

VDB1620使用手册 蓝牙信标

VDB1620 User Manual Bluetooth Beacon

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设备清单/Product List

设备名称/Device Name	型号/Device No.	数量/Number	备注/Remark
蓝牙信标/Bluetooth Beacon	VDB1620	1 PCS	带防拆按键/With detachable button
电池/Battery	SIZE AA(5号)	2 PCS	南孚 Excell 工业装, 2600mAh

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1. 产品介绍/Product introduction

VDB1620 是一款防拆型资产标签蓝牙信标。其广播协议符合蓝牙 BLE 广播协议，包括 iBeacon（Apple）和 Eddystone（Google）两种协议。它通常被安装在一个合适的位置，周期性地向它的周围环境进行广播，从而被其他蓝牙设备如蓝牙网关扫描到其广播内容，并计算出位置信息。通常它是不会被其他 BLE 的主机设备连接上的，但是可以通过手机 APP 进行连接，并修改其广播参数等内容。

The VDB1620 is an anti-disassembly Bluetooth beacon that can be used as an asset tag. Its broadcast protocol conforms to Bluetooth BLE, including iBeacon (Apple) and Eddystone (Google). The beacon is usually installed in a suitable location, periodically broadcast to its surroundings, so that other Bluetooth devices such as Bluetooth gateways can scan its broadcast content and calculate the location information. Normally, it is not connected by other BLE host devices, but can be connected through mobile APP, and modify its broadcast parameters and other contents.

Skylab_xBeacon 是一款 SKYLAB 研发团队研发用于配置 VDB1620 参数的 APP。用这款 APP 去连接 VDB1620，可以修改它的广播频率、功率，UUID, Major, Minor 和设备名称等参数。当 VDB1620 处于广播状态时这些参数将被广播出来。

Skylab_xBeacon is an APP developed by SKYLAB R&D team for configuring VDB1620 parameters. If you connect VDB1620 with this APP, you can modify its broadcast frequency, power, UUID, Major, Minor, device name and other parameters. These parameters will be broadcast when VDB1620 is in broadcast state.



Figure 1: VDB1620 产品图/ product picture

1.1 VDB1620 内部模块介绍/ VDB1620 Internal Modules

VDB1620 基于 nordic 的 nRF52832 芯片，内部支持防拆按键，可以在被拆下时上传报警信息（安装时需要确保安装面平整，常规安装时把防拆按键按下，按键弹起时会在广播包中增加防拆报警信息）。

VDB1620 is based on Nordic nRF52832 chip, Its internal support anti-disassembly button, and can upload alarm information when it is disassembled. (During installation, ensure that the installation surface is flat. Press the anti-disassembly button during conventional installation, and anti-disassembly alarm information will be added to the broadcast package when the button is pulled up).

VDB1620 内部预留加速度和温湿度传感器，可以采集相应信息并广播出去（默认不贴）。
The VDB1620 reserves acceleration and temperature and humidity sensors to collect and broadcast information (not displayed by default).

VDB1620 用两节 5 号电池（南孚 Excell 工业装）串联供电，方便更换电池。
VDB1620 is powered by two no. 5 batteries (Nanfu Excell Industrial) in series for easy Easy to replace.

1.2 VDB1620 特性/ VDB1620 Feature

- ◆ 低功耗/ Low Energy
- ◆ IP67 级防尘防水/ IP67
- ◆ 支持二维码，NFC 定制内容/ Support two-dimensional code, NFC customized content
- ◆ 应用灵活/ Flexible application
- ◆ 安装便捷/ Easy to Install
- ◆ 广播距离可达 70 米/ Broadcasting distance can reach 70 meters
- ◆ 符合 RoHS, FCC, CE 标准/Compliance with RoHS, FCC, CE standards

1.3 VDB1620 应用/ VDB1620 Application

- ◆ 资产标签/ Asset tag
- ◆ 室内定位/ Indoor positioning
- ◆ 信息推送/ Information push
- ◆ 身份识别/ Identity recognition
- ◆ 微信摇一摇/ Wechat shake

