Advanced Card Systems Ltd.
Card & Reader Technologies

ACR3x
Mobile Card Reader

User Manual V1.00

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1.0. Introduction

The ACR3x Mobile Card Reader serves as an interface for the communication between a mobile device and a magnetic stripe card or smart card. Different types of cards have different communication protocols which, in most cases, prevent direct communication between a card and a mobile device.The ACR3x Mobile Card Reader establishes a uniform interface from the mobile device to the card. By taking care of the card's particulars, it releases the computer software programmer from being responsible with the operations' technical details, which in many cases, are not relevant to the implementation of the card system.

This document contains information regarding the installation and workflow of demo included in the Android™ and iOS library of the ACR3x Mobile Card Reader.
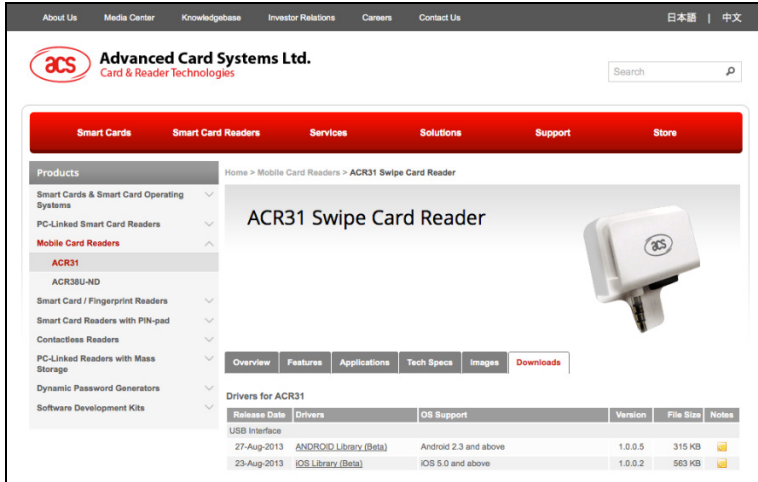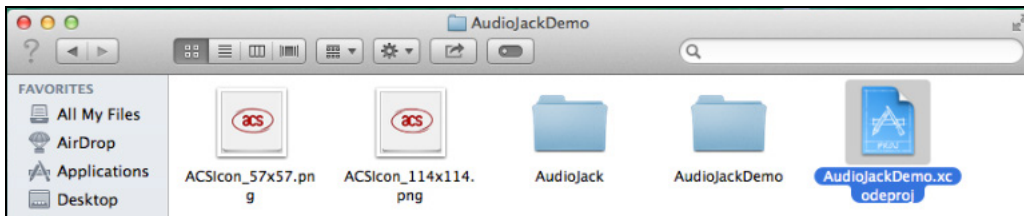
2.0. Installing the demo application

2.1. For iOS

1. Download the device library from the link below:

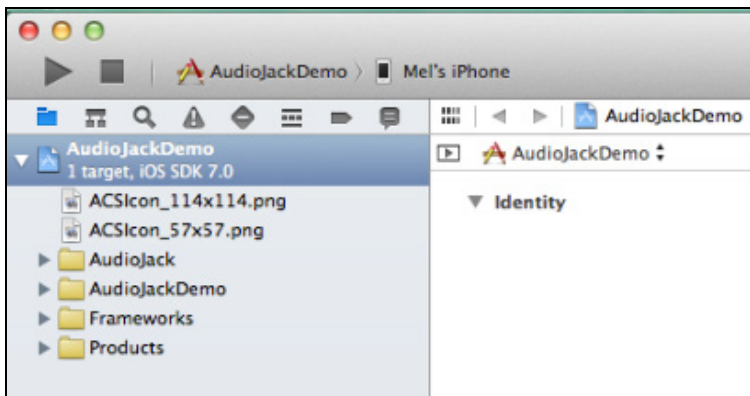   http://acs.com.hk/en/products/227/acr31-swipe-card-reader/.

2. Using XCode application, open the *AudioJackDemo.xcodeproj*.
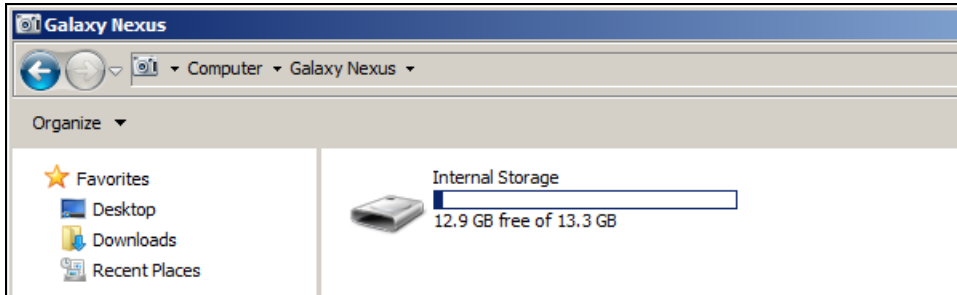

3. Transfer the *AudioJackDemo.xcodeproj* to your mobile device by choosing your mobile device and then clicking the play button.

   Note: *Make sure that your mobile device is connected to your computer.*
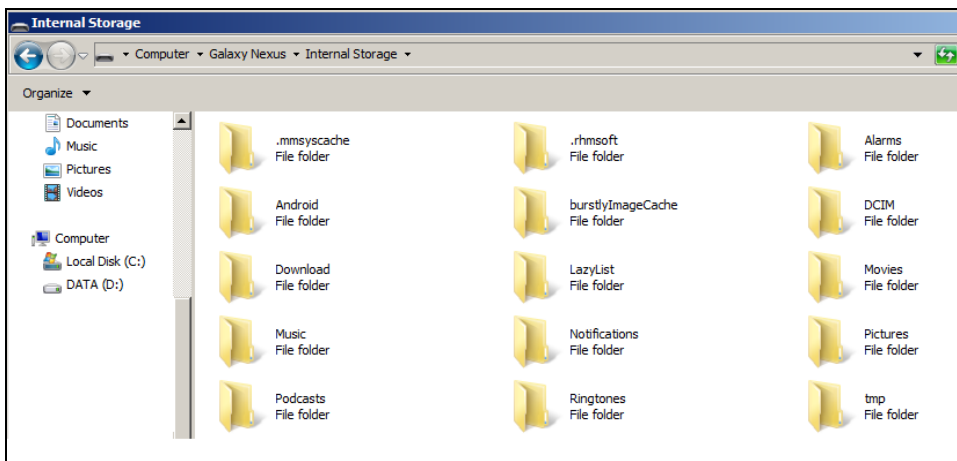
2.2. For Android™

