VDB1612规格书
VDB1612 Datasheet

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V1.01	初始文档/Initial Release	谢晓博/Sherman	2020.9.22
V1.02	更新产品图片/Update product pictures	Wendy	2022.11.3
V1.03	更新产品特性描述/Updated the product feature description	Wendy	2023.1.3

设备清单/Product List

名称/Item	型号/Model Number	数量/Number	备注/Remark
蓝牙道钉信标/Road spike BLE Beacon	VDB1612	1	
锂亚电池/Li-SOCl2　Battery	ER18505	1/2	标配 1 节/Standard 1 section
膨胀螺栓	M5*50	2 个	使用 8mm 钻头打孔 /Use 8mm drill for holes

目录/Content

1. 产品介绍/Product Induction

VDB1612 是一款蓝牙道钉信标。该信标使用 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 "Skylab_xbeacon" 读取，包括 UUID、Major、Minor、RSSI 等信息。

VDB1612 is a Bluetooth spike beacon.The beacon USES the BLE low power Bluetooth broadcasting method and USES its supported common properties profile to continuously send astatic broadcast packets over channels 37, 38, and 39.The broadcast content can be read by the APP "Skylab_xbeacon" developed by our r&d team, including UUID, Major, Minor, RSSI and other information.

图 1:VDB1612 产品图/ Figure 1: VDB1612 product diagram

1.1 VDB1612 内部介绍

VDB1612 基于 Nordic BLE 4.2 芯片。其内部由 1 节 ER18505 电池供电，默认配置下电池续航时间可达 10 年以上。

VDB1612 is based on the Nordic BLE 4.2 chip. It is powered internally by one ER18505 batteries and has a default battery life of more than 10 years.

1.2 VDB1612 特性

低功耗，支持开关线剪断工作/ Low power consumption, support switch line shear work

高防护等级、结实耐用、方便地面安装/ High protection grade, strong and durable, easy to install on the ground

APP 可灵活配置参数/ APP can flexibly configure parameters

OTA 无线升级/ OTA Wireless upgrade

广播范围最大可达 100 米/ The maximum broadcast range is 100 meters

防护等级为 IP68/ IP grade is IP68

防爆等级符合 Ex ib IIC T6 Gb；Ex ib 21 T85℃/ Explosion-proof grade：Ex ib IIC T6 Gb; Ex ib 21 T85℃

符合 RoHS (无铅)/ RoHS compliant (lead-free)

符合 FCC, CE/ In line with the FCC, CE

1.3 VDB1612 应用

室内定位/ Indoor positioning

智慧停车/ Wisdom parking

信息推送/ Information push

身份识别/ Identification

微信摇一摇/ WeChat, shake

2. 硬件参数/Hardware Specification

硬件特性/Hardware features	
型号/**Model**	VDB1612
天线类型/ **Type of antenna**	PCB antenna
电池/**battery**	ER18505　单节 3800mAh，标配 1 节/ ER18505 single section of 3800mAh, standard with 1 section
标称电压 /**nominal voltage**	3.6 V
尺寸/**Dimension**	L:110（±2）mm * W:105（±2）mm * H:23.8(±0.5)mm
无线功能/**Wireless capabilities**	
无线标准/ **Wireless standards**	BLE ® 4.2
频率范围 **frequency domain**	2400MHz——-2483.5MHz
数据速率/**data rate**	250kbps / 1Mbps / 2Mbps
调制技术/ **modulation system**	GFSK 调制
无线安全/ **Wireless security**	AES
传输功率/ **transmission power**	Tx 功率在-20 到+4dBm 范围内以 4dB 递增
灵敏度/**Sensitivity**	-93dBm @ 1Mbps BLE
工作模式/**Workig mode**	iBeacon / Eddystone
其他/**rest**	
工作环境/ **work environment**	工作温度:-40℃~ 85℃
	储存温度:-40℃~ 85℃
	工作湿度:10%~90%不凝结
	储存湿度:5%~90%不凝结

2.1 电池寿命/Battery life

发射功率（dbm）Tx Power	广播距离 The radio range	广播间隔（ms）Broadcast interval	一天的功耗（mah）Power consumption per day	待机时长(day) The standby time
4	80	100	8.70984	436
		400	2.23146	1703
		500	1.799568	2112
		900	1.03176	3683
		1000	0.935784	4061
0	50	100	5.82984	652
		400	1.51146	2514
		500	1.223568	3106
		600	1.03164	3683
-4	30	100	4.38984	866
		200	2.23092	1703
		400	1.15146	3300
		500	0.935568	4062

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。

The above data may vary from environment to environment, and are not included in the battery loss, only for reference.

