

BlueBeacon

Bluetooth Low Energy proximity beacon

Configuration and installation procedures

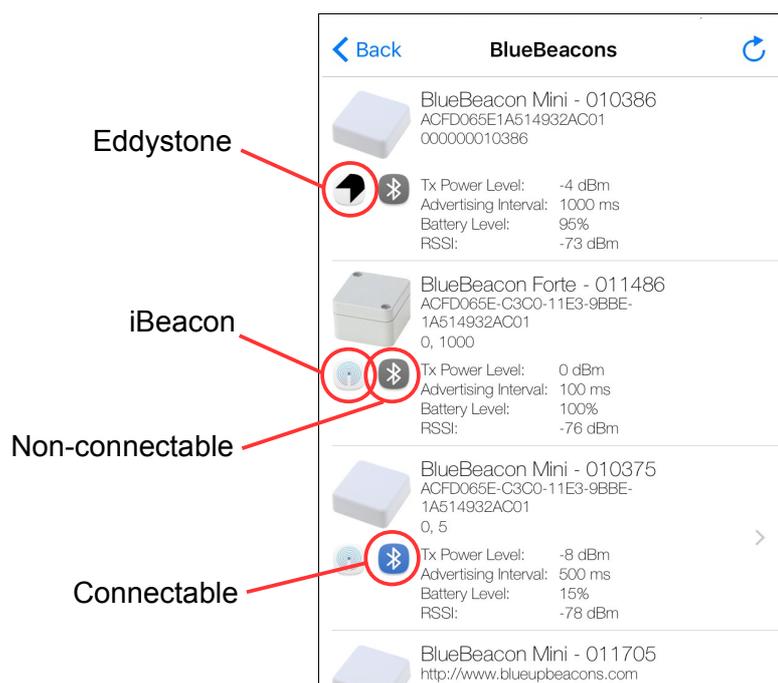
This document contains the description of the procedures for configuration and installation of the beacons of the BlueBeacon series produced by BlueUp.

Please read the instructions below before start using your beacons. Figures refers to iOS version of BlueBeacon Tool app; Android version is similar.

Configuration

The following steps describe the procedure for beacon configuration.

1. Launch the configuration app **BlueBeacon Tool**, freely available for both iOS and Android
2. Select the **Configure Beacon** option
3. Power-up your beacon.
For battery-powered beacons, pull the plastic tab out of the device. In the case where the battery is not present, insert the battery in the holder following to the instructions in paragraph "Battery replacement" of the User Manual. Note: take care of the battery polarity according to the indications on the battery holder;
For USB-powered beacons, simply plug your beacon into USB port of an electronic device (PC, battery charger, ...).
4. The beacon appear in the list of received BlueBeacon devices, as shown in the following figure



Note: the BlueBeacon beacons are shipped with the following default settings:

iBeacon: connectable

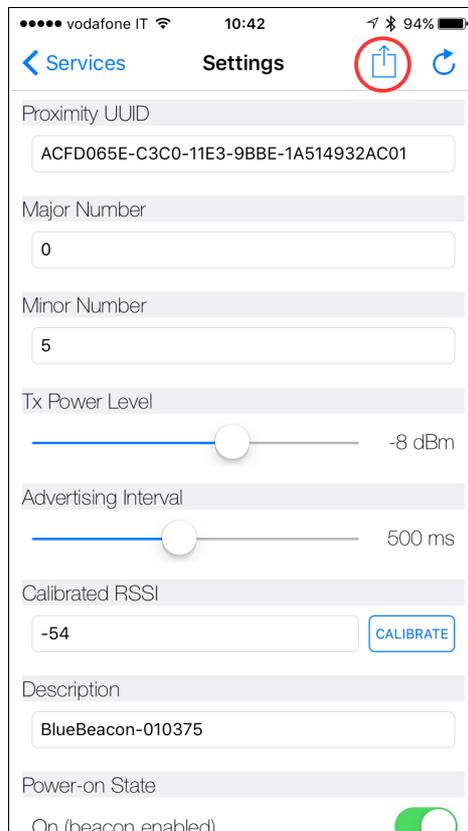
Eddystone: connectable only for the first 30 seconds, then automatically goes in non-connectable mode. To restore in connectable mode, remove and insert battery (for battery-powered) or unplug and plug (for USB-powered) the beacon.

