

# VDB1618规格书

## 蓝牙信标

# VDB1618 Datasheet

## BLE Beacon

### 文档信息/Document information

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此文档适用于以下产品/This document applies to the following products:

产品名称/Name	产品型号/Model	产品状态/Status
Beacon	VDB1618	量产/Mass

## 列表/List

设备名称/Device Name	型号/Device No.	数量/Number	备注/Remark
蓝牙信标/Bluetooth 4.2 Beacon	VDB1618	1 PCS	
电池/Battery	ER14250	2 PCS	默认安装在 VDB1618 内部/ Inside VDB1618

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## 1. VDB1618 产品介绍/ VDB1618 Product Introduction

VDB1618 是一款带加速度计和温湿度传感器的蓝牙信标。蓝牙信标使用 BLE 低功耗蓝牙广播的方法，利用其支持的通用属性配置文件在第 37、38、39 三个信道上连续发送无定向性的广播包。其广播内容可由我司研发团队开发的 APP “95POWER\_xbeacon” 读取，包括 UUID、Major、Minor、RSSI 等信息。

The VDB1618 is a Bluetooth beacon with an accelerometer, temperature and humidity sensor. It uses a broadcasting protocol which is based on BLE (Bluetooth Low Energy ). VDB1618 broadcasts its general config parameters like UUID, Major, Minor, RSSI etc. to surroundings over the BLE channels 37, 38 and 39 continuously and non-directionally. The broadcasting information can be read by “95POWER\_xbeacon” APP, which is designed by 95POWER R&D Team.



Figure 1: VDB1618 top view

### 1.1 内部介绍/ Internal introduction

VDB1618 基于 Nordic BLE 4.2 芯片。使用 LIS2DH12 三轴加速度传感器和 SH31 温湿度传感器，实现运动状态，温湿度信息的广播。其内部由 2 节 ER14250 电池供电，电池续航时间与 VDB1618 广播参数有关。

VDB1618 is based on Nordic Bluetooth 4.2 chip. It uses LIS2DH12 triaxial acceleration sensor and SH31 temperature and humidity sensor to realize the broadcasting of motion state and temperature and humidity information. It is powered by 2 ER14250 batteries. Its battery life is related to the internal broadcasting parameters.

## 1.2 特性/Features

低功耗/ Low Power Consumption

体积小、重量轻、造型美观/ Small,Lightweight,Beautiful appearance

APP 可灵活配置参数/ Flexible Application

安装方便(可磁吸/3M 胶安装) /Easy to Install(use 3M sticky tape)

加速度和温湿度数据采集/ Acceleration, temperature and humidity data collection

广播范围最大可达 100 米/ Advertise Range up to 100 Meters

符合 RoHS (无铅)/ RoHS compliance (Lead-free)

符合 FCC, CE/ FCC,CE compliance

## 1.3 应用/Application

室内定位/ Indoor Positioning

信息推送/ Information Push

身份识别/ Identification

微信摇一摇/ WeChat Shake

## 2. 硬件参数/Hardware parameters

### 2.1 产品参数/Product Parameter

硬件特性 Hardware Features	
型号 Model	VDB1618
天线类型 Antenna Type	PCB 天线/ PCB Antenna
电池 Battery	ER14250 2 * 1200mAh
标称电压 Voltage	3.6 v
尺寸(D×H) Dimension(D×H)	52.0 * 23.2(±0.3)mm
无线功能 Wireless Features	
无线标准 Wireless Standards	蓝牙®4.2/ Bluetooth ® 4.2
频率范围 Frequency Range	2400MHz——2483.5MHz
数据速率 Data Rates	250kbps / 1Mbps / 2Mbps
调制技术 Modulation Technique	GFSK 调制

无线安全 <b>Wireless Security</b>	AES
传输功率 <b>Transmit Power</b>	-20~+4dBm 可调，步长 4 dB Tx Power -20 to +4dBm in 4dB Steps
灵敏度 <b>Sensitivity</b>	-93dBm at 1Mbps BLE
工作模式 <b>Work Mode</b>	Peripheral
<b>传感器参数/ Sensor parameter</b>	
加速度传感器/ <b>Acceleration sensor</b>	3 轴，±2g/4g/8g/16g 四档可调 3 axis, ±2g/4g/8g/16g four gears adjustable
湿度传感器/ <b>Humidity sensor</b>	0%RH~100%RH (±%2RH)
温度传感器/ <b>Temperature sensor</b>	-20℃~70℃ (±0.2℃)
<b>其他 Others</b>	
工作环境 <b>Environment</b>	工作温度:-40℃~ 85℃ Operating Temperature: -40℃~85℃
	储存温度:-40℃~ 85℃ Storage Temperature: -40℃~85℃
	工作湿度:10%~90%不凝结 Operating Humidity: 10%~90% Non-condensing
	储存湿度:5%~90%不凝结 Storage Humidity: 5%~90% Non-condensing

**注：**加速度传感器默认工作中断模式（运动后就会给出中断），最后一次运动 10s 后认为进入静止状态；  
温湿度采样频率默认每分钟采样一次。

**Note:** By default, the acceleration sensor works in interrupt mode (interruption will be given after movement), and it is considered to be in static state after the last movement for 10 seconds.  
By default, temperature and humidity sampling frequency is once every minute.

