AB1565/AB1568 FOTA Application Note

Version: 1.1
Release date: 22 January 2021

Document revision history

Revision	Date	Description
1.0	15 June 2020	Initial version
1.1	22 January 2021	Added selecting the FOTA package in local path for iOS user guide

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Lists of tables and figures

1. Introduction

1.1. Overview

This FOTA application note contains the following information:

The Firmware Over-the-Air (FOTA) application process;

How to generate the FOTA package;

Android FOTA application user guide; and

iOS FOTA application user guide.

2. FOTA Application Flow

2.1. Flow chart for a single device

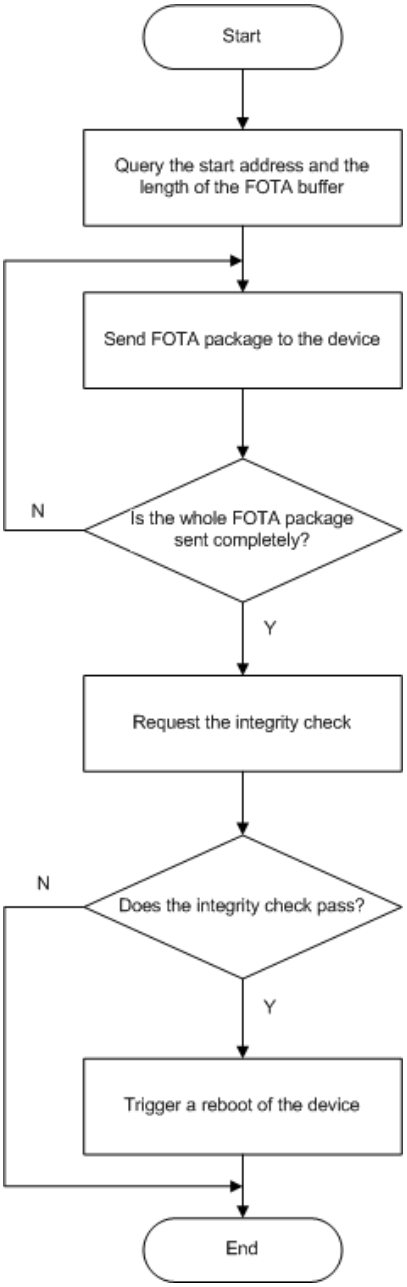

Figure 2-1. FOTA application flow chart for single device

2.2. Flow chart for dual devices

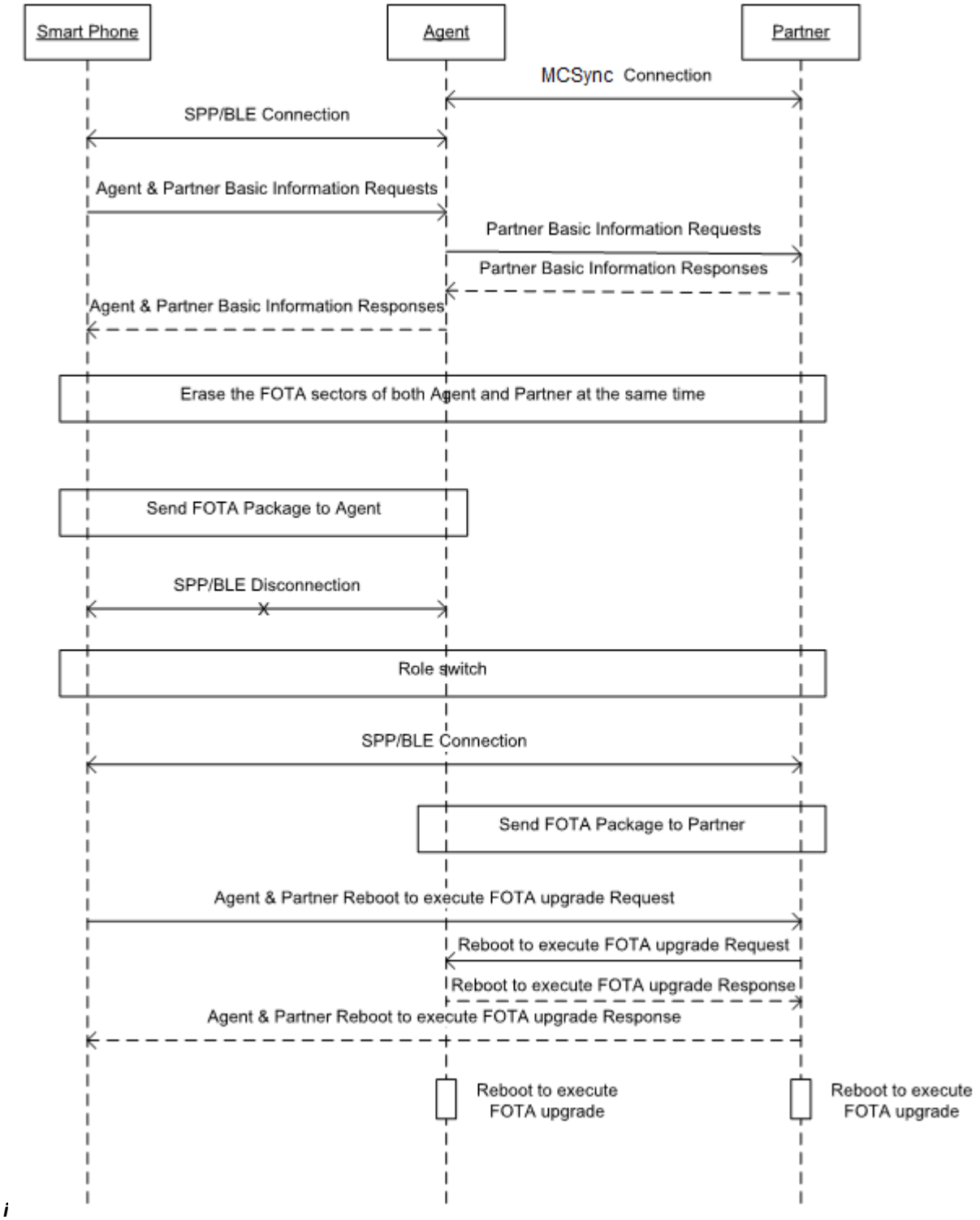

Figure 2-2. FOTA application flow chart for dual devices

3. Generating the FOTA Package

3.1. Starting the Airoha FOTA package tool

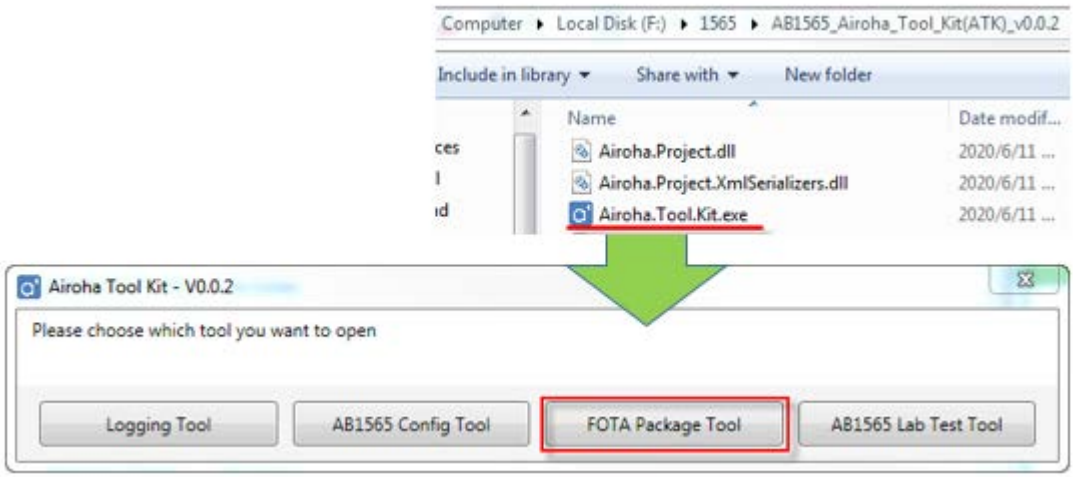

Figure 3-1. Starting the Airoha FOTA package tool

3.2. Generating the FOTA package

The FOTA package tool helps the user to generate the FOTA package.

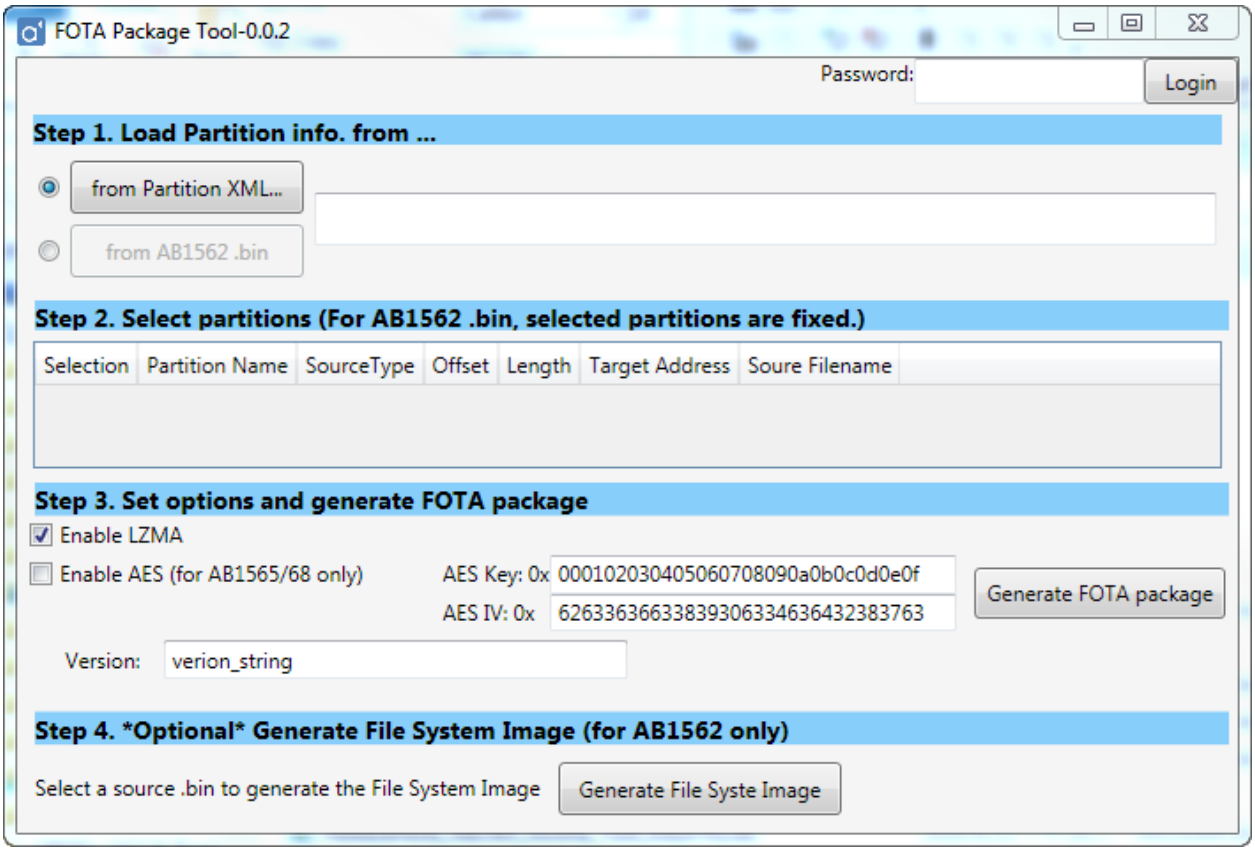

Figure 3-2. FOTA package tool UI

To generate the FOTA package:

1) Load the partition info.
    a. Load from Partition XML. For AB1565/AB1568, the user must prepare a partition XML which describes the layout of the AB1565/AB1568 partition.
    b. Load from AB1562 .bin. For AB1562, the partition layout is automatically retrieved when the user selects an AB1562 .bin.
2) Select the partitions to update
