SCS-001

User Guide

Version 0.2

4/21/2015

Revision History

Rev	Author	Comments
0.1	TRE	Initial Revision
0.2	TRE	Add application development information

TABLE OF CONTENTS

1   Introduction

This document describes user interaction and features with the SCS-001 prototype.

1.1   Intended Audience

This intended audience of this document is any persons involved in use or testing of the SCS-001 prototypes.

1.2   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 to an outlet on a circuit different from that to which the receiver is connected.

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.

Note: Modifications to this product will void the user's authority to operate this equipment.

1.3   Mobile Category Device

This device can be used as a mobile category device, it's antenna must be installed to provide at least a minimum separation distance of 20 cm from all persons.
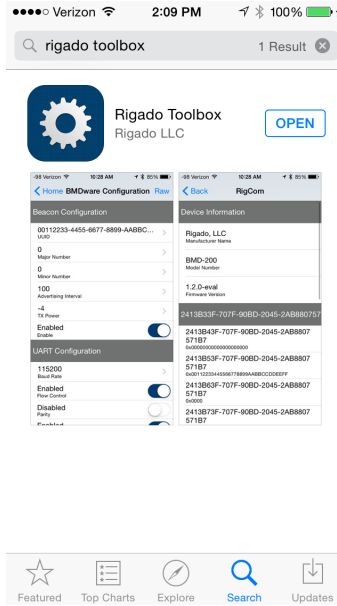
2   Connecting using BLE

2.1   Getting Rigado Toolbox Application

The Rigado Toolbox application can be downloaded from the iTunes app store.

2.2   Connecting using Rigado Toolbox

To connect to the SCS-001 using the RigadoToolbox application, first open the application. In the list of peripherals at the Home page you should see a device labelled RigCom (see figure 1). Select the RigCom device. The app will connect to the device. Once a successful connection is made you will be taken to the BMDware Configuration page (see Figure 1.)
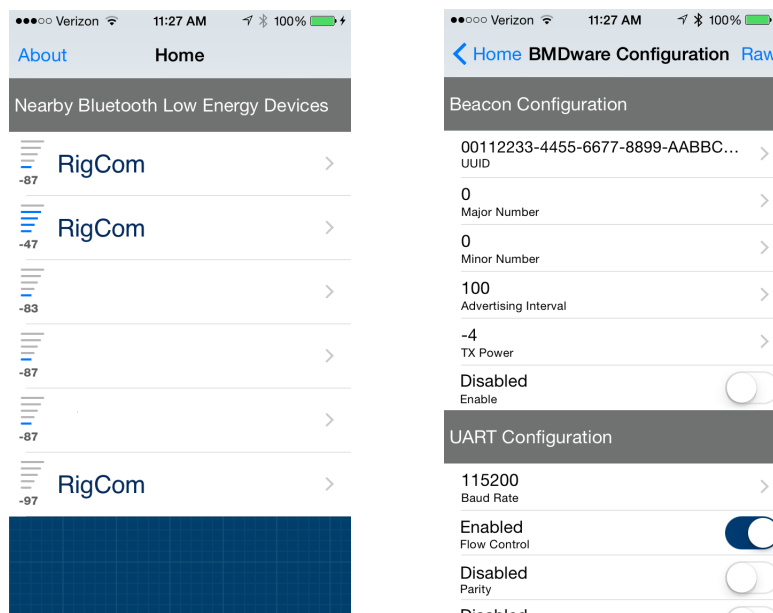

Figure 1: RigadoToolbox Home(left) and BMDware Configuration(right) pages

3 Beacon BLE Characteristics

The Beacon configuration service has six characteristics. For application development you will need the beacon configuration service UUID and the characteristic UUIDs for each of the individual characteristics (see table 1).

Beacon Service/Characteristic Name	UUID	Data length
Beacon Configuration Service	b7717580-b82a-4502-bd90-7f703fb31324	n/a
Beacon UUID Characteristic	b7717580-b82a-4502-bd90-7f703fb51324	16 bytes
Beacon Major Number Characteristic	b7717580-b82a-4502-bd90-7f703fb61324	2 bytes
Beacon Minor Number Characteristic	b7717580-b82a-4502-bd90-7f703fb71324	2 bytes
Beacon Advertising Interval Characteristic	b7717580-b82a-4502-bd90-7f703fb81324	2 bytes
Beacon TX Power Characteristic	b7717580-b82a-4502-bd90-7f703fb91324	1 byte
Beacon Enable Characteristic	b7717580-b82a-4502-bd90-7f703fba1324	2 bytes