## 2.2 电池寿命/Battery life

发射功率(dBm) Transmission Power (dBm)	广播距离(m) Broadcast Distance (m)	广播间隔(ms) Broadcast time interval (ms)	一天的功耗(mAh) Power consumption per day (mAh)	待机时长(天) Battery life (days)
4	70	100	8.70984	276
		400	2.23146	1076
		500	1.799568	1334
		1000	0.935784	2565
0	50	100.	5.82984	412
		400	1.51146	1588
		500	1.223568	1961
		1000	0.647784	3705
-4	35	100	4.38984	547
		400	1.15146	2084
		500	0.935568	2565
		1000	0.503784	4764

注：以上数据可能因环境不同而有所改变，且未计入电池损耗，仅供参考。

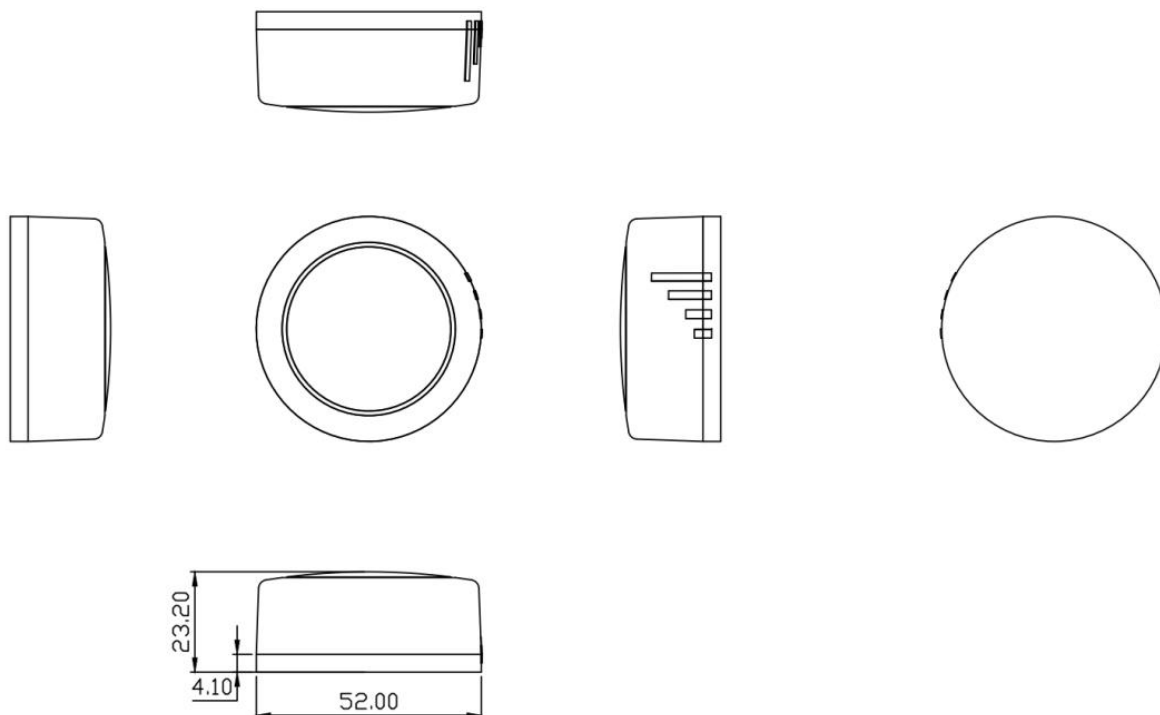
**Note:** The above data may differ from different environments. It is caculated by current-test (Battery Loss not included) and just for reference.

