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1 Product introduction:

1.1 summarize

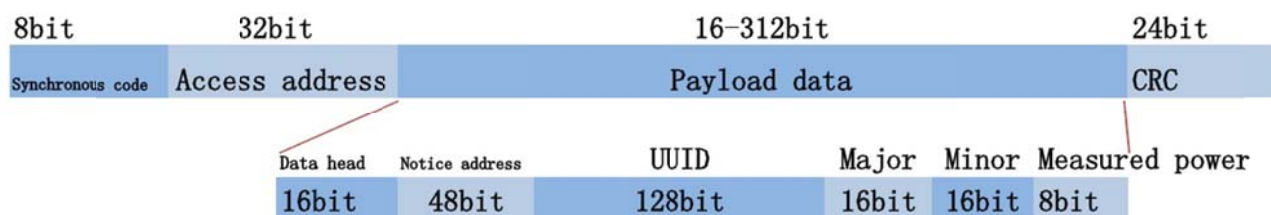
iBeacon is a BLE (Bluetooth low energy) introduced by Apple's Bluetooth application, a technology that can be used indoor positioning, to a certain extent, be used to compensate for the lack of poor locate for GPS in the room, but iBeacon is different from GPS positioning principle , iBeacon positioning is calculated by the signal strength received by the receiver to determine the distance between the two, iBeacon continuing transmitting broadcast information which contains a specific MAC address, UUID, MAJOR, MINOR, etc., when the phone receives the APP You can determine when this broadcast information iBeacon location, but also by APP mobile client tells the server has access to the iBeacon broadcast area. iBeacon send to phone only broadcast information without any other information, but according to broadcast information sent by iBeacon , the phone can download required information in relevant server.

1.2 iBeacon technical introduction

iBeacon broadcast frame using "announcement frame" (Advertising) to send the message, the notice issued by a periodic frame with BLE devices (iBeacon), as long as the support BLE terminal can receive the signal. Announcement frame payload portion, and writes the data defined by Apple.

iBeacon data mainly constituted by the four kinds of information, namely, UUID (Universal Unique Identifier), Major, Minor, Measured Power. UUID is defined as ISO/IEC11578: 1996 standard 128-bit identifier. Major and Minor iBeacon set by the owner, is a 16-bit identifier. For example, stores can use UUID name on behalf of the head office, Major representatives of regional names, Minor behalf of a shop name Measured Power is iBeacon distance between the module and the receiver reference received signal strength at 1 m. (RSSI: Received Singnal Strength Indicator) , the receiver of the reference RSSI based on the intensity of the received signal to the receiver module and calculating iBeacon distance.

As Measured Power, because Apple's iOS is not careful in judging distance, while using only close (Immidiante), 1m or less (Near), 1m or more (Far) from three kinds of states. When the distance less than 1m, RSSI value is substantially proportional to the reduction, a more accurate distance, the distance 1m in the above, the influence of the reflected waves and the like, RSSI but not significantly reduce fluctuations. In other words, when you can not be inferred from the above 1m apart, so simply judged Far.



iBeacon Data frame structure

2 Technical parameter setting:

2.1 Use Platform

Receiving end (mobile) hardware must be Bluetooth 4.0 or more, the software requires Android 4.3 or above Apple IOS5.0 more.

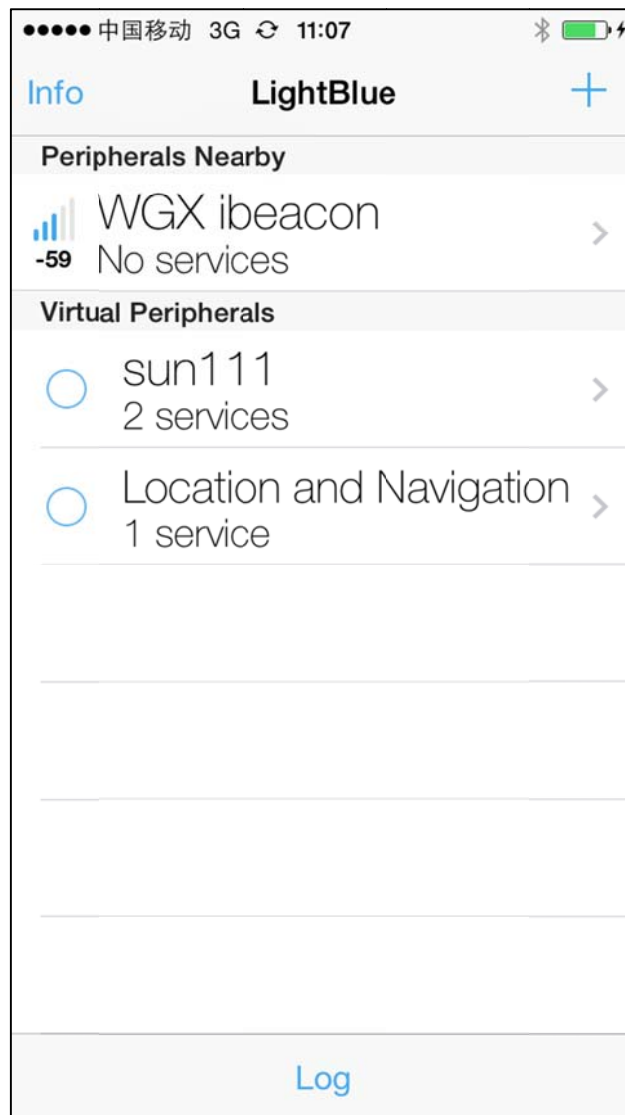
2.2 Test Software

Software Name: Light blue, the software can be downloaded free from the Apple APP store.

