# 中磁 POS Android 平台 SDK 使用说明及示例

版本 1.2

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## 概述

本文档适用于本司智能 POS(Z90, Z91, Z92, Z100), MPOS(Z70), 多合一读卡模块(Z45)等产品 Android 平台 SDK。

## 环境

本文档默认以 AndroidStudio 作为开发环境进行说明。如有使用其它开发平台开发的请以对应平台的环境为准，本文档仅供参考。

1. Jar 包导入

拷贝 SmartPos_xxx.jar 文件到 app\libs 目录下，拷贝完成后，点击 jar 包，右键—>add as library。

如需要使用打印二维码功能则还需要导入 zxing 的 jar 包，即拷贝 core-3.2.1.jar 文件到 app\libs 目录下，拷贝完成后，点击 jar 包，右键—>add as library。

如需使用 EMV 功能，参考以上步骤添加 emv_xxx.jar 文件。

2. so 库导入

拷贝 armeabi-v7a 和 arm64-v8a 目录至 src/main/jniLibs 目录下。

so 库包括 libSmartPosJni.so 和 libEmvCoreJni.so 。其中 libSmartPosJni.so 为基础 so，libEmvCoreJni.so 为 EMV 功能相关的 so，如不需要 EMV 功能可以不添加 libEmvCoreJni.so。

## 常用类

1. 说明

DriverManager 用于生成各模块操作类实例。

Sys 用于获取各种设备硬件信息、以及系统封装接口

Printer 打印

CardReaderManager 寻卡，获取各类型卡片操作类

EmvHandler 执行 Emv 类

PinPadManager 密码键盘相关

Led 操作 Led 灯

Beeper 操作蜂鸣器

BluetoothHandler 用于本司 Z70 蓝牙刷卡器

2. 获取方法

通过 DriverManager 的各种 getXXX() 函数获取各个模块操作类

```
DriverManager mDriverManager = DriverManager.getInstance();
Sys mSys = mDriverManager.getBaseSysDevice();
CardReaderManager mCardReadManager = mDriverManager.getCardReadManager();
EmvHandler mEmvHandler = EmvHandler.getInstance();
PinPadManager mPadManager = mDriverManager.getPadManager();
Printer mPrinter = mDriverManager.getPrinter();
Beeper mBeeper = mDriverManager.getBeeper();
Led mLed = mDriverManager.getLedDriver();
BluetoothHandler mBluetoothHandler = mDriverManager.getBluetoothHandler();
```

## 初始化

所有接口都需要在初始化之后才能使用。

1. 默认（适用于 Z90，Z91，Z92，Z100）

参考如下代码。

```
private void initSdk() {
```

```
    int status = mSys.sdkInit();
    if(status != SdkResult.SDK_OK) {
        mSys.sysPowerOn();
        try {
            Thread.sleep(1000);
        } catch (InterruptedException e) {
            e.printStackTrace();
        }
    }
    status = mSys.sdkInit();
    if(status != SdkResult.SDK_OK) {
        //init failed.
    }
}
```

## 2. 蓝牙（适用于 Z70）

参考如下代码。

```
private void initSdk() {
    // Config the SDK base info
    mSys = mDriverManager.getBaseSysDevice();
    mSys.showLog(true);
    mBluetoothManager = BluetoothManager.getInstance()
    .setContext(mActivity)
    .setBluetoothListener(new BluetoothListener() {
        @Override
        public boolean isReader(BluetoothDevice bluetoothDevice) {
            // Get device searched by bluetooth
            mAdapter.addDevice(bluetoothDevice);
            mAdapter.notifyDataSetChanged();
            return false;
        }
        @Override
        public void startedConnect(BluetoothDevice device) {
            Log.e(TAG, "startedConnect: ");
        }
        @Override
        public void connected(BluetoothDevice device) {
            Log.e(TAG, "connected: ");
            mHandler.obtainMessage(MSG_TOAST, "Connected").sendToTarget();
            int sdkInit = mSys.sdkInit(ConnectTypeEnum.BLUETOOTH);
            String initRes = (sdkInit == SdkResult.SDK_OK) ? getString(R.string.init_success
```

```
) : SDK_Result.obtainMsg(mActivity, sdkInit);
            // mBluetoothManager.connect called in sub thread, u need to switch to main thre
ad when u need to change ui
            mHandler.obtainMessage(MSG_TOAST, initRes).sendToTarget();
        }
        @Override
        public void disConnect() {
            Log.e(TAG, "disConnect: ");
            mHandler.obtainMessage(MSG_TOAST, "Disconnect").sendToTarget();
        }
        @Override
        public void startedDiscovery() {
            Log.e(TAG, "startedDiscovery: ");
        }
        @Override
        public void finishedDiscovery() {
            Log.e(TAG, "finishedDiscovery: ");
        }
    })
    .init();
}
```

### 3. USB（适用于 Z45）

参考如下代码。

```
private int openUsb() {
    if (mUsbHandler != null) {
        mUsbHandler.close();
    }
    mUsbHandler = UsbHandler.getInstance().setContext(this).init();
    int nRet = mUsbHandler.connect();
    if (nRet == USBConstants.USB_NO_PERMISSION) {
        mUsbHandler.checkPermission();
        nRet = mUsbHandler.connect();
    } else if (nRet == USBConstants.USB_NO_USB_DEVICE || nRet == USBConstants.USB_NOT_FIND_D
EVICE) {
        SystemClock.sleep(2000);
        if (mUsbHandler != null) {
            mUsbHandler.close();
        }
        mUsbHandler = UsbHandler.getInstance().setContext(this).init();
        nRet = mUsbHandler.connect();
```

```
    }
    showLog("openUsb: " + nRet);
    if (nRet == 0) {
        nRet = mSys.sdkInit(ConnectTypeEnum.USB);
        showLog("sdkInit:" + nRet);
    }
    return nRet;
}
```

