

sdk_helper_doc

Table of Contents

- 1. update record.....6
- 2. Notice.....26
- 3. Procedure.....26
 - 3.1 eclipse.....26
 - 3.1.1 import resource.....26
 - 3.1.2 configure lib.....27
 - 3.1.3 configureAndroidManifest.xml.....30
 - 3.1.4 initial device.....32
 - 3.2 android studio.....33
 - 3.2.1 import resource.....33
 - 3.2.2 configure lib.....34
 - 3.2.3 configure AndroidManifest.xml.....38
 - 3.2.4 initial device.....40
- 4. Modules.....40
 - 4.1 print module.....40
 - 4.1.1 Notice.....40
 - 4.1.2 print.....40
 - 4.1.3 printNoFeed.....42
 - 4.1.4 printBottomFeedLine.....44
 - 4.1.5 PrintStep.....44
 - 4.1.6 PrintStepl.....44
 - 4.1.7 setPrintGray.....45
 - 4.1.8 setLineSpace.....45
 - 4.1.9 setParameters.....45
 - 4.1.10 getParameters.....45
 - 4.1.11 setFontSize.....46
 - 4.1.12 setPrintFont.....46
 - 4.1.13 setPrintFontByAsserts.....46
 - 4.1.14 cleanCache.....47
 - 4.1.15 addText.....47
 - 4.1.16 addBitMap.....47
 - 4.1.17 beginPrint.....48
 - 4.1.18 printText.....48
 - 4.1.19 PrintStepByBlackTag.....48
 - 4.1.20 PrintStepByBlackTagMax.....49
 - 4.1.21 queryIfHavePaper.....49
 - 4.1.22 refreshCallBack.....49
 - 4.1.23 getPrinterInfoForNow.....50
 - 4.1.24 getPrinterNum.....50
 - 4.1.25 getPrinterInfo.....50
 - 4.1.26 selectPosPrinter.....50
 - 4.2 code-scanning.....51
 - 4.2.1 Notice.....51
 - 4.2.2 startScan.....51
 - 4.2.3 startScanZbar.....51
 - 4.3 pinPad.....52
 - 4.3.1 notice.....52
 - 4.3.2 DES key system.....53
 - 4.3.3 SM4 key system.....59
 - 4.3.4 unique identifier interface.....64
 - 4.3.5 GM algorithm.....66
 - 4.3.6 addKeyOwner.....69

4.3.7 deleteKeyOwner.....	70
4.3.8 OwnerPermission.....	70
4.3.9 setPinpadMode.....	71
4.3.10 setOnPinInputListener.....	71
4.3.11 setPinpadLayout.....	72
4.3.12 format.....	72
4.3.13 getRandom.....	72
4.3.14 ClosePinpad.....	72
4.4 led module.....	73
4.4.1 notice.....	73
4.4.2 enableLedIndex.....	73
4.4.3 enableLedIndex.....	74
4.5 beeper module.....	74
4.5.1 notice.....	74
4.5.2 beep.....	74
4.6 pboc module.....	75
4.6.1 notice.....	75
4.6.2 startTransfer.....	76
4.6.3 refreshListener.....	78
4.6.4 stopTransfer.....	78
4.6.5 setAmount.....	79
4.6.6 selectApplication.....	79
4.6.7 comfirmPinpad.....	79
4.6.8 confirmCardInfo.....	79
4.6.9 confirmCerInfo.....	80
4.6.10 inputOnlineProcessResult.....	80
4.6.11 updateAID.....	81
4.6.12 updateRID.....	81
4.6.13 setMerchantName.....	81
4.6.14 setMerchantId.....	82
4.6.15 setTerminalId.....	82
4.6.16 getEmvTlvData.....	82
4.6.17 readEcBalance.....	84
4.6.18 getScriptResult.....	84
4.6.19 getPosTermInfo.....	84
4.6.20 setPosTermInfo.....	85
4.6.21 getPosTermPara.....	85
4.6.22 setPosTermPara.....	85
4.6.23 DelAid.....	85
4.6.24 DelCapk.....	86
4.7 terninal information.....	86
4.7.1 notice.....	86
4.7.2 getSN.....	86
4.7.3 getVID.....	86
4.7.4 getVName.....	87
4.7.5 getKSN.....	87
4.7.6 isSupportIcCard.....	87
4.7.7 isSupportMagCard.....	88
4.7.8 isSupportRfCard.....	88
4.7.9 isSupportPrint.....	88
4.7.10 isSupportOffLine.....	89
4.7.11 isSupportBeep.....	89
4.7.12 isSupportLed.....	89
4.7.13 getVersion.....	90
4.7.14 getDeviceType.....	90

4.7.15 setSpTime.....	90
4.7.16 getSpTime.....	90
4.7.17 getSystemVersion.....	91
4.8 serial port.....	91
4.8.1 notice.....	91
4.8.2 open.....	91
4.8.3 init.....	91
4.8.4 readData.....	92
4.8.5 sendData.....	92
4.8.6 close.....	92
4.9 card reading.....	93
4.9.1 notice.....	93
4.9.2 openPsamAndDetect.....	93
4.9.3 openPsamAndDetect.....	93
4.9.4 openPsam2AndDetect.....	93
4.9.5 openPsam2AndDetect.....	94
4.9.6 openPsamAndDetectBy38400.....	94
4.9.7 openPsamAndDetectBy38400.....	94
4.9.8 openPsam2AndDetectBy38400.....	95
4.9.9 openPsam2AndDetectBy38400.....	95
4.9.10 openM1AndDetect.....	95
4.9.11 openM1AndDetect.....	96
4.9.12 openCPUAndDetect.....	96
4.9.13 openCPUAndDetect.....	97
4.9.14 openAllAndDetect.....	97
4.9.15 openIDCardAndDetect.....	97
4.9.16 openIDCardAndDetect.....	98
4.9.17 openM1_MagAndDetect.....	98
4.9.18 openM1_MagAndDetect.....	98
4.9.19 openPsamAndDetectNotCloseOtherCard.....	99
4.9.20 openPsamAndDetectNotCloseOtherCard.....	99
4.9.21 openPsam2AndDetectNotCloseOtherCard.....	99
4.9.22 openPsam2AndDetectNotCloseOtherCard.....	100
4.9.23 openPsamAndDetectBy38400NotCloseOtherCard.....	100
4.9.24 openPsamAndDetectBy38400NotCloseOtherCard.....	101
4.9.25 openPsam2AndDetectBy38400NotCloseOtherCard.....	101
4.9.26 openPsam2AndDetectBy38400NotCloseOtherCard.....	101
4.9.27 openM1AndDetectNotCloseOtherCard.....	102
4.9.28 openM1AndDetectNotCloseOtherCard.....	102
4.9.29 openIccAndDetectNotCloseOtherCard.....	103
4.9.30 openIccAndDetectNotCloseOtherCard.....	103
4.9.31 openPiccAndDetectNotCloseOtherCard.....	103
4.9.32 openPiccAndDetectNotCloseOtherCard.....	103
4.9.33 openM1_MagAndDetectNotCloseOtherCard.....	104
4.9.34 openM1_MagAndDetectNotCloseOtherCard.....	104
4.9.35 selectMag.....	105
4.9.36 selectPicc.....	105
4.9.37 selectCpu.....	105
4.9.38 selectPsam.....	106
4.9.39 selectPsamBy38400.....	106
4.9.40 selectPsam2.....	106
4.9.41 selectPsam2By38400.....	107
4.9.42 transmitApduToCard.....	107
4.9.43 transmitApduToCard.....	107
4.9.44 getCardInfoList.....	108

4.9.45	getCardInfo.....	108
4.9.46	getIdCardInfo.....	108
4.9.47	transmitApduToldCard.....	108
4.9.48	transmitApduToldCard.....	109
4.9.49	M1CardKeyAuth.....	109
4.9.50	M1CardReadBlock.....	109
4.9.51	M1CardWriteBlock.....	110
4.9.52	M1CardOperateBlock.....	110
4.9.53	openVicc.....	111
4.9.54	DetectISO15963CardAndTransmit.....	112
4.9.55	openMemoryAndDetect.....	112
4.9.56	transmitApduToMemoryCard.....	113
4.9.57	transmitApduToMemoryCard.....	113
4.9.58	VerifyMemory4442.....	114
4.9.59	updateMemory4442.....	114
4.9.60	readMemory4442.....	114
4.9.61	writeMemory4442.....	115
4.9.62	pacMemory4442.....	115
4.9.63	resetCard.....	115
4.9.64	removeCard.....	116
4.9.65	isCardInster.....	116
4.9.66	setRFRegister.....	116
4.9.67	setParams.....	117
4.9.68	getParams.....	117
4.10	communication module.....	117
4.10.1	notice.....	117
4.10.2	example.....	117
4.10.3	socket example.....	118
4.10.4	http example.....	119
4.11	8583 module.....	120
4.11.1	notice.....	120
4.11.2	setBit.....	122
4.11.3	setBit.....	123
4.11.4	deleteBit.....	123
4.11.5	deleteBit.....	123
4.11.6	setBinaryBit.....	124
4.11.7	setBinaryBit.....	124
4.11.8	getBit.....	124
4.11.9	getBit.....	125
4.11.10	getBitBytes.....	125
4.11.11	getBitBytes.....	125
4.11.12	pack.....	126
4.11.13	unpack.....	126
4.11.14	getMacData.....	126
4.11.15	getBitString.....	126
4.11.16	Load8583XMLconfigByTag.....	127
4.11.17	restore8583XMLconfig.....	127
4.12	database module.....	127
4.12.1	notice.....	127
4.12.2	how to use.....	128
4.13	eletronic signature.....	133
4.13.1	how to use.....	133
4.14	GPS module.....	133
4.14.1	notice.....	133
4.14.2	example.....	133

- 4.14.3 startGPS..... 134
 - 4.14.4 closeGPS..... 134
 - 4.15 utility class..... 134
 - 4.15.1 BCDHelper..... 134
- 5. error code..... 136

1. update record

Num	revision content	Author	Version		Date	Note

1	Create document	刘德宇 Deiyu Liu	2.0.0		2016-03-13	
---	-----------------	---------------	-------	--	------------	--

2	Enrich aidl module, add database, 8583 and communication modules.	刘德宇 Deiyu Liu	2.0.1		2016-03-20	
---	---	---------------	-------	--	------------	--

3	Enrich aidl module, add electronic signature, complete appendix.	刘德宇 Deiyu Liu	2.0.2		2016-03-27	
---	---	---------------	-------	--	------------	--

4	Add the special encryption and decryption interface.	刘德宇 Deiyu Liu	2.0.3		2016-03-30	
---	--	---------------	-------	--	------------	--

5	Enrich the introduction of the document, add the interface of getting device version.	刘德宇 Deiyu Liu	2.0.4		2016-04-03	
---	---	---------------	-------	--	------------	--

6	Add pin pad interface, load the device initialization key and the main key ciphertext.	刘德宇 Deiyu Liu	2.0.5		2016-04-06	
---	--	---------------	-------	--	------------	--

7	Update document, no check if kv value is null.	刘德宇 Deiyu Liu	2.0.6		2016-04-07	
---	--	---------------	-------	--	------------	--

8	Add some interfaces in deviceinfo, add an example of adb command.	刘德宇 Deiyu Liu	2.0.7		2016-04-13	
---	---	---------------	-------	--	------------	--

9	Add paper feeding (走纸) interface, which is turned off at printing.	刘德宇 Deiyu Liu	2.0.8		2016-04-14	
---	--	---------------	-------	--	------------	--

10	The service is integrated into jar package.	刘德宇 Deiyu Liu	2.0.9		2016-04-18	
----	---	---------------	-------	--	------------	--

11	Add interfaces for M1 and PSAM card, add the interface for parameter setting of print,add interface for plaintext key reading of magnetic track encryption ,add interface for indexing self-maintaining key pad, optimize the pop-up window and screen-off in the transaction process.	刘德宇 Deiyu Liu	2.0.10		2016-05-04	
----	--	---------------	--------	--	------------	--

12	<div>1. Adapt the compatibility between sp 12 and 13 key.</div> <div>2. Non-cantact flash card treat.</div> <div>3. CPU card interface treat.</div> <div>4. Control the transaction card-swiping, add magnetic strip, non-contact card,IC card launching mark.</div> <div>5. optimize code-scanning.</div> <div>6. Pinpad supporting numbers of sp keys is changed to determined by the calling numbers of key.</div> <div>7. Support the switch among the psam card, CPU card, etc.</div> <div>8.Add the interface to determine whether the card is on the right positioin.</div> <div>9. support the mac value of special calculating characters.</div> <div>10. delete several resource files of code-scanning.</div> <div>11. repair the bug that continuous swip listener can not be acquired in degrade transaction.</div> <div>12. upgrade code-scanning base</div>	刘德宇 Deiyu Liu	2.0.11		2016-05-27	
----	--	---------------	--------	--	------------	--

13	1.Add the introduction of demo 2.Add the procedure of integration. 3.Add “The process of PBOC collecting card data” 4.Add Pinpad description. 5.Add the description of print 6.Add the method of setPrintFont in 6.1.7	王东辉 Donghui Wang	2. 0. 12		2016-6-17	
----	---	---------------------	----------	--	-----------	--

14	1.Add the attention of power key shield 2.revise the description of pictures 3.Add the vibration of permissions of scan module. 4.revise the name of jar package.	王东辉 Donghui Wang	2. 0. 13		2016-06-23	-
----	--	---------------------	----------	--	------------	---

sdk_helper_doc						
15	<p>1.Clean method in IsoManager is to delete data in list.</p> <p>2.Query the transaction detail, and put the size into intent.</p> <p>3.After contactless electronic cash completion , several universal data was saved to intent and returned to the upper layer.</p> <p>4.Set the property attribute, and print the version number.</p> <p>5.Add the zbar code-scanning.</p> <p>6.Add the interface to set the parameter.</p> <p>7.Add the webservice interface</p> <p>8.Add the GPS location interface</p> <p>9.SP time problem is solved. SP time will make a comparison with the system time in the SDK initiation process. It will simultaneous remedied if they are difference.</p> <p>10.Add GPS interface to get longitude and latitude data.</p> <p>11.Add http interface</p> <p>12.If App does not load AID parameter, sdk will load a default value.</p> <p>13.SSL socket is supported</p>	<p>王东辉</p> <p>Donghui Wang</p>	2. 0. 17		2016-7-29	

sdk_helper_doc						
16	<p>V2.0.18</p> <p>1.Optimize the timeout of SSL communication.</p> <p>2.Bottom API transmission is supported in print.</p> <p>3.Text printing interface is added.</p> <p>4.The secret algorithm is added</p> <p>5.Non-contact ISO15963 interface is added.</p> <p>6.Serial port communication interface is added</p> <p>7.Boardcast is added to deal with the problems in re-initiation of bottom.</p> <p>8.Identification card interactive interface is added.</p> <p>9.Black label paper feeding interface is added.</p> <p>10.Ordered pinpad is supported, and the key sound of the pinpad is added in demo</p> <p>11.No extension of base application is supported.</p> <p>12.New interface is added in LED light.</p> <p>13.Exception handling is optimized in EMV process.</p> <p>14.Card synchronous operation interface is added, including card seaching ,APDU</p> <p>15,Multiple application key module is added.</p> <p>16 , correct the length caculation error of the String ASC code in 8583 package.</p>	<p>王东辉&刘德宇</p> <p>Donghui wang &Deyu Liu</p>	2.0.18		2016-9-5	

17	<p>v2.0.19</p> <p>1.SM4 encryption and decryption is supported, add interfaces loadSM4KeyWithoutEncrypt encryptDataSM4 and decryptDataSM4.</p> <p>2.add interface to delete AID and CAPK.</p> <p>3.optimize the hint in print, and check the necessary field.</p> <p>4.add search card as M1 card in startTransfer.</p> <p>5.add check paper in queryIfHavePaper</p> <p>6.add callback to handle message header in the upper communication layer.</p> <p>7.add multi-zone key interface</p> <p>8.amount with long type is compatible in startTransfer.</p> <p>9.add refresh listener interface</p> <p>10.key algorithms support owner certification1</p> <p>11.key algorithms support DES</p> <p>12.add voice of pinpad</p> <p>13.add the callback of send once and receive multiple.</p> <p>14.delete webservice</p> <p>15.optimize the update of database,</p> <p>16.add unique identifier interface of No.21 file</p>	deyu Liu	2.0.19		2017-4-5
----	--	----------	--------	--	----------

sdk_helper_doc					
18	<div>1.Add the DUKPT key system</div> <div>2. When the serial port is open, judge the SDK version to select GS0 or GS1</div> <div>3. The Gps initialization will remove the monitoring and registration, start the registration, and cancel the registration when close</div> <div>4. The process callback of the people's bank is processed by thread</div> <div>5. Support offline express PIN authentication</div> <div>6. Offline FDDA fails to determine whether online is required</div> <div>7. The electronic cash balance query and log inquiry do not require GPO</div> <div>8. If the model is W9110, block no. 1 of the key interface</div> <div>9. The interface of the byarea interface SM4 increases</div> <div>10. Composite card search card, which is not connected with the switch problem of 300ms, and the default is delayed, which can be set without delay</div> <div>11. Increase the use of the original TMK interface</div> <div>12. Provide security partitions with data interface set get</div> <div>13. Pinkey does not allow decryption interfaces</div> <div>14. The serial port does not instantiate ttydevice when initializing, and then instantiate it when open, preventing some old systems from not switching ports to cause no ttyGS1 files</div> <div>15. Increase the SN key load result</div> <div>16. Judge the middle tier version, add the new interface to the SDK compatible with the old system version, unsupported throwing exception</div> <div>17. The maximum value of the modified AID quota is 2147483647, the original quota of 99999999</div> <div>The serial open exception determines the changes</div> <div>19. The Chinese and English language prompts for modification</div>	deyu Liu	2.0.20		2017-7-14

2. Notice

The log switch is default to be turned on. `LogUtil.closeLog()` in the `onCreate()` of `Application` can be called to turn it off.

All the logs are printed by calling the function in `com.basewin.log.LogUtil`.

