



# **FSC-BT936E User Guide**

Release 3.7.0

# Table of contents

|          |                                        |          |
|----------|----------------------------------------|----------|
| <b>1</b> | <b>Hardware Design</b>                 | <b>2</b> |
| 1.1      | Module Pin Diagram . . . . .           | 2        |
| 1.2      | Module Pin Description . . . . .       | 3        |
| 1.3      | Power-on Circuit Design . . . . .      | 3        |
| 1.4      | Antenna Note . . . . .                 | 4        |
| 1.5      | Hardware Design Note . . . . .         | 4        |
| <b>2</b> | <b>Functional Description</b>          | <b>5</b> |
| 2.1      | Default Configuration . . . . .        | 5        |
| 2.2      | Supported Profiles . . . . .           | 5        |
| 2.3      | GPIO Indication . . . . .              | 6        |
| 2.3.1    | Operating Status . . . . .             | 6        |
| 2.4      | GATT Service . . . . .                 | 6        |
| <b>3</b> | <b>Quick Development Kit</b>           | <b>7</b> |
| 3.1      | Datasheet . . . . .                    | 7        |
| 3.2      | Evaluation Board . . . . .             | 7        |
| 3.3      | AT Command Set . . . . .               | 7        |
| 3.4      | Serial Port Tool . . . . .             | 7        |
| 3.5      | APP&SDK . . . . .                      | 7        |
| 3.6      | Firmware Upgrade Tool . . . . .        | 8        |
| 3.6.1    | OTA Update . . . . .                   | 8        |
| <b>4</b> | <b>Quick Start</b>                     | <b>9</b> |
| 4.1      | What you need . . . . .                | 9        |
| 4.1.1    | Hardware Preparation . . . . .         | 9        |
| 4.1.2    | Software and Setup . . . . .           | 9        |
| 4.2      | Hardware Access . . . . .              | 10       |
| 4.3      | Communication Test . . . . .           | 11       |
| 4.3.1    | AT - UART Communication Test . . . . . | 11       |

|          |                                                      |           |
|----------|------------------------------------------------------|-----------|
| 4.3.2    | AT+NAME - Read/Write Local BR/EDR Name . . . . .     | 12        |
| 4.3.3    | AT+LENNAME - Read/Write Local BLE Name . . . . .     | 12        |
| 4.3.4    | AT+VER - Read the Current Firmware Version . . . . . | 12        |
| <b>5</b> | <b>Obtain Firmware Version</b>                       | <b>13</b> |
| 5.1      | FeasyBlue App . . . . .                              | 13        |
| 5.2      | AT Command . . . . .                                 | 14        |
| <b>6</b> | <b>Development Examples</b>                          | <b>15</b> |
| 6.1      | Profile Initialization . . . . .                     | 15        |
| 6.2      | Parameter Modification . . . . .                     | 16        |
| 6.2.1    | Modify Bluetooth Name . . . . .                      | 16        |
| 6.2.2    | MCU modifying module parameters . . . . .            | 17        |
| 6.3      | one-Slave-and-Two-Masters Application . . . . .      | 18        |
| 6.3.1    | Application Block Diagram . . . . .                  | 18        |
| 6.3.2    | Application Description . . . . .                    | 19        |
| 6.3.3    | Application Examples . . . . .                       | 23        |
| <b>7</b> | <b>Firmware upgrade</b>                              | <b>24</b> |
| 7.1      | OTA upgrade . . . . .                                | 24        |
| 7.1.1    | App Download . . . . .                               | 24        |
| 7.1.2    | User Guide . . . . .                                 | 24        |
| 7.1.3    | OTA Upgrade Example . . . . .                        | 25        |
| <b>8</b> | <b>Contact Information</b>                           | <b>27</b> |
| <b>9</b> | <b>Appendix</b>                                      | <b>28</b> |
| 9.1      | PDF Dowload . . . . .                                | 28        |

[中文版]

This guide is applicable to

**FSC-BT936E** Bluetooth Audio Application Module

This guide consists of the following parts:

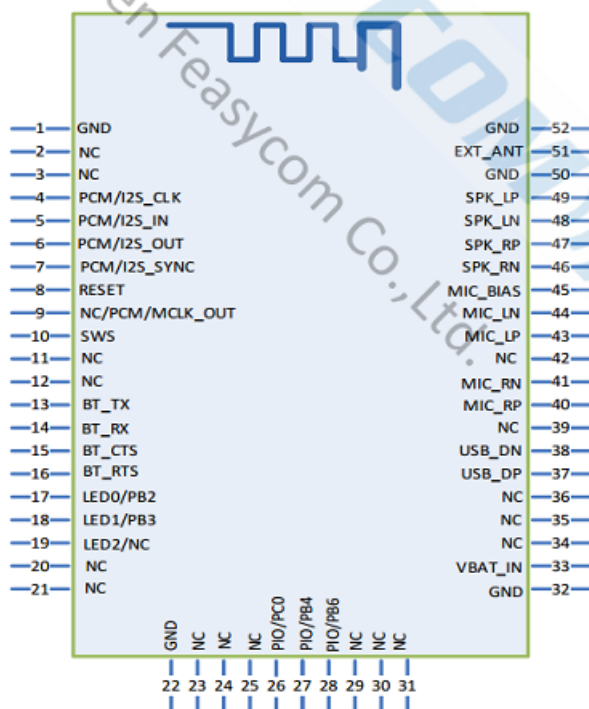
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# Chapter 1