    a. For AB1565/AB1568, this step is not necessary because all update information is described in Section 3.3, “Partition XML”.
    b. AB1562 only supports the code update when using the internal flash.
3) Set the FOTA package options and generate the FOTA package.
    a. AB1562 only supports LZMA when using the internal flash.
    b. AB1562 does not support AES.
4) Generate a file system image (if necessary).

a. For AB1562, the user must generate the file system image for the FOTA update if they are using the internal flash for FOTA.

b. Click the “Generate File System Image” button then select an AB1562 .bin and the location to save the file system image file.

3.3. Partition XML

```
<PartitionTable>

  <Partition>
    <Selected>True</Selected>
    <Name>CM4</Name>
    <SourceType>WholeFile</SourceType>
    <TargetAddress>0x00013000</TargetAddress>
    <SourceFilename>F:\1565\earbuds_ref_design.bin</SourceFil
  </Partition>

  <Partition>
    <Selected>False</Selected>
    <Name>DSP0</Name>
    <SourceType>WholeFile</SourceType>
    <TargetAddress>0x00177000</TargetAddress>
    <SourceFilename>F:\1565\dsp0_headset_ref_design.bin</Sour
  </Partition>

  <Partition>
    <Selected>False</Selected>
    <Name>ROFS</Name>
    <SourceType>WholeFile</SourceType>
    <TargetAddress>0x00798000</TargetAddress>
    <SourceFilename>F:\1565\Fota\earbuds\filesystem.bin</Sour
  </Partition>

</PartitionTable>
```

Figure 3-3. A sample of partition XML

The partition XML describes the partition layout and tells the FOTA package tool how to retrieve the partition data from files. One Partition tag matches one partition.