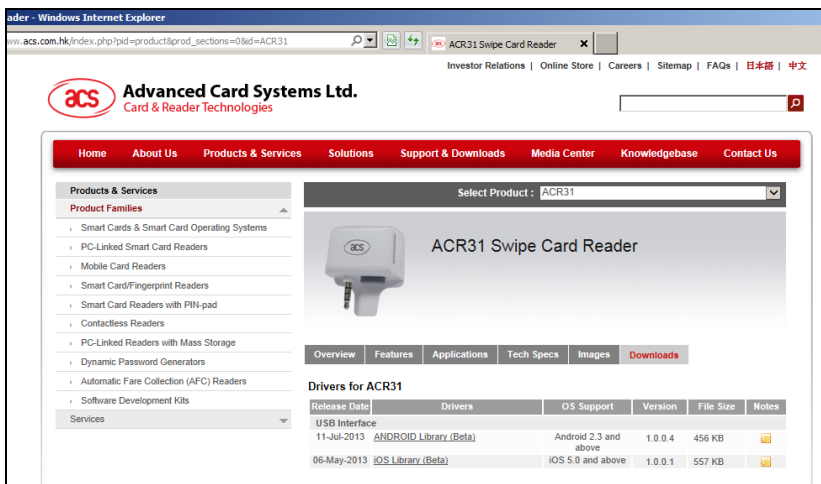1. Connect your mobile device to the computer.

2. In the internal storage of your device, create a folder where the ACR31 Android demo will be placed.
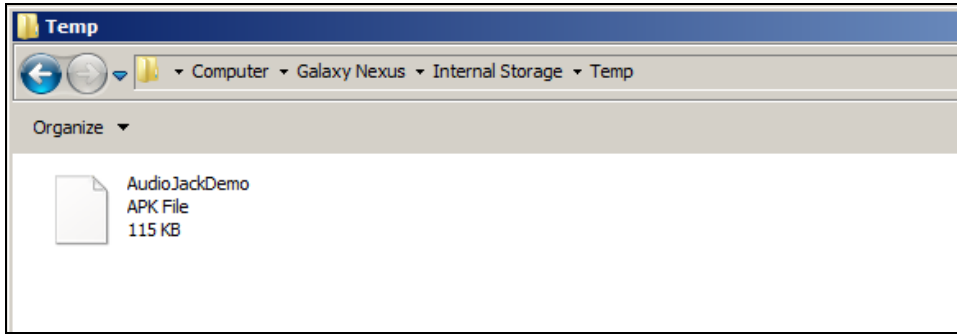

3. Download the ACR31 Android library from the link below:

http://www.acs.com.hk/index.php?pid=product&prod_sections=0&id=ACR31
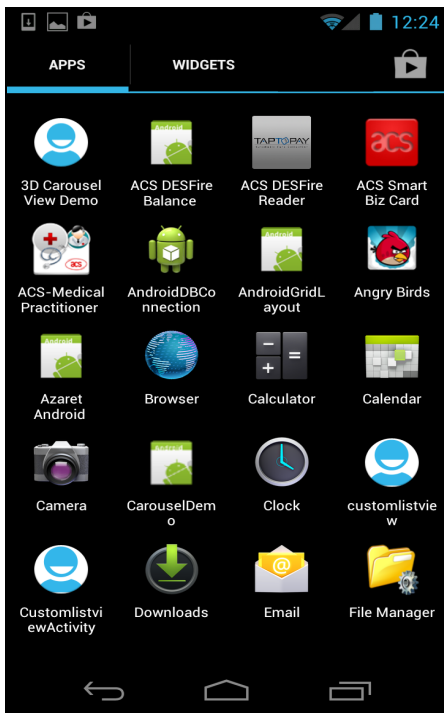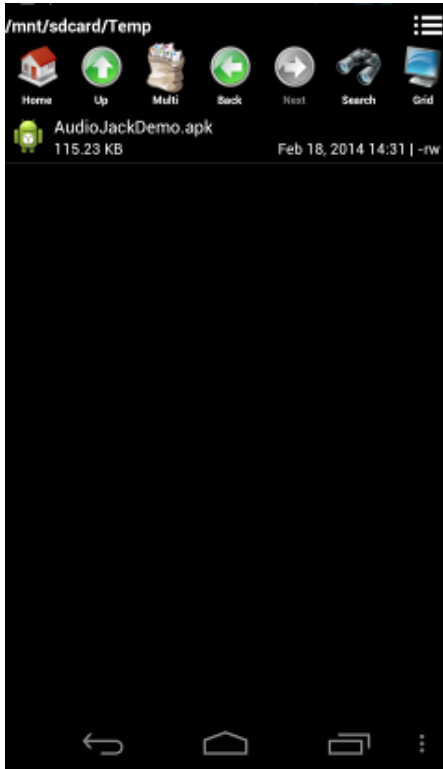
4. Copy the *AudioJackDemo.apk* file from the downloaded ACR31 Android library into the previously created folder.