2. 硬件参数/Hardware Features

产品参数/Product parameter	
尺寸/Dimensions	72*45*26mm (L*W*H)
电池型号/Battery model	Size AA (5号电池/Excell 工业装 2600mAh 容量)
工作温度/Operating temperature	-40℃~85℃

传感器参数 (预留, 默认不贴) /Sensor parameters (reserved, not attached by default)	
加速度传感器/Acceleration sensor	3轴, ±2g/4g/8g/16g 四档可调
湿度传感器/Humidity sensor	0%RH~100%RH (±%2RH)
温度传感器/ Temperature sensor	-20℃~70℃ (±0.2℃)

蓝牙参数/Bluetooth parameters	
无线标准/Wireless Standards	蓝牙®4.2/5.0,ANT Bluetooth® 4.2/5.0,ANT
频率范围/Frequency Range	2400MHz--2483.5MHz
数据速率/Data Rates	1Mbps(Bluetooth® 4.2); 2Mbps(Bluetooth® 5.0)
调制技术/Modulation technique	GFSK 调制
无线安全/Wireless Security	AES HW Encryption
传输功率/Transmit Power	Tx Power-40dBm, -20dBm, -16dBm, -12dBm, -8dBm, -4dBm, 0dBm, +3dBm and +4dBm.
灵敏度/Sensitivity	-94dBm at 1Mbps BLE
工作模式/Work Mode	Central/ Peripheral

电池使用寿命/Battery life			
广播功率/Broadcasting power	覆盖范围/coverage area	广播间隔 /Broadcas	电池使用时间（月）/Battery life (month)
+4dBm	70m	100ms	10.2
		200ms	19.7
		500ms	45.1
		1000ms	78.9
+0dBm	50m	100ms	13.8
		200ms	26.5
		500ms	58.9
		1000ms	99.2

注/Note:

功耗数据仅供参考，未考虑电池自放电因素，当计算寿命大于电池寿命（5年）时，以电池寿命为准；
The power consumption data is for reference only, and the battery self-discharge factor is not taken into account. If the calculated life is longer than the battery life (5 years), the battery life shall be the criterion.

上述计算默认采用南孚 Excell 工业装，2600mAh 作为电量参考。

The above calculation uses nanfu Excell industrial pack by default, 2600mAh as power reference.

3. 电池安装指导/ Battery installation guide

VDB1620 在默认情况下，出厂时已安装 2 节 5 号干电池。如果您需要更换电池，请遵循以下说明。
By default, the VDB1620 is delivered with two no.5 dry batteries. If you need to change its batteries, please follow the instruction below:

- (1) 用十字螺丝刀拆卸 4 颗螺丝；

Remove 4 screws with a Phillips screwdriver



(2) 打开 VDB1620 的底部外壳和橡胶垫，对准电池的正负极，安装 2 节电池；

Open the bottom shell and rubber pad of the VDB1620, follow the Battery polarity on the bottom of the battery cell, and replace its 2 batteries.



4. 软件使用说明//Software Instructions

4.1 VDB1620 开机/ Power on

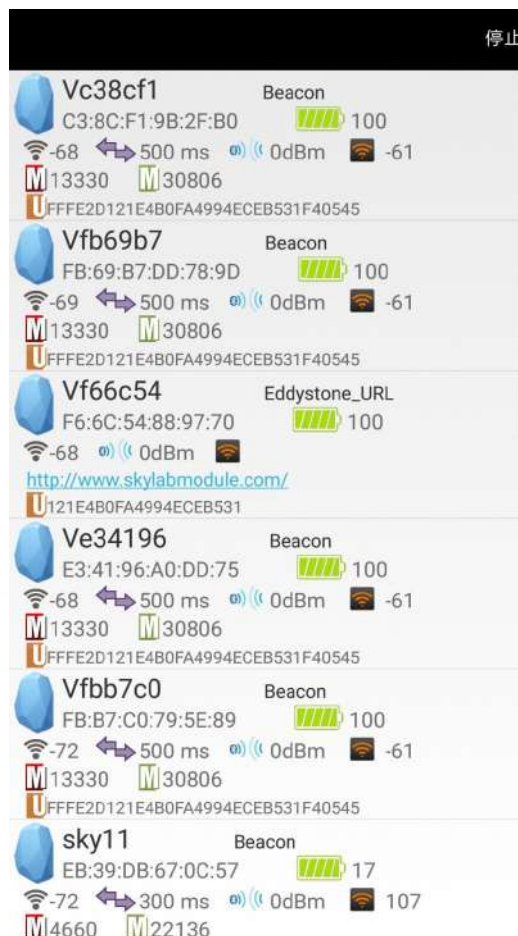
打开 VDB1620 的底壳，安装两个 Size AA 电池，再将开关拨到“ON”。此时，VDB1620 开始广播，再安装 VDB1620 的底壳。如未特殊要求，默认出货样机已提前拨到“ON”上，并装好电池打好螺丝。

