2018

TopWise SmartPos Interface

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VERSION

ver no	data	design	note
V1.0	2018-5-17	HanJia	loadDuKPTkey(byte[] key, byte[] ksn) getMac, key_type=12 for dukpt getpin key_type=13 for dukpt

1. Introduction

1.1 Purpose

This document describes the SDK design of the platform in detail and provides reference for the Developer.

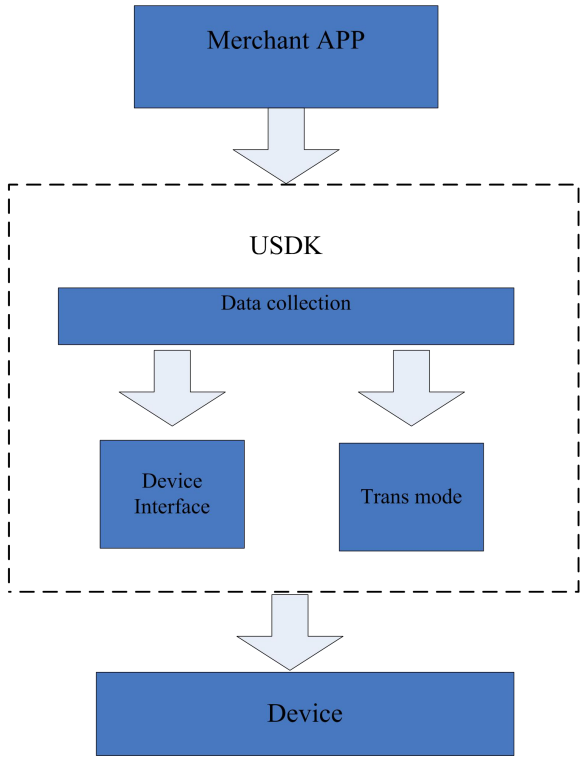
1.2 Audience

This document is intended for testers ,software SDK developers and software application developers.

2. Overview

The merchants offer the interfaces by apk or pre-install apk into the smart pos. The application must call these interfaces by the way with AIDL.

3. Overall Design



1. Merchant APP: third party APP, to accomplish payment by calling USDK.
2. USDK : payment module, supports payment function.
3. Data collection: business module,collects the exchange data.
4. Device :manufacturers device, supports magcard, IC card, nfc, printer, pinpad and so on.

4. Device Interfaces

4.1 Service Action name

```
<service android:name="Package Name.DeviceService" >
<intent-filter>
<action android:name="topwise_cloudpos_device_service" />
</intent-filter>
</service>
```

4.2 Safe Controllable

This refers to the security control is a single device module, calling APP must be in use before

The AndroidManifest.xml declares the access rights of the device module. When the service APP initializes the device handle, it needs to check if the caller has access to the module. If the module does not have access permission, the access is denied. According to the abstract module division, the permission list is as follows：

1.Set printer permissions
<uses-permission android:name="android.permission.CLOUDPOS_PRINTER" />
2.Access password keyboard permission
<uses-permission android:name="android.permission.CLOUDPOS_PINPAD" />
3.Password keyboard to calculate Pinblock permissions
<uses-permission android:name="android.permission.CLOUDPOS_PINPAD_PIN_BLOCK" />
4.Password Keyboard Calculate Mac Permissions
<uses-permission android:name="android.permission.CLOUDPOS_PINPAD_PIN_MAC" />
5.Password keyboard encryption data permissions<uses-permission
android:name="android.permission.CLOUDPOS_PINPAD_ENCRYPT_DATA" />
6.Password Keyboard Update Terminal Master Key Permissions<uses-permission
7.Password keyboard to update work key permissions<uses-permission
android:name="android.permission.CLOUDPOS_PINPAD_UPDATE_WKEY" />
8.Access to contactless IC card reader device permissions
<uses-permission android:name="android.permission.CLOUDPOS_ICCARD" />
9.Access EMV permissions<uses-permission
android:name="android.permission.CLOUDPOS_EMVL2" />
10.Access non-contact IC card reader device permissions
<uses-permission android:name="android.permission.CLOUDPOS_RFCARD" />
11. Access magnetic stripe card reader device permissions
<uses-permission android:name="android.permission.CLOUDPOS_MAGCARD" />

4.3 EMV

4.3.1 Character

Used to process financial EMV transactions related to financial cards

4.3.2 Interface list

Interfaces	Description
void checkCard	EMV swipe card
void cancelCheckCard();	Stop swipe card
void emvProcess()	Start EMV processing
void endEMV()	Stop EMV processing
boolean clearKernelICTransLog()	Clear EMV kernel IC log
int readKernelData(String [] taglist,out byte[] buffer)	Read kernel data
void setTlv(String tag, byte[] value)	Set TLV data
String parseTLV (String tag,String tlvlist);	Analysis TLV
boolean importAmount(String amt)	Import amount of money
boolean importAidSelectRes(int index)	Import application selected result
boolean importPin(String pin)	Import PIN
boolean importUserAuthRes(boolean res)	Import identity authentication result
boolean importConfirmCardInfoRes (boolean res)	Import pad confirmed result

boolean importMsgConfirmRes(boolean confirm);	Import infomation confirmed result
Boolean importECashTipConfirmRes(boolean confirm);	Import using e-cash confirmed reslut
boolean importOnlineResp(boolean onlineRes, String respCode,String icc55)	Import online response data
void onSetTRiskManageResponse(String result)	Import terminal risk management result
boolean updateAID(int optflag,String aid)	Update AID parameter
boolean updateCAPK(int optflag,String capk)	Update CA public key parameter
boolean updateSMCAPK(int optflag,String capk)	Update national chip CA public key parameter
int isExistAidPublicKey();	Judge public key and AID parameter null or not
int isExistAidSMPublicKey();	Judge national chip public key and AID parameter null or not
initTermCfg();	Initialize terminal parameter
getAidParams();	Read EMV AID parameter list
getCAPKs	Read EMV public key list
getTermConfig	Read terminal parameter configuration

4.3.3 Interfaces

4.3.3.1 EMV swipe card

Function prototype	Void checkCard (BooleansupportMag, boolean supportIC , boolean supportRF,,int timeout,AidlCheckCardListener listener);	
Description	Swipe card	
	Enter the reference	supportMag: Whether to support the magnetic stripe card
		supportIC: Whether to support IC card
		supportRF: Whether to support RF card
		timeout: overtime time
		listener: Listen to the callback interface
	Out of reference	
Return value		
Supplementary explanation	interface AidlCheckCardListener { void onFindMagCard (TrackData data); / / detected magnetic stripe card void onSwipeCardFail (); / / credit card failure	

	void onFindICCard (); // Detects contactless IC card
	void onFindRFCard (); // detected RF card void onTimeout (); / / detection timeout
	void onCanceled (); // is canceled void onError (int errCode); // error
	}
	Note: After the check-card is completed and the AidlCheckCardListener interface is called back, the check-out process is automatically exited without requiring the user to cancel the check-card by calling the cancelCheckCard method

4.3.3.2 Canceled swipe card

Function prototype	void cancelCheckCard();	
Description	Canceled swipe card	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.3.3.3 Start EMV processing

Function prototype	void processPBOC(EmvTransData transData, PbocStartListener listener)	
Description	Import e-cash information to confirm the result	
	Enter the reference	transData: See EmvTransData definition
		listener: Execution result callback interface

	Out of reference	
Return value		
Supplementary explanation	interface PBOCStartListener { / ** request the amount of money, simple process does not callback this method Amount category (1byte), value Description: 0x01: as long as authorized amount;	