注意：广播距离为室外空旷距离测试结果，室内场景因电磁环境较为复杂，会快速衰减。请根据实际部署情况测试广播距离，并可以通过调整发射功率来减少广播距离，从而达到延长使用寿命的目的。

Note: The broadcast distance is the test result of outdoor open distance. The indoor scene will decay rapidly due to the complex electromagnetic environment.Please test the broadcast distance according to the actual deployment situation, and the broadcast distance can be reduced by adjusting the transmission power, so as to achieve the purpose of extending the service life

3.安装方法/Installation method

（1）在安装面使用 8mm 钻头，间隔 84mm 打孔（也可以提前拿道钉在地面用记号笔在螺丝孔对应地面画点打孔）。

(1) Use an 8mm drill on the mounting surface and drill holes 84mm apart (you can also take a sample device to the ground in advance and use a marker to draw holes in the screw hole corresponding to the ground)

（2）将 2 颗膨胀螺栓拧下螺帽后放到安装孔中，膨胀螺栓规格如下：

(2) Unscrew the 2 expansion bolts and place them into the mounting hole. The specifications of the expansion bolts are as follows:

（3）把道钉的螺丝孔对齐两颗膨胀螺栓放到安装面上，漏出底部开关线，拧上螺帽，并使用 10mm 扳手固定螺帽（拧紧后建议松半圈）。

(3) Align the screw hole of the spike with the two expansion bolts on the mounting surface, leak out the switch line at the bottom, screw on the nut, and fix the nut with a 10mm wrench (loose half turn is recommended after tightening).

（4）安装完后剪断底部开关线，道钉即可开始工作。

(4) After installation, cut off the switch wire at the bottom and the spike can begin to work.

4. 软件使用说明/Software Instructions

    Skylab_xbeacon 是 Skylab 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。

Skylab_xbeacon is a Bluetooth Beacon software developed by Skylab 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 the application

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

At present, the APP has not been put on the shelf. Please contact the sales staff to provide the APP

name Skylab_xbeacon.

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 phone prompts to turn on Bluetooth, please allow the phone to automatically scan

the surrounding Bluetooth beacons.
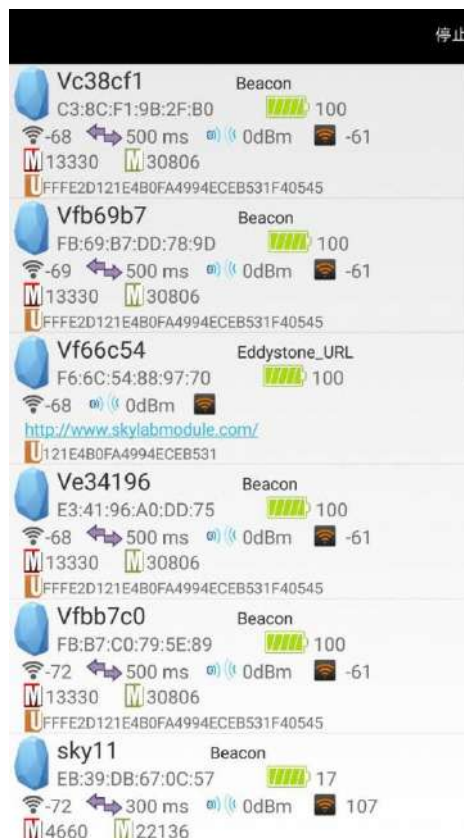
4.3 连接蓝牙信标/Connect to bluetooth beacons