## Hardware Design

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### 1.1 Module Pin Diagram

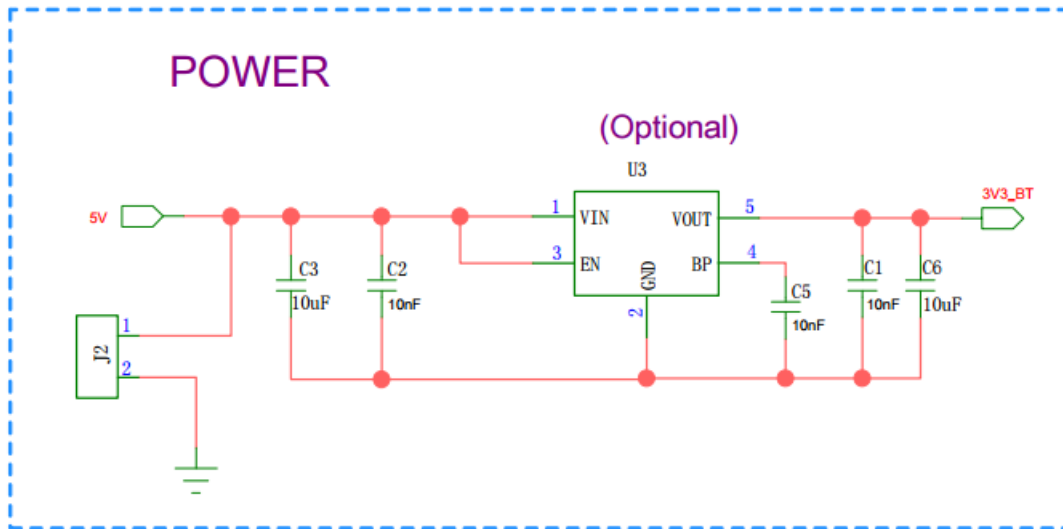


## 1.2 Module Pin Description

| Pin | Pin Name | Type  | Pin Descriptions                     |
|-----|----------|-------|--------------------------------------|
| 4   | I2S_CLK  | I/O   | I2S bit clock                        |
| 5   | I2S_IN   | I     | I2S data input                       |
| 6   | I2S_OUT  | O     | I2S data output                      |
| 7   | I2S_WS   | I/O   | Frame Sync Clock                     |
| 8   | RESET    | I     | active-low reset                     |
| 13  | UART_TX  | O     | UART TX                              |
| 14  | UART_RX  | I     | UART RX                              |
| 17  | LED0     | I/O   | Bluetooth Status Indication          |
| 32  | GND      | GND   | GND                                  |
| 33  | VDD      | VDD   | 3.3V power supply                    |
| 43  | MIC_LP   | Audio | Left MIC Differential Input Positive |
| 44  | MIC_LN   | Audio | Left MIC Differential Input Negative |
| 45  | MIC_BIAS | Audio | microphone bias voltage              |
| 46  | SPK_RN   | Audio | Analog Output Right Channel Negative |
| 47  | SPK_RP   | Audio | Analog Output Right Channel Positive |
| 48  | SPK_LN   | Audio | Analog Output Left Channel Negative  |
| 49  | SPK_LP   | Audio | Analog Output Left Channel Positive  |
| 51  | EXT_ANT  | ANT   | external Bluetooth antenna           |

## 1.3 Power-on Circuit Design

- To ensure the stable operation of the Bluetooth module, the power supply for the VDD\_3V3 pin must reserve a current of  $\geq 300\text{mA}$  for the Bluetooth module.
- If the power supply is converted from 5V to 3.3V, you can refer to the following optional recommended schematic diagram for design:



## 1.4 Antenna Note

| PIN   | Description                                                           |
|-------|-----------------------------------------------------------------------|
| PIN51 | To avoid signal discrepancies, external Bluetooth antenna is required |

## 1.5 Hardware Design Note

- For the module's simple test environment, you only need to connect **VDD / GND / UART\_RX / UART\_TX** to test and use it.
- After completing the PCB circuit schematic, please contact the staff of [Feasycom](#) for review to prevent the Bluetooth range from failing to reach the optimal performance.

# Chapter 2

## Functional Description

[中文版]

### 2.1 Default Configuration

|                                   |                    |
|-----------------------------------|--------------------|
| <b>Name</b>                       | FSC-BT936E-XXXX    |
| <b>LE-Name</b>                    | FSC-BT936E-LE-XXXX |
| <b>Pin Code</b>                   | 0000               |
| <b>Secure Simple Pairing Mode</b> | On                 |
| <b>UART Baudrate</b>              | 115200/8/N/1       |

### 2.2 Supported Profiles

- SPP (Serial Port Profile)
- GATTs (Generic Attribute Profile LE-Peripheral role)
- GATTC (Generic Attribute Profile LE-Central role)
- HFP-HF (Hands-Free Profile)
- HFP-AG (Hands-Free-AG Profile)
- A2DP-Sink (Advanced Audio Distribution Profile)
- A2DP-Source (Advanced Audio Distribution Profile)
- AVRCP-Controller (Audio/Video remote controller Profile)



- AVRCP-Target (Audio/Video remote controller Profile)
- HID-DEVICE (Human Interface Profile)
- PBAP (Phonebook Access Profile)

## 2.3 GPIO Indication

### 2.3.1 Operating Status

| PIN   | Status                       | Description   |
|-------|------------------------------|---------------|
| PIN17 | Periodic High and Low Levels | Not Connected |
| PIN17 | Low Level                    | Connected     |

## 2.4 GATT Service

| Type    | UUID                                   | Permission                    | Description                                 |
|---------|----------------------------------------|-------------------------------|---------------------------------------------|
| Service | 0x0000B360-D6D8-C7EC-BDFO-EAB1BFC6BCBC |                               | Throughput transmission service             |
| Write   | 0x0000B362-D6D8-C7EC-BDFO-EAB1BFC6BCBC | Write, Write Without Response | The APP sends (data/messages) to the module |
| Notify  | 0x0000B362-D6D8-C7EC-BDFO-EAB1BFC6BCBC | Notify                        | The module sends (data/messages) to the APP |

# Chapter 3

## Quick Development Kit

[中文版]

### 3.1 Datasheet

- FSC-BT936E Datasheet

### 3.2 Evaluation Board

- FSC-DB200 : Feasycom Bluetooth audio application development board

### 3.3 AT Command Set

- FSC-BT936E General Audio AT Command Set

### 3.4 Serial Port Tool

- Feasycom Serial Port Tool : A serial port communication analysis tool based on Windows PC.

### 3.5 APP&SDK

- FeasyBlue : Feasycom App & SDK resource supporting Android and iOS, which enables functions such as Bluetooth BLE & SPP data communication test, Feasycom module

firmware version reading, parameter configuration, OTA Upgrade and OTA AT commands etc.

## 3.6 Firmware Upgrade Tool

### 3.6.1 OTA Update

- Tool: FeasyBlue App
- User Guide: Please refer to [FSC-BT936E - OTA Update](#) .