1. Selected – When the partition XML is loaded, the partition is selected by default if this tag is True.
2. Name – The name of the partition.
3. SourceType – WholeFile: The source file would be retrieved entirely as partition data. For AB1565/AB1568, this tag is always WholeFile.
4. TargetAddress – The target address to which the partition data would be updated to during the FOTA upgrade process. This address is referred to by the bootloader, so the addressing rule must be matched to the bootloader.
5. SourceFilename – The source filename of partition data.

4. Android FOTA Application User Guide

4.1. Pairing the device through Bluetooth settings

You must pair the device through the system Bluetooth settings before using the application to connect to the Serial Port Profile (SPP) due to Android's security policy.

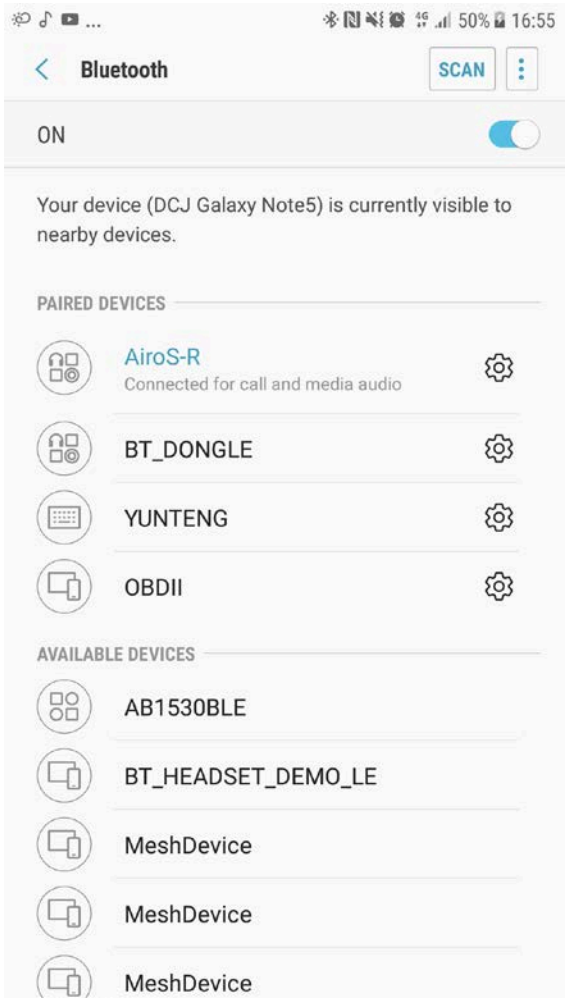

Figure 4-1. Pair the Airoha device via System Bluetooth Setting

4.2. Device selection

Click SPP option and the devices will be listed. Select the device to performing FOTA. Make sure your device is in the paired list and the target BDA is correct before going to next page.

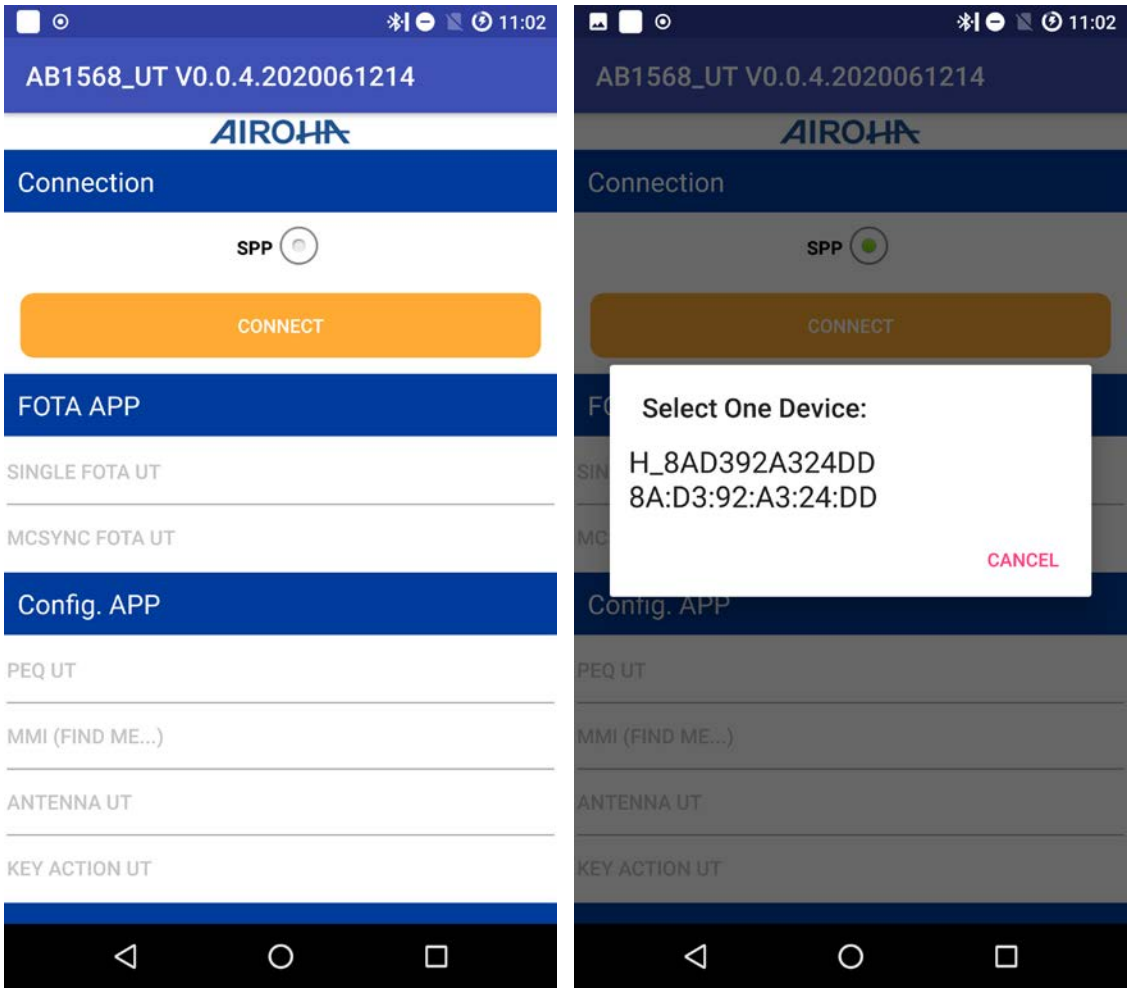

Figure 4-2. Device selection

4.3. FOTA mode selection (SINGLE/MCSYNC)

Select a FOTA mode that is compatible with the Bluetooth device. Make sure your device is in the paired list and the target BDA is correct before going to next page.