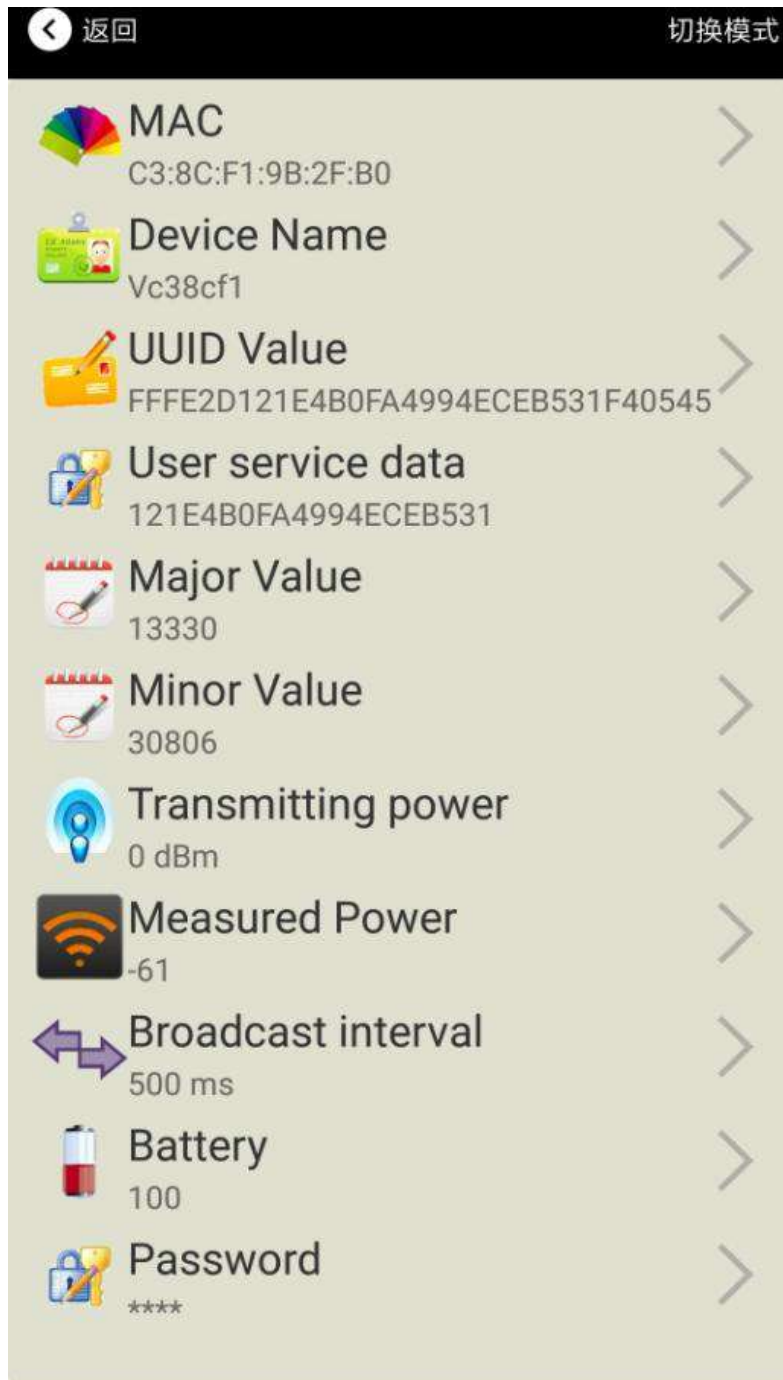　　点击要连接的蓝牙信标，30 秒内输入密码，即可获得操作权限。(出厂密码:1234)

Click the Bluetooth beacon to connect and enter the password within 30 seconds to obtain the operation