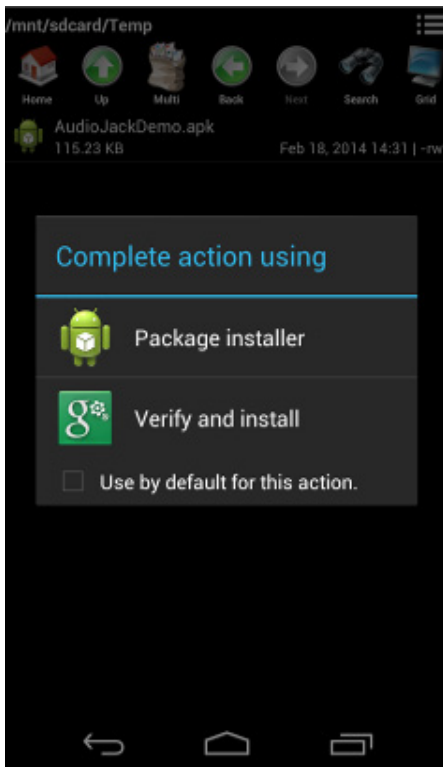5. Disconnect your mobile device from the computer, and then locate the *AudioJackDemo.apk* using a file manager application.
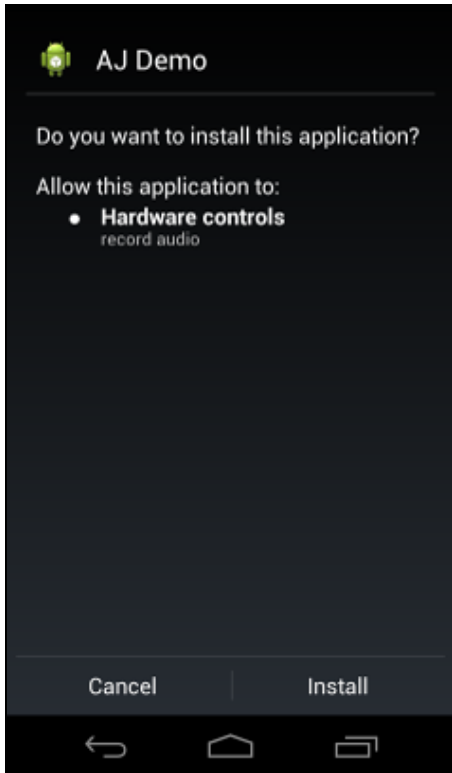
6. Tap the *AudioJackDemo.apk* file to start the installation process.
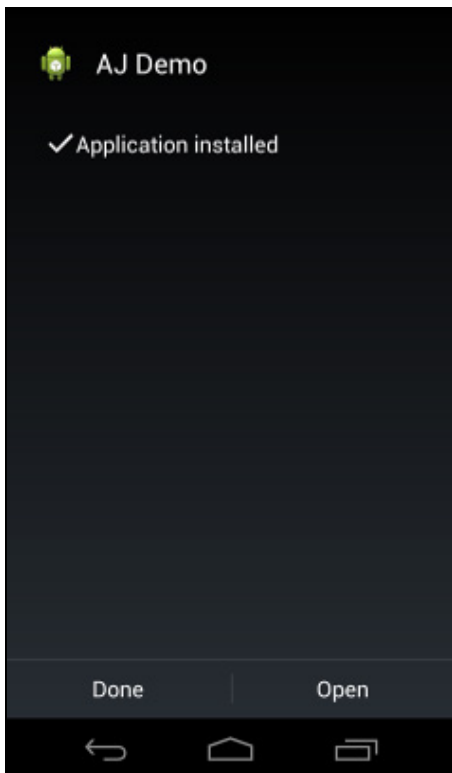

7. Complete the action using **Package Installer**.

8. A prompt will ask for hardware control access. Tap **Install** to proceed.

9. Once the installation is complete, you may now open the AJ Demo application.

3.0. Using the application with ACR31 mobile card reader

This section provides a simple step-by-step procedure on how to use the ACR31 mobile card reader with a magnetic stripe card using the AudioJack demo application.

3.1. Using a magnetic stripe card

1. Connect the ACR31 to the audio port of your mobile device.

   Note: Make sure that the volume is set to its maximum level to allow communication between the ACR31 reader and your mobile device.

2. Open the **AJ Demo application**.
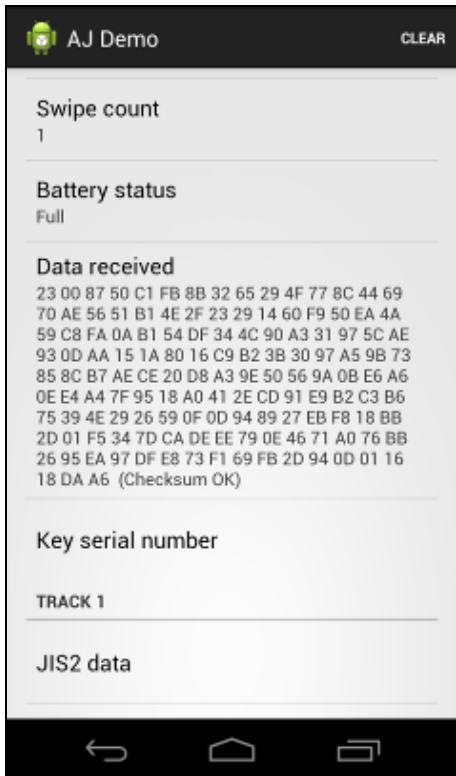
3. The reader is in sleep mode by default. Tap **Reset** to wake up the reader.

   Note: By default, the reader will enter sleep mode if there is no operation after 4 seconds.
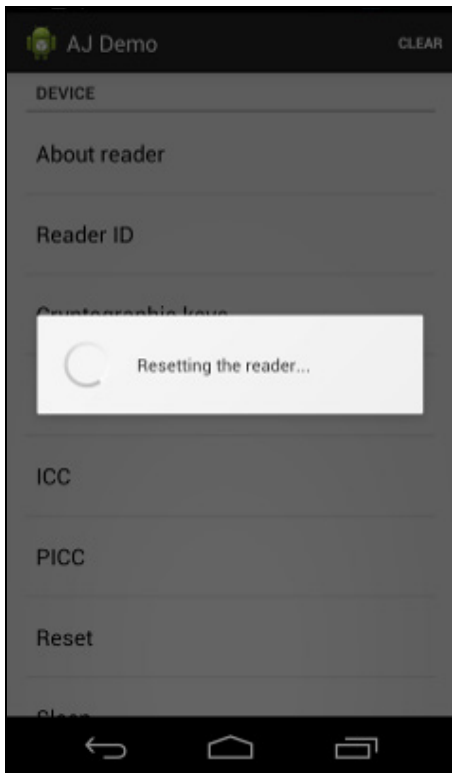
4. Swipe your magnetic stripe card to the reader. The reader and card details will be displayed on the screen.