## 2.3 结构参数/structural parameters



**天线方向：**指 PCB 板载天线信号强度最强的方向

Antenna direction: the direction with the strongest signal strength of PCB onboard antenna





### 3. 硬件使用说明/Hardware Instructions

#### 3.1 VDB1618 安装电池/ install battery

VDB1618 安装电池后就会自动开机。默认情况下，出厂时已安装 2 节 ER14250 电池，并塞好了绝缘片。

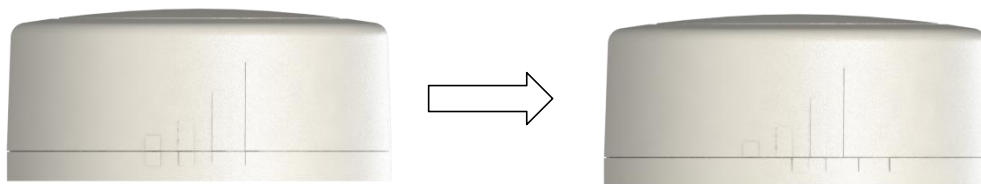
VDB1618 will start automatically after the battery is installed. By default, two ER14250 batteries are installed and insulation sheet is inserted when it leave factory.

如果您需要更换电池，请遵循以下说明。

If you need to replace the battery, follow the instructions below.

a. 一只手固定面壳，另一只手顺时针旋转后盖，取下后盖。

a. Holding the shell in place with one hand, remove the back cover by rotating it clockwise with the other hand.



b. 取下旧电池，并更换 2 节 ER14250 锂电池，负极对弹簧，正极对铁片，两节电池并联，方向相同。

b. Remove the old batteries, and replace the two ER14250 lithium batteries, negative pole to spring, positive pole to iron, two batteries in parallel, the same direction



c. 重新安装后壳，请把后盖和面壳上有天线信号标志的方向对齐。

c. Reinstall the rear cover. Align the direction of the antenna signal mark on the rear cover and the face cover.

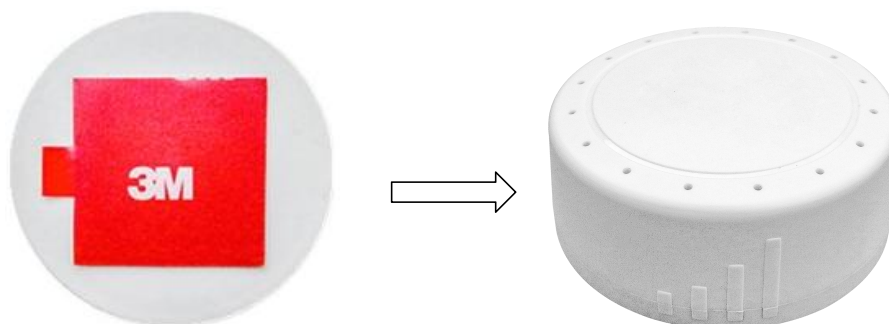
注意：请勿把电池方向装反！

**Note: Don't put the battery in the wrong direction!**

## 3.2 VDB1618 安装固定方法/Mounting and fixing method

### 3M 胶式安装

- a. 使用无尘布把 VDB1618 后盖擦拭干净，防止使用过程中有灰尘或油污；  
a. Clean the back cover of VDB1618 with a dust-free cloth to prevent dust or oil stains.
- b. 把 3M 胶片从油纸贴上揭掉，贴到 VDB1618 后盖上。  
b. Remove the 3M thick double-sided tape from the oil paper and attach it to the back cover of VDB1618.
- c. 把 VDB1618 贴 3M 胶一面放到平面上（如桌子上）均匀按压。  
c. Place the VDB1618 on the 3M thick double-sided tape side on a surface (such as a table) and press evenly.
- d. 撕掉红色 3M 胶保护膜，并把 VDB1618 有 3M 胶一面贴到目标安装位置（选择合适贴装位置，目标位置如果有灰尘或油渍需要提前清理干净，并保持干燥）。然后均匀施力按压 5~10 秒。  
d. Tear off the red protective film of 3M thick double-sided tape and attach the 3M adhesive side of VDB1618 to the target installation position (select the appropriate installation position, the target position should be cleaned in advance if there is dust or oil stains, and keep dry). Then apply force evenly and press for 5~10 seconds



## 4. 软件使用说明/Software Instructions

95POWER\_xbeacon 是 95POWER 研发团队开发的一款蓝牙 Beacon 软件，支持 iBeacon 和 Eddystone 两种模式，可灵活配置常用参数。

95POWER\_xbeacon is a Bluetooth Beacon software developed by 95POWER research and development team. It supports iBeacon and Eddystone modes and can flexibly configure common parameters