# 打印

本章节将会演示部分打印功能的方法，具体用法请根据实际需要进行调整。打印前需要初始化 sdk，请参考前面的章节。

1. 打印文本

```
private void printText() {
    int printStatus = mPrinter.getPrinterStatus();
    if (printStatus == SdkResult.SDK_PRN_STATUS_PAPEROUT) {
        //out of paper
    } else {
        PrnStrFormat format = new PrnStrFormat();
        format.setTextSize(30);
        format.setAli(Layout.Alignment.ALIGN_CENTER);
        format.setStyle(PrnTextStyle.BOLD);
        format.setFont(PrnTextFont.CUSTOM);
        format.setPath(Environment.getExternalStorageDirectory() + "/fonts/simsun.ttf");
        mPrinter.setPrintAppendString("POS SALES SLIP", format);
        format.setTextSize(25);
        format.setStyle(PrnTextStyle.NORMAL);
        format.setAli(Layout.Alignment.ALIGN_NORMAL);
        mPrinter.setPrintAppendString(" ", format);
        mPrinter.setPrintAppendString("MERCHANGT NAME:" + " Test ", format);
        mPrinter.setPrintAppendString("MERCHANT NO:" + " 123456789012345 ", format);
        mPrinter.setPrintAppendString("TERMINAL NAME:" + " 12345678 ", format);
        mPrinter.setPrintAppendString("OPERATOR NO:" + " 01 ", format);
        mPrinter.setPrintAppendString("CARD NO: ", format);
        format.setAli(Layout.Alignment.ALIGN_CENTER);
        format.setTextSize(30);
        format.setStyle(PrnTextStyle.BOLD);
```

```
        mPrinter.setPrintAppendString("6214 44** **** **** 7816", format);
        format.setAli(Layout.Alignment.ALIGN_NORMAL);
        format.setStyle(PrnTextStyle.NORMAL);
        format.setTextSize(25);mPrinter.setPrintAppendString(" ----------------------------
", format);
        mPrinter.setPrintAppendString(" ", format);
        mPrinter.setPrintAppendString(" ", format);
        mPrinter.setPrintAppendString(" ", format);
        mPrinter.setPrintAppendString(" ", format);
        printStatus = mPrinter.setPrintStart();
    }
}
```

2. 打印二维码 ( 需要导入 zxing 的 jar 包 )

```
private void printQrcode(String qrString) {
    int printStatus = mPrinter.getPrinterStatus();
    if (printStatus != SdkResult.SDK_PRN_STATUS_PAPEROUT) {
        mPrinter.setPrintAppendQRCode(qrString, 200, 200, Layout.Alignment.ALIGN_CENTER);
        printStatus = mPrinter.setPrintStart();
    }
}
```

3. 打印条形码（需要导入 zxing 的 jar 包）

本小节只演示了打印格式为 CODE_128 的条形码，其他格式需要替换为对应的参数。必须是 zxing 支持的格式。

```
private void printBarCode128(String barcodeString) {
    int printStatus = mPrinter.getPrinterStatus();
    if (printStatus != SdkResult.SDK_PRN_STATUS_PAPEROUT) {
        mPrinter.setPrintAppendBarCode(getActivity(), barcodeString, 360, 100, true, Layout.
Alignment.ALIGN_CENTER, BarcodeFormat.CODE_128);
        printStatus = mPrinter.setPrintStart();
    }
}
```

4. 打印图片

```
private void printBitmap(Bitmap bitmap) {
```

```
    int printStatus = mPrinter.getPrinterStatus();
    if (printStatus != SdkResult.SDK_PRN_STATUS_PAPEROUT) {
        mPrinter.setPrintAppendBitmap(bitmap, Layout.Alignment.ALIGN_CENTER);
        printStatus = mPrinter.setPrintStart();
    }
}
```

5. 打印标签

标签打印需要硬件支持才可以打印，否则会打印报错。

```
private void printLabel(Bitmap bitmap) {
    int printStatus = mPrinter.getPrinterStatus();
    if (printStatus != SdkResult.SDK_PRN_STATUS_PAPEROUT) {
        mPrinter.printLabel(bitmap);
    }
}
```