5. Select the beacon (the beacon must be in connectable-mode, with the Bluetooth icon in blue color).

6. *(only for iBeacon version)* If “secure-mode” is enabled, you will be requested to insert the password (8 decimal digit).
Note: by default secure-mode is not enabled, thus, at the first access you will not be requested to insert the password. The first time you enable it, the default password is 00000000.

7. The list of available Services is shown. Refer to the documents “BlueBeacon – iBeacon Services” and “BlueBeacon – Eddystone Services” for a detailed description of the available Services and related Characteristics.

8. *(only for iBeacon version)* By selecting **Device Settings**, you will be prompted to the list of modifiable parameters:
 - Proximity UUID (default: ACFD065E-C3C0-11E3-9BBE-1A514932AC01)
 - Major number (default: 0)
 - Minor number (default: 0)
 - TX power level (default: -8dBm for battery-powered, 0dBm for USB-powered)
 - Advertising interval (default: 400msec for battery-powered, 100msec for USB-powered)
 - Calibrated RSSI (default: depends on model)
 - Description
 - Power-on State (default: ON)
 - Connectable mode (default: connectable)
 - Unconnectable interval (default: N/A, indefinite)You can modify parameters according your needs. Once modified, press the button in the upper right.



Note: use your own Proximity UUID for your final application, instead of the default one. Also use major and minor values different from 0 (0 is usually interpreted as unset).

9. (only for iBeacon version) By selecting **Device Security**, you will be prompted to the list of parameters for secure access:
- Password protection (default: password disabled)
 - New password (default: 00000000)

Note: the first time, password is disabled. The first time you enable password, if you want to change the default password you need to follow the procedure: (a) set password enabled; (b) disconnect from the beacon; (c) connect to the beacon; (d) insert the default password (00000000); (e) select **Device Security**; (f) insert New Password value (8 decimal digits);

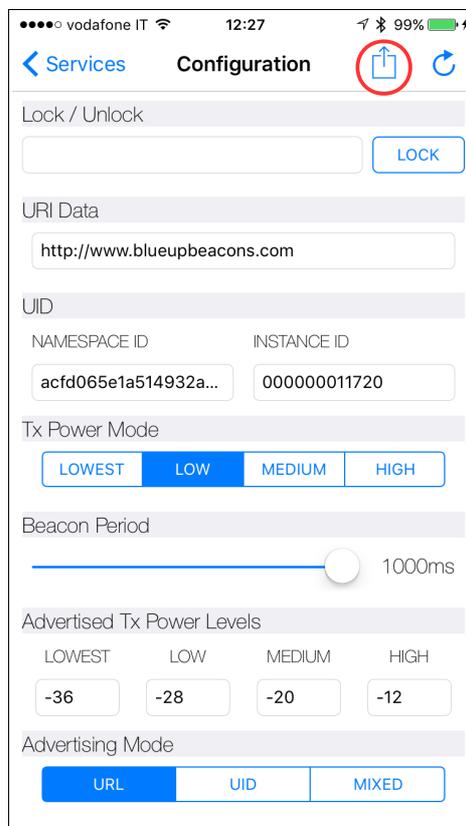
10. (only for Eddystone version) By selecting **Device Settings**, you will be prompted to the list of modifiable parameters:

- Lock State (default: unlock)
- Lock/Unlock password
- URL (default: www.blueupbeacons.com)
- Advertised TX Power Levels (power level at 0m, for each TX Power Mode; default: depends on model)
- TX Power Mode (default: LOW)
- Beacon Period (default: 1000msec)
- Reset
- Namespace ID (default: ACFD065E1A514932AC01)
- Instance ID (default: string containing the serial number)
- Advertising mode (default: URL-TLM)
- Connectable mode (default: non-connectable)

You can modify parameters according your needs. Once modified, press the button at the top right.

