**Dspread Technology Co., Ltd**

# QPOS SDK
# Integration Guide

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# Table

# 1   Introduction

## 1.1   Summary

QPOS is a mobile payment card reader device with pinpad that works with mobile devices such as smart phone. It provides merchants and consumers a safe and convenient way to make mobile payments. QPOS can communicate with the mobile device through many methods, such as: audio

jack, Bluetooth and USB cable.

QPOS Reader is another mobile payment card reader device without pinpad. QPOS Reader can communicate with the mobile device through audio jack or USB cable.

SPOS is a yet another mobile payment card reader device with pinpad and touch screen, SPOS can communicate with the mobile device through many methods, such as: audio jack, Bluetooth and USB cable. The touch screen can be used to capture the signature of consumer in an electronic way.
QPOS share a lot in common, the SDK API is almost same for QPOS. In the following chapters.

Features:

- Ensure secure transactions: integrated keyboard and multiple encryption algorithms to ensure secure transactions.
- Accept all types of bank card: supports magnetic stripe card, contact EMV IC card and contactless EMV IC card.
- Adapts to more smart devices through audio jack: Supports over 2,000 smart devices through audio jack.
- Fulfill global standards: EMV L1&L2, PCI PTS and more.
- Supports all types of mobile systems: Such as iOS, Android, Windows phone and PC OS.

This document is to help readers to integrate QPOS SDK into their mobile payment APPs.

## 1.2  Connection map For QPOS

## 1.3  Connection map For QPOS Reader
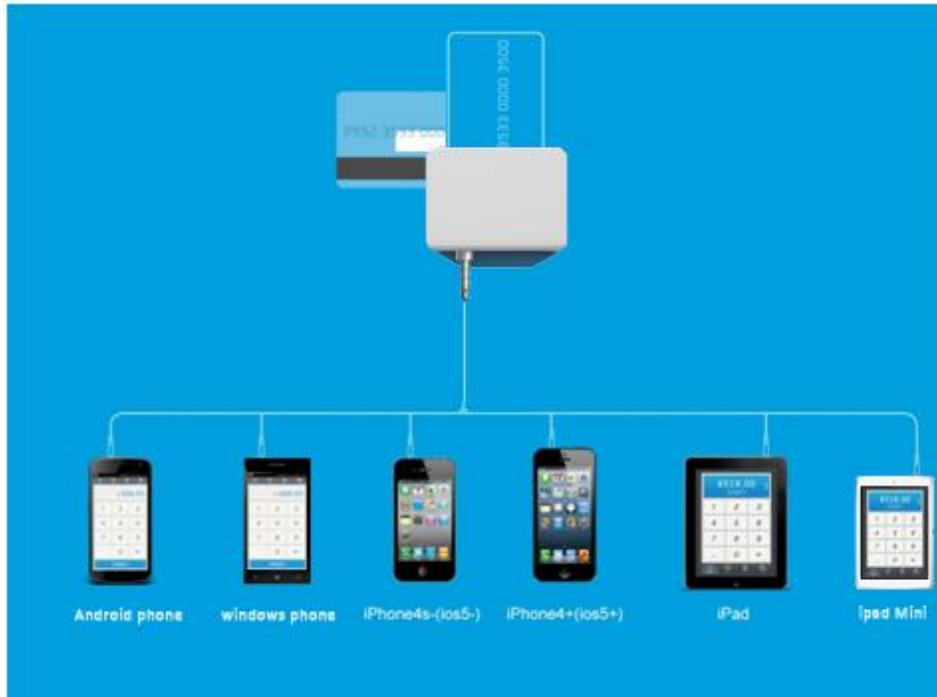


## 1.4  Purpose and Scope

This document is to describe the APIs of QPOS iOS SDK . The goal of SDK is to communicate between the smart device and QPOS.

The readers of the document are those who plans to use QPOS SDK in their application.

## 1.5  Glossary and Definitions

| DUKPT | DERIVED UNIQUE KEY PER TRANSACTION. |
|---|---|
| PK_Q | QPOS Public Key |
| SK_Q | QPOS Private Key |
| PK_P | Payment Operator Public Key |
| SK_P | Payment Operator Private Key |
| PK_T | Terminal Manufacturer Public Key |
| SK_T | Terminal Manufacturer Private Key |
| KSN | Key Serial Number |
| BDK | Base Derivation Key |
| IPEK | Initial PIN Encryption Key |
| DATA-key | The data key to be generated by KSN and IPEK or by KSN and BDK |
| PIN-key | The PIN key to be generated by KSN and IPEK or by KSN and BDK |

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## 1.6 Transaction Key

Unless otherwise specified, Triple DES encryption with EBC and DUKPT key management are assumed. DUKPT is specified in ANSI X9.24 part 1.
Refer to
http://en.wikipedia.org/wiki/DUKPT#Key_Register_.2832_hexadecimal_digits.29

In the Demo, the default transaction keys refer to the following table.

| Key Name | Default | Length(Bytes) |
|---|---|---|
| KSN | 00000332100300e00001 | 20 |
| BDK | 0123456789ABCDEFFEDCBA9876543210 | 32 |

## 1.7 EMVCo Terminal Type Approval

EMVCo has approved QPOS application EMVCo type for Terminal level 2. QPOS application is based on the requirements stated in the EMV 4.3 specification.

## 1.8 Message Format

Messages within data communication protocols between the mobile payment application and QPOS EMV kernel are encoded as a BER-TLV (Basic Encoding Rules-Tag-Length-Value) which is defined in EMV 4.3 book3 Annex B.

## 1.9 EMV Standard Tags

EMV Standard Tags are defined in EMV 4.3 book3 Annex A.

## 1.10 Proprietary Tags Description

| Tag | Description | Length(Bytes) | Key | Algorithm |
|---|---|---|---|---|
| 0xC0 | KSN of online message | 10 | No | No |
| 0xC3 | KSN of Batch | 10 | No | No |
| 0xC4 | Masked PAN | 0-10 | No | No |
| 0xC5 | Batch message[1] | Var | DATA-key | Triple-Des |
| 0xC2 | Online message[3] | Var | DATA-key | Triple-Des |
| 0x70 | Online EMV data message[2] | Var | No | No |

Note:

1. The **Batch message** is the Triple-Des encrypted result with Data-key. For using, first Triple-Des decrypted the **batch message** with **DATA-key**, the decrypted result is encoded as a

BER-TLV which is defined in EMV 4.3 book3 Annex B.

2. The **Online EMV data message** is encoded as a BER-TLV which is defined in EMV 4.3 book3 Annex B.

3. The **Online message** is the Triple-Des encrypted result with Data-key. For using, first Triple-Des decrypted the **Online message** with **DATA-key,** the decrypted result is encoded as a BER-TLV which is defined in EMV 4.3 book3 Annex B and Proprietary Tags.

## 1.11  Bluetooth Mode

### 1.11.1 How to get QPOS/SPOS Bluetooth ID

QPOS Bluetooth ID is combined by  'QPOS' strings and the last-10 numbers of the label.
For example:
QPOS_ID := 1207000200**0200100151**
QPOS_BT_ID := **QPOS0200100151**



(The label is sticked on QPOS back cover)

SPOS Bluetooth ID is similar to QPOS' but starting with SPOS.

### 1.11.2  How to connect QPOS/SPOS through Bluetooth

| CONNECT METHOD | Automatic |
|---|---|
| PASSWORD | NA |

## 1.12 Management Keys For QPOS

Pk_Q, Sk_Q, Pk_T, Pk_
P,
KSN, IPEK

QPOS

Pk_T, Sk_T,
Pk_Q list

Terminal Manufacturer

Pk_P, Sk_P,
Pk_Q list,
KSN, BDK

Payment Operator
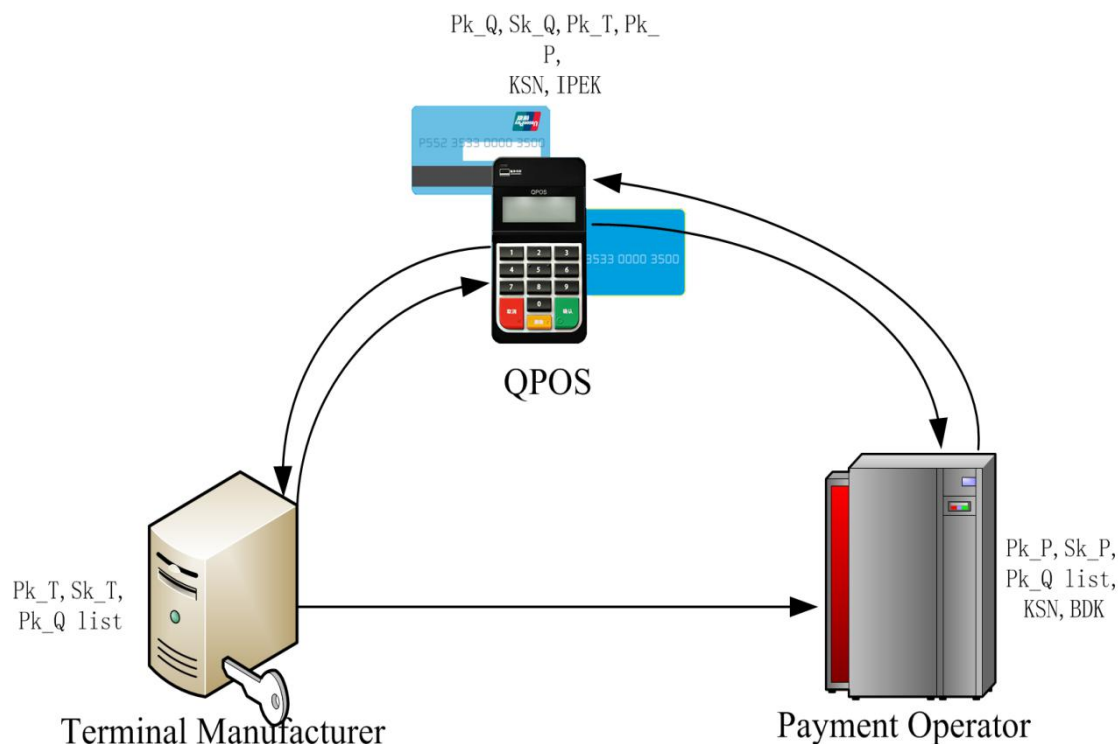
## 1.13 Firmware Upgrade For QPOS

Firmware binary
plaintext, Sign(Sk_T)[binary],
Sign(Sk_P)[binary || Sign(Sk_T)[binary]],
Pk_Q, Sk_Q, Pk_P, Pk_T

QPOS

online

offline

Firmware binary,
Pk_T, Sk_T,
PK_Q list

Terminal Manufacturer

online

Firmware binary
plaintext,
Sign(Sk_T)[binary],
Pk_P, Sk_P
PK_Q list

Payment Operator
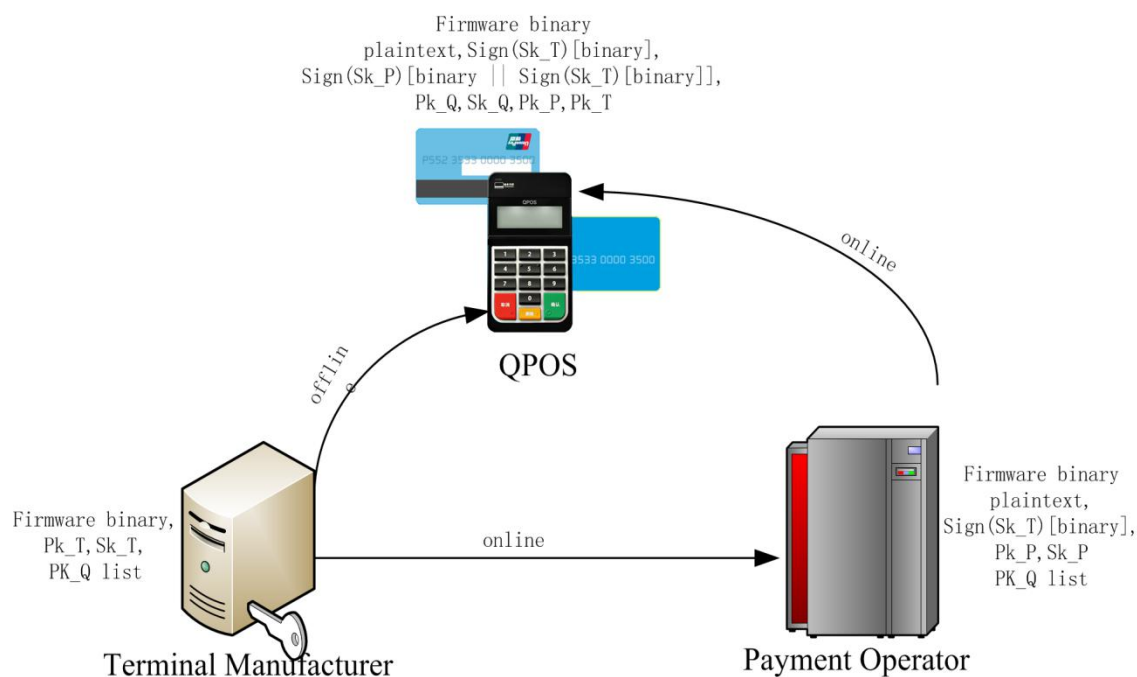
# 2   iOS SDK API

## 2.1  System Requirement

Target    System (Audiojack):
          iOS 3.2 or   above   (iOS 4   or   above   is   recommended)
          iPhone   3GS or   above   (iPhone 4   or   above   is   recommended)
          iPod Touch     3
          Generation    or    above
          iPad 1     or    above