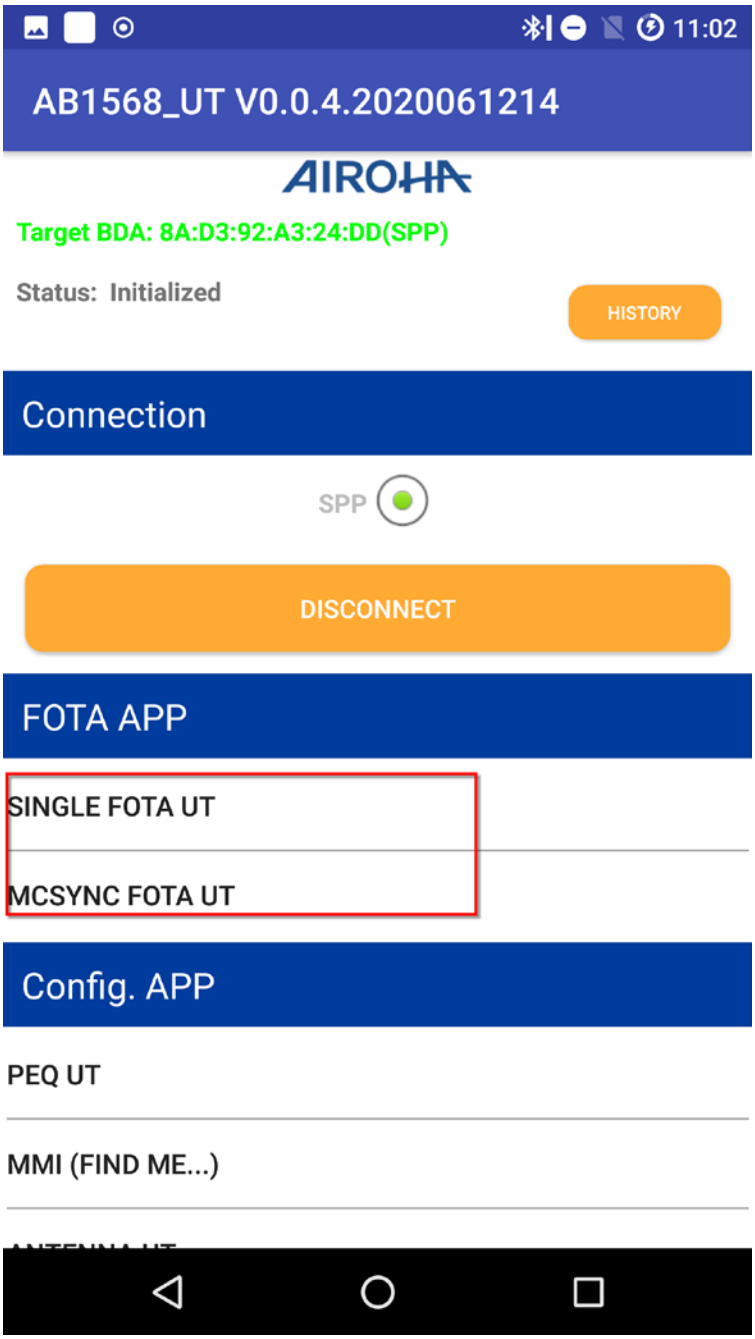

Figure 4-3. FOTA mode selection

4.4. Selecting FOTA package file

You can select the FOTA package file from mobile storage.

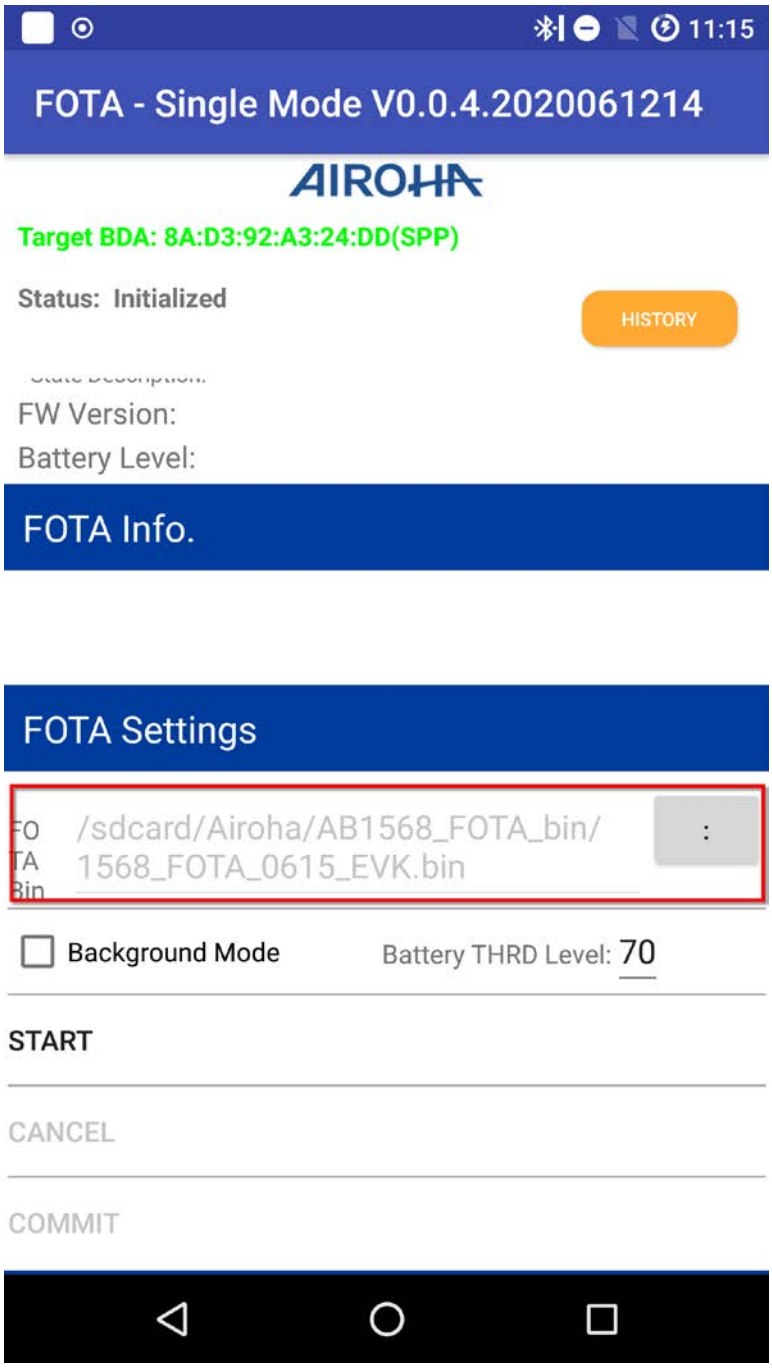

Figure 4-4. Selecting FOTA package file

4.5. FOTA Settings

The default settings are applicable for the FOTA process. It is not necessary to change these settings.