## 读卡

1. 一些共用的方法

本小节列出部分读卡将会用到的共用的方法。读卡前需要初始化sdk，请参考前面的章节。

```
    private DriverManager mDriverManager = DriverManager.getInstance();
    private CardReaderManager mCardReadManager = mDriverManager.getCardReadManager();
    private static final int READ_TIMEOUT = 60 * 1000;
    private ProgressDialog mProgressDialog;

    private void showSearchCardDialog(@StringRes int title, @StringRes int msg) {
        mProgressDialog = (ProgressDialog) DialogUtils.showProgress(getActivity(), getString
(title), getString(msg), new DialogInterface.OnCancelListener() {
            @Override
            public void onCancel(DialogInterface dialog) {
                mCardReadManager.cancelSearchCard();
            }
```

```
        });
    }

    private static String cardInfoToString(CardInfoEntity cardInfoEntity) {
        if (cardInfoEntity == null)
            return null;
        StringBuilder sb = new StringBuilder();
        sb.append("Resultcode:\t" + cardInfoEntity.getResultcode() + "\n")
                .append(cardInfoEntity.getCardExistslot() == null ? "" : "Card type:\t" + ca
rdInfoEntity.getCardExistslot().name() + "\n")
                .append(cardInfoEntity.getCardNo() == null ? "" : "Card no:\t" + cardInfoEnt
ity.getCardNo() + "\n")
                .append(cardInfoEntity.getRfCardType() == 0 ? "" : "Rf card type:\t" + cardI
nfoEntity.getRfCardType() + "\n")
                .append(cardInfoEntity.getRFuid() == null ? "" : "RFUid:\t" + new String(car
dInfoEntity.getRFuid()) + "\n")
                .append(cardInfoEntity.getAtr() == null ? "" : "Atr:\t" + cardInfoEntity.get
Atr() + "\n")
                .append(cardInfoEntity.getTk1() == null ? "" : "Track1:\t" + cardInfoEntity.
getTk1() + "\n")
                .append(cardInfoEntity.getTk2() == null ? "" : "Track2:\t" + cardInfoEntity.
getTk2() + "\n")
                .append(cardInfoEntity.getTk3() == null ? "" : "Track3:\t" + cardInfoEntity.
getTk3() + "\n")
                .append(cardInfoEntity.getExpiredDate() == null ? "" : "expiredDate:\t" + ca
rdInfoEntity.getExpiredDate() + "\n")
                .append(cardInfoEntity.getServiceCode() == null ? "" : "serviceCode:\t" + ca
rdInfoEntity.getServiceCode());
        return sb.toString();
    }

    private String rfCardTypeToString(byte rfCardType) {
        String type = "";
        switch (rfCardType) {
            case SdkData.RF_TYPE_A:
                type = "RF_TYPE_A";
                break;
            case SdkData.RF_TYPE_B:
                type = "RF_TYPE_B";
                break;
            case SdkData.RF_TYPE_MEMORY_A:
                type = "RF_TYPE_MEMORY_A";
                break;
            case SdkData.RF_TYPE_FELICA:
```

```
                type = "RF_TYPE_FELICA";
                break;
            case SdkData.RF_TYPE_MEMORY_B:
                type = "RF_TYPE_MEMORY_B";
                break;
        }
        return type;
    }
```

## 2. IC 卡

本小节将演示如何读取 IC 卡的信息。

```
    private void searchICCard() {
        showSearchCardDialog(R.string.waiting, R.string.msg_ic_card);
        mCardReadManager.cancelSearchCard();
        mCardReadManager.searchCard(CardReaderTypeEnum.IC_CARD, READ_TIMEOUT, mICCardSearchCardListener);
    }

    private OnSearchCardListener mICCardSearchCardListener = new OnSearchCardListener() {
        @Override
        public void onCardInfo(CardInfoEntity cardInfoEntity) {
            mProgressDialog.dismiss();
            readICCard();
        }

        @Override
        public void onError(int i) {
            mProgressDialog.dismiss();
            showReadICCardErrorDialog(i);
        }

        @Override
        public void onNoCard(CardReaderTypeEnum cardReaderTypeEnum, boolean b) {

        }
    };

    public static final byte[] APDU_SEND_IC = {0x00, (byte) 0xA4, 0x04, 0x00, 0x0E, 0x31, 0x50, 0x41, 0x59, 0x2E, 0x53, 0x59, 0x53, 0x2E, 0x44, 0x44, 0x46, 0x30, 0x31, 0X00};
    private void readICCard() {
        ICCard icCard = mCardReadManager.getICCard();
```

```
        int result = icCard.icCardReset(CardSlotNoEnum.SDK_ICC_USERCARD);
        if (result == SdkResult.SDK_OK) {
            int[] recvLen = new int[1];
            byte[] recvData = new byte[300];
            result = icCard.icExchangeAPDU(CardSlotNoEnum.SDK_ICC_USERCARD, APDU_SEND_IC, re
cvData, recvLen);
            if (result == SdkResult.SDK_OK) {
                final String apduRecv = StringUtils.convertBytesToHex(recvData).substring(0,
 recvLen[0] * 2);
                CardFragment.this.getActivity().runOnUiThread(new Runnable() {
                    @Override
                    public void run() {
                        DialogUtils.show(getActivity(), "Read IC card result", apduRecv);
                    }
                });
            } else {
                showReadICCardErrorDialog(result);
            }
        } else {
            showReadICCardErrorDialog(result);
        }
        icCard.icCardPowerDown(CardSlotNoEnum.SDK_ICC_USERCARD);
    }

    private void showReadICCardErrorDialog(final int errorCode) {
        CardFragment.this.getActivity().runOnUiThread(new Runnable() {
            @Override
            public void run() {
                DialogUtils.show(getActivity(), "Read IC card failed", "Error code = " + err
orCode);
            }
        });
    }
```