Note 1: Lock/Unlock password can be a mnemonic word. The app convert it into a 128bit sequence, using internal hash table.

Note 2: URL must be maximum 17 characters long. Refer to URL encoding rules reported in <https://github.com/google/eddystone/tree/master/eddystone-url>.



11. Configuration is completed.

Installation

The following steps describe the *suggested* procedure for beacon installation. You can manage the installation according your needs, taking care of the main requirements of your installation.

1. Verify the beacon is in connectable-mode. You may need to change some settings during installation (e.g., TX power level)
2. Install the beacon in the selected place. To select the position where install the beacon and maximize the transmission distance, please consider the following rules-of-thumb:
 - The higher is the position, the longer is the transmission distance;
 - Obstacles (mainly metallic objects) in front of the beacon reduce the transmission distance;
 - Transmission distance may be not the same in all directions around the beacon, due to the presence of obstacles, walls, objects, people, ...;
 - The same beacon installed in different positions, may have different maximum transmission distance(s), depending on the surrounding scenario.
 - Ensure the beacon is properly fixed, avoiding the possibility of unwanted detachment. The following solutions are suggested:
 - Mini: dual-lock, double-sided tape
 - Maxi: screws, double-sided tape
 - Forte: screws, silicone glue
 - Install the beacon in a place where it cannot easily fraudulently removed.
3. Test the transmission distance: by placing yourself at the maximum distance(s) you want to receive the beacon signal, verify (you may use **Configure Beacon** or **Locate Beacon**) if you receive the beacon and the value of signal strength (RSSI; a signal level below -90dBm is low). To verify the transmission distance use the following criteria:
 - If the transmission distance is too short, you may increase the TX power level, using the **Device Settings**.
 - If the transmission distance is too short and the TX power level is at the higher value, please consider to install the beacon in a different location (maybe at higher position). Return to point 2.
 - If the transmission distance is too long, you may decrease the TX power level, using the **Device Settings**.
 - If the transmission distance is too long and the TX power level is at the lower value, please consider to install the beacon in a different location (maybe at lower position, behind a wall, etc...). Return to point 2.

Note: **Locate Beacon** presently works only with iBeacon version.

4. (*only for iBeacon version*) If (and only if) you require a more precise accuracy, you may need to perform on-site beacon RSSI calibration (a default Calibrated RSSI is configured in the beacon settings, whose value depends on beacon model). To perform RSSI calibration, use the following procedure:
 - Launch BlueBeacon Tool app on an iPhone 5S (you can also use a different model, from iPhone4S and later);
 - select **Configure Beacon**;
 - select the beacon (it must be in connectable-mode, Bluetooth icon in blue color);
 - select **Device Settings**;

- place yourself in front of the beacon, at distance of 1m, holding the iPhone in portrait orientation, with the top half uncovered;
- press the *Calibrate* button;
- the calibration procedure starts;
- at the end, you will be prompted to the Device Settings view, with the new computed Calibrated RSSI shown in the window;
- press the button in the upper right to save the new value.

Note: because of the way iOS caches device data, the beacon may be advertised with a wrong Accuracy value, after the RSSI Calibration procedure. You need to clear the cache by enabling and then disabling Bluetooth on your iOS device. This is unfortunately something outside the application level, and you cannot reset Bluetooth inside an app ourselves.

5. To maximize the security of your beacon installation, it is strongly suggested to:

- (a) enable the “secure mode”, by enabling the password;
- (b) use your own password instead of the default one;
- (c) enable “non-connectable mode”

Note: use of “non-connectable mode” not only gives you the maximum secure protection, but also increase operating life, before battery substitution. Consider that current consumption in “non-connectable mode” can be up to 30% lower than in “connectable mode”.

6. Installation is completed