment

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALIGNMENT_LEFT</td>
<td>0</td>
<td>Align to left</td>
</tr>
<tr>
<td>ALIGNMENT_CENTER</td>
<td>1</td>
<td>Align to center</td>
</tr>
<tr>
<td>ALIGNMENT_RIGHT</td>
<td>2</td>
<td>Align to right</td>
</tr>
</tbody>
</table>

* attribute: attributes of the character string. When more than one parameter is configured, each option should be combined through bitwise OR operation.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEXT_ATTRIBUTE_FONT_A</td>
<td>0</td>
<td>font type A (12X24)</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_FONT_B</td>
<td>1</td>
<td>font type B (9X17)</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_FONT_C</td>
<td>2</td>
<td>font type C (9X24)</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_UNDERLINE1</td>
<td>4</td>
<td>Underline with 1 dot thickness</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_UNDERLINE2</td>
<td>8</td>
<td>Underline with 2 dots thickness</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_EMPHASIZED</td>
<td>16</td>
<td>Bold</td>
</tr>
<tr>
<td>TEXT_ATTRIBUTE_REVERSE</td>
<td>32</td>
<td>Reversed</td>
</tr>
</tbody>
</table>

* size: size of character string to print. The width and height parameters should be combined through bitwise OR operation.
<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEXT_SIZE_HORIZONTAL1</td>
<td>0</td>
<td>1X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL2</td>
<td>16</td>
<td>2X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL3</td>
<td>32</td>
<td>3X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL4</td>
<td>48</td>
<td>4X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL5</td>
<td>64</td>
<td>5X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL6</td>
<td>80</td>
<td>6X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL7</td>
<td>96</td>
<td>7X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_HORIZONTAL8</td>
<td>112</td>
<td>8X magnification on width</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL1</td>
<td>0</td>
<td>1X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL2</td>
<td>1</td>
<td>2X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL3</td>
<td>2</td>
<td>3X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL4</td>
<td>3</td>
<td>4X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL5</td>
<td>4</td>
<td>5X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL6</td>
<td>5</td>
<td>6X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL7</td>
<td>6</td>
<td>7X magnification on height</td>
</tr>
<tr>
<td>TEXT_SIZE_VERTICAL8</td>
<td>7</td>
<td>8X magnification on height</td>
</tr>
</tbody>
</table>

* getResponse: A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...
```
private final Handler mHandler = new Handler(new Handler.Callback() {
    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printText("printText\n", ZQ110.ALIGNMENT_LEFT, ZQ110.TEXT_ATTRIBUTE_FONT_A | ZQ110.TEXT_ATTRIBUTE_UNDERLINE1, ZQ110.TEXT_SIZE_HORIZONTAL1 | ZQ110.TEXT_SIZE_VERTICAL1, true);
                }
                break;

            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }
});
6-5 Receive Printer Response

6-5-1 automateStatusBack
This method enables or disables automatic status check function of printer. When it is activated, the MESSAGE_READ message (arg1: PROCESS_AUTO_STATUS_BACK) is sent to the application handler whenever there is any change in the printer status. The arg2 includes the following values if there is any error in printer.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO_STATUS_COVER_OPEN</td>
<td>32</td>
<td>Printer cover is open.</td>
</tr>
<tr>
<td>AUTO_STATUS_NO_PAPER</td>
<td>12</td>
<td>No printer paper</td>
</tr>
</tbody>
</table>

[Syntax]
* public void automateStatusBack(boolean isEnable)

[Example]

```java
public class MainActivity extends Activity {

    ... 

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect();

        ...

    }

    public void onDestroy() {

        ...