permission.(Factory Password :1234)
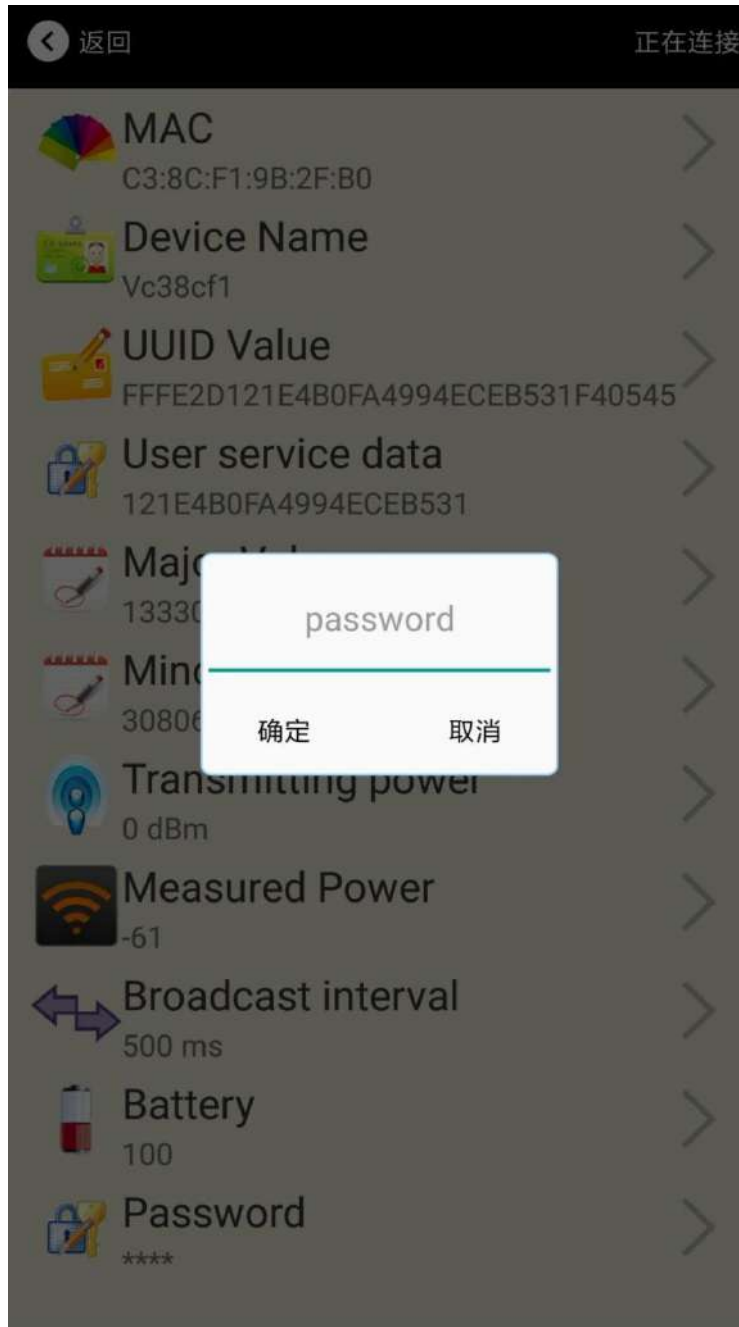
　! 注意：密码忘记后无法恢复，请务必做好记录！

! Note: The password cannot be recovered after forgetting, please make a good record!

4.4 配置介绍/Configuration is introduced

介绍:

MAC: MAC 地址

Name: 所选蓝牙信标的名称。

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

User service data: 用户数据，24 个 16 进制数字

Major: 16 位标识符(0-65535)

Minor: 16 位标识符(0-65535)

Measured Power: 距离 1 米时的参考信号强度

Transmit Power: VDB1612 发射功率

Advertise Interval: VDB1612 广播间隔

Battery Level: VDB1612 电池电量

Password: VDB1612 密码（默认 1234）

配置好信息后，蓝牙连接断开，配置将生效。

Introduction:

MAC: MAC address

Name: The Name of the selected Bluetooth beacon.

UUID: 128-bit (16-byte) identifier according to ISO/IEC11578:1996

User Service data: User data, 24 hexadecimal digits

Major: 16-bit identifier (0-65535)

Minor: 16-bit identifier (0-65535)

Measured Power: Reference signal strength Measured at a distance of 1 m

Transmit Power: VDB1612 Transmit Power

Advertise Interval: The VDB1612 broadcast Interval

Battery Level: VDB1612 Battery Level

Password: VDB1612 (default: 1234)

After the information is configured, the Bluetooth connection is disconnected and the configuration will take effect.

4.5 修改蓝牙信标名称/Modify the Bluetooth 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 "Device Name" to bring up the following UI. Then enter the English character Name of less than 12 characters in the "Enter a Name" box, or select a Name in the "Choose one" box.Then click "Confirm changes".

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 VDB1612 的 UUID。然后点击"确认修改"。

Click "UUID" to bring up the following UI, then type a full 16 bytes (32 hexadecimal characters) in the "Enter a UUID Value" box as the UUID for VDB1612.Then click "Confirm changes".

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 "User Service Data" and the following interface will appear. Enter 24 hexadecimal characters in "Enter User Data".And I'm gonna go ahead and say ok

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 "Major", and the following interface appears, and set 0~65535 as the Major value of the device.

Then click "Confirm modification".

修改 Minor

同上面 Major 类似，点击 Minor 进入修改即可。

Modify the Minor

Similar to the Major above, click Minor to enter the modification.