Table 1: Beacon Configuration UUIDs

3.1 UUID Characteristic (b7717580-b82a-4502-bd90-7f703fb51324)

The UUID characteristic can be used to modify the beacon UUID. To modify the UUID select the UUID characteristic from the BMDware Configuration page and select the UUID text box. Once you have selected the text box an editor will appear. The editor can be used to modify the beacon UUID (see Figure 2).
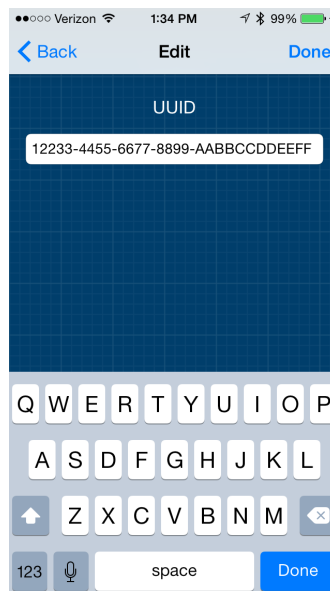

Figure 2: Beacon UUID editor page

The UUID characteristic can also be modified by other applications. Table 1 shows the UUID Characteristic UUID. Table 2 shows the miniumim/maxium values.

Characteristic UUID	Length	Min Value	Max Value
b7717580-b82a-4502-bd90-7f703fb51324	16 Bytes	00000000-0000-0000-0000-000000000000	ffffffff-ffff-ffff-ffff-ffffffffffff

Table 2: Beacon UUID Characteristic information

3.2 Major Number Characteristic (b7717580-b82a-4502-bd90-7f703fb61324)

The major number is used to identify the beacon. The major number characteristic can be used to modify the major number. To modify the Major number select the major number characteristic, select the major number text box, and enter a new major number (see Figure 3).
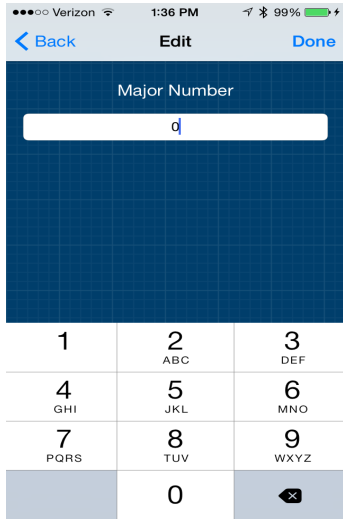

Figure 3: Major Number editor page

The information to modify the Major Number using another application can be found in Table 3.

Characteristic UUID	Length	Min Value	Max Value
b7717580-b82a-4502-bd90-7f703fb61324	2 Bytes	0000	FFFF

Table 3: Beacon Major Number Characteristic information

3.3 Minor Number Characteristic (b7717580-b82a-4502-bd90-7f703fb71324)

The minor number is used to identify the beacon. The minor number characteristic can be used to modify the minor number. To modify the minor number select the minor number characteristic, select the minor number text box, and enter a new minor number (see Figure 4).
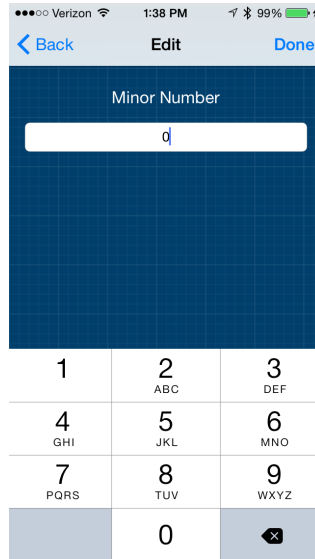

Figure 4: Minor Number editor page

Characteristic UUID	Length	Min Value	Max Value
b7717580-b82a-4502-bd90-7f703fb71324	2 Bytes	0000	FFFF

Table 4: Beacon Minor Number Characteristic information

3.4 Advertising Interval Characteristic (b7717580-b82a-4502-bd90-7f703fb81324)

The advertising interval characteristic is used to modify the timing of the beacon in milliseconds. To change the advertising interval select the Advertising Interval characteristic, press the interval text box, and enter a new advertising interval (see Figure 5). The maximum advertising interval is 4000ms (4 seconds).
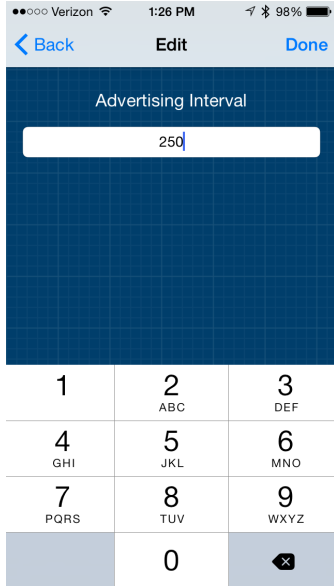