    }
```
if (mZQ110 != null) {
    mZQ110.automateStatusBack(false);
    mZQ110.disconnect();
}

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.automateStatusBack(true);
                }
                break;

            case ZQ110.MESSAGE_READ:
                StringBuffer buffer = new StringBuffer(0);
                if (msg.arg1 == ZQ110.PROCESS_AUTO_STATUS_BACK) {
                    if ((msg.arg2 & ZQ110.AUTO_STATUS_COVER_OPEN) ==
                        ZQ110.AUTO_STATUS_COVER_OPEN) {
                        buffer.append("Cover is open.\n");
                    }
                    if ((msg.arg2 & ZQ110.AUTO_STATUS_NO_PAPER) ==
                        ZQ110.AUTO_STATUS_NO_PAPER) {
                        buffer.append("Paper end sensor: no paper present.\n");
                    }
                }
                if (buffer.capacity() > 0) {
                    Toast.makeText(getApplicationContext(), buffer.toString(),
                        Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(getApplicationContext(), "No error. ",
                        Toast.LENGTH_SHORT).show();
                }
                break;
        }
    }

    ...
return true;

};

}
6-5-2 getBatteryStatus
This method checks the battery status of mobile printer. The MESSAGE_READ message (arg1: PROCESS_GET_BATTERY_STATUS) is sent to the application handler when battery status check is completed. The arg2 of this message includes the following values to indicate the battery status.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS_BATTERY_FULL</td>
<td>48</td>
<td>Battery is full.</td>
</tr>
<tr>
<td>STATUS_BATTERY_HIGH</td>
<td>49</td>
<td>Battery high.</td>
</tr>
<tr>
<td>STATUS_BATTERY_MIDDLE</td>
<td>50</td>
<td>Battery is middle.</td>
</tr>
<tr>
<td>STATUS_BATTERY_LOW</td>
<td>51</td>
<td>Battery is low.</td>
</tr>
</tbody>
</table>

[Syntax]
* public void getBatteryStatus()

[Example]
```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...
```
if (mZQ110 != null) {
    mZQ110.disconnect();
}

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getBatteryStatus();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_BATTERY_STATUS) {
                    switch (msg.arg2) {
                        case ZQ110.STATUS_BATTERY_FULL:
                            Toast.makeText(getApplicationConte
x(),
                            “Battery is full”,
                            Toast.LENGTH_SHORT).show();
                            break;

                        case ZQ110.STATUS_BATTERY_HIGH:
                            Toast.makeText(getApplicationConte
x(),
                            “Battery is high”,
                            Toast.LENGTH_SHORT).show();
                            break;

                        case ZQ110.STATUS_BATTERY_MIDDLE:
                            Toast.makeText(getApplicationConte
x(),
                            “Battery is middle”,
                            Toast.LENGTH_SHORT).show();
                            break;
                    }
                }
            break;
        }
    }

    
}
case ZQ110.STATUS_BATTERY_LOW:
    Toast.makeText(getApplicationContext(),
        "Battery is low",
        Toast.LENGTH_SHORT).show();
    break;

};

return true;

}
6-5-3 getPrinterId

This method checks the printer information. When the information is available, MESSAG_READ message (arg1: PROCESS_GET_PRINTER_ID) is sent to the application handler.

[Syntax]
* public void getPrinterId(int idType)

[Parameters]
* idType: Information of the printer to check

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRINTER_ID_FIRMWARE_VERSION</td>
<td>65</td>
<td>Firmware version</td>
</tr>
<tr>
<td>PRINTER_ID_MANUFACTURER</td>
<td>66</td>
<td>Manufacturer (Zebra Technologies)</td>
</tr>
<tr>
<td>PRINTER_ID_PRINTER_MODEL</td>
<td>67</td>
<td>Printer model name</td>
</tr>
<tr>
<td>PRINTER_ID_CODE_PAGE</td>
<td>69</td>
<td>Current code page</td>
</tr>
</tbody>
</table>

[Example]

```java
public class MainActivity extends Activity {

  ...

  private ZQ110 mZQ110;

  ...

  public void onCreate(Bundle savedInstanceState) {

    ...

    mZQ110 = new ZQ110(this, mHandler, null);
    mZQ110.connect(null);

    ...

  }

  public void onDestroy() {

  }
```
... 

if (mZQ110 != null) {
    mZQ110.disconnect();
}

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getPrinterId(ZQ110.PRINTER_ID_FIRMWARE_VERSION);
                }
                break;
            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_PRINTER_ID) {
                    Bundle data = msg.getData();
                    Toast.makeText(getApplicationContext(),
                                    data.getString(ZQ110.KEY_STRING_PRINTER_ID),
                                    Toast.LENGTH_SHORT).show();
                }
                break;
            }
        return true;
    }
};
6-5-4 getStatus

This method gets the status of printer. When the status is obtained, the MESSAGE_READ message (arg1: PROCESS_GET_STATUS) is sent to the application handler. The following values can be returned in arg2.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATUS_NORMAL</td>
<td>0</td>
<td>Normal</td>
</tr>
<tr>
<td>STATUS_COEVER_OPEN</td>
<td>4</td>
<td>Cover is open</td>
</tr>
<tr>
<td>STATUS_PAPER_NEAR_END</td>
<td>12</td>
<td>Printer paper is near end state</td>
</tr>
<tr>
<td>STATUS_PAPER_NOT_PRESENT</td>
<td>96</td>
<td>No printer paper</td>
</tr>
</tbody>
</table>

[Syntax]

* public void getStatus()

[Example]