### 3. PSAM 卡

本小节将演示如何读取 PSAM 卡。代码只演示如何获取卡槽 1 的 PSAM 卡，如果要读取其他卡槽的 PSAM 卡需要替换对应的参数。

```
    private void searchPSAM1() {
        showSearchCardDialog(R.string.waiting, R.string.psam_ic_card);
        mCardReadManager.cancelSearchCard();
```

```
        mCardReadManager.searchCard(CardReaderTypeEnum.PSIM1, READ_TIMEOUT, mPSAM1SearchCard
Listener);
    }

    private OnSearchCardListener mPSAM1SearchCardListener = new OnSearchCardListener() {
        @Override
        public void onCardInfo(CardInfoEntity cardInfoEntity) {
            mProgressDialog.dismiss();
            readPSAM1();
        }

        @Override
        public void onError(int i) {
            mProgressDialog.dismiss();
            showReadPSAM1ErrorDialog(i);
        }

        @Override
        public void onNoCard(CardReaderTypeEnum cardReaderTypeEnum, boolean b) {

        }
    };

    public static final byte[] APDU_SEND_RANDOM = {0x00, (byte) 0x84, 0x00, 0x00, 0x08};
    private void readPSAM1() {
        ICCard icCard = mCardReadManager.getICCard();
        int result = icCard.icCardReset(CardSlotNoEnum.SDK_ICC_SAM1);
        if (result == SdkResult.SDK_OK) {
            int[] recvLen = new int[1];
            byte[] recvData = new byte[300];
            result = icCard.icExchangeAPDU(CardSlotNoEnum.SDK_ICC_SAM1, APDU_SEND_RANDOM, re
cvData, recvLen);
            if (result == SdkResult.SDK_OK) {
                final String apduRecv = StringUtils.convertBytesToHex(recvData).substring(0,
 recvLen[0] * 2);
                CardFragment.this.getActivity().runOnUiThread(new Runnable() {
                    @Override
                    public void run() {
                        DialogUtils.show(getActivity(), "Read PSAM1 result", apduRecv);
                    }
                });
            } else {
                showReadPSAM1ErrorDialog(result);
            }
```

```
        } else {
            showReadPSAM1ErrorDialog(result);
        }
        icCard.icCardPowerDown(CardSlotNoEnum.SDK_ICC_SAM1);
    }

    private void showReadPSAM1ErrorDialog(final int errorCode) {
        CardFragment.this.getActivity().runOnUiThread(new Runnable() {
            @Override
            public void run() {
                DialogUtils.show(getActivity(), "Read PSAM1 failed", "Error code = " + error
Code);
            }
        });
    }
```

## 4. 磁条卡

本小节将演示如何读取磁条卡信息。

```
    private void searchMagnetCard() {
        showSearchCardDialog(R.string.waiting, R.string.msg_magnet_card);
        mCardReadManager.cancelSearchCard();
        mCardReadManager.searchCard(CardReaderTypeEnum.MAG_CARD, READ_TIMEOUT, mMagnetCardSe
archCardListener);
    }

    private OnSearchCardListener mMagnetCardSearchCardListener = new OnSearchCardListener()
{
        @Override
        public void onCardInfo(CardInfoEntity cardInfoEntity) {
            mProgressDialog.dismiss();
            readMagnetCard();
        }

        @Override
        public void onError(int i) {
            mProgressDialog.dismiss();
            showReadMagnetCardErrorDialog(i);
        }

        @Override
        public void onNoCard(CardReaderTypeEnum cardReaderTypeEnum, boolean b) {
```

```
        }
    };
    private void readMagnetCard() {
        MagCard magCard = mCardReadManager.getMAGCard();
        final CardInfoEntity cardInfoEntity = magCard.getMagReadData();
        if (cardInfoEntity.getResultcode() == SdkResult.SDK_OK) {
            CardFragment.this.getActivity().runOnUiThread(new Runnable() {
                @Override
                public void run() {
                    DialogUtils.show(getActivity(), "Read Magnet card result", cardInfoToStr
ing(cardInfoEntity));
                }
            });
        } else {
            showReadMagnetCardErrorDialog(cardInfoEntity.getResultcode());
        }
        magCard.magCardClose();
    }

    private void showReadMagnetCardErrorDialog(final int errorCode) {
        CardFragment.this.getActivity().runOnUiThread(new Runnable() {
            @Override
            public void run() {
                DialogUtils.show(getActivity(), "Read magnetic card failed", "Error code = "
 + errorCode);
            }
        });
    }
```

## 5. 非接卡

本小节将演示如何读取非接卡信息。

```
    private void searchRfCard() {
        showSearchCardDialog(R.string.waiting, R.string.msg_contactless_card);
        mCardReadManager.cancelSearchCard();
        mCardReadManager.searchCard(CardReaderTypeEnum.RF_CARD, READ_TIMEOUT, mRfCardSearchC
ardListener);
    }

    private OnSearchCardListener mRfCardSearchCardListener = new OnSearchCardListener() {
        @Override
```

```
        public void onCardInfo(CardInfoEntity cardInfoEntity) {
            mProgressDialog.dismiss();
            byte rfCardType = cardInfoEntity.getRfCardType();
            readRfCard(rfCardType);
        }

        @Override
        public void onError(int i) {
            mProgressDialog.dismiss();
            showReadRfCardErrorDialog(i);
        }

        @Override
        public void onNoCard(CardReaderTypeEnum cardReaderTypeEnum, boolean b) {

        }
    };

    public static final byte[] APDU_SEND_RF = {0x00, (byte) 0xA4, 0x04, 0x00, 0x0E, 0x32, 0x
50, 0x41, 0x59, 0x2E, 0x53, 0x59, 0x53, 0x2E, 0x44, 0x44, 0x46, 0x30, 0x31, 0x00};
    public static final byte[] APDU_SEND_FELICA = {0x10, 0x06, 0x01, 0x2E, 0x45, 0x76, (byte
) 0xBA, (byte) 0xC5, 0x45, 0x2B, 0x01, 0x09, 0x00, 0x01, (byte) 0x80, 0x00};
    private void readRfCard(final byte rfCardType) {
        RfCard rfCard = mCardReadManager.getRFCard();
        int result = rfCard.rfReset();
        if(result == SdkResult.SDK_OK) {
            byte[] apduSend;
            if (rfCardType == SdkData.RF_TYPE_FELICA) { // felica card
                apduSend = APDU_SEND_FELICA;
            } else {
                apduSend = APDU_SEND_RF;
            }
            int[] recvLen = new int[1];
            byte[] recvData = new byte[300];
            result = rfCard.rfExchangeAPDU(apduSend, recvData, recvLen);
            if(result == SdkResult.SDK_OK) {
                final String apduRecv = StringUtils.convertBytesToHex(recvData).substring(0,
 recvLen[0] * 2);
                CardFragment.this.getActivity().runOnUiThread(new Runnable() {
                    @Override
                    public void run() {
                        DialogUtils.show(getActivity(), "Read contactless card result",
                                "Card type: " + rfCardTypeToString(rfCardType) + "\n" +
                                "Result: " + apduRecv);
```

```
                    }
                });
            } else {
                showReadRfCardErrorDialog(result);
            }
        } else {
            showReadRfCardErrorDialog(result);
        }
        rfCard.rfCardPowerDown();
    }

    private void showReadRfCardErrorDialog(final int errorCode) {
        CardFragment.this.getActivity().runOnUiThread(new Runnable() {
            @Override
            public void run() {
                DialogUtils.show(getActivity(), "Read contactless card failed", "Error code
= " + errorCode);
            }
        });
    }
```