0x02: as long as the cashback amount;
0x03: both authorized amount, but also cash back the amount;
* /
void requestImportAmount (int type);
/ ** request message, the message format is hexadecimal string, the format is
Display Flag + Display Timeout Time + Display Title Length + Display Title Content + Display Content Length + Display Content;
Display flag: 1byte, indicates whether you need to hold the card 人 confirm;
0x00: do not need to confirm;
0x01: need to confirm;
Display timeout: 1byte, unit s;
Display title length: 1byte, if 0, the title does not exist;
Title: ASC code, if "display title length" is 0, then the field does not exist;
Display content length: 1byte, if 0, if the "display content length" is 0, then the field does not exist;
Display: ASC code
* /
void requestTipsConfirm (String msg);
/ ** Request multiple application selection * /
void requestAidSelect (int times, in String [] aids);
/ ** Request to confirm the use of electronic cash * /
void requestEcashTipsConfirm ();
/ ** Request confirmation card information,
CardInfoData
Member attribute Description
cardno String card number
* /
Void onConfirmCardInfo (CardInfoData cardInfo)
/ ** Request Import into PIN * /
void requestImportPin (int type, boolean lasttimeFlag, String
amt);
/ ** Request Status Certification * /
void requestUserAuth (int certype, String certnumber);
/ ** Request online * /
Void onRequestOnline ()
/ ** Back to read card offline balance result * /
void onReadCardOffLineBalance (String moneyCode, String balance, String
secondMoneyCode, String secondBalance);

	/ ** Back to read card transaction log result * / Void onReadCardTransLog (in PCardTransLog [] log); / ** Back to read the card deposit log results * / Void onReadCardLoadLog (String atc, String checkCode, in PCardLoadLog [] logs); / ** Approved: 0x01 Rejected: 0x02 Terminated: 0x03 FALLBACK: 0x04 Other Interfaces Used: 0x05 Other: 0x06 * / void onTransResult (int result) / / EMV simple flow callback / ** error * / void onError (int erroCode);

EMVTransData

member	Attributes	Description
transtype	byte	transtype: transaction type, defined as follows: Consumption 0x00 Query 0x31 Pre-authorization 0x03 Specified account deposit 0x60 Non-designated account deposit 0x62 Cash deposit 0x63 Cash Rebate 0x17 Returns 0x20 Consumer withdrawn 0x20 Non-designated account deposit read into the card 0xF1 Card balance inquiry 0xF2 Card Transaction Log Query 0xF3 Card inventory log query 0xF4
requestAmtPosition	byte	Request input amount location 0x01: before the card number 0x02: After the card number is displayed
isEcashEnable	boolean	Whether to support electronic cash

isSmEnable	boolean	Whether to support the national secret algorithm
isForceOnline	boolean	Whether to force online
EMVFlow	byte	0x01 – PBOC processing 0x02 – qPBOC processing
slotType	byte	Interface Type: 0x00 - contact 0x01 - not connected
Resv	Byte[3]	Keep For extended use When the transaction type is 0xF4-card deposit log query: Resv [0] is defined as follows: 0x00 - read by one 0x01 - one-time read

4.3.3.4 Stop EMV processing

Function prototype	void endPBOC();	
Description	End PBOC process	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation	Normal end of the process call	

4.3.3.5 Clear the core IC card transaction log

Function prototype	Boolean clearKernelICTransLog();
Description	Clears the IC card transaction log stored by the kernel and is used when performing terminal risk management

	The total amount of offline transactions for an IC card on a terminal	
	Enter the reference	
	Out of reference	
Return value	The operation is successful	
Supplementary explanation	Called after batch settlement	

4.3.3.6 Read kernel data

Function prototype	int readKernelData(String [] taglist,out byte[] buffer);	
Description	Read kernel data	
	Enter the reference	taglist: taglist data to be output Format: {"9F26", "5A"}
	Out of reference	buffer: Data format read: TLV
Return value	int <0 means read failed,> 0 means the number of bytes read	
Supplementary explanation		

4.3.3.7 Set TLV data

Function prototype	Void setTlv(String tag, byte[] value);
Description	Set TLV data

	Enter the reference	The following TLV data can be set: Terminal Type 9F35 Terminal performance 9F33 Terminal Additional Performance 9F40 Terminal Country Code 9F1A Trading Currency Code 5F2A Trading Currency Index 5F36 Transaction Reference Currency Code 9F3C Transaction Reference Currency Index 9F3D Acquirer ID Number 9F01 Merchant category code 9F15 Merchant ID 9F16 Merchant Name 9f4e Terminal ID 9F1C IFD Serial Number 9F1E
	Out of reference	
Return value		
Supplementary explanation	The kernel will have a default terminal configuration Parameter, the application needs to be modified through the interface, be sure to complete the modification before starting the transaction；	

4.3.3.8 Analysis TLV

Function prototype	String parseTLV (String tag,String tlvlist);	
Description	According to the specified TAG, get the corresponding value from the tlv string	
	Enter the reference	Tag: Label value, for example 9F26
		tlvlist: tlv string, for example 9F260800000000000000000
	Out of reference	
Return value	The value of the label	
Supplementary explanation		

4.3.3.9 Import amount

Function prototype	boolean importAidSelectRes(int index);	
Description	Import application selection results	
	Enter the reference	index:application index
	Out of reference	
Return value	boolean, whether succeed	
Supplementary explanation		

4.3.3.10 Import application selection results

Function prototype	boolean importAidSelectRes(int index);	
Description	Import application selection results	
	Enter the reference	index:application index
	Out of reference	
Return value	boolean, whether succeed	
Supplementary explanation		

4.3.3.11.Import PIN

Function prototype	boolean importPin(String pin);	
Description	Import PIN	
	Enter the reference	pin,pinblock
	Out of reference	
Return value	boolean, whether succeed	

Supplementary explanation	

4.3.3.12 Import certification results

Function prototype	boolean importUserAuthRes(boolean res);	
Description	Import certification results	
	Enter the reference	res: Certification Result, trueCertification succeeded, falseCertification failed
	Out of reference	
Return value	boolean, The order is successful	
Supplementary explanation		

4.3.3.13 Import card information confirmation result

Function prototype	boolean importConfirmCardInfoRes (boolean confirm)	
Description	Import card information to confirm the result	
	Enter the reference	confirm: confirm the result, true confirm, false cancel
	Out of reference	
Return value	boolean, Interface execution is successful	
Supplementary explanation		

4.3.3.14 Import prompt information to confirm the result

Function prototype	boolean importMsgConfirmRes(boolean confirm);	
Description	Import prompt information to confirm the result	
	Enter the reference	confirm: confirm the result, true confirm, false cancel
	Out of reference	
Return value	boolean, Interface execution is successful	

Supplementary explanation	

4.3.3.15 Import e-cash prompt information to confirm the result

Function prototype	boolean importECashTipConfirmRes(boolean confirm);	
Description	Import e-cash prompt information to confirm the result	
	Enter the reference	confirm: confirm the result, true confirm, false cancel
	Out of reference	
Return value	boolean, Interface execution is successful	
Supplementary explanation		

4.3.3.16 Import online response data

Function prototype	boolean importOnlineResp(boolean onlineRes, String respCode,String icc55);	
Description	Import online response data	
	Enter the reference	onlineRes: online is successful
		respCode: Background reply code value is as follows: "00": online approval; "01": Issuer Voice Reference; "05": Online refusal;
		icc55: 55 domain data returned by the issuing bank
	Out of reference	
Return value		
Supplementary explanation		

4.3.3.17 Import terminal risk management confirmation result

Function prototype	void onSetTRiskManageResponse(String result)	
Description	Import terminal risk management confirmation result	
	Enter the reference	Result: the string with length of 13 bits 1bit （0.unblack listed,1.black listed） The last 12 bits（from right to left filled with zero,12 bits amount） When it is black listed, filled with 12 zero.
	Out of reference	
Return value	boolean, the command is successful	
Supplementary explanation		