```java
public class MainActivity extends Activity {

  ...

  private ZQ110 mZQ110;

  ...

  public void onCreate(Bundle savedInstanceState) {

    ...

    mZQ110 = new ZQ110(this, mHandler, null);
    mZQ110.connect();

    ...

  }

  public void onDestroy() {

    ...

    if (mZQ110 != null) {
```
mZQ110.disconnect();

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getStatus();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_STATUS) {
                    if (msg.arg2 == ZQ110.STATUS_NORMAL) {
                        Toast.makeText(getApplicationContext(), "No error",
                                Toast.LENGTH_SHORT).show();
                    } else {
                        StringBuffer buffer = new StringBuffer();
                        if ((msg.arg2 & ZQ110.STATUS_COVER_OPEN) ==
                                ZQ110.STATUS_COVER_OPEN) {
                            buffer.append("Cover is open.
");  
                        }
                        if ((msg.arg2 & ZQ110.STATUS_PAPER_NOT_PRESENT) ==
                                ZQ110.STATUS_PAPER_NOT_PRESENT) {
                            buffer.append("Paper end sensor: " +
                                    "paper not present."");
                        }
                        Toast.makeText(getApplicationContext(), buffer.toString(),
                                Toast.LENGTH_SHORT).show();
                }
                break;
        }
    }

    return false;
});
return true;
}
};
}
6-6 NV Image

6-6-1 defineNvImage
This method saves the image in the non-volatile memory area of printer. When image is saved, the MESSAGE_WRITE message (arg1: PROCESS_DEFINE_NV_IMAGE) is sent to the application handler.

[Syntax]
* public void defineNvImage(Bitmap bitmap, int width, int level, int keyCode)

[Parameters]
* bitmap: Bitmap instance to save
* width: width of image to save

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITMAP_WIDTH_FULL</td>
<td>-1</td>
<td>Image is enlarged or reduced to the maximum print width and saved.</td>
</tr>
<tr>
<td>BITMAP_WIDTH_NONE</td>
<td>0</td>
<td>Image is saved without resizing or reduced to the maximum print width if the image is wider than the maximum width.</td>
</tr>
</tbody>
</table>

* level: brightness level of image to save (13 ~ 88)
* keyCode: address of memory area to save image. (0 ~ 255)

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);
    }

```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
        case ZQ110.MESSAGE_STATE_CHANGE:
            if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                BitmapDrawable drawable = (BitmapDrawable)
                        getResources().getDrawable(R.drawable.logo);
                Bitmap bitmap = drawable.getBitmap();
                mZQ110.defineNvImage(bitmap,
                        ZQ110.BITMAP_WIDTH_FULL, 50, 0);
            }
            break;

        case ZQ110.MESSAGE_WRITE:
            if (msg.arg1 == ZQ110.PROCESS_DEFINE_NV_IMAGE) {
                mZQ110.disconnect();
            }
            break;
        }
        return true;
    }
});
6-6-2 defineNvImage
This method saves the image in the non-volatile memory area of printer. When the image save operation is completed, the MESSAGE_WRITE message (arg1: PROCESS_DEFINE_NV_IMAGE) is sent to the application handler.