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# Chapter 4

## Quick Start

[中文版]

### 4.1 What you need

#### 4.1.1 Hardware Preparation

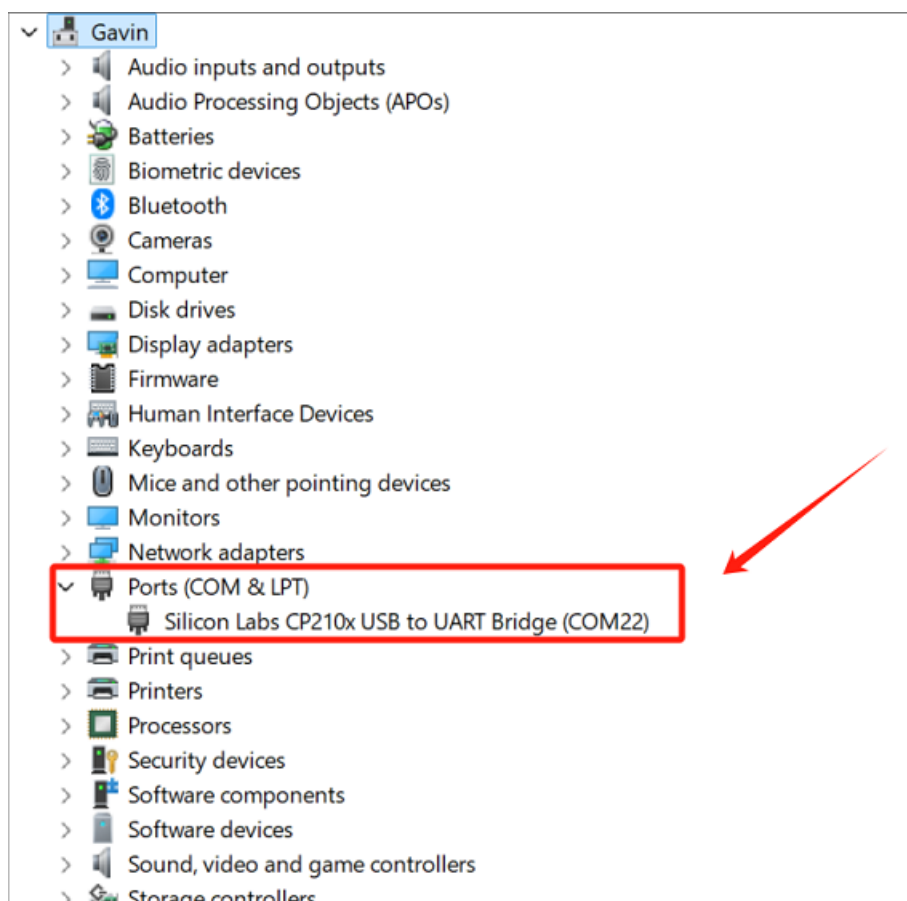
- 1 x FSC-DB200-BT936E Rapid Development Kit : FSC-DB200 Rapid Development Kit pre-integrated with the FSC-BT936E Bluetooth Audio Module.
- 1 x Windows PC
- 1 x Mobile Phone (Android / iOS)
- 2 x Bluetooth Headphones / Bluetooth Helmet

#### 4.1.2 Software and Setup

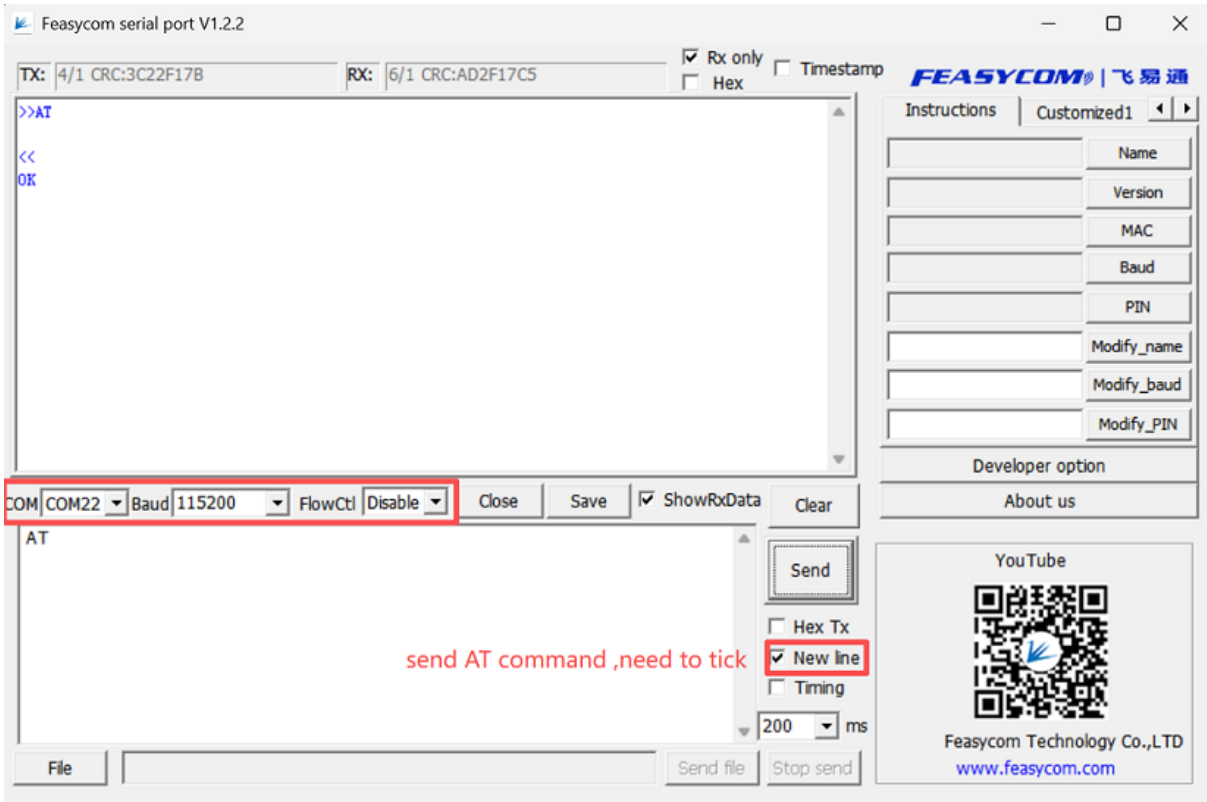
- Feasycom Serial Port Tool : A serial port communication analysis tool based on Windows PC.
- FeasyBlue App : A mobile application based on Android or iOS.
- Communication Interface : UART
- UART Configuration : 115200/8/N/1

## 4.2 Hardware Access

1. Connect the FSC-DB200-BT936E to the PC via a USB-to-Type-C data cable. The PC will automatically recognize the serial port and generate a virtual COMx port. As shown in the diagram below:



2. Run the Feasycom Serial Port Tool on the PC, set the correct **COM** and **Baud**, and check the **New Line**.



### 4.3 Communication Test

The following are several basic general AT command test examples.