Background Mode

- Turning on IDLE mode allows the FOTA operation and listening to music at the same time. Otherwise, the application sends an active FOTA preparation command to avoid interference during the FOTA process.

Battery THRD Level

- The application uses the value as the battery level check threshold. If the battery level is lower than the THRD, the FOTA operation is not allowed.

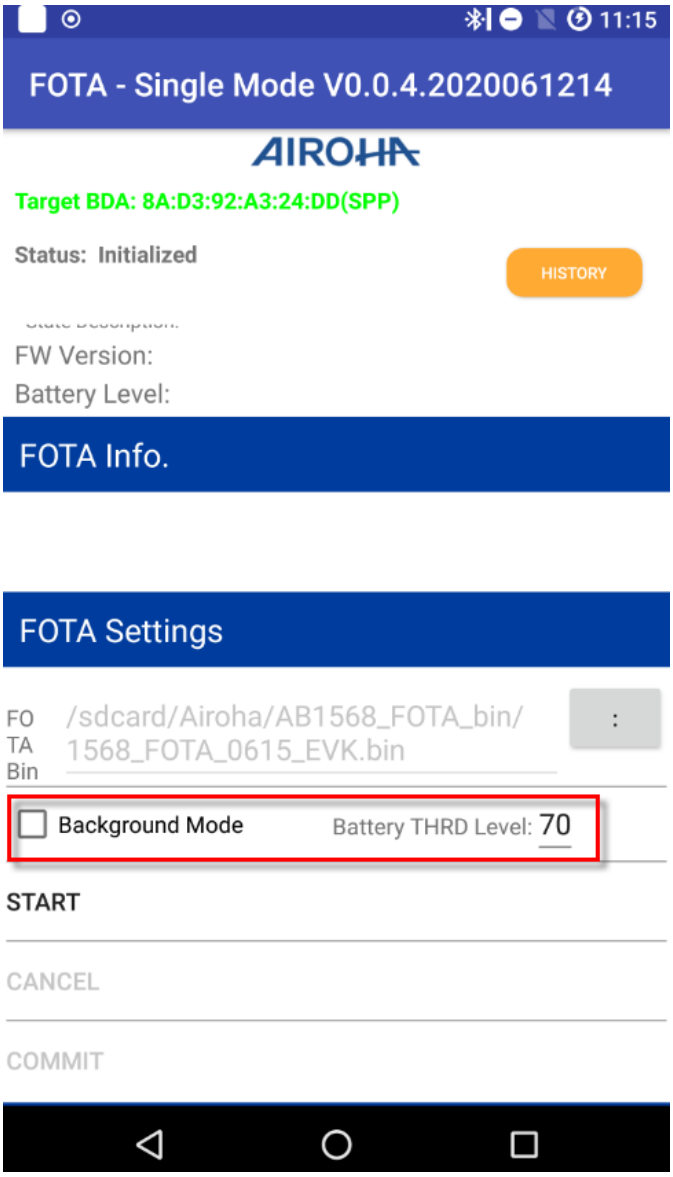

Figure 4-5. FOTA settings

4.6. FOTA operations

When you have the *.bin file of a FOTA package, you can start FOTA operation. When the FOTA partition is updated, you can commit to let the device to perform the firmware upgrade.

During the FOTA operation, you can simply cancel the running processes.

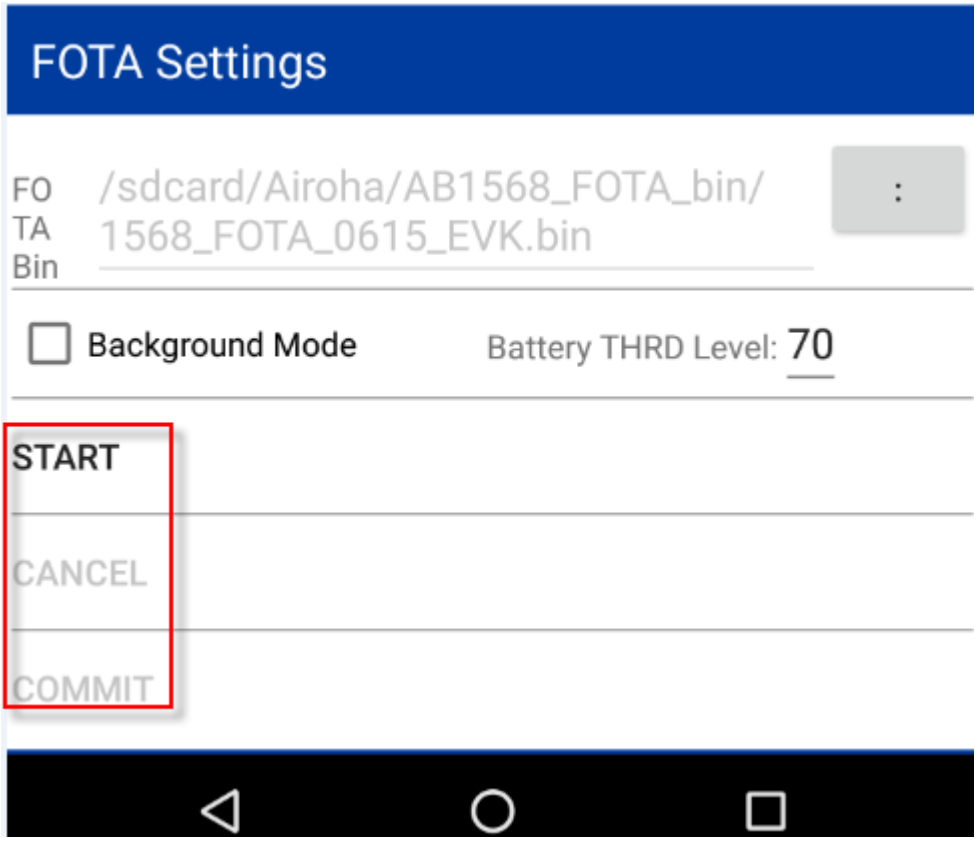

Figure 4-6. FOTA operations

START FOTA – Starts the FOTA process.