[Syntax]
* public void defineNvImage(String pathName, int width, int level, int keyCode)

[Parameters]
* pathName: absolute path of the image file to save in printer
* width: width of image to save
* level: brightness level of image to save (13 ~ 88)
* keyCode: address of memory area to save image (0 ~ 255)

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BITMAP_WIDTH_FULL</td>
<td>-1</td>
<td>Image is enlarged or reduced to the maximum print width and saved.</td>
</tr>
<tr>
<td>BITMAP_WIDTH_NONE</td>
<td>0</td>
<td>Image is saved without resizing or reduced to the maximum print width if the image is wider than the maximum width.</td>
</tr>
<tr>
<td>Integer</td>
<td></td>
<td>Enter integer number directly</td>
</tr>
</tbody>
</table>

[Example]

```java
class MainActivity extends Activity {
    ...
    private ZQ110 mZQ110;
    ...
    public void onCreate(Bundle savedInstanceState) {
        ...
        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);
        ...
```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    String pathName = 
                        Environment.getExternalStorageDirectory().
                        getAbsolutePath() + 
                        "logo.png";
                    mZQ110.defineNvImage(pathName, 
                        ZQ110.BITMAP_WIDTH_FULL, 50, 0);
                }
                break;

            case MESSAGE_WRITE:
                if (msg.arg1 == ZQ110.PROCESS_DEFINE_NV_IMAGE) {
                    mZQ110.disconnect();
                }
                break;
        }
        return true;
    }
});
6-6-3 getDefinedNvImageKeyCodes
This method obtains the address of image saved in the non-volatile memory area of printer. When address is obtained, the MESSAGE_READ message (arg1: PROCESS_GET_NV_IMAGE_KEY_CODES) is sent to the application handler. If there is any image stored in the area, the address list of the images is returned as integer array or null is returned if there is no image.

[Syntax]
* public void getDefinedNvImageKeyCodes()

[Example]

class MainActivity extends Activity {
    
    private ZQ110 mZQ110;
    
    public void onCreate(Bundle savedInstanceState) {
        
        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);
    }
    
    public void onDestroy() {
        
        if (mZQ110 != null) {
            mZQ110.disconnect();
        }
    }
}
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == STATE_CONNECTED) {
                    mZQ110.getDefinedNvImageKeyCodes();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 ==
                    ZQ110.PROCESS_GET_NV_IMAGE_KEY_CODES) {
                    Bundle data = msg.getData();
                    int[] keyCodes =
                        data.getIntArray(ZQ110.NV_IMAGE_KEY_CODES);
                    if (keyCodes != null) {
                        // TODO: Image address processing
                    }
                }
                break;
        }
        return true;
    }
});

    ...
6-6-4 printNvImage
This method prints image stored in the non-volatile memory area of printer.

[Syntax]
* public void printNvImage(int keyCode, boolean getResponse)

[Parameters]
* keyCode: address code of NV image to print
* getResponse: MESSAGE_PRINT_COMPLETE A message is sent to the application handler upon completion of printing if this parameter is set to True, and message is not sent if it is set to False.

[Example]

class MainActivity extends Activity {
...

    private ZQ110 mZQ110;

    public void onCreate(Bundle savedInstanceState) {
...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

...

    }

    public void onDestroy() {
...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }
    }
}
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getDefinedNvImageKeyCodes();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_NV_IMAGE_KEY_CODES) {
                    Bundle data = msg.getData();
                    int[] keyCodes =
                        data.getIntArray(ZQ110.NV_IMAGE_KEY_CODES);
                    if (keyCodes != null) {
                        for (int i = 0; i < keyCodes.length; i++) {
                            mZQ110.printNvImage(keyCodes[i], false);
                        }
                    }
                }
                break;
        }
        return true;
    }
});
6-6-5 `removeAllNvImage`
This method deletes all image data stored in the non-volatile memory area of the printer.

[Syntax]
* public void printAllNvImage()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...
    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...
    }

}```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
        case ZQ110.MESSAGE_STATE_CHANGE:
            if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                mZQ110.removeAllNvImage();
                break;
            }
            break;
        }
        return true;
    }
});
6-6-6 removeNvImage
This function deletes image data stored in the non-volatile memory area of the printer.