## 4.1 下载应用程序/Download APP

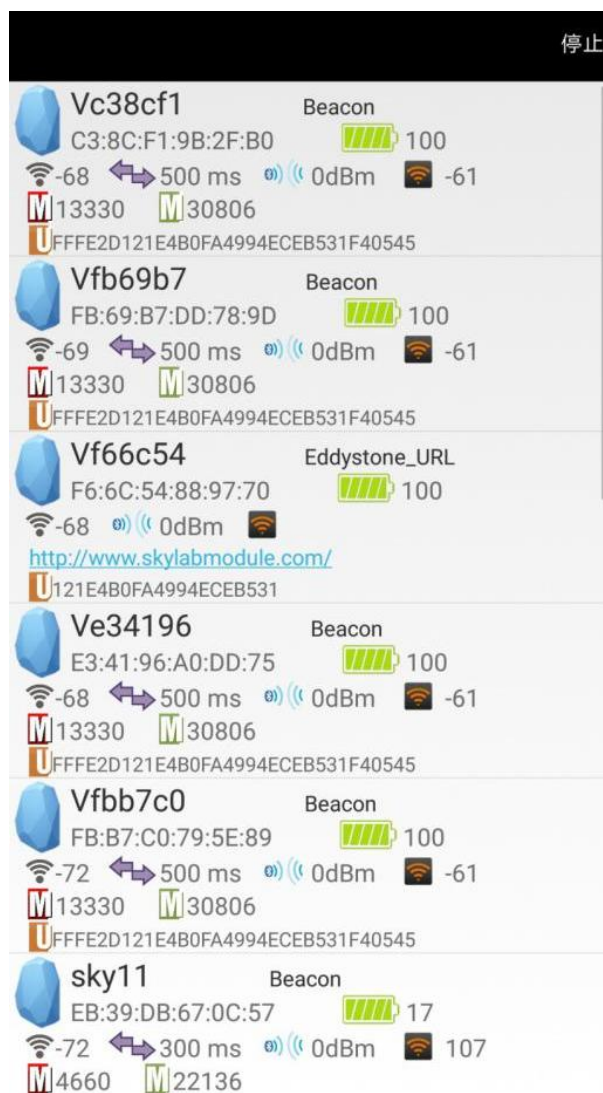
目前 APP 尚未上架，请联系销售人员提供，APP 名称 95POWER\_xbeacon。

95power\_xbeacon hasn't been put into the market yet. Please contact our salesman for this APP.

## 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。

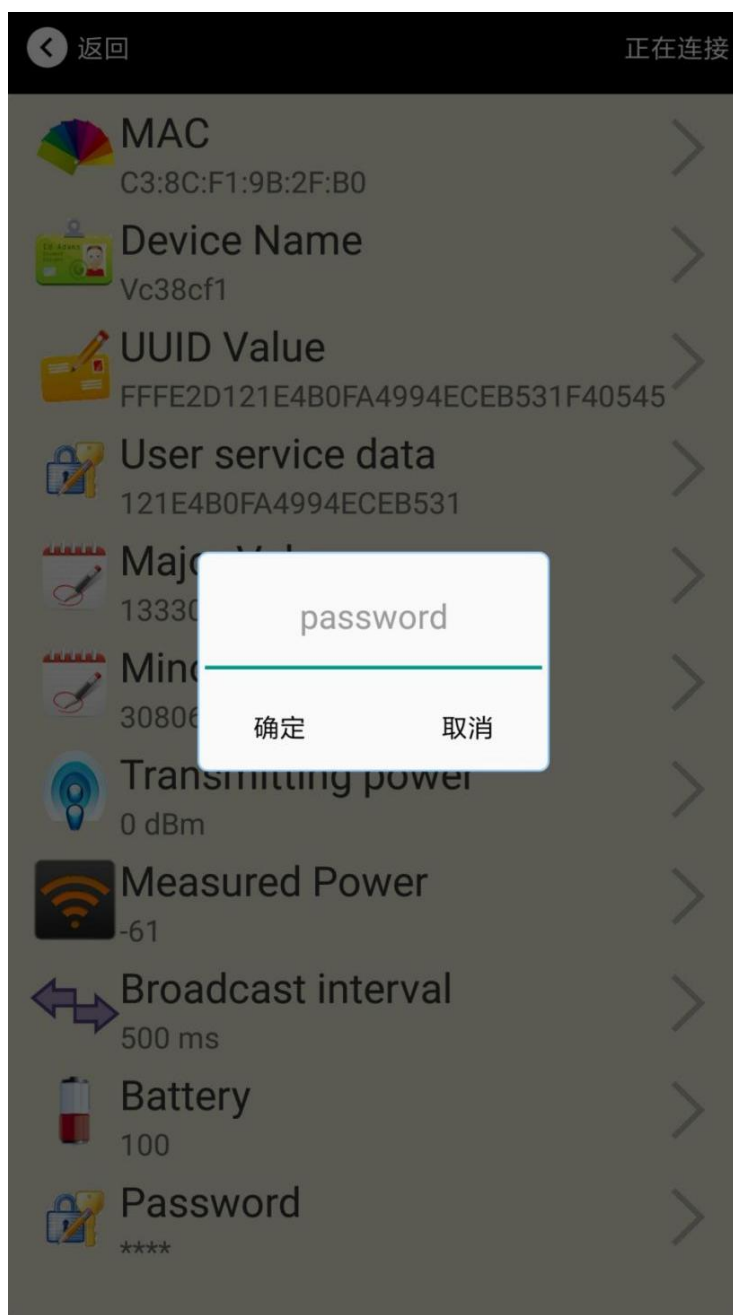
Open the APP, if cell phone ask for permission to open bluetooth please select yes. Then it will begin to scan the surrounding Bluetooth 4.2 Beacons.