For more AT commands, please refer to [FSC-BT936E General Audio AT Command Set](#).

#### 4.3.1 AT - UART Communication Test

|              |                                                                                            |
|--------------|--------------------------------------------------------------------------------------------|
| Com-mand     | AT\r\n                                                                                     |
| Response     | \r\nOK\r\n                                                                                 |
| Descrip-tion | Test the UART communication between HOST and Module after power on, baudrate changed, etc. |

Example:

```
Send:      >>AT\r\n
Response: <<\r\nOK\r\n
```

### 4.3.2 AT+NAME - Read/Write Local BR/EDR Name

Example:

```
Send:      <<AT+NAME\r\n
Response: >>\r\n+NAME=FSC-BT936E-1B43\r\n    //Example, please refer_
↳to the actual reading
Response: >>\r\nOK\r\n
```

### 4.3.3 AT+LENAM - Read/Write Local BLE Name

Example:

```
Send:      <<AT+LENAM\r\n
Response: >>\r\n+LENAM=FSC-BT936E-LE-0D15\r\n    //Example, please_
↳refer to the actual reading
Response: >>\r\nOK\r\n
```

### 4.3.4 AT+VER - Read the Current Firmware Version

Example:

```
Send:      <<AT+VER\r\n
Response: >>\r\n+VER=BT936E,V2.3.9,20250917\r\n    //Example, please_
↳refer to the actual reading
Response: >>\r\nOK\r\n
```

## Chapter 5

# Obtain Firmware Version

[中文版]

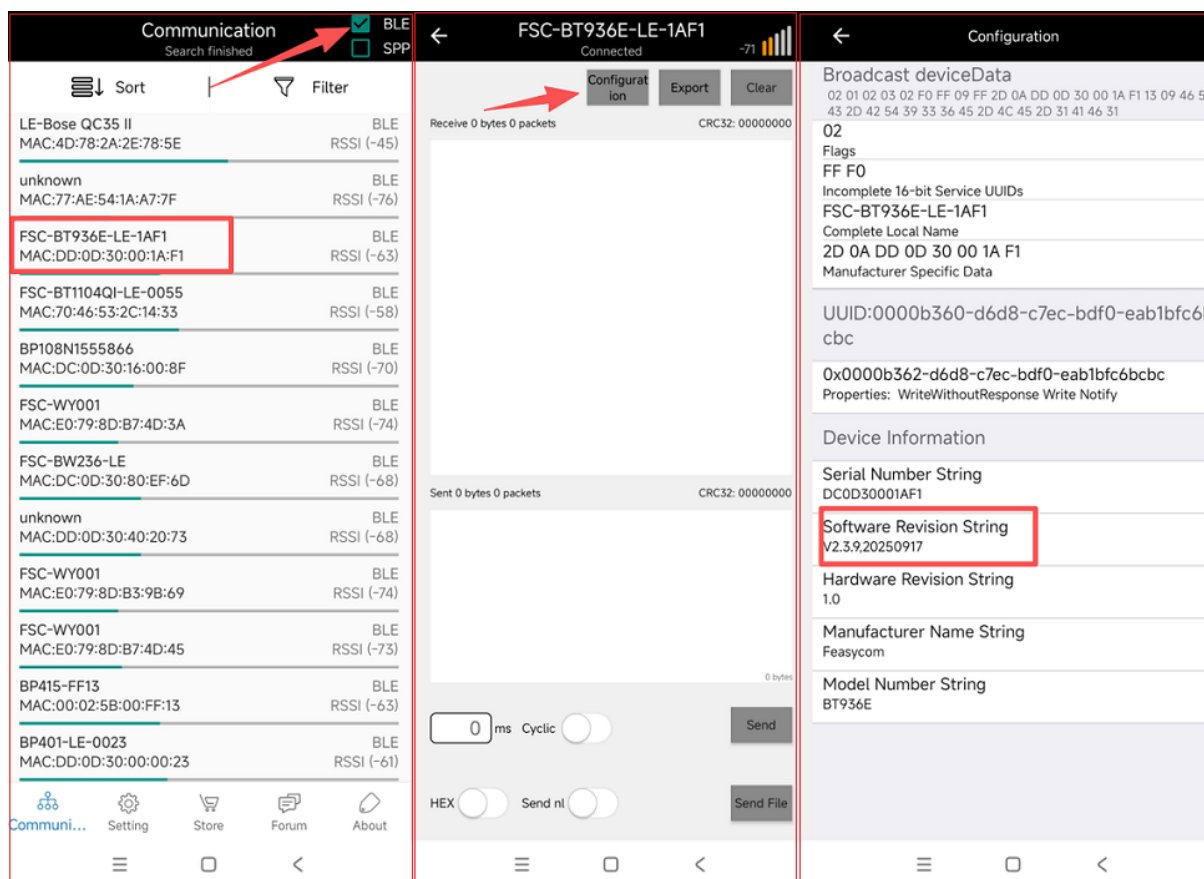
Currently, there are two ways to obtain the firmware version information of FSC-BT936E , as follows:

### 5.1 FeasyBlue App

After establishing a BLE connection between the mobile app [FeasyBlue](#) and the FSC-BT936E series modules, check the firmware version information on the **Transmission Configuration** function interface.

**The profile of the Bluetooth module needs to enable the BLE (GATT) function**





## 5.2 AT Command

Send the **AT+VER** command through UART to obtain firmware version information.