4.3.3.18 Update AID Parameter

Function prototype	boolean updateAID(int optflag,String aid);	
Description	Update EMV application list	
	Enter the reference	optflag: type of operation The values are as follows: 0x01: Add or replace 0x02: Delete one 0x03: Clear all
		String aid: aid record When optflag = 0x01, aid is the AIDParameter (TLV string) When optflag = 0x02, aid for the background to return the AID number (TLV grid formula) When optflag = 0x03, aid is empty
	Out of reference	

Return value	boolean, The operation is successful
Supplementary explanation	

4.3.3.19 Update the public key Parameter

Function prototype	boolean updateCAPK(int optflag,String capk);	
Description	Update EMV application list	
	Enter the reference	optflag: type of operation The values are as follows: 0x01: Add or replace 0x02: Delete one 0x03: Clear all
		capk:public key When optflag = 0x01,capkis the number of public key returned by the backend Parameter data （TLV Format）; When optflag = 0x02,capk is the specified RID+public key index （TLV Format）; When optflag = 0x03,capk is null
	Out of reference	
Return value	boolean, The operation is successful	
Supplementary explanation		

4.3.3.20 Update national chip CA public key parameter

Function prototype	boolean updateSMCAPK(int optflag,String capk);

Description	Update national chip CA public key parameter	
	Enter the reference	optflag: type of operation The values are as follows: 0x01: Add or replace 0x02: Delete one 0x03: Clear all
		capk:public key When optflag = 0x01,capkis the number of public key returned by the backend Parameter data （TLV Format）； When optflag = 0x02,capk is the specified RID+public key index （TLV Format）； When optflag = 0x03,capk is null
	Out of reference	
Return value	boolean, The operation is successful	
Supplementary explanation		

4.3.3.21 Determine whether AID and public key Parameter are empty

Function prototype	int isExistAidPublicKey();	
Description	Determine whether AID and public key Parameter are empty	
	Enter the reference	
	Out of reference	

Return value	0x00：AID Parameter 、public key Parameter None of them are empty -0x01： Public key does not exist -0x02： AID Parameter does not exit -0x03： AID Parameter 、public Parameter none of them are empty
Supplementary explanation	

4.3.3.22 Determine whether AID and public key Parameter are empty

Function prototype	Int isExistAidSMPublicKey();	
Description	Determine whether AID and public key Parameter are empty	
	Enter the reference	
	Out of reference	
Return value	0x00：AID Parameter 、public key Parameter None of them are empty -0x01： Public key does not exist -0x02： AID Parameter does not exit -0x03： AID Parameter 、public Parameter none of them are empty	
Supplementary explanation		

4.3.3.23 Initialize terminal parameter

Function prototype	int initTermCfg(EmvTermCfgEntity entity)	
Description	Initialize terminal parameter	
	Enter the reference	entity- terminal parameter，detail in EmvTermCfgEntity class

	Out of reference	
Return value	0 – success; other value; failed	
Supplementary explanation		

EMV terminal parameter class description (EmvTermCfgEntity)

Class attribute description

Attribute name	type	description
AdditionalTermCap	byte[]	Terminal additional property
CountryCode	byte[]	CountryCode (9F1A)
CurCode	byte[]	Transaction currency(5F2A)
EntryModeUsingMagStripe	byte	ICC breakdown, when only can use magnetic card , POSEntryMode value
IFDSerialNum	byte[]	IFD serial num.(9F1E)
TermCap	byte[]	Terminal quality(9F33)
TermId	byte[]	Terminal identify(9F1C)
TermType	byte	Terminal type(9F35)
isAccountSelect	boolean	Whether support account selection
isAdvices	boolean	Whether support inform
isAmountBeforeCVM	boolean	Whether know the amount before CVM
isBatchDataCapture	boolean	Whether support batch data capture
isBypassPIN	boolean	Whether bypass PIN entering
isCAPKChecksum	boolean	Whether checksum the CAPK
isCAPKFailOperAction	boolean	Whether need operator action if CAPK failed
isCardHolderConfirm	boolean	Whether need the cardholder confirm
isCardVoiceReferal	boolean	Whether support voice reference by the issuing bank
isCommonCharset	boolean	Whether support the common character set

isContainDefaultDDOL	boolean	Whether include the default DDOL
isDefActCodesAfter1stGenAC	boolean	Whether the Default action code after the FirstGenerateAC
isDefaultTDOL	boolean	Whether has default TDOL
isExceptionFile	boolean	Whether support exception file
isForceAccept	boolean	Whether allow to force accept transaction
isForceOnline	boolean	Whether allow to force online
isGetDataForPINCounter	boolean	Whether PIN counter support GetData
isIISVoiceReferal	boolean	Whether support the voice referenced by issuing bank
isIpKCVValidtionCheck	boolean	Whether check KCV valid
isLimitFloorCheck	boolean	Whether check the floor amount
isMulLanguage	boolean	Whether support multiple languages
isPartialAID	boolean	Whether support partial AID match
isPreferedOrder	boolean	Whether support preferred order
isPse	boolean	Whether support select PSE
isRandomTransSel	boolean	Whether do random transaction selection
isTerminalActionCode()	boolean	Whether support terminal action code
isTransLog	boolean	Whether record transaction log
isTrmBaseOnAIP	boolean	Whether terminal risk management based on app contact characteristic

isVelocityCheck	boolean	whether velocity check

AID parameter class description (EmvAidParaEntity)

Class attribute description

Attribute name	type	description
AcquirerID	byte[]	Acquirer identify tag: 9F01
AddTermCap	byte[]	Terminal additional quality data format (n 3)
AID_length	int	AID length
AID	byte[]	AID
AppSelIndicator	byte	App selected indicator
DDOL_Length	byte	DDOL length
DDOL	byte[]	DDOL
EC_TFL	byte[]	Terminal e-cash transaction limited amount tag:9F7B
MaxTargetDomestic	byte	The maximum percent offset that select random
MaxTargetPercentageInt	byte	The maximum percent offset that select random
MerCateCode	byte[]	Merchant category code 商 tag: 9F15
RFCVMLimit	byte[]	Terminal execute CVM limited tag: DF21
RFOfflineLimit	byte[]	Contactless offline the least limited amount tag: DF19
RFTransLimit	byte[]	Contactless transaction limited amount tag: DF20
StatusCheck	byte	Contactless status check 0x00-no need to check 0x01-need check
TAC_Default	byte[]	TAC default data format (n 5)
TAC_Denial	byte[]	TAC denial data format (n 5)

TAC_Online	byte[]	TAC online data format (n 5)
TargetPercentageDomestic	byte	Target percent selected random
TargetPercentageInt	byte	Target percent selected random
TDOL_Length	int	TDOL length
TDOL	byte[]	TDOL
TermAppVer	byte[]	Terminal app. version
TermCap	byte[]	Terminal capacity data format (n 3)
TermCountryCode	byte[]	Terminal Country Code tag: 9F1A
TerminalPriority	byte	TerminalPriority
TermType	byte	Terminal type data format (n 3)
TFL_Domestic	byte[]	The terminal minimum threshold
TFL_International	byte[]	The terminal minimum threshold
ThresholdValueDomestic	byte[]	The threshold offset that selected random
ThresholdValueInt	byte[]	The threshold offset that selected random
TransCateCode	byte	Transaction type code Europay only,tag: 9F53
TransProp	byte[]	Terminal transaction attribute tag: 9F66
TrnCurrencyCode	byte[]	Currency code tag: 5F2A
TrnCurrencyExp	byte	tag: 5F36