Open the bottom shell of the VDB1620 and install two Size AA batteries, and then switch to "ON". At this point, VDB1620 starts broadcasting, and then install the VDB1620 bottom shell. If there is no special requirement, the delivery prototype has been dialed to "ON" in advance by default, and the battery and screws has been installed.

4.2 扫描蓝牙信标/ Scan Bluetooth beacons

打开 APP，如果手机提示打开蓝牙，请允许，手机自动开始扫描周围的蓝牙信标。

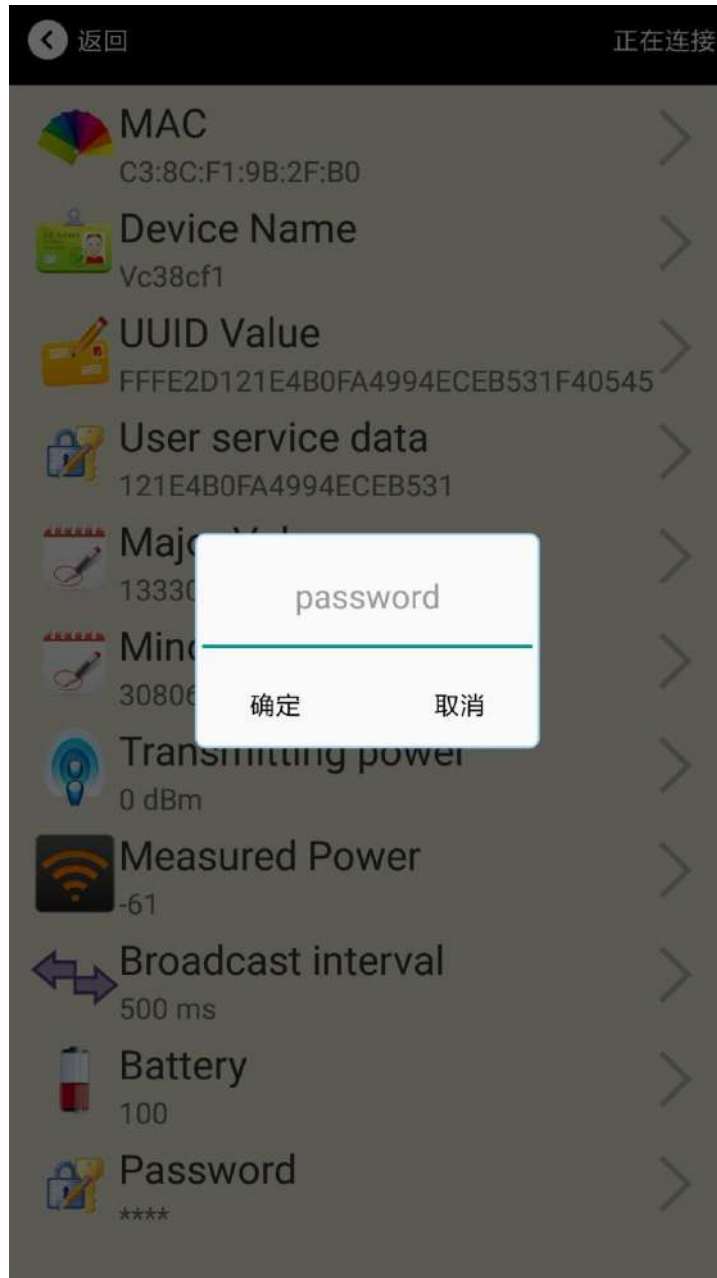
Open the APP. If the mobile phone prompts you to turn on Bluetooth, please allow. The mobile phone automatically starts to scan the Bluetooth beacons around it.