Send: <<AT+VER

Response: >>+VER=BT936E,V2.3.9,20250917 //Example, please refer  
 ↳to the actual reading

Response: >>OK

# Chapter 6

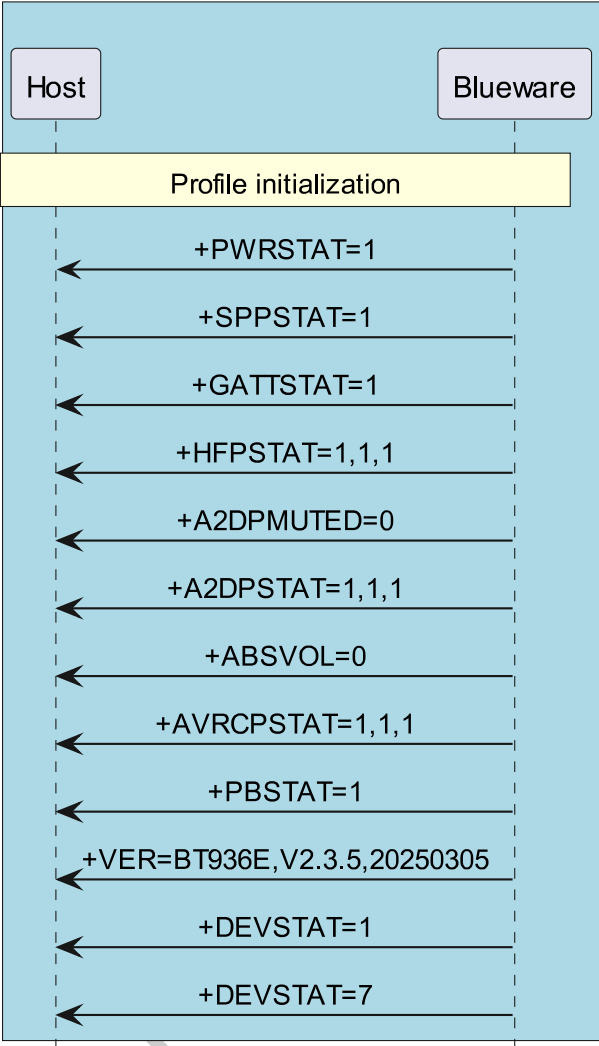
## Development Examples

[中文版]

### 6.1 Profile Initialization

Module Profile initialization, examples:

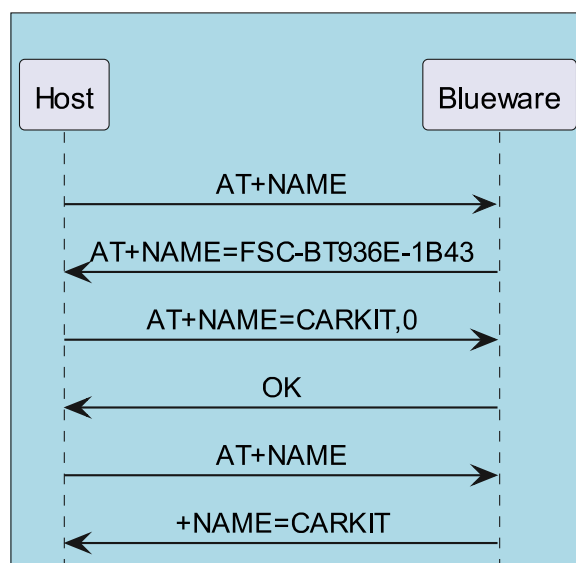
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## 6.2 Parameter Modification

### 6.2.1 Modify Bluetooth Name

Examples: Modify Bluetooth name to CARKIT(without address code suffix) and verify it.



### 6.2.2 MCU modifying module parameters

Before the MCU modifies any parameters, it is recommended to first query, then modify, and finally verify.

For the MCU to modify the device name to CARKIT, the reference code example is as follows:

```

void change_name(void)
{

    uart_send("AT+NAME\r\n");
    if(uart_read("+NAME", name_buf))
    {
        if(memcmp(name_buf, "CARKIT", 6))
        {
            uart_send("AT+NAME=CARKIT,0\r\n"); //defalut disable_
↪MAC address suffix
            uart_send("AT+NAME\r\n"); // read bt name
            if(uart_read("+NAME", name_buf))
            {
                if(memcmp(name_buf, "CARKIT", 6))
                {
                    //change name fail
                }
            }
            else

```

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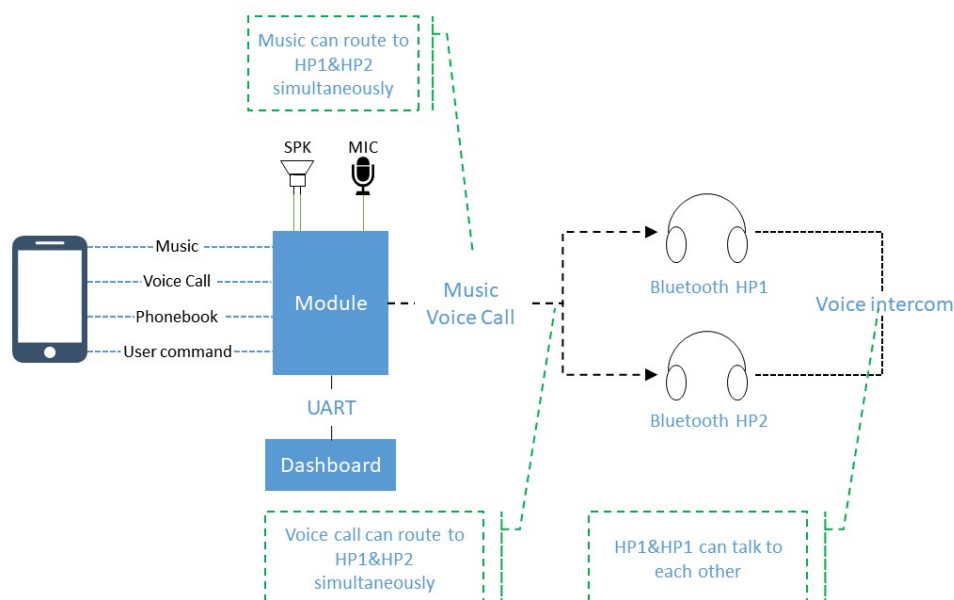
```

    {
        //change name success
    }
}
}
}
}
}
}

```

## 6.3 one-Slave-and-Two-Masters Application

### 6.3.1 Application Block Diagram



#### **Note**

1.FSC-BT936E module integrates a transceiver and supports simultaneous operation, enabling simultaneous connection to 2 headphones and 1 mobile phone. When no headphones are connected, audio plays locally if the mobile phone plays music. When headphones are connected, the audio is automatically transmitted to the headphones.