CANCEL – Cancels the running FOTA process

COMMIT – Triggers the device reboot and FOTA upgrade.

4.7. Checking the FOTA process is successful or not

There are two steps to check if FOTA is successful.

1. Before FOTA, modify the firmware version when you generate FOTA package.

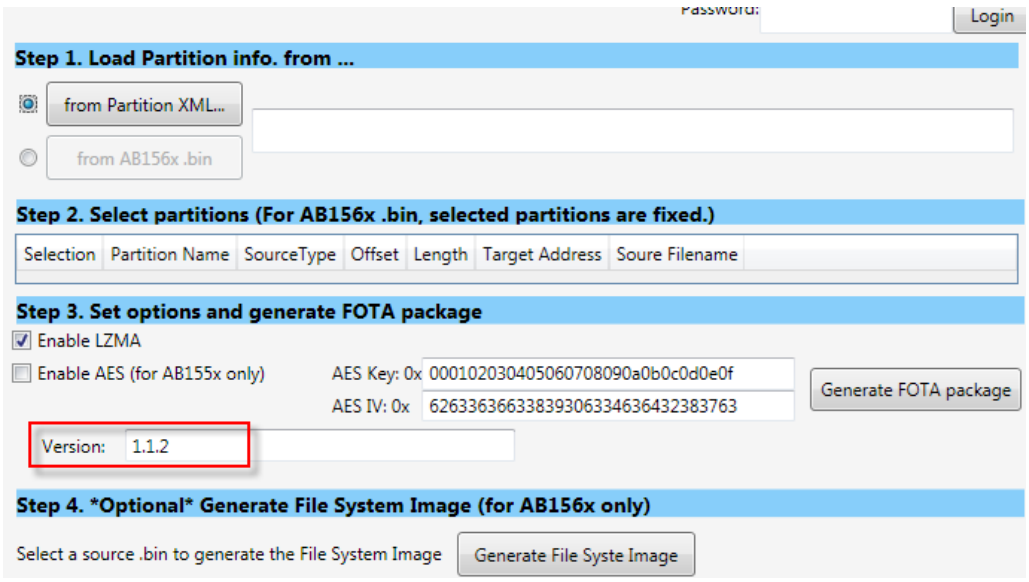

Figure 4-7. Version setting in FOTA package tool

2. when the FOTA process is complete, make sure the version number is updated.

You can check the firmware version when the FOTA process is complete.

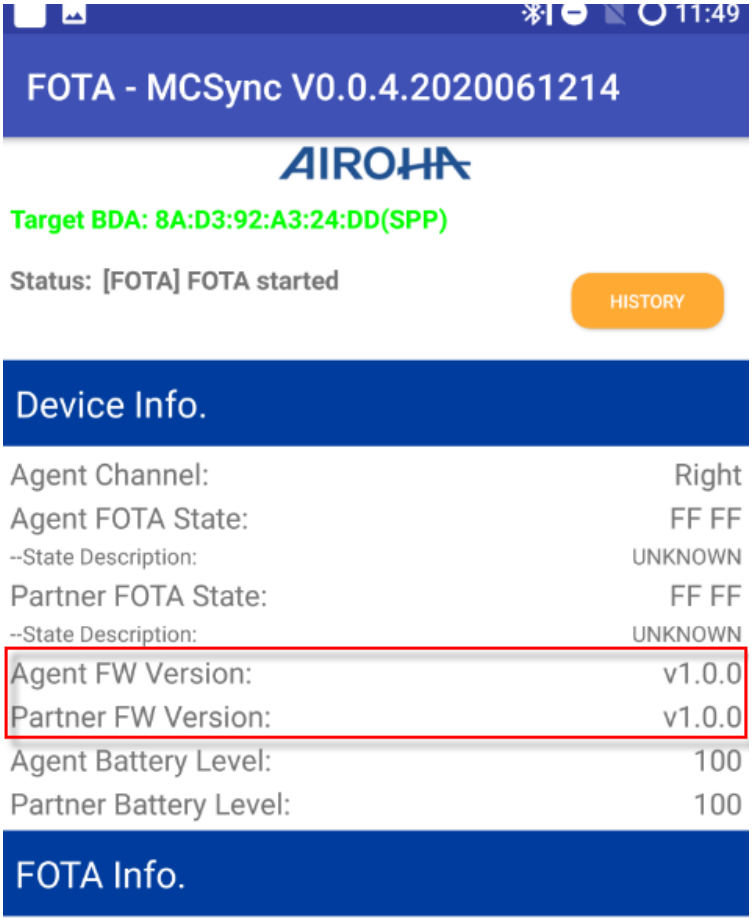

Figure 4-8. Checking the firmware version

5. iOS FOTA Application User Guide

5.1. BLE device connection

The application starts searching for any nearby BLE devices. Select the AB1565/AB1568 device for the FOTA process.

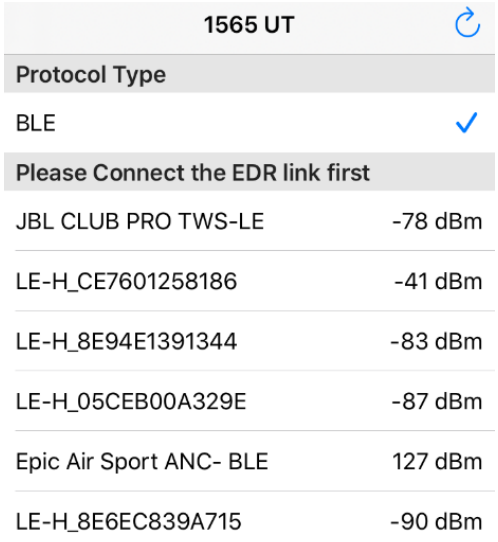

Figure 5-1. BLE Device Connection

5.2. FOTA mode selection (Single/ MCSync)

Select the FOTA mode according to the Bluetooth device you have.