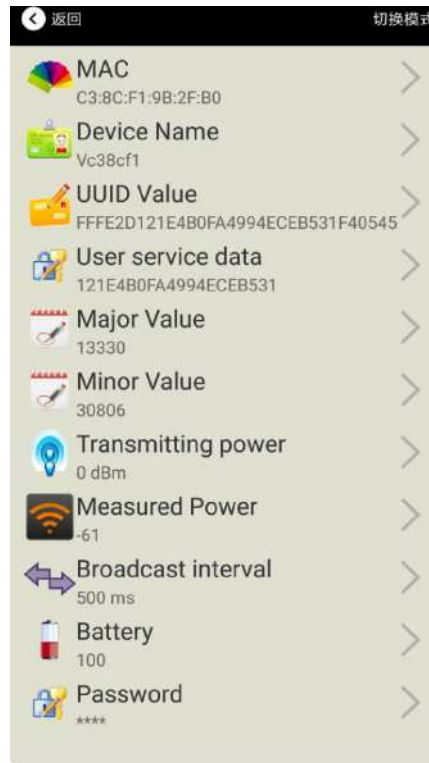
4.3 连接蓝牙信标/Connect Bluetooth beacon

点击要连接的蓝牙信标，30 秒内输入密码，即可获得操作权限。(出厂密码:1234)

Click the Bluetooth beacon you want to connect to, enter your password within 30 seconds, and you will get the operation permission. (Factory password :1234)



4.4 配置介绍/Configuration Introduction



介绍/ Introductions:

MAC: MAC 地址/ Chip MAC address

Name: 所选蓝牙信标的名称/ The name of the Bluetooth 4.2 Beacon which is selected.

UUID: 按照 ISO/IEC11578:1996 标准的 128 位标识符(16 字节)/

128-bit identifier according to ISO/IEC11578:1996 standard (32 hexadecimal digits)

User service data: 用户数据, 24 个 16 进制数字 User data, 24 hexadecimal digits

Major: 16 位标识符(0-65535)/ set 16-bit identifier (0-65535)

Minor: 16 位标识符(0-65535)/ set 16-bit identifier (0-65535)

Measured Power: 距离 1 米时的参考信号强度/ Signal strength at 1 meter (VDB1620 transmission power is 0dBm)

Transmit Power: VDB1620 发射功率/ VDB1620 transmit power

Advertise Interval: VDB1620 广播间隔/ VDB1620 advertise interval

Battery Level: VDB1620 电池电量/ VDB1620 battery Capacity

Password: VDB1620 密码 (默认 1234) / VDB1620 connection password

配置好信息后, 蓝牙连接断开, 配置将生效。

After the information is configured ,the configuration will take effect after the bluetooth connection is disconnected.

4.5 修改蓝牙信标名称/ Modify Bluetooth 4.2 Beacon Name

点击“Device Name”，出现以下 UI，然后在“输入一个名称”框中输入长度小于 12 位的英文字符名称，也可以在“或者选一个”里选一个名称。然后点击“确认修改”。

Click the “Device Name”, the following UI will be opened. Then enter a length of less than 12-bit English characters as VDB1620 device name in the following “Enter a Name” box. Then click “confirm to modify”.



4.6 修改 UUID/ Modify UUID

点击“UUID”，出现以下 UI，然后在“输入一个 UUID 值”框中输满 16 个字节（32 个十六进制字符）作为 VDB1620 的 UUID。然后点击“确认修改”。

Click the “UUID”, ,the following UI will be opened. Then and then enter a 32-byte string of sixteen as the UUID of VDB1620 in the following “Enter an UUID” box. Then click “confirm to modify”.