Target    System (Bluetooth):
          iPhone 4S / new Pad or above

## 2.2  SDK Framework

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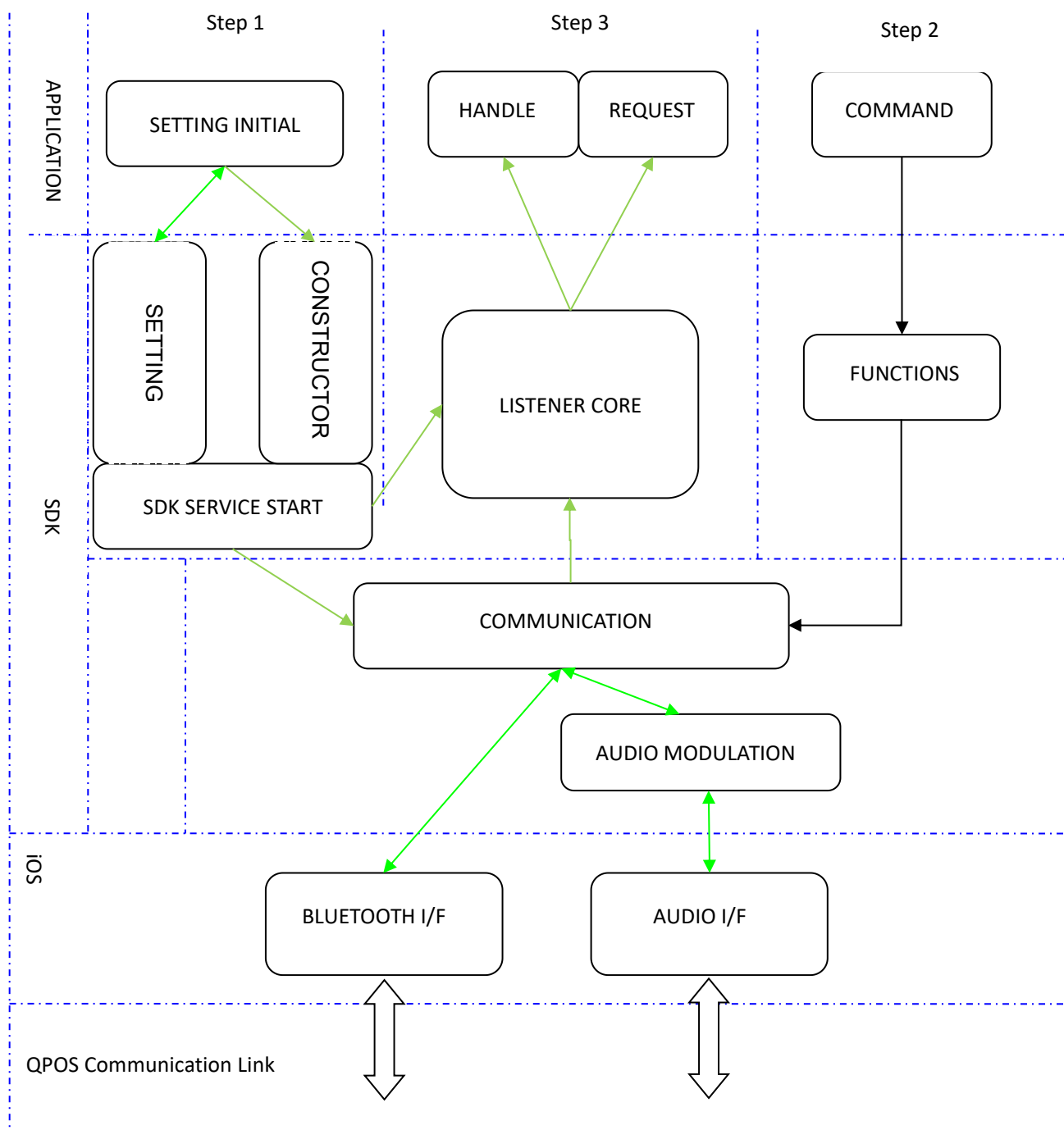
## 2.3 XCode Project Settings

The library needs several frameworks to be included into the XCode project for a successful compilation:

AudioToolbox.framework

CoreBluetooth.framework

AVFoundation.framework

## 2.4 SDK Methods

### 2.4.1 Common methods

With iOS SDK, developer has two ways to communicate with QPOS, audiojack or Bluetooth.

Initiation with audio mode:

QPOSService *pos = [QPOSService sharedInstance];
[pos setDelegate:self];
[pos setPosType:PosType_AUDIO];
[pos setQueue:nil];

Initiation with bluetooth Mode:

QPOSService *pos = [QPOSService sharedInstance];
[pos setDelegate:self];
[pos setPosType: PosType_BLUETOOTH];
[pos setQueue:nil];

| Method Name | Description |
|---|---|
| sharedInstance | Get an QPOSService instance |
| getSdkVersion | Get this SDK version |
| resetQPOS | Reset and bring the QPOS back to a known initial state. |
| resetPosStatus | Reset and bring the QPOS back to a known initial state. Synchronized methods |
| startAudio | Start the audio instance for playing, recording and modulating |
| stopAudio | Stop the audio instance for playing, recording and |

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| | modulating |
| connectBT | Connect to QPOS by Bluetooth, using for exchanging data between APP and QPOS |
| disconnectBT | Disconnect from QPOS with bluetooth |

## 2.4.2  Transaction related methods

| Method Name | Description | | Handle Name |
|---|---|---|---|
| getQposId | Get the serial number about Qpos | → | onQposIdResult |
| getQposInfo | Get the config information from Qpos | → | onQposInfoResult |
| setAmount | Set the amount and transaction type required for EMV transaction. | ← | onRequestSetAmount |
| cancelSetAmount | Cancel the process about setting amount | ← | onRequestSetAmount |
| doTrade | Send the command as swiping/inserting card to QPOS. | → | onDoTradeResult |
| doEmvApp | Send the command as executing the EMV transaction flow to QPOS | | no |
| selectEmvApp | Select one application of the application list returned from EMV kernel, then set the application ID to EMV kernel | ← | onRequestSelectEmvApp |

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| | | | |
|---|---|---|---|
| cancelSelectEmvApp | Cancel the process about setting one application | ← | onRequestSelectEmvApp |
| finalConfirm | Send transaction confirmation command to Qpos | ← | onRequestFinalConfirm |
| sendOnlineProcessResult | Send the connectivity status about network to Qpos | | |
| isServerConnected | Send the connectivity status about network to Qpos | | |
| sendTime | Set the date and time formatted as 'YYMMDDHHMMSS' to Qpos,based the smart terminal date and time | ← | onRequestTime |
| sendPin | Set the pin to QPOS Reader | ← | onRequestSetPin |
| emptyPin | Set the empty pin to QPOS Reader | ← | onRequestSetPin |
| cancelPin | Set cancel to QPOS Reader | ← | onRequestSetPin |
| powerOnIcc | Turn on the EMV card. | ← | onReturnPowerOnIccResult |
| powerOffIcc | Turn off the EMV card. | ← | onReturnPowerOffIccResult |
| sendApdu | Send data to EMV card in raw APDU formats. This is the EMV Level 1 protocol and developers can develop their only EMV Level 2 application | ← | onReturnApduResult |
| setPosSleepTime | Set the pos sleep time | ← | onReturnSetSleepTimeResult |
| udpateWorkKey | update the pos work key | ← | onRequestUpdateWorkKeyResult |

## 2.4.3  Delegate Methods

The controller has a public member delegate that must be set with an object that Implements the protocol **QPOSServiceListener**.    This delegate handles different asynchronous events that occur during the operation of the QPOS.

The developermustdesign a class that implements the interface and assign it to the **delegate** member.

**QPOSServiceListener Protocol Methods**

| Handle Name | Description | | | Method Name |
|---|---|---|---|---|
| onRequestWaitingUser | Qpos is ready and waiting for swiping or inserting a EMV card | o | | no |
| onQposIdResult | Return the serial number about Qpos | o | ← | getQposId |
| onQposInfoResult | Return the config information about Qpos | o | ← | getQposInfo |
| onDoTradeResult | Return the action about swiping, inserting the ICC, canceling etc. | m | ← | doTrade |
| onRequestSetAmount | Prompt to inputting the transaction amount to the application | m | → | setAmount |
| onRequestSelectEmvApp | Supply application list supported by EMV ICC to the application for selecting. | m | → | selectEmvApp |

| onRequestIsServerConnected | | | ➡ | isServerConnected |
|---|---|---|---|---|
| | | m | | |
| onRequestFinalConfirm | Finally confirm before generating the AC by the ICC COS | m | ➡ | finalConfirm |
| onRequestOnlineProcess | EMV kernel request the online handler | m | ➡ | sendOnlineProcessResult |
| onRequestTime | Request setting the date and time from Qpos | o | ➡ | sendTime |
| onRequestTransactionResult | After finishing this transaction, EMV kernel report this transaction result to the application | m | | |
| onRequestTransactionLog | After finishing this transaction, EMV kernel report this transaction log to the application | o | | |
| onRequestBatchData | EMV kernel send the batch data to the application | m | | |
| onRequestPosConnected | SDK report to the application about the connected event between smart terminal and Qpos | m | | |
| onRequestPosDisconnected | SDK report to the application about the disconnected event between smart terminal and Qpos | m | | |
| onRequestNoPosDetected | SDK report to the application about the no connected event between | m | | |

| | smart terminal and Qpos | | | |
|---|---|---|---|---|
| onError | SDK report the error ID to the application during transaction | m | | |
| onRequestDisplay | SDK request display to the application | o | | |
| onRequestSetPin | SDK request the application to set PIN for the EMV card. Note, this is only available for QPOS Reader since QPOS Reader doesn't has PINPAD. | o | ➡ | sendPin<br>emptyPin<br>cancelPin |
| onReturnPowerOnIccResult | Turn on the EMV card result | o | ➡ | powerOnIcc |
| onReturnPowerOffIccResult | Turn off the EMV card result | o | ➡ | powerOffIcc |
| onReturnApduResult | | o | ➡ | sendApdu |
| onReturnSetSleepTimeResult | Set the pos sleep time | o | ➡ | setPosSleepTime |
| onRequestUpdateWorkKeyResult | update the pos work key | o | ➡ | udpateWorkKey |

# 2.5  Transaction Flow

From the return of '**onDoTradeResult'**, the APP can find out whether consumer use an EMV ICC card or a magnetic card.

-(void) onDoTradeResult: (DoTradeResult)result DecodeData:(NSDictionary*)decodeData
typedef NS_ENUM(NSInteger, DoTradeResult)
{
        DoTradeResult_NONE,
        DoTradeResult_MCR,
        DoTradeResult_ICC,
        DoTradeResult_BAD_SWIPE,
        DoTradeResult_NO_RESPONSE,
        DoTradeResult_NOT_ICC
};
When the delegate method "**onDoTradeResult"** is triggered to return the "Enum DoTradeResult" result, if this result is **DoTradeResult_ICC**, the APP will trigger the EMV ICC transaction flow, or this result is **DoTradeResult_MCR**, the APP will trigger the magnetic transaction flow.