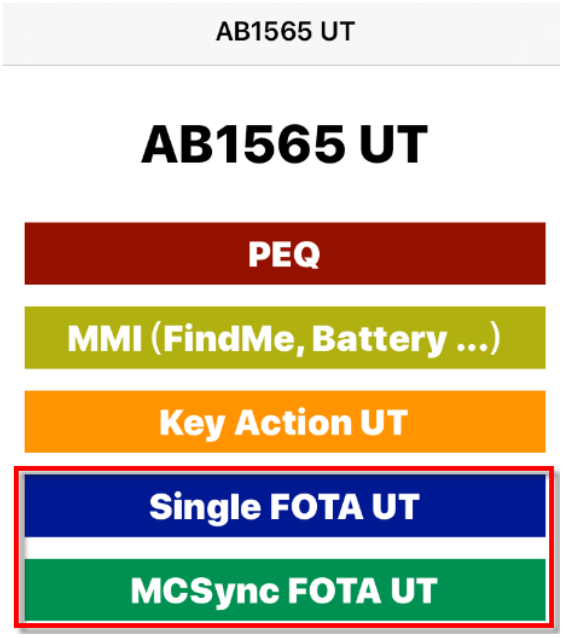

Figure 5-2. iOS FOTA Mode Selection

5.3. Downloading the FOTA package

Set the FOTA bin file and select “Start Download File”.
The FOTA package is ready when the application shows the firmware download success message.

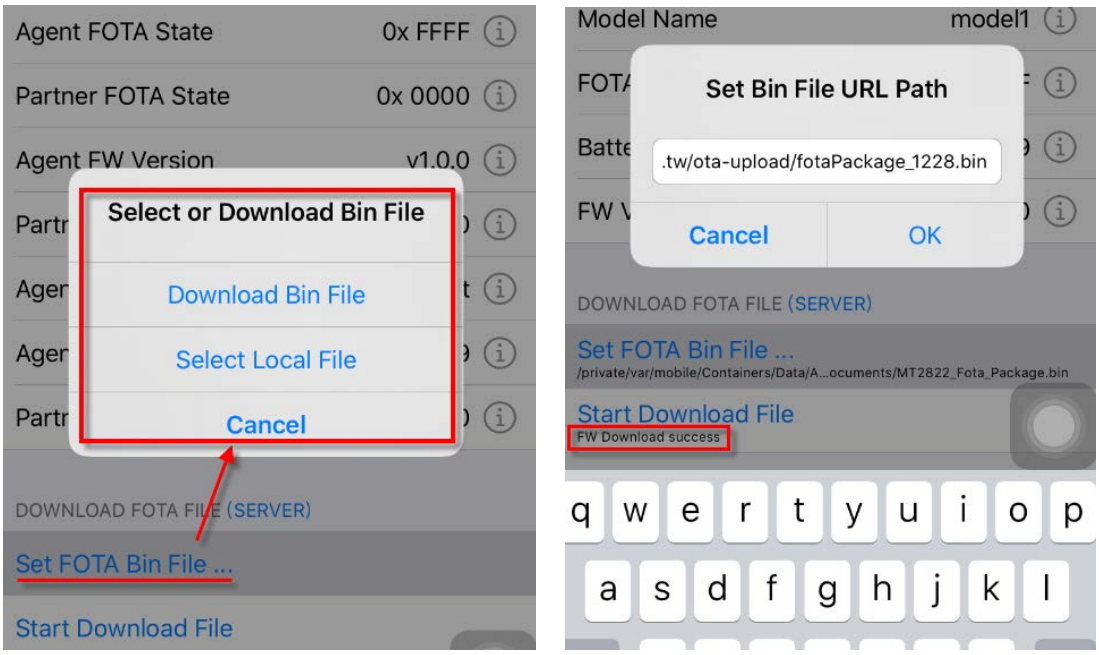

Figure 5-3. Downloading the FOTA package

5.4. Selecting the FOTA package in local path

Put FOTA package in specified path “/Files/On My iPhone/AB1568UT”.

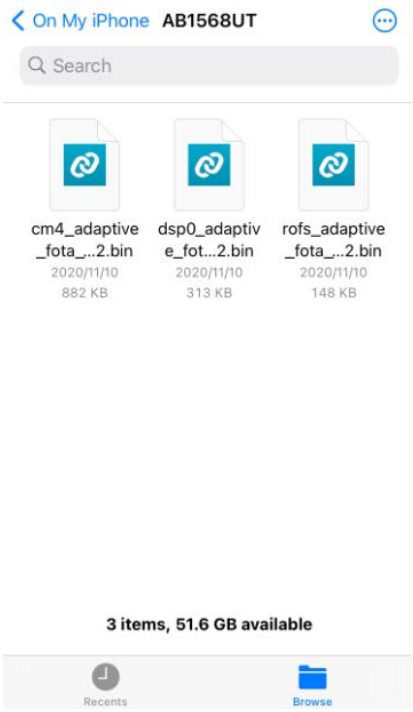

Figure 5-4. FOTA package in local path

The FOTA package is ready when clicking “Select Local File”.

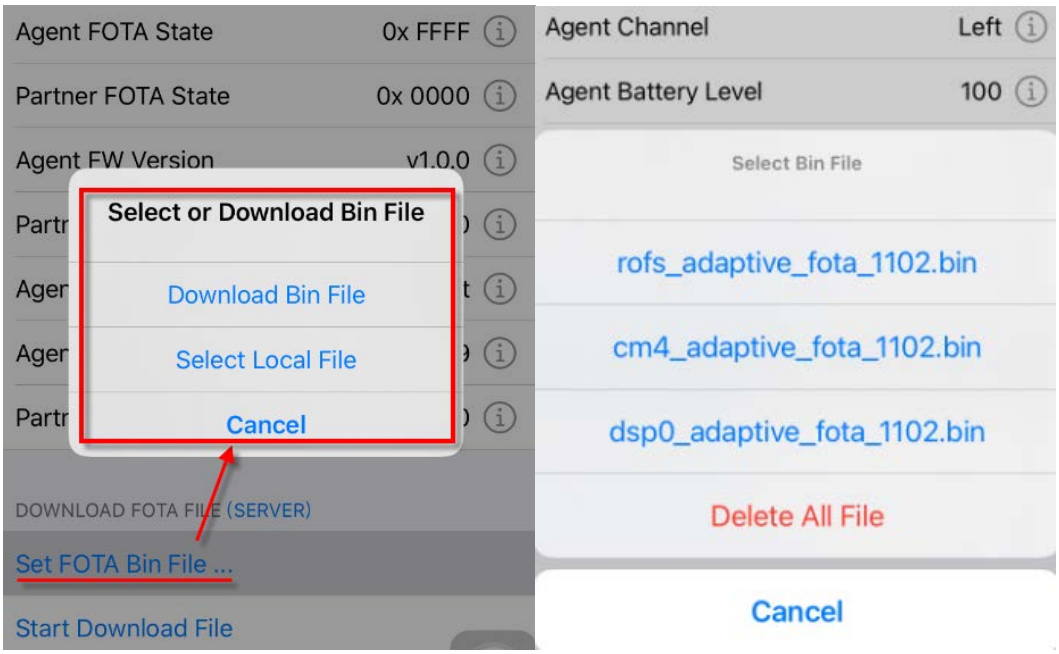

Figure 5-5. Selecting the FOTA package

5.5. FOTA configuration

The default settings are applicable for the FOTA process. It is not necessary to change these settings.