2.3 Light blue menu Introduction

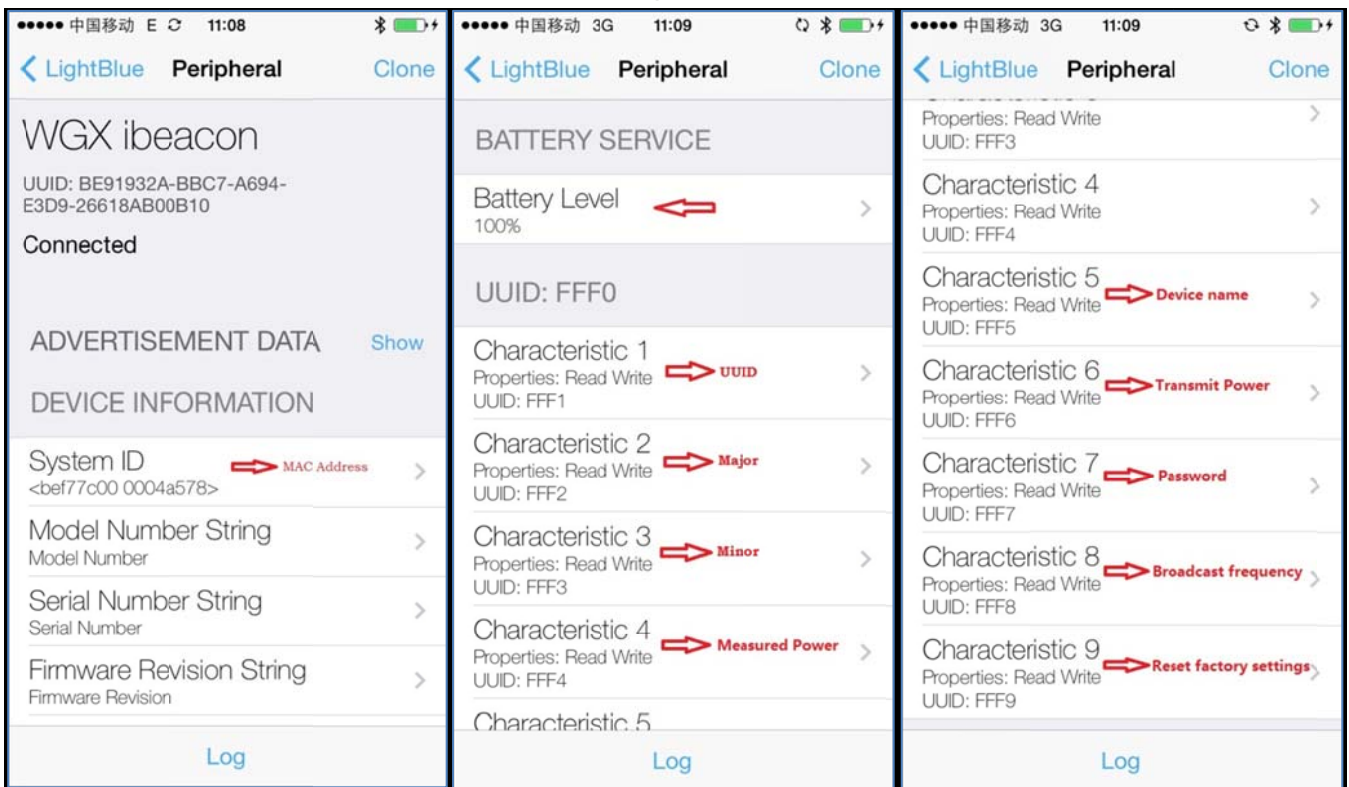
Open the software Light blue, this time will automatically search out iBeacon device can also be connected to the sliding screen refresh Equipment, open software displays the following figure, this time in the menu Peripherals Nearby displayed at WGX ibeacon It means that the search has been successful to the device, the device name is WELLCORE factory default settings, the user can modify Refer to Section 2.9 to modify the method.

Figure 1



Click below (Figure 1) name of the device icon: WGX ibeacon, then enter (Figure 2) interface, this menu has all the information listed ibeacon, click on the corresponding option to read or modify data, such as System ID <bef77c000004a578 > this unique MAC address for the device: 78 A5 04 7C F7 BE (this address is actually read in the reverse direction shown, and removed four zero in the middle); Battery Level <100%> this indicates that the current capacity of 100% (3.0V), power low than 2.0V then show 0%.

Figure 2



2.4 The login password and how to modify.

Attention: For the iBeacon we provide, the login password is needed if want to check or modify Device Parameters. The original code is:140611,Please see Figure3-5 for the right way of Entering the password.Before entering the right password, it all shows 0(Figure 3) on the Icon: READ again.Click: Write new value(Figure 3),start to enter the password(Figure 4), now Enter AA140611,Prefix AA means enter password,Click done when finished.now you can Check Modify other parameters, It means the password is wrong if you can not see the parameters,Then need to enter the right password.

Modify password(Figure 5): Only can modify the password when the right password has been put in. For example if you need to modify password to be : 123456,then you Need Enter AC123456, Prefix AC means modify password,the password can be 6-20 letters.Click Done when finished.

Figure 3

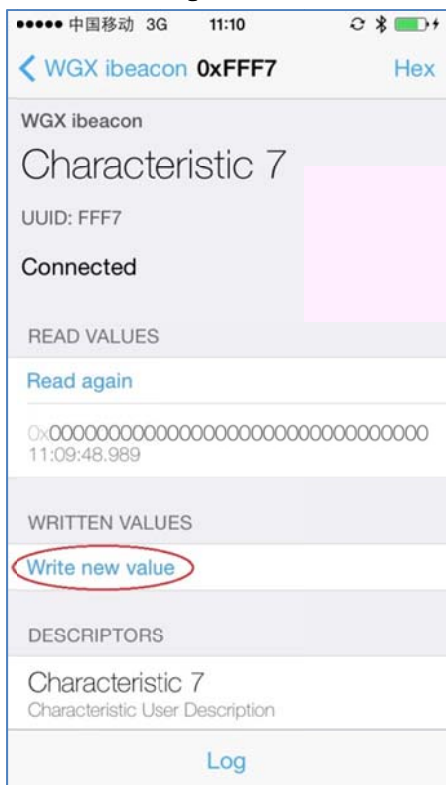


Figure 4

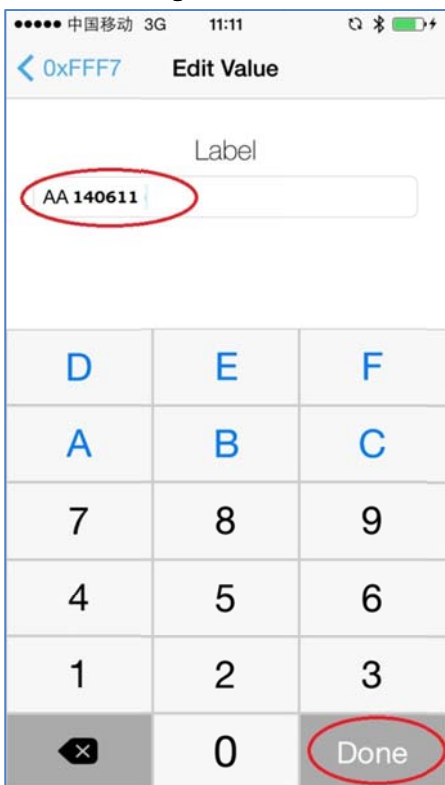
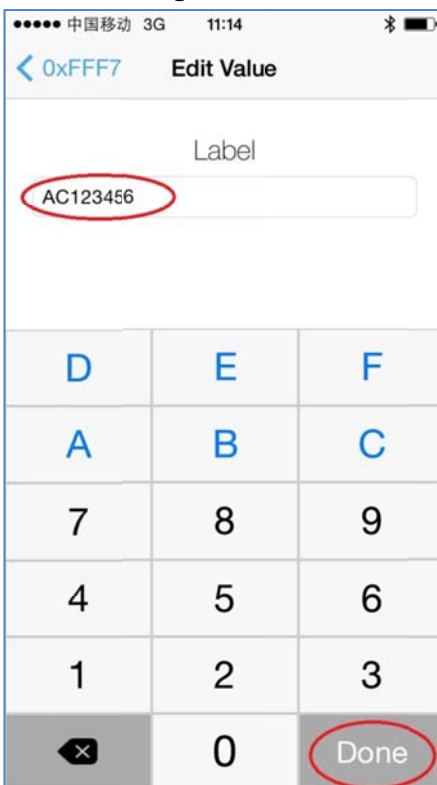