6. 其它卡片

其他特殊卡片如 M1 卡，mifare plus 卡，SLE4428 卡，SLE4442 卡等卡片的操作请参考附件中的 demo。如有不支持的卡片请联系商务进行定制。

7. NFC

NFC 功能采用 Android 原生 API，具体使用方法请参考官方 API 文档

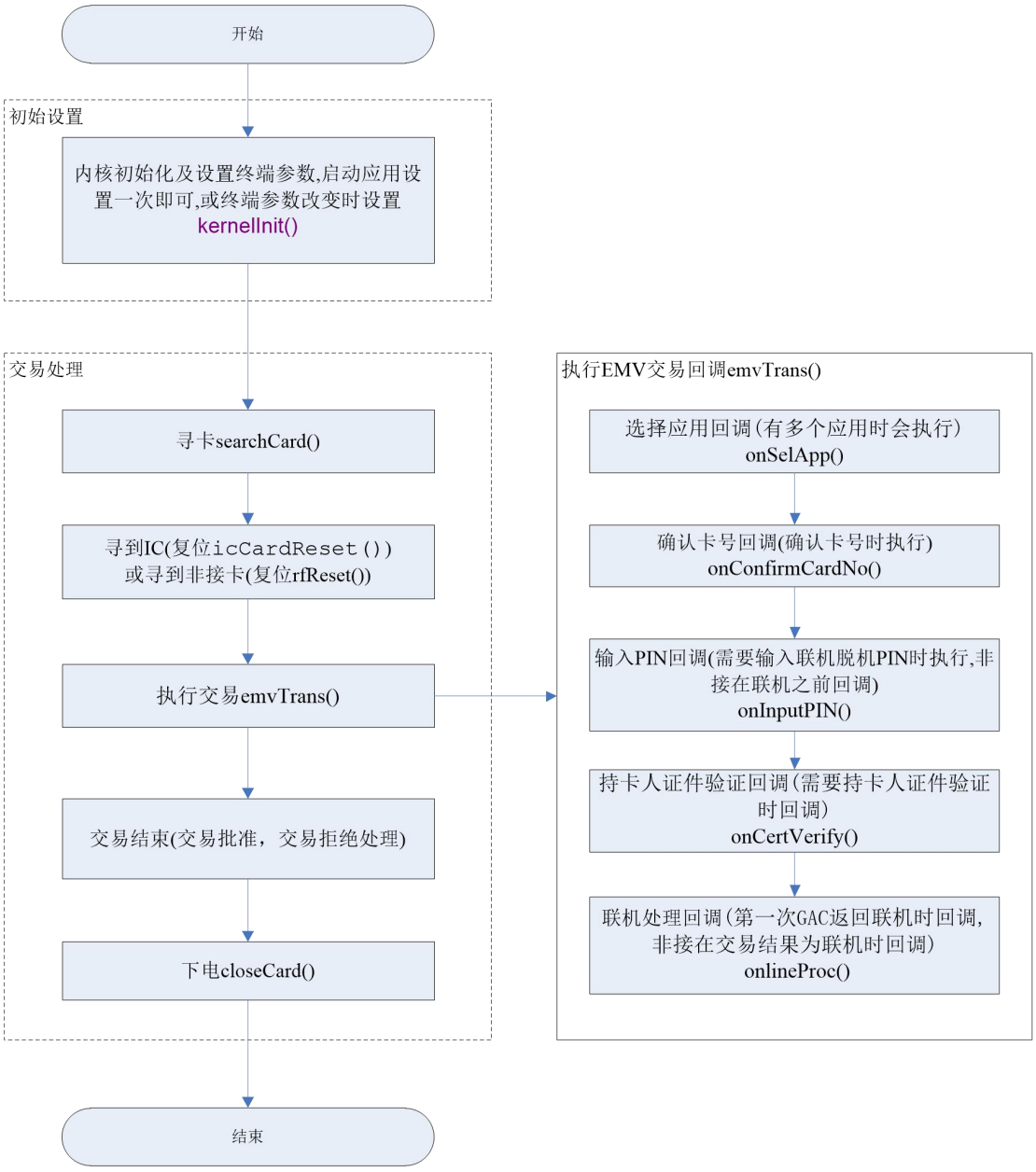
国内请参考这里。

# EMV

本章节仅演示 EMV 流程及关键代码，完整流程请参考附件中的 demo 中的 EmvActivity.java。

EMV 具体接口以及参数含义请参考 EMV_API.doc。

## 1. EMV 交易流程图



## 2. 初始化

```
emvHandler = EmvHandler.getInstance();
mPinPadManager = mDriverManager.getPadManager();
byte[] pucIsEcTrans = new byte[1];
byte[] pucBalance = new byte[6];
byte[] pucTransResult = new byte[1];
```