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## 2.5.1 EMV ICC Transaction Flow For QPOS
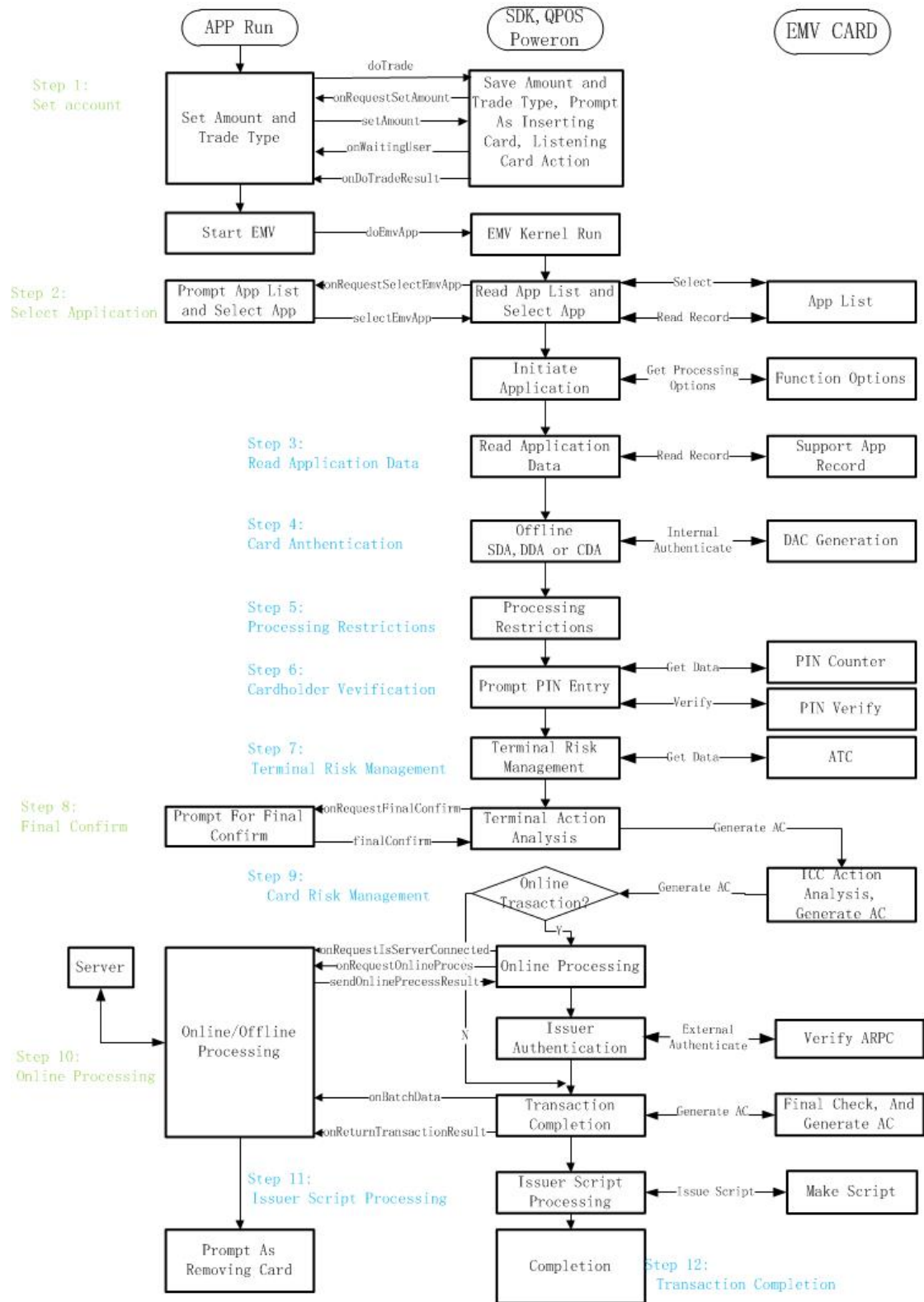
## 2.5.2  EMV ICC Transaction Flow for QPOS Reader
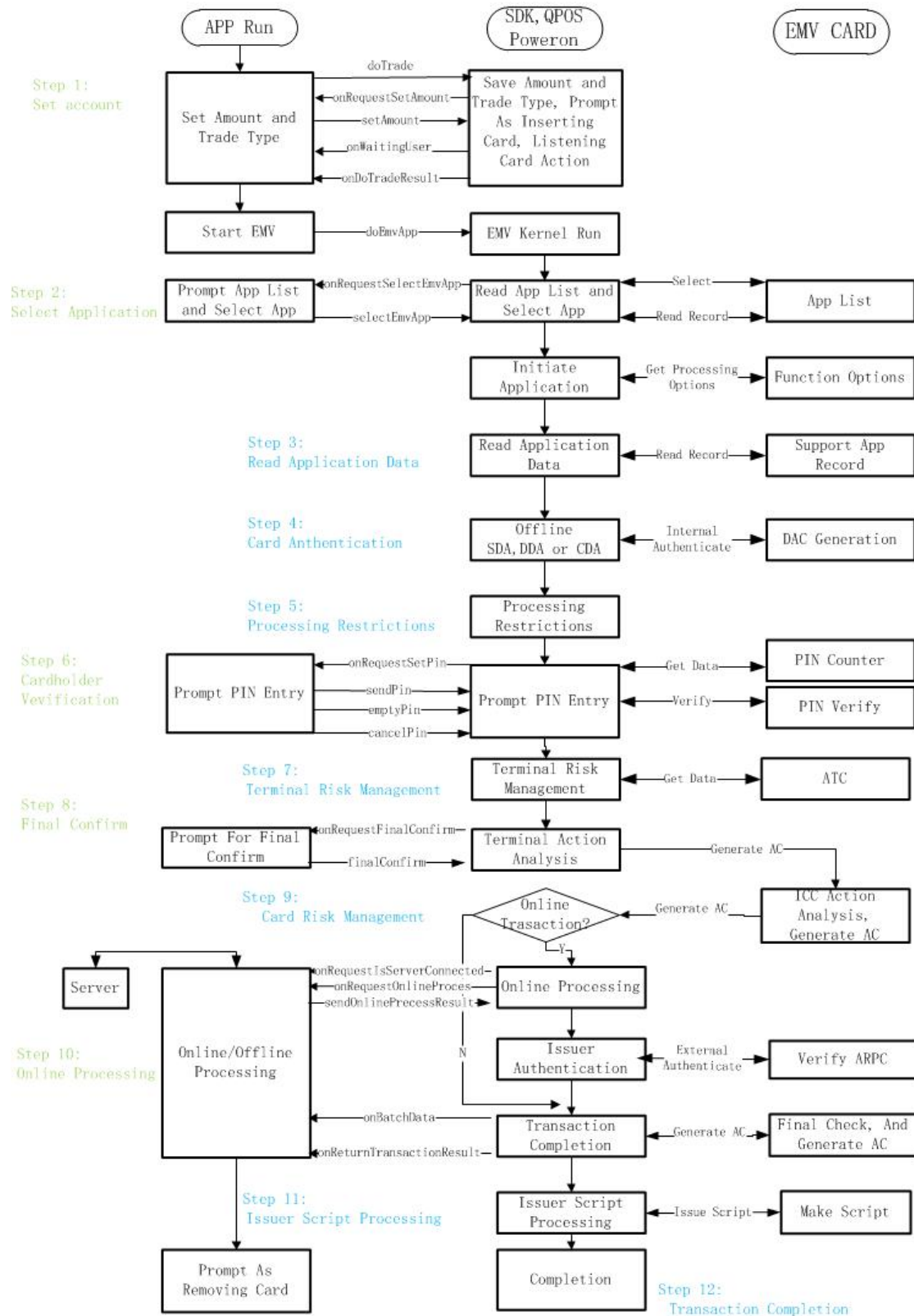
## 2.5.3  EMV ICC Transaction Description

**Step 1:** A transaction amount is needed for a payment transaction and it to be entered by the operator (or calculated by the inventory system) regardless of whether magnetic stripe card or EMV card. The **onRequestSetAmount** delegate method is triggered.

Public void **onRequestSetAmount** ();

The APP should prompt the operator to enter the amount and then call the **setAmount** to send the data back to EMV kernel.

Public void **setAmount**(String amount,String cashbackAmount,String currency,TransactionType transactionType);//2 decimal places.e.g.234.87
The **transactionType** can be any of the following:

    GOODS,
    SERVICES,
    CASHBACK,
    INQUIRY,
    TRANSFER,
    PAYMENT

The amount has an upper limit of 1000000000.00.
The user can also select to abort the transaction.

Public void **cancelSetAmount**();

**Step 2: Select Application**
An EMV card may support multiple payment applications. The EMV kernel reads the list of applications supported by the EMV card and asks the customer/operator to select the desired application.
The delegate method **onRequestSelectApplication** is triggered to return an array of application Ids.

Public void **onRequestSelectEmvApp** (ArrayList<String>applist);

The APP should prompt the user to select one application and then call the **selectEmvApp** method.

Public void **selectEmvApp** (int index)

The user can also select to abort the transaction.

Public void **cancelSelectEmvApp** ()

In most cases, there is only one default application and this step is skipped.

**Step 3: Read Application Data**
In this step, EMV kernel reads the necessary data from the EMV card. The EMV kernel asks for the terminal time through the **onRequestTime** method.
This step is only done between the EMV kernel and EMV card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops.

Public void **onRequestTime** ();

The terminal time in YYMMDDHHmmss formats should be sent in response:

Public void **sendTime**(String terminalTime);

**Step 4: Card Authentication**
This step is only done between the EMV kernel and EMV ICC card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops.

**Step 5: Processing Restrictions**
This step is only done between the EMV kernel and EMV ICC card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops.

**Step 6: Cardholder Verification**
There are the different cardholder verification methods (CVMs) supported in an EMV transaction and some require the customer to enter a PIN (personal identifier number). If the EMV transaction requires PIN verification, the customer must enter his PIN by the keypad of QPOS. Where PIN is 4-12 digits. The PIN can be input via PINPAD for QPOS and SPOS, or can be input via mobile application for QPOS Reader.

Some applications (e.g. for small amount payment) does not require CVM (Cardholder Verification Method) and this step is skipped. But it is also possible that the EMV card decline a transaction without PIN. The customer/operator can press the **cancel** key on the keypad of QPOS to cancel the PIN entry and abort.

**Step 7: Terminal Risk Management**
This step is only done between the EMV kernel and EMV ICC card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops.

**Step 8: Terminal Action Analysis**
This step is only done between the EMV kernel and EMV ICC card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops. At the end of this step, a final confirmation will be needed to proceed via **onRequestFinalConfirm**.

Public void **onRequestFinalConfirm**();

The APP should prompt the user for a confirmation to proceed. This gives the user a chance to review the amount, the payment method, etc.

A final confirmation is sent to EMV kernel by calling this :

public void **finalConfirm**(boolean isConfirmed);

**Step 9: Card Risk Management**

This step is only done between the EMV kernel and EMV ICC card. If this step fails, **onRequestTransactionResult** will be returned and the EMV process stops.

**Step 10: Online Processing**

An EMV transaction can either be online or offline. If online processing is required, then the **onRequestOnlineProcess** delegate method is triggered.

public void **onRequestOnlineProcess**(string tlv);

The parameter TLV contains the tag-length-value data structure returned by the EMV kernel. After that, the client APP should send the data to the payment operator. When the processing results are returned from the payment operator, it should send the results back to EMV kernel by **sendOnlineProcessResult.**

public void **sendOnlineProcessResult**(String tlv);

The data elements that are required are payment operator and issuer dependent.    See **chapter 1.9** and the **EVM Book 3 Annex A** for the full list of tags and the TLV structure.

The following tags are usually required but are ICC dependent:

| Tags | Parameter |
|------|-----------|
| 0089 | Authorisation Code |
| 008A | Authorisation Response Code |
| 0091 | Issuer Authentication Data |
| 0071 | Issuer Script Template 1 (needed for Step 11) |
| 0072 | Issuer Script Template 2 (needed for Step 11) |

This step is skipped in offline processing.

**Step 11: Issuer Scripts Processing**

This step is handled transparently between the EMV kernel and EMV ICC card if issue scripts are present in the online processing results or skipped otherwise. This step is skipped in offline processing.

**Step 12: Completion**

In this step, EMV kernel sends back the final transaction result from the EMV card by the

**onRequestBatchData** method.

public void **onRequestBatchData** (String tlv);

The data elements that are required are payment operator and issuer dependent.    See the **EVM Book 3 Annex A** for the full list of tags and the TLV structure.

In this step, the client APP should store the results, display the results, print receipts, and prompt the user to remove the card from the QPOS device. Later, the batch data should be updated to the server for settlement.

## 2.5.4  Magnetic Transaction Flow
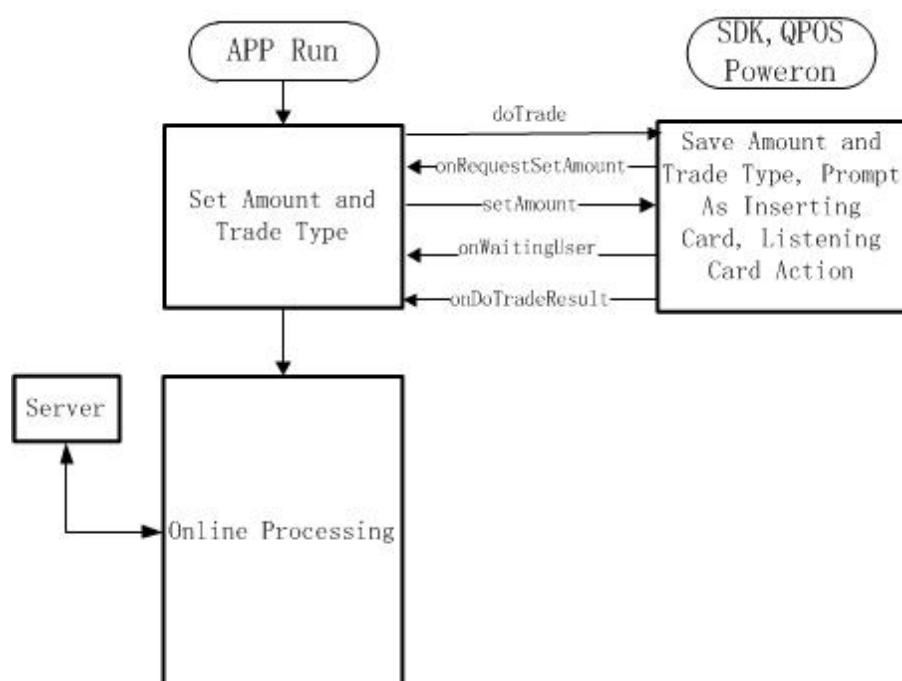


## 2.5.5  Magnetic Transaction Description

If a magnetic stripe card has been swiped, the encrypted PINBLOCK and the encrypted track data will be returned along with the **trackksn** and the **pinKsn** in the **decodeData Hashtable**.

Public void **onDoTradeResult**(DoTradeResult result, Hashtable<String, String> decodeData);

The **Hashtable** contain keys for the values:

| Key | Description |
|---|---|
| maskedPAN | Masked card number showing at most the first 6 and last 4 digits with in-between digits masked by "X" |

| expiryDate | 4-digit in the form of YYMM in the track data |
|---|---|
| cardHolderName | The cardholder name as seen on the card. This can be up to 26 characters. |
| serviceCode | 3-digit service code in the track data |
| track1Length | Length of Track 1 data |
| track2Length | Length of Track 2 data |
| track3Length | Length of Track 3 data |
| encTracks | Reserved |
| encTrack1 | Encrypted track 1 data with T-Des encryption key derived from **DATA-key** to be generated with **trackksn** and **IPEK** |
| encTrack2 | Encrypted track 2 data with T-Des encryption key derived from **DATA-key** to be generated with **trackksn** and **IPEK** |
| encTrack3 | Encrypted track 3 data with T-Des encryption key derived from **DATA-key** to be generated with **trackksn** and **IPEK** |
| partialTrack | Reserved |
| pinKsn | KSN of the Pin-block |
| trackksn | KSN of the track data |
| pinBlock[1] | Encrypted PIN data with T-Des encryption key derived from **PIN-key** to be generated with **pinKsn** and **IPEK** |

Note:

1. The **PIN** format is defined as **ANSI X9.8**.

    pinBlock := (**PIN^PAN**);

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## 2.6 API Methods Reference

### 2.6.1 getSdkVersion

| Signature | -(NSString *) getSdkVersion |
|---|---|
| Inputs | None |
| Outputs | SDK version |
| Description | Return the SDK version |
| See also | |

### 2.6.2 resetPos

| Signature | -(BOOL) resetPos; |
|---|---|
| Inputs | None |
| Outputs | BOOL |
| Description | Reset and bring the QPOS back to a known initial state. |
| See also | |

### 2.6.3 startAudio

| Signature | -(void)startAudio; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Start the audio instance for playing, recording and modulating. |

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| See also | |
|----------|---|
| | |

## 2.6.4 stopAudio

| Signature | -(void)stopAudio; |
|-----------|-------------------|
| Inputs | None |
| Outputs | None |
| Description | Stop the audio instance for playing, recording and modulating. |
| See also | |

## 2.6.5 connectBT

| Signature | -(BOOL) connectBT: (NSString *)bluetoothName; |
|-----------|----------------------------------------------|
| Inputs | Bluetooth Name. |
| Outputs | BOOL |
| Description | Connect to QPOS by Bluetooth, using for exchanging data between APP and QPOS. |
| See also | |