Figure 5



2.5 UUID revise

UUID is a 16 digits (32 characters)HEX value , the default value is (Figure 6): E2 C5 6D B5 DF FB 48 D2 B0 60 D0 F5 A7 10 96 E0,For example,modify UUID to be: E2 C5 6D B5 DF FB 48 D2 B0 60 D0 F5 A7 10 96 E1,then write Corresponding values on “Write new value”(Figure 7), Clink Done when finished.Meanwhile,,the new set UUID shows on the “Read again”,Notice:The devices can not be searched out on Locate ibeacon after finished modify UUID, As Locate ibeacon can only shows the Registered device,so you need to add a modified UUID device on the Options of iBeacon Transmitter.

Figure 6

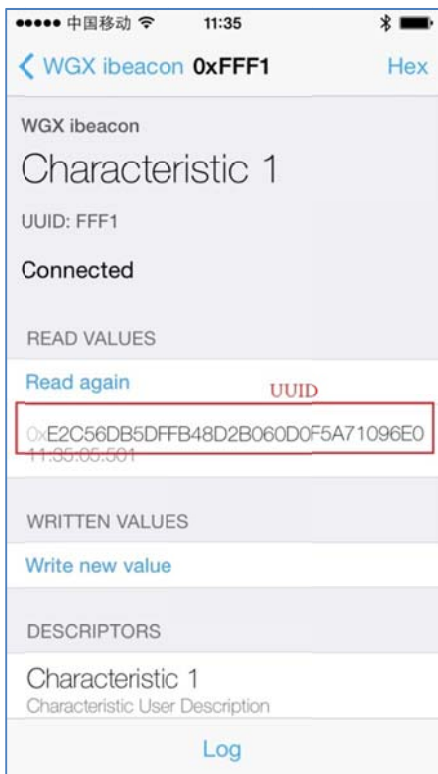


Figure 7

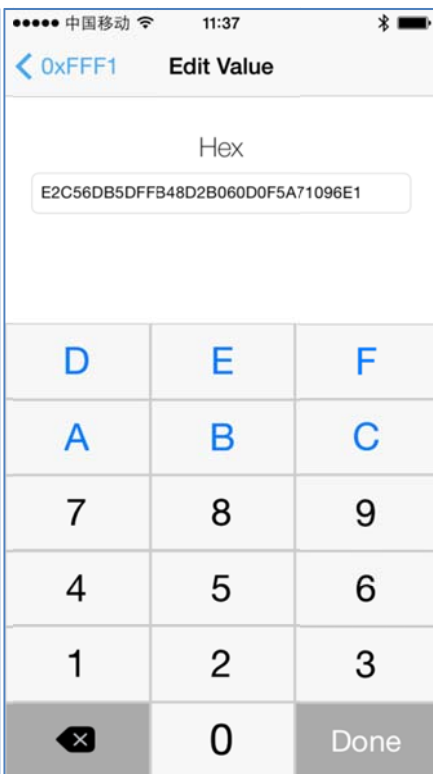
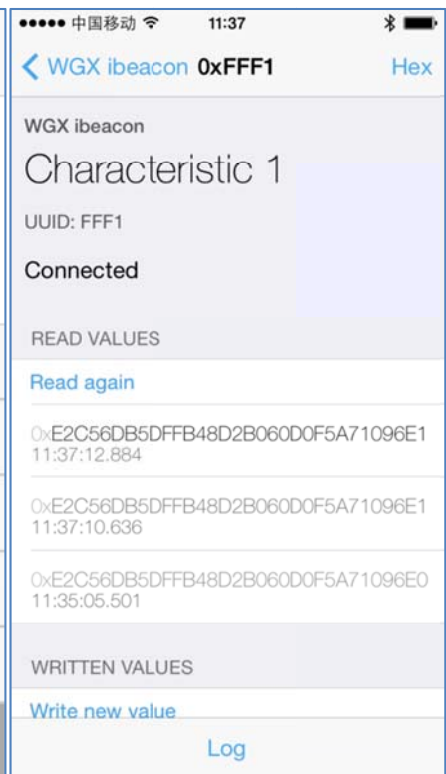


Figure 8



2.6 Major revise

Major is 2 digits(4characters)HEX value, default value is (Figure 9):0000, For example,modify Major to be : 8810,Then write Corresponding values in the “Write new value”(Figure 10), Click Done when finished. Meanwhile, the new set Major shows on the Read again(Figure11).