Figure 5-6. FOTA Configuration

ACTIVE OR IDLE MODE – Selecting Idle Mode allows the FOTA operation and listening to music at the same time. Otherwise, the application sends an active FOTA preparation command to avoid interference during the FOTA process.

Set Battery Threshold – The application uses the value as the battery level check threshold to avoid an incomplete update process because the battery level is too low.

Program Interval (Idle Mode) – The application uses the value as the interval of program command to send to the device.

5.6. FOTA state and corresponding operation

The FOTA state is automatically queried when BLE is connected.

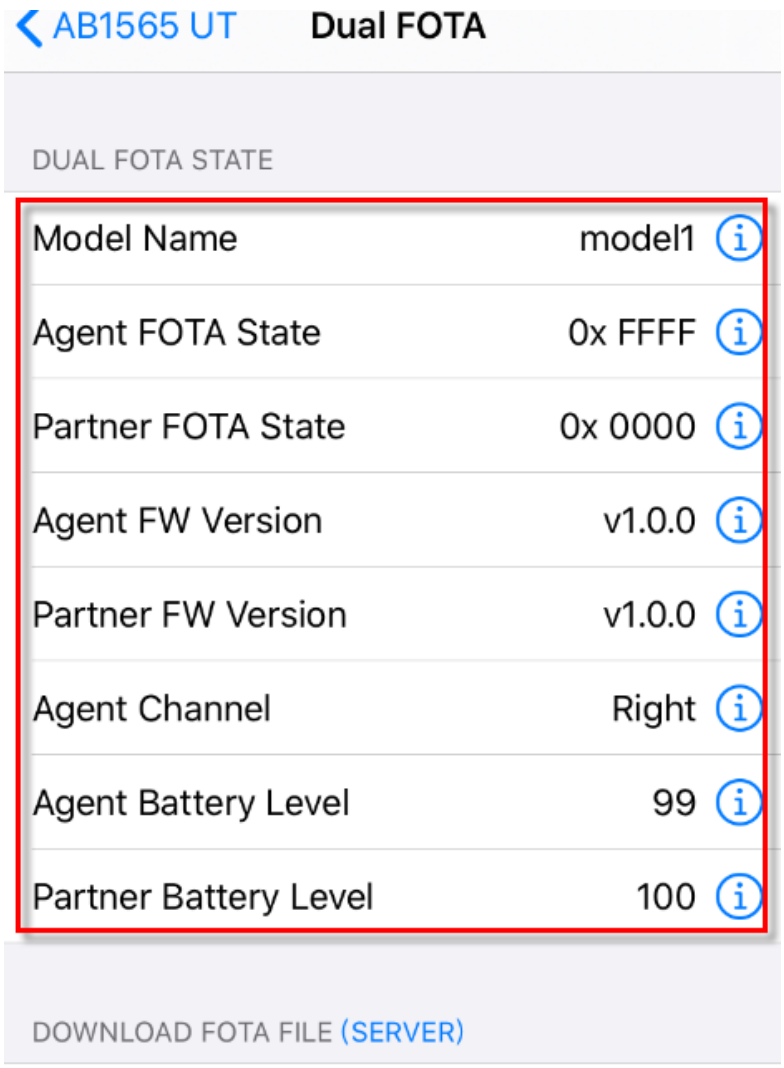

Figure 5-7. FOTA state

Model Name – The model name of the device.

Agent FOTA State – A UInt16 value represents the agent device state of FOTA.

Partner FOTA State – A UInt16 value represents the partner device state of FOTA.

Agent FW Version – Shows the agent device FW version.

Partner FW Version – Shows the partner device FW version.

Agent Channel – Shows the agent device is right or left channel.

Agent Battery Level – Shows the agent device battery level. The FOTA process cannot start if the battery level is less than 70%.

Partner Battery Level – Shows the partner device battery level. The FOTA process cannot start if the battery level is less than 70%

There are two FOTA operations.

Figure 5-8. FOTA Operation

Start FOTA – Starts the FOTA process.

Cancel – Cancels the FOTA process.

5.7. Exporting the application log

If there is an issue during the FOTA process, please click “Export Log” to export the log and send the Airoha support team the file for debugging.

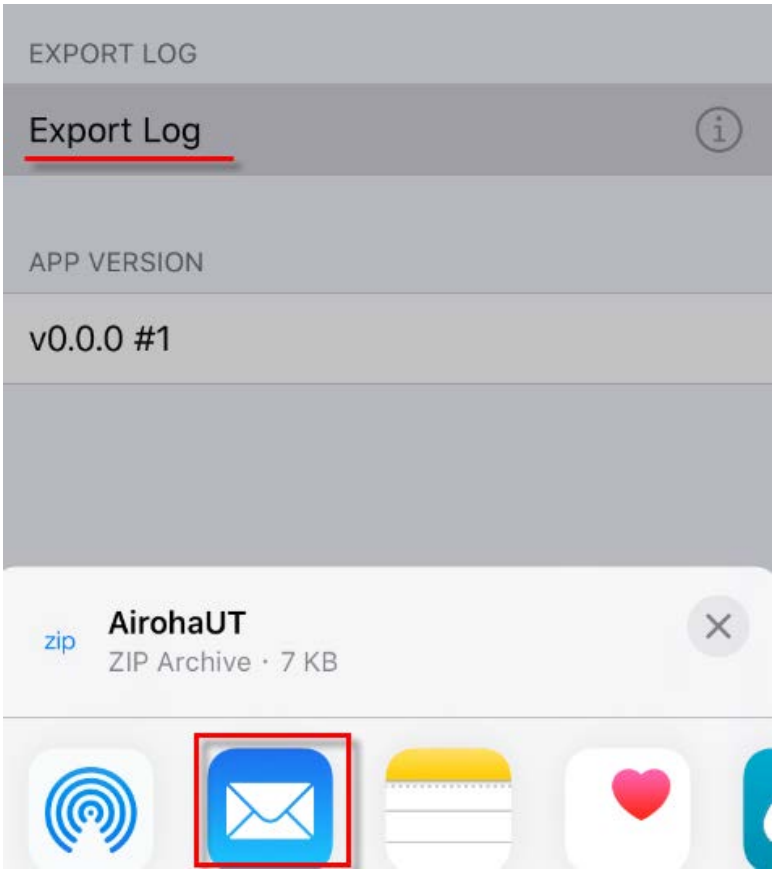

Figure 5-9. Export application log