5. Tap **About reader** to know more about the firmware version, battery status and sleep timeout.
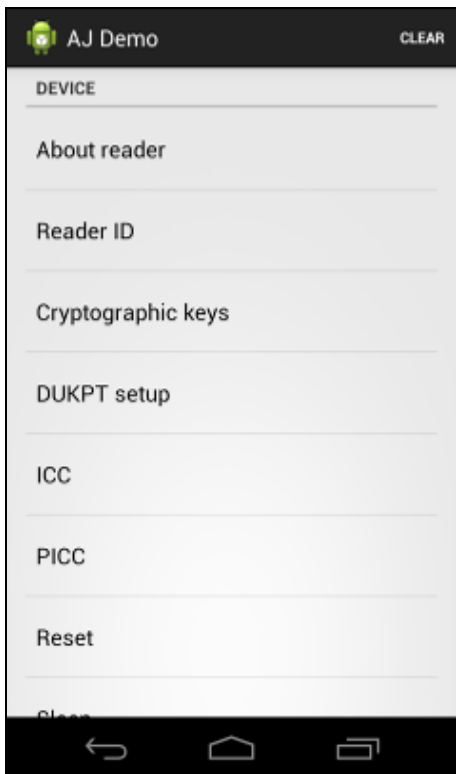
3.1.1. Getting the firmware version

To get the reader's firmware version:

1. Go to **About reader**, and then tap **Get firmware version**.

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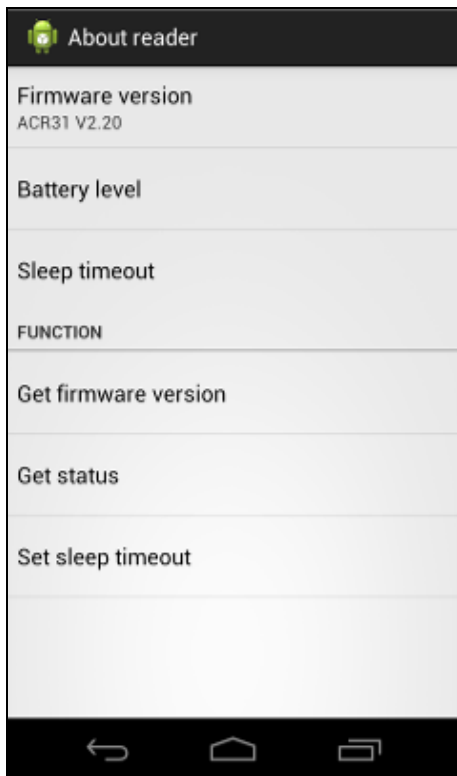
3.1.2. Getting the battery status

To get the battery status:

1. Go to **About reader**, and then tap **Get status**.
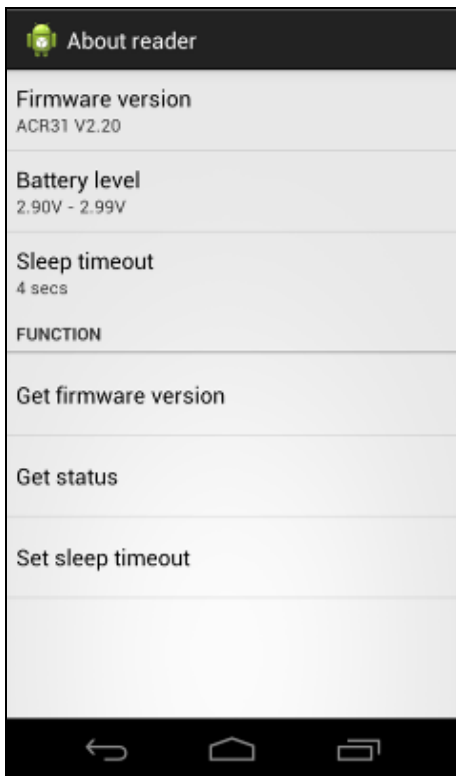
3.1.3. Setting the sleep timeout

To set the sleep timeout:

1. Go to **About reader**, and then tap **Sleep timeout**.
2. Enter a value between 4 and 20, and then tap **OK**.
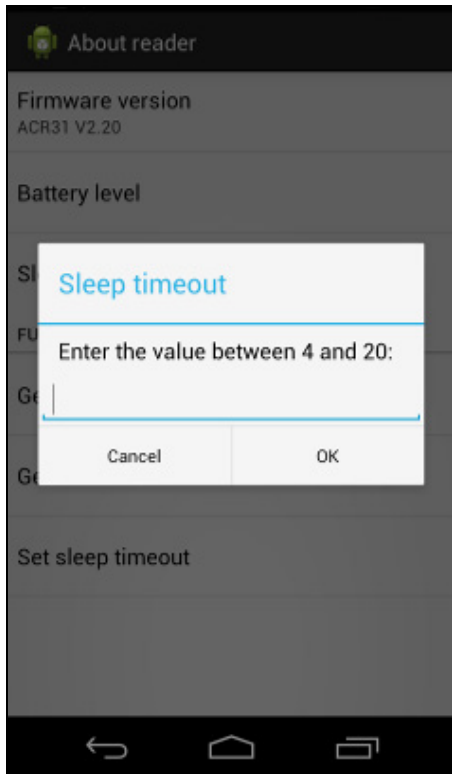
3.1.3.1.   Customizing ID

To change the Custom ID:

1. Go to **Reader ID**, and then tap **Set custom ID**.
2. Type in your preferred ID text, and then tap **OK**.
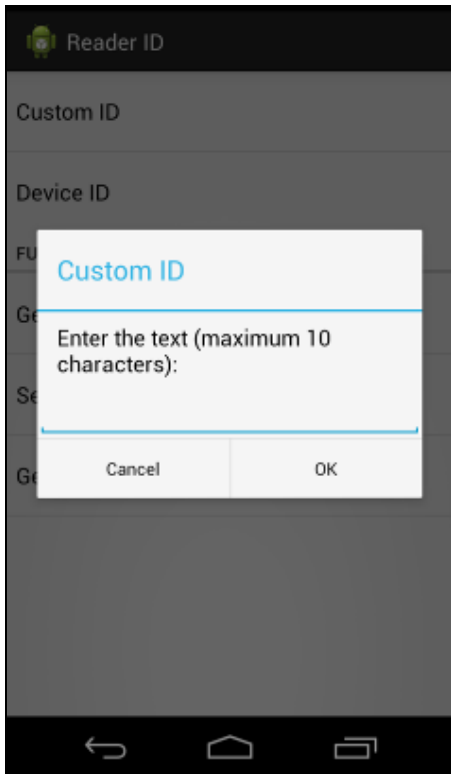
3.1.3.2. Getting the Device ID