Figure 9

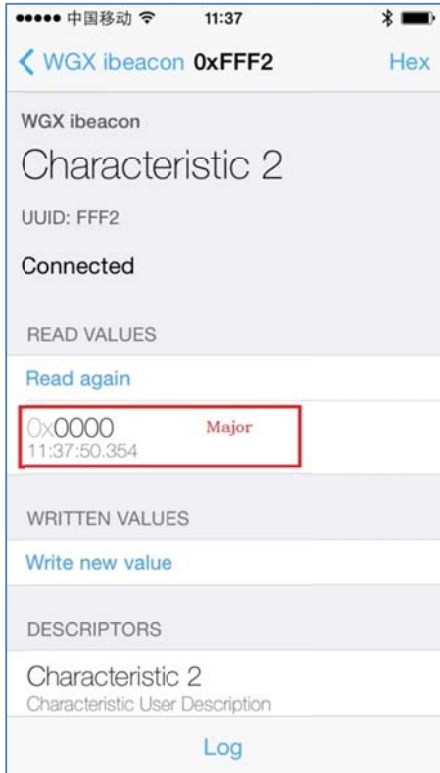


Figure 10

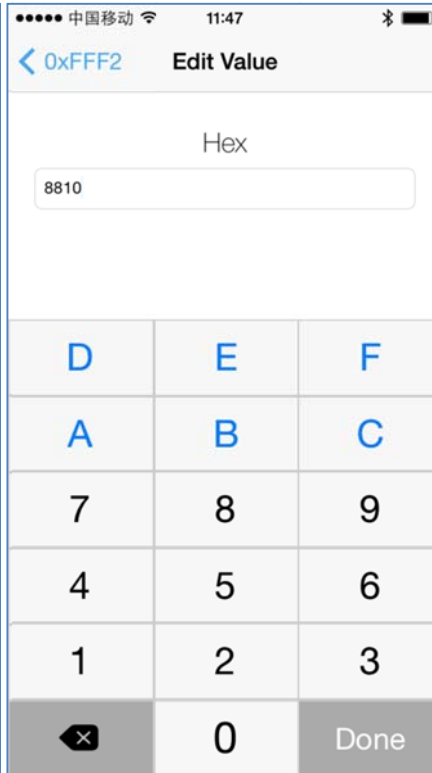
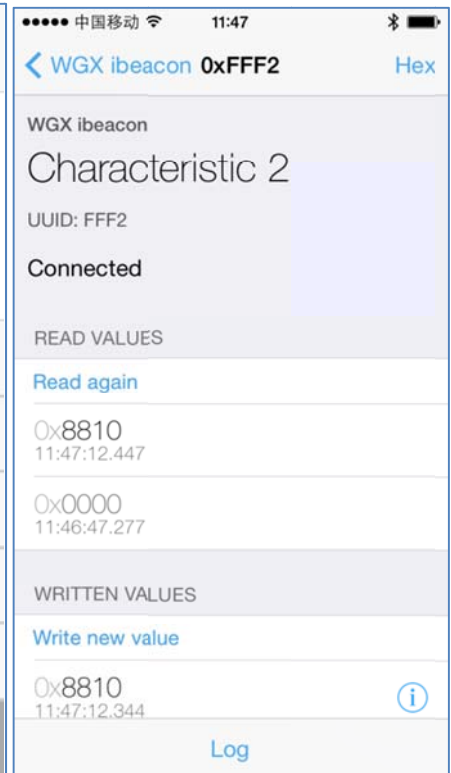


Figure 11



2.7 Minor revise

Minor is 2 digits(4characters)HEX value, default value is (Figure 12):0000, For example, modify Minor to be: 8811,Then write Corresponding values in the “Write new value”(Figure 13), Click Done when finished.Meanwhile, the new set Minor shows on the Read again(Figure14).

Figure 12

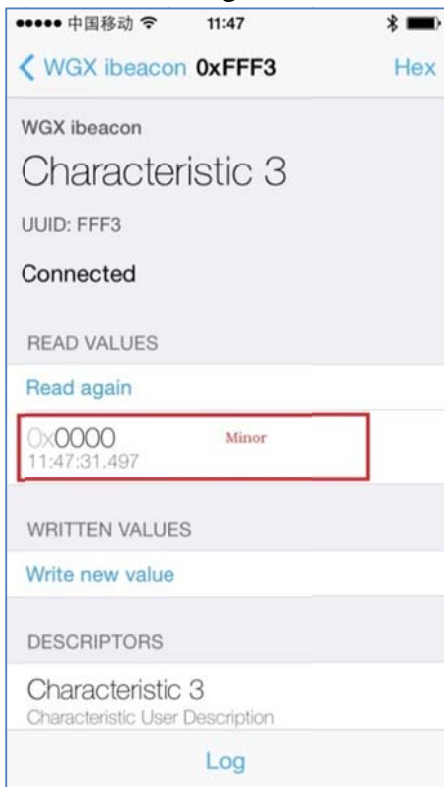


Figure 13

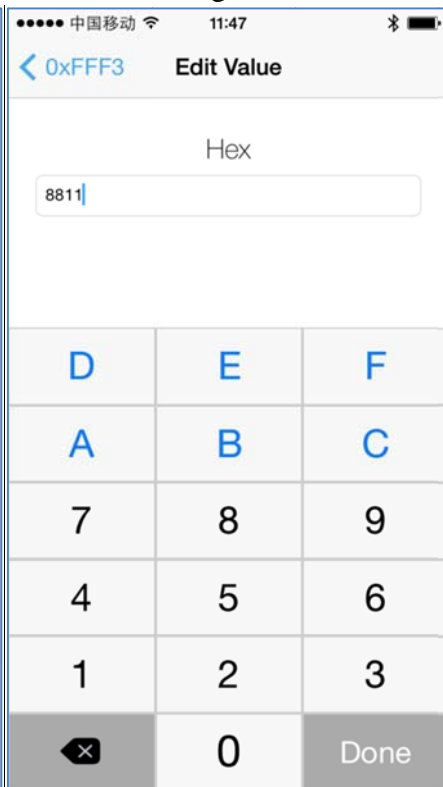
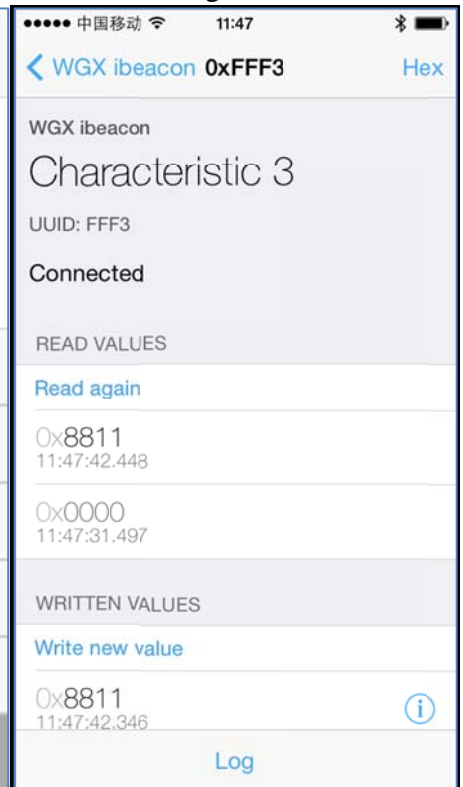


Figure 14



2.8 Measured Power revise

Measured Power is a 1digit(2 characters)HEX value, default value is(Figure15):C5,For example, modify Measured Power to be: C6,Then write Corresponding values in the Write new value(Figure 16), Click Done when finished.Meanwhile, the new set Measured Power shows on the Read again(Figure17).Notice Measured Power is a ISSI when the distance is 1 meter.The default value has been optimized,It's not recommended modification.