4.7 修改 User service data/ Modify User service data

点击“User service data”，出现如下界面，在“输入用户数据”中输入 24 个 16 进制字符。然后点击“确认修改”。

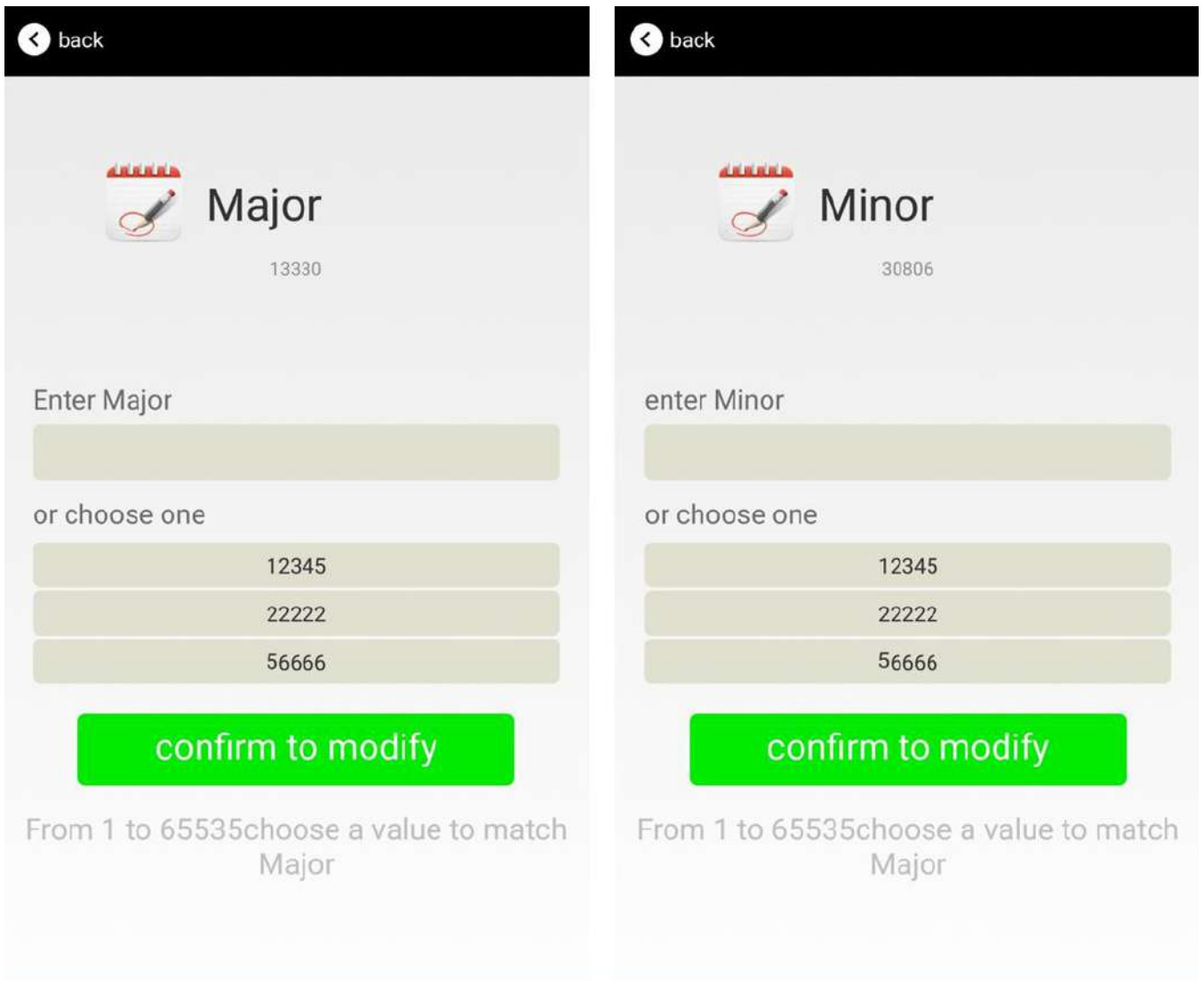
Click the " User service data ", the following interface will be opened. Then enter a Hexadecimal string of 24 word . Then click "confirm to modify".