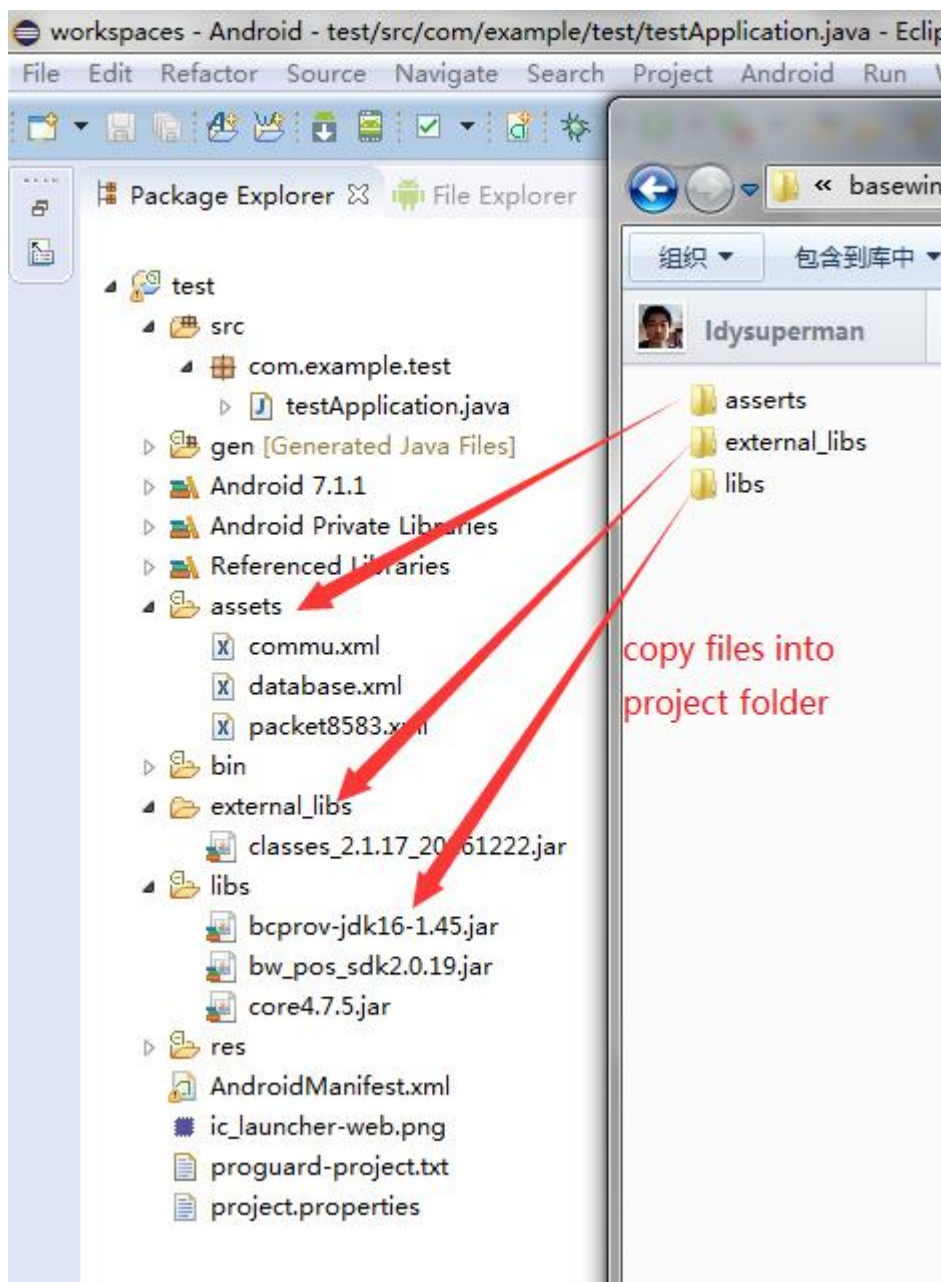
`LogUtil.i(getClass(), "[log show test]");`

Exceptions need to extend `BwBaseException`

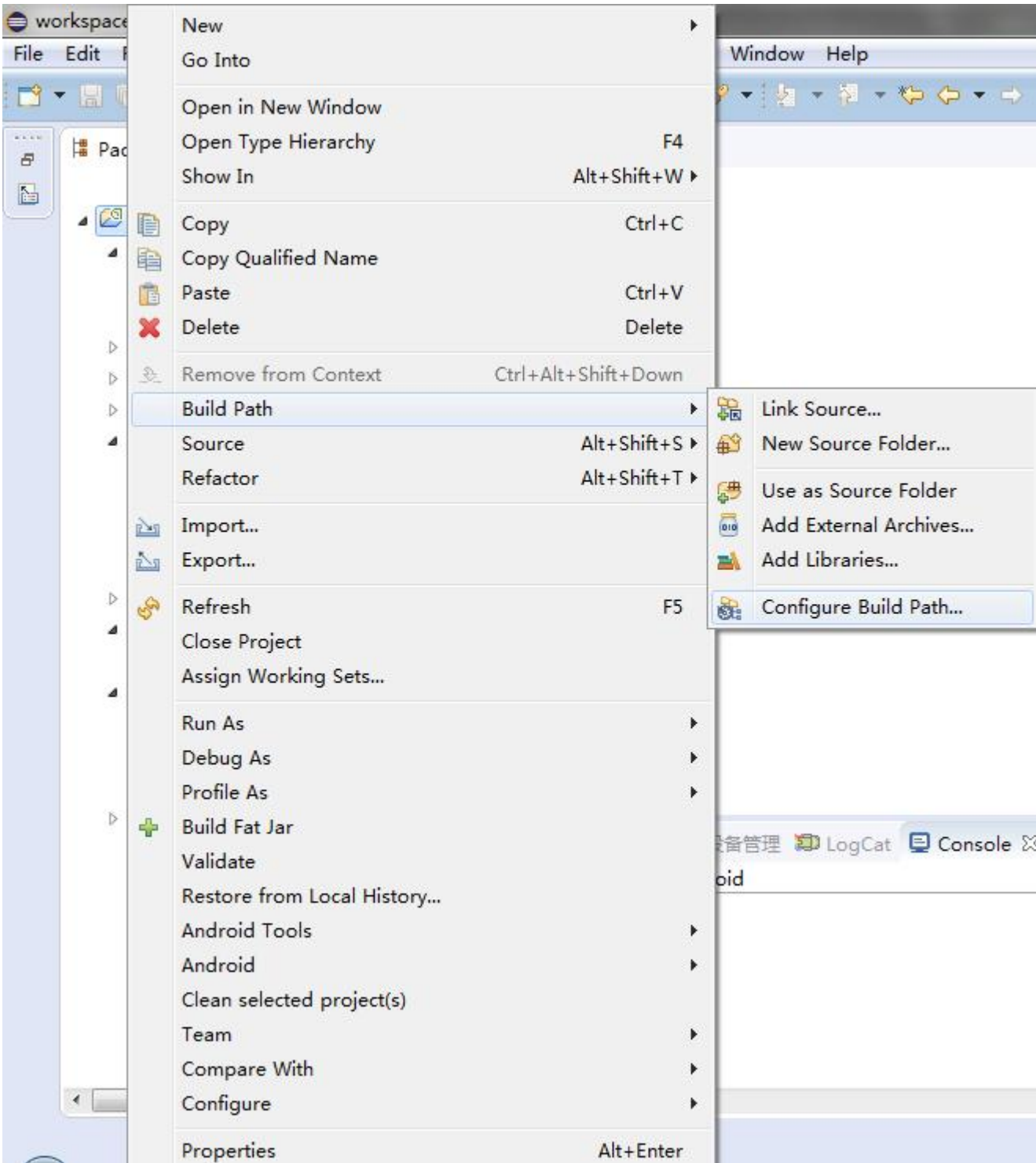
3. Procedure

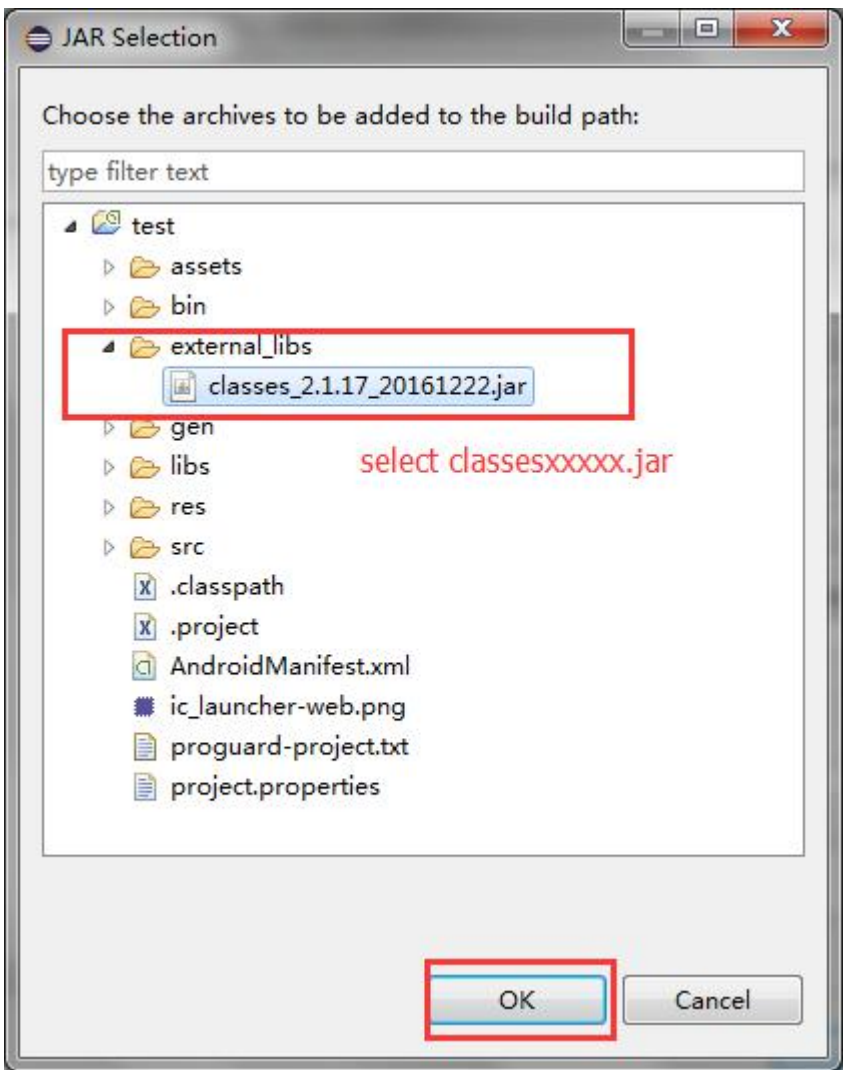
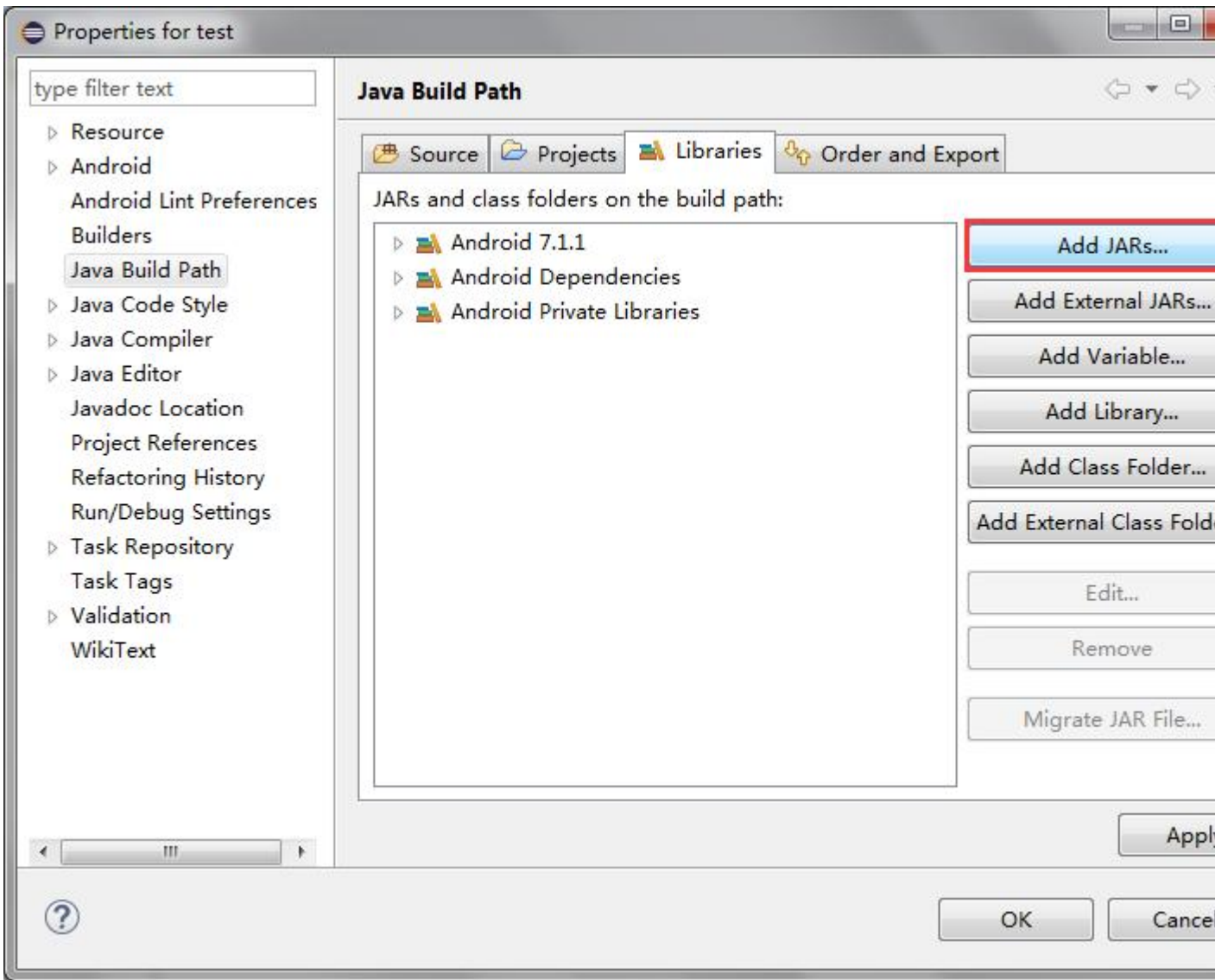
3.1 eclipse