## 2.6.6 disconnectBT

| Signature | -(void) disconnectBT; |
|-----------|----------------------|
| Inputs | None |
| Outputs | None |
| Description | Connect to QPOS by Bluetooth, using for exchanging data |

| | |
|---|---|
| | between APP and QPOS. |
| See also | |

## 2.6.7 isQposPresent

| | |
|---|---|
| Signature | -(BOOL)isQposPresent; |
| Inputs | None. |
| Outputs | BOOL: Presence of the EmvSwipe. |
| Description | Check if an QPOS is connected and ready. |
| See also | |

## 2.6.8 getQposId

| | |
|---|---|
| Signature | -(void) getQPosId; / -(void) getQPosId:(NSInteger)timeout; |
| Inputs | timeout; |
| Outputs | None |
| Description | Retrieve the POS_ID of the QPOS device. Results are returned by onQposIdResult. |
| See also | onQposIdResult |

## 2.6.9 getQposInfo

| | |
|---|---|
| Signature | -(void) getQPosInfo; |
| Inputs | None |
| Outputs | None |
| Description | Retrieve parameters about the QPOS device. Results are returned by onQposInfoResult which includes: firmware |

| | |
|---|---|
| | version, bootloader version, USB connection and charging status, battery level, and hardware version |
| See also | onQposInfoResult |

## 2.6.10  setAmount

| | |
|---|---|
| Signature | -(void) setAmount: (NSString *)aAmount aAmountDescribe:(NSString *)aAmountDescribe currency:(NSString *)currency transactionType:(TransactionType)transactionType; |
| Inputs | amount: the amount for a transaction.⌷⌷<br><br>cashbackAmount: the amount for a transaction. If this is non-zero, amount cannot be zero.<br><br>currencyCode: three digits of the currency code, e.g. "840" for USD<br><br>transactionType: enum of the transaction type. |
| Outputs | None |
| Description | Set the amount, currency and type of a transaction. This method can be called before a transaction or in response to an onRequestSetAmount call requested by the EMV engine.⌷⌷The Enum **TransactionType** can be<br><br>GOODS, SERVICES, CASHBACK, INQUIRY, TRANSFER, PAYMENT |
| See also | onRequestSetAmount , cancelSetAmount |

## 2.6.11  cancelSetAmount

| | |
|---|---|
| Signature | -(void) cancelSetAmount; |
| Inputs | None |

| Outputs | None |
|---|---|
| Description | Cancel setting the amount of a transaction. This method can be called to abort a transaction in response to onRequestSetAmount |
| See also | onRequestSetAmount |

## 2.6.12 doTrade

| Signature | -(void) doTrade; / -(void) doTrade:(NSInteger) timeout; |
|---|---|
| Inputs | Timeout |
| Outputs | None |
| Description | Check the status of the Magnetic Card Reader, the EMV Card reader, or NFC transceiver. It checks if a card has been swiped, a NFC card has been tapped or an EMV card is inserted. The result is returned by the onDoTradeResult delegate method. |
| See also | onDoTradeResult |

## 2.6.13 doCheckCard

| Signature | -(void) doCheckCard;/-(void) doCheckCard:(NSInteger) timeout; |
|---|---|
| Inputs | Timeout |
| Outputs | None |
| Description | Start transaction，no pin input |
| See also | onDoTradeResult |

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## 2.6.14 doEmvApp

| Signature | -(void) doEmvApp: (EmvOption)aemvOption; |
|---|---|
| Inputs | EmvOption |
| Outputs | None |
| Description | Start Emv app，Emv card |
| See also | onDoTradeResult |

## 2.6.15 setAmount

| Signature | -(void) setAmount: (NSString *)aAmount<br>aAmountDescribe:(NSString *)aAmountDescribe<br>currency:(NSString *)currency<br>transactionType:(TransactionType)transactionType<br>OR<br>-(void) setAmount: (NSString *)aAmount<br>aAmountDescribe:(NSString *)aAmountDescribe<br>currency:(NSString *)currency<br>transactionType:(TransactionType)transactionType<br>posDisplayAmount:(BOOL)flag; |
|---|---|
| Inputs | Amount：<br><br>CashbackAmount<br><br>CurrencyCode<br><br>TransactionType<br><br>IsPosDisplayAmount |
| Outputs | None |
| Description | Set amount |
| See also | |

## 2.6.16  selectEmvApp

| Signature | -(void) selectEmvApp: (NSInteger)index; |
|---|---|
| Inputs | Index: select emv app index |
| Outputs | None |
| Description | Select Emv App |
| See also | |

## 2.6.17  cancelSelectEmvApp

| Signature | -(void) cancelSelectEmvApp; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Cancel Select Emv App |
| See also | |

## 2.6.18  finalConfirm

| Signature | -(void) finalConfirm: (BOOL)isConfirmed; |
|---|---|
| Inputs | isConfirmed |
| Outputs | None |
| Description | Not support |
| See also | |

## 2.6.19  sendOnlineProcessResult

| Signature | -(void) sendOnlineProcessResult: (NSString *)tlv; |
|---|---|
| Inputs | tlv |

| | |
|---|---|
| Outputs | None |
| Description | Send transaction results from the processor back to EMVSwipe |
| See also | onRequestOnlineProcess |

## 2.6.20  isServerConnected

| | |
|---|---|
| Signature | -(void) isServerConnected: (BOOL)isConnected; |
| Inputs | isConnected |
| Outputs | None |
| Description | Send the connectivity status to EMVSwipe |
| See also | onRequestIsServerConnected |

## 2.6.21  sendTime

| | |
|---|---|
| Signature | -(void) sendTime: (NSString *)aterminalTime; |
| Inputs | aterminalTime |
| Outputs | None |
| Description | Send the terminal time in yyyyMMddHHmmss format to EMVSwipe |
| See also | onRequestTime |

## 2.6.22  setAmountIcon

| | |
|---|---|
| Signature | -(void)setAmountIcon:(NSString *)aAmountIcon; / <br><br> -(void)setAmountIcon:(AmountType) amtType amtIcon:(NSString *)aAmountIcon; |

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| Inputs | amtType |
| --- | --- |
| | aAmountIcon |
| Outputs | None |
| Description | Set Amount symbol. |
| | String Data is a string with length below 4 characters, and can only be ASCII string.   below are some valid examples : |
| | "RUP" |
| | "USD" |
| | "CNY" |
| See also | |

## 2.6.23  getPin

| Signature | -(void)getPin:(NSString *)aTransactionData; |
| --- | --- |
| Inputs | aTransactionData |
| Outputs | None |
| Description | Get Pin |
| See also | onReturnGetPinResult |

## 2.6.24  powerOnIcc

| Signature | -(void)powerOnIcc; |
| --- | --- |
| Inputs | None |
| Outputs | None |
| Description | Provide power to ICC for level 1 APDU exchange |
| See also | onReturnPowerOnIccResult |

### 2.6.25  powerOffIcc

| | |
|---|---|
| Signature | -(void)powerOffIcc; |
| Inputs | None |
| Outputs | None |
| Description | Cut off power to ICC after level 1 APDU exchange |
| See also | onReturnPowerOnIccResult |

### 2.6.26  sendApdu

| | |
|---|---|
| Signature | -(void)sendApdu:(NSString *)apduStr; |
| Inputs | apduStr |
| Outputs | None |
| Description | Send APDU exchange to ICC. Response data are returned by onReturnApduResult |
| See also | onReturnApduResult |

### 2.6.27  setPosSleepTime

| | |
|---|---|
| Signature | -(void)setPosSleepTime:(NSInteger)sleepTime; |
| Inputs | sleepTime |
| Outputs | None |
| Description | Set Sleep Time |
| See also | onReturnSetSleepTimeResult |

### 2.6.28  updateEmvConfig

| | |
|---|---|
| Signature | -(void)updateEmvConfig:(NSString *)emvAppCfg emvCapk:(NSString*)emvCapkCfg; |

| Inputs | emvAppCfg<br><br>emvCapkCfg |
|---|---|
| Outputs | None |
| Description | update emv config files(CAPK and AID) |
| See also | onReturnCustomConfigResult |

## 2.6.29  readEmvAppConfig

| Signature | -(void)readEmvAppConfig; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | read emv app config |
| See also | onReturnCustomConfigResult |

## 2.6.30  readEmvCapkConfig

| Signature | -(void)readEmvCapkConfig; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | read emv capk config |
| See also | onReturnCustomConfigResult |

## 2.6.31  udpateWorkKey

| Signature | -(void)udpateWorkKey:(NSString *)pik<br>pinKeyCheck:(NSString *)pikCheck trackKey:(NSString *)trk trackKeyCheck:(NSString *)trkCheck macKey:(NSString *)mak macKeyCheck:(NSString *)makCheck transKey:(NSString *)tnsk |
|---|---|

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| | |
|---|---|
| | transKeyCheck:(NSString *)tnskCheck<br>keyIndex:(NSInteger) mKeyIndex<br>delay:(NSInteger)timeout; |
| Inputs | pik<br><br>pikCheck<br><br>trk<br><br>trkCheck<br><br>mak<br><br>makCheck<br><br>tnsk<br><br>tnskCheck<br><br>keyIndex<br><br>timeout |
| Outputs | None |
| Description | Update Work Key |
| See also | onRequestUpdateWorkKeyResult |

## 2.6.32  MacKeyEncrypt

| | |
|---|---|
| Signature | -(void)MacKeyEncrypt:(NSString *)macStr; |
| Inputs | macStr |
| Outputs | None |
| Description | macKey Encrypt |
| See also | onRequestCalculateMac |

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## 2.6.33   isQposPresent

| Signature | -(BOOL)isQposPresent; |
|---|---|
| Inputs | None |
| Outputs | BOOL |
| Description | Get Qpos available status |
| See also | |

## 2.6.34   setMasterKey

| Signature | -(void) setMasterKey:(NSString *)key checkValue:(NSString *)chkValue keyIndex:(NSInteger) mKeyIndex; |
|---|---|
| Inputs | key<br><br>ckValue<br><br>keyIndex<br><br>timeout |
| Outputs | None |
| Description | Set Master Key |
| See also | onReturnSetMasterKeyResult |

## 2.6.35   calcMacSingle

| Signature | -(void)calcMacSingle:(NSString *)macStr; |
|---|---|
| Inputs | macStr |
| Outputs | None |
| Description | Calculate mac (single ) |
| See also | onRequestCalculateMac |

### 2.6.36 calcMacDouble

| Signature | -(void)calcMacDouble:(NSString *)macStr; |
|---|---|
| Inputs | macStr<br><br>keyIndex<br><br>timeout |
| Outputs | None |
| Description | Calculate mac (double ) |
| See also | onRequestCalculateMac |

### 2.6.37 calcMacSingleNoCheck

| Signature | -(void)calcMacSingleNoCheck:(NSString *)macStr delay:(NSInteger)timeout; |
|---|---|
| Inputs | macStr<br><br>timeout |
| Outputs | None |
| Description | Calculate mac (single) |
| See also | onRequestCalculateMac |

### 2.6.38 calcMacDoubleNoCheck

| Signature | -(void)calcMacDoubleNoCheck:(NSString *)macStr keyIndex:(NSInteger) mKeyIndex delay:(NSInteger)timeout; |
|---|---|
| Inputs | macStr<br><br>keyIndex<br><br>timeout |

| Outputs | None |
|---|---|
| Description | Calculate mac (double) |
| See also | onRequestCalculateMac |

## 2.6.39  downloadRsaPublicKey

| Signature | -(void)downloadRsaPublicKey:(NSInteger)useType RID:(NSString*)rid keyIndex:(NSString *)index keyModule:(NSString *)module keyExponent:(NSString *)exponent delay:(NSInteger)timeout; |
|---|---|
| Inputs | useType<br><br>rid：public Key RID<br><br>index：Public Key Index<br><br>module：Public Key Module<br><br>exponent：Public Key Exponent<br><br>timeout |
| Outputs | None |
| Description | Acquire server RSA public key<br>Execute process:<br>Step1:call host interface ,get public key from host<br>Step2: call the interface get random key<br>Step 3: upload randomkey to host .host return encrypted terminal master key<br>Step 4: call setMasterKey to set master key. |
| See also | onReturnDownloadRsaPublicKey |

## 2.6.40  updateMasterKeyRandom

| Signature | -(void)updateMasterKeyRandom:(NSInteger)step keyIndex:(NSString *)index masterKey:(NSString *)mKey masterKeyCheck:(NSString *)mKeyCheck delay:(NSInteger)timeout; |
|---|---|

| Inputs | step：step index |
| --- | --- |
| | keyIndex |
| | masterKey |
| | masterKeyCheck |
| | timeout |
| Outputs | None |
| Description | Update Master Key in Random method<br>Execute Process:<br>Step 1: call this interface to get random<br>Step 2: use the random number to encrypt terminal master key. Then call the interface to set master key. |
| See also | onUpdateMasterKeyResult |

## 2.6.41  updateMasterKey

| Signature | -(void)updateMasterKey:(NSInteger)step RN1:(NSString *)RN1Str RN2:(NSString *)RN2Str masterKey:(NSString *)mKey masterKeyCheck:(NSString *)mKeyCheck delay:(NSInteger)timeout; |
| --- | --- |
| Inputs | step |
| | RN1 |
| | RN2 |
| | masterKey |
| | masterKeyCheck |
| | timeout |
| Outputs | None |
| Description | |
| See also | onUpdateMasterKeyResult |

## 2.6.42  pinKey_TDES

| Signature | -(void)pinKey_TDES:(NSInteger) keyIndex pin:(NSString *)inStr delay:(NSInteger)timeout; |
|---|---|
| Inputs | keyIndex<br><br>pin<br><br>timeout |
| Outputs | None |
| Description | Use pinKey to encrypt data |
| See also | onPinKey_TDES_Result |

## 2.6.43  pinKey_TDESNoCheck

| Signature | -(void)pinKey_TDESNoCheck:(NSInteger) keyIndex pin:(NSString *)inStr delay:(NSInteger)timeout; |
|---|---|
| Inputs | keyIndex<br><br>pin<br><br>timeout |
| Outputs | None |
| Description | Use pinKey to encrypt data (NoCheck) |
| See also | onPinKey_TDES_Result |