4.8 修改 Major、Minor/ Modify Major、Minor

点击“Major”，出现如下界面，设置 0~65535 为设备的 Major 值。然后点击“确认修改”。

Click the "Major"/"Minor" ,the following UI will be opened. Then set a value between 0~65535 as the Major/Minor value of the device.



修改 Minor

同上面 Major 类似，点击 Minor 进入修改即可。

4.9 修改 Measured Power/ Modify Measured Power

点击“Measured Power”，出现如下 UI，在距离 VDB1620 1 米远处，设置测量功率，可调范围 -100dBm~-30dBm，默认为-61dBm。然后点击“确认修改”。

Click the “Measured Power”, ,the following UI will be opened. Then select a measured power range from -100dBm to -30dBm. The default is -61dBm. Then click “confirm to modify”.

Measured Power 含义为，当接收设备接收到的信号强度为-61dBm 时，可认为该设备距离 VDB1620 约为 1 米。

Measured Power means, when a phone's RSSI is -61dBm, it is about 1 meter from VDB1620.



4.10 修改发射功率/ Modify Transmitting Power

点击“Transmission Power”出现如下 UI，设置 VDB1620 的发射功率。功率可设置为:-30dBm，-20dBm， -16dBm， -12dBm， -8dBm， -4dBm, 0dBm, 4dBm。默认是 0dBm。然后点击“确认修改”。

Click the "Transmitting Power" ,the following UI will be opened. Then set a transmitting power, which can be set to: -30dBm, -20dBm, -16dBm, -12dBm, -8dBm, -4dBm, 0dBm, 4dBm and 8dBm. Default Power is 0dBm. Then click “confirm to modify”.



4.11 修改广播间隔/ Modify Advertise Interval

点击“广播间隔”出现如下 UI，设置广播间隔，广播间隔可以设置为 100ms、200ms、300ms、400ms、500ms、600ms、700ms、800ms、900ms 和 1000ms。默认为 500ms。然后点击“确认修改”。

Click the "Advertise Interval", the following UI will be opened. Then set a advertise interval. Broadcasting interval can be set to 100ms, 200ms, 300ms, 400ms, 500ms, 600ms, 700ms, 800ms, 900ms and 1000ms. The default is 500ms. Then click "confirm to modify".



4.12 修改密码/ Modify Password

点击“Password”，出现如下 UI，然后在“Password”框中输入 4 个字符作为连接密码，默认为 1234。然后点击“确认修改”。

Click the “Password”, the following UI will be opened. Then and then enter the 4 characters as a connection password in the “Password” box, the default is 1234. Then click “confirm to modify”.



注意：请提前保存好您的密码，一旦修改新密码，原密码将失效，必须用新密码才能登陆。

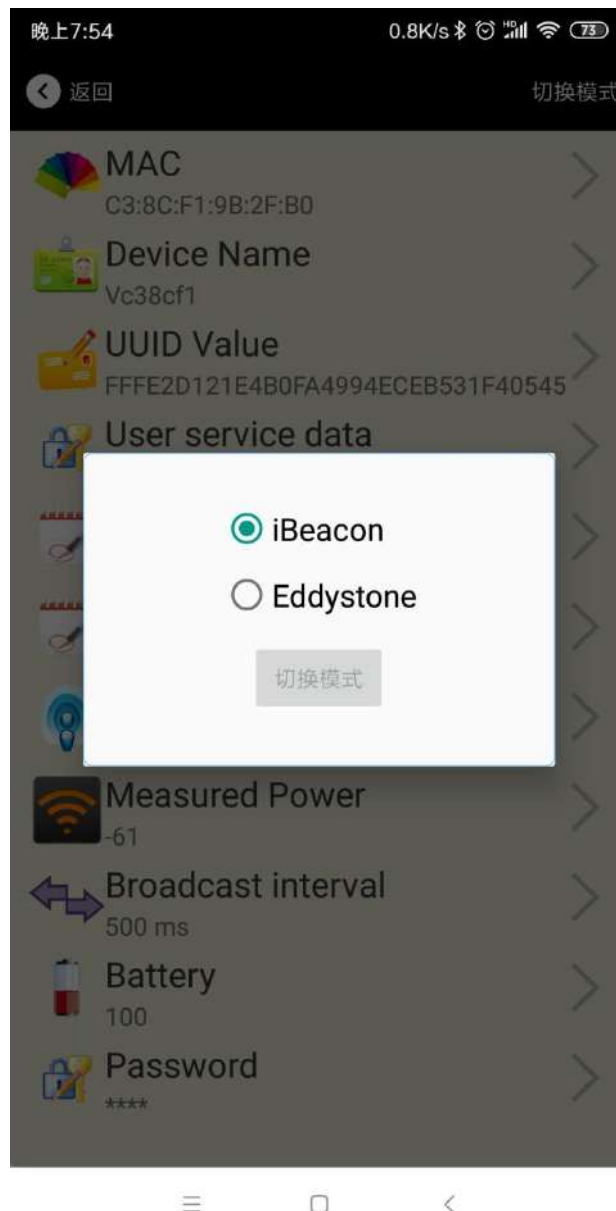
Note:

Please save your password in advance, once you change the new password, the original password will be invalid, you must use the new password to log in.

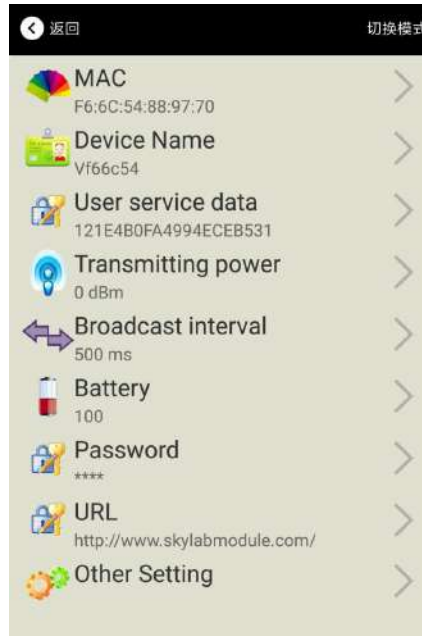
4.13 切换模式/ Switch mode

点击右上角切换模式文字，出现模式选择窗口，点选 Eddystone。

Click “switch mode” on the upper right corner, the mode selection window will be opened. Then you can choose iBeacon or Eddystone mode. Default mode is iBeacon.



4.14 Eddystone 配置页面简介/ Eddystone configuration page Introduction



介绍/ Introductions:

MAC: MAC 地址/ Eddystone configuration page Introduction

Name: 蓝牙信标的名称，配置方式同 iBeacon 模式。/ The name of the Bluetooth 4.2 Beacon which is selected.

User service data: 用户自定义的数据，配置方式同 iBeacon 模式。/ User-defined data in broadcasting

Transmit Power: VDB1620 发射功率，配置方式同 iBeacon 模式。/ VDB1620 transmit power

Advertise Interval: VDB1620 广播间隔，配置方式同 iBeacon 模式。/ VDB1620 advertise interval

Battery Level: VDB1620 电池电量。/ VDB1620 battery Capacity

Password: VDB1620 连接密码，配置方式同 iBeacon 模式。/ VDB1620 connection password

URL: 修改 Eddystone 字段信息。默认格式是 URL。/ modify the Frame field information in Eddystone. The default format is URL. Other Formats can be selected by other setting

Other Setting: 用于选择 Eddystone 其他字段信息。/ Format selection of Frame field information in Eddystone.