To get the Device ID:

1. Go to **Reader ID**, and then tap **Get device ID**.
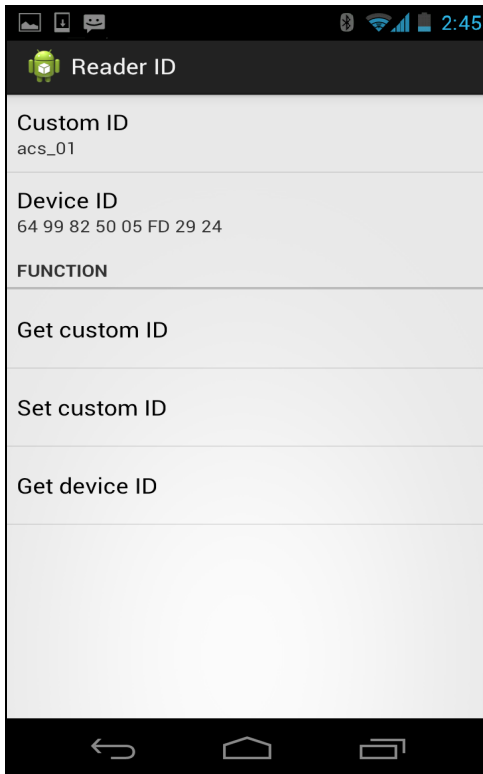
3.1.3.3. Changing the master key

To change the master key:

1. Go to **Cryptographic keys**, and then tap **Master key**.
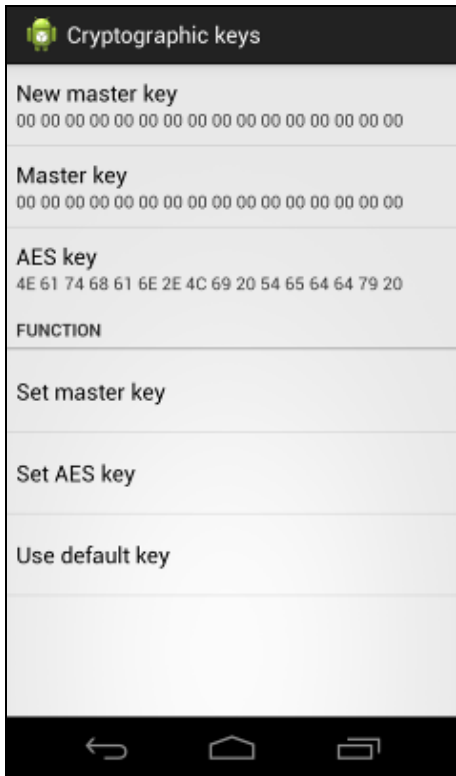
2. Type in your preferred value (in hexadecimal format), and then tap **OK**.

3. To set the keys back to its default value, tap **Use default key**.

3.1.3.4. Changing the AES key

To change the AES key:

1. Go to **Cryptographic keys**, and then tap **AES Key.**

2. Type in your preferred value (in hexadecimal format), and then tap **OK**.
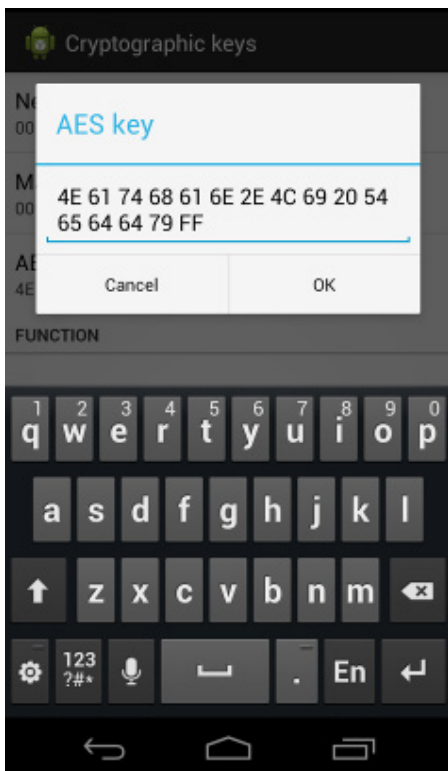
3. To set the keys back to its default state, tap **Use default key**.
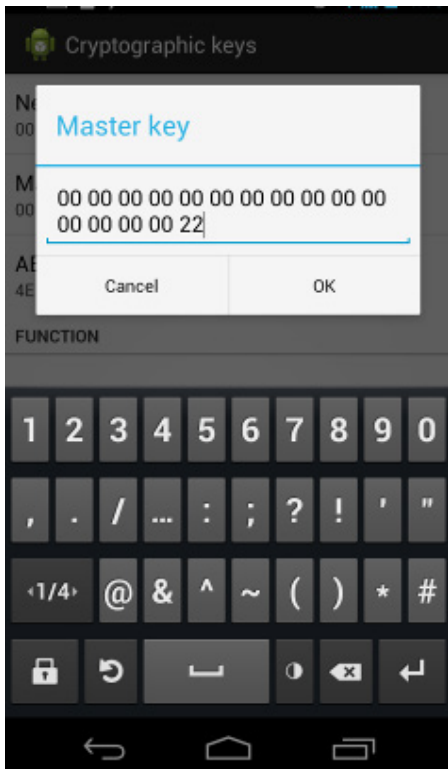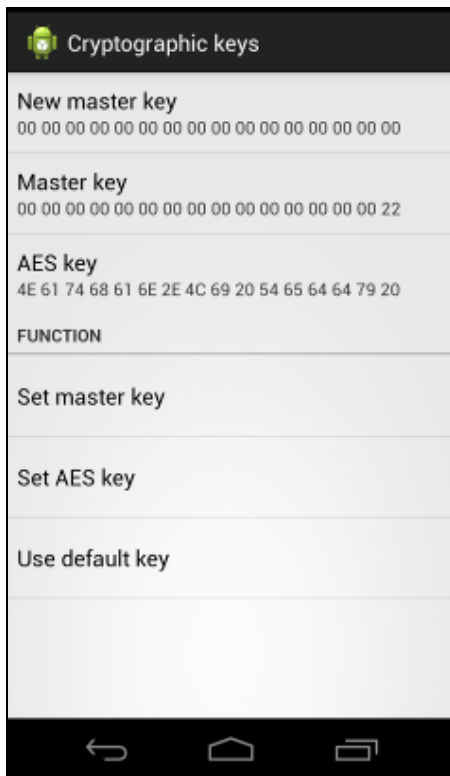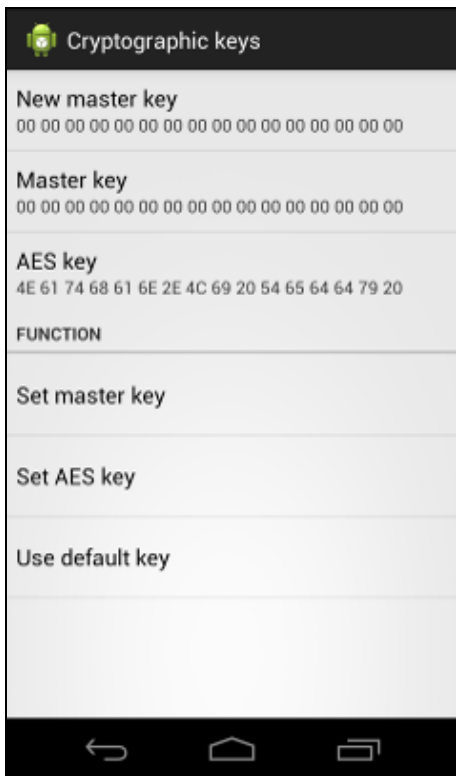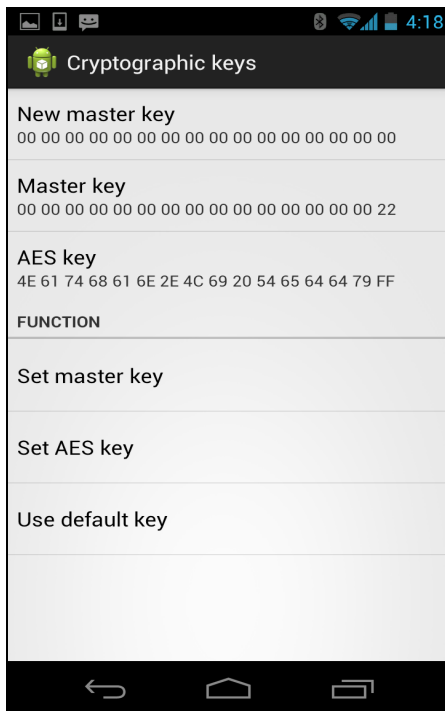
4.0. Using the application with ACR32 mobile card reader

This section provides a simple step-by-step procedure on how to use the ACR32 mobile card reader with various card types using the AudioJack demo application.

4.1. Using a magnetic stripe card

For instructions on how to use a magnetic stripe card with ACR32, please refer to **Section 3.1** of this document.

4.2. Using a contact smart card (ICC)

1. Connect the ACR32 to the audio port of your mobile device.

   Note: Make sure that the volume is set to its maximum level to allow communication between the ACR32 reader and your mobile device.

2. Tap **ICC** to explore the functions of a contact smart card.
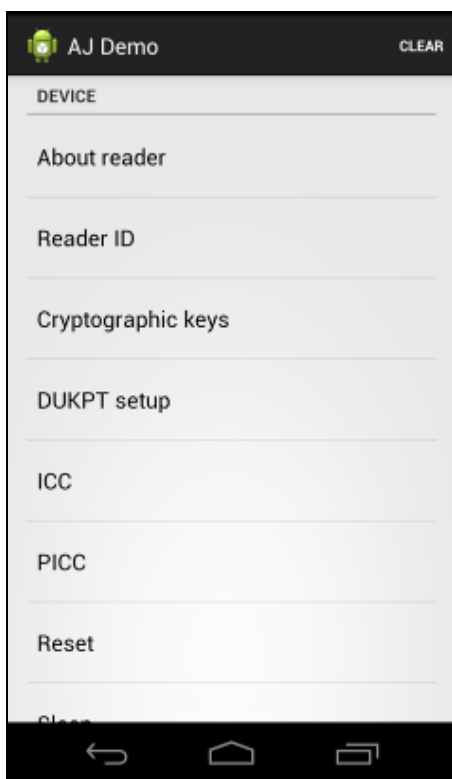
4.2.1. Changing the timeout setting

To change the timeout setting of the reader:

1. Go to **ICC**, and then tap **Wait timeout**.
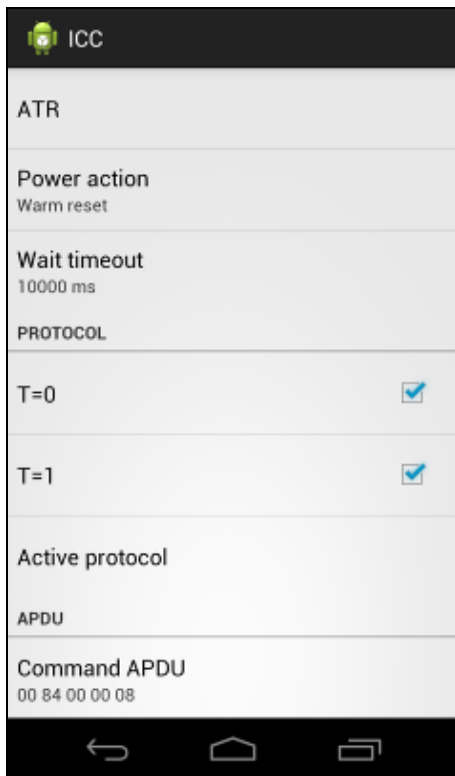
2. Type in your preferred value, and then tap **OK**.
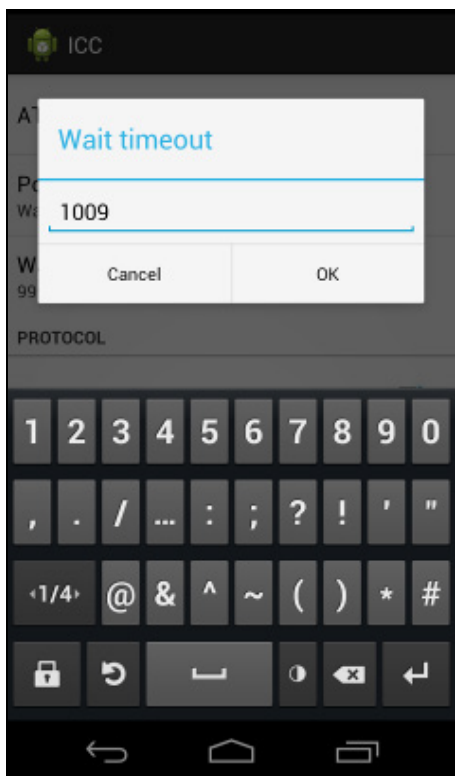
4.2.2. Getting the ATR