## 2.6.44  setSystemDateTime

| Signature | - (void)setSystemDateTime:(NSString *)dateTimeStr delay:(NSInteger)timeout block:(void (^)(BOOL isSuccess, NSDictionary *resultDic))dateTimeBlock; |
|---|---|
| Inputs | dataTime<br><br>timeout |

| Outputs | None |
|---|---|
| Description | Set SystemDate Time |
| See also | |

## 2.6.45 setMerchantID

| Signature | - (void)setMerchantID:(NSString *)merchantID delay:(NSInteger)timeout block:(void (^)(BOOL isSuccess, NSDictionary *resultDic))merchantIDBlock; |
|---|---|
| Inputs | merchantID<br><br>timeout |
| Outputs | None |
| Description | Set Merchant ID |
| See also | |

## 2.6.46 setTerminalID

| Signature | - (void)setTerminalID:(NSString *)TerminalID delay:(NSInteger)timeout block:(void (^)(BOOL isSuccess, NSDictionary *resultDic))terminalIDBlock; |
|---|---|
| Inputs | terminalID<br><br>timeout |
| Outputs | None |
| Description | Set Terminal ID |
| See also | |

## 2.6.47 getMagneticTrackPlaintext

| Signature | - (void)getMagneticTrackPlaintext:(NSInteger)timeout; |
|---|---|

| Inputs | timeout |
|---|---|
| Outputs | None |
| Description | Get Magnetic Track Plaintext |
| See also | onDoTradeResult |

## 2.6.48  getCardNo

| Signature | -(void) getCardNo; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Acquire card number（Magnetic stripe card） |
| See also | onGetCardNoResult |

## 2.6.49  getIccCardNo

| Signature | -(void) getIccCardNo: (NSString *)aterminalTime; |
|---|---|
| Inputs | aterminalTime |
| Outputs | None |
| Description | Acquire card number（IC、Magnetic stripe card） |
| See also | onGetCardNoResult |

## 2.6.50  powerOffNFC

| Signature | - (void)powerOffNFC:(NSInteger) timeout withBlock:(void (^)(BOOL isSuccess))onPowerOffNFCResultBlock; |
|---|---|
| Inputs | timeout |
| Outputs | None |
| Description | Turn off the NFC transceiver |

| See also | onReturnPowerOffNFCResult |
|---|---|

## 2.6.51 sendApduByNFC

| Signature | - (void)sendApduByNFC:(NSString *)apduString delay:(NSInteger)timeout withBlock:(void (^)(BOOL isSuccess, NSString *apdu, NSInteger apduLen))onNFCApduResultBlock; |
|---|---|
| Inputs | apduString<br><br>timeout |
| Outputs | None |
| Description | Send data to EMV card in raw APDU formats by nfc |
| See also | onReturnNFCApduResult |

## 2.6.52 powerOnNFC

| Signature | - (void)powerOnNFC:(NSInteger) isEncrypt delay:(NSInteger) timeout withBlock:(void (^)(BOOL isSuccess, NSString *ksn, NSString *atr, NSInteger atrLen))onPowerOnNFCResultBlock; |
|---|---|
| Inputs | isEncrypt<br><br>timeout |
| Outputs | None |
| Description | Turn on the NFC transceiver |
| See also | onReturnPowerOnNFCResult |

## 2.6.53 cbc_mac

| Signature | - (void)cbc_mac:(NSInteger)keyLen atype:(NSInteger)algorithmType otype:(NSInteger)operatorType data:(NSString *)dataStr delay:(NSInteger)timeout withResultBlock:(void |
|---|---|

| | (^)(NSString *))cbcmacBlock; |
|---|---|
| Inputs | keyLen |
| | algorithmType |
| | operatorType |
| | data |
| | timeout |
| Outputs | None |
| Description | With 3DES CBC mode calculate Mac |
| See also | onCbcMacResult |

## 2.6.54  cbc_macNoCheck

| | |
|---|---|
| Signature | - (void)cbc_macNoCheck:(NSInteger)keyLen atype:(NSInteger)algorithmType otype:(NSInteger)operatorType data:(NSString *)dataStr delay:(NSInteger)timeout withResultBlock:(void (^)(NSString *))cbcmacBlock; |
| Inputs | keyLen |
| | algorithmType |
| | operatorType |
| | data |
| | timeout |
| Outputs | None |
| Description | Calculate Mac (No Check)with 3DES CBC mode |
| See also | onCbcMacResult |

## 2.6.55  inquireECQAmount

| Signature | -(void) inquireECQAmount: (NSString *)aterminalTime; |
| --- | --- |
| Inputs | transactionTime |
| Outputs | None |
| Description | Inquire IC card Electronic pocket balance |
| See also | onRequestBatchData |

## 2.6.56  isIdle

| Signature | -(BOOL)isIdle; |
| --- | --- |
| Inputs | transactionTime |
| Outputs | None |
| Description | Flag indicate pos is working |
| See also | |

## 2.6.57  anlysEmvIccData

| Signature | -(NSDictionary *)anlysEmvIccData:(NSString *)tlv; |
| --- | --- |
| Inputs | tlv |
| Outputs | None |
| Description | Parsing    ICC data |
| See also | |

## 2.6.58  VIPOSBatchSendAPDU

| Signature | -(void)VIPOSBatchSendAPDU:(NSDictionary *) batchAPDU; |
| --- | --- |

| Inputs | batchAPDU |
|---|---|
| Outputs | None |
| Description | send Batch APDU command  VIPOS protocol |
| See also | onReturnBatchSendAPDUResult |

## 2.6.59  synVIPOSBatchSendAPDU

| Signature | -(NSDictionary *)synVIPOSBatchSendAPDU:(NSDictionary *) batchAPDU; |
|---|---|
| Inputs | isOpen<br><br>batchAPDU |
| Outputs | None |
| Description | send Batch APDU command  VIPOS protocal （synchronize mode） |
| See also | onReturnBatchSendAPDUResult |

## 2.6.60  anlysEmvIccData_qf

| Signature | -(NSDictionary *)anlysEmvIccData_qf:(NSString *)tlv; |
|---|---|
| Inputs | tlv |
| Outputs | None |
| Description | Parsing ICC data  qf |
| See also | |

## 2.6.61  iccCashBack

| Signature | -(void)iccCashBack:(NSString *)transactionTime random:(NSString *)aRandom; |
|---|---|

| Inputs | transactionTime random |
|---|---|
| Outputs | None |
| Description | Specific customer IC card cach back trade |
| See also | onReturniccCashBack |

## 2.6.62 setPosPresent

| Signature | -(void) setPosPresent:(BOOL) flag; |
|---|---|
| Inputs | flag |
| Outputs | None |
| Description | Flag for POS existence |
| See also | |

## 2.6.63 setCardTradeMode

| Signature | -(void)setCardTradeMode:(CardTradeMode) aCardTMode; |
|---|---|
| Inputs | cardTradeMode： enum{ONLY_INSERT_CARD//only IC ONLY_SWIPE_CARD//Only Magnetic stripe card SWIPE_INSERT_CARD//Magnetic stripe card and IC UNALLOWED_LOW_TRADE//the devices will remind to insert the card if the card are both chip and track } |
| Outputs | None |
| Description | Set Card Trade Mode， （Only Magnetic stripe card，only IC，Magnetic stripe card and IC ） |
| See also | |

## 2.6.64  setPinPadFlag

| | |
|---|---|
| Signature | -(void)setPinPadFlag:(BOOL)flag; |
| Inputs | flag |
| Outputs | None |
| Description | Device keypad flag |
| See also | |

## 2.6.65  qposStatus

| | |
|---|---|
| Signature | -(BOOL)qposStatus; |
| Inputs | None |
| Outputs | None |
| Description | Check APP connect status |
| See also | |

## 2.6.66  readBusinessCard

| | |
|---|---|
| Signature | - (void)readBusinessCard:(NSString *)cardType businessID:(NSInteger)businessID pin:(NSString *)pinStr address:(NSString *)addr readLen:(NSInteger)len delay:(NSInteger)timeout withResultBlock:(void (^)(BOOL isSuccess, NSString * result))readBusinessCardResultBlock; |
| Inputs | cardType<br><br>address<br><br>readLen<br><br>cardPin<br><br>vender_id |

| | |
|---|---|
| | timeout |
| Outputs | None |
| Description | Read Business Card |
| See also | onReadBusinessCardResult |

## 2.6.67 writeBusinessCard

| | |
|---|---|
| Signature | - (void)writeBusinessCard:(NSString *)cardType businessID:(NSInteger)businessID address:(NSString *)addr writeData:(NSString *)data cardPin:(NSString *)pin isUpdatePin:(BOOL)updateFlag delay:(NSInteger)timeout withResultBlock:(void (^)(BOOL isSuccess, NSString * result))writeBusinessCardResultBlock; |
| Inputs | cardType<br><br>address<br><br>data<br><br>cardPin<br><br>isUpdatePinFlag<br><br>vender_id<br><br>timeout |
| Outputs | None |
| Description | write Business Card |
| See also | onWriteBusinessCardResult |

## 2.6.68 syncReadBusinessCard

| | |
|---|---|
| Signature | - (NSData *)syncReadBusinessCard:(NSString *)cardType businessID:(NSInteger)businessID pin:(NSString *)pinStr address:(NSString *)addr readLen:(NSInteger)len delay:(NSInteger)timeout; |
| Inputs | cardType |

| | |
|---|---|
| | address |
| | readLen |
| | cardPin |
| | vender_id |
| | timeout |
| Outputs | None |
| Description | Read　Business Card（synchronize mode） |
| See also | |

## 2.6.69  syncWriteBusinessCard

| | |
|---|---|
| Signature | - (NSInteger)syncWriteBusinessCard:(NSString *)cardType businessID:(NSInteger)businessID address:(NSString *)addr writeData:(NSString *)data cardPin:(NSString *)pin isUpdatePin:(BOOL)updateFlag delay:(NSInteger)timeout; |
| Inputs | cardType |
| | address |
| | data |
| | cardPin |
| | isUpdatePinFlag |
| | vender_id |
| | timeout |
| Outputs | None |
| Description | Write Business Card（synchronize mode） |
| See also | |

## 2.6.70  confirmAmount

| Signature | - (void)confirmAmount:(NSString *)wKey delay:(NSInteger)timeout withResultBlock:(void (^)(BOOL isSuccess))confirmAmountBlock; |
|---|---|
| Inputs | amount<br><br>timeout |
| Outputs | None |
| Description | Confirm Amount |
| See also | onConfirmAmountResult |

## 2.6.71  setAmount

| Signature | -(void) setAmount: (NSString *)aAmount aAmountDescribe:(NSString *)aAmountDescribe currency:(NSString *)currency transactionType:(TransactionType)transactionType posDisplayAmount:(BOOL)flag; |
|---|---|
| Inputs | amount：transaction amount<br><br>cashbackAmount：enchashment amount<br><br>currencyCode：currency code<br><br>transactionType：transaction type<br><br>isPosDisplayAmount：whether display on POS device or not |
| Outputs | None |
| Description | Set Amount |
| See also | |

## 2.6.72  getPin

| Signature | - (void)getPin:(NSInteger)encryptType keyIndex:(NSInteger)keyIndex maxLen:(NSInteger)maxLen typeFace:(NSString |
|---|---|

| | |
|---|---|
| | *)typeFace cardNo:(NSString *)cardNo data:(NSString *)data delay:(NSInteger)timeout withResultBlock:(void (^)(BOOL isSuccess, NSDictionary * result))getPinBlock; |
| Inputs | encryptType：default:0<br><br>keyIndex：default:0<br><br>maxLen：max length of pin<br><br>typeface：display the font<br><br>cardNo<br><br>data：attached data<br><br>timeout |
| Outputs | None |
| Description | Get Pin |
| See also | onReturnGetPinResult |

## 2.6.73 doMifareCard

| | |
|---|---|
| Signature | - (void) doMifareCard:(NSString *)paras timeout:(int)timeout; |
| Inputs | paras:Operation command code, hex string. Example: "01" polling card<br>timeout |
| Outputs | None |
| Description | Mifare card operation |
| See also | - (void) onSearchMifareCardResult:(NSDictionary *)result;<br>- (void) onVerifyMifareCardResult:(BOOL)result;<br>- (void) onReadMifareCardResult:(NSDictionary *)result;<br>- (void) onWriteMifareCardResult:(BOOL)result;<br>- (void) onOperateMifareCardResult:(NSDictionary *)result;<br>- (void)getMifareCardVersion:(NSDictionary *)result;<br>- (void)getMifareReadData:(NSDictionary *)result; |

- (void)getMifareFastReadData:(NSDictionary *)result;
- (void)writeMifareULData:(NSString *)result;
- (void)verifyMifareULData:(NSDictionary *)result;
- (void) onFinishMifareCardResult:(BOOL)result;
- (void) batchReadMifareCardResult:(NSDictionary *)result;
- (void) batchWriteMifareCardResult:(NSDictionary *)result;

## 2.6.74 doUpdateIPEKOperation

| Signature | -(void)doUpdateIPEKOperation:(NSString *)groupKey<br>tracksn:(NSString *)trackksn<br>trackipek:(NSString *)trackipek<br>trackipekCheckValue:(NSString *)trackipekCheckValue<br>emvksn:(NSString *)emvksn<br>emvipek:(NSString *)emvipek<br>emvipekcheckvalue:(NSString *)emvipekcheckvalue<br>pinksn:(NSString *)pinksn<br>pinipek:(NSString *)pinipek<br>pinipekcheckValue:(NSString *)pinipekcheckValue<br>block:(void(^)(BOOL isSuccess,NSString *stateStr))EMVBlock; |
|---|---|
| Inputs | groupKey、tracksn、trackipek、trackipekCheckValue、emvksn、emvipek、emvipekcheckvalue、pinksn、pinipek、pinipekcheckValue |
| Outputs | The result of updating IPEK |
| Description | Update IPEK |