EMV public key class description (emvcapkEntity)

Class attribute description

Attribute name	type	description
CA_HashAlgoIndicator	byte	Certification authority public key hash algorithm indicator

CA_PKAlgoIndicator	byte	Certification authority public key algorithm indicator
CA_PKIndex	byte	Certification authority public key index
CAPKExpDate	byte[]	Certification authority public key period of validity
CAPKExponent	byte[]	Certification authority public key exponent
CAPKModulus	byte[]	Certification authority public key module
ChecksumHash	byte[]	Certification authority public key check sum
LengthOfCAPKExponent	int	Certification authority public key exponent length
LengthOfCAPKModulus	int	Certification authority public key module length
RID	byte[]	RID

4.3.3.24 Read emv AID parameter list

Function prototype	java.util.List<EmvAidParaEntity> getAidParams()	
Description	Read emv AID parameter list	
	Enter the reference	
	Out of reference	
Return value	entity- terminal parameter， detail in EmvTermCfgEntity class	
Supplementary explanation		

4.3.3.25 Read terminal parameter configuration

Function prototype	EmvTermCfgEntity getTermConfig ()
Description	Read terminal parameter configuration

	Enter the reference	entity- terminal parameter，detail in EmvTermCfgEntity class
	Out of reference	
Return value	EmvTermCfgEntity – success Null -- failed	
Supplementary explanation		

4.3.3.26 lear the public key

Function prototype	Void clearCapk();	
Description	Clear the public key	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.3.3.27 Clear terminal AID parameter

Function prototype	Void clearTermAid();	
Description	Clear terminal aid parameter	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.4 PED

4.4.1 Character

PINPAD equipment used to deal with transactions sensitive data encryption, such as tracks, MAC, Pin and other data, you need to provide encryption, generally more commonly used by the built-in and external two, external password keyboard need to have data display function Display some transaction information, such as balance information。

4.4.2 interface list

Interface	Function Description
void getPin(in Bundle param, GetPinListener listener)	Enter the PIN interface
boolean setPinKeyboardMode(int mode)	Set the password keyboard display mode
void stopGetPin();	Cancel input PIN
boolean loadTEK(int keyID , byte[] key, byte[] checkvalue);	Download terminal KEK master key, TEK is the key to encrypt the master key, plaintext download
boolean loadEncryptMainkey(int tekkeyID, int keyID ,byte[] key, byte[] checkvalue);	Download the TEK encrypted master key
boolean loadMainkey(int keyID , byte[] key, byte[] checkvalue);	Download master key, download in clear text
boolean loadWorkKey(int keyType, int masterKeyId,int wkeyid,byte[] keyvalue,byte[] checkvalue);	Download the work key
loadSMWorkKey();	Download the work key to national chip encrypted;
boolean loadTWK(int keyType, int tekkeyid,int wkeyid, byte[] keyvalue,byte[] checkvalue);	Download the work key encrypted by TEK
int getMac(in Bundle param,out byte[] mac);	Calculate MAC

int encryptByTdk(intkeyindex, byte mode, in byte[] random, in byte[] data, out byte[] encryptdata);	TDK encryption
byte[] getRandom();	Get a random number
deleteMKey()	Delete MKey
format()	Format the key area

4.3.3 Interfaces

4.4.3.1 Read PINBLOCK

Function prototype	void getPin(in Bundle param, GetPinListener listener)	
Description	Listen for PIN input	
Parameter Description	Enter the reference	Bundle param Get the PIN-related Parameter configuration
		GetPinListener listener PIN input callback notification interface
	Out of reference	
Return value	No	
Supplementary explanation	1.Bundleparam definition TAG value Description Required type wkeyid work key ID Required int keytype online PIN or offline PIN, the default online PIN. The values are as follows 0x00: Online PIN 0x01: Offline PIN Required int key_type: DUKPT 0x0d:DUKPT bundle.putInt("key_type", 13); random random number, pass NULL means that the use of work keys, non-NULL process key optional byte []	

	inputtimes Enter the number of times, the default 1 must int
	minlength password maximum length, the default 6 required int
	maxlength password maximum length, the default 6 required int
	pan card number, card number data processing applications (Cara convenience PIN calculation rules for the card number default 16 0, La Kala receipt PAN for the card number + 3 to 15) Required String
	tips external password keyboard screen display optional String
	GetPinListener type definition
	interface GetPinListener {
	void onInputKey (int len, String msg); // Key event void onError (int errorCode); //
	void onConfirmInput (byte [] pin); // NULL code returns NULL void onCancelKeyPress (); // Cancel
	void onStopGetPin (); // stop getting the PIN
	}

Function prototype	java.util.List<EmvAidParaEntity> getAidParams()	
Description	Initialize terminal parameter	
	Enter the reference	entity- terminal parameter，detail in EmvTermCfgEntity class

4.4.3.2 Stop enter pin

Function prototype	stopGetPin	
Description	Stop enter pin	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.4.3.3 Download the TEK

Function prototype	boolean loadTEK(int keyID , byte[] key, byte[] checkvalue)	
Description	Download the TEK	
	Enter the reference	Int keyID: key id Byte[] key: key value，plaintext Checkvalue : check code，if enter NULL ,not need check code
	Out of reference	
Return value	True-- OK ; false --failed	
Supplementary explanation		

4.4.3.4 Download the mainkey that encrypted by TEK

Function prototype	boolean loadEncryptMainkey(int tekkeyID, int keyID ,Byte[] key, byte[] checkvalue);	
Description	Download the mainkey that encrypted by TEK	
	Enter the reference	Int tekkeyID TEK key index Int keyID: key id Byte[] key: key value，plaintext Checkvalue : check code，if enter NULL ,not need check code
	Out of reference	
Return value	True-- OK ; false --failed	
Supplementary explanation		

4.4.3.5 Download the master key

Function prototype	boolean loadMainkey(int keyID ,Byte[] key, byte[] checkvalue);	
Description	Download the master key	
Parameter	Enter the	Int keyID Key index

Description	reference	Byte [] key The key value, in plain text
		Checkvalue, check value, pass NULL No need to check Byte [] key Key value, clear text。
	Out of reference	
Return value	boolean download success	
Supplementary explanation		

4.4.3.6 Download the work key

Function prototype	boolean loadWorkKey(int keyType, int masterKeyId,int wkeyid, byte[] keyvalue,byte[] checkvalue);	
Description	Download the work key	
Parameter Description	Enter the reference	int keyType The working key type is defined as follows public static final int WKEY_TYPE_PIK = 0x01; public static final int WKEY_TYPE_TDK = 0x02; public static final int WKEY_TYPE_MAK = 0x03;
		int masterKeyId The master key ID
		int wkeyid The work key ID
		byte [] keyvalue Key value, ciphertext data
		byte [] checkvalue 4 bytes check value
	Out of reference	
Return value	boolean download successful	
Supplementary explanation		

4.4.3.5 Download the master key

Function prototype	boolean loadMainkey(int keyID ,Byte[] key, byte[] checkvalue);	
Description	Download the master key	
Parameter	Enter the	Int keyID Key index

Description	reference	Byte [] key The key value, in plain text
		Checkvalue, check value, pass NULL No need to check Byte [] key Key value, clear text。
	Out of reference	
Return value	boolean download success	
Supplementary explanation		

4.4.3.6 Initially Loaded Key Serial Number

Function prototype	public boolean loadDuKPTkey(byte[] key, byte[] ksn)	
Description	ONLEY ONE INDEX, default 0	
	Enter the reference	byte [] Key value,
		byte [] ksn 10 bytes
	Out of reference	
Return value	boolean Initially successful	
Supplementary explanation		