Figure 15



Figure 16

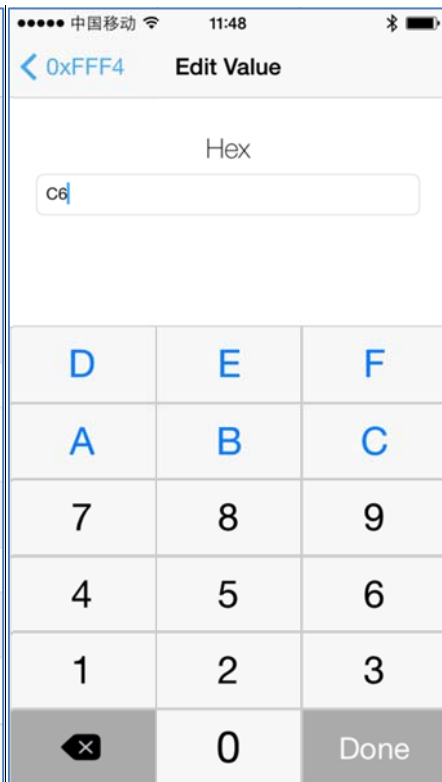
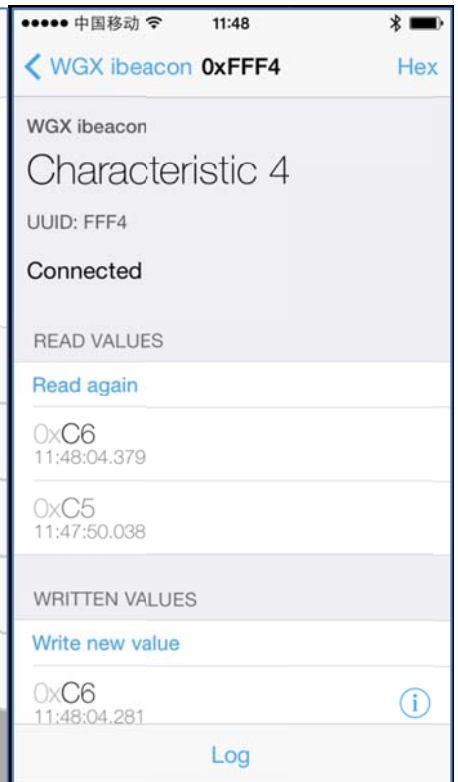


Figure 17



2.9 Device name revise

Device Name is 1-15 characters (ASCII Code), the default device name is “WGX ibeacon”(Figure 18) Example:Modify the Device name is:“wellcore01”: Writing the corresponding values in the place of "Write new value"(Figure 19). After finished Click“Done”to exit. At this time it displayed a new Device Name in the“Read again”(Figure 20), because this value must be entered in ASCII.So before modifying,click the top right corner of the“Hex”(Figure 18),And change to the entry mode of“UTF-8”(Figure 19). Please pay attention:You should re-search the device again then it can display the New Modified Device Name.

Figure 18

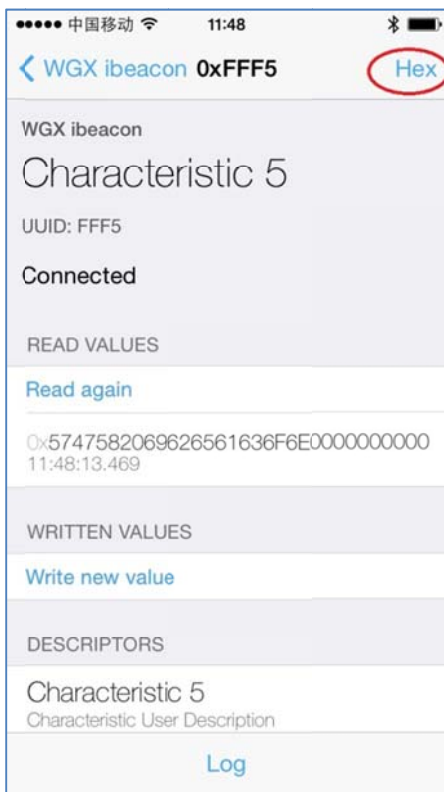


Figure 19

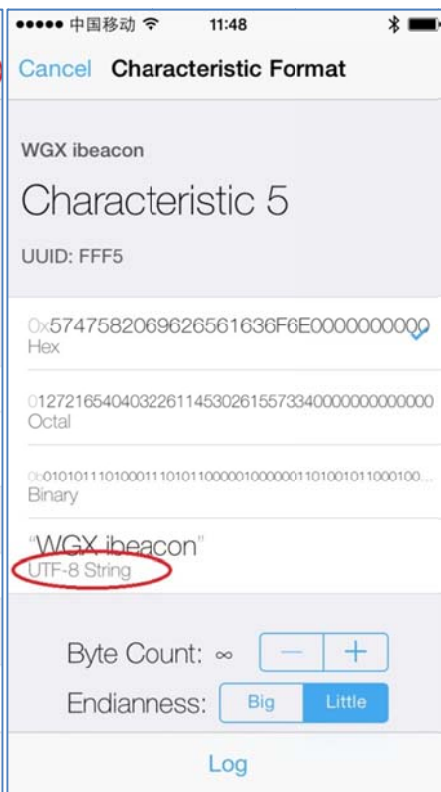
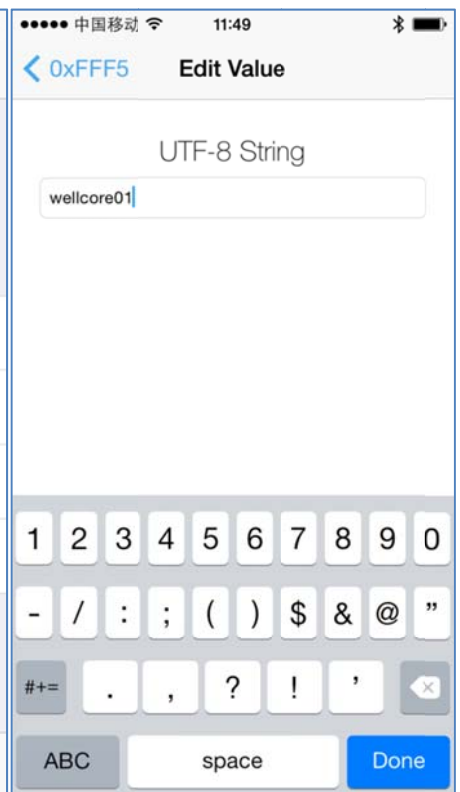


Figure 20



2.10 Transmit Power revise

“Transmit Power” is a (2 characters) HEX value, the default value is 02 (Figure 21), the transmit power has 3 grades. "00" represent -23db; "01" represent -6db; "02" represent 0db. Example: Modify the Transmit Power is 01: Writing the corresponding value in the place of "Write new value" (Figure 22). After finished Click “Done” to exit. At this time it can display the new Transmit Measured Power in the place of "Read again" (Figure 23). Please pay attention: You should modify transmit power according to the actual needs, "02 --- 0db" corresponds to the maximum power, the signal transmission distance can up to 100 meters, but the battery life will be relatively short.