4.9 修改 Measured Power/Modify Measured Power

点击"Measured Power"，出现如下 UI，在距离 VDB1612 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"。

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 VDB1612 约为 1 米。

Click "Measured Power", and the following UI appears. Set Measured Power at a distance of 1 meter from VDB1612. The adjustable range is -100dbm ~ -30dbm, and the default is -61dbm.Then click "Confirm changes".

Measured Power means that when the signal strength received by the receiving equipment is -61dbm, the Measured Power can be considered to be about 1 m away from VDB1612.

4.10 修改发射功率/Modified transmitting power

点击"Transmission Power"出现如下 UI，设置 VDB1612 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 "Transmission Power" to display the following UI and set the Transmission Power of VDB1612.The

power can be set to: -30dbm, -20dbm, -16dbm, -12dbm, -8dbm, -4dbm, 0dBm, 4dBm. The default is

0dBm. Then click "Confirm changes".

4.11 修改广播间隔/Modify broadcast 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 "Broadcast Interval" to display the following UI and set the broadcast interval. The broadcast interval can be set to 100ms, 200ms, 300ms, 400ms, 500ms, 600ms, 700ms, 800ms, 900ms and 1000ms.The default is 500ms.Then click "Confirm changes".

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 "Password", the following UI appears, and then enter 4 characters in the "Password" box as the

connection password, and the default is 1234. Then click "Confirm Modification."

！！！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 well in advance. Once you change the new password, the original

password will become invalid and you must use the new password to log in.
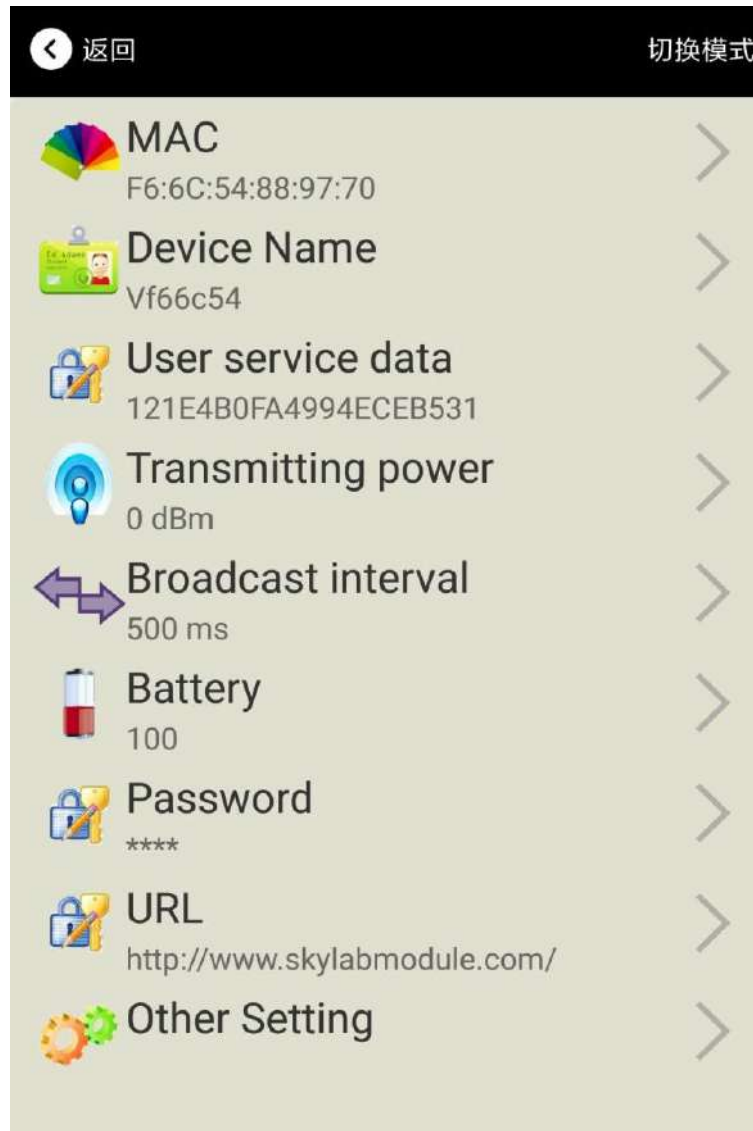
4.13 切换模式/switching mode

点击右上角切换模式文字，出现模式选择窗口，点选 Eddystone。

Click the upper-right corner to switch mode text, the mode selection window appears, and click