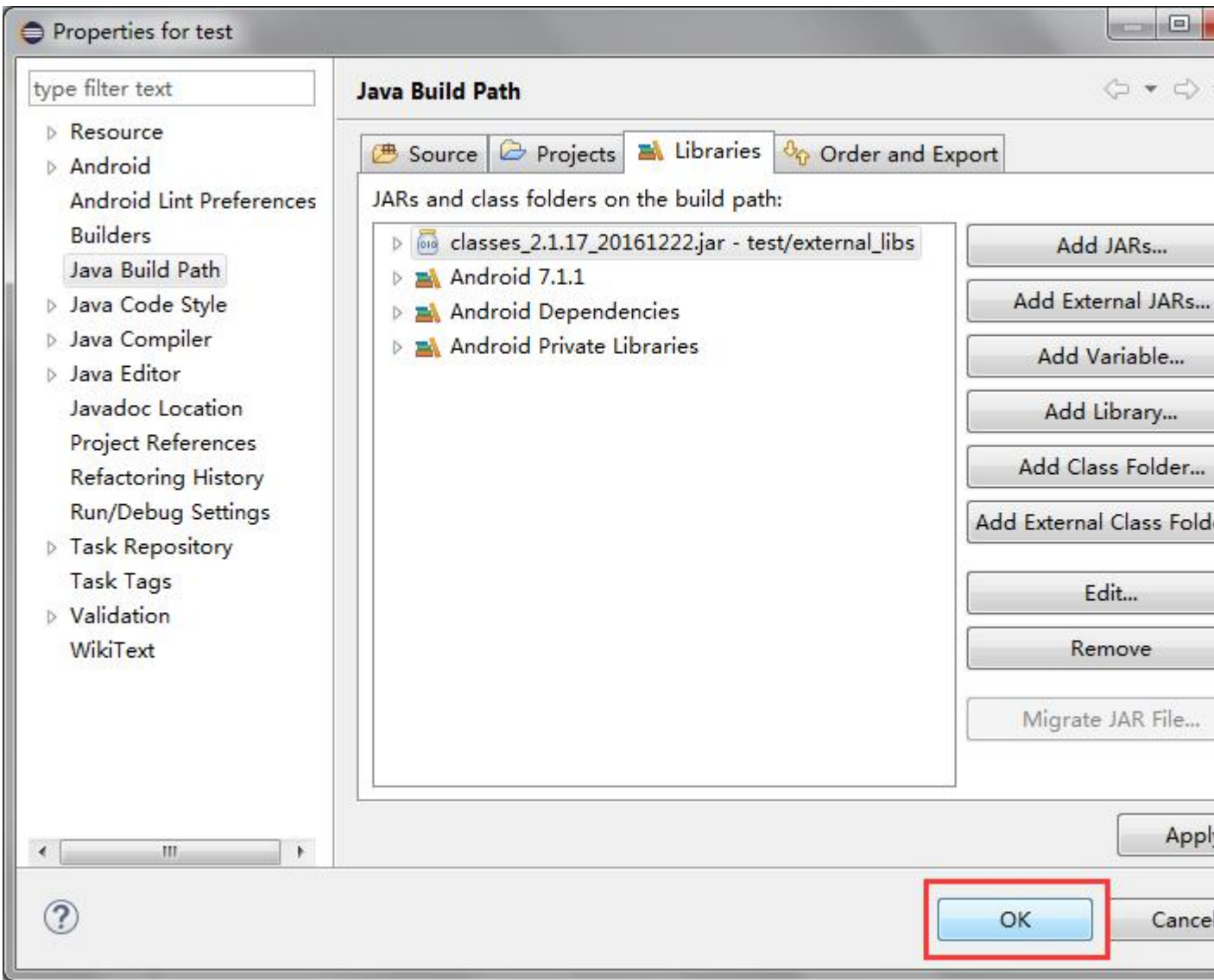
3.1.1 import resource



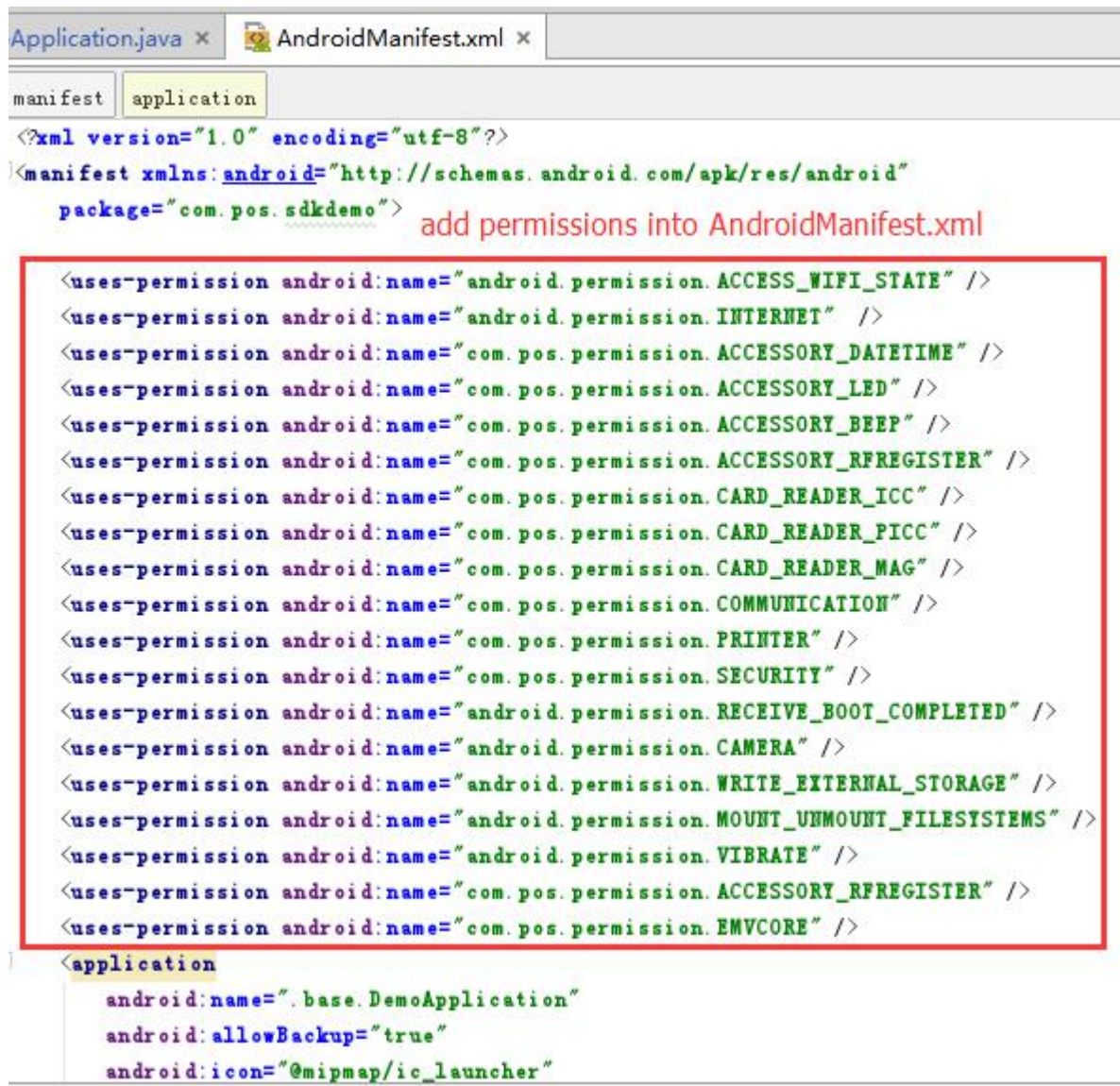
3.1.2 configure lib







3.1.3 configureAndroidManifest.xml

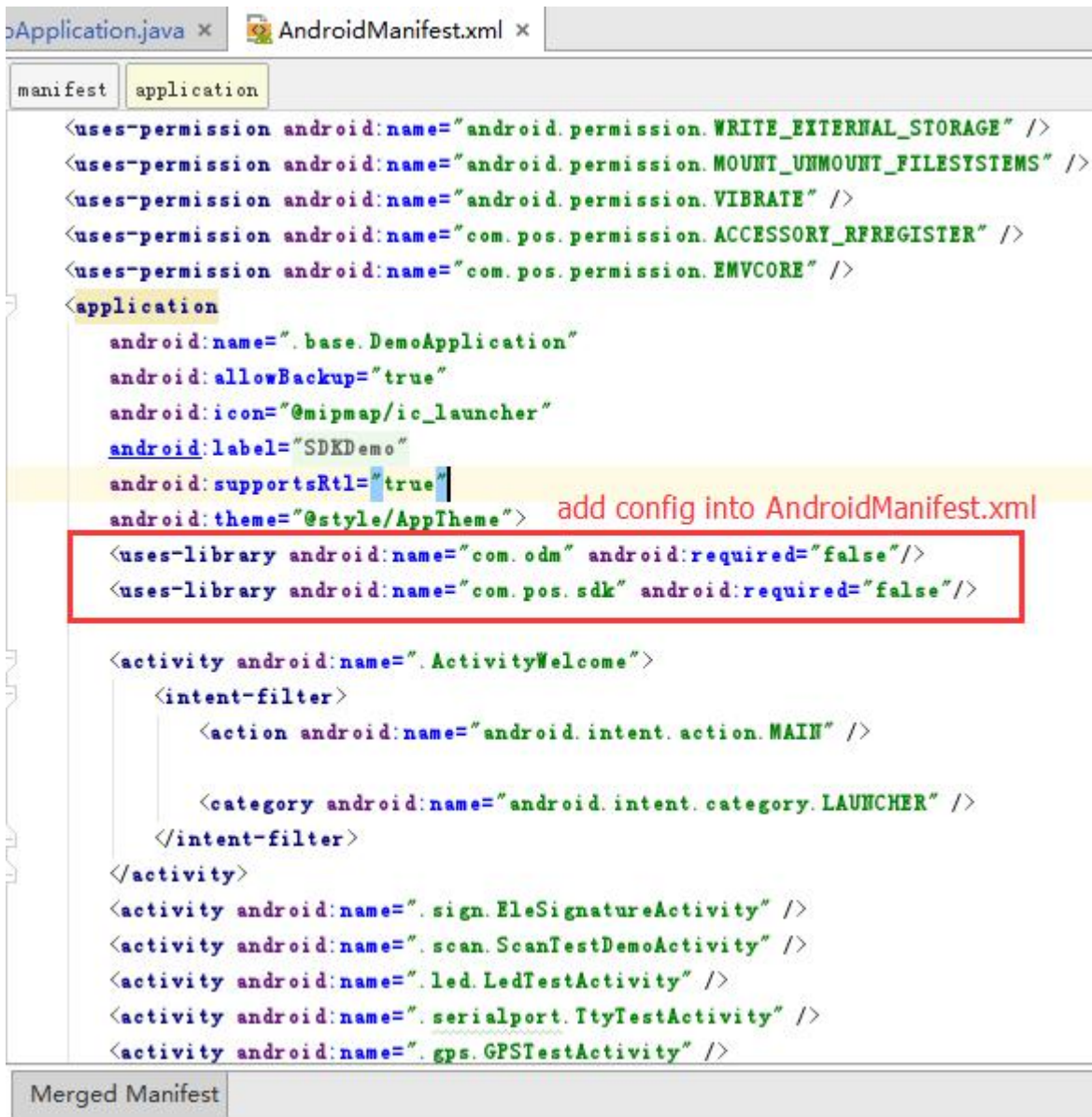


```

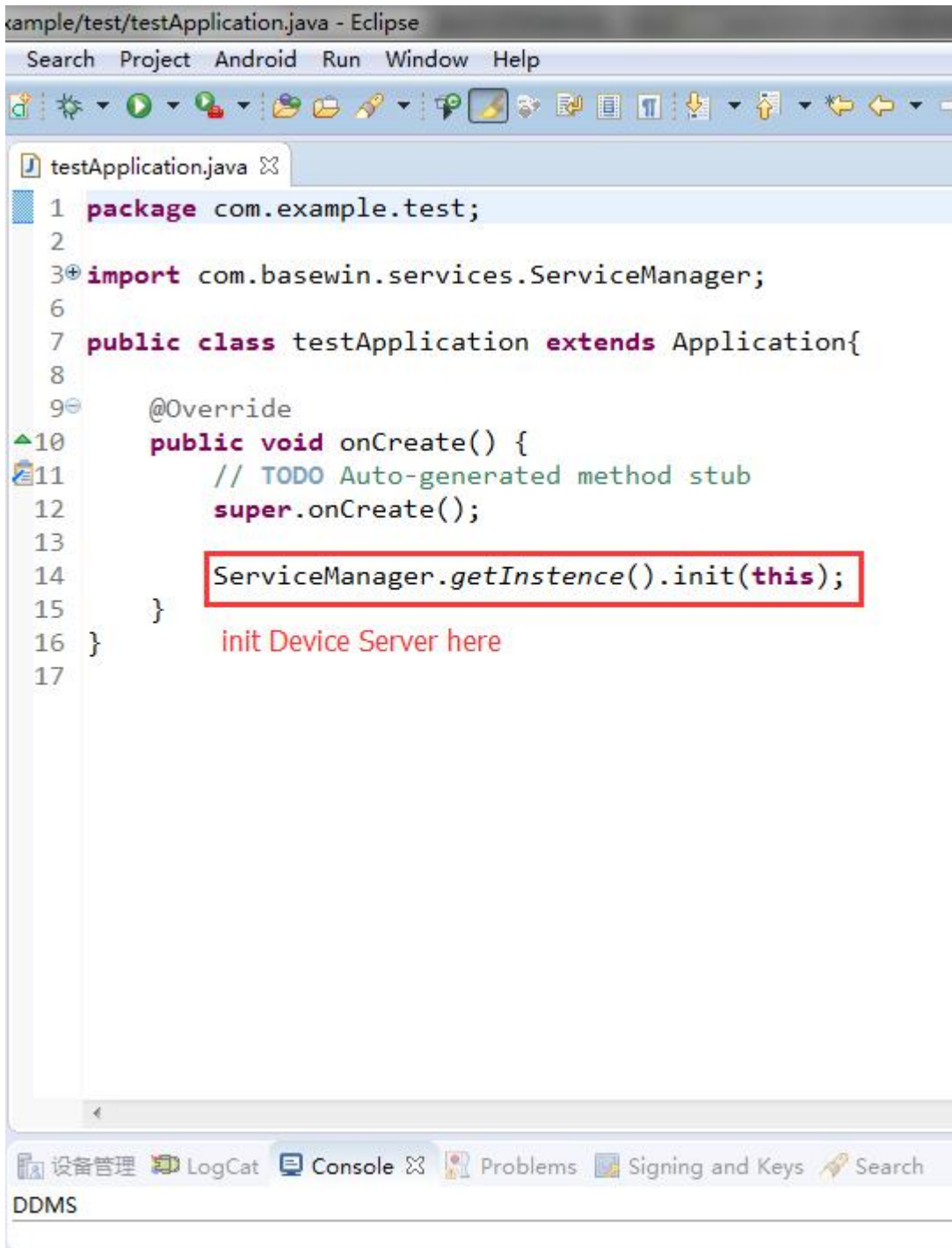
Application.java x  AndroidManifest.xml x
manifest  application
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.pos.sdkdemo">
    add permissions into AndroidManifest.xml

    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE" />
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_DATETIME" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_LED" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_BEEP" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_RFREGISTER" />
    <uses-permission android:name="com.pos.permission.CARD_READER_ICC" />
    <uses-permission android:name="com.pos.permission.CARD_READER_PICC" />
    <uses-permission android:name="com.pos.permission.CARD_READER_MAG" />
    <uses-permission android:name="com.pos.permission.COMMUNICATION" />
    <uses-permission android:name="com.pos.permission.PRINTER" />
    <uses-permission android:name="com.pos.permission.SECURITY" />
    <uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
    <uses-permission android:name="android.permission.CAMERA" />
    <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
    <uses-permission android:name="android.permission.MOUNT_UNMOUNT_FILESYSTEMS" />
    <uses-permission android:name="android.permission.VIBRATE" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_RFREGISTER" />
    <uses-permission android:name="com.pos.permission.EMVCORE" />

    <application
        android:name=".base.DemoApplication"
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
  