## 2.6.75 updateIPEKOperationByKeyType

| Signature | - (void)updateIPEKOperationByKeyType:(NSString *)groupKey<br>tracksn:(NSString *)trackksn<br>trackipek:(NSString *)trackipek<br>trackipekCheckValue:(NSString |
|---|---|

| | |
|---|---|
| | *)trackipekCheckValue<br>emvksn:(NSString *)emvksn<br>emvipek:(NSString *)emvipek<br>emvipekcheckvalue:(NSString<br>*)emvipekcheckvalue<br>pinksn:(NSString *)pinksn<br>pinipek:(NSString *)pinipek<br>pinipekcheckValue:(NSString<br>*)pinipekcheckValue<br>block:(void(^)(BOOL isSuccess,NSString<br>*stateStr))EMVBlock; |
| Inputs | groupKey、tracksn、trackipek、trackipekCheckValue、emvksn、emvipek、emvipekcheckvalue、pinksn、pinipek、pinipekcheckValue |
| Outputs | The result of updating IPEK |
| Description | Update IPEK |

## 2.6.76  doSetBuzzerOperation

| | |
|---|---|
| Signature | -(void)doSetBuzzerOperation:(NSInteger)timeOut<br>block:(void (^)(BOOL isSuccess,<br>NSString*stateStr))buzzerBlock; |
| Inputs | timeOut |
| Outputs | The result of setting buzzer |
| Description | Set buzzer operation |

## 2.6.77  updateEMVRID

| | |
|---|---|
| Signature | -(void)updateEMVRID:(NSInteger)operationType<br>data:(NSString *)data<br>block:(void(^)(BOOL isSuccess,NSString<br>*stateStr))EMVBlock; |
| Inputs | operationType |

| | data |
|---|---|
| Outputs | Update result |
| Description | Update emv RID configuration |
| See also | onReturnUpdateEMVRIDResult |

## 2.6.78  updateAID

| Signature | -(void)updateAID:(NSInteger)operationType<br>data:(NSString *)data<br>block:(void(^)(BOOL isSuccess,NSString<br>*stateStr))EMVBlock; |
|---|---|
| Inputs | operationType<br><br>data |
| Outputs | Update result |
| Description | Update emv AID configuration |

## 2.6.79  setAIDwithBool

| Signature | -(void)setAIDwithBool:(BOOL)isTrue<br>data:(NSString *)data<br>block:(void(^)(BOOL isSuccess,NSString<br>*stateStr))EMVBlock |
|---|---|
| Inputs | isTrue<br><br>data |
| Outputs | Update result |
| Description | Setting AID |

## 2.6.80 setOnlineTime

| Signature | -(void)setOnlineTime:(NSInteger)aTime |
|---|---|
| Inputs | aTime |
| Outputs | None |
| Description | Set the time to wait for ARPC |

## 2.6.81 getUpdateCheckValueBlock

| Signature | -(void)getUpdateCheckValueBlock:(void(^)(BOOL isSuccess,NSString *stateStr))updateCheckValueBlock |
|---|---|
| Inputs | None |
| Outputs | upgrade key |
| Description | Read upgrade key |

## 2.6.82 doSetShutDownTime

| Signature | -(void)doSetShutDownTime:(NSString *)timeOut |
|---|---|
| Inputs | timeOut |
| Outputs | None |
| Description | Set shutdown time |
| See also | onReturnSetSleepTimeResult |

## 2.6.83 getBluetoothState

| Signature | -(BOOL)getBluetoothState |
|---|---|

| Inputs | None |
|---|---|
| Outputs | Bluetooth State |
| Description | Get Bluetooth State |

## 2.6.84  setBTAutoDetecting

| Signature | -(void)setBTAutoDetecting: (BOOL)flag |
|---|---|
| Inputs | flag |
| Outputs | None |
| Description | Set BT Auto Detecting |

## 2.6.85  getConnectedPeripheral

| Signature | -(CBPeripheral*)getConnectedPeripheral:(NSString *)bluetoothName; |
|---|---|
| Inputs | Bluetooth Name |
| Outputs | Peripheral |
| Description | Get Connected Peripheral |

## 2.6.86  connectBluetoothByCBPeripheral

| Signature | -(BOOL)connectBluetoothByCBPeripheral: ( CBPeripheral*)myCBPeripheral; |
|---|---|
| Inputs | myCBPeripheral |
| Outputs | Connected result |
| Description | Connect Bluetooth By CBPeripheral |

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### 2.6.87   connectBluetoothNoScan

| Signature | -(BOOL)connectBluetoothNoScan: (NSString*)bluetoothName; |
|---|---|
| Inputs | bluetoothName |
| Outputs | Connected result |
| Description | You can connect bluetooth without scanning bluetooth |

### 2.6.88   getConnectedDevices

| Signature | -(NSArray *)getConnectedDevices; |
|---|---|
| Inputs | None |
| Outputs | Connected Devices |
| Description | Get Connected Devices |

### 2.6.89   cancelTrade

| Signature | -(BOOL)cancelTrade:(BOOL)isUserCancel; |
|---|---|
| Inputs | isUserCancel |
| Outputs | The result of canceling trade |
| Description | Cancel Trade |

### 2.6.90   asynresetPosStatus

| Signature | -(void)asynresetPosStatus; |
|---|---|
| Inputs | None |
| Outputs | None |

| Description | Asyn reset Pos Status |
|---|---|
| See also | onAsyncResetPosStatus |

## 2.6.91 setDoTradeMode

| Signature | -(void)setDoTradeMode:(DoTradeMode)doTradeMode; |
|---|---|
| Inputs | doTradeMode |
| Outputs | None |
| Description | set DoTradeMode before calling doTrade |

## 2.6.92 setFormatID

| Signature | -(void)setFormatID:(NSString *)formatID; |
|---|---|
| Inputs | formatID |
| Outputs | None |
| Description | Set format ID before calling doTrade |

## 2.6.93 setAmountPoint

| Signature | -(void)setAmountPoint:(BOOL)amoutPoint; |
|---|---|
| Inputs | amoutPoint |
| Outputs | None |
| Description | Set Amount Point before calling doTrade |

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## 2.6.94 doTrade_QF

| Signature | -(void)doTrade_QF:(NSInteger)tradeMode TradeRandomString:(NSString *)randomString TradeExtraString:(NSString *)extraString timeout:(NSInteger) delay; |
|---|---|
| Inputs | tradeMode 、randomString、extraString、delay |
| Outputs | None |
| Description | Do trade for QF |

## 2.6.95 setIsQuickEMV

| Signature | -(void)setIsQuickEMV:(BOOL)isQuickEMV; |
|---|---|
| Inputs | isQuickEMV |
| Outputs | None |
| Description | Set quick emv before calling doTrade |

## 2.6.96 getQuickEMV

| Signature | -(BOOL)getQuickEMV; |
|---|---|
| Inputs | None |
| Outputs | QuickEMV |
| Description | Get Quick EMV |

## 2.6.97 getNFCBatchData

| Signature | -(NSDictionary *)getNFCBatchData; |
|---|---|

| Inputs | None |
|---|---|
| Outputs | NFC Batch Data |
| Description | You can use it to get NFC batch data |

## 2.6.98  powerOffNFC

| Signature | -(void)powerOffNFC:(NSInteger) timeout withBlock:(void (^)(BOOL isSuccess))onPowerOffNFCResultBlock; |
|---|---|
| Inputs | timeout |
| Outputs | Power Off NFC Result |
| Description | Power Off NFC |

## 2.6.99  sendPinEntryResult

| Signature | -(void)sendPinEntryResult:(NSString *)pin; |
|---|---|
| Inputs | pin |
| Outputs | None |
| Description | Send Pin Entry Result to terminal |

## 2.6.100   cancelPinEntry

| Signature | -(void)cancelPinEntry; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Cancel Pin Entry |

## 2.6.101 bypassPinEntry

| | |
|---|---|
| Signature | -(void)bypassPinEntry; |
| Inputs | None |
| Outputs | None |
| Description | Bypass Pin Entry |

## 2.6.102 updateEMVConfigByXml

| | |
|---|---|
| Signature | -(void)updateEMVConfigByXml:(NSString *)xmlStr; |
| Inputs | xmlStr |
| Outputs | None |
| Description | update emv configure api by xml file |
| See also | onReturnCustomConfigResult |

## 2.6.103 updateEmvAPPByTlv

| | |
|---|---|
| Signature | -(void)updateEmvAPPByTlv:(EMVOperation)emvOperation appTlv:(NSString *)appTlv; |
| Inputs | appTlv |
| Outputs | None |
| Description | update emv configure by appTlv |
| See also | onReturnUpdateEMVResult<br><br>onReturnGetEMVListResult |

## 2.6.104 updateEmvCAPKByTlv

| Signature | -(void)updateEmvCAPKByTlv:(EMVOperation)emvOperation capkTlv:(NSString *)capkTlv; |
|---|---|
| Inputs | capkTlv |
| Outputs | None |
| Description | update emv configure by capkTlv |
| See also | onReturnUpdateEMVRIDResult<br><br>onReturnGetEMVListResult |

## 2.6.105 updateEmvAPP

| Signature | -(void)updateEmvAPP:(NSInteger )operationType data:(NSArray*)data block:(void (^)(BOOL isSuccess, NSString *stateStr))updateCAPKBlock; |
|---|---|
| Inputs | operationType、data |
| Outputs | Update result |
| Description | Update emv app configure |
| See also | onReturnUpdateEMVResult<br><br>onReturnGetEMVListResult |

## 2.6.106 updateEmvCAPK

| Signature | -(void)updateEmvCAPK:(NSInteger )operationType data:(NSArray *)data block:(void (^)(BOOL isSuccess, NSString *stateStr))updateCAPKBlock; |
|---|---|
| Inputs | operationType、data |
| Outputs | Update result |

| Description | update emv capk configure |
|---|---|
| See also | onReturnUpdateEMVRIDResult<br><br>onReturnGetEMVListResult |

## 2.6.107 lcdShowCustomDisplay

| Signature | -(void)lcdShowCustomDisplay:(LcdModeAlign) alcdModeAlign lcdFont:(NSString *)alcdFont delay:(NSInteger)timeout; |
|---|---|
| Inputs | alcdModeAlign、alcdFont、timeout |
| Outputs | None |
| Description | you can use it to show custom text on pos |
| See also | onLcdShowCustomDisplay |

## 2.6.108 lcdShowCloseDisplay

| Signature | -(void)lcdShowCloseDisplay; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Close the function of lcdShowCustomDisplay |

## 2.6.109 getUpdateProgress

| Signature | -(NSInteger)getUpdateProgress; |
|---|---|
| Inputs | None |
| Outputs | None |

| Description | you can use it to get progress of updating pos firmware |
|---|---|

## 2.6.110　updatePosFirmware

| Signature | -(NSInteger)updatePosFirmware:(NSData*)aData address:(NSString*)devAddress; |
|---|---|
| Inputs | Firmware data、bluetooth address |
| Outputs | None |
| Description | you can use it to update pos firmware |
| See also | onUpdatePosFirmwareResult |

## 2.6.111　syncGetPin

| Signature | -(NSDictionary*)syncGetPin:(NSInteger)encryptType keyIndex:(NSInteger)keyIndex maxLen:(NSInteger)maxLen typeFace:(NSString *)typeFace cardNo:(NSString *)cardNo date:(NSString *)data delay:(NSInteger)timeout; |
|---|---|
| Inputs | encryptType、keyIndex、maxLen、typeFace、cardNo、Data、timeout |
| Outputs | Get pin result |
| Description | Sync get pin block and pin ksn |

## 2.6.112　getICCTag

| Signature | -(NSDictionary *)getICCTag:(EncryptType)encryTypeStr cardType:(NSInteger)cardType tagCount:(NSInteger) mTagCount tagArrStr:(NSString*)mTagArrStr; |
|---|---|
| Inputs | encryTypeStr 、cardType("0" for ICC and "1" for NFC) 、mTagCount 、mTagArrStr |

| Outputs | Value of special emv tag |
|---|---|
| Description | you can use it to get value of special emv tag |

## 2.6.113　customInputDisplay

| Signature | -(void)customInputDisplay:(NSInteger)operationType displayType:(NSInteger)dispType maxLen:(NSInteger)maxLen DisplayString:(NSString *)displayStr delay:(NSInteger)timeout withResultBlock:(void (^)(BOOL isSuccess, NSString * result))customInputDisplayResult; |
|---|---|
| Inputs | operationType 、dispType 、maxLen、displayStr 、timeout |
| Outputs | Custom Input Display Result |
| Description | you can use it to custom input on pos |

## 2.6.114　isCardExist

| Signature | -(void)isCardExist:(NSInteger)timeout withResultBlock:(void (^)(BOOL))isCardExistBlock; |
|---|---|
| Inputs | timeout |
| Outputs | The result of checking card if exist |
| Description | Check card if exist |

## 2.6.115　isCardExistInOnlineProcess

| Signature | -(void)isCardExistInOnlineProcess:(NSInteger)timeout withResultBlock:(void (^)(BOOL))isCardExistBlock; |
|---|---|
| Inputs | timeout |
| Outputs | The result of Card Exist |

| Description | Check card if exist in this method "onRequestOnlineProcess" |
|---|---|

## 2.6.116   cbc_mac_cn_all

| Signature | -(void)cbc_mac_cn_all:(NSInteger)keyLen atype:(NSInteger)algorithmType otype:(NSInteger)operatorType data:(NSString *)dataStr delay:(NSInteger)timeout withResultBlock:(void (^)(NSString *))cbcmacBlock; |
|---|---|
| Inputs | keyLen、algorithmType、operatorType、dataStr、timeout |
| Outputs | The result of calculating mac |
| Description | Calculate mac |

## 2.6.117   getKsn

| Signature | -(void)getKsn:(void(^)(BOOL isSuccess,NSDictionary *dict))getKsnBlock; |
|---|---|
| Inputs | None |
| Outputs | Ksn |
| Description | Get Ksn |

## 2.6.118   getKeyCheckValue

| Signature | -(void)getKeyCheckValue:(CHECKVALUE_KEYTYPE)checkValueType keyIndex:(NSInteger)keyIndex; |
|---|---|
| Inputs | checkValueType、keyIndex |
| Outputs | None |
| Description | Get Key Check Value |

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| See also | onGetKeyCheckValue |
|---|---|

## 2.6.119    setBuzzerStatus

| Signature | -(void)setBuzzerStatus:(NSInteger)status; |
|---|---|
| Inputs | status |
| Outputs | None |
| Description | Set Buzzer Status |
| See also | onReturnBuzzerStatusResult |