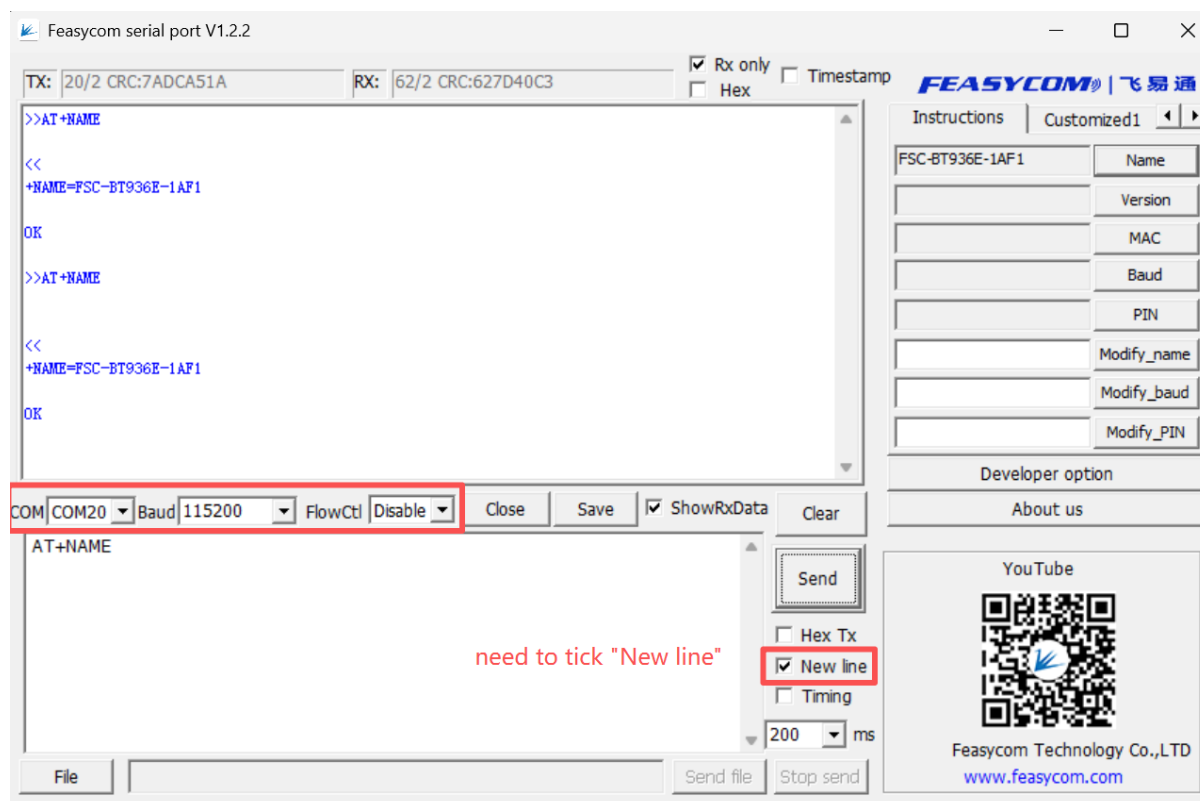
2.Due to the high RF requirements for the Bluetooth module in this application scenario, the module's antenna must be configured as external. Additionally, it is recommended that after the customer completes the product design of their end product, they send the circuit

diagrams/PCB layouts of the Bluetooth part to Feasycom hardware department for review, and proceed with board fabrication only after confirmation of no issues.

### 6.3.2 Application Description

(1).Connect the development board and the PC via a Type-C cable.

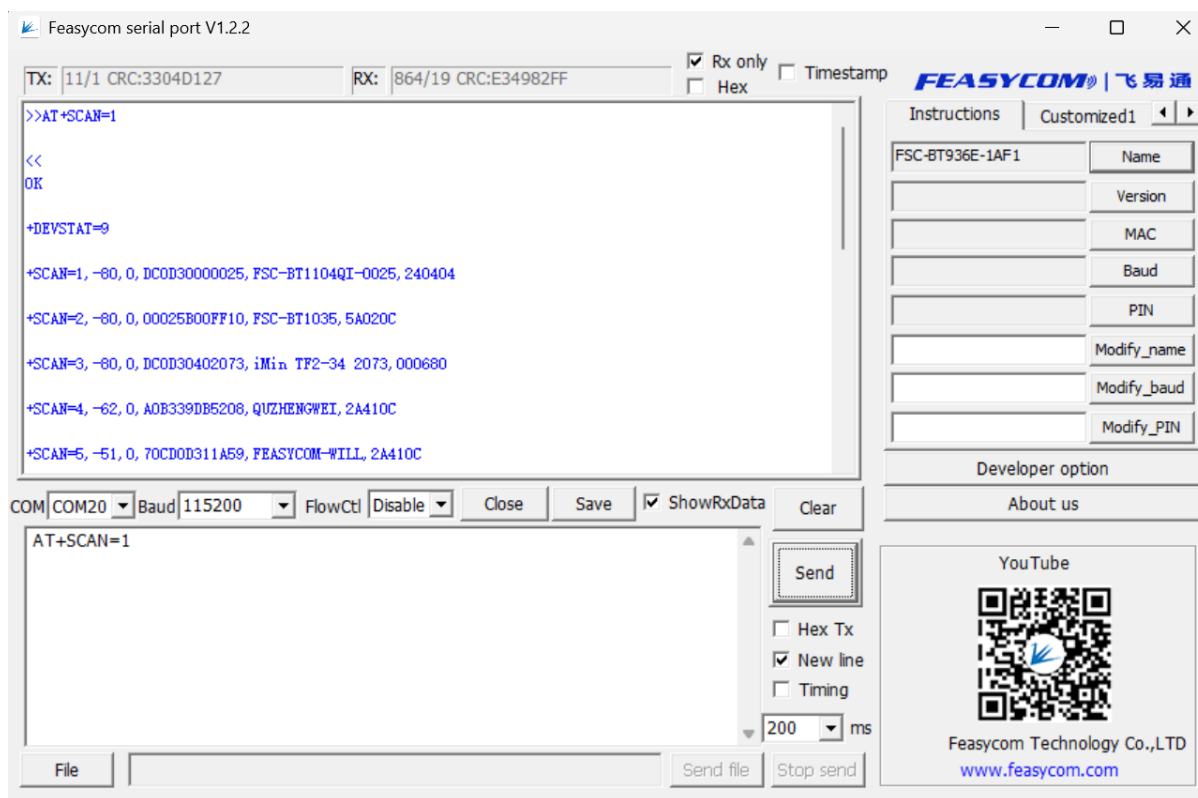
(2).After connection, the PC will recognize a serial port (COMx). Examples:



(3).The mobile phone searches for and connects to the Module. Examples:

```
RX: +HFPSTAT=3,1,1 // Indicates that the HFP protocol is connected.
→ (for calls)
RX: +A2DPSTAT=3,1,1 // Indicates that the A2DP protocol is connected.
→ (for music)
```

(4).Set the Bluetooth headset to be connected to pairing mode, and send AT+SCAN=1 to the Module to search at the same time. Examples:



#### (5).Connecting the Bluetooth Headset. Examples:

```
TX: AT+FOCUS=FF733EEF25E9           // Connect the main_
    ↳headphone A

TX: AT+FOCUS=,B85E052670BD           //connect the secondary_
    ↳headphone B. ", " used to separate them.

TX: AT+FOCUS=FF733EEF25E9,B85E052670BD //Connect the headphone A_
    ↳and B simultaneously

RX: +A2DPSTAT=3,3,1 // Indicates that Headphone A successfully_
    ↳connected via A2DP

RX: +HFPSTAT=3,3,1 // Indicates that Headphone A successfully_
    ↳connected via HFP

RX: +A2DPSTAT=3,3,3 // Indicates that Headphone B successfully_
    ↳connected via A2DP

RX: +HFPSTAT=3,3,3 // Indicates that Headphone B successfully_
    ↳connected via HFP
```

#### Note

After the settings are configured, the Module will automatically connect to the designated headphones (it will also connect automatically after being powered on again).

#### (6).A2DP Music Mode:

When the mobile phone is playing music, example of the serial port response:

```
RX: +A2DPSTAT=5,3,3
RX: +PLAYSTAT=1
RX: +A2DPSTAT=5,5,5
```

#### (7).HFP Call Mode:

When the mobile phone is making a call and the call is ongoing with the main headset, AT command example:

Mode1: Switches to the main headphone call mode

```
TX: AT+AUDROUTE=2    // Switch to the main headset for the call
RX: +HFPSTAT=4,3,3
RX: +HFPAUDIO=1,0,0
RX: +HFPAUDIO=1,1,0
RX: +HFPCID=10086
RX: +HFPCIE=10086
RX: +HFPSTAT=6,6,3
```

Mode2: Switches to the secondary headphone call mode

```
TX: AT+AUDROUTE=3    // Switch to the secondary headset for the
→call
RX: +HFPAUDIO=1,0,0
RX: +HFPAUDIO=1,0,1
RX: +HFPSTAT=6,3,6
```

Mode 3: Main and secondary headphones intercom mode

#### Note

It supports the intercom mode between the main headset and the secondary headset, which takes effect only after the configuration of AT-HFPCFG=1 is performed.



TX: AT-HFPCFG=1

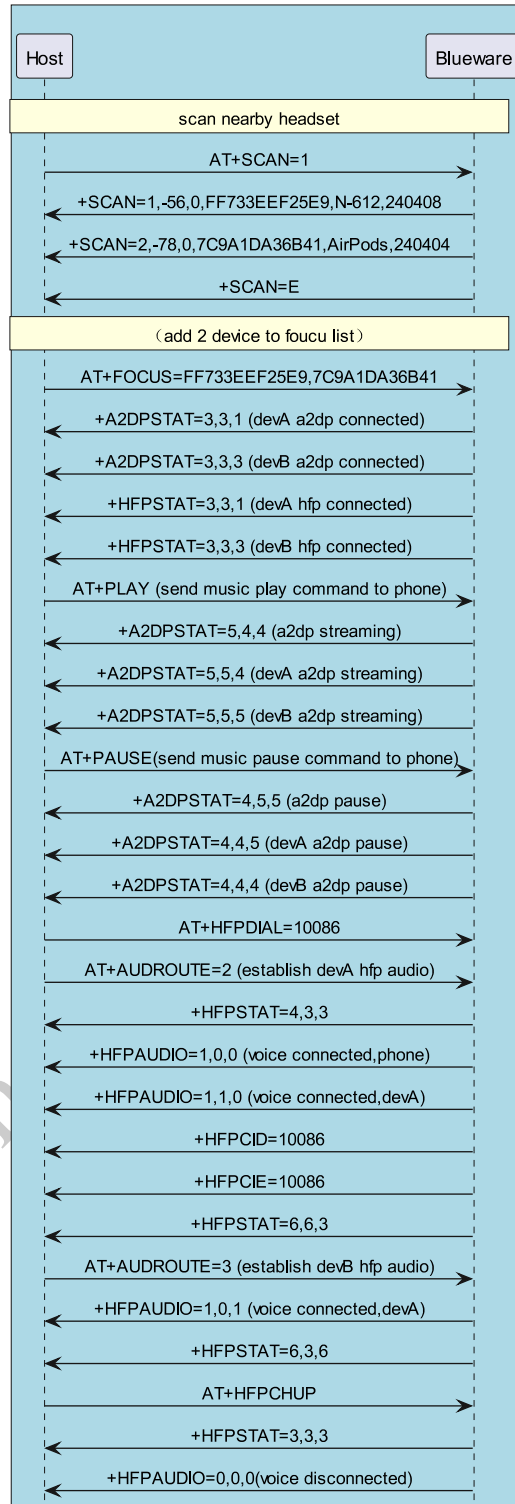
TX: AT+AUDROUTE=4

 **Note**

If no headphones are connected, the audio will be output locally from the module when playing music.