```

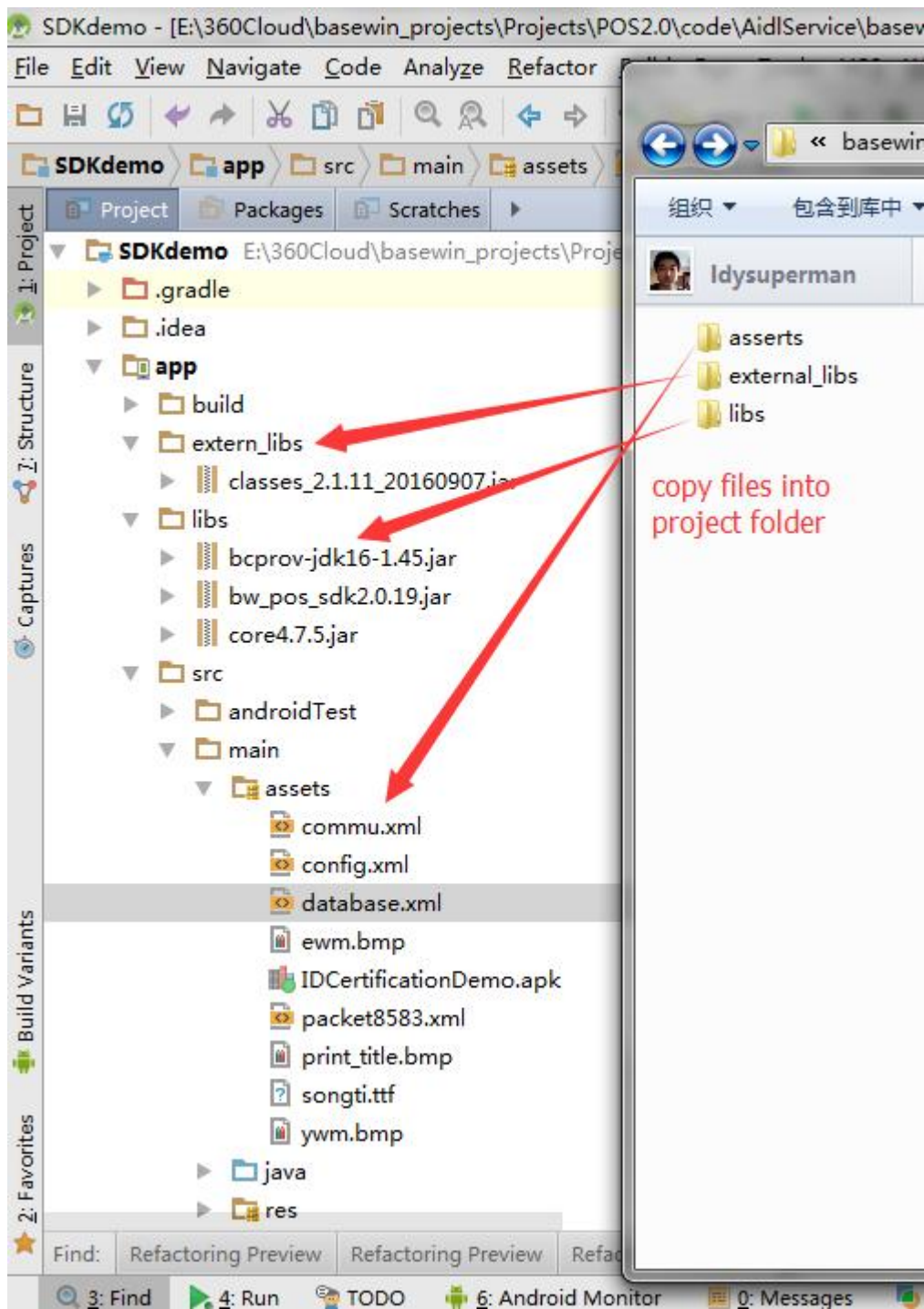


3.1.4 initial device

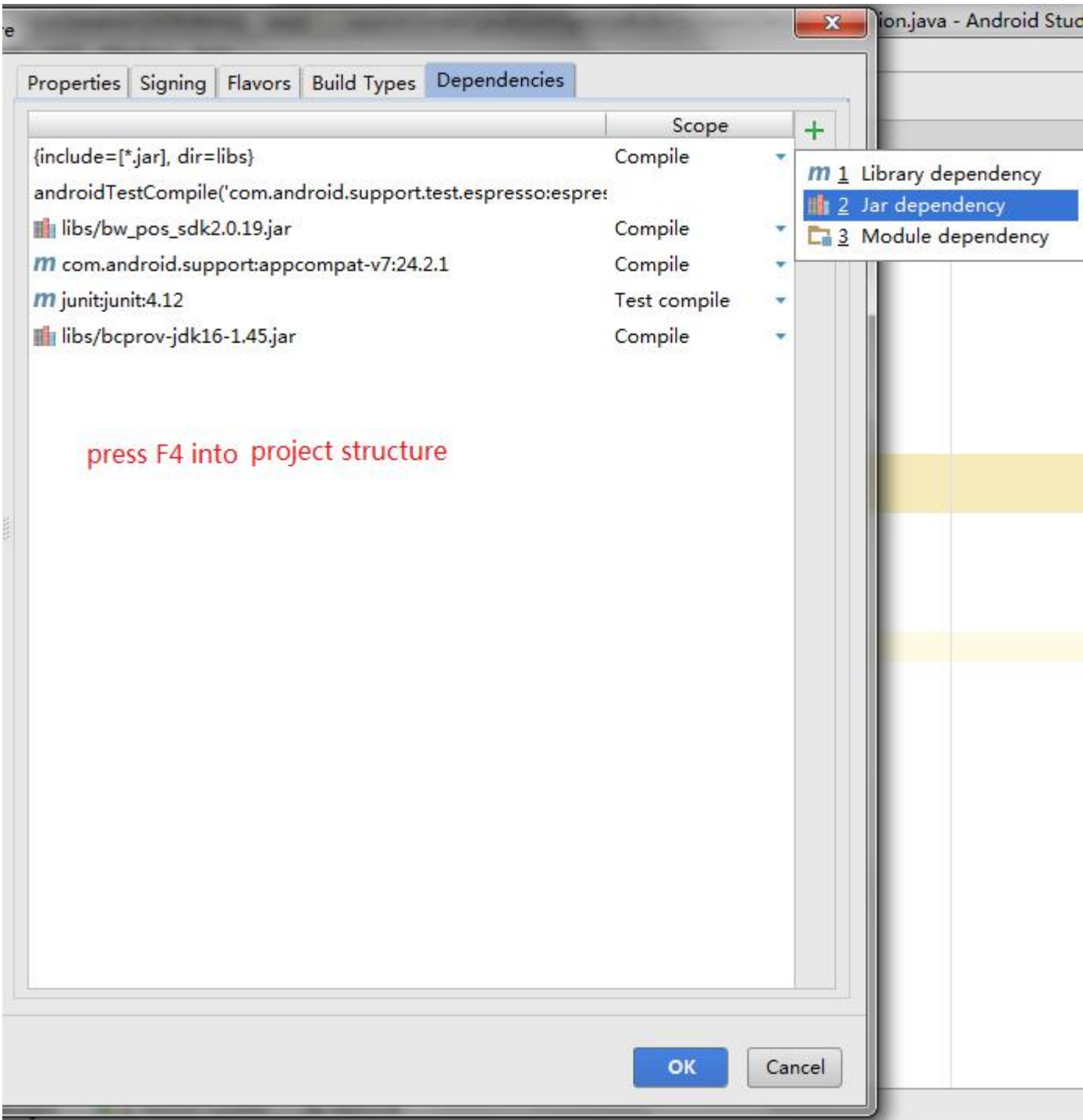


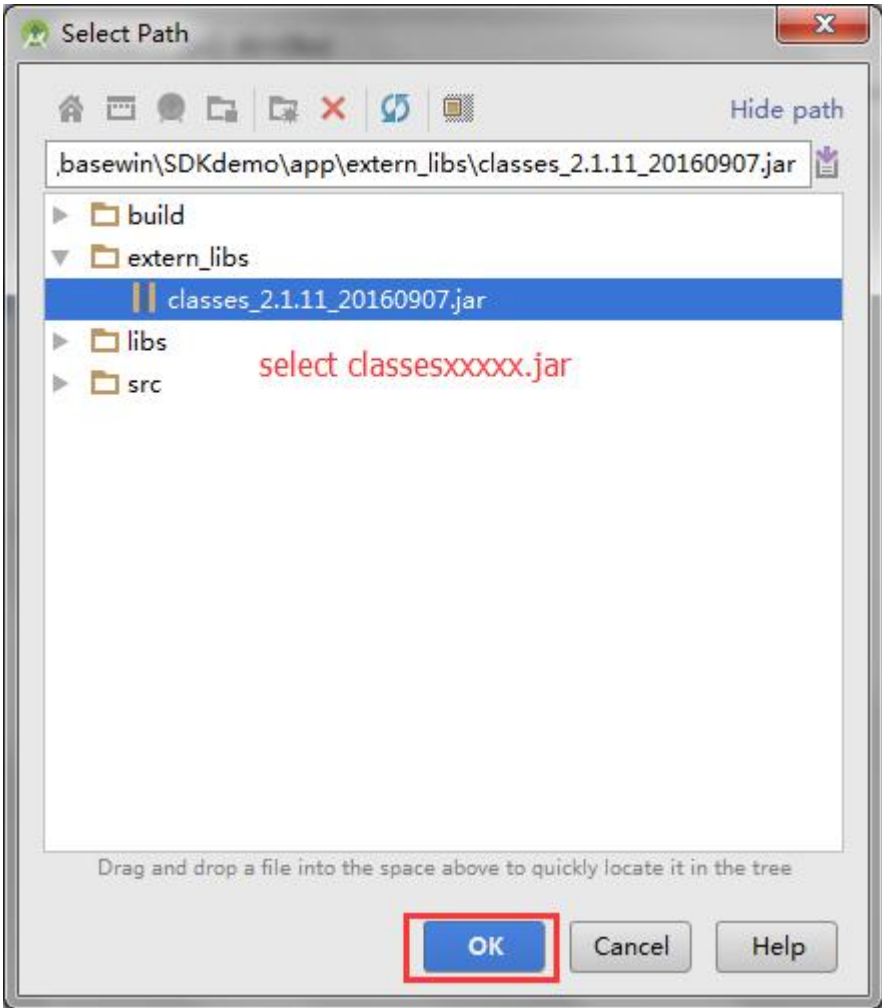
3.2 android studio

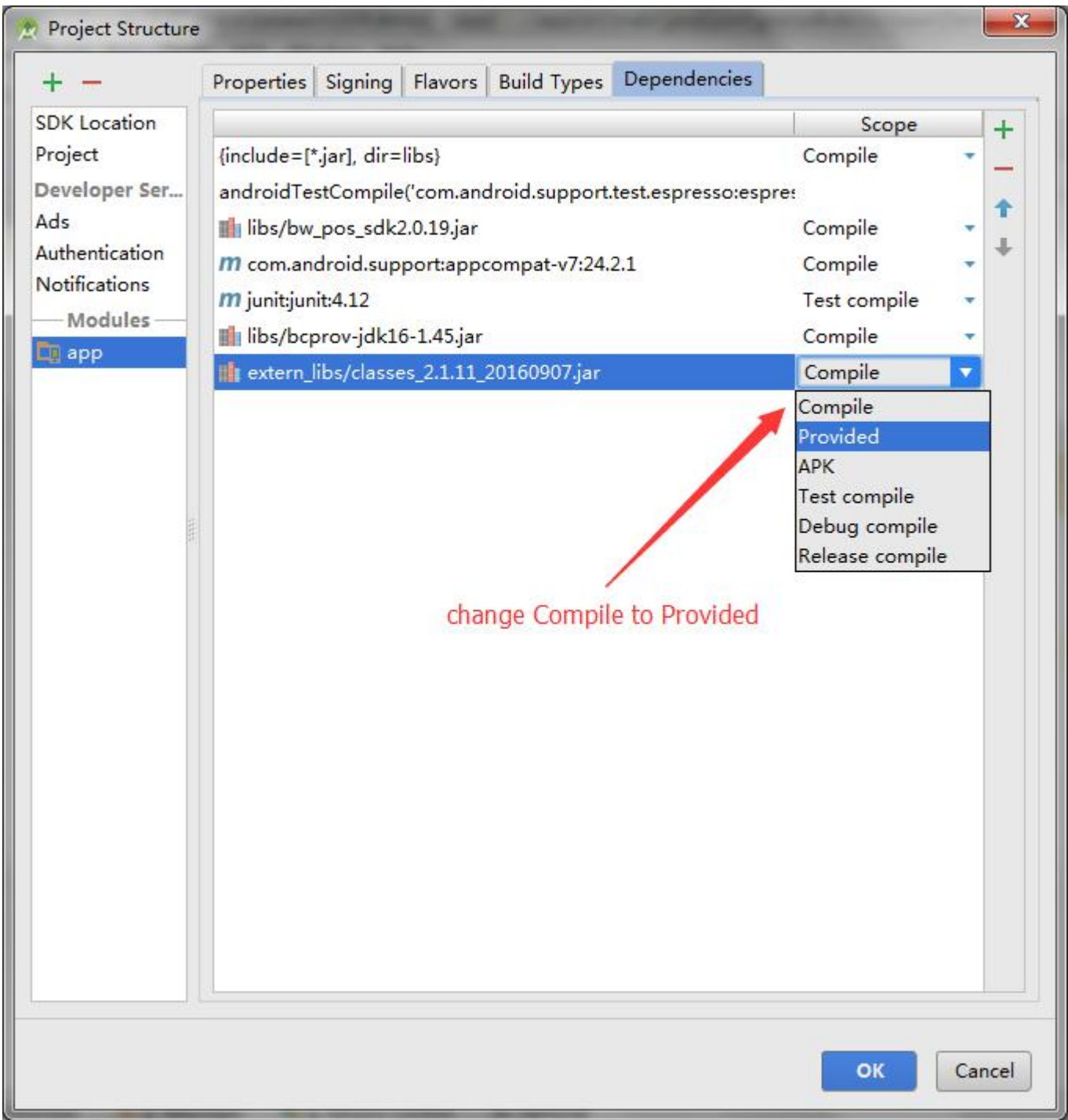
3.2.1 import resource

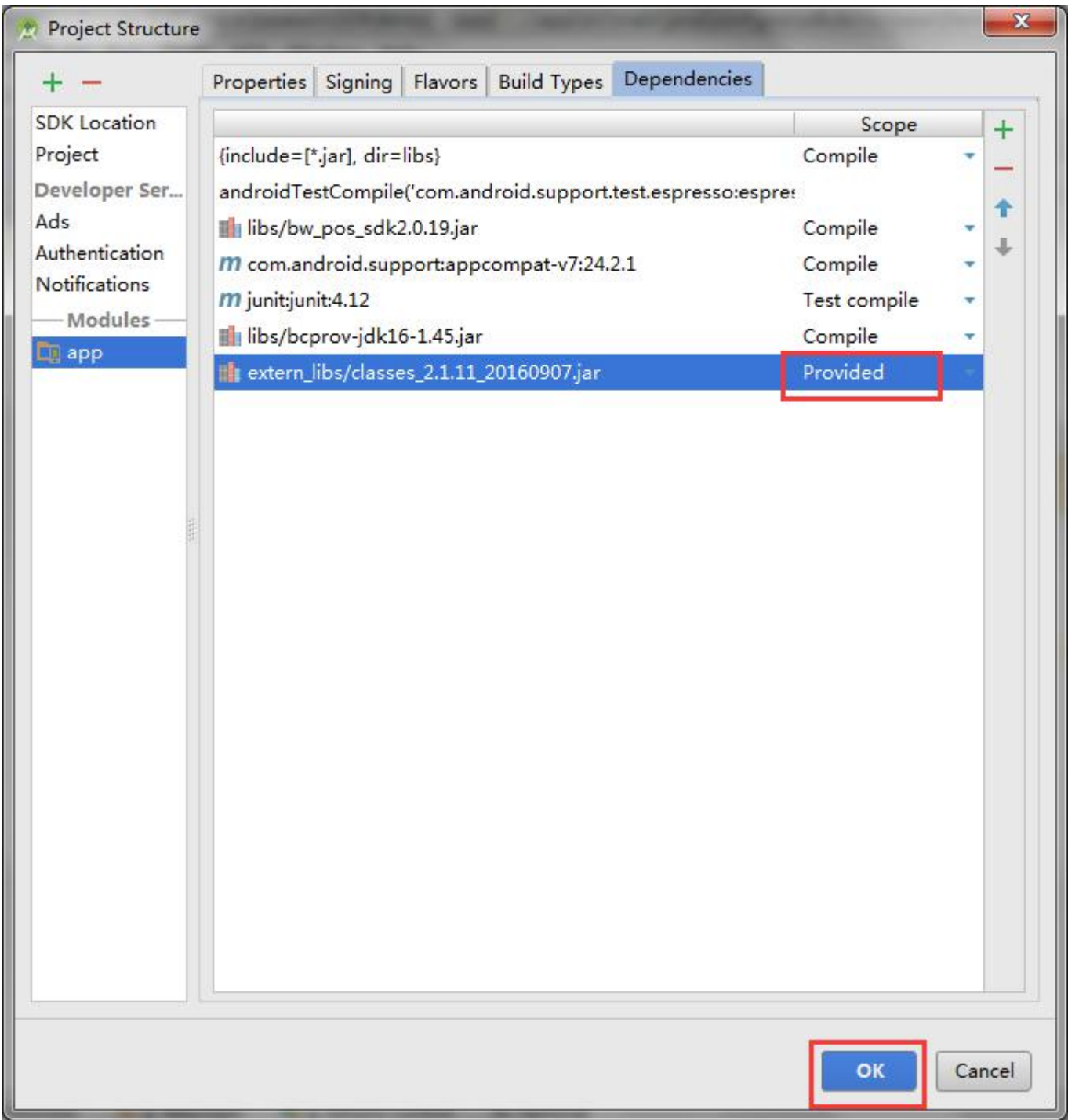


3.2.2 configure lib

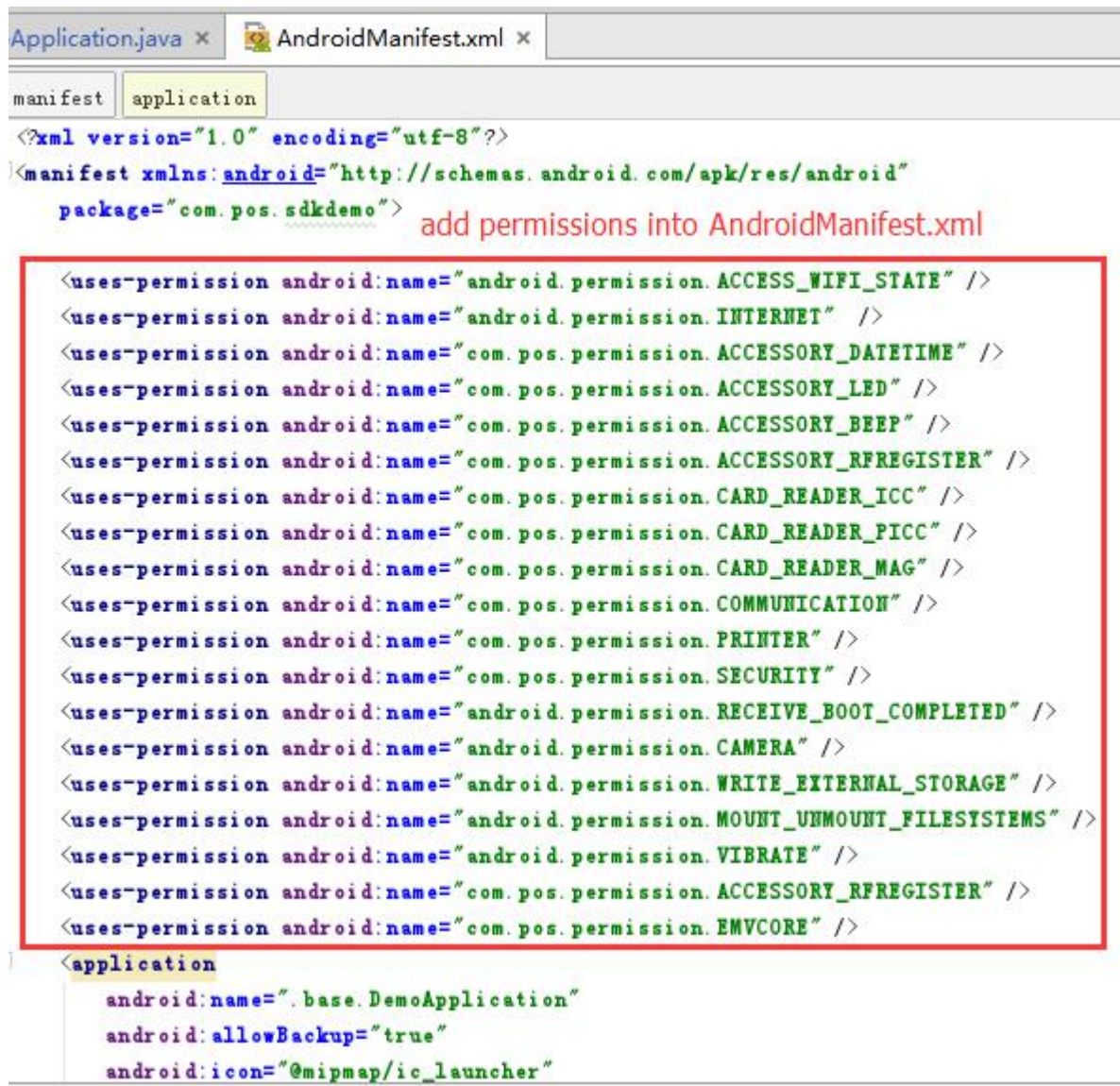








3.2.3 configure AndroidManifest.xml

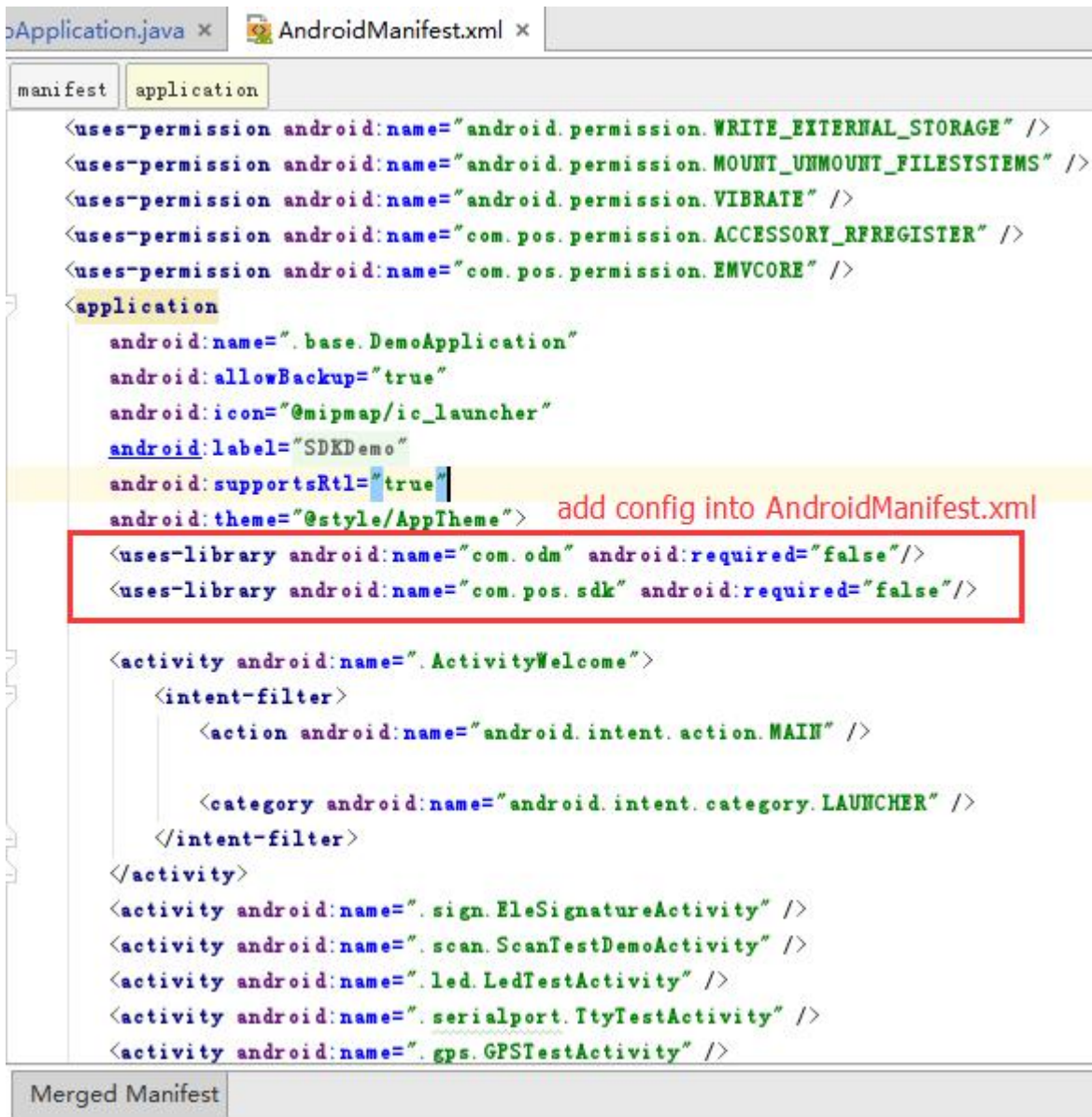


```

Application.java x  AndroidManifest.xml x
manifest  application
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.pos.sdkdemo">
    add permissions into AndroidManifest.xml

    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE" />
    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_DATETIME" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_LED" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_BEEP" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_RFREGISTER" />
    <uses-permission android:name="com.pos.permission.CARD_READER_ICC" />
    <uses-permission android:name="com.pos.permission.CARD_READER_PICC" />
    <uses-permission android:name="com.pos.permission.CARD_READER_MAG" />
    <uses-permission android:name="com.pos.permission.COMMUNICATION" />
    <uses-permission android:name="com.pos.permission.PRINTER" />
    <uses-permission android:name="com.pos.permission.SECURITY" />
    <uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
    <uses-permission android:name="android.permission.CAMERA" />
    <uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
    <uses-permission android:name="android.permission.MOUNT_UNMOUNT_FILESYSTEMS" />
    <uses-permission android:name="android.permission.VIBRATE" />
    <uses-permission android:name="com.pos.permission.ACCESSORY_RFREGISTER" />
    <uses-permission android:name="com.pos.permission.EMVCORE" />

    <application
        android:name=".base.DemoApplication"
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
  
```



3.2.4 initial device

Application.java x

DemoApplication onCreate()

```
package com.pos.sdkdemo.base;

import android.app.Application;

import com.basewin.services.ServiceManager;
import com.pos.sdkdemo.utils.GlobalData;

/**
 * Created by Administrator on 2016/11/30.
 */

public class DemoApplication extends Application{
    private static final String TAG = "DemoApplication";
    @Override
    public void onCreate() {
        super.onCreate();

        /**
         * init Device Server
         */
        ServiceManager.getInstance().init(getApplicationContext());

        /**
         * init the GlobalData cashe
         */
        GlobalData.getInstance().init(this);
    }
}
```

4. Modules

4.1 print module

4.1.1 Notice

This module interface is in `ServiceManager.getInstance().getPrinter()` in sdk.
The width of picture for print is no more than 384 pixel, and it should be mutiple of 8.

4.1.2 print

Function

print data. To easy to tear sheet, several line will be left at the bottom.

If it is not needed, printNoFeed can be called

Parameter

ParaName	Type	Description
json	String	The json character string to be printed. the string formats can be seen in the Appendix
bitmap	Bitmap[]	The bitmap array to be printed, arranged as the order of the json character string
listener	AidlPrinterListener	print callback new OnPrinterListener()

Return value

return value	Description
null	

Format and content can be controlled through the passed json string when the text or image is printed.

Example:

```

{
    "spos": [
        {
            "content-type": "txt",
            "size": "2",
            "content": "示例文字\n",
            "position": "left",
            "italic": "1",
            "bold": "1",
        },
        {
            "content-type": "jpg",
            "position": "center",
        },
        {
            "content-type": "two-dimension",
            "size": "2",
            "content": "891110847565611252"
        },
        {
            "content-type": "one-dimension",
            "size": "2",
            "height": "1",
            "content": "891110847565611252"
        }
    ]
}
    
```

Notice:

- 1.The content to be printed should be put in the array of container named “spos”. An element of the array is the smallest printable unit. And an element represents a paragraph with the same format.
2. Both key and value are denoted with String.
- 3.Json string and bitmap array are passed into the print interface.
- 4.If image is printed, “content” is not passed in and the length of “spos” array must be one .

Key	Value
content-type	Content type, optional fields: ”txt”, “jpg”, ”one-dimension”(one-dimensional code), “two-dimension”(two-dimensional code) (Required)
Size	Printing type is txt: The optional fields of the txt sizes: 1-3 Printing type is two-dimension: The sizes of two-dimensional code: 1-8. Printing type is one-dimension: The width of one-dimensional code: 1-3
Content	The printed txt/one-dimensional /two-dimensional code
Position	Alignment, optional fields “left”, “center”, “right” Default: left (Optional)
Offset	Offset, no effect currently
italic	“1”: Italic, “0” normal Default: 0 (Optional)
Bold	“1”: Bold, “0”: No bold Default: 0 (Optional)
Height	The height of one-dimensional code: 1-3

4.1.3 printNoFeed

Function

print data, the difference to [print](#) is that [printNoFeed](#) has no paper feed after finish printing.

Parameter

ParaName	Type	Description
json	String	The json character string to be printed. the string formats can be seen in the Appendix
bitmap	Bitmap[]	The bitmap array to be printed, arranged as the order of the json character string
listener	AidlPrinterListener	print callback new OnPrinterListener()

Return value

Return value	Description
null	

Format and content can be controlled through the passed json string when the text or image is printed.

Example :

```
{
  "spos": [
    {
      "content-type": "txt",
      "size": "2",
      "content": "示例文字\n",
      "position": "left",
      "italic": "1",
      "bold": "1",
    },
    {
      "content-type": "jpg",
      "position": "center",
    },
    {
      "content-type": "two-dimension",
      "size": "2",
      "content": "891110847565611252"
    },
    {
      "content-type": "one-dimension",
      "size": "2",
      "height": "1",
      "content": "891110847565611252"
    }
  ]
}
```

Notice:

- 1.The content to be printed should be put in the array of container named “spos”.An element of the array is the smallest printable unit. And an element represents a paragraph with the same format.
- 2. Both key and value are denoted with String.
- 3.Json string and bitmap array are passed into the print interface.
- 4.If image is printed, “content” is not passed in and the length of “spos”array must be one .

Key	Value
content-type	Content type, optional fields: ”txt”, “jpg”, ”one-dimension”(one-dimensional code), “two-dimension”(two-dimensional code) (Required)
Size	Printing type is txt: The optional fields of the txt sizes: 1-3 Printing type is two-dimension: The sizes of two-dimensional code: 1-8. Printing type is one-dimension: The width of one-dimensional code: 1-3
Content	The printed txt/one-dimensional /two-dimensional code
Position	Alignment, optional fields “left”, “center”, “right” Default: left (Optional)
Offset	Offset, no effect currently

<i>italic</i>	“1”: Italic, “0” normal Default: 0 (Optional)
Bold	“1”: Bold, “0”: No bold Default: 0 (Optional)
<i>Height</i>	The height of one-dimensional code: 1-3

4.1.4 printBottomFeedLine

Function

Set the feed line at the bottom of print

Parameter

ParaName	Type	Description
line	int	line number

Return value

Return value	Description
null	

4.1.5 PrintStep

Parameter

ParaName	Type	Description
line	int	line number

Return value

Return value	Description
null	

4.1.6 PrintStepI

Parameter

ParaName	Type	Description
line	int	line number

Return value

Return value	Description
null	

4.1.7 setPrintGray

Parameter

ParaName	Type	Description
gray	int	grayscale

Return value

Return value	Description
null	

4.1.8 setLineSpace

Parameter

ParaName	Type	Description
line	int	Line space

Retun value

Return value	Description
null	

4.1.9 setParameters

Parameter

paraName	Type	Description
printParams	com.pos.sdk.printer.PosPrinter .Parameters	

Return value

Return valu	Description
null	

4.1.10 getParameters

Parameter

paraName	Type	Description
----------	------	-------------

null		
------	--	--

Return value

Return valu	Description
com.pos.sdk.printer.PosPrinter.Parameters	

4.1.11 setFontSize

Function

Set print parameter, it can not be use with print at the same time. Font size can be set in print, it is usually used with beginiPrint.