## 3. 回调

```
OnEmvListener onEmvListener = new OnEmvListener() {
    @Override
    public int onSelApp(String[] appLabelList) {
        Log.d("Debug", "onSelApp");
        return 0;
    }

    @Override
    public int onConfirmCardNo(String cardNo) {
        Log.d("Debug", "onConfirmCardNo");
        String[] track2 = new String[1];
        final String[] pan = new String[1];
        emvHandler.getTrack2AndPAN(track2, pan);
        int index = 0;
        if (track2[0].contains("D")) {
            index = track2[0].indexOf("D") + 1;
        } else if (track2[0].contains("=")) {
            index = track2[0].indexOf("=") + 1;
        }
        final String exp = track2[0].substring(index, index + 4);
        showLog("cardNum:" + pan[0]);
        showLog("exp:" + exp);
        return 0;
    }

    @Override
    public int onInputPIN(byte pinType) {
        // 1. open the secret pin pad to get pin block
        // 2. send the pinBlock to emv kernel
        if (emvTransParam.getTransKernalType() == EmvData.KERNAL_CONTACTLESS_ENTRY_POINT) {
            String[] track2 = new String[1];
            final String[] pan = new String[1];
```

```
            emvHandler.getTrack2AndPAN(track2, pan);
            int index = 0;
            if (track2[0].contains("D")) {
                index = track2[0].indexOf("D") + 1;
            } else if (track2[0].contains("=")) {
                index = track2[0].indexOf("=") + 1;
            }
            final String exp = track2[0].substring(index, index + 4);
            showLog("card:" + pan[0]);
            showLog("exp:" + exp);
        }
        Log.d("Debug", "onInputPIN");
        int iRet = 0;
        iRet = inputPIN(pinType);
        Log.d("Debug", "iRet=" + iRet);
        if (iRet == EmvResult.EMV_OK) {
            emvHandler.setPinBlock(mPinBlock);
        }
        return iRet;
    }

    @Override
    public int onCertVerify(int certType, String certNo) {
        Log.d("Debug", "onCertVerify");
        return 0;
    }

    @Override
    public byte[] onExchangeApdu(byte[] send) {
        Log.d("Debug", "onExchangeApdu");
        if (realCardType == CardReaderTypeEnum.IC_CARD) {
            return mICCard.icExchangeAPDU(CardSlotNoEnum.SDK_ICC_USERCARD, send);
        } else if (realCardType == CardReaderTypeEnum.RF_CARD) {
            return mRFCard.rfExchangeAPDU(send);
        }
        return null;
    }

    @Override
    public int onlineProc() {
        // 1. assemble the authorisation request data and send to bank by using get 'emvHand
ler.getTlvData()'
        // 2. separateOnlineResp to emv kernel
        // 3. return the callback ret
```

```
        Log.d("Debug", "onOnlineProc");
        byte[] authRespCode = new byte[3];
        byte[] issuerResp = new byte[512];
        int[] issuerRespLen = new int[1];
        int iSendRet = emvHandler.separateOnlineResp(authRespCode, issuerResp, issuerRespLen
[0]);
        Log.d("Debug", "separateOnlineResp iSendRet=" + iSendRet);
        return 0;
    }
};
```

## 4. 设置参数

```
final EmvTransParam emvTransParam = new EmvTransParam();
if (cardType == CardReaderTypeEnum.IC_CARD) {
    emvTransParam.setTransKernalType(EmvData.KERNAL_EMV_PBOC);
} else if (cardType == CardReaderTypeEnum.RF_CARD) {
    emvTransParam.setTransKernalType(EmvData.KERNAL_CONTACTLESS_ENTRY_POINT);
}
emvHandler.transParamInit(emvTransParam);
final EmvTermParam emvTermParam = new EmvTermParam();
emvHandler.kernelInit(emvTermParam);
```

## 5. 添加 AID 及 CAPK

注意添加 AID 和 CAPK 需要在 emvHandler.kernelInit(emvTermParam)之后执行，且 AID 和 CAPK 将会持久化存储在文件系统，所以避免重复添加。可通过 emvHandler.delAllApp() , emvHandler.delAllCapk() 清空之前添加过的。

```
private void loadVisaAIDs(EmvHandler emvHandle) {
    // Visa Credit/Debit EmvApp
    ea = new EmvApp();
    ea.setAid("A0000000031010");
    ea.setSelFlag((byte) 0);
    ea.setTargetPer((byte) 0x00);
    ea.setMaxTargetPer((byte) 0);
    ea.setFloorLimit(1000);
    ea.setOnLinePINFlag((byte) 1);
```

```
    ea.setThreshold(0);
    ea.setTacDefault("0000000000");
    ea.setTacDenial("0000000000");
    ea.setTacOnline("0000000000");
    ea.settDOL("0F9F02065F2A029A039C0195059F3704");
    ea.setdDOL("039F3704");
    ea.setVersion("008C");
    ea.setClTransLimit("000000015000");
    ea.setClOfflineLimit("000000008000");
    ea.setClCVMLimit("000000005000");
    ea.setEcTTLVal("000000100000");
    emvHandle.addApp(ea);
}

private void loadMasterCardCapks(EmvHandler emvHandle) {
    EmvCapk capk = new EmvCapk();
    capk.setKeyID((byte) 0x05);
    capk.setRID("A000000004");
    capk.setModul("B8048ABC30C90D976336543E3FD7091C8FE4800"
            + "DF820ED55E7E94813ED00555B573FECA3D84AF6"
            + "131A651D66CFF4284FB13B635EDD0EE40176D8B"
            + "F04B7FD1C7BACF9AC7327DFAA8AA72D10DB3B"
            + "8E70B2DDD811CB4196525EA386ACC33C0D9D45"
            + "75916469C4E4F53E8E1C912CC618CB22DDE7C3"
            + "568E90022E6BBA770202E4522A2DD623D180E21"
            + "5BD1D1507FE3DC90CA310D27B3EFCCD8F83DE"
            + "3052CAD1E48938C68D095AAC91B5F37E28BB49EC7ED597");
    capk.setCheckSum("EBFA0D5D06D8CE702DA3EAE890701D45E274C845");
    capk.setExpDate("20211231");
    // YYYYMMDD
    emvHandle.addCapk(capk);
}
```