To get the ATR of the card:

1. Go to **ICC**.

2. Tap **Reset**, and then tap **Power** to wake up the smart card.

3. Insert the smart card to the ACR32 to display the ATR.

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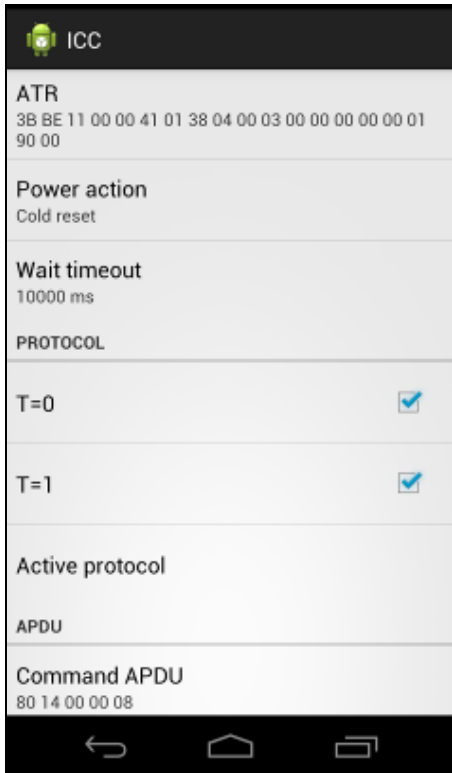
4.2.3. Transmitting command APDU

To send message to the card:

1. Go to **ICC**.

2. Under **APDU**, tap **Command APDU**.

3. Type in the command (in hexadecimal format), and then tap **OK**.

    Note: For the list of APDU commands, please refer to the Reference Manual of the card in use.
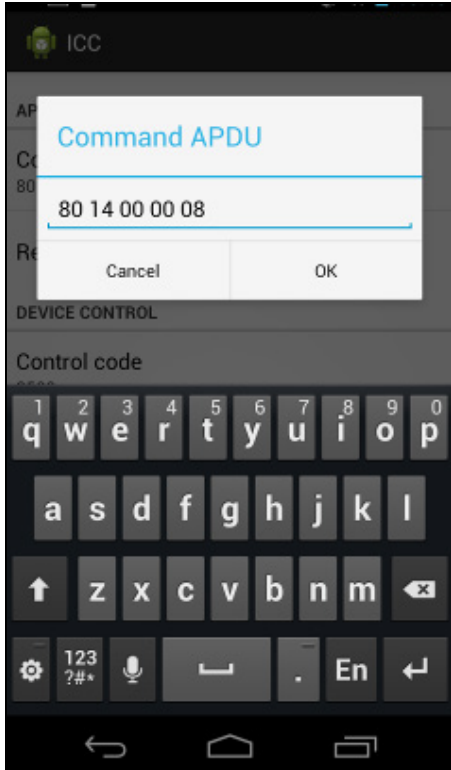
4. Tap **Reset**, and then tap **Power** to wake up the smart card.

5. Under **Function**, tap **Transmit** to execute the APDU command. The reponse will be displayed under Response APDU.

4.2.4. Executing a command

To send message to the reader:

1. Go to **ICC**, and then tap **Control Command**.

2. Type in the command (in hexadecimal format), and then tap **OK**.

    Note: For a list of APDU commands, please refer to the Reference Manual of ACR32 mobile card reader.

3. Tap **Reset**, and then tap **Power** to wake up the smart card.

4. Tap **Control** to execute the APDU command. The reponse will be displayed under **Control Response**.

5.0. Using the application with ACR35 mobile card reader

This section provides a simple step-by-step procedure on how to use the ACR35 mobile card reader with various card types using the AudioJack demo application.

5.1. Using a magnetic stripe card

For instructions on how to use a magnetic stripe card with ACR35, please refer to **Section 3.1** of this document.

5.2. Using a contactless smart card (PICC)

1. Connect the ACR35 to the audio port of your mobile device.

   Note: Make sure that the volume is set to its maximum level to allow communication between the ACR31 reader and your mobile device.