Parameter

paraName	Type	Description
printParams	int	font size

Return value

Return value	Description
null	

4.1.12 setPrintFont

Function

Set print Font. The definition can be inferred in com.basewindefine.FontsType.

Parameter

ParaName	Type	Description
fontname	String	The font path is embedded in Android syste. Path constant can be used in FontsType.class.

return value	Description
null	

Note:

Font in common use: FontsType.simsun (Song Typeface)

4.1.13 setPrintFontByAsserts

Function

Set print Font. The font is put into assets directory.

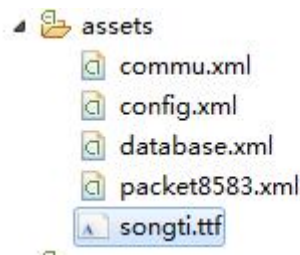
Parameter

ParaName	Type	Description
fontname	String	The font path is embedded inAndroid syste.

		Path constant can be used in FontType.class.
--	--	---

return value	Description
null	

Example :



```
ServiceManager.getInstncece().getPrinter().setPrintFontByAsserts("songti.ttf");
```

4.1.14 cleanCache

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
null	

4.1.15 addText

Parameter

ParaName	Type	Description
text	String	text need to be added

Return value

Return value	Description
null	

4.1.16 addBitMap

Parameter

ParaName	Type	Description
path	String	bitmap path need to be added

Return value

Return value	Description
null	

4.1.17 beginPrint

Function

start to print

Parameter		
ParaName	Type	Description
listener	OnPrinterListerner	print listener

Return value

Return value	Description
null	

Note:

Process: cleanCache -----> addText/addBitmap -----> beginPrint

4.1.18 printText

Function

start to print

Parameter		
ParaName	Type	Description
listener	OnPrinterListerner	print listener

Return value

Return value	Description
null	

Note:

4.1.19 PrintStepByBlackTag

Function

paper feed and detect black label

Parameter		
ParaName	Type	Description
count	int	line number
detectBlackMark	int	line number occupied by black label

Return value

Return value	Description
--------------	-------------

null

4.1.20 PrintStepByBlackTagMax

Function

paper feed, detect black label and threshold

Parameter

ParaName	Type	Description
count	int	line number
detectBlackMark	int	line number occupied by black lablle
detectBlackMarkThres hold	int	threshold, 200

Return value

Return value	Description
null	

4.1.21 queryIfHavePaper

Function

whether it is lack of paper

Parameter

ParaName	Type	Description

Return value

Return value	Description
boolean	true, lack peper; false, normal

4.1.22 refreshCallBack

Function

update the printer listener, it is set as null, or reset the printer listener in another activity.

Parameter

ParaName	Type	Description
listener	OnPrinterListener	Printer listener

Return value

return value	Description
void	

4.1.23 getPrinterInfoForNow

Function

get the status information of the printer

Parameter

ParaName	Typer	Description

Return value

return value	Description
PrinterInfo	Printer information

4.1.24 getPrinterNum

Function

get the number of printers

Parameter

ParaName	Type	Description

Return value

return value	Description
int	printer number

4.1.25 getPrinterInfo

Parameter

ParaName	Type	Description

Return value

返回值 return value	Description
List<PrinterInfo>	information list

4.1.26 selectPosPrinter

Function

select Printer, the system printer is used by default, if it has the bluetooth printer, the interface is used to choose it.

Parameter

ParaName	Type	Description
id	int	printer id, it can be found through getPrinterInfo.

Return value

return value	Description
boolean	true , select successfully; false, failed

4.2 code-scanning

4.2.1 Notice

Resource for code-scanning is put in the directory of res in sdk package.

4.2.2 startScan

Parameter

ParaName	Type	Description
timeout	long	Time of timeout, for example, 60 means 60 seconds overtime.
barcodeCallBack	AidlBarcodeCallBack	Scanning result callback

Return value

Return value	Description
null	

4.2.3 startScanZbar

Function

Zbar code-scanning interface

Parameter

ParaName	Type	Description
timeout	long	The limited time
barcodeCallBack	AidlBarcodeCallBack	result

Return value

Return value	Description
null	

4.3 pinPad

4.3.1 notice

Notice : there are three key modules of pinpad. The former two modules are suggested.

1.Single application key module: the uppper do not need to care about the index of the main key and work key.

2.Multiple application key module: Simutaneous usage of ten application is supported at present. And the application only need to keep the index of main key, the index of work key can be ignored.

3.Completed user-defined key module. All the key index need to be kept. And this module is not suggested.

pinPad module includes key loading and key entering.

Key type is defined in the constant class "com.base win.define.**KeyType**"

```
/**
 * pin key
 */
public static final int PIN_KEY = 1;
/**
 * track key
 */
public static final int TRACK_KEY = 2;
/**
 * mac key
 */
public static final int MAC_KEY = 3;
/**
 * loading key type of pinpad
 */
public static final int PED_TMK = 0X02;//main key
public static final int PED_TPK = 0X03;//pin key
public static final int PED_TAK = 0X04;//mac key
public static final int PED_TDK = 0X05;//track encrypted key
```

Notice of Pos security modules:

Shield of power key:

It is suggested to shield power key when sdk interface is used in transaction and some sensitive operations. And the key should be recovered when other operations is switched, or problems are likely to be occurred.

Example:

1.When pin pad is called in the transaction, screen-off and low-voltage alert dialog will cause that the pin pad can not be closed and then stop the transaction process.

2.Print process may be interrupted d by the screen-off operation.

3.power key failure , AppUtil.TransStart() is called but power key is not recovered.

Application :

Power key should be shielded in the transaction and print process and other processes that may be affected by screen-off operation.

Use:

if the short click function of power and the alert dialog need to be shielded, AppUtil.TransStart() can be called. It can be recorved by calling AppUtil.TransEnd().
 <!--EndFragment-->

4.3.2 DES key system

4.3.2.1 loadProtetKeyByArea

Function

load protect key

Parameter

ParaName	Type	Description
area	int	[1,60] area index
keyValue	String	plain text

Return value

Return value	Description
boolean	loading result

4.3.2.2 loadMainKeyWithKcvByArea

Function

load mainkey plaintext(transmit key is existed), with kcv check. If kcv is null, then it is not checked.

Parameter

ParaName	Type	Description
----------	------	-------------

area	int	[1,60] area index
tmkid	int	[1,1000]main key index
key	String	ciphertext
kcv	String	kcv chek value

Return value

return value	Description
boolean	loading result

4.3.2.3 laodMainKeyByArea

Function

load mainkey plaintext(without transmit key),without kcv check.

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	plaintext

Return value

Return value	Description
boolean	loading result

4.3.2.4 UpdateMainKeySM4ByArea

Function

load mainkey plaintext(without transmit key),decrypt by the mainkey which inject by loadMianKeyByArea

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	plaintext

Return value

Return value	Description
boolean	loading result

4.3.2.5 loadMacKeyByArea

Function

load mac key ciphertext

Parameter

Parameter	type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	ciphertext
kcv	String	kcv check value

return value

return value	Description
boolean	loading result

4.3.2.6 loadPinKeyByArea

Function

load pin key text, it will not check if kcv is null

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	cyphertext
kcv	String	kcv check value

Return value

return value	description
boolean	laoding result

4.3.2.7 loadTDKeyByArea

Function

Load magnetic track cypher text. it will not check if kcv is null.

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]
key	String	plaintex
kcv	String	kcv check value

Return value

return value	Description
boolean	result

4.3.2.8 encryptDataByArea

Parameter

ParaName	Typed	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]
keytype	int	main key type, support: KeyType.MAC_KEY , KeyType.PIN_KEY , KeyType.TRACK_KEY
data	String	data to be encrypted

Return value

return value	description
String	result, null will be returned if failed.

4.3.2.9 decryptDataByArea

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main index [1,1000]
keytype	int	keytype,support: KeyType.MAC_KEY , KeyType.PIN_KEY , KeyType.TRACK_KEY
data	String	data to be decrypted

Return value

return value	description
String	decrypt result, nulll will be returned if failed.

4.3.2.10 calcMACByArea

Function

calculate mac

Parameter

paraName		Type	Description
area		int	area index [1,60]
tmkid		int	main key index [1,1000]
data		String	data to be calculated
mode	int	mode:support : BwPinpadSource.MAC_MOD1 BwPinpadSource.MAC_MOD2 BwPinpadSource.MAC_MOD919 BwPinpadSource.MAC_ECB (unionpay standard algorithm)	

Return value

return value	description
--------------	-------------

String	result
--------	--------

4.3.2.11 encryptMagTrackByArea

Function

encrypt magnetic track data.

Parameter

ParaName	Type	Description
area	int	Area index [1,60]
tmkid	int	Main key index [1,1000]
data	String	magnetic track data

Return value

Return valude	Description
String	the encrypted data

4.3.2.12 inputOnlinePinByArea

Function

input online password, it needs to complete trusteeship.

Parameter

ParaName	Type	Description
area	int	Area index [1,60]
tmkid	int	Main key index [1,1000]
panBlock	String	card number
lenLimit	byte[]	length limit of the password,such as {0,6} ,add the same number at the end can confirm the card num automatically,such as {0,6,6}

Return value

Return value	Description
--------------	-------------

4.3.3 SM4 key system

4.3.3.1 loadProtectKeySM4ByArea

Parameter

ParaName	Type	Description
area	int	[1,60] area index
keyValue	String	plain text

Return value

Return value	Description
boolean	loading result

4.3.3.2 loadMainKeyWithKcvSM4ByArea

Function

load mainkey plaintext(transmit key is existed), with kcv check. If kcv is null, then it is not checked.

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000]main key index
key	String	ciphertext
kcv	String	kcv chek value

Return value

return value	Description
boolean	loading result

4.3.3.3 loadMainKeySM4ByArea

Function

load mainkey plaintext(without transmit key),without kcv check.

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	plaintext

Return value

Return value	Description
boolean	loading result

4.3.3.4 UpdateMainKeySM4ByArea

Function

load mainkey plaintext(without transmit key),decrypt by the mainkey which inject by loadMianKeyByArea

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	plaintext

Return value

Return value	Description
boolean	loading result

4.3.3.5 loadMacKeySM4ByArea

Function

load mac key ciphertext

Parameter

Parameter	type	Description
-----------	------	-------------

area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	ciphertext
kcv	String	kcv check value

return value

return value	Description
boolean	loading result

4.3.3.6 loadPinKeySM4ByArea

Function

load pin key text, it will not check if kcv is null

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
key	String	cyphertext
kcv	String	kcv check value

Return value

return value	description
boolean	laoding result

4.3.3.7 loadTDKeySM4ByArea

Function

Load magnetic track cypher text. it will not check if kcv is null.

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]

key	String	plaintex
kcv	String	kcv check value

Return value

return value	Description
boolean	result

4.3.3.8 encryptDataSM4ByArea

Parameter

ParaName	Typed	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]
keytype	int	main key type, support: KeyType.MAC_KEY , KeyType.PIN_KEY , KeyType.TRACK_KEY
data	String	data to be encrypted

Return value

return value	description
String	result, null will be returned if failed.

4.3.3.9 decryptDataSM4ByArea

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main index [1,1000]
keytype	int	keytype,support: KeyType.MAC_KEY , KeyType.PIN_KEY ,

		KeyType.TRACK_KEY
data	String	data to be decrypted

Return value

return value	description
String	decrypt result, nulll will be returned if failed.

4.3.3.10 calcMACSM4ByArea

Function

calculate mac

Parameter

paraName		Type	Description
area		int	area index [1,60]
tmkid		int	main key index [1,1000]
data		String	data to be calculated
mode	int	mode:support : BwPinpadSource.MAC_MOD1 BwPinpadSource.MAC_MOD2 BwPinpadSource.MAC_MOD919 BwPinpadSource.MAC_ECB (unionpay standard algorithm)	

Return value

return value	description
String	result

4.3.3.11 encryptMagTrackSM4ByArea

Function

encrypt magnetic track data.

Parameter

ParaName	Type	Description
----------	------	-------------

area	int	Area index [1,60]
tmkid	int	Main key index [1,1000]
data	String	magnetic track data

Return value

Return valude	Description
String	the encrypted data

4.3.3.12 inputOnlinePinSM4ByArea

Function

input online password, it needs to complete trusteeship.

Parameter

ParaName	Type	Description
area	int	Area index [1,60]
tmkid	int	Main key index [1,1000]
panBlock	String	card number
lenLimit	byte[]	length limit of the password,such as {0,6} ,add the same number at the end can confirm the card num automatically,such as {0,6,6}

Return value

Return value	Description
--------------	-------------

4.3.4 unique identifier interface

4.3.4.1 loadSnkey

Function

load sn key, Unique identifier used for reform

Parameter

ParaName	Type	Description
key	String	sn key

Return value

return value	Description
boolean	result

4.3.4.2 getEncryptedUniqueCode

Function

use the sn number to encrypt sn + random, unionpay standard algorithm.

Parameter

ParaName	Type	Description
sn	String	SN number
random	String	random

Return value

return value	description
String	result

4.3.4.3 encryptDataBySnKey

Function

use the sn number to encrypt data.

Parameter

ParaName	Type	Description
data	String	data to be encrypted

Return value

return value	Description
String	result

4.3.5 GM algorithm

4.3.5.1 GM_RAW

Function

RAW command interface

parameter

paraName	type	description
tlvData	byte[]	

Return value

return value	description
PosByteArray	

4.3.5.2 GM_SM2_Encrypt

Function

SM2 encryption

parameter

ParaName	type	description
publicKey	byte[]	public key with 64bytes
plainData	byte[]	plain text

return value

return value	description
PosByteArray	

4.3.5.3 GM_SM2_Decrypt

Function

SM2 decryption

parameter

paraName	Type	description
privateKey	byte[]	private key data with 32bytes

ciperData	byte[]	secret text
-----------	--------	-----------------------------

return value

return value	description
PosByteArray	

4.3.5.4 GM_SM2_Sign

Function

SM2 signature

parameter

paraName	type	description
privateKey	byte[]	private key data with 32bytes
hashData	byte[]	hash data with 32bytes

return value

return value	description
PosByteArray	

4.3.5.5 GM_SM2_Verify

Function

SM2verification

parameter

paraName	type	description
privateKey	byte[]	public key with 64bytes
hashData	byte[]	hash data with 32bytes
signData	byte[]	signature data with 32bytes

return value

return value	description
boolean	

4.3.5.6 GM_SM2_Digest

Function

[SM2 abstract hash data](#)

parameter

parameter	type	description
publicKey	byte[]	public key with 64bytes
id	byte[]	id data of user
hashData	byte[]	hash data to be loaded

return value

return value	description
PosByteArray	

4.3.5.7 GM_SM3_Digest

Function

SM3 abstract

Parameter

parameter	type	description
Data	byte[]	data need to be loaded

return value

return value	description
PosByteArray	

4.3.5.8 loadSM4KeyWithoutEncrypt

Parameter

ParaName	Type	Description
index	index	[1,59]
keyValue	byte[]	plaintext key

return value

return value	description
boolean	

4.3.5.9 encryptDataSM4

Function

encryption with SM4

Parameter

ParaName	Type	Description
index	key index	[1,59]
data	String	data to be encrypted

Return value

Return value	Description
String	the encrypted data

4.3.5.10 decryptDataSM4

Function

description with SM4

Parameter

ParaName	Type	Description
index	key index	[1,59]
data	String	data to be descrypted

Return value

Return value	Description
String	the descrypted data

4.3.6 addKeyOwner

Function

add the key permission

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]
keyType	int	key type: KeyType.PED_TAK

		KeyType.PED_TPK KeyType.PED_TEK
ownerPkgName	String	package name

Return value

Return value	Description
boolean	result

4.3.7 deleteKeyOwner

Function

delete the key permission.

Parameter

ParaName	Type	Description
area	int	[1,60] area index
tmkid	int	[1,1000] main key index
keyType	int	key type: KeyType.PED_TAK KeyType.PED_TPK KeyType.PED_TEK
ownerPkgName	String	packageName

Return value

Return value	Description
boolean	result

4.3.8 OwnerPermission

Function

check the permission of the key

Parameter

ParaName	Type	Description
area	int	area index [1,60]
tmkid	int	main key index [1,1000]
keyType	int	key type: KeyType.PED_TAK KeyType.PED_TPK KeyType.PED_TEK

Return value

Return value	Description
boolean	check result

4.3.9 setPinpadMode

Function

I s the pinpad in order or out of order

parameter

paraName	type	description
mode	int	in order: PinpadBinder. <i>MODE_FIXED</i> out of order: PinpadBinder. <i>MODE_RANDOM</i>

return value

return value	description
void	

4.3.10 setOnPinInputListener

Return value

Return value	Descriptiion
null	

4.3.11 setPinpadLayout

Parameter

ParaName	Type	Description
layout	byte []	position of the virtual pad

Return value

Return value	Description
null	

4.3.12 format

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
null	

4.3.13 getRandom

parameter

paraName	type	description
len	int	length of the random number

return value

return value	description
String	

4.3.14 ClosePinpad

parameter

paraName	type	description
null		

return value

return value	description
null	

4.4 led module

4.4.1 notice

```
led lighting form definition:
public class BwLedType {
/**
 * green light
 */
public static final int LED_GREEN = 0x20;
/**
 * 红灯 red light
 */
public static final int LED_RED = 0x80;
/**
 * 黄灯 yellow light
 */
public static final int LED_YELLOW = 0x40;
/**
 * 蓝灯 blue light
 */
public static final int LED_BLUE = 0x10;
}
```

enableLedIndex(int idx, int onMs, int offMs)
interface is suggested

4.4.2 enableLedIndex

Function

Led light control

parameter

paraName	type	description
idx	int	color of the Led light, refer inBwLedType LED_GREEN 0x20 LED_RED 0x80 LED_YELLOW 0x40 LED_BLUE 0x10
flag	boolean	light is on or off

return value

return value	description
int	result , 0 -- success , failure

4.4.3 enableLedIndex

function

Led light control

parameter

paraName	type	description
idx	int	color of the Led light, refer in BwLedType LED_GREEN 0x20 LED_RED 0x80 LED_YELLOW 0x40 LED_BLUE 0x10
onMs	int	time of the light on
offMs	int	time of the light off

return value

return value	description
null	

4.5 beeper module

4.5.1 notice

4.5.2 beep

Function

Beeper sound

Parameter

ParaName	Type	Description
time	int	length, unit: millisecond
frequency	int	Frequency, unit: HZ, between 20 and 20000
voice	int	volume , no effect currently and the default value is 1.

Return value

Return value	Description
null	

4.6 pboc module

4.6.1 notice

3.The process of PBOC collecting card data.

1.3.1 start pboc listening

example :

```
Intent in = new Intent();
int amt = Integer.parseInt("99999");
in.putExtra(InputPBOCInitData.AMOUNT_FLAG, amt);
in.putExtra(InputPBOCInitData.USE_DEVICE_FLAG, InputPBOCInitData.USE_MAG_CARD
            InputPBOCInitData.USE_RF_CARD | InputPBOCInitData.USE_IC_CARD);
in.putExtra(InputPBOCInitData.TIMEOUT, 60);
try {
    ServiceManager.getInstance().getPboc().startTransfer(PBOCOption.ONLINE_PA
} catch (Exception e) {
    // TODO Auto-generated catch block
    e.printStackTrace();
}
```

Parameter:

pbocType: consumer amount

Intent:

User_device:select the type of the reading card.

InputPBOCInitData.AMOUNT_FLAG: transaction amount

listener : an implementation class of com.basewin.aidl.OnPBOCListener; Please refer to

12.3:Detailed annotation of PBOC process

1.3.2 PBOC swiping listener

After the PBOC is started, the swiping card listener will be called when swipe or insert card.Please refer to 12.3:Detailed annotation of PBOC process

Swiping card listener is showed on the following graph:

PBOCListener

- onStartPBOC() : void
- onRequestAmount() : void
- onSelectApplication(List<String>) : void
- onFindingCard(int, Intent) : void
- onRequestInputPIN(boolean, int) : void
- onConfirmCardInfo(Intent) : void
- onConfirmCertInfo(String, String) : void
- onAAResultOnlineProcess(Intent) : void
- onTransactionResult(int, Intent) : void
- onReadECBalance(Intent) : void
- onReadCardOfflineRecord(Intent) : void
- onError(Intent) : void

The executive process of Ic card:

- 1. onFindingCard(int cardType, Intent data)

- onStartPBOC()
- onSelectApplication(List<String> applicationList)
- onConfirmCardInfo(Intent info) :

The pinpad can be called in the functioin When the “confirm” is clicked, please execute:

```

BCDHelper.hex2DebugHexString(data,data.length)

ServiceManager.getInstance().getPboc().comfirmPinpad(data);
    
```

- The following process will be executed after the confirm procedure finished.

onAAResponseOnlineProcess(Intent actionAnalysisData)

- Input password in (5)->execute organization message->send message etc.