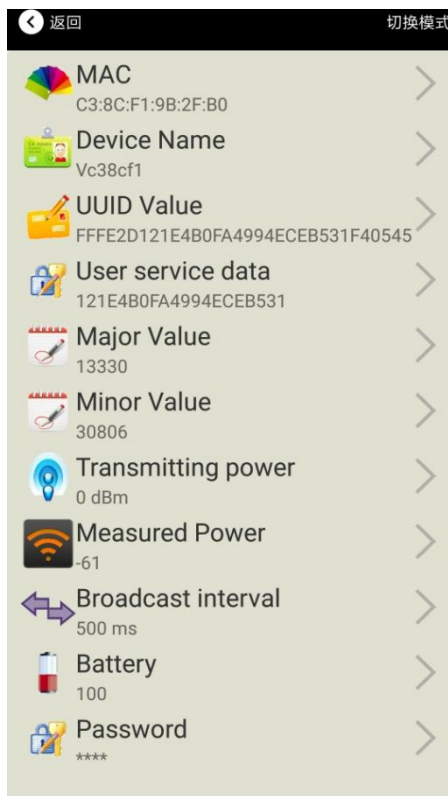
### 4.3 连接蓝牙信标/Connect Bluetooth 4.2 Beacon

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 4.2 Beacon to be connected, enter the password within 30 seconds, in order to obtain operating privileges .(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 (VDB1618 transmission power is 0dBm)

**Trasmit Power:** VDB1618 发射功率/ VDB1618 transmit power

**Advertise Interval:** VDB1618 广播间隔/ VDB1618 advertise interval

**Battery Level:** VDB1618 电池电量/ VDB1618 battery Capacity

**Password:** VDB1618 密码 (默认 1234) / VDB1618 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 VDB1618 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 VDB1618 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 VDB1618 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”.