## 6. 执行及结果

```
    int ret = emvHandler.emvTrans(emvTransParam, onEmvListener, pucIsEcTrans, pucBalance, pu
cTransResult);
    showLog("Emv trans end, ret = " + ret);
    String str = "Decline";
    if (pucTransResult[0] == EmvData.APPROVE_M) {
        str = "Approve";
    } else if (pucTransResult[0] == EmvData.ONLINE_M) {
        str = "Online";
```

```
    } else if (pucTransResult[0] == EmvData.DECLINE_M) {
         str = "Decline";
    }
    showLog("Emv trans result = " + pucTransResult[0] + ", " + str);
    if (ret == 0) {
        getEmvData();
    }
    mCardReadManager.closeCard();

int[] tags = {
            0x9F26,
            0x9F27,
            0x9F10,
            0x9F37,
            0x9F36,
            0x95,
            0x9A,
            0x9C,
            0x9F02,
            0x5F2A,
            0x82,
            0x9F1A,
            0x9F03,
            0x9F33,
            0x9F34,
            0x9F35,
            0x9F1E,
            0x84,
            0x9F09,
            0x9F41,
            0x9F63,
            0x5F24
    };

private void getEmvData() {
    byte[] field55 = emvHandler.packageTlvList(tags);
    showLog("Filed55: " + StringUtils.convertBytesToHex(field55));
}
```

# 密码键盘

本章节仅演示密码键盘的关键代码，完整流程请参考附件中的 demo 中的 PinpadFragment.java。

使用前需要初始化，并获取 PinPadManager 对象。

```
PinPadManager mPadManager = mDriverManager.getPadManager();
```

## 1. 下载主密钥

```
    private void setMainKey() {
        String main_key = "31313131313131313232323232323232";
        byte[] main_key_byte = StringUtils.convertHexToBytes(main_key);
        // index: means Key index, 0x00~0x0F
        // key: The key length is a multiple of 8.
        int ret = mPadManager.pinPadUpMastKey(0,  //index
                main_key_byte ,  //key
                (byte) main_key_byte.length);
        Log.d(TAG, "setMainKey: " + ret);
    }
```

## 2. 下载工作密钥

```
    private void setWorkKey() {
        String pin_key = "BF1CA957FE63B286E2134E08A8F3DDA903E0686F";
        String mac_key = "8670685795c8d2ea0000000000000000d2db51f1";
        String tdk_key = "00A0ABA733F2CBB1E61535EDCFDC34A93AA3EA2D";

        byte[] pin_key_byte = StringUtils.convertHexToBytes(pin_key);
        byte[] mac_key_byte = StringUtils.convertHexToBytes(mac_key);
        byte[] tdk_key_byte = StringUtils.convertHexToBytes(tdk_key);

        int ret
= pinPadManager.pinPadUpWorkKey(index_all, pin_key_byte, (byte) pin_key_byte.length,
                mac_key_byte, (byte) mac_key_byte.length, tdk_key_byte, (byte) tdk_key_byte.
length);
        Log.d(TAG, "setWorkKey: " + ret);

    }
```

## 3. pinblock（安全随机密码键盘)

使用 pinblock 需要在 Manifest 中声明指定 Activity，并定义其样式。

```
<!-- add in AndroidManifest.xml-->
<activity android:name="com.zcs.sdk.pin.pinpad.PinPadPasswordActivity"
    android:theme="@style/Theme.WindowActivity">
</activity>

<!-- add in styles.xml-->
<style name="Theme.WindowActivity" parent="android:style/Theme.Dialog">
    <item name="android:windowNoTitle">true</item>
    <item name="android:windowIsTranslucent">true</item>
    <item name="android:windowBackground">@android:color/transparent</item>
    <item name="android:windowContentOverlay">@null</item>
    <item name="android:windowIsFloating">true</item>
    <item name="android:backgroundDimEnabled">true</item>
    <item name="android:windowAnimationStyle">@android:style/Animation.Dialog</item>
</style>
```

在代码中使用。

```
pinPadManager.inputOnlinePin(getActivity(), (byte) 6, (byte) 12, 60, true, "5187108106590784
", (byte) 0, PinAlgorithmMode.ANSI_X_9_8, new PinPadManager.OnPinPadInputListener() {
        @Override
        public void onError(final int code) {
        }
        @Override
        public void onSuccess(final byte[] bytes) {
            Log.d(TAG, "PinBlock: " + StringUtils.convertBytesToHex(bytes));
        }
    });
```

## 4. MAC 计算

```
private void mac() {
    String mac_data = "0200302004C030C098110000000000000000010000080210001232518710810659076
99B0E751ADD38E06801049951871081065907840D156156199999999300199900000003434341303 10DD068423601
059800005219298D060D745153979CC00313233343536373831323334353637383930313233343531353611 7A7E3
A0DFD417926100000000000000001422000335000601";
    byte[] mac = new byte[8];
    int ret = mPadManager.pinPadMac(0, PinMacTypeEnum.ECB, StringUtils.convertHexToBytes(mac
```

```
_data), mac_data.length() / 2, mac);
    Log.d(TAG, "mac: " + ret + " " + StringUtils.convertBytesToHex(mac));
}
```