The executive process of non-contact card:

- onFindingCard(int cardType, Intent data)
- onTransactionResult(int result, Intent data)
- Input password in (2)->execute organization message->send message etc.

The executive process of magnetic strip card:

- onFindingCard(int cardType, Intent data)
- Input password in (1)->execute organization message->send message etc.

1.3.3 Stop PBOC listening

If you want to stop PBOC listener, please execute the following procedure:

ServiceManager.getInstance().getPboc().stopTransfer();

4.6.2 startTransfer

Function

Start PBOC process request, meanwhile the device start to search card

parameter

paraName	type	description
pbocType	int	Transaction type. PBOCOption.ONLINE_PAY, defined in the jar package, is frequently used.
intent	Intent	Pass parameter, generally the “amount” field, which means the transaction amount.
listener	AidlPBOCListener	PBOC transaction callback listener

Return value

Return value	Description
--------------	-------------

null	
------	--

```
process:
interface AidlPBOCListener{
    /**
     * PBOC process failure
     * @param state    device action state,can refer to PBOCErrorTransactionCode Class
     * @param code    error code in current state
     */
    void onError(in Intent result);

    /**
     * card searching success
     * @param cardType  Card type can be referred to CardType Class
     * @param data    OutputMagCardInfo Class is used for magnetic card, and
     *               OutputRFCardPassInfo Class is used for RF card. It is null value if IC card is used.

     */
    void onFindingCard(int cardType, in Intent data);

    /**
     * Start phoc process
     */
    void onStartPBOC();

    /**
     * Select applications
     * @param applicationList
     */
    void onSelectApplication(in List<String> applicationList);

    /**
     * Confirm certification information
     * @param certType certification Type
     * @param certInfo cdrtification information
     */
    void onConfirmCertInfo(String certType, String certInfo);

    /**
     * Confirm card information
     * @param info OutputCardInfoData is used for card reading.
     */
    void onConfirmCardInfo(in Intent info);

    /**
     * Input PIN
     * @param isOnlinePin    Is Onling Pin
     * @param retryTimes    Input times of the off-line pin
     */
    void onRequestInputPIN(boolean isOnlinePin, int retryTimes);

    /**
     * Online connection is requested after PBOC action analysis    * @param
     * actionAnalysisData    Online connection data, analyzed by OutputPBOCAADData Class
     */
}
```

```

void onAAResultOnlineProcess(in Intent actionAnalysisData);

/**
 * pboc process result
 * @param result It can be referred to PBOCTransactionResult Class.
 * @param data Data is null if rejection, if accept, OutputPBOC Class is used
to get data.
 */
void onTransactionResult(int result, in Intent data);

/**
 * Input amount is requested */
void onRequestAmount();

/**
 * Electronic cash balance is got.
 * @param ecBalance amount, It can be referred to OutputECBalance Class
 */
void onReadECBalance(in Intent ecBalance);

/**
 * Offline electronic cash transaction record collection is got

 * @param contents transaction record, It can be referred to
OutputOfflineRecord Class
 */
void onReadCardOfflineRecord(in Intent contents);
}

```

4.6.3 refreshListener

return value

return value	description
null	

4.6.4 stopTransfer

Function

stop PBOC transation

parameter

ParaNmae	type	description
null		

Return value

return value	description
null	

4.6.5 setAmount

Return value

Return value	Description
void	

4.6.6 selectApplication

Function

When PBOC processes request to select applicatioin (onSelectApplication()), PBOC select the application.

Parameter

ParaName	Type	Description
index	int	Application selection is from “1”, “0”means cancellation.

Return value

Return value	Description
null	

4.6.7 comfirmPinpad

Function

When pboc processes request to input pin code(onRequestInputPIN()), it is called after inputting the pin with pinpad.

Parameter

ParaName	Type	Description
pin	byte []	The value is null if the PIN is for on-line. The value is not null if the PIN is not for on-line.

Return value

Return value	Description
null	

4.6.8 confirmCardInfo

Function

When pboc processes request to confirm the card information(`onConfirmCardInfo()`), it is called after user confirmation.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
null	

4.6.9 confirmCerInfo

Function

When pboc processes request to confirm the certification information(`onConfirmCerdInfo()`), it is called after user confirmation.

Parameter

ParaName	Type	Description
null		

Return value

4.6.10 inputOnlineProcessResult

Function

When pboc processes request for on-line operation(`onAARequestOnlineProcess()`) and the value is returned, the online data is passed into the process through this interface.

Parameter

ParaName	Type	Description
respData	Intent	<i>PBOCInputOnlineData</i> class is suggested for data setting.

Return value

Return value	Description
null	

Notice: After online manipulation, this interface will be called at the second time of GAC.

```
InputPBOCOnlineData onlineData = new InputPBOCOnlineData();
onlineData.setResponseCode("39 域返回码，比如 00");
```

```
onlineData.setAuthCode("91tag 返回值 , 不包括 TAG , 只需要数据");
onlineData.setICData("71/72tag 返回值 ,包括 71/72 整个 TLV 数据");
ServiceManager.getInstnce().getPboc().inputOnlineProcessResult
(onlineData.getIntent());
```

4.6.11 updateAID

Parameter

ParaName	Type	Description
operation	int	Use the variable in AIDOperatorPara, The default value is increase.
aid	String	Parameter data TAG:9F06,DF01, 9F08,9F09, DF11, DF12, DF13, 9F1B,DF15, DF16, DF17, DF14, DF18,9F7B,DF19, DF20, DF21

Return value

4.6.12 updateRID

Parameter

ParaName	Type	Description
operation	int	Use the variable in RIDOperatorPara, The default value is increase.
rid	String	Rid parameter data, the TLV format string, TAG:9F06,9F22,DF05,DF06,DF07,DF02,DF03,DF04

Return value

4.6.13 setMerchantName

Parameter

ParaName	Type	Description
merchantName	String	Merchant name

Return value

Return value	Description
void	

4.6.14 setMerchantId

Parameter

ParaName	Type	Description
merchantId	String	Merchant ID

Return value

Return value	Description
void	

4.6.15 setTerminalId

Parameter

ParaName	Type	Description
terminalId	String	Terminal ID

Return value

Return value	Description
void	

4.6.16 getEmvTlvData

Function

get tlv data in emv

Parameter

paraName	type	description
tag	int	tag

return value

return value	description
void	

notice: The method is called to get the tlv data in or after the emv process

@Override

```

public void onTransactionResult(int result, Intent data) throws RemoteException {
    Log.d(TAG, "onTransactionResult");
    sb.append("onTransactionResult --- " + "result = " + result + "\n");
    if (result == PBOCTransactionResult.QPBOC_ARQC) {

```

```

// data is got and pinpad is called here for non-contact card
OutputQPBOCResult rf_data = new OutputQPBOCResult(data);
//get data
// TLV data of 55 field
String field55String = rf_data.get55Field();
// card number
String pan = rf_data.getPAN();
// half-shielded card number
String maskedpan = rf_data.getMaskedPan();
// equivalent data of magnetic track 2
// -two magnetic track equivalent data...
String trackString = rf_data.getTrack();
Log.d(TAG, getStr(R.string.two_track_data) + trackString);
byte[] bcdTrack = BCDHelper.StrToBCD(trackString, trackString.length());
Log.d(TAG, getStr(R.string.two_track_data) + " bcd: " +
BCDHelper.hex2DebugHexString(bcdTrack, bcdTrack.length));
// expired data
// The period of validity
String expiredate = rf_data.getExpiredDate();
sb.append(getStr(R.string.quick_pass_call_password_keyboard) + "\n");
handler2.sendEmptyMessage(PIN_DIALOG_SHOW);
} else if (result == PBOCTransactionResult.APPROVED) {
sb.append(getStr(R.string.ic_card_transaction_success) + "\n");

try {
sb.append("电子现金余额: "+ServiceManager.getInstance().getPboc().readEcBalance()
+ "\n");
timeTools.stop();
sb.append(getStr(R.string.pboc_time_consuming) + timeTools.getProcessTime() / 1000
+ getStr(R.string.s) + timeTools.getProcessTime() % 1000 + getStr(R.string.ms) + "\n");
Log.d(TAG, getStr(R.string.pboc_time_consuming) + timeTools.getProcessTime() /
1000 + getStr(R.string.s) + timeTools.getProcessTime() % 1000 + getStr(R.string.ms));
showText(sb);
byte[] data1 = ServiceManager.getInstance().getPboc().getEmvTlvData(0x9F5D);
if (data1!=null) {
Log.d(TAG, "data1 = " + BCDHelper.hex2DebugHexString(data1, data1.length));
}

byte[] data2 = ServiceManager.getInstance().getPboc().getEmvTlvData(0x9F79);
if (data2!=null) {
Log.d(TAG, "data2 = " + BCDHelper.hex2DebugHexString(data2, data2.length));
}

} catch (Exception e) {
// TODO Auto-generated catch block
e.printStackTrace();
}
// IC card transaction success
} else if (result == PBOCTransactionResult.TERMINATED)
// IC card transaction is refused, if online is successfull, reverse is needed.
// mechanism
sb.append(getStr(R.string.ic_refuse_trade) + "\n");
}

```

```
showText(sb);
}
```

4.6.17 readEcBalance

Function

to get the balance after the electronic cash transation

parameter

paraName	type	description
null		

return value

return value	description
int	balance value, accurate to points

4.6.18 getScriptResult

Function

to get the result after the script is excuted.

parameter

paraName	type	description
null		

return value

return value	描述 description
byte[]	result

4.6.19 getPosTermInfo

Function

get the terminal information of the emv

parameter

paraName	type	description
null		

return value

return value	description
PosTermInfo	terminal information

4.6.20 setPosTermInfo

return value

return value	description
null	

4.6.21 getPosTermPara

Funtion

get the terminal parameters in emv kernel

parameter

paraName	type	description
null		

return value

return value	description
PosEmvParam	terminal parameters

4.6.22 setPosTermPara

Function

set the terminal parameters for emv

parameters

paraName	type	description
posEmvParam	PosEmvParam	terminal parameters

return value

return value	description
null	

4.6.23 DelAid

Parameter

ParaName	Type	Description

Return value

return value	Description
void	

4.6.24 DelCapk

Parameter

ParaName	Type	Description

Return value

return value	Description
void	

4.7 terninal information

4.7.1 notice

4.7.2 getSN

Function

Get serial number of device.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	

4.7.3 getVID

Function

Get vendors ID

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	

4.7.4 getVName

Funciton

Get vendors Name

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	

4.7.5 getKSN

unction

Get the key serial number defined by customer

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	

4.7.6 isSupportIcCard

Function

Return whether IC card is supported.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.7 isSupportMagCard

Function

Return whether magnetic card is supported

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.8 isSupportRFCard

Function

Return whether radio frequency card is supported.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.9 isSupportPrint

Function

Return whether printer is supported.

Parameter

Parameter	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.10 isSupportOffLine

Function

Return whether off-line transaction is supported.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.11 isSupportBeep

Function

Return whether beeper is supported.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.12 isSupportLed

Function

Return whether LED light is supported.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	

4.7.13 getVersion

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	Return the version of Service, such as"2.0.6".

4.7.14 getDeviceType

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
String	

4.7.15 setSpTime

Function

Set SP time

Parameter

ParaName	Type	Description
time	byte[]	Time array, BCD code with 6 bytes. For example, 13 y- 10 m- 1 d, 13 h-05 min -10 s should be set as 0x13 0x10 0x01 0x13 0x05 0x10

Return value

4.7.16 getSpTime

Function

get SP time

parameter

paraName	type	description
null		
return value		
return value	description	
byte[]		

4.7.17 getSystemVersion

parameter		
paraName	type	description
null		
return value		
return value	description	
String		

4.8 serial port

4.8.1 notice

4.8.2 open

Function

open serial port

parameter		
paraName	type	description
null		
return value		
return value	description	
boolean		

4.8.3 init

Function

initial serial port function

parameter		
paraName	type	description
botratebyte	int	baud rate
dataBits	byte	data bit

parity	byte	parity check
StopBits	byte	stop bit
ifUsb	boolean	is it the usb module

return value

return value	description
boolean	

4.8.4 readData

parameter

paraName	type	description
timeout	int	time of timeout, unit: millisecond

return value

return value	description
byte[]	

4.8.5 sendData

parameter

parameter	type	description
data	byte[]	

return value

return value	description
boolean	

4.8.6 close

parameter

paraName	type	description
null		

return value

return value	description
boolean	

4.9 card reading

4.9.1 notice

单独的读卡模块，对于一些 M1 卡，CPU 卡，Psam 卡，逻辑加密卡，身份证等等进行支持，传统的银行卡使用 pboc 模块进行操作即可。

It is an independent card reading module. M1 card ,CPU card, Psam card, logic security card, identification card are all supported. For the traditional bank card, pboc module can handle it.

4.9.2 openPsamAndDetect

Function

Open up and listen to the Psam card slot1

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit :millisecond
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.3 openPsamAndDetect

Function

Open up and listen to the Psam card slot1

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.4 openPsam2AndDetect

Function

Open up and listen to the Psam card slot2

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond.
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.5 openPsam2AndDetect

Function

Open up and listen to the Psam card slot2, and returned

Parameter

ParaName	Type	Description

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.6 openPsamAndDetectBy38400

Function

Use the Baud rate 38400 to open up and listen to the Psam card slot1

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.7 openPsamAndDetectBy38400

Function

Use the Baud rate 38400 to open up and listen to the Psam card slot1

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.8 openPsam2AndDetectBy38400

Function

Use the Baud rate 38400 to open up and listen to the Psam card slot2

Parameter

参数名ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.9 openPsam2AndDetectBy38400

Function

Use the Baud rate 38400 to open up and listen to the Psam card slot2

Parameter

参数名ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.10 openM1AndDetect

Function

Open up and listen to the M1 card

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.11 openM1AndDetect

Function

Open up and listen to the M1 card

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.12 openCPUAndDetect

Function

Open up and listen to the CPU card.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.13 openCPUAndDetect

Function

Open up and listen to the CPU card. And returned the card searching result, generally is is used with while loop.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned.

4.9.14 openAllAndDetect

功能

open and detect all card type

参数

参数名	类型	描述
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

返回值

返回值	描述
null	

4.9.15 openIDCardAndDetect

Function

open up and detect ID card

parameter

paraName	type	description
timeout	int	
listener	OnDetectListener	

Return value

return value	description
void	

4.9.16 openIDCardAndDetect

Function

open up and detect ID card, and return the card searching result.

parameter

paraName	type	description
null		

Return value

return value	description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.17 openM1_MagAndDetect

Function

Open up and listen to the M1 card and magnetic strip card.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.18 openM1_MagAndDetect

Function

Open up and listen to the M1 card and magnetic strip card. And return searching result.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.19

openPsamAndDetectNotCloseOtherCard

Function

Open up and listen to the Pscam card1 with the previous card interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.20

openPsamAndDetectNotCloseOtherCard

Function

Open up and listen to the Pscam card1 with the previous card interaction not closed. And return searching result

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.21

openPsam2AndDetectNotCloseOtherCard

Function

Open up and listen to the Pscam card2 with the previous card interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.22

openPsam2AndDetectNotCloseOtherCard

Function

Open up and listen to the Pscam card2 with the previous card interaction not closed. And return

searching result

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.23

openPsamAndDetectBy38400NotCloseOtherCard

Function

Use the Baud rate 38400 to open up and listen to the Pscam card1 with the previous cards

interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.24

openPsamAndDetectBy38400NotCloseOtherCard

Function

Use the Baud rate 38400 to open up and listen to the Pscam card1 with the previous cards interaction not closed. And return searching result

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.25

openPsam2AndDetectBy38400NotCloseOtherCard

Function

Use the Baud rate 38400 to open up and listen to the Pscam card2 with the previous cards interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.26

openPsam2AndDetectBy38400NotCloseOtherCard

Function

Use the Baud rate 38400 to open up and listen to the Pscam card2 with the previous cards interaction not closed. And return searching result

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.27 openM1AndDetectNotCloseOtherCard

Function

Open up and listen to M1 card with the previous card interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.28 openM1AndDetectNotCloseOtherCard

Function

Open up and listen to M1 card with the previous card interaction not closed. And return searching result.

Parameter

ParaName	Type	Description
null		

Return value

Return valule	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.29 openIccAndDetectNotCloseOtherCard

Function

Open up and listen to the IC card with the previous cards not closed.

Paremeter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.30 openIccAndDetectNotCloseOtherCard

Function

Open up and listen to the IC card with the previous cards not closed. And return searching result

Paremeter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.31 openPiccAndDetectNotCloseOtherCard

Fucntioin

Open up and listen to the Picc card with the previous cards interaction not closed.

Paremeter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

4.9.32 openPiccAndDetectNotCloseOtherCard

Fucntioin

Open up and listen to the Picc card with the previous cards interaction not closed. And return searching result.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.33 openM1_MagAndDetectNotCloseOtherCard

Function

Open up and listen to M1 card and magnetic card with the previous cards interaction not closed.

Parameter

ParaName	Type	Description
time	int	Time of timeout, unit:millisecond
listener	OnDetectListener	Listener call back

Return value

Return value	Description
null	

4.9.34 openM1_MagAndDetectNotCloseOtherCard

Function

Open up and listen to M1 card and magnetic card with the previous cards interaction not closed.

 and return searching result

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	card type, if card is not found, 0 will be returned, if error, -1 will be returned

4.9.35 selectMag

Function

Convert to the magnetic card interaction.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	Is conversion successful

4.9.36 selectPicc

Function

Convert to picc interaction

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	is conversion successful

4.9.37 selectCpu

Function

Convert to CPU interaction

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
--------------	-------------

boolean	is conversion successful
---------	--------------------------

4.9.38 selectPsam

Function

Convert to psam interaction

ParaName

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	is conversion successful

4.9.39 selectPsamBy38400

Function

Convert to psam card1 interaction, Baud rate is 38400

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	is conversion successful

4.9.40 selectPsam2

Function

Convert to psam card interaction

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
boolean	is conversion successful

4.9.41 selectPsam2By38400

Function

Convert to psam card interaction, Baud rate is 38400

Parameter

ParaName	Type	Description
null		

Return value

return value	Description
boolean	is conversion successful

4.9.42 transmitApduToCard

Function

APDU command interaction

Parameter

ParaName	Type	Description
apdu	byte[]	Date of Apdu command
apduCmdListener	OnApduCmdListener	listener call back

Return value

Return value	Description
null	

4.9.43 transmitApduToCard

Function

APDU command interaction, and return

Parameter

ParaName	Type	Description
apdu	byte[]	Date ofApdu command

Return value

Return value	Description
--------------	-------------

ApduResult	if failure, null is returned
------------	------------------------------

4.9.44 getCardInfoList

Return value

Return value	Description
null	

4.9.45 getCardInfo

Parameter

ParaName	Type	Description
cardtype	int	Card type
cardInfo	PosCardInfo	Information of card

Return value

Return value	Description
null	

4.9.46 getIdCardInfo

parameter

paraName	type	description
cardinfo	PosByteArray	

return value

return value	description
int	

4.9.47 transmitApduToldCard

Function

ID card interactive

parameter

ParaName	type	description
apdu	byte[]	

apduCmdListener	OnApduCmdListener	
-----------------	-------------------	--

return value

return value	description
void	

4.9.48 transmitApduToldCard

Function

ID card interactive, and return.

parameter

paraName	type	description
apdu	byte[]	

return value

return value	description
PosByteArray	if failure , null is returned

4.9.49 M1CardKeyAuth

Function

card authorization.

Parameter

ParaName	Type	Description
keyType	int	card type
blkNo	int	block number
keyBuf	byte[]	authentication key
serialNum	byte[]	serial number of card

Return value

Return value	Description
int	0 -- success, others -- failure

4.9.50 M1CardReadBlock

Function

Read the block data

Parameter

ParaName	Type	Description
blkNo	int	block number
out	byte[]	to store the data of readings.