[Syntax]
* public void removeNvImage(int keyCode)

[Parameters]
* keyCode: address code of the NV image to delete

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...
```
private final Handler mHandler = new Handler(new Handler.Callback() {

public boolean handleMessage(Message msg) {
    switch (msg.what) {
        case ZQ110.MESSAGE_STATE_CHANGE:
            if (msg.arg1 == STATE_CONNECTED) {
                mZQ110.getDefinedNvImageKeyCodes();
            }
            break;
        case ZQ110.MESSAGE_READ:
            if (msg.arg1 == ZQ110.PROCESS_GET_NV_IMAGE_KEY_CODES) {
                Bundle data = msg.getData();
                int[] keyCodes =
                data.getIntArray(ZQ110.NV_IMAGE_KEY_CODES);
                if (keyCodes != null) {
                    mZQ110.removeNvImage(keyCodes[0]);
                }
            }
            break;
    }
    return true;
}
});
6-7 Page Mode

6-7-1 setAbsolutePrintPosition
This method sets the horizontal position in the page mode.

[Syntax]
* public void setAbsolutePrintPosition(int position)

[Parameters]
* position: horizontal position to set

6-7-2 setAbsoluteVerticalPrintPosition
This method sets the vertical position in the page mode.

[Syntax]
* public void setAbsoluteVerticalPrintPosition(int position)

[Parameters]
* position: vertical position to set

6-7-3 setPageMode
This function switches the mode to page mode.

[Syntax]
* public void setPageMode()

6-7-4 setPrintArea
This function sets the printing area in the page mode.

[Syntax]
* public void setPrintArea(int x, int y, int width, int height)

[Parameters]
* x: origin of the horizontal printing area
* y: origin of the vertical printing area
* width: width of printing area
* height: height of printing area
6-7-5 setPrintDirection
This method sets the print direction in the page mode.

[Syntax]
* public void setPrintDirection(int direction)

[Parameters]
* direction: direction of printing. Refer to the following table for possible options.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRECTION_0_DEGREE_ROTATION</td>
<td>0</td>
<td>Print without rotation</td>
</tr>
<tr>
<td>DIRECTION_90_DEGREE_ROTATION</td>
<td>1</td>
<td>Print clockwise 90° rotated image</td>
</tr>
<tr>
<td>DIRECTION_180_DEGREE_ROTATION</td>
<td>2</td>
<td>Print clockwise 180° rotated image</td>
</tr>
<tr>
<td>DIRECTION_270_DEGREE_ROTATION</td>
<td>3</td>
<td>Print clockwise 270° rotated image</td>
</tr>
</tbody>
</table>

6-7-6 setStandardMode
This method closes the page mode and switches to the standard mode.

[Syntax]
* public void setStandardMode()
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case MESSAGE_STATE_CHANGE:
                    if (msg.arg1 == STATE_CONNECTED) {
                        mZQ110.setPageMode();
                        mZQ110.setPrintDirection(;
                    }

                    ...

                }

                public boolean handleMessage(Message msg) {
                    switch (msg.what) {
                        case MESSAGE_STATE_CHANGE:
                            if (msg.arg1 == STATE_CONNECTED) {
                                mZQ110.setPageMode();
                                mZQ110.setPrintDirection(;
ZQ110.\text{DIRECTION\_180\_DEGREE\_ROTATION});
  mZQ110.setPrintArea(0, 0, 384, 840);
  mZQ110.setAbsoluteVerticalPrintPosition(100);
  mZQ110.printBitmap(bitmap,
      ZQ110.\text{ALIGNMENT\_CENTER},
      ZQ110.\text{BITMAP\_WIDTH\_FULL},
      88, false);
  mZQ110.formFeed(true);
  mZQ110.setStandardMode();
}
  break;

  case MESSAGE\_PRINT\_COMPLETE:
        mZQ110.disconnect();
        break;
  }
  return true;
};
6-8 MSR

6-8-1 cancelMsrReaderMode
This method terminates the reader mode when the current mode is Track 1/2/3 Command Read Mode. Printer cannot read the card when the read mode is terminated.

[Syntax]
* public void cancelMsrReaderMode()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.cancelMsrReaderMode();
            mZQ110.disconnect();
        }
    }
```

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getMsrMode();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_MSR_MODE) {
                    if (msg.arg2 ==
                        ZQ110.MSR_MODE_TRACK123_COMMAND) {
                        mZQ110.setMsrReaderMode();
                    }
                }
                break;
        }

        return true;
    }
};
6-8-2 getMsrMode

This method obtains the current MSR settings. When the settings are obtained, the MESSAGE_READ message (arg1: PROCESS_GET_MSR_MODE) is sent to the application handler. The arg2 of the message can have the following values.