4.4.3.7 Download the work key for national chip encrypt

Function prototype	boolean loadSMWorkKey (int keyType, int masterKeyId,int wkeyid, byte[] keyvalue,byte[] checkvalue);	
Description	Download the work key for national chip encrypt	
Parameter Description	Enter the reference	int keyType The working key type is defined as follows public static final int WKEY_TYPE_PIK = 0x01; public static final int WKEY_TYPE_TDK = 0x02; public static final int WKEY_TYPE_MAK = 0x03;
		int masterKeyId The master key ID

		int wkeyid The work key ID
		byte [] keyvalue Key value, ciphertext data
		byte [] checkvalue 4 bytes check value
	Out of reference	
Return value	boolean download successful	
Supplementary explanation		

4.4.3.8 Download the TWK encrypted by TEK

Function prototype	boolean loadTWK(int keyType,int tekkeyid, int wkeyid, byte[] keyvalue, byte[] checkvalue);	
Description	Download the work key for national chip encrypt	
Parameter Description	Enter the reference	int keyType The working key type is defined as follows public static final int WKEY_TYPE_PIK = 0x01; public static final int WKEY_TYPE_TDK = 0x02; public static final int WKEY_TYPE_MAK = 0x03;
		int tekkeyid TEK key ID
		int wkeyid The work key ID
		byte [] keyvalue Key value, ciphertext data
		byte [] checkvalue 4 bytes check value
	Out of reference	
Return value	boolean download successful	
Supplementary explanation		

4.4.3.9 MAC calculation

Function prototype	int getMac(in Bundle param,out byte[] mac);	
Description	MAC calculation	
Parameter	Enter the reference	Bundle param Calculates MAC-related Parameter configuration

Description	Out of reference	byte [] mac: mac value
Return value	Return 0 if successful, fail otherwise	
Supplementary explanation	1. Bundle param definition TAG value Description Required type wkeyid MAK index ID Required int data Data to be calculated for MAC Required byte [] type MAC Algorithm type, with the following values, default 0 public static byte TYPE_X919 = 0; public static byte TYPE_CUP_ECB = 1; Required int random Random Number Pass NULL Table Use 工 as key, no NULL Use procedure key Optional byte [] key_type: DUKPT 0x0c:DUKPT bundle.putInt("key_type", 12);	

4.4.3.10 encrypt the magcard data by TDK

Function prototype	int encryptByTdk(int keyindex, byte mode, in byte[] random, in byte[] data, out byte[] encryptdata)	
Description	Download the work key for national chip encrypt	
Parameter Description	Enter the reference	keyindex : key index
		byte mode: 0 ECB ; 1 CBC
		random: random data, enter random data, disperse the TDK and encrypt the magcard data, else enter null, use the TDK to encrypt 随机数，传入随机数说明使用该随机数分
		Byte[] data：the data to encrypt
	Out of reference	encryptdata：encrypted data
Return value	0 – ok, other value -- failed	
Supplementary explanation		

4.4.3.11 Get random data

Function prototype	byte[] getRandom()

Description	Get random data, 8 bytes	
	Enter the reference	
	Out of reference	
Return value	Return null, failed	
Supplementary explanation		

4.4.3.12 delete the selected Mkey

Function prototype	boolean deleteMKey(int mKeyIdx)	
Description	Delete the selected MKey	
	Enter the reference	mKeyIdx – the mkey index will be delete
	Out of reference	
Return value	True – ok, false -- failed	
Supplementary explanation		

4.4.3.13 Load key by com from mother pos

Function prototype	int loadKeyByCom()	
Description	Load key by com from mother pos	
	Enter the reference	
	Out of reference	
Return value	0 – ok; other value -- failed	
Supplementary explanation		

4.4.3.14 Format the key area

Function prototype	boolean format()

Description	Format the key area	
	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.5 Printer

4.5.1 Character

Thermal printer is used to provide some print ticket functions, such as text messages, two-dimensional code, bar code and so on

4.5.2 interface list

Function	Interface Description
int getPrinterState()	Get the printer status
void printText(in List<PrintItemObj> data,AidlPrinterListener listener);	Print the text
void printBarCode(int width,int height,intleftoffset,intbar codetype,in String barcode,AidlPrinterListener listener);	Print barcode
void printBmp(intleftoffset,int width,int height, in Bitmap picture,AidlPrinterListener listener);	Print bitmap
void setPrintGray(int gray)	Set the print grayscale

4.5.3 Interfaces

4.5.3.1 Get the printer status

Function prototype	int getPrintState()	
Description	Get the printer status	
Parameter Description	Enter the reference	No
	Out of reference	

Return value	Printer Status at com.topwise.cloudpos.data.PrinterState Definition:
	public static class PrinterState {
	/ ** Normal * /
	public static int PRINTER_STATE_NORMAL = 0x00;
	/ ** Out of paper * /
	public static int PRINTER_STATE_NOPAPER = 0x01;
	/ ** high temperature * /
	public static int PRINTER_STATE_HIGHTEMP = 0x02;
	/ ** unknown anomaly * /
	public static int PRINTER_STATE_UNKNOWN = 0x03;
	/ ** device not open * /
	public static int PRINTER_STATE_NOT_OPEN = 0x04;
	/ ** Device communication error * /
	public static int PRINTER_STATE_DEV_ERROR = 0x05;}	

4.5.3.2 Print the text

Function prototype	`void printText(in List<PrintItemObj> data,AidlPrinterListener listener);`	
Description	Print the text	
Parameter Description	Enter the reference	1 list: print list of text objects, each object represents a line of print information, object attributes control the text alignment, left margin, line spacing, character spacing, font size, bold, underline, print content 2 listener: print listener, see Supplementary explanation

	Out of reference	
Return value		

Supplementary explanation	1) interface AidlPrinterListener
	
	{
	public void onErro (int errorId); // print fialed
	publicvoidonFinish (); // print success and over
	}
	When an error occurs in printing, whether it is text, barcode or bitmap, it should not be printed
	Any content. The error code was printed at com.topwise.cloudpos.data.AidlErrorCode when printing
	.Printer class, as follows:
	public static class Printer {
	/ ** Out of paper * /
	public static int ERROR_PRINT_NOPAPER = 0x01;
	/ *** high temperature * /
	public static int ERROR_PRINT_HOT = 0x02;
	/*** unknown mistake */
	public static int ERROR_PRINT_UNKNOWN = 0x03;
	/ ** device not open * /
	public static int ERROR_DEV_NOT_OPEN = 0x04;
	/ ** Device busy * /
	public static int ERROR_DEV_IS_BUSY = 0x05;
	/ ** print bitmap width overflow * /
	public static int ERROR_PRINT_BITMAP_WIDTH_OVERFLOW = 0x06;
	/ ** print bitmap error * /
	public static int ERROR_PRINT_BITMAP_OTHER = 0x07;
	/ ** print barcode error * /
	public static int ERROR_PRINT_BARCODE_OTHER = 0x08;
	/ ** Parameter error * /
	public static int ERROR_PRINT_ILLIGALARGUMENT = 0x09;
	/ *** print text error * /
	public static int ERROR_PRINT_TEXT_OTHER = 0x0A;
	/ *** mac check error (when asked to print data anti-string change check) * /
	public static int ERROR_PRINT_DATA_MAC = 0x0B;