Return values

Return value	Description
int	

4.9.51 M1CardWriteBlock

Function

Write data to block region

Parameter

ParaName	Type	Description
blkNo	int	block number
buffer	byte[]	data needed to be written

Return value

Return value	Description
int	

4.9.52 M1CardOperateBlock

Function

get the card information.

1. If BlkNo is same to UpdateBlkNo, the block number is added or reduced with “+”or”-” operation.
2. If BlkNo is different from UpdateBlkNo, the amount stored in BlkNo stayed the same after “+”or “-”operation. If the amount of updateBlkNo equals to that of BlkNo, the amount will be added or reduced correspondingly.
3. Value does not work in “>”operation, the block number related to the function that the amount in BlkNo store in UpdateBlkNo should be numerical block, and the BlkNo and UpdateBlkNo must be in the same sector.

Parameter

ParaName	Type	Description
type	int	operation type
blkNo	int	Block to be operated
money	int	amount
updateBlkno	int	block to be updated.

Return value

4.9.53 openVicc

Function

open non-contact, and ISO15963 card searching is prepared.

parameter

paraName	type	description
timeout	int	
listener	OnDetectListener	

return value

return value	description
void	

process :

- 1) openVicc
- 2) DetectISO15963CardAndTransmit command interactive :

{

Mandatory commands :

1. Inventory
2. Quiet

Optional commands :

3. Read Single block
4. Write single block
5. Lock block
6. Read multiple block


```

7. Write multiple block

8. Select

9. Reset to ready

10. Write AFI

11. Lock AFI

12. Write DSFID

13. Lock DSFID

15. Get system information

16. Get multiple block security

}

3) close  non-contact

```

4.9.54 DetectISO15963CardAndTransmit

Function

ISO15963 card searching

parameter

paraName	type	description
mode	int	
request	byte[]	
ViccListener	OnViccTransmitListener	

return value

return value	description
void	

4.9.55 openMemoryAndDetect

Function

open up and listen to Memory card slot

parameter

paraName	type	description
time	int	Time of timeout, unit:millisecond

listener	OnDetectListener	listenning callback
----------	------------------	---------------------

return value

return value	description
null	

process :

1)openMemoryAndDetect

2) reset

3) MemoryCardTransmitCmd command interactive :

read

write

verify

update

Pac

Auth

config

4) close

4.9.56 transmitApduToMemoryCard

Function

memory card interactive

parameter

pareName	type	description
apdu	byte[]	
apduCmdListener	OnApduCmdListener	

return value

return value	description
void	

4.9.57 transmitApduToMemoryCard

Function

memory card interactive interface, and return.

parameter		
paraName	type	description
apdu	byte[]	
return value		
return value		description
PosByteArray		if failure, null is returned

4.9.58 VerifyMemory4442

Function

to verify 4442 card key

parameter		
paraName	type	description
code	byte[]	
return value		
return value		description
boolean		

4.9.59 updateMemory4442

Function

to update 4442 card key

paremeter		
paraName	type	description
code	byte[]	
return value		
return value		description
boolean		

4.9.60 readMemory4442

Function

read 4442 card data

parameter

paraName	type	description
readoffset	int	the offset
len	int	read the length of data

return value

return value	描述 description
byte[]	result, if failure, null is returned.

4.9.61 writeMemory4442

Function

write data to 4442 card

parameter

paraName	type	description
writeoffset	int	write offset
writedata	byte[]	write data

return value

return value	description
boolean	

4.9.62 pacMemory4442

Function

get the remained check time of 4442 card key

parameter

paraName	type	description
null		

return value

return value	description
int	

4.9.63 resetCard

Parameter

ParaName	Type	Description
----------	------	-------------

null		
------	--	--

Return value

Return value	Description
int	

4.9.64 removeCard

Function

Reset the card position, and recharged.

Parameter

ParaName	Type	Description
null		

Return value

Return value	Description
int	

4.9.65 isCardInster

Function

is card insert

parameter

paraName	type	description
null		

return value

return value	description
boolean	

4.9.66 setRFRegister

Function

frequency of RF register

parameter

paraName	type	description
rfreg	int	

return value

return value	description
null	

4.9.67 setParams

parameter

paraName	type	description
params	<u>com.pos.sdk.card.PosCard</u> <u>Manager.Parameters</u>	parameters

return value

return vlaue	description
null	

4.9.68 getParams

parameter

paraName	type	description

return value

return value	description
<u>com.pos.sdk.card.PosCardManager</u> .Parameters	

4.10 communication module

4.10.1 notice

included: socket, SSL socket , HTTP
Parameters in socket can be set in "commu.xml" in assets and **Commu.getInstance().setCommuParams(params)** methods.

4.10.2 example

//socket communication process
1.configurecommu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<commu>
  <type>socket</type>
  <ip>192.168.0.1</ip>
  <port>10000</port>
  <timeout>60</timeout>
```

```
<!-- whether to start SSL -->
<ifSSL>0</ifSSL>
<!-- certificate name,which should be put in ra w directory, ifnull is been
set, all the certificate can be trusted -->
<cer>null</cer>
</commu>
```

此处配置的参数在通讯的时候将自动加载，如果有多个通讯地址，需要在每次通讯之前调用
Commu.getInstance().setCommuParams(new CommuParams())进行设置

the parameters here will be auto loaded in the communication. If multiple communication addresses exist,Commu.getInstance().setCommuParams(new CommuParams()) should be called to configure the parameters before each communications.

Situation:

```
byte[] sendData = new byte[100];
Commu.getInstance().dataCommu(this, sendData, new CommuListener() {

    @Override
    public void OnStatus(int status, byte[] recvdData) {
        // TODO Auto-generated method stub
        switch (status) {
            case CommuStatus.INIT_COMMU:
                break;
            case CommuStatus.CONNECTING:
                break;
            case CommuStatus.SENDING:
                break;
            case CommuStatus.RECVING:
                break;
            case CommuStatus.FINISH:
                break;
            default:
                break;
        }
    }

    @Override
    public void OnError(int code, String msg) {
        // TODO Auto-generated method stub
    }

});
```

Description :

Void Onstatus(int,byte):communication status listener, byte will transefer the received data.

Void OnError(int,String):It is called when communication has error.

4.10.3 socket example

```
new Thread(new Runnable() {

    @Override
    public void run() {
        // TODO Auto-generated method stub

        String testString =
"600301000061310000000008000020000000c0001600100030303030303030313635323
```

```
03030303537333330303030001100001000003000129f1e09d9200b31603150080700033
03031";
```

```
Commu.getInstance().dataCommu(AidlActivity.this, BCDHelper.stringToBcd(testString,
testString.length()), new CommuListener() {
```

```
    @Override
    public void OnStatus(int arg0, byte[] arg1) {
        // TODO Auto-generated method stub
        Log.d(TAG, "OnStatus:"+arg0);
        if (arg0 == CommuStatus.FINISH) {
            Log.d(TAG, "received data:"+BCDHelper.hex2DebugHexString(arg1, arg1.length));
        }
    }

    @Override
    public void OnError(int arg0, String arg1) {
        // TODO Auto-generated method stub

    }
});
//    byte[] testdata = new byte[]{0x00,0x01,0x02,0x03};
//    exchangeDataWithServer(testdata);
//    }
//}).start();
```

4.10.4 http example

```
// HTTP test
CommuParams params = new CommuParams();
params.setType(CommuType.HTTP);
params.clearHttpParams();
params.addHttpParams("method", "erp.addr.get");
params.addHttpParams("format", "json");
params.addHttpParams("timestamp", Timestamp.GetTimesTamp());
params.addHttpParams("appid", "2");
// Is the parameters needed to be sorted as alphabet order. if needed, the method can be
called.
params.sortParams();
List<paramsBean> secretParams = params.getHttpParams();
Map<String, String> signParaMap = new HashMap<String, String>();
String[] params_key = new String[secretParams.size()];
String[] params_value = new String[secretParams.size()];
for (int i = 0; i < secretParams.size(); i++) {
    params_key[i] = secretParams.get(i).GetKey();
    params_value[i] = secretParams.get(i).GetValue();
}
signParaMap.clear();
for (int i = 0; i < params_key.length; i++) {
    signParaMap.put(params_key[i], params_value[i]);
}
params.addHttpParams("sign", ParamUtil.signRequestParam(signParaMap, "
encryptedkey"));
// parameter is sorted again
params.sortParams();
```



```

// initial http params
params.initHttpParams();
Commu.getInstnce().dataCommu(HttpPostDemo.this, null, new CommuListener() {

@Override
public void OnStatus(int code, byte[] data) {
// TODO Auto-generated method stub
// if it is Json data
try {
JSONObject Jpaser = new JSONObject(data.toString());
// process of Json data
} catch (JSONException e) {
// TODO Auto-generated catch block
e.printStackTrace();
}
// if it is XML data
try {
XmlPullParser parser = Xml.newPullParser();
// parser.setInput(receiveMsg, "UTF-8");
StringReader ss = new StringReader(data.toString());
parser.setInput(ss);
// process of XML data
}
catch (Exception e) {
e.printStackTrace();
}
}

@Override
public void OnError(int code, String msg) {
// TODO Auto-generated method stub

}
}

```

4.11 8583 module

4.11.1 notice

All the standareds of 8583 is configured in packet8583.xml
 Configure packet8583.xml parameter

```

<?xml version="1.0" encoding="UTF-8"?>
<root>

    <!-- 任何属性在不影响解析的情况下都可以不写 -->

    <!-- 划分为 BINARY,CHAR,NUMERIC,LLVAR,LLLVAR,LLVAR_NUMERIC,LLLVAR_NUMERIC,LLBINARY,LLLBINARY 这几种格式

        BINARY 采用二进制编码(8 位二进制数编码为一个字节)
        LLBINARY 域前加一个字节的字节长度（采用 bcd 编码）
        LLLBINARY 域前加两个字节的长度(注： 字节长度,如 0x00 0x20 就取后面 20 个字节长度数据)（采用 bcd 编码）
        CHAR,LLVAR,LLLVAR 为 ASC（即正常的 getBytes(Encoding)）编码
        LLVAR 域前加一个字节的字节长度（采用 bcd 编码），LLLVAR 域前加两个字节的字节长度（采用 bcd 编码），
        NUMERIC,LLVAR_NUMERIC,LLLVAR_NUMERIC 采用 BCD(半个字节表示一个 10 进制数， 每两位编码为一个字节)
        编码，
        LLVAR_NUMERIC 域前加一个字节的字节长度（采用 bcd 编码），LLLVAR_NUMERIC 域前加两个字节的长度(注： 非
    
```

字节长度，而是数字的长度，即字节长度的两倍）（采用 bcd 编码）

CHAR、BINARY、NUMERIC 都需要指定长度，默认 CHAR 类型左对齐、右补空格，NUMERIC 右对齐、左补零，有特殊，就需要 增加 align 属性，

lengthType 指明变长字段长度表示的方法，bcd 表示十进制压缩码，hex 表示十六进制数据,正常不需要设置，只有非常特殊的情况

代码中会在 IsoField setValue 时进行格式化，组装报文时计算 LLVAR 等域长 -->

<!-- compress=true 默认压缩，type 为 NUMERIC 的域都为 BCD 类型，变长域长度也要压缩成 BCD 码 -->

<ISO8583Config compress="true">
 <field id="tpdu" type="NUMERIC" length="5" /> <!-- tpdu，一般都会有值 -->
 <field id="header" type="NUMERIC" length="6" /> <!-- msgid 之前的报文头部分，一般都会有值，在这边设置好可以，bcd 压缩格式，长度不限制 -->
 <field id="msgid" type="NUMERIC" length="2" /> <!-- msgid-->
 <field id="bitmap" type="NUMERIC" length="8" /> <!-- 第1域 bitmap 必须使用这个 -->
 <field id="2" type="LLVAR_NUMERIC" />
 <field id="3" type="NUMERIC" length="3" />
 <field id="4" type="NUMERIC" length="6" />
 <field id="8" type="CHAR" length="11" />
 <field id="11" type="NUMERIC" length="3" />
 <field id="12" type="NUMERIC" length="3" />
 <field id="13" type="NUMERIC" length="2" />
 <field id="14" type="NUMERIC" length="2" />
 <field id="15" type="NUMERIC" length="2" />
 <field id="22" type="NUMERIC" length="2" align="Left" />
 <field id="23" type="NUMERIC" length="2" align="right" />
 <field id="24" type="NUMERIC" length="2" />
 <field id="25" type="NUMERIC" length="1" />
 <field id="26" type="NUMERIC" length="1" />
 <field id="32" type="LLVAR_NUMERIC" />
 <field id="35" type="LLVAR_NUMERIC" />
 <field id="36" type="LLLVAR_NUMERIC" />
 <field id="37" type="CHAR" length="12" />
 <field id="38" type="CHAR" length="6" />
 <field id="39" type="CHAR" length="2" />
 <field id="41" type="CHAR" length="8" />
 <field id="42" type="CHAR" length="15" />
 <field id="44" type="LLVAR" />
 <field id="48" type="LLLVAR_NUMERIC" />
 <field id="49" type="CHAR" length="3" />
 <field id="52" type="BINARY" length="8" />
 <field id="53" type="NUMERIC" length="8" />
 <field id="54" type="LLLVAR" />
 <field id="55" type="LLLBINARY" />
 <field id="58" type="LLLVAR" />
 <field id="60" type="LLLVAR_NUMERIC" />
 <field id="61" type="LLLVAR_NUMERIC" />
 <field id="62" type="LLLTRACK" />
 <field id="63" type="LLLVAR" />
 <field id="64" type="BINARY" length="8" />
 </ISO8583Config>
 <!--第二个 8583 配置，多个可以在下面添加 -->
 <ISO8583Config-config compress="true">
 <field id="tpdu" type="NUMERIC" length="5" /> <!-- tpdu，一般都会有值 -->
 <field id="header" type="NUMERIC" length="6" /> <!-- msgid 之前的报文头部分，一般都会有值，在这边

```

    设置好可以，bcd 压缩格式，长度不限制 -->

    <field id="msgid" type="NUMERIC" length="2" />          <!-- msgid-->
    <field id="bitmap" type="NUMERIC" length="8" />      <!-- 第1域 bitmap 必须使用这个 -->
    <field id="2" type="LLVAR_NUMERIC" />
    <field id="3" type="NUMERIC" length="3" />
    <field id="4" type="NUMERIC" length="6" />
    <field id="8" type="CHAR" length="11" />
    <field id="11" type="NUMERIC" length="3" />
    <field id="12" type="NUMERIC" length="3" />
    <field id="13" type="NUMERIC" length="2" />
    <field id="14" type="NUMERIC" length="2" />
    <field id="15" type="NUMERIC" length="2" />
    <field id="22" type="NUMERIC" length="2" align="Left" />
    <field id="23" type="NUMERIC" length="2" align="right" />
    <field id="24" type="NUMERIC" length="2" />
    <field id="25" type="NUMERIC" length="1" />
    <field id="26" type="NUMERIC" length="1" />
    <field id="32" type="LLVAR_NUMERIC" />
    <field id="35" type="LLVAR_NUMERIC" />
    <field id="36" type="LLLVAR_NUMERIC" />
    <field id="37" type="CHAR" length="12" />
    <field id="38" type="CHAR" length="6" />
    <field id="39" type="CHAR" length="2" />
    <field id="41" type="CHAR" length="8" />
    <field id="42" type="CHAR" length="15" />
    <field id="44" type="LLVAR" />
    <field id="48" type="LLLVAR_NUMERIC" />
    <field id="49" type="CHAR" length="3" />
    <field id="52" type="BINARY" length="8" />
    <field id="53" type="NUMERIC" length="8" />
    <field id="54" type="LLLVAR" />
    <field id="55" type="LLLBINARY" />
    <field id="58" type="LLLVAR" />
    <field id="60" type="LLLVAR_NUMERIC" />
    <field id="61" type="LLLVAR_NUMERIC" />
    <field id="62" type="LLLTRACK" />
    <field id="63" type="LLLVAR" />
    <field id="64" type="BINARY" length="8" />

</ISO8583Config-config>
</root>

```

Normally 8583 only need a configuration file *ISO8583Config*. If there are multiple 8583 configurations needed to be called, *ISO8583Config-config* should be loaded by using new `Iso8583Manager(this).Load8583XMLconfigByTag ("ISO8583Config-config")`

4.11.2 setBit

Function

set 8583 field data

parameter

paraName	type	description
id	int	field id

value	String	data to be set
-------	--------	----------------

return value

return value	descriptioin
null	

4.11.3 setBit

Function

set 8583 field data

parameter

paraName	type	description
id	string	field id
value	String	data to be set

return value

return value	descriptioin
null	

4.11.4 deleteBit

Function

delete the field data

parameter

paraName	type	description
id	string	field id

return value

return value	descriptioin
null	

4.11.5 deleteBit

Function

delete the field data

parameter

paraName	type	description
id	int	field id

--	--	--

return value

return value	descriptioin
null	

4.11.6 setBinaryBit

Function

set the field data of 8583, it can only be used for the field with BINARY

format

parameter

paraName	type	description
id	int	field id
value	byte[]	data to be set

return value

return value	descriptioin
null	

4.11.7 setBinaryBit

Function

set the field data of 8583, it can only be used for the field with BINARY

format

parameter

paraName	type	description
id	string	field id
value	byte[]	data to be set

return value

return value	descriptioin
null	

4.11.8 getBit

Function

get field data

parameter

paraName	type	description
id	int	field id

return value

return value	description
String	the returned string data

4.11.9 getBit

Function

get field data

parameter

paraName	type	description
id	string	field id

return value

return value	description
String	the returned string data

4.11.10 getBitBytes

get field data

parameter

paraName	type	description
id	int	field id

return value

return value	description
byte[]	the returned byte[] data

4.11.11 getBitBytes

get field data

parameter

paraName	type	description
id	string	field id

return value

return value	description
byte[]	the returned byte[] data

4.11.12 pack

Function

pack the data

parameter

paraName	type	description
null		

return value

return value	description
byte[]	the packed data

4.11.13 unpack

return value

return value	description
null	

4.11.14 getMacData

Function

get the packed data in [field1,field2], it is usually for the caculation of MAC

parameter

paraName	type	description
start	String	start id
end	String	end id

return value

return value	description
byte[]	

4.11.15 getBitString

Function

get the string information of 8583, it is usually used to debug

parameter

paraName	type	description
null		

return value

return value	description
String	

4.11.16 Load8583XMLconfigByTag

Function

load 8583 configuration

parameter

paraName	type	description
xml8583tag	String	name of packet8583.xml, such as ISO8583Config

return value

return value	description
null	

4.11.17 restore8583XMLconfig

Function

reset 8583 configuration, namely ISO8583Config

parameter

paraName	type	description
null		

return value

return value	description
null	

4.12 database module

4.12.1 notice

Database modules can be configured in the database.xml. If the APP is updated, the database is updated as well. The version of the database must increased, or the data can not be transfered and the table can not be created.

```
<?xml version="1.0" encoding="utf-8"?>
<!-- dadabase definition -->
<!-- version After the definition of field, the version should be revised if
the fields are added or deleted. And the SDK can automatically reinitialize the
database on the basis of the new version -->
<Database
  name="Cashier.db"
  defaultTable="transaction_data"
```



```
version="1" >
<!-- transation data saved -->
<!-- primaryKey should be defined in the first field -->
<table
  name="transaction_data"
  primaryKey="id" >
  <field name="id" /> <!-- major key, It is a self-propagation interger
-->
  <field name="referenceNo" /> <!-- Reference Number , It may has multiple
numbers -->
  <field name="trace" /> <!-- serial number -->
  <field name="merchant_name" /> <!-- merchant name -->
  <field name="merchant_no" /> <!-- mechant number -->
  <field name="terminal_no" /> <!-- terminal number -->
  <field name="pay_type" /> <!-- type of payment, bank card or mobile
payment -->
  <field name="func" /> <!-- transation type: purchase, revocation or
return -->
  <field name="card_number" /> <!-- card number -->
  <field name="operatorNo" /> <!-- operator number -->
  <field name="exp_date" /> <!-- expire data -->
  <field name="batch_no" /> <!-- batch number -->
  <field name="auth_no" /> <!-- authorization number -->
  <field name="date_time" /> <!-- transaction time -->
  <field name="amount" /> <!-- amount -->
  <field name="ticket_no" /> <!-- ticket number -->
  <field name="iss_desc" /> <!-- -->
  <field name="issuerId2" /> <!-- issuer card ID -->
  <field name="app_Lab" /> <!-- APP LAB -->
  <field name="maskedPan" /> <!-- maskedPan -->
  <field name="atc" /> <!-- ATC -->
  <field name="aid" /> <!-- AID -->
  <field name="csn" /> <!-- CSN -->
  <field name="iad" /> <!-- IAD -->
  <field name="tc" /> <!-- TC -->
  <field name="aip" /> <!-- AIP -->
  <field name="cardtype" /> <!-- card type. bank card:magnetci card, IC,
RF Mobile payment: wechat ,alipay -->
  <field name="qrcode" /> <!-- two-dimension code, it will be returned
during mobile payment -->
  <field name="status" /> <!-- the current state of
transation:normal,been revoked, been returned -->
  <field name="oldreferenceNo" /> <!-- the old reference Number -->
  <field name="oldtrace" /> <!-- the old serial number -->
</table>
</Database>
```

4.12.2 how to use

Extend TransactionDataDao and TransactionData Class respectively. An example is shown below.