## 5. 加密磁道数据

```
private void encryptTrack() {
    String track = "6258091644092434=20102010000089500000";
    // track is ascii string, one letter is one byte
    // hex string: two letter is one byte
    byte[] encryptedTrack = new byte[track.length()];
    int ret = mPadManager.pinPadEncryptTrackData(0, MagEncryptTypeEnum.UNION_ENCRYPT, track.
getBytes(), (byte) (track.length()), encryptedTrack);
    Log.d(TAG, "encryptTrack: " + ret + " " + new String(encryptedTrack));
}
```

## 6. 加密数据

```
private void encryptData() {
    String dataForDes = "11111111111111111111111111111111";
    byte[] res = new byte[dataForDes.length() / 2];
    int ret = mPadManager.pinPadEncryptData(0, PinWorkKeyTypeEnum.MAC_KEY, StringUtils.conve
rtHexToBytes(dataForDes), dataForDes.length() / 2, res);
    Log.d(TAG, "encryptData: " + ret + " " + StringUtils.convertBytesToHex(res));
}
```

## 7. dukpt 密钥相关

### 7.1 下载 dukpt 密钥

```
private void setDukptKey() {
    String key = "6AC292FAA1315B4D858AB3A3D7D5933A";
    String ksn = "FFFF9876543210E00000";
    int upDukpt = mPadManager.pinPadUpDukpt(0, StringUtils.convertHexToBytes(key), (byte) (k
ey.length() / 2), StringUtils.convertHexToBytes(ksn));
}
```

### 7.2 获取 pinblock

```
private void getPinBlockByDukpt() {
```

```
    final byte[] ksn = new byte[10];
    mPadManager.inputOnlinePinByDukpt(getActivity(), (byte) 6, (byte) 12, 60, true, "5187108106590784", (byte) 0, PinAlgorithmMode.ANSI_X_9_8, new PinPadManager.OnPinPadInputListener() {
        @Override
        public void onError(final int code) {
        }

        @Override
        public void onSuccess(final byte[] bytes) {
            Log.d(TAG, "PinBlock: " + StringUtils.convertBytesToHex(bytes));
            Log.d(TAG, "ksn: " + StringUtils.convertBytesToHex(ksn));
        }
    }, ksn);
}
```

## 7.3 MAC 计算

```
private void getMacByDukpt() {
    String input = "0200302004C030C0981100000000000000000010000080210001232518710810659076 99B0E751ADD38E06801049951871081065907 84D1561561999999993001999000000034343413031 0DD0684236010598000052192 98D060D745153979CC003132333435363738313233343536373839303132333435313536117A7E3A0DFD4179261000000000000000014220003 35000601";
    byte[] outData = new byte[8];
    byte[] ksn = new byte[10];
    int ret = mPadManager.pinPadMacByDukpt(0, PinMacTypeEnum.ECB, StringUtils.convertHexToBytes(input), input.length() / 2, outData, ksn);
    Log.d(TAG, "pinPadMacByDukpt:" + ret);
    if (ret == SdkResult.SDK_OK) {
        Log.d(TAG, "outData:" + StringUtils.convertBytesToHex(outData));
        Log.d(TAG, "ksn:" + StringUtils.convertBytesToHex(ksn));
    }
}
```

## 7.4 加密

```
 private void encryptByDukpt() {
    String input = "0200302004C030C0981100000000000000000010000080210001232518710810659076 99B0E751ADD38E06801049951871081065907 84D1561561999999993001999000000034343413031 0DD0684236010598000052192 98D060D745153979CC003132333435363738313233343536373839303132333435313536117A7E3A0DFD4179261000000000000000014220003";
    byte[] outData = new byte[input.length() / 2];
```

```
    byte[] ksn = new byte[10];
    int ret = mPadManager.pinPadEncryptDataByDukpt(0, PinWorkKeyTypeEnum.PIN_KEY, StringUtil
s.convertHexToBytes(input), input.length() / 2, outData, ksn);
    Log.d(TAG, "sdkPadEncryptDataByDukpt:" + ret);
    if (ret == SdkResult.SDK_OK) {
        Log.d(TAG, "outData:" + StringUtils.convertBytesToHex(outData));
        Log.d(TAG, "ksn:" + StringUtils.convertBytesToHex(ksn));
    }
}
```

## 其它

包括了硬件相关功能的接口，均需要硬件支持才能正常使用，如硬件不支持则会返回错误码。

### 1. LED

```
int ret = mLed.setLed(LedLightModeEnum.RED, true);
```

### 2. 蜂鸣器

```
int ret = mBeeper.beep(4000, 600);
```

### 3. 切刀

```
    private void cutPaper() {
        int printStatus = mPrinter.getPrinterStatus();
        if(printStatus == SdkResult.SDK_OK) {
            mPrinter.openPrnCutter((byte) 1);
        }
    }
```

### 4. 客显屏

仅支持设置大小为 128px*64px 的 bitmap。

```
mSys.showBitmapOnLcd(bitmap, true);
```

5. 钱箱

```
mPrinter.openBox();
```

6. 扫码头

扫码头需要先上电才能打开。

（扫码头使用代码因扫码头型号的不同有少许差异，开发时如有问题请联系业务）

6.1 上电

```
mhqscanner = mDriverManager.getHQrsannerDriver();
mhqscanner.QRScanerPowerCtrl((byte) 1);
```

6.2 打开

```
mhqscanner.QRScanerCtrl((byte)1);
try {
    Thread.sleep(10);
} catch (InterruptedException e) {
    e.printStackTrace();
}
mhqscanner.QRScanerCtrl((byte)0);
```

## 其他注意事项

编译时请勿混淆 sdk 中的代码，在混淆配置中添加如下配置。

```
-keep class com.zcs.base.SmartPosJni{*;}
-keep class com.zcs.sdk.DriverManager{*;}
-keep class com.zcs.sdk.emv.**{*;}
```