	} 2) For additional print object PrintItemObj, please refer to USDK provided by LaCala The com.topwise.cloudpos.aidl.printer.PrintItemObj object in the AIDL package. 3) font size, in the PrinterConstant.FontSize class provides four fonts Size: SMALL NORNAL LARGEXLARGE, specifications are as follows: SMALL: Chinese DOT16 * 16 SC1 * 1, ASCII characters DOT16 * 8 SC1 * 1 NORNAL: Chinese DOT24 * 24 SC1 * 1, ASCII DOT24 * 12 SC1 * 1 LARGE: Chinese characters DOT16 * 16 SC2 * 2, ASCII characters DOT16 * 8 SC2 * 2 XLARGE: Chinese characters DOT24 * 24 SC2 * 2, ASCII characters DOT24 * 12 SC2 * 2

4.5.3.3 Print bitmap

Function prototype	void printBmp(intleftoffset,int width,int height, in Bitmap bmp,AidlPrinterListener listener);	
Description	Printed bitmap	
Parameter Description	Enter the reference	1 leftoffset, left margin offset 2 width Print bitmap width 3 height Print bitmap height 4 bitmap Print bitmap object 5 printer monitor
	Out of reference	No
Return value		
Supplementary explanation		

4.5.3.4 Print barcode

Function prototype	void printBarCode(int width,int height,intleftoffset,intbarcodetype,in String barcode,AidlPrinterListener listener);	
Description	Print barcode	
Parameter Description	1 Enter the reference	2 width single bar width (usually 2 ~ 5) 3 height bar height 4 offset Left margin offset 5 barCodeType Barcode type 6 Barcode content 7 Print listener
	Out of reference	
Return value		
Supplementary explanation	Supported barcode types are: UPCA, UPCE, EAN8, EAN13, ITF, CODEBAR, CODE39, CODE93, CODE128, if the user does not know how to distinguish between barcode types, pass CODE128	

4.5.3.5 Set the print grayscale

Function prototype	void setPrinterGray(int gray)	
Description	Set the print grayscale	
Parameter Description	Enter the reference	1 gray The gray value of the printer is 0x01,0x02,0x03,0x04, the greater the value, the deeper the gray
	Out of reference	No
Return value	No	
Supplementary explanation		

4.6 IC card

4.6.1 Character

Support protocol: 7816 protocol card, EMV protocol card, PBOC protocol card

4.6.2 Interface list

Interfaces	Description
open	Open ic card
close	Close ic card
Reset	Reset ic card
isExist	Whether the card is exit or not
apduComm	Apdu comunication
halt	Power down

4.6.3 Interfaces

4.6.3.1 open ic card

Function prototype	boolean open();	
Description	Open ic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether open is successfull	
Supplementary explanation		

4.6.3.2 Close ic card

Function prototype	boolean close();	
Description	Close ic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether close is successfull	
Supplementary explanation		

4.6.3.3 Reset ic card

Function prototype	boolean reset();	
Description	Reset ic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether reset is successfull	
Supplementary explanation		

4.6.3.4 Whether the card is exit or not

Function prototype	boolean isExist ();	
Description	Whether the card is exit or not	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean Whether the card is exit or not	
Supplementary explanation		

4.6.3.5 Apdu comunication

Function prototype	boolean apduComm ();	
Description	Apdu comunication	
Parameter Description	Enter the reference	Apdu data
	Out of reference	
Return value	Return apdu data	
Supplementary explanation		

4.6.3.6 halt ic card

Function	boolean halt();

prototype		
Description	halt ic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether halt is successfull	
Supplementary explanation		

4.7 Magcard

4.7.1 Character

This module is used for get magnetic stripe data

4.7.2 Interface list

Interfaces	Description
open	Open magnetic card
close	Close magnetic card
searchEncryptCard	Get magnetic stripe ciphertext

4.7.3 Interfaces

4.7.3.1 open magnetic card

Function prototype	boolean open();	
Description	Open magnetic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether open is successfull	
Supplementary explanation		

4.7.3.2 Close magnetic card

Function prototype	boolean close();

Description	Close magnetic card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether close is successfull	
Supplementary explanation		

4.7.3.3 Get magnetic stripe ciphertext

Function prototype	void searchEncryptCard (int timeout, byte keyIndex,byte encryptFlag, in byte[] random,byte pinpadType, EncryptMagCardListener listener);	
Description	Get magnetic stripe ciphertext	
Parameter Description	Enter the reference	Timeout: swiping card timeout keyIndex: keyIndex encryptFlag 0x00:use the bctc magnetic rule to encrypt data 0x01:use format magnetic data to encrypt data Random: if it is not null, disperse before encrypt pinpadType: pinpad type，0x00—build-in，0x01—external listener: get magnetic ciphertext listener
	Out of reference	
Return value		

Supplementary explanation	EncryptMagCardListener description
	interface EncryptMagCardListener{
	/** timeout*/
	void onTimeout();
	/** device module error*/
	void onError(int errorCode);
	/** canceled*/
	void onCanceled();
	/** swipe card failed */
	void onSuccess(in String[] trackData);
	/** swipe card success，return ciphertext */
	void onGetTrackFail();
	}	

4.8 Contactless card

4.8.1 Character

This module is deal with TYPEA card, TYPEB card, mi card.

4.8.2 Interface list

Interfaces	Description
open	Open Contactless card
close	Close Contactless card
Reset	Reset Contactless card
isExist	Whether the card is exit or not
apduComm	Apdu comunication
halt	Power down
getCardCode	Get card code
getCardType	Get card type
int auth(int type, byte blockaddr,byte[] keydata, byte[] resetRes)	Certification
int readBlock(byte blockaddr,out byte[] blockdata);	Read data, success will return 0
byte[] readBlockX(byte blockaddr)	Return data，success will return the actual byte
int writeBlock(byte blockaddr, byte[] data);	Write data
int addValue(byte blockaddr, in byte[] data);	Add value
int reduceValue(byte blockaddr,in byte[] data)	Reduce value

4.8.3 Interfaces

4.8.3.1 open contactless card

Function prototype	boolean open();	
Description	Open contactless card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether open is successfull	

Supplementary explanation	

4.8.3.2 Close contactless card

Function prototype	boolean close();	
Description	Close contactless card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether close is successfull	
Supplementary explanation		

4.8.3.3 Reset contactless card

Function prototype	boolean reset();	
Description	Reset contactless card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether reset is successfull	
Supplementary explanation		

4.8.3.4 Whether the card is exit or not

Function prototype	boolean isExist ();	
Description	Whether the card is exit or not	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean Whether the card is exit or not	
Supplementary explanation		

4.8.3.5 Apdu comunication

Function prototype	boolean apduComm ();	
Description	Apdu comunication	
Parameter Description	Enter the reference	Apdu data
	Out of reference	
Return value	Return apdu data	
Supplementary explanation		

4.8.3.6 halt contactless card

Function prototype	boolean halt();	
Description	halt contactless card	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether halt is successfull	
Supplementary explanation		

4.8.3.7 Get card code

Function prototype	byte[] getCardCode()	
Description	Get card code(card uid)	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Success –return card code uid; failed –return null	
Supplementary explanation	This function must call before reset, close, if a card has many uid, should attach them together.	