```
public class TransactionData extends BaseModel {
```

```
private String trace; /* 流水号 */
private String merchant_name; /* 商户名称 */
private String merchant_no; /* 商户号 */
private String terminal_no; /* 终端号 */
private int func; /* 交易类型 消费，撤销，退货 */
private String card_number; /* 卡号 */
private String operatorNo; /* 操作员号 */
private String exp_date; /* 有效期 */
private String batch_no; /* 批次号 */
private String auth_no; /* 授权号 */
private String date_time; /* 交易时间 */
private String amount; /* 交易金额 */
private String ticket_no; /* 票据号 */
private String referenceNo; /* 参考号 */
private int status; /* 状态 */

/**
 * @return the trace
 */
public String getTrace() {
    return trace;
}

/**
 * @param trace
 *         the trace to set
 */
public void setTrace(String trace) {
    this.trace = trace;
}

/**
 * @return the merchant_name
 */
public String getMerchant_name() {
    return merchant_name;
}

/**
 * @param merchant_name
 *         the merchant_name to set
 */
public void setMerchant_name(String merchant_name) {
    this.merchant_name = merchant_name;
}

/**
 * @return the merchant_no
 */
public String getMerchant_no() {
    return merchant_no;
}

/**
 * @param merchant_no
 *         the merchant_no to set
 */
public void setMerchant_no(String merchant_no) {
    this.merchant_no = merchant_no;
}
```

```
}

/**
 * @return the terminal_no
 */
public String getTerminal_no() {
    return terminal_no;
}

/**
 * @param terminal_no
 *      the terminal_no to set
 */
public void setTerminal_no(String terminal_no) {
    this.terminal_no = terminal_no;
}

/**
 * @return the func
 */
public int getFunc() {
    return func;
}

/**
 * @param func
 *      the func to set
 */
public void setFunc(int func) {
    this.func = func;
}

/**
 * @return the card_number
 */
public String getCard_number() {
    return card_number;
}

/**
 * @param card_number
 *      the card_number to set
 */
public void setCard_number(String card_number) {
    this.card_number = card_number;
}

/**
 * @return the operatorNo
 */
public String getOperatorNo() {
    return operatorNo;
}

/**
 * @param operatorNo
 *      the operatorNo to set
 */
public void setOperatorNo(String operatorNo) {
    this.operatorNo = operatorNo;
}

/**
 * @return the exp_date
```

```

*/
public String getExp_date() {
    return exp_date;
}
/**
 * @param exp_date
 *         the exp_date to set
 */
public void setExp_date(String exp_date) {
    this.exp_date = exp_date;
}
/**
 * @return the batch_no
 */
public String getBatch_no() {
    return batch_no;
}
/**
 * @param batch_no
 *         the batch_no to set
 */
public void setBatch_no(String batch_no) {
    this.batch_no = batch_no;
}
/**
 * @return the auth_no
 */
public String getAuth_no() {
    return auth_no;
}
/**
 * @param auth_no
 *         the auth_no to set
 */
public void setAuth_no(String auth_no) {
    this.auth_no = auth_no;
}
/**
 * @return the date_time
 */
public String getDate_time() {
    return date_time;
}
/**
 * @param date_time
 *         the date_time to set
 */
public void setDate_time(String date_time) {
    this.date_time = date_time;
}
/**
 * @return the amount
 */
public String getAmount() {
    return amount;
}

```

<pre>} /** * @param amount * the amount to set */ public void setAmount(String amount) { this.amount = amount; } /** * @return the ticket_no */ public String getTicket_no() { return ticket_no; }</pre>	
<pre>public class TransactionDataDao extends BaseDbManagerDao { @Override public BaseModel setData(Cursor cursor) { // TODO Auto-generated method stub if (cursor == null) { return null; } TransactionData datatmp = new TransactionData(); datatmp.setAmount(getNameByIndex(cursor, "amount")); datatmp.setAuth_no(getNameByIndex(cursor, "auth_no")); datatmp.setBatch_no(getNameByIndex(cursor, "batch_no")); datatmp.setCard_number(getNameByIndex(cursor, "card_number")); datatmp.setDate_time(getNameByIndex(cursor, "date_time")); datatmp.setExp_date(getNameByIndex(cursor, "exp_date")); datatmp.setFunc(Integer.parseInt(getNameByIndex(cursor, "func"))); datatmp.setMerchant_name(getNameByIndex(cursor, "merchant_name")); datatmp.setMerchant_no(getNameByIndex(cursor, "merchant_no")); datatmp.setOperatorNo(getNameByIndex(cursor, "operatorNo")); datatmp.setReferenceNo(getNameByIndex(cursor, "referenceNo")); datatmp.setTerminal_no(getNameByIndex(cursor, "terminal_no")); datatmp.setTicket_no(getNameByIndex(cursor, "ticket_no")); datatmp.setTrace(getNameByIndex(cursor, "trace")); datatmp.setStatus(Integer.parseInt(getNameByIndex(cursor, "status"))); return datatmp; } @Override public ContentValues getContentValues(BaseModel data) throws BwDatabaseException { // TODO Auto-generated method stub TransactionData transactionData = (TransactionData)data; ContentValues values = new ContentValues(); values.put("amount", transactionData.getAmount()); values.put("auth_no", transactionData.getAuth_no()); values.put("batch_no", transactionData.getBatch_no()); values.put("card_number", transactionData.getCard_number()); values.put("date_time", transactionData.getDate_time()); values.put("exp_date", transactionData.getExp_date()); values.put("func", String.valueOf(transactionData.getFunc()));</pre>	

```

values.put("merchant_name", transactionData.getMerchant_name());
values.put("merchant_no", transactionData.getMerchant_no());
values.put("operatorNo", transactionData.getOperatorNo());
values.put("referenceNo", transactionData.getReferenceNo());
values.put("terminal_no", transactionData.getTerminal_no());
values.put("ticket_no", transactionData.getTicket_no());
values.put("trace", transactionData.getTrace());
values.put("status", String.valueOf(transactionData.getStatus()));

return values;
}
}

```

3. Call the methods in TransactionData BaseHandler can achieve the operation of transaction table.

4.13 eletronic signature

4.13.1 how to use

```

<com.basewin.widgets.HandWriteView
    android:id="@+id/handwrite"
    android:layout_width="match_parent"
    android:layout_height="match_parent" />

```

Signature layout is completed in layout file. If there is background, setting method need to be explicitly called in activity.

The method isValid() is used to determine whether signed or not. If signed, return true. If not, return false. The method getCacheBitmap() is used to get the bitmap of signature.

4.14 GPS module

4.14.1 notice

GPS depended on wifi, so it must be online to fix position

4.14.2 example

```

// try {
ServiceManager.getInstance().getGPS().startGPS(new OnGpsCallBack() {

@Override
public void onGetGps(GpsSource gps) {
// TODO Auto-generated method stub
Log.d(TAG, " get the GPS data :"+gps.toString());
// GPS service should be closed after data is got. or GPS will receive data all the time.
try {
ServiceManager.getInstance().getGPS().closeGPS();
} catch (Exception e) {
// TODO Auto-generated catch block

```

```
e.printStackTrace();
}
}

@Override
public void onError(String msg) {
// TODO Auto-generated method stub
Log.d(TAG, " error info of getting GPS data :"+msg);
}
});
} catch (Exception e) {
// TODO Auto-generated catch block
e.printStackTrace();
}
```

4.14.3 startGPS

parameter		
paraName	type	description
null		

return value	
return value	description
null	

4.14.4 closeGPS

parameter		
paraName	type	description
null		

return value	
return value	description
null	

4.15 utility class

4.15.1 BCDHelper

```
Byte array and string array are inter-transferred. It is frequently used to print log.
/**
 * BCD code is transfered to ASCII code, eg: hex("\x21\x31\x24") 转成 "213124"
 *
 * @param bcdNum
 *         BCD code
 * @param offset
 *         which code is the transformation started from
 */
```

```

* @param numlen
*     length the BCD code
* @return
*/
String bcdToString (byte[] bcdNum, int offset, int numlen) ;
/**
* hexadecimal array is transfered to string(capital letter)
*
* @param b
* @return
*/
String hex2DebugHexString (byte[] b, int len) ;
/**
* int value is transfered to byte[] with 4bytes
* @param value
*     int value to be transfered
* @return byte[]
*/
byte[] intToBytes ( int value ) ;

/**
* int array is transfered to byte[] with 4bytes
*/
byte[] intToBytes2 (int value) ;

/**
* int value in byte[] array
*
* @param src t
*     byte array
* @param offset
*     start from the offset
* @return int value
*/
int bytesToInt (byte[] src, int offset);

/**
* int value in byte[] array
*/
int bytesToInt2 (byte[] src, int offset) ;

/**
* is the length of the two arrays the same
* @return
*/
boolean memcmp (byte[] src,int srcposition,byte[] des,int desposition,int len);

void memset (byte[] src, byte des,int length);

void memcpy (byte[] des,byte[] src,int length);

/**
* Is certain data in the array

```



```

* @param src
* @param des
* @return
*/

boolean ifContain (byte[] src,byte des);

char ConvertHexChar (char ch) ;
// byte value is transfered to INT value
int byte2int (byte val) ;
byte[] StrToBCD (String str) ;
byte[] StrToBCD (String str, int numlen);
byte[] stringToBcd (String src, int numlen) ;

```

5. error code

code	name	note
F7CC(-2100)	SC_VCCERR	voltage mode error
F7CB(-2101)	SC_SLOTERR	card passageway error
F7CA(-2102)	SC_PARERR	odd-even
F7C9(-2103)	SC_PARAERR	parameter error
F7C8(-2104)	SC_PROTOCALERR	protocal error
F7C7(-2105)	SC_DATALENERR	data length error
F7C6(-2106)	SC_CARDOUT	card out
F7C5(-2107)	SC_NORESET	no reset
F7C4(-2108)	SC_TIMEOUT	communication time out
F7C3(-2109)	SC_PPSERR	PPS error
F7C2(-2110)	SC_ATRERR	ATR error
F7C1(-2111)	SC_APDUERR	card communication error

Error code in non-contact module

code	name	note
F447(-3001)	RET_RF_ERR_PARAM	parameter error
F446	RET_RF_ERR_NO_OPEN	RF mode is not opened
F445	RET_RF_ERR_NOT_ACT	card is not activated
F444	RET_RF_ERR_MULTI_CARD	multiple card conflict
F443	RET_RF_ERR_TIMEOUT	time-out no response
F442	RET_RF_ERR_PROTOCOL	protocol eror
F441	RET_RF_ERR_TRANSMIT	communication transmission error
F440	RET_RF_ERR_AUTH	M1 card authentication failed
F43F	RET_RF_ERR_NO_AUTH	sectors are not authenticated
F43E	RET_RF_ERR_VAL	data format error or file length orror in DesFire card corporation
F43D	RET_RF_ERR_CARD_EXIST	card is still in

		inducing field
F43C	RET_RF_ERR_STATUS	card status error. (M1 card is called in A/B card, or PiccIsoCommand is called in M1 card)
F43B	RET_RF_ERR_OVERFLOW	
F43A	RET_RF_ERR_FAILED	Response data error in DesFire card.
F439	RET_RF_ERR_COLLERR	
F438	RET_RF_ERR_FIFO	lack of space in application of buffer during DesFire operation
F437	RET_RF_ERR_CRC	
F436	RET_RF_ERR_FRAMING	
F435	RET_RF_ERR_PARITY	
F434	RET_RF_ERR_DES_VAL	the response data of DesFire card does not agree with the DES calculation result
F433	RET_RF_ERR_NOT_ALLOWED	operation is not allowed,
F3E4	RET_RF_ERR_CHIP_ABNORMAL	Chip is not exited or has exception
F37F	RET_RF_DET_ERR_INVALID_PARAM	
F37E	RET_RF_DET_ERR_NO_POWER	
F37D	RET_RF_DET_ERR_NO_CARD	
F37C	RET_RF_DET_ERR_COLL	
F37B	RET_RF_DET_ERR_ACT	
F37A	RET_RF_DET_ERR_PROTOCOL	
F31B	RET_RF_CMD_ERR_INVALID_PARAMETER	
F31A	RET_RF_CMD_ERR_NO_POWER	
F319	RET_RF_CMD_ERR_NO_CARD	
F318	RET_RF_CMD_ERR_TX	
F317	RET_RF_CMD_ERR_PROTOCOL	

Error code in magnetic card mode

Error code	Error name	note
0xFFFF	FAILURE	Turning on/off the magenetic card is failed
0xFD42(-702)	ERR_MSR_OPENERR	
0xFD43(-701)	ERR_MSR_NOSWIPE D	

Error code in keyboard mode

Error	error name	note
FFFF(-1)		time-out
FFFD(-3)		The user cancel the input
FFFC(-4)		IC card is out
FFFB(-5)	ERR_PIN_LEN	the pin length mode is incorrect.It

		shoule be over 4 and less than 12 Bit.
FFFA(-6)	KEY_ERRPAD	Key pad error
FC0B(-1013)	KB_UserEnter_Exit	User cancel the input
FC09(-1015)	KB_UserSleep	User come into dormancy activily
FC03(-1021)	TP_TAG_ERR	0x73 is not received
FC02(-1022)	TP_TLV_ERR	Number of the received key coordinate is error.
FC01(-1023)	TP_EXG_SIZE_ERR	the received key coordinate is error. The top-left corner and the bottom-right corner are not logical.
FC00(-1024)	TP_CMDEXG_TO_ER R	order time-out of the exchange of coordinate.

14.1.5. Error code in clock mode

Error	name	note
FC7C(-900)	TIME_FORMAT_ERR	time format error
FC7B	TIME_YEAR_ERR	error in year
FC7A	TIME_MONTH_ERR	error in month
FC79	TIME_DAY_ERR	error in day
FC78	TIME_HOUR_ERR	error in hour
FC77	TIME_MINUTE_ERR	error in minute
FC76	TIME_SECOND_ERR	error in seconde
FC75	TIME_WEEK_ERR	error in week
FC74	TIME_SET_ERR	setting failed
FC73	TIME_GET_ERR	getting failed
FC72	TIME_RAMADDR_OVER	time content address exceed
FC71	TIME_RAMLEN_OVER	time length exceed.

Error code in PIN input mode

Error code	name	note
FED3(-301)	PED_RET_ERR_NO_KEY	key is not existed
FED2	PED_RET_ERR_KEYIDX_ERR	key index error, the index is out of the range.
FED1	PED_RET_ERR_DERIVE_ERR	when to input key, the original key type or level is lower than the target key.
FED0	PED_RET_ERR_CHECK_KEY_FAIL	key verification failed
FECF	PED_RET_ERR_NO_PIN_INPUT	No PIN input
FECE	PED_RET_ERR_INPUT_CANCEL	user cancel the PIN input
FECD	PED_RET_ERR_WAIT_INTERVAL	method called time is less than the minimum interval.
FECC	PED_RET_ERR_CHECK_MODE_ERR	KCV mode error,it is not surpported.
FECB	PED_RET_ERR_NO_RIGHT_USE	No right to use the key,the current key tag of PED should not be equal to the key tag need to use..
FECA	PED_RET_ERR_KEY_TYPE_ERR	key type error
FEC9	PED_RET_ERR_EXPLEN_ERR	the string error of the expected length of PIN
FEC8	PED_RET_ERR_DSTKEY_IDX_ERR	the target key index error,it is out of range.
FEC7	PED_RET_ERR_SRCKEY_IDX_ERR	original key index error, it is out of range.
FEC6	PED_RET_ERR_KEY_LEN_ERR	key length error
FEC5	PED_RET_ERR_INPUT_TIMEOUT	input PIN timeout
FEC4	PED_RET_ERR_NO_ICC	IC card is not exsited
FEC3	PED_RET_ERR_ICC_NO_INIT	IC card is not initilized
FEC2	PED_RET_ERR_GROUP_IDX_ERR	number of DUKPT group index error
FEC1	PED_RET_ERR_PARAM_PTR_NULL	point parameters is null
FEC0	PED_RET_ERR_TAMPERED	PED have been attacked.
FEBF	PED_RET_ERROR	PED common error
FEBE	PED_RET_ERR_NOMORE_BUF	no vacant buffer
FEBD	PED_RET_ERR_NEED_ADMIN	need to get the advanced permission.
FEBC	PED_RET_ERR_DUKPT_OVERFLOW	DUKP is overflowed.
FEBB	PED_RET_ERR_KCV_CHECK_FAIL	KCV verification failed
FEBA	PED_RET_ERR_SRCKEY_TYPE_ERR	when to input key, the source key id type does not match with its key type.
FEB9	PED_RET_ERR_UNSPT_CMD	the command is not supported.
FEB8	PED_RET_ERR_COMM_ERR	communication error
FEB7	PED_RET_ERR_NO_UAPUK	no public key verified by user
FEB6	PED_RET_ERR_ADMIN_ERR	getting the sensitive system service failed

FEB5	PED_RET_ERR_DOWNLOAD_INACTIVE	PED is under the unactivated status.
FEB4	PED_RET_ERR_KCV_ODD_CHECK_FAIL	odd verification of KCV failed
FEB3	PED_RET_ERR_PED_DATA_RW_FAIL	reading data from PED faild
FEB2	PED_RET_ERR_ICC_CMD_ERR	IC card operation error
FEB1	PED_RET_ERR_KEY_VALUE_INVALID	the input key are all zero,or they are parlty the same.
FEB0	PED_RET_ERR_KEY_VALUE_EXIST	the key with the same key value is existed.
FEAF	PED_RET_ERR_UART_PARAM_INVALID	serial port isn ot supported.
FEAE	PED_RET_ERR_KEY_INDEX_NOT_SELECTED_OR_NOT_MATCH	key index is not selected or not matched.
FEAD	PED_RET_ERR_INPUT_CLEAR	CLEAR button is pressed to exit PINC input
FEAC	PED_RET_ERR_LOAD_TRK_FAIL	
FEAB	PED_RET_ERR_TRK_VERIFY_FAIL	
FEAA	PED_RET_ERR_MSR_STATUS_INVALID	
FEA9	PED_RET_ERR_NO_FREE_FLASH	
FEA8	PED_RET_ERR_DUKPT_NEED_INC_KSN	DUKPT KSN need to add 1 first
FEA7	PED_RET_ERR_KCV_MODE_ERR	KCV MODE error
FEA6	PED_RET_ERR_DUKPT_NO_KCV	NO KCV
FEA5	PED_RET_ERR_PIN_BYPASS_BYFUNKEY	press FN/ATM4 button to cancel PIN input
FEA4	PED_RET_ERR_MAC_ERR	MAC verification failed
FEA3	PED_RET_ERR_CRC_ERR	CRC verification error
FEA2	PED_RET_ERR_ALG_ERR	
FEA1	PED_RET_ERR_STATE	PED status error
FEA0	PED_RET_ERR_PWD	password error
FE9F	PED_RET_ERR_NEWPWD	the password needs to be reset.
FE9E	PED_RET_ERR_PWDVERRUN	error times are exceeded.
FE9D	PED_RET_ERR_REQ_SSA	sensitive service request is needed.
FE70	PED_RET_ERR_KEY_KCV_TAB_NULL	
FE6F	PED_RET_ERR_PED_CFG_RW_FAIL	reading PED configuration failed

Error code in print mode

error code	error name	note
-601(FDA7)	ERR_PAPER	no paper error
-602(FDA6)	ERR_OVERHEAT	printer overheat
-603(FDA5)	ERR_PARA	parameters error
-604(FDA4)	ERR_NO_BLACKMAKER	black laber detection failed
-26216(9998)	ERR_PARA_VAL	value of parameters error