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### 6.3.3 Application Examples



# Chapter 7

## Firmware upgrade

[中文版]

FSC-BT936E series of Bluetooth audio modules already support Over-the-Air (OTA) updates.

### 7.1 OTA upgrade

#### 7.1.1 App Download

- FeasyBlue App (Base on Andriod or iOS)

#### 7.1.2 User Guide

1.Run the FeasyBlue App, select **Setting - OTA Upgrade** to enter the OTA Upgrade function page. After entering, it will redirect to the device search page where you can select the Bluetooth device to be upgraded.

2.Scan and select the Bluetooth devices that need to be upgraded. After selecting the device, you will enter the **Firmware Loading** interface to load the firmware update file.

3.There are two ways to load the firmware update file:

- **Select firmware:** Choose to load the firmware update file stored locally on the phone (the firmware update file is provided by Feasycom).
- **Get the firmware:** By entering the **DFU name**, the corresponding firmware update file can be downloaded and imported from the Feasycom cloud server via the network (the DFU name is provided by Feasycom).

4. After successfully loading the firmware update file, click the **Start Upgrade** button. The message “**Upgrading**” and the upgrade progress will be displayed, indicating that the upgrade mode has been successfully entered and the upgrade is in progress.

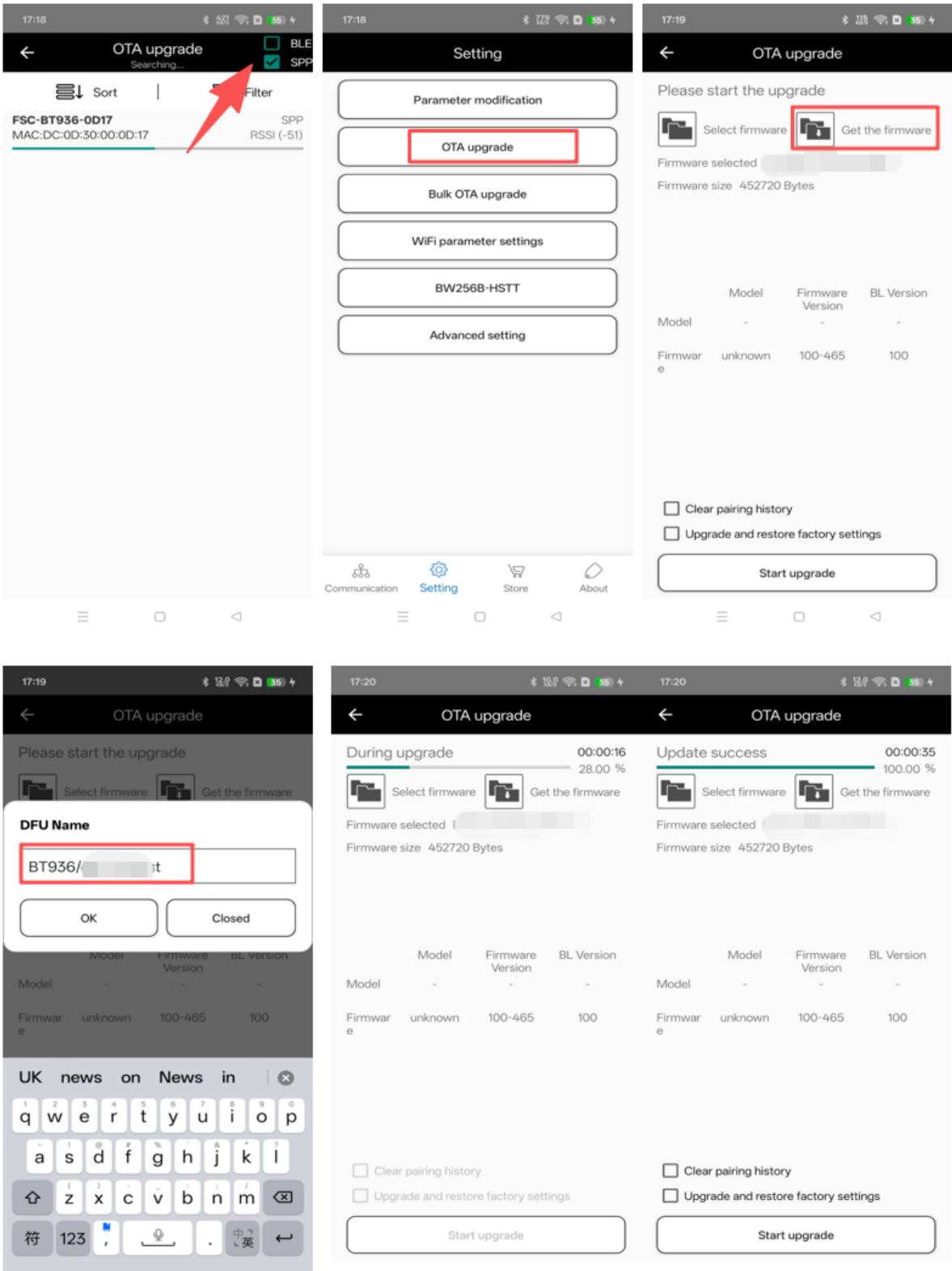
5. Wait for the upgrade progress bar to complete and display “**Upgrade Completed**”, then the upgrade is considered complete.

**Warning:**

1. When installing and running the FeasyBlue App, please allow the App to access **nearby devices, location information, and media and file access** permissions. Otherwise, it will result in the inability to search for nearby Bluetooth devices and load firmware update files.
2. If you choose to import the firmware update file by obtaining the firmware through the **DFU name**, please note that your phone needs to be connected to the Internet and ensure that the DFU name is entered correctly (case sensitive), otherwise an error message of **network or file error** will be displayed.
3. During the upgrade process, do not disconnect the power supply.

### 7.1.3 OTA Upgrade Example

Note: The following example is based on operations on the Android platform. The involved device name, parameters, and firmware DFU name are for demonstration purposes only. Please refer to the actual information during project implementation.



# Chapter 8

## Contact Information

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Home Page : [www.feasycom.com](http://www.feasycom.com)

Support Forum : [forum.feasycom.com](http://forum.feasycom.com)

## Chapter 9

## Appendix

### 9.1 PDF Dowload

PDF Download

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