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSR_MODE_TRACK123_COMMAND</td>
<td>65</td>
<td>Track 1/2/3 command read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK1_AUTO</td>
<td>66</td>
<td>Track 1 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK2_AUTO</td>
<td>67</td>
<td>Track 2 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK3_AUTO</td>
<td>68</td>
<td>Track 3 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK12_AUTO</td>
<td>69</td>
<td>Track 1/2 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK23_AUTO</td>
<td>70</td>
<td>Track 2/3 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_TRACK123_AUTO</td>
<td>71</td>
<td>Track 1/2/3 automatic trigger read mode</td>
</tr>
<tr>
<td>MSR_MODE_NOT_USED</td>
<td>72</td>
<td>MSR is not used</td>
</tr>
</tbody>
</table>

**[Syntax]**
* public void getMsrMode()

**[Parameters]**
* getResponse: MESSAGE_PRINT_COMPLETE message is sent to the application handler when paper cut operation is completed if this parameter is set to True. If this is set to False, message is not sent to the application handler after paper is cut.

**[Example]**

    public class MainActivity extends Activity {
        ...
        private ZQ110 mZQ110;
        ...
        public void onCreate(Bundle savedInstanceState) {
            ...
            mZQ110 = new ZQ110(this, mHandler, null);
            mZQ110.connect(null);
public void onDestroy() {
    
    ...

    if (mZQ110 != null) {
        mZQ110.disconnect();
    }

    ...

}

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getMsrMode();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_MSR_MODE) {
                    // TODO: Processing for MSR mode
                }
                break;
        }

        return true;
    }

};
6-8-3 setMsrReaderMode
This method switches the mode to the reader mode so that printer can read the card in
Track 1/2/3 command read mode.

[Syntax]
* public void setMsrReaderMode()

[Example]

public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...

    }

}
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.getMsrMode();
                }
                break;

            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_GET_MSR_MODE) {
                    if (msg.arg2 ==
                        ZQ110.MSR_MODE_TRACK123_COMMAND) {
                        mZQ110.setMsrReaderMode();
                    }
                }
                break;
        }
        return true;
    }
});

6-9 Settings

6-9-1 setSingleByteFont
This method sets the single byte font.

[Syntax]
* public void setSingleByte(int codePage)
### Parameters

* `codePage`: code page to set

<table>
<thead>
<tr>
<th>Code</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CODE_PAGE_437_USA</td>
<td>0</td>
<td>Page 0 437 (USA standard Europe)</td>
</tr>
<tr>
<td>CODE_PAGE_KATAKANA</td>
<td>1</td>
<td>Page 1 Katakana</td>
</tr>
<tr>
<td>CODE_PAGE_850_MULTILINGUAL</td>
<td>2</td>
<td>Page 2 850 (Multilingual)</td>
</tr>
<tr>
<td>CODE_PAGE_860_PORTUGUESE</td>
<td>3</td>
<td>Page 3 860 (Portuguese)</td>
</tr>
<tr>
<td>CODE_PAGE_863_CANADIAN_FRENCH</td>
<td>4</td>
<td>Page 4 863 (Canadian-French)</td>
</tr>
<tr>
<td>CODE_PAGE_865_NORDIC</td>
<td>5</td>
<td>Page 5 865 (Nordic)</td>
</tr>
<tr>
<td>CODE_PAGE_1252_LATIN1</td>
<td>16</td>
<td>Page 16 1252 (Latin 1)</td>
</tr>
<tr>
<td>CODE_PAGE_866_CYRILLIC2</td>
<td>17</td>
<td>Page 17 866 (Cyrillic #2)</td>
</tr>
<tr>
<td>CODE_PAGE_852_LATIN2</td>
<td>18</td>
<td>Page 18 852 (Latin 2)</td>
</tr>
<tr>
<td>CODE_PAGE_858_EURO</td>
<td>19</td>
<td>Page 19 858 (Euro)</td>
</tr>
<tr>
<td>CODE_PAGE_862_HEBREW_DOS_CODE</td>
<td>21</td>
<td>Page 21 862 (Hebrew DOS code)</td>
</tr>
<tr>
<td>CODE_PAGE_864_ARABIC</td>
<td>22</td>
<td>Page 22 864 (Arabic)</td>
</tr>
<tr>
<td>CODE_PAGE_THAI42</td>
<td>23</td>
<td>Page 23 Thai42</td>
</tr>
<tr>
<td>CODE_PAGE_1253_GREEK</td>
<td>24</td>
<td>Page 24 1253 (Greek)</td>
</tr>
<tr>
<td>CODE_PAGE_1254_TURKISH</td>
<td>25</td>
<td>Page 25 1254 (Turkish)</td>
</tr>
<tr>
<td>CODE_PAGE_1257_BALTIC</td>
<td>26</td>
<td>Page 26 1257 (Baltic)</td>
</tr>
<tr>
<td>CODE_PAGE_Farsi</td>
<td>27</td>
<td>Page 27 Farsi</td>
</tr>
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</table>
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {

            switch (msg.what) {

            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {

                }

            }
mZQ110.setSingleByteFont(ZQ110.CODE_PAGE_437_USA);
    }
    break;
    }
    return true;
    }
};
}
6-10 Miscellaneous Functions

6-10-1 executeAutomaticCalibration
This method executes auto calibration in black mark mode.

[Syntax]
* public void executeAutomaticCalibration ()

⚠️ NOTE - refer to sample source code at setBlackMarkMode.
6-10-2 `executeDirectIo`
This method sends command directly to printer. If response is to be received from the printer, the `MESSAGE_READ` message (arg1: `PROCESS_EXECUTE_DIRECT_IO`) should be sent to the application handler.

**[Syntax]**
* public void `executeDirectIo`(byte[] command, boolean hasResponse)

**[Parameters]**
* command: command to send to the printer
  * hasResponse: Set this True if response to the command is to be received from the printer, or False if not.

**[Example]**

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect(null);

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {

            ...

        }

```
mZQ110.disconnect();

...

private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    byte[] command = new byte[] {0x10, 0x04, 0x02};
                    mZQ110.executeDirectIo(command, true);
                }
                break;
            case ZQ110.MESSAGE_READ:
                if (msg.arg1 == ZQ110.PROCESS_EXECUTE_DIRECT_IO) {
                    Bundle data = msg.getData();
                    byte[] response =
                        data.getByteArray(ZQ110.KEY_STRING_DIRECT_IO);
                    // TODO: response time
                }
                break;
        }
        return true;
    }
});
6-10-3 getMacAddress
This method obtains and returns network MAC address of the printer connected with Wireless LAN.

[Syntax]
* public String getMacAddress()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;
    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect("192.168.0.100", 9100, 5000);
        ...
    }

    public void onDestroy() {
        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }
    }

}```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    String macAddress = mZQ110.getMacAddress();
                    Toast.makeText(getApplicationContext(), macAddress,
                        Toast.LENGTH_SHORT).show();
                }
                break;
        }
        return true;
    }
});
6-10-4 initialize
This method initializes the printer settings to a state the same as after booting. The data in
the printer buffer is initialized but the data in the printer receive buffer is not. NV image
stored in the printer is not initialized. If the printer is in the page mode, all data in the print
area is removed and the printer is initialized to the standard mode.

[Syntax]
* public void initialize()  

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect();

        ...

    }

    public void onDestroy() {

        ...

        if (mZQ110 != null) {
            mZQ110.disconnect();
        }

        ...
```
private final Handler mHandler = new Handler(new Handler.Callback() {

    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.initialize();
                }
                break;
        }
        return true;
    }
};
6-10-5 setBlackMarkMode
This method changes from receipt mode to black mark mode.

[Syntax]
* public void setBlackMarkMode()

6-10-6 setReceiptMode
This method changes from black mark mode to receipt mode.

[Syntax]
* public void setReceiptMode()

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {
        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect();

        ...
    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_STATE_CHANGE:
```

if (msg.arg1 == ZQ110.STATE_CONNECTED) {
    mZQ110.setBlackMarkMode();
    mZQ110.executeAutomaticCalibration();
    mZQ110.setReceiptMode();

    mZQ110.disconnect();
}
break;
return true;
}
6-10-7 updateFirmware
This method sends the specified firmware binary file to the printer and updates the printer firmware. Printer should be rebooted after updating printer firmware.

[Syntax]
* public void updateFirmware(String binaryFilePath)

[Parameters]
* binaryFilePath: absolute path to the firmware binary file to send to printer

[Example]

```java
public class MainActivity extends Activity {

    ...

    private ZQ110 mZQ110;

    ...

    public void onCreate(Bundle savedInstanceState) {

        ...

        mZQ110 = new ZQ110(this, mHandler, null);
        mZQ110.connect();

        ...