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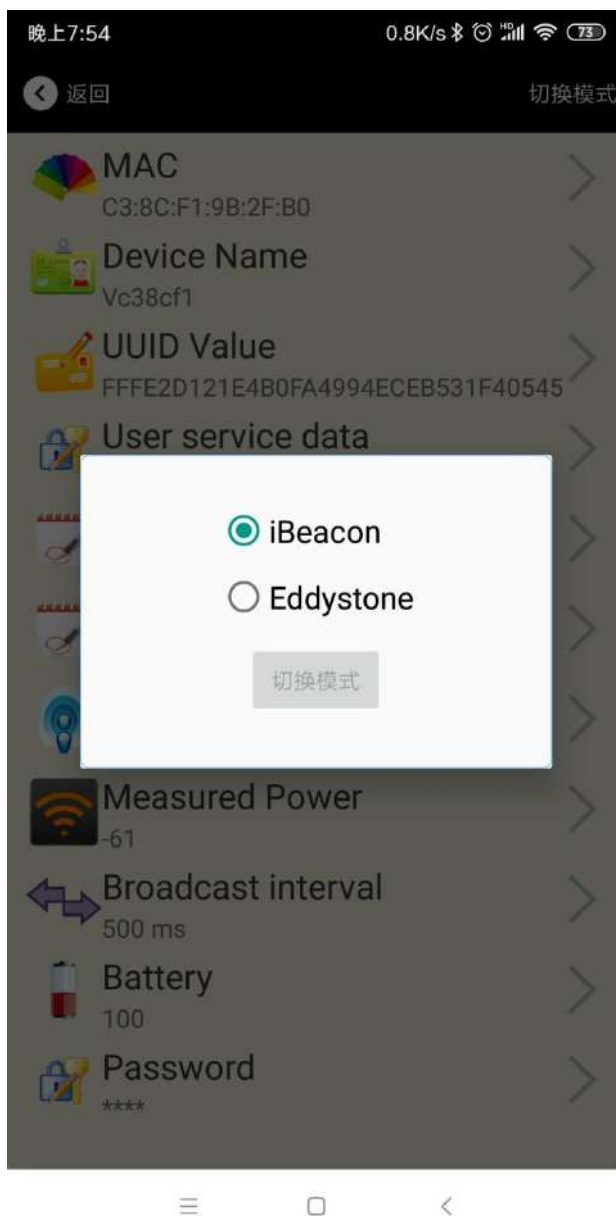
4.14 Eddystone 配置页面简介/Eddystone Introduction to configuration page

简介**:**

MAC: MAC 地址

Name: 蓝牙信标的名称，配置方式同 iBeacon 模式。

User service data: 用户自定义的数据，配置方式同 iBeacon 模式。

Transmit Power: VDB1612 发射功率，配置方式同 iBeacon 模式。

Advertise Interval: VDB1612 广播间隔，配置方式同 iBeacon 模式。

Battery Level: VDB1612 电池电量

Password: VDB1612 连接密码，配置方式同 iBeacon 模式。

URL: 修改 Eddystone 字段信息。默认格式是 URL。

Other Setting: 用于选择 Eddystone 其他字段信息。

配置好信息后，蓝牙连接断开，配置将生效。

Introduction:

MAC: MAC address

Name: The Name of the Bluetooth beacon, configured in the same manner as iBeacon mode.

User Service data: User-defined data, configured in the same way as iBeacon mode.

Transmit Power: VDB1612 Transmit Power, configured in the same mode as iBeacon.

Recording Interval: VDB1612 broadcast Interval, configured in iBeacon mode.

Battery Level: VDB1612 Battery Level

Password: VDB1612 connection Password, configured in the same way as iBeacon mode.

URL: Modify the Eddystone field information.The default format is URL.

Other Setting: Used to select Eddystone's Other field information.

After the information is configured, the Bluetooth connection is disconnected and the configuration will

take effect.

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" and the following UI appears. Then type a string of up to 16 bytes on the "URL" underscore to broadcast the URL.

4.16 修改 Other Setting//Modify Other Setting

选择并设置 UID 信息:

Select and set 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 EID information:

设置 EID 信息，最多 8 个字节。

Set EID information, up to 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, Encrypted TLM Data, Encrypted TLM

Data, 2-byte 16-bit Salt, and 2-byte 16-Bit Message Integrity Check for Encrypted TLM Data,

respectively.

5. 联系方式/Contact

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