4.8.3.8 Get card type

Function	Int getCardType()

prototype		
Description	Get card type	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Apdu data	
Supplementary explanation	Contactless card class define in com.topwise.cloudpos.data.RFCard.RFCardType： public static final int UNSUPPORTED = 0x00; public static final int TYPEA = 0x01; public static final int TYPEB = 0x02; public static final int MIFARE_ONE = 0x10; public static final int MIFARE_S50 = 0x20; public static final int MIFARE_ONE_S70 = 0x40; public static final int MIFARE_ULTRALIGHT = 0x50; public static final int MIFARE_ULTRALIGHT_C = 0x51; public static final int MIFARE_PLUS = 0x60; public static final int MIFARE_DESFIRE = 0x70; public static final int MIFARE_CPU = 0x80; public static final int MIFARE_PRO = 0x81; public static final int MIFARE_S50_PRO = 0x82; public static final int MIFARE_S70_PRO = 0x83;	

4.8.3.9 Certification

Function prototype	int auth(int type,byte blockaddr,byte[] keydata, byte[] resetRes)	
Description	Block authority， M1's data should be certificated before write and read	
Parameter Description	Enter the reference	int type : type， use KEYA or KEYB value define: 0x00:KEYA 0x01:KEYB byte blockaddr： the block address byte[] keydata:key value(plaintext) byte[] resetRes: result value
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.8.3.10 Read Block data

Function prototype	int readBlock(byte blockaddr,out byte[] data)	
Description	Read block data	
Parameter Description	Enter the reference	byte blockaddr: byte[] data:
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.8.3.11 Read spread block data

Function prototype	byte[] readBlockX(byte blockaddr)	
Description	Read spread block data	
Parameter Description	Enter the reference	byte blockaddr: byte[] data:
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.8.3.12 Write block data

Function prototype	int writeBlock(byte blockaddr,in byte[] data);	
Description	Read spread block data	
Parameter Description	Enter the reference	byte blockaddr: byte[] data:
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.8.3.13 Add value

Function prototype	int addValue(byte blockaddr,in byte[] data);	
Description	Add value	
Parameter Description	Enter the reference	byte blockaddr: byte[] data:
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation	On processing add value, read data, chose block data to deal, error means failed.	

4.9 Serial com

4.9.1 Character

To reach some specific demand, using the serial device, terminal can communicate with the standard serial device.

4.9.2 Interface list

interface	description
open	Open device
init	Init device
close	Close device
sendData	Send data
readData	Read data

4.9.3 Interfaces

4.9.3.1 Open device

Function prototype	boolean open();	
Description	Open device	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether open is successfull	

Supplementary explanation	

4.9.3.2 Close device

Function prototype	boolean close();	
Description	Close device	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether close is successfull	
Supplementary explanation		

4.9.3.3 Init device

Function prototype	boolean init(int botratebyte ， byte dataBits,byte parity,byte StopBits);	
Description	Init device	
Parameter Description	Enter the reference	Borderate:baud rate dataBits: data bits parity: stopBits: stop bits
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.9.3.4 Send data

Function prototype	boolean sendData(byte[] data,int timeout);dataBits,byte parity,byte	
Description	Send data	
Parameter Description	Enter the reference	data timeout
	Out of reference	
Return value	Success – 0; other value -- failed	

Supplementary explanation	

4.9.3.5 Receive data

Function prototype	byte[] readData(int timeout);	
Description	Receive data	
Parameter Description	Enter the reference	timeout
	Out of reference	
Return value	Success – 0; other value -- failed	
Supplementary explanation		

4.10 Led

4.10.1 Character

Use the device'led

4.10.2 Interface list

Interface	description
setLed	Set led

4.10.3 Interfaces

4.10.3.1 Set led

Function prototype	void setLed(int light,boolean isOn)	
Description	light LED bits(see LedLightConstrants class definition) isOn on or off (true: on false: off)	
Parameter Description	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation	LED constant description	

Class description	LED constant calss description	
Constant name	Constant value	description

	ALL	0(int)	All bits
	RED	1(int)	Red
	GREEN	2(int)	Green
	YELLOW	3(int)	Yellow
	BLUE	4(int)	blue

4.11 Beep

4.11.1 Character

Use the device's beep

4.11.2 Interface list

Interface	description
beep	Start beep
stopBeep	Stop beep

4.11.3 Interfaces

4.11.3.1 Beep

Function prototype	void beep(int mode， int ms)	
Description	Start beep	
Parameter Description	Enter the reference	Beep constant value: ms
	Out of reference	
Return value		

Supplementary explanation

Class description	LED constant calss description	
Constant name	Constant value	description
NORAML	0(int)	Beep once
SUCCESS	1(int)	Success beep
FAIL	2(int)	Failed beep
INTERVAL	3(int)	Intermittent beep
ERROR	4(int)	Error beep

4.12 PSAM Card

4.12.1 Character

Use the terminal PSAM card to store the encrypted data, the PSAM card support the protocol PSAM card.

4.12.2 Interface list

Interfaces	Description
open	Open device
close	Close device
Reset	Reset device
apduComm	Apdu comunication

4.12.3 Interfaces

4.12.3.1 open device

Function prototype	boolean open();	
Description	Open device	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether open is successfull	
Supplementary explanation		

4.12.3.2 Close device

Function prototype	boolean close();	
Description	Close device	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether close is successfull	
Supplementary explanation		

4.12.3.3 Reset contactless card

Function prototype	boolean reset();

Description	Reset device	
Parameter Description	Enter the reference	
	Out of reference	
Return value	boolean whether reset is successfull	
Supplementary explanation		

4.12.3.4 Apdu comunication

Function prototype	boolean apduComm ();	
Description	Apdu comunication	
Parameter Description	Enter the reference	Apdu data
	Out of reference	
Return value	Return apdu data	
Supplementary explanation		

4.13 System information

4.13.1 Character

This module is used for get system information, such as sn, PSAM card, installed app and so on.

4.13.2 Interface list

Interfaces	Description
getSerialNo	Get sn
installApp	Install APP
getKsn	Get KSN
getCurSdkVersion	Get version of the interface
getSecurityDriverVersion	Get the SP version
getHardwareVersion	Get hardware version
getAndroidOsVersion	Get android version
getRomVersion	Get ROM version(AP version)
getAndroidKernelVersion	Get Android kernel version
updateSysTime	Update system time，time format: yyyyMMddhhmmss

getStoragePath	Get storage path
getIMSI	Get IMSI
getManufacture	Get merchant name
getModel	Get nodule num.
getICCID	Get SIM's ICCID
setAPN	Set APN
reboot	Restart terminal
updateFirmware	Update SP
isSupportNativeVerification	Whether support the native application signed or not.
getNativeVerificationSPECVersion	Get version of the native appliaction's signed software in terminal
recovery	Recovery as setup first
canRecovery	To know whether can be recovery under the circumstances.
getHardwareSNPlaintext	Get terminal hardware serial num. plaintext.
getHardwareSNCiphertext	Get terminal hardware serial num. ciphertext.

4.13.3 Interfaces

4.13.3.1 Get Serial No.

Function prototype	String getSerialNo()	
Description	Get serial no.	
Parameter Description	Enter the reference	
	Out of reference	
Return value	If the terminal support 21th-file stated terminal hardware serial num. that will return the it, else return terminal serial num.（YPXXXXXXXXX）	
Supplementary explanation	Return terminal hardware serial num. only on the condition of it exist, or return terminal serial num.	