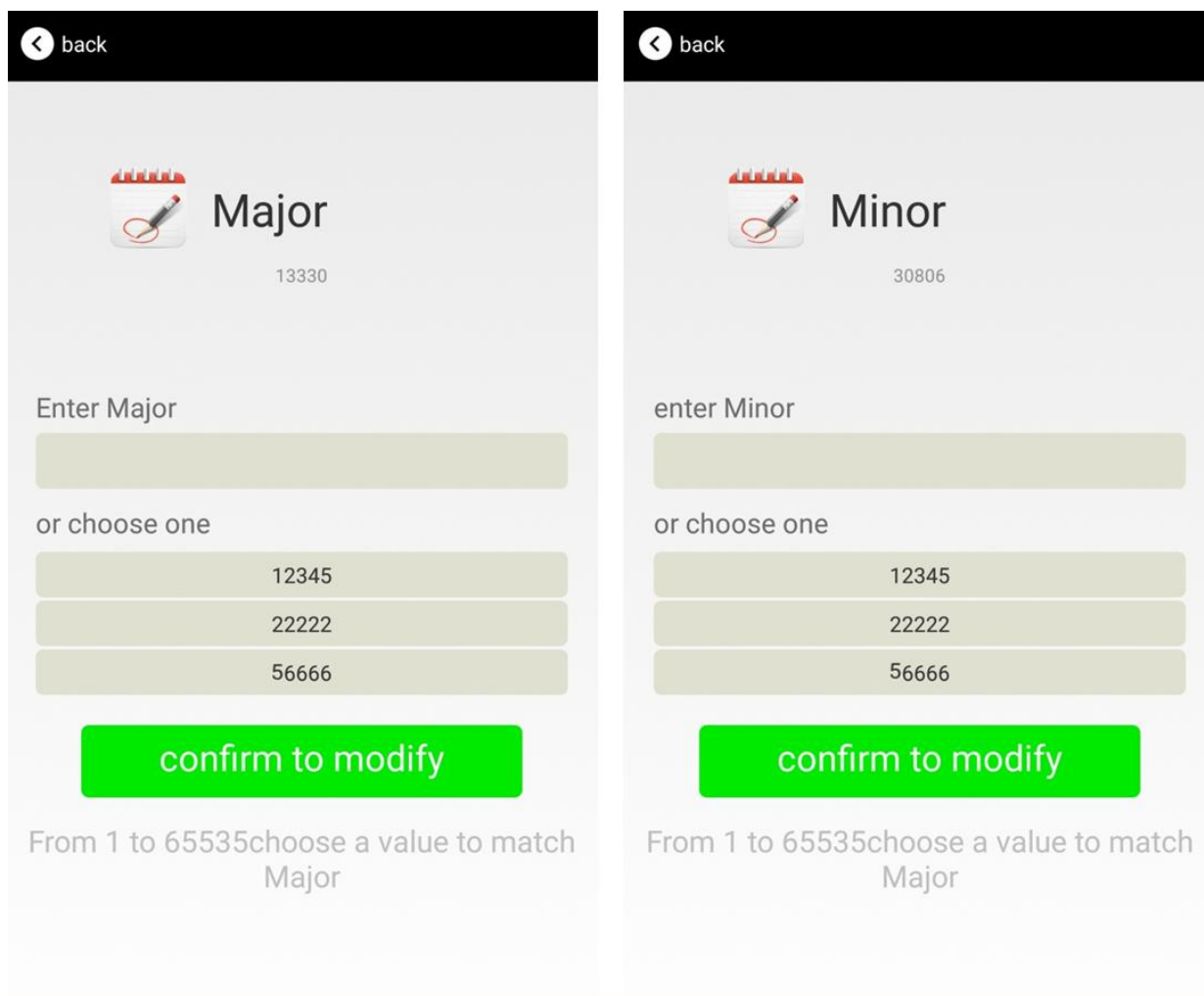




## 4.8 修改 Major、Minor/Modify Major、Minor

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”。Minor 类似，点击 Minor 进入修改即可。

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. Then click “confirm to modify”. Minor is similar, click Minor to enter modify.



Two side-by-side screenshots of a mobile application interface for modifying Major and Minor values.

**Left Screenshot (Major):**

- Top bar: back
- Icon: A notepad with a pencil.
- Title: Major
- Value: 13330
- Input field: Enter Major
- Options: or choose one
- Buttons: 12345, 22222, 56666
- Action: confirm to modify
- Footer: From 1 to 65535 choose a value to match Major

**Right Screenshot (Minor):**

- Top bar: back
- Icon: A notepad with a pencil.
- Title: Minor
- Value: 30806
- Input field: enter Minor
- Options: or choose one
- Buttons: 12345, 22222, 56666
- Action: confirm to modify
- Footer: From 1 to 65535 choose a value to match Major

## 4.9 修改 Measured Power/Modify Measured Power

点击“Measured Power”，出现如下 UI，在距离 VDB1618 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 VDB1618 约为 1 米。

Measured Power means, when a phone's RSSI is -61dBm, it is about 1 meter from VDB1618.



## 4.10 修改发射功率/Modify Transmitting Power

点击“Transmission Power” 出现如下 UI，设置 VDB1618 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. 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。