## 2.6.120    setAESKey

| Signature | -(void)setAESKey:(NSString *)AESCiphertext CRC:(NSString *)CRC timeout:(NSInteger)timeout; |
|---|---|
| Inputs | AESCiphertext 、 CRC、timeout |
| Outputs | None |
| Description | Set AES Key |
| See also | onReturnSetAESResult |

## 2.6.121    getAESTransmissionKey

| Signature | -(void)getAESTransmissionKey:(NSInteger)timeout; |
|---|---|
| Inputs | timeout |
| Outputs | None |
| Description | Get AES Transmission Key |

| See also | onReturnAESTransmissonKeyResult |
|----------|----------------------------------|

## 2.6.122   getShutDownTime

| Signature | -(void)getShutDownTime; |
|-----------|--------------------------|
| Inputs | None |
| Outputs | None |
| Description | Get Shut Down Time |
| See also | onGetShutDownTime |

## 2.6.123   setPanStatus

| Signature | -(void)setPanStatus:(NSInteger )panStatus; |
|-----------|---------------------------------------------|
| Inputs | PanStatus_DEFAULT<br><br>PanStatus_PLAINTEXT<br><br>PanStatus_ENCRYPTED |
| Outputs | None |
| Description | Set Pan Status |

## 2.6.124   getDevicePublicKey

| Signature | -(void)getDevicePublicKey:(NSInteger)timeout; |
|-----------|------------------------------------------------|
| Inputs | timeout |
| Outputs | None |
| Description | Get Device Public Key |

| See also | onGetDevicePublicKey |
|----------|----------------------|

## 2.6.125   setShutDownTimeOnConnected

| Signature | -(void)setShutDownTimeOnConnected:(NSInteger)time; |
|-----------|-----------------------------------------------------|
| Inputs | time |
| Outputs | None |
| Description | Set Shut Down Time On Connected |
| See also | onReturnSetConnectedShutDownTimeResult |

## 2.6.126   getShutDownTimeOnConnected

| Signature | -(void)getShutDownTimeOnConnected; |
|-----------|-------------------------------------|
| Inputs | None |
| Outputs | None |
| Description | Get Shut Down Time On Connected |
| See also | onReturnGetConnectedShutDownTimeResult |

## 2.6.127   getCvmPinTryLimit

| Signature | -(NSInteger)getCvmPinTryLimit; |
|-----------|---------------------------------|
| Inputs | None |
| Outputs | Pin Try Limit |
| Description | Get Cvm Pin Try Limit |

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## 2.6.128 updateKeyByTR_31

| Signature | -(void)updateKeyByTR_31:(NSInteger)keyIndex keyBlock:(NSString *)keyBlock; <br> -(void)updateKeyByTR_31:(NSInteger)keyIndex keyBlock:(NSString *)keyBlock timeout:(NSInteger)timeout; |
|---|---|
| Inputs | keyIndex、keyBlock <br><br> timeout |
| Outputs | None |
| Description | Update Key By TR_31 |
| See also | onReturnUpdateKeyByTR_31Result |

## 2.6.129 generateSessionKeys

| Signature | -(void)generateSessionKeys; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Generate Session Keys |
| See also | onQposGenerateSessionKeysResult |

## 2.6.130 updateRSA

| Signature | -(void)updateRSA:(NSString *)publicKey pemFile:(NSString *)pemFile; |
|---|---|
| Inputs | publicKey、pemFile |
| Outputs | None |

| Description | Update RSA |
|---|---|
| See also | onDoSetRsaPublicKey |

## 2.6.131　getEncryptData

| Signature | -(void)getEncryptData:(NSData *)data keyType:(NSString*)keyType keyIndex:(NSString *)keyIndex timeOut:(NSInteger)timeout; |
|---|---|
| Inputs | Data、keyType、keyIndex、timeout |
| Outputs | None |
| Description | Get Encryp tData |
| See also | onReturnGetEncryptDataResult |

## 2.6.132　getMPUCardInfo

| Signature | -(void)getMPUCardInfo:(MPUInfoBlock)mpuInfoBlock; |
|---|---|
| Inputs | None |
| Outputs | MPU card Info |
| Description | Get MPU Card Info |

## 2.6.133　getMIccCardData

| Signature | -(void)getMIccCardData:(NSString *)transactionTime; |
|---|---|
| Inputs | transactionTime |
| Outputs | None |
| Description | Get ICC Data |

| See also | onRequestBatchData |
|---|---|

## 2.6.134   updateKeyByTR_31VersionD

| Signature | -(void)updateKeyByTR_31VersionD:(NSInteger)keyIndex ksn:(NSString *)ksn keyBlock:(NSString *)keyBlock; |
|---|---|
| Inputs | keyIndex、ksn、keyBlock |
| Outputs | Update result |
| Description | Update Key By TR_31VersionD |

## 2.6.135   powerOnFelica

| Signature | -(void)powerOnFelica:(NSInteger)timeout; |
|---|---|
| Inputs | timeout |
| Outputs | None |
| Description | Power On Felica |
| See also | onReturnPowerOnFelicaResult |

## 2.6.136   powerOffFelica

| Signature | -(void)powerOffFelica:(NSInteger)timeout; |
|---|---|
| Inputs | timeout |
| Outputs | None |
| Description | Power Off Felica |
| See also | onReturnPowerOffFelicaResult |

## 2.6.137  sendApduByFelica

| Signature | -(void)sendApduByFelica:(NSString *)apduString timeout:(NSInteger)timeout; |
|---|---|
| Inputs | apduString、timeout |
| Outputs | None |
| Description | Send Apdu By Felica |
| See also | onReturnPowerOffFelicaResult |

## 2.6.138  generateTransportKey

| Signature | -(void)generateTransportKey:(NSInteger)timeout dataBlock:(void(^)(NSDictionary *))dataBlock; |
|---|---|
| Inputs | timeout |
| Outputs | Transport Key |
| Description | Generate Transport Key |

## 2.6.139  sendCVV

| Signature | -(void)sendCVV:(NSString *)cvvStr resultBlock:(void(^)(BOOL))resultBlock; |
|---|---|
| Inputs | cvvStr |
| Outputs | Send CVV result |
| Description | Send CVV to terminal |

## 2.6.140  getEncryptedDataBlock

| Signature | -(void)getEncryptedDataBlock:(NSInteger)keyIndex dataBlock:(void(^)(NSDictionary *))dataBlock; |
|---|---|

| Inputs | keyIndex |
|---|---|
| Outputs | Encrypted Data Block |
| Description | Get Encrypted Data Block |

## 2.6.141   setIsSaveLog

| Signature | -(void)setIsSaveLog:(BOOL)IsSaveLog block:(void(^)(BOOL isSuccess,NSString *stateStr))IsSaveLogBlock; |
|---|---|
| Inputs | IsSaveLog |
| Outputs | result |
| Description | Set Is Save Log |

## 2.6.142   doTradeLogOperation

| Signature | -(void)doTradeLogOperation:(NSInteger)operationType data:(NSInteger)data block:(void(^)(BOOL isSuccess,NSInteger markType, NSDictionary *stateStr))doTradeLogBlock; |
|---|---|
| Inputs | operationType<br><br>data |
| Outputs | Get Trade Log |
| Description | Get Trade Log Operation |

## 2.7  Delegate Methods Reference

### 2.7.1  onRequestWaitingUser

| Signature | -(void) onRequestWaitingUser |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | In the callback to waiting user operating |
| See also | |

### 2.7.2  onQposIdResult

| Signature | -(void) onQposIdResult: (NSDictionary*)posId |
|---|---|
| Inputs | None |
| Outputs | posId; |
| Description | Callback of pos id response |
| See also | getQposId |

### 2.7.3  onQposInfoResult

| Signature | -(void) onQposInfoResult: (NSDictionary*)posInfoData |
|---|---|
| Inputs | None |
| Outputs | POS Information Data |
| Description | Callback of getQposInfo response |
| See also | getQposInfo |

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### 2.7.4   onDoTradeResult

| Signature | -(void) onDoTradeResult: (DoTradeResult)result DecodeData:(NSDictionary*)decodeData |
|---|---|
| Inputs | None |
| Outputs | result<br><br>decodeData |
| Description | The callback of transaction data |
| See also | doTrade<br><br>doEmvApp: (EmvOption)aemvOption |

### 2.7.5   onRequestSetAmount

| Signature | -(void) onRequestSetAmount |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | The callback of request user set amount |
| See also | doTrade()<br><br>-(void) setAmount: (NSString *)aAmount aAmountDescribe:(NSString *)aAmountDescribe currency:(NSString *)currency transactionType:(TransactionType)transactionType |

### 2.7.6   onRequestSelectEmvApp

| Signature | -(void) onRequestSelectEmvApp: (NSArray*)appList |
|---|---|
| Inputs | None |
| Outputs | appList |

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| Description | Callback method of request user to select emv app |
|---|---|
| See also | doTrade； <br><br> -(void) selectEmvApp: (NSInteger)index; <br><br> -(void) cancelSelectEmvApp; |

## 2.7.7 onRequestIsServerConnected

| Signature | -(void) onRequestIsServerConnected |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | In the method judge the network state |
| See also | doTrade <br><br> -(void) isServerConnected: (BOOL)isConnected; |

## 2.7.8 onRequestFinalConfirm

| Signature | -(void) onRequestFinalConfirm; |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Final confirm amount response |
| See also | doTrade <br><br> -(void) finalConfirm: (BOOL)isConfirmed; |

## 2.7.9 onRequestOnlineProcess

| Signature | -(void) onRequestOnlineProcess: (NSString*) tlv |
|---|---|
| Inputs | None |

| Outputs | Tlv    tag+length+value |
|---|---|
| Description | Response of request data to server |
| See also | doTrade<br><br>anlysEmvIccData<br><br>sendOnlineProcessResult |

## 2.7.10 onRequestTime

| Signature | -(void) onRequestTime |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Set terminal time response |
| See also | doTrade<br><br>sendTime |

## 2.7.11 onRequestTransactionResult

| Signature | -(void) onRequestTransactionResult:<br>(TransactionResult)transactionResult |
|---|---|
| Inputs | None |
| Outputs | None |
| Description | Transaction response |
| See also | doTrade |

## 2.7.12 onRequestTransactionLog

| Signature | -(void) onRequestTransactionLog: (NSString*)tlv |
|---|---|
| Inputs | None |

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| | |
|---|---|
| Outputs | Tlv tag+length+value |
| Description | reserve |
| See also | |

## 2.7.13 onRequestBatchData

| | |
|---|---|
| Signature | -(void) onRequestBatchData: (NSString*)tlv |
| Inputs | None |
| Outputs | Tlv tag+length+value |
| Description | Response of ICC transactions |
| See also | doTrade |

## 2.7.14 onRequestQposConnected

| | |
|---|---|
| Signature | -(void) onRequestQposConnected |
| Inputs | None |
| Outputs | None |
| Description | Callback of connected success |
| See also | connectBluetoothDevice |

## 2.7.15 onRequestQposDisconnected

| | |
|---|---|
| Signature | -(void) onRequestQposDisconnected |
| Inputs | None |
| Outputs | None |
| Description | Callback of disconnect |
| See also | disconnectBT |

### 2.7.16 onRequestNoQposDetected

| | |
|---|---|
| Signature | -(void) onRequestNoQposDetected |
| Inputs | None |
| Outputs | None |
| Description | Callback of connected fail |
| See also | connectBT |

### 2.7.17 onError

| | |
|---|---|
| Signature | -(void) onError: (Error)errorState |
| Inputs | None |
| Outputs | enum Error errorState error type information |
| Description | SDK error information response |
| See also | |

### 2.7.18 onRequestDisplay

| | |
|---|---|
| Signature | -(void) onRequestDisplay: (Display)displayMsg |
| Inputs | None |
| Outputs | enum Display displayMsg: display content |
| Description | Notify the terminal displays the current related content |
| See also | |

### 2.7.19 onRequestUpdateWorkKeyResult

| | |
|---|---|
| Signature | -(void) onRequestUpdateWorkKeyResult: |

| | (UpdateInformationResult)updateInformationResult |
|---|---|
| Inputs | None |
| Outputs | enum UpdateInformationResult result |
| Description | Update work key response |
| See also | udpateWorkKey |

## 2.7.20 onGetCardNoResult

| Signature | -(void) onGetCardNoResult:(NSString *)result |
|---|---|
| Inputs | None |
| Outputs | String result card no |
| Description | Get Card number response |
| See also | getCardNo |

## 2.7.21 onReturnReversalData

| Signature | -(void) onReturnReversalData: (NSString*)tlv |
|---|---|
| Inputs | None |
| Outputs | tlv : tag+length+value |
| Description | ic card reversal data response |
| See also | doEmvApp |

## 2.7.22 onReturnGetPinResult

| Signature | -(void) onReturnGetPinResult:(NSDictionary*)decodeData |
|---|---|
| Inputs | None |
| Outputs | pinKsn , pinBlock |

| Description | Get pin response |
|---|---|
| See also | getPin |

## 2.7.23 onReturnPowerOnIccResult

| Signature | -(void) onReturnPowerOnIccResult:(BOOL) isSuccess KSN:(NSString *) ksn ATR:(NSString *)atr ATRLen:(NSInteger)atrLen |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure<br><br>ksn: EMV KSN used for encryption of ATR data and APDU data. If<br><br>ksn is all FF, then ATR and APDU data are not encrypted.<br><br>atr: data returned in ATR<br><br>atrLen: length of the ATR data |
| Description | Respond to powerOnIcc. If ksn is all FF, then ATR and APDU are not<br><br>encrypted. Otherwise, ATR and APDU are encrypted by the key<br><br>derived from EMV KSN. |
| See also | powerOnIcc |

## 2.7.24 onReturnPowerOffIccResult

| Signature | -(void) onReturnPowerOffIccResult:(BOOL) isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | Respond to powerOffIcc. |
| See also | powerOffIcc |