Figure 21

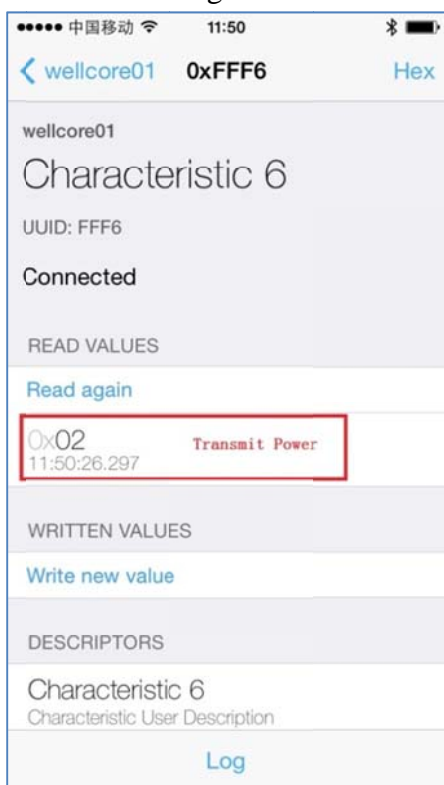


Figure 22

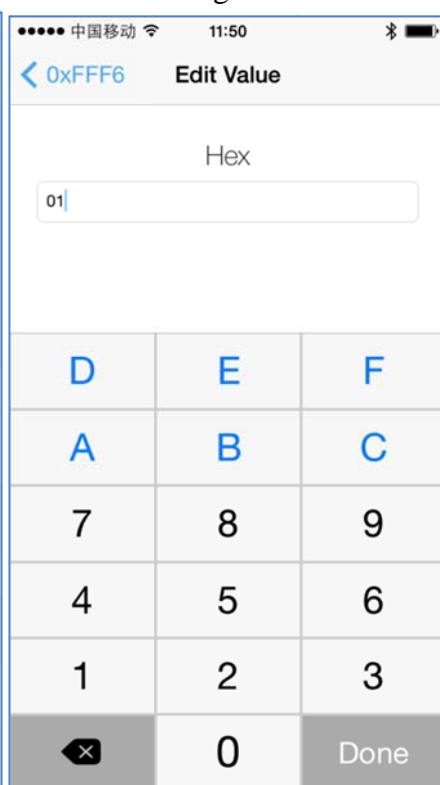
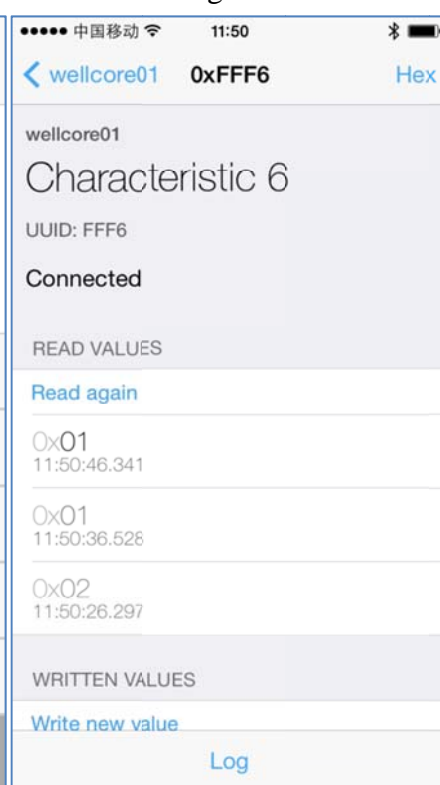


Figure 23



2.11 Broadcast frequency revise

"Broadcast Frequency" is a (2 characters) HEX value, the default value is 0A (Figure 24). The Broadcast Frequency can be regulated from 0.1 second to 10 seconds: 01 (0.1 seconds); 05 (0.5 seconds)..... 0A (1s); 64 (10 seconds) Example: Modify the Broadcast Frequency is 0.5 seconds: Writing the "05" in the place of "Write new value" (Figure 25). After finished Click "Done" to exit. At this time it can display the new Broadcast Frequency in the place of "Read again" (Figure 26). Please pay attention: You should modify the Broadcast Frequency according to the actual needs, the Broadcast Frequency is small and power consumption is also small. The battery life will be relatively increased.