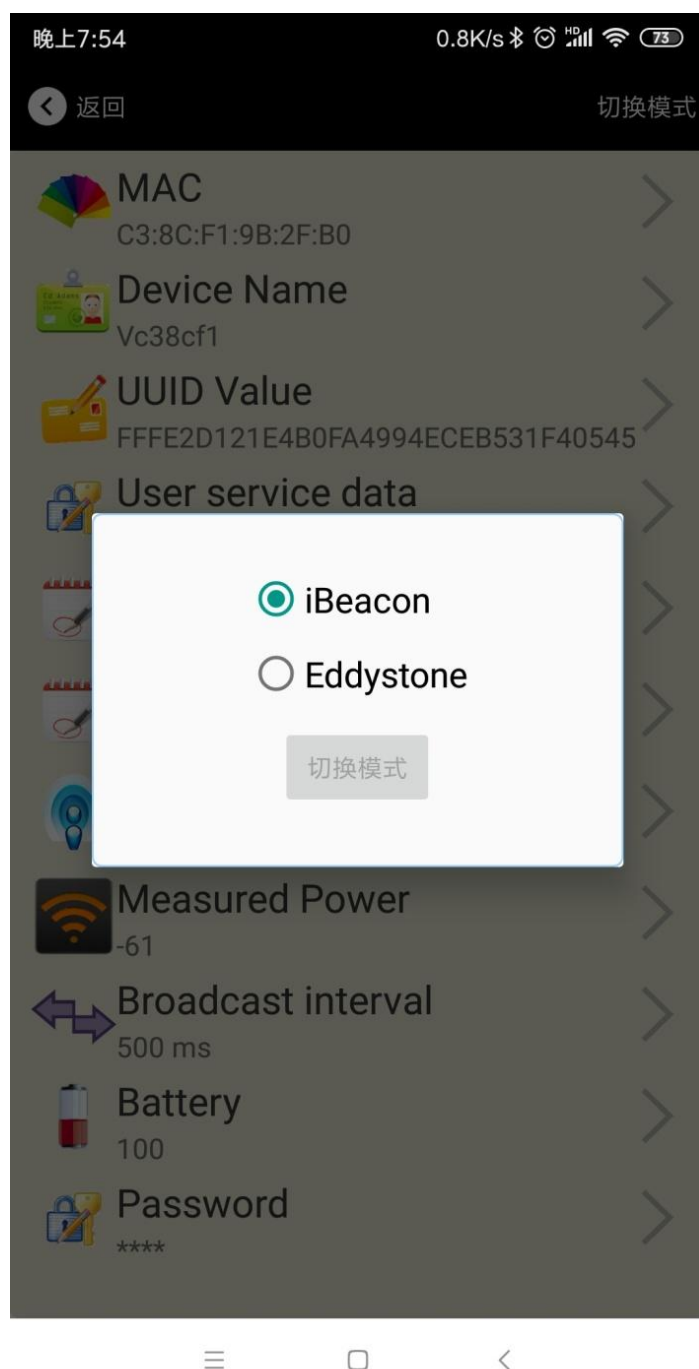
**!!! Note:**

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

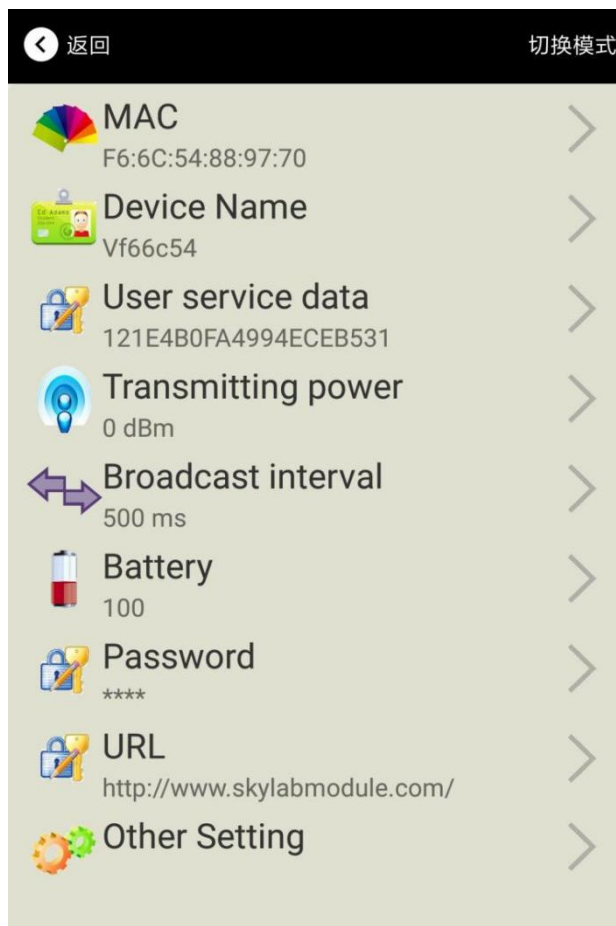
点击右上角切换模式文字，出现模式选择窗口，点选 Eddystone。

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:** VDB1618 发射功率，配置方式同 iBeacon 模式。/VDB1618 transmit power

**Advertise Interval:** VDB1618 广播间隔，配置方式同 iBeacon 模式。/VDB1618 advertise interval

**Battery Level:** VDB1618 电池电量。/VDB1618 battery Capacity

**Password:** VDB1618 连接密码，配置方式同 iBeacon 模式。/VDB1618 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。 / Fornat selection of Frame field information in Eddystone.