    }

    private final Handler mHandler = new Handler(new Handler.Callback() {

        public boolean handleMessage(Message msg) {
            switch (msg.what) {
                case ZQ110.MESSAGE_STATE_CHANGE:
                    if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                        String binaryFilePath = Environment.
                        ...
```
getExternalStorageDirectory().getAbsolutePath() +
FIRMWARE_FILE_PATH;

mZQ110.updateFirmware(binaryFilePath);

try {
    Thread.sleep(5000);
} catch (InterruptedException e) {
    // TODO Auto-generated catch block
    e.printStackTrace();
}

mZQ110.disconnect();

break;
}

return true;
}
7. Programming

7-1 Programming Flow

Applications should be programmed in the following sequence.
1. Search printer
2. Open printer port
3. Send print data
4. Close printer port

7-2 Search Printer

Search available printers. This step can be skipped if the printer to connect is manually specified. Refer to the following codes.

```java
...

private ZQ110 mZQ110;

...

mZQ110 = new ZQ110(this, mHandler, null);
mZQ110.findBluetoothPrinters(); // When connecting over Bluetooth
// mZQ110.findNetworkPrinters(5000); // When connecting over Network
// mZQ110.findUsbPrinters(); // When connecting over USB

private final Handler mHandler = new Handler(new Handler.Callback() {
    public boolean handleMessage(Message msg) {
        ...
    }
});
```
7-3 Open Printer Port

Use the connect method to create printer instance and open the port. Refer to the codes provided below.

```java
private final Handler mHandler = new Handler(new Handler.Callback() {
    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_BLUETOOTH_DEVICE_SET:
                if (msg.obj != null) {
                    Set<BluetoothDevice> bluetoothDeviceSet = (Set<BluetoothDevice>) msg.obj;
                    BluetoothDevice[] bluetoothDevices = bluetoothDeviceSet.toArray(new BluetoothDevice[bluetoothDeviceSet.size()]);
                    mZQ110.connect(bluetoothDevices[i].getAddress());
                }
                break;
            case ZQ110.MESSAGE_USB_DEVICE_SET:
                if (msg.obj != null) {
                    Set<String> networkDeviceSet = (Set<String>) msg.obj;
                    String[] networkDevices = networkDeviceSet.toArray(new String[networkDeviceSet.size()]);
                    mZQ110.connect(networkDevices[i].getAddress(), 9100, 5000);
                }
                break;
            case ZQ110.MESSAGE_NETWORK_DEVICE_SET:
                if (msg.obj != null) {
                    Set<UsbDevice> usbDeviceSet = (Set<UsbDevice>) msg.obj;
                    UsbDevice[] usbDevices = usbDeviceSet.toArray(new UsbDevice[usbDeviceSet.size()]);
                    mZQ110.connect(usbDevices[i]);
                }
        }
    }
});
```
7-4 Send Printer Data

Application handler sends print data to the printer after receiving connection completion message. Refer to the following codes.

```java
private final Handler mHandler = new Handler(new Handler.Callback() {
    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_STATE_CHANGE:
                if (msg.arg1 == ZQ110.STATE_CONNECTED) {
                    mZQ110.printText("Text to print
",
                                    ZQ110.ALIGNMENT_LEFT,
                                    ZQ110.TEXT_ATTRIBUTE_FONT_A,
                                    ZQ110.TEXT_SIZE_HORIZONTAL1 |
                                    ZQ110.TEXT_SIZE_VERTICAL1, false);
                }
                break;
            }
            return true;
        }
    }
});
```
7-5 Close Printer Port

Close the printer connection when application is shutdown if connection with the printer is maintained while application is running. If printer is to be connected on demand, close the connection after receiving print completion message. Refer to the following codes.

```java
private final Handler mHandler = new Handler(new Handler.Callback() {
    public boolean handleMessage(Message msg) {
        switch (msg.what) {
            case ZQ110.MESSAGE_PRINT_COMPLETE:
                mZQ110.disconnect();
                break;
        }
        return true;
    }
});
```