4.13.3.2 Install APK

Function prototype	installApp(String filePath,InstallAppObserver observer)

Description	Install apk	
Parameter Description	Enter the reference	1 APK storage path 2 install control listener
	Out of reference	
Return value		

Supplementary explanation	public interface InstallAppObserver {
	void onFinished(); //install finished
	void onErro(int errorid); //install error
	}	

4.13.3.3 Get KSN

Function prototype	String getKSN()	
Description	Get ksn	
Parameter Description	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.13.3.4 Get driver version

Function prototype	String getDriverVersion()	
Description	Get driver version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return driver version	
Supplementary explanation		

4.13.3.5 Get SDK version

Function prototype	String getCurSDKVersion()
Description	Get SDK version

Parameter Description	Enter the reference	
	Out of reference	
Return value	Return SDK version	
Supplementary explanation		

4.13.3.6 Update system time

Function prototype	boolean updateSysTime(String dateStr)	
Description	Update system time	
Parameter Description	Enter the reference	dateStr:time string， format: yyyyMMddhhmmss
	Out of reference	
Return value	Whether update is successful or not	
Supplementary explanation		

4.13.3.7 Get storage path

Function prototype	String getStoragePath()	
Description	Get storage path，this special path was set by terminal producer to store the SP pack，if success, the producer should delete the pack immediately.	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return the path	
Supplementary explanation		

4.13.3.8 Get IMSI

Function prototype	String getIMSI()	
Description	Get IMSI	
Parameter	Enter the	

Description	reference	
	Out of reference	
Return value	Return IMSI	
Supplementary explanation		

4.13.3.9 Get module num.

Function prototype	String getModel()	
Description	Get IMSI	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return the module num. that be certificated by BCTC.	
Supplementary explanation		

4.13.3.10 Get IMEI

Function prototype	String getIMEI()	
Description	Get IMEI	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return IMEI	
Supplementary explanation		

4.13.3.11 Get hardware version

Function prototype	String getHardWireVersion()	
Description	Get hardware version	
Parameter Description	Enter the reference	
	Out of reference	

Return value	Return hardware version known by BCTC.
Supplementary explanation	

4.13.3.12 Get SP version

Function prototype	String getSecurityDriverVersion ()	
Description	Get SP version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return SP version	
Supplementary explanation		

4.13.3.13 Get manufacture name

Function prototype	String getManufacture()	
Description	Get manufacture name	
Parameter Description	Enter the reference	
	Out of reference	
Return value	topwise	
Supplementary explanation		

4.13.3.14 Get android system information

Function prototype	String getAndroidOsVersion()	
Description	Get android system information version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return android system version	

Supplementary explanation	

4.13.3.15 Get android ROM information

Function prototype	String getRomVersion()	
Description	Get android ROM information version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return android ROM version	
Supplementary explanation		

4.13.3.16 Get android kernel information

Function prototype	String getAndroidKernelVersion()	
Description	Get android kernel information version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return android kernel version	
Supplementary explanation		

4.13.3.17 Restart terminal

Function prototype	void reboot()	
Description	Restart POS terminal	
Parameter Description	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		

4.13.3.18 Get SIM ICCID

Function prototype	String getICCID()	
Description	Get SIM's CCID	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return CCID if success, null if failed.	
Supplementary explanation		

4.13.3.19 Get USDK version

Function prototype	String getOSSpecsVersion()	
Description	Get USDK version	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Return USDK string if success, null if failed.	
Supplementary explanation		

4.13.3.20 Set APN

Function prototype	boolean setAPN(String name, String apn, String userName, String password)	
Description	Set APN	
Parameter Description	Enter the reference	name: APN name， user can define casually apn : username password username and password only be transferred on condition of operator need, if no need, transfer null.
	Out of reference	
Return value	True--success, false-- failed.	
Supplementary explanation	APN's other parameter use default value, APN can work immediately after setAPN successfully,	

4.13.3.21 Whether support the native application signed or not.

Function prototype	boolean isSupportNativeVerification()password)	
Description	Before Install app, should confirm that whether use the TOPWISE's certificate to sign the app or not	
Parameter Description	Enter the reference	I.
	Out of reference	
Return value	True--success, false-- failed.	
Supplementary explanation		

4.13.3.22 Get version of the native application's signed software in terminal

Function prototype	String getNativeVerificationSPECVersion()	
Description	Get version of the native application's signed software in terminal	
Parameter Description	Enter the reference	
	Out of reference	
Return value	True--success, false-- failed.	
Supplementary explanation		

4.13.3.23 Recovery

Function prototype	void recovery()	
Description	Recovery as setup first	
Parameter Description	Enter the reference	
	Out of reference	
Return value	True--success, false-- failed.	

Supplementary explanation	APN's other parameter use default value, APN can work immediately after setAPN successfully,

4.13.3.24 whether can be recovery under the circumstances.

Function prototype	boolean canRecovery()	
Description	To know whether can be recovery under the circumstances.	
Parameter Description	Enter the reference	
	Out of reference	
Return value	True--success, false-- failed.	
Supplementary explanation	Don't support If the battery's volume below 15%.	

4.13.3.25 Get terminal hardware serial num. plaintext.

Function prototype	String getHardwareSNPlaintext	
Description	Get terminal hardware serial num. plaintext.	
Parameter Description	Enter the reference	
	Out of reference	
Return value	Conform to BCTC<sale POS terminal application specification terminal unique identify technical precept> ,the terminal return hardware serial num. ciphertext. Or return NULL; if the factor is null, return null; if failed ,return null.	
Supplementary explanation		

4.13.3.26 Get terminal hardware serial num. ciphertext.

Function prototype	byte[] getHardwareSNCiphertext(in byte[] factor)	
Description	Get terminal hardware serial num. ciphertext.	
Parameter Description	Enter the reference	factor: encryption factor, for card deal, it is the last 6bits of the pan, the pan include card deal and quick pass, the quick pass 's card num. is token num. for scan deal, encryption factor is ：

		1、bar code deal is the last 6 bits of C2B； 2、QR CODE deal refer to《BCTC QR code pay application specification》， get tag FF60 C2B
	Out of reference	
Return value	Conform to BCTC<sale POS terminal application specification terminal unique identify technical precept> ,the terminal return hardware serial num. ciphertext. Or return NULL; if the factor is null, return null; if failed ,return null.	
Supplementary explanation		

4.14 Scan code

4.14.1 Character

Use the camer to scan the QR codes to get its content.

4.14.2 Interface list

Interfaces	Description
startScan	Start scan
stopScan	Stop scan

4.14.3 Interfaces

4.14.3.1 Start scan

Function prototype	Void startScan(Bundle params, ScannerCallBack callback)	
Description	Start scan	
Parameter Description	Enter the reference	CAMERA_ID camerid int :camer type。 TIMEOUT timeount scan timeout: s
	Out of reference	
Return value		

Supplementary explanation	ScannerCallBack definition
	Public interface ScannerCallback{
	void onResult(String result);//scan result
	Void onCancel();cancel scan
	Void onError(int code);//scan failed， error code
	Void onTimeount()//scan timeout	

4.12.3.2 Stop scan

Function prototype	Void stopScan()	
Description	Stop scan	
Parameter Description	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation	constant value description ERROR_ALREADY_INIT 109001 initialized ERROR_INIT_SCANNER_ENGINE 109002 initialize module failed ERROR_INIT_DECODER 109003 initialize Decoding Library failed ERROR_DECODE_FAILED 109004 decode failed ERROR_AUTH_LICENSE 109005 License license certificate failed ERROR_OPEN_CAMERA 109006 open camer failed	

4.15 Decode

4.15.1 Character

Given specific QR code image byte data, return the decoded data.

4.15.2 Interface list

Interfaces	Description
Int init()	Initialize
String decode(byte[] imageData, int imageWidth, int imageHeight)	Decode
Void exit	Exit from decode

4.15.3 Interfaces

4.15.3.1 Initialize

Function prototype	Int init()	
Description	initialize	
Parameter Description	Enter the reference	
	Out of	

	reference	
Return value	0 –success; other value--failed	
Supplementary explanation		

4.15.3.2 Decode

Function prototype	String decode(byte[] imageData, int imageWidth, int imageHeight)	
Description	decode	
Parameter Description	Enter the reference	QR codes data: （less than 1MB） Length : px Width: px
	Out of reference	
Return value		
Supplementary explanation		

4.15.3.3 Exit

Function prototype	Void exit()	
Description	Exit from decode	
Parameter Description	Enter the reference	
	Out of reference	
Return value		
Supplementary explanation		