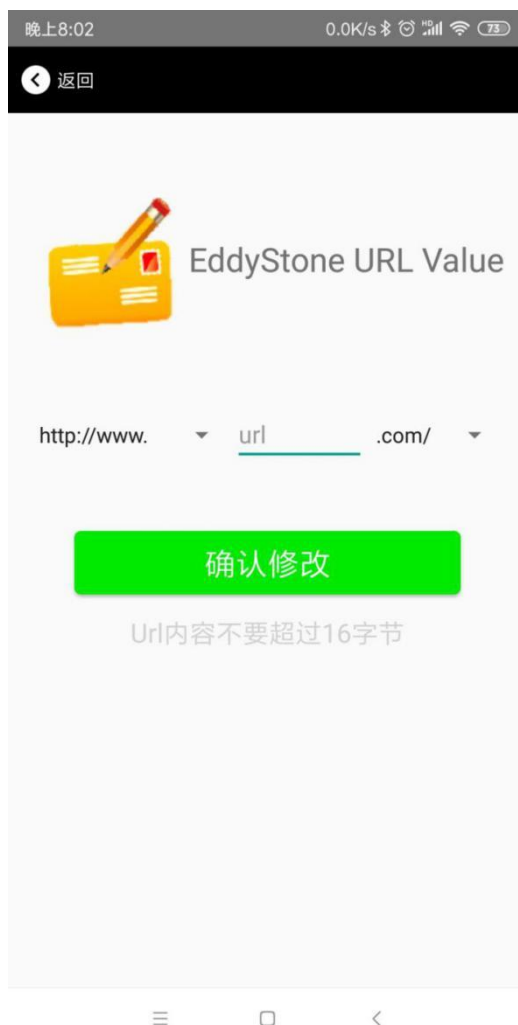
配置好信息后，蓝牙连接断开，配置将生效。

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

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

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

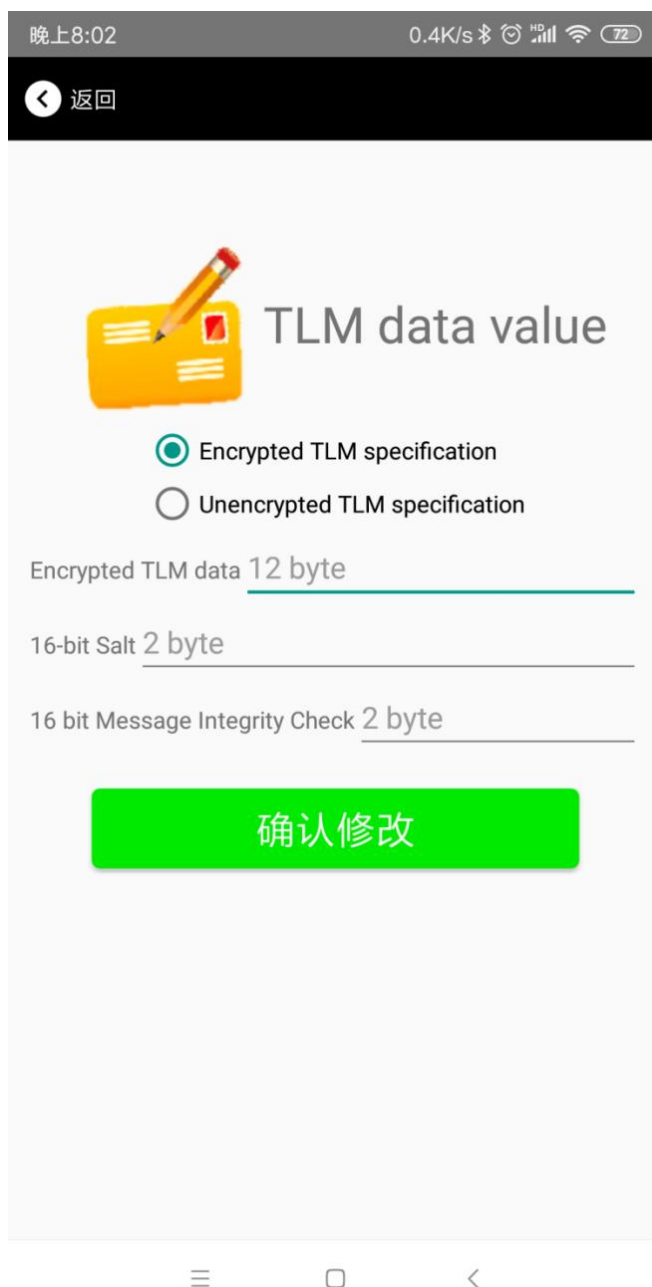


The image shows a mobile application interface for setting EID information. At the top, there is a status bar with the time '晚上8:02', network speed '1.2K/s', and battery level '72'. Below the status bar is a black header with a white back arrow and the text '返回'. The main content area has a light gray background. It features a yellow notepad icon with a red pencil and the text 'Encrypted 值'. Below this is a text input field with the placeholder '输入一个 Encrypted 值'. Underneath the input field is the text '或者选一个', followed by three selectable options: 'AABBCCDDEEFF0011', '0011223344556677', and '1234567812345678'. A large green button with the text '确认修改' is positioned below the options. At the bottom, there is a gray note: '使用长度不多于8的英文字符命名, 不推荐使用中文。'. The bottom of the screen shows standard Android navigation icons: a menu icon, a home icon, and a back icon.

设置 EID 信息，最多 8 个字节。

Set the EID information to a maximum of 8 bytes.

## 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”.

## 5.联系信息/Content

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