Figure 24

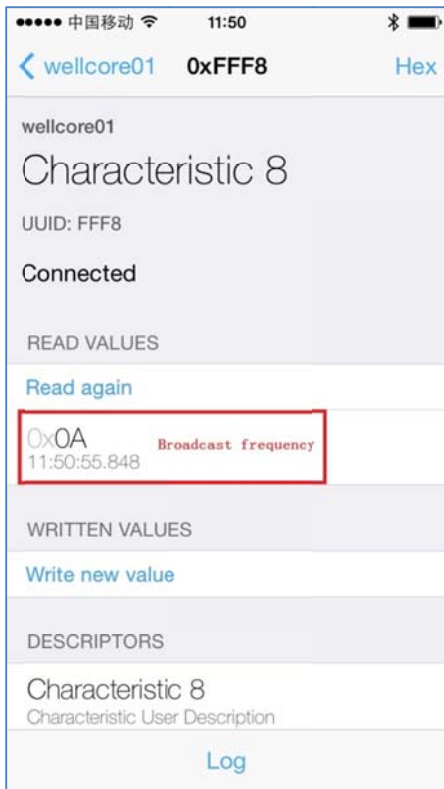


Figure 25

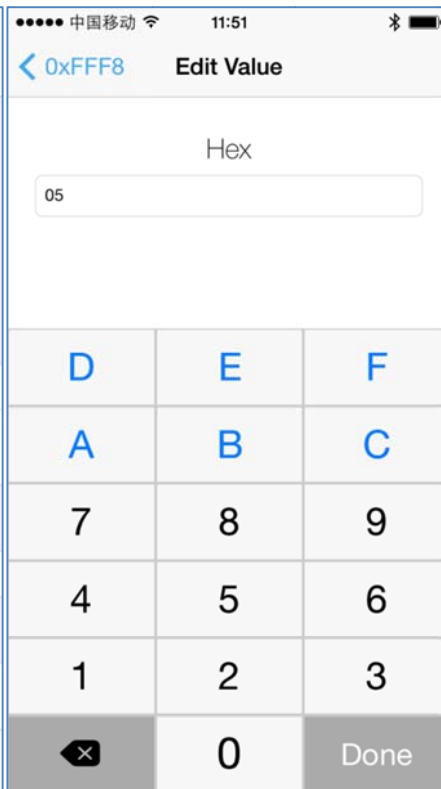
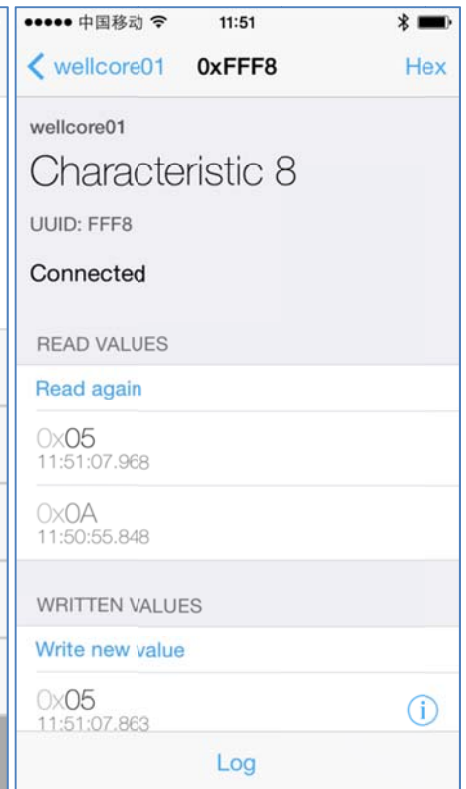


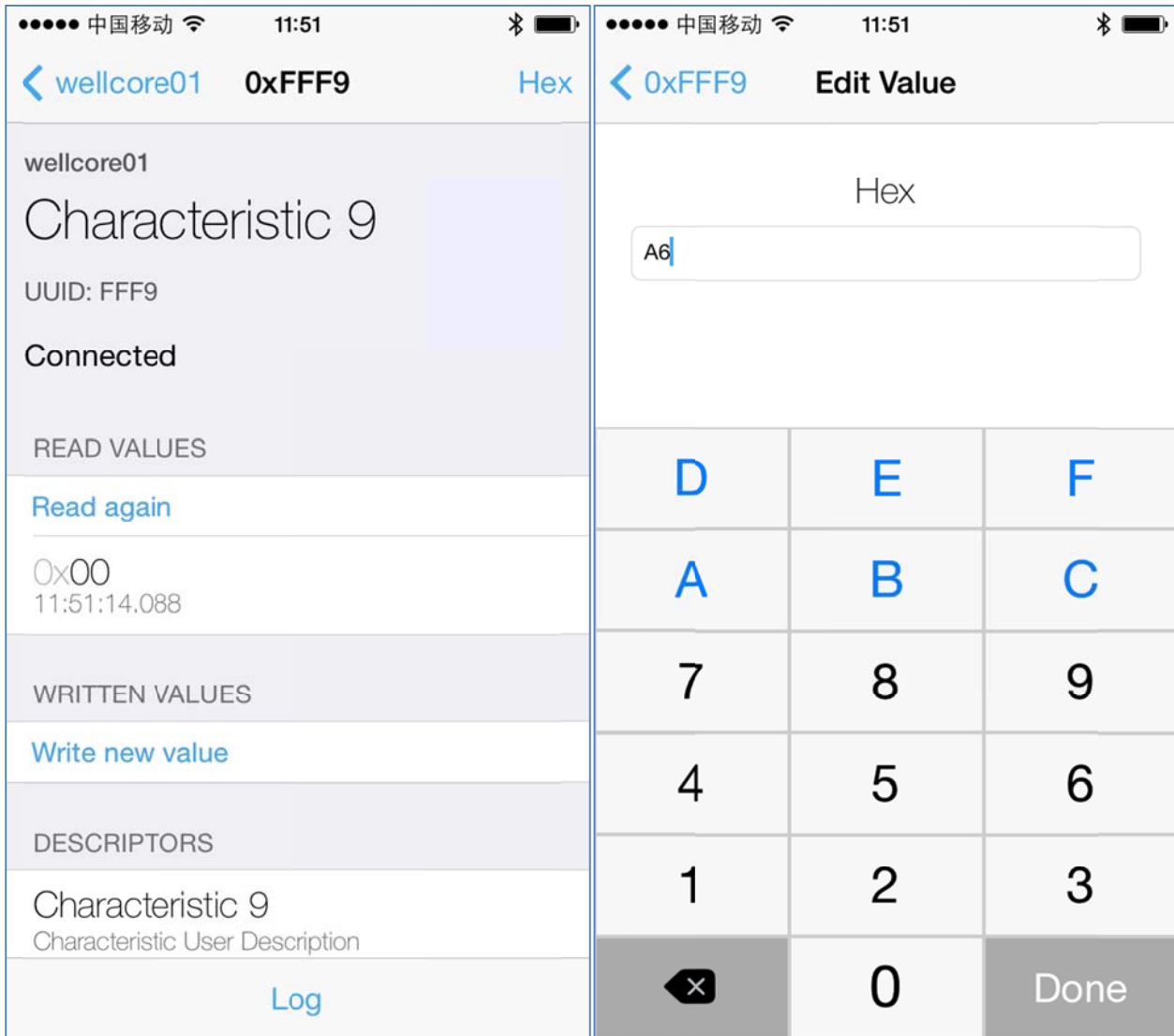
Figure 26



2.12 Reset factory settings

"Reset factory settings" is a 1 bit (2 characters) HEX value,A6.Writing the "A6" in the place of "Write new value"(Figure 27). After finished Click "Done" to exit. Note that you must first restore the factory settings after power off and then turn on the device.

Figure 27



3 Distance function:

3.1 Test Software

Software Name:Locate ibeacon .You can download from the iphone “APP STORE”with free charge.

3.2 The Use-method of Locate iBeacon

1. Open the software “Locate ibeacon” (Figure 28).Click“Locate iBeacons”you can enter the next two levels of menu (Figure29,30) At this time you can see all the informations of the device.Such as UUID,Major ,Minor, ISSI,Range Information,etc.