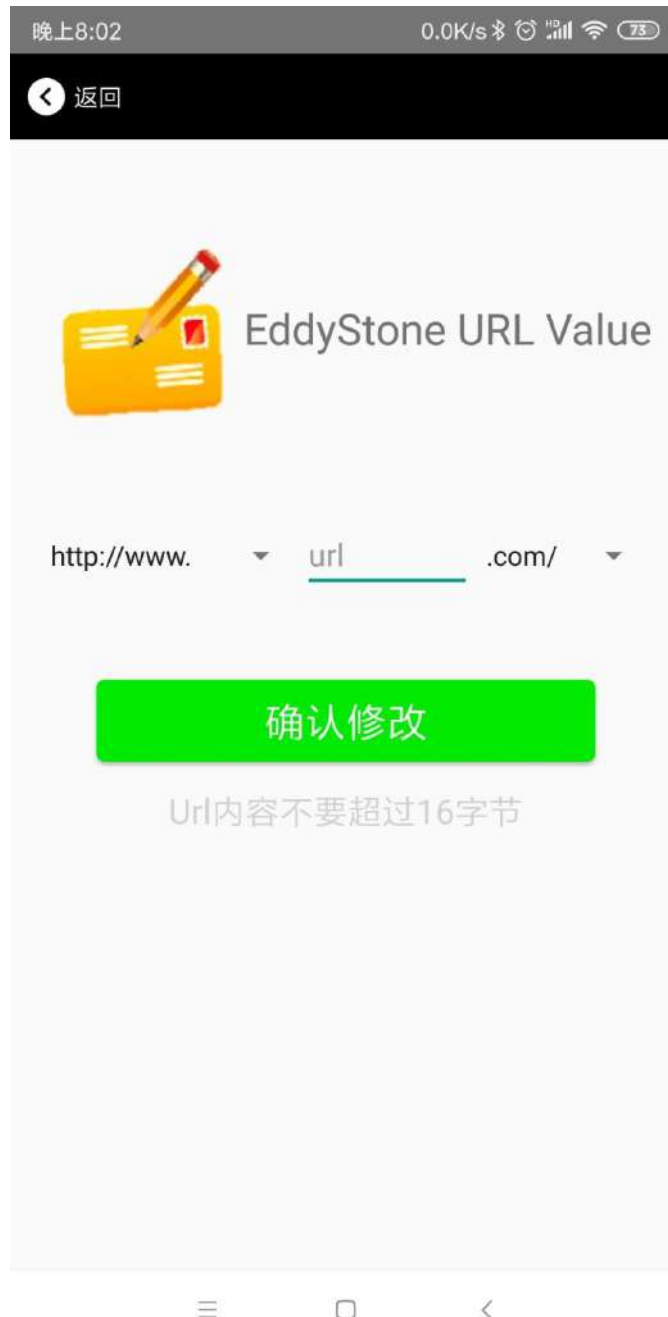
配置好信息后，蓝牙连接断开，配置将生效。

After the information is configured, the configuration will take effect after the bluetooth connection is disconnected.

4.15 修改 URL/ Modify URL

点击“URL”，出现如下 UI，然后在“url”下划线上输入最多 16 字节的字符串，即可广播 URL。

Click "URL", the following UI appears, and then enter a string of up to 16 bytes on the "URL" underscore, you can broadcast the URL.



4.16 修改 Other Setting/ Modify Other Setting

a.选择并设置 UID 信息/Select and set the UID information:

分别设置 NameSpace(10 字节)和 Instance(6 字节)。

Set NameSpace(10 bytes) and Instance(6 bytes) respectively.



b.选择并设置 EID 信息 Select and set the EID information:

设置 EID 信息，最多 8 个字节。

Set the EID information to a maximum of 8 bytes.



c.选择并设置 TLM 信息 Select and set TLM information:

推荐选择 Encrypted TLM specification（加密的 TLM 规范），然后输入分别输入最多 12 字节的 Encrypted TLM data（加密 TLM 数据），2 字节的 16-bit Salt，以及 2 字节的 16 bit Message Integrity Check。

It is recommended to select the Encrypted TLM Specification, then enter up to 12 bytes of Encrypted TLM Data, 2 bytes of 16-bit Salt, and 2 bytes of 16-bit Message Integrity Check.

**4.17 APP 下载/ Download the APP**

目前最新 APP 尚未上架，请联系销售人员提供，APP 名称 Skylab_xbeacon。

At present, the latest APP has not been put on the shelves, please contact sales. APP name is Skylab_xbeacon.

5. 联系方式/ Content

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