### 2.7.25 onReturnApduResult

| Signature | -(void) onReturnApduResult:(BOOL)isSuccess APDU:(NSString *)apdu APDU_Len:(NSInteger) apduLen |
|---|---|
| Inputs | None |
| Outputs | isSuccess: true – success, false – failure<br><br>apdu: data returned<br><br>apduLength: length of the apdu data |
| Description | Return data in response to the level 1 EMV method sendApdu. If<br><br>the apdu data are encrypted, the KSN returned after the<br><br>powerOnIcc command is used for encryption. |
| See also | sendApduByNFC<br><br>sendApdu |

### 2.7.26 onReturnSetSleepTimeResult

| Signature | -(void)onReturnSetSleepTimeResult:(BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | isSuccess: true – success, false – failure |
| Description | The response of set device sleep time |
| See also | setPosSleepTime |

### 2.7.27 onRequestCalculateMac

| Signature | -(void)onRequestCalculateMac:(NSString *)calMacString |
|---|---|
| Inputs | None |
| Outputs | calMac: calculate mac result data |

| Description | Calculate mac response method |
|---|---|
| See also | doCalculateMac<br><br>doDoubleMac<br><br>doSingleMac |

## 2.7.28 onReturnCustomConfigResult

| Signature | -(void)onReturnCustomConfigResult:(BOOL)isSuccess config:(NSString*)resutl |
|---|---|
| Inputs | None |
| Outputs | isSuccess: true – success, false – failure<br><br>result : data of result |
| Description | Save Emv Config response |
| See also | updateEmvConfig |

## 2.7.29 onReturnSetMasterKeyResult

| Signature | -(void) onReturnSetMasterKeyResult: (BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | isSuccess: true – success, false – failure |
| Description | Set masterKey response |
| See also | setMasterKey |

## 2.7.30 onReturnBatchSendAPDUResult

| Signature | -(void) onReturnBatchSendAPDUResult:(NSDictionary *)apduResponses |
|---|---|
| Inputs | None |

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| Outputs | apduResponses |
|---|---|
| Description | Response of batch APDU instruction execution |
| See also | VIPOSBatchSendAPDU |

## 2.7.31 onReturniccCashBack

| Signature | -(void) onReturniccCashBack: (NSDictionary*)result |
|---|---|
| Inputs | None |
| Outputs | result |
| Description | Cash back response（Special needs） |
| See also | iccCashBack<br><br>getIccCardNo<br><br>inquireECQAmount |

## 2.7.32 onUpdatePosFirmwareResult

| Signature | -(void) onUpdatePosFirmwareResult:(UpdateInformationResult)result |
|---|---|
| Inputs | None |
| Outputs | enum UpdateInformationResult result |
| Description | Response of upgrade the firmware |
| See also | updatePosFirmware |

## 2.7.33 onReturnDownloadRsaPublicKey

| Signature | -(void) onDownloadRsaPublicKeyResult:(NSDictionary *)result |
|---|---|
| Inputs | None |

| Outputs | result |
|---|---|
| Description | Callback of encrypt random number using RSA public key |
| See also | downloadRsaPublicKey |

## 2.7.34 onPinKey_TDES_Result

| Signature | -(void) onPinKeyTDESResult:(NSString *)encPin |
|---|---|
| Inputs | None |
| Outputs | result: data of response |
| Description | Response of 3DES encrypt pin |
| See also | pinKey_TDES |

## 2.7.35 onUpdateMasterKeyResult

| Signature | -(void) onUpdateMasterKeyResult:(BOOL)isSuccess aDic:(NSDictionary *)resultDic |
|---|---|
| Inputs | None |
| Outputs | (BOOL)isSuccess aDic:(NSDictionary *)resultDic |
| Description | Update masterKey response |
| See also | updateMasterKeyRandom updateMasterKey |

## 2.7.36 onEmvICCExceptionData

| Signature | void onEmvICCExceptionData (String tlv) |
|---|---|
| Inputs | None |
| Outputs | Tlv : tag+length+value |
| Description | Emv ICC Exception response |

| See also | |
|---|---|
| | |

## 2.7.37 onSearchMifareCardResult

| Signature | - (void) onSearchMifareCardResult:(NSDictionary *)result |
|---|---|
| Inputs | None |
| Outputs | cardData:Return polled card data<br>example:<br><br>String statuString=cardData.get("status");<br><br>String cardTypeString=cardData.get("cardType");<br><br>String cardUidLen=cardData.get("cardUidLen");<br><br>String cardUid=cardData.get("cardUid");<br><br>String cardAtsLen=cardData.get("cardAtsLen");<br><br>String cardAts=cardData.get("cardAts");<br><br>String ATQA=cardData.get("ATQA");<br><br>String SAK=cardData.get("SAK"); |
| Description | The response of doMifareCard:"01" timeout:(int)timeout; |
| See also | |

## 2.7.38　onVerifyMifareCardResult

| Signature | - (void) onVerifyMifareCardResult:(BOOL)result |
|---|---|
| Inputs | None |
| Outputs | result:M1 card verification password operation result |
| Description | The response of doMifareCard:"02" timeout:(int)timeout; |
| See also | |

## 2.7.39  onReadMifareCardResult

| Signature | - (void) onReadMifareCardResult:(NSDictionary *)result |
|---|---|
| Inputs | None |
| Outputs | result:M1 card read data operation results<br><br>example:<br><br>String statuString=cardData.get("status");<br><br>String addr = arg0.get("addr"); //block addr<br><br>String cardDataLen = arg0.get("cardDataLen");<br><br>String cardData = arg0.get("cardData"); |
| Description | The response of doMifareCard:"03"  timeout:(int)timeout; |
| See also | |

## 2.7.40  onWriteMifareCardResult

| Signature | - (void) onWriteMifareCardResult:(BOOL)result |
|---|---|
| Inputs | None |
| Outputs | result:M1 card write data operation results |
| Description | The response of doMifareCard:"04"  timeout:(int)timeout; |
| See also | |

## 2.7.41 onOperateMifareCardResult

| Signature | - (void) onOperateMifareCardResult:(NSDictionary *)result |
|---|---|
| Inputs | None |

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| Outputs | result:M1 card addition, impairment, storage operation results<br><br>example:<br><br>String cmd = arg0.get("Cmd");<br><br>String blockAddr = arg0.get("blockAddr"); |
|---------|---|
| Description | cmd = "add" / "reduce" / "restore"<br><br>The response of doMifareCard("05"+cmd, int timeout) |
| See also | |

## 2.7.42   getMifareCardVersion

| Signature | - (void)getMifareCardVersion:(NSDictionary *)result |
|-----------|---|
| Inputs | None |
| Outputs | arg0: Ul card gets the result of the version information operation<br><br>example:<br><br>String verLen = arg0.get("versionLen");<br><br>String ver = arg0.get("cardVersion"); |
| Description | The response of doMifareCard:"06"   timeout:(int)timeout; |
| See also | |

## 2.7.43   getMifareReadData

| Signature | - (void)getMifareReadData:(NSDictionary *)result |
|-----------|---|
| Inputs | None |
| Outputs | result:Ul card read data operation results |

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| | |
|---|---|
| | example:<br><br>String blockAddr = arg0.get("blockAddr");<br><br>String dataLen = arg0.get("dataLen");<br><br>String cardData = arg0.get("cardData"); |
| Description | The response of doMifareCard:"07" timeout:(int)timeout; |
| See also | |

## 2.7.44 getMifareFastReadData

| | |
|---|---|
| Signature | - (void)getMifareFastReadData:(NSDictionary *)result |
| Inputs | None |
| Outputs | result:Ul card fast read operation results<br><br>example:<br><br>String startAddr = arg0.get("startAddr");<br><br>String endAddr = arg0.get("endAddr");<br><br>String dataLen = arg0.get("dataLen");<br><br>String cardData = arg0.get("cardData"); |
| Description | The response of doMifareCard:"08" timeout:(int)timeout; |
| See also | |

## 2.7.45 writeMifareULData

| | |
|---|---|
| Signature | - (void)writeMifareULData:(NSString *)result |
| Inputs | None |
| Outputs | result:Ul card write data operation results |

| Description | The response of doMifareCard:"0B" timeout:(int)timeout; |
|---|---|
| See also | |

## 2.7.46   verifyMifareULData

| Signature | - (void)verifyMifareULData:(NSDictionary *)result |
|---|---|
| Inputs | None |
| Outputs | result:Ul card verification password operation result example: String dataLen = arg0.get("dataLen"); String pack = arg0.get("pack"); |
| Description | The response of doMifareCard:"0D" timeout:(int)timeout; |
| See also | |

## 2.7.47   onFinishMifareCardResult

| Signature | - (void) onFinishMifareCardResult:(BOOL)result |
|---|---|
| Inputs | None |
| Outputs | result:End the result of the mifare communication operation |
| Description | The response of doMifareCard:"0E" timeout:(int)timeout; |
| See also | |

## 2.7.48   batchReadMifareCardResult

| Signature | - (void) batchReadMifareCardResult:(NSDictionary *)result |
|---|---|
| Inputs | None |

| Outputs | result:Mifare M1 batch card reading operation results<br><br>example:<br><br>List<String> data = table.get("data")<br>String format：addr:statusCode:readData |
|---|---|
| Description | The response of doMifareCard:"10 InstructionSet"<br>timeout:(int)timeout; |
| See also | |

## 2.7.49  batchWriteMifareCardResult

| Signature | - (void) batchWriteMifareCardResult:(NSDictionary *)result |
|---|---|
| Inputs | None |
| Outputs | Same batch read operation |
| Description | The response of doMifareCard:"11 InstructionSet"<br>timeout:(int)timeout; |
| See also | |

## 2.7.50  onReturnUpdateEMVRIDResult

| Signature | -(void)onReturnUpdateEMVRIDResult:(BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – fail |
| Description | The response of updateEMVRID |

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## 2.7.51 onLcdShowCustomDisplay

| Signature | -(void)onLcdShowCustomDisplay: (BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of lcdShowCustomDisplay |

## 2.7.52 onGetKeyCheckValue

| Signature | -(void)onGetKeyCheckValue:(NSDictionary *)checkValueResult |
|---|---|
| Inputs | None |
| Outputs | checkValueResult |
| Description | The response of Get Key Check Value |

## 2.7.53 onGetShutDownTime

| Signature | -(void)onGetShutDownTime:(NSString *)time |
|---|---|
| Inputs | None |
| Outputs | time |
| Description | The response of get Shut Down Time |

## 2.7.54 onGetDevicePublicKey

| Signature | -(void)onGetDevicePublicKey:(NSString *)clearKeys |
|---|---|
| Inputs | None |

| Outputs | clearKeys |
|---|---|
| Description | The response of get Device Public Key |

## 2.7.55   onReturnUpdateKeyByTR_31Result

| Signature | -(void)onReturnUpdateKeyByTR_31Result:(BOOL)result |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of update key by TR_31 |

## 2.7.56   onQposGenerateSessionKeysResult

| Signature | -(void)onQposGenerateSessionKeysResult:(NSDictionary *)result |
|---|---|
| Inputs | None |
| Outputs | result |
| Description | The response of update key by TR_31 |

## 2.7.57   onReturnGetEncryptDataResult

| Signature | -(void)onReturnGetEncryptDataResult:(NSDictionary*)tlv |
|---|---|
| Inputs | None |
| Outputs | Tlv: tag+length+value |
| Description | The response of get encrypt data |

### 2.7.58  onReturnPowerOnFelicaResult

| Signature | -(void)onReturnPowerOnFelicaResult:(FelicaStatusCode)result |
|---|---|
| Inputs | None |
| Outputs | result |
| Description | The response of Power On Felica |

### 2.7.59  onReturnPowerOffFelicaResult

| Signature | -(void)onReturnPowerOffFelicaResult:(FelicaStatusCode)result |
|---|---|
| Inputs | None |
| Outputs | result |
| Description | The response of Power Off Felica |

### 2.7.60  onReturnSendApduFelicaResult

| Signature | -(void)onReturnSendApduFelicaResult:(FelicaStatusCode)result responseLen:(NSString *)responseLen responseData:(NSString *)responseData |
|---|---|
| Inputs | None |
| Outputs | Result、responseLen、responseData |
| Description | The response of send apdu Felica |

### 2.7.61  onAsyncResetPosStatus

| Signature | -(void)onAsyncResetPosStatus:(NSString *)isReset |
|---|---|
| Inputs | None |

| Outputs | Reset |
|---|---|
| Description | The response of setPosSleepTime |

## 2.7.62   onReturnUpdateEMVResult

| Signature | -(void)onReturnUpdateEMVResult:(BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of updateEmvAPPByTlv and updateEmvAPP |

## 2.7.63   onReturnGetEMVListResult

| Signature | -(void)onReturnGetEMVListResult:(NSString *)result |
|---|---|
| Inputs | None |
| Outputs | result |
| Description | The response of updateEmvAPPByTlv &updateEmvCAPKByTlv&updateEmvAPP&updateEmvCAPK |

## 2.7.64   onReturnBuzzerStatusResult

| Signature | -(void)onReturnBuzzerStatusResult:(BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | callback of Setting whether the buzzer |

### 2.7.65 onReturnSetAESResult

| Signature | -(void)onReturnSetAESResult:(BOOL)isSuccess resultStr:(NSString *)result |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of set AES |

### 2.7.66 onReturnAESTransmissonKeyResult

| Signature | -(void)onReturnAESTransmissonKeyResult:(BOOL)isSuccess resultStr:(NSString *)result |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of getAESTransmissionKey |

### 2.7.67 onReturnSetConnectedShutDownTimeResult

| Signature | -(void)onReturnSetConnectedShutDownTimeResult:(BOOL)isSuccess |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of setShutDownTimeOnConnected |

### 2.7.68 onReturnGetConnectedShutDownTimeResult

| Signature | -(void)onReturnGetConnectedShutDownTimeResult:(NSString *)time |
|---|---|
| Inputs | None |

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| Outputs | result: true – success, false – failure |
|---|---|
| Description | The response of getShutDownTimeOnConnected |

## 2.7.69  onDoSetRsaPublicKey

| Signature | -(void)onDoSetRsaPublicKey:(BOOL)result |
|---|---|
| Inputs | None |
| Outputs | result: true – success, false – failure |
| Description | The response of update RSA |