Figure 28

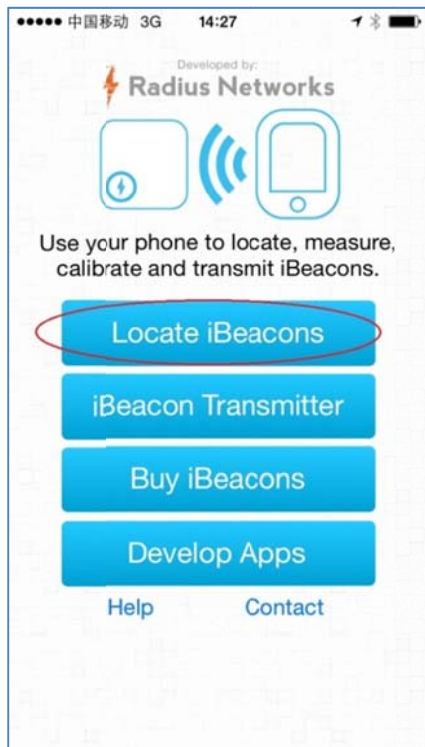


Figure 29

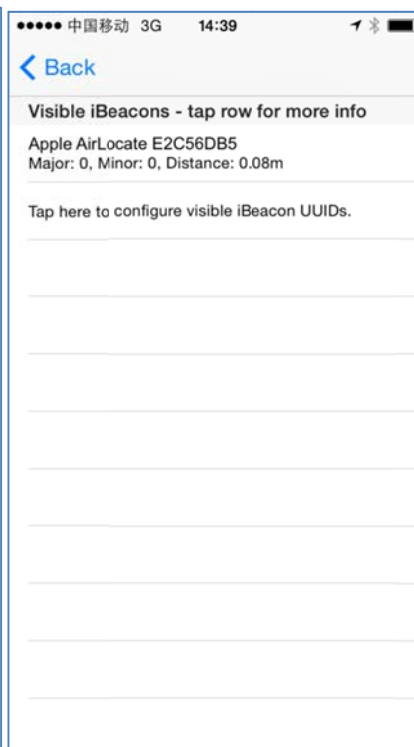


Figure 30



2, If you had modified the present UUID:E2 C5 6D B5 DF FB 48 D2 B0 60 D0 F5 A7 10 96 E0 to E2 C5 6D B5 DF FB 48 D2 B0 60 D0 F5 A7 10 96 E5 At this time you can't recognize the current device in the place of "Locate iBeacon", you must add an identical device UUID (Figure 32) ,Writing "Name"and "UUID",you needn't write the Major,Minor. After finished click "SAVE", (Figure 33) The interface indicates you has been set it successfully.

Figure 31

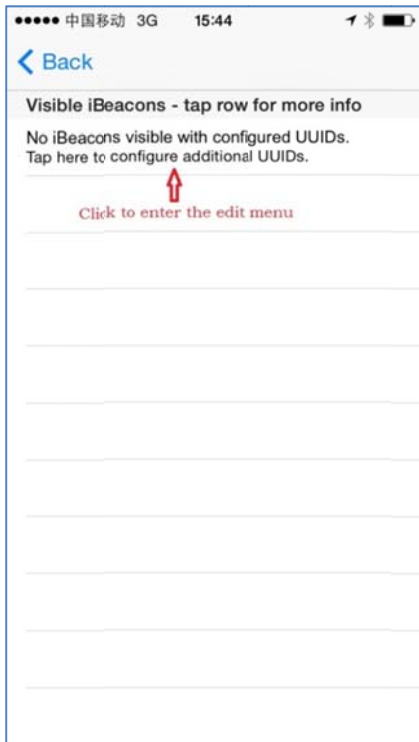


Figure 32

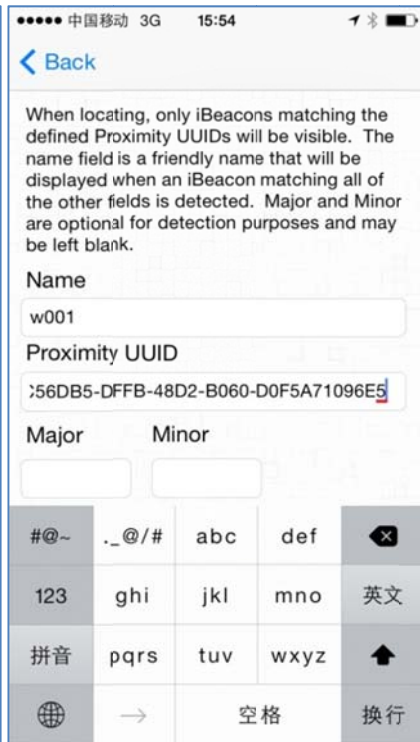
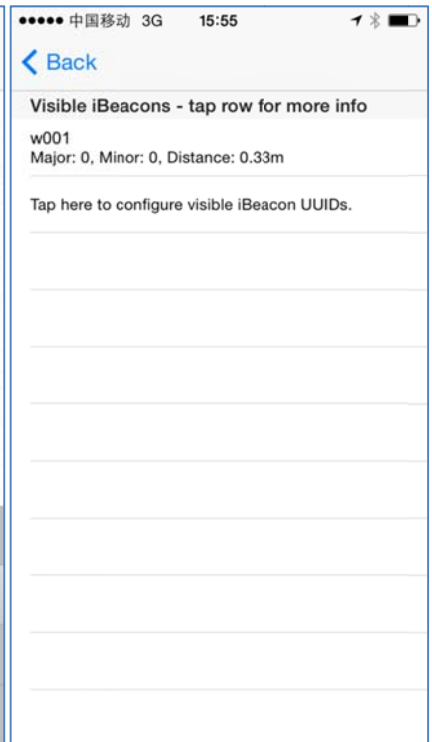


Figure 33



4 Product Specifications

4.1 Products Sample Figure



4.2 Mechanical Dimensions: L*W*H: 40*40*14.5mm

4.3 Weight: 35g

5 Electrical Parameters:

5.1 Battery Type: CR2477

5.2 Operating Voltage: 2.0-3.6V

5.3 Hardware Standards: Bluetooth BLE V4.0

5.4 Operating Frequency: 2.4GHz ISM band

5.5 Modulation: GFSK(Gaussian Frequency Shift Keying)

6 Use Environment:

6.1 Operating temperature: -25~+65°C

6.2 Storage Temperature: -40~+75°C

6.3 Environment Humidity: 5%~85%

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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.

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

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.