2. Tap **PICC** to explore the functions of a contactless smart card.
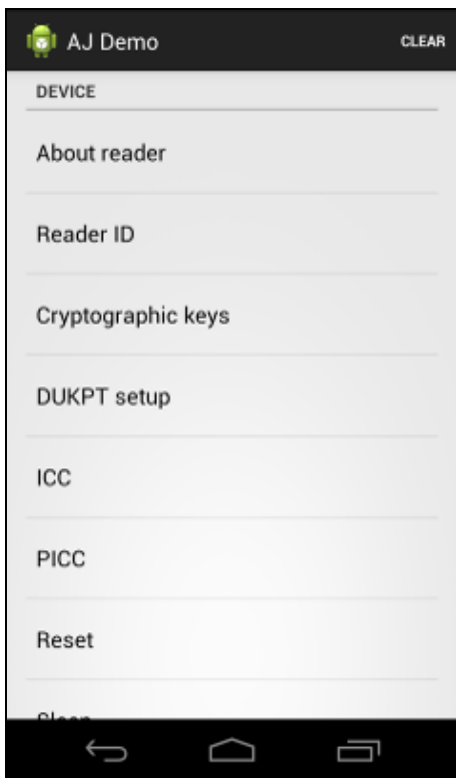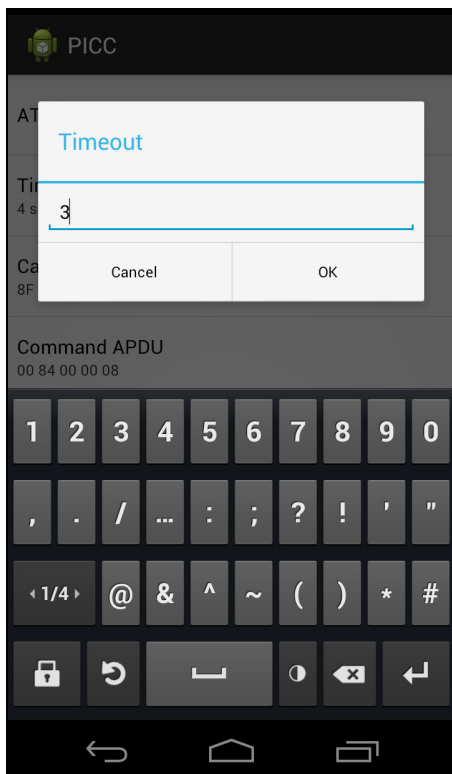
5.2.1. Changing the timeout setting

Timeout is the value of response time (in seconds) before a card starts to poll. To change the timeout setting of the reader:

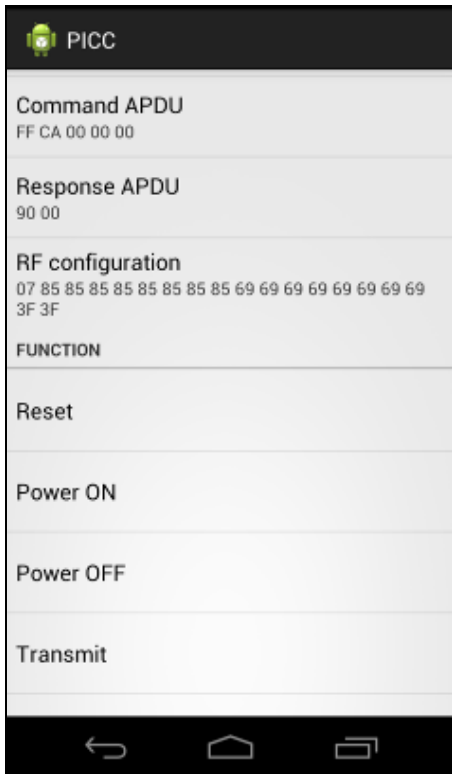1. Go to **PICC**, and then tap **Timeout**.

2. Type in a value between 1 to 5, and then tap **OK**.

5.2.2. Getting the ATR

To get the ATR of the card:

1. Go to **PICC**.

2. Tap **Reset**, and then tap **Power ON** to power up the reader.

3. Quickly tap the contactless smart card to the ACR35 to display the ATR of the card.
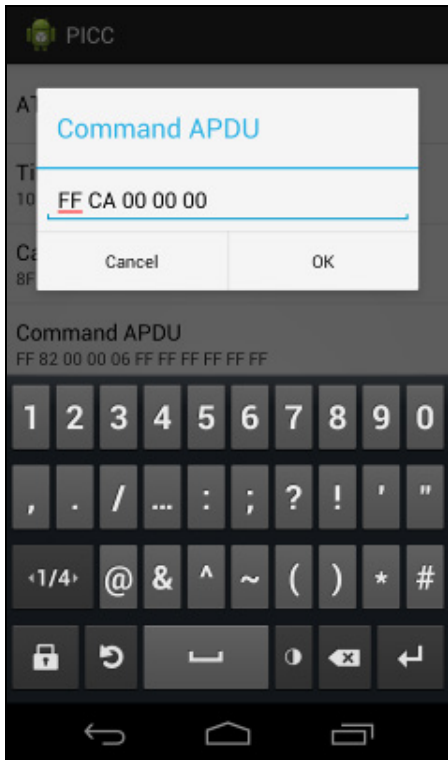
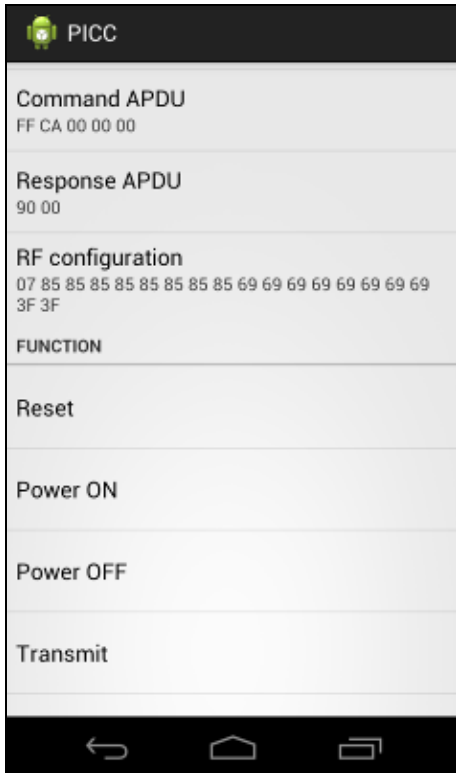### 5.2.3. Transmitting command APDU

To send message to the card:

1. Go to **PICC**, and then tap **Command APDU**.

2. Type in the command (in hexadecimal), and then tap **OK**.

   Note: For a list of APDU commands, please refer to the Reference Manual of the card in use.

3. Tap **Reset**, and then tap **Power ON** to wake up the reader and start polling.

4. Tap **Transmit**, and then quickly tap the contactless smart card to the ACR35 to send the APDU command. The response will be displayed under Response APDU.

5.2.4. Configuring radio frequency

The RF Configuration sets the antenna setting parameter. For more information, please contact ACS.

FCC Caution:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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