Figure 5: Advertising Interval Editor page

Characteristic UUID	Length	Min Value	Max Value
b7717580-b82a-4502-bd90-7f703fb81324	2 Bytes	0	4000

Table 5: Beacon Advertising Interval Characteristic information

3.5 TX Power Characteristic (b7717580-b82a-4502-bd90-7f703fb91324)

The Beacon TX power can be used to change the broadcasting. To change the TX power select the TX power characteristic and select a TX power from the Select TX Power Level page (see Figure 6). For SCS-001 the TX power selection is limited to -4 dBm and below because the amplifier adds +24dB of gain.
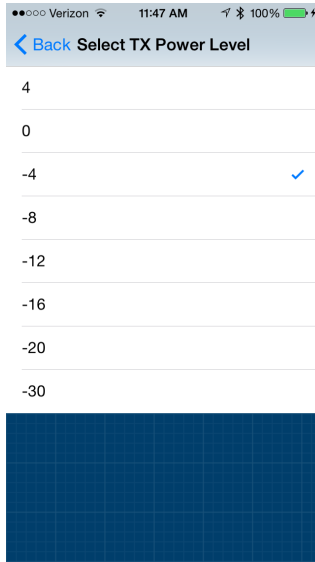

Figure 6: Beacon TX Power selection page

Characteristic UUID	Length	Min Value	Max Value
b7717580-b82a-4502-bd90-7f703fb91324	1 Bytes	-40	-4

Table 6: Beacon Advertising Interval Characteristic information

Table 7 shows the accepted characteristic values for transmission power.

TX Power	Characteristic Value
-4 dBm	0xFC
-8 dBm	0xF8
-12 dBm	0xF4
-16 dBm	0xF0
-20 dBm	0xEC
-30 dBm	0xE2
-40 dBm	0xD8

Table 7: Valid TX Power values

3.6 Enable Characteristic (b7717580-b82a-4502-bd90-7f703fba1324)

The enable characteristic is used to enable the beacon service to advertise. To enable or disable to the beacon select use the slide button. Once enabled, the beacon will start advertising after you exit the BMDware Configuration page. In the case of another application once the Beacon configuration service is disconnected, the beacon will being advertising. Figure 7 shows examples of the beacon enable characteristic.
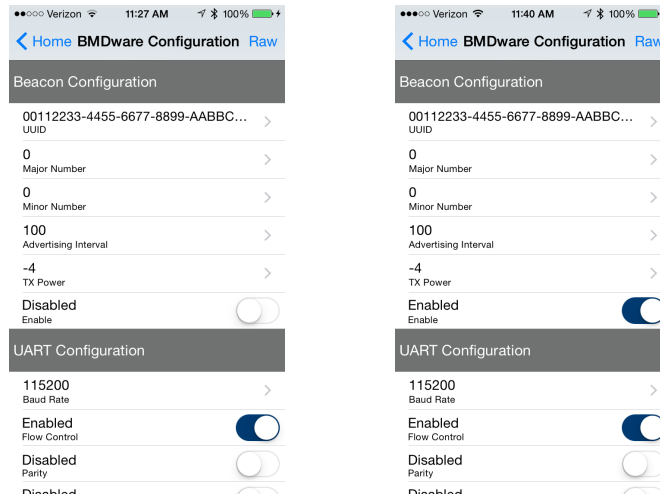

Figure 7: Beacon disabled (left). Beacon enabled (right).

Characteristic UUID	Length	Disable Value	Enable Value
b7717580-b82a-4502-bd90-7f703fba1324	1 Bytes	0	1

Figure 8: Beacon Enable Characteristic information

After enabling the beacon in the beacon configuration service, exit the beacon configuration service to start beacon advertisement. In the BMDware Home page you will now see a new "Unknown" device advertising. This unknown device will be the beacon (non-connectable).
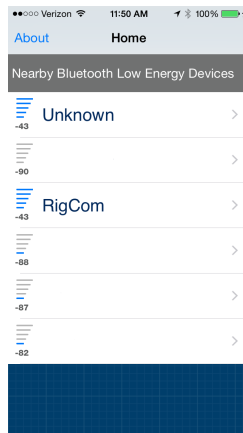

Figure 8: Beacon enabled and advertising