

# MPact

## Indoor Beacon Toolbox



**ZEBRA**

## User Guide

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# Purpose

This document describes using the BLE Beacon (Beacon) toolbox.

This document will address the usage of each of the three screens in the BLE Beacon Toolbox. It will go into detail on setting up various parameters that the toolbox can set in each of the Zebra BLE Beacons (excluding the Superbeacon). It also will address how various parameters may affect the operation of the beacon and the best way to set these values considering the application the beacons might be deployed.

Zebra's location solutions deploy BLE Beacons for various applications. The most common are:

- **Waypoint Beacons:** These Beacons are used to define a geographical location. One might place a Waypoint Beacon in a patient's room in a hospital so whenever this beacon is heard by a BLE receiver, the location server will assume that the receiver is in or near the patient's room.
- **Asset Beacons:** Beacons attached to mobile assets such as carts, people, animals, tools, pallets, etc. When the location server receives information regarding these beacons it will use the near by waypoint beacons to determine where the asset is located.

In a warehouse, one might deploy waypoint beacons at the start and end of each aisle and maybe more in between. These waypoint beacons may all have the same UUID so that whenever the location server hears a certain UUID, it will treat it as a fixed or waypoint beacon. One might set the major field to be unique for all the waypoint beacons in a certain aisle. To conserve battery life, the installer may set the chirp rate to a longer period to reduce the power consumption. The same is true for Asset Beacons. The user might select a different UUID for assets and use the major field to distinguish shopping carts from mobile ladders or pallets or even handle scanners. The user may set the chirp rate for the pallet and ladder to a longer period of time because these units don't move as often and thus might use a smaller beacon with a smaller battery.

To control these parameters, one must use the BLE Beacon Toolbox to attach to the desired beacon, read its current parameter settings and then change those settings if needed. The toolbox also will provide a means for updating portions of the Beacon code over the air.

The following sections will describe in detail how to setup a BLE beacon by placing the Beacon in the connect mode and then allowing the BLE Beacon Toolbox to connect to it to change its parameters as well as update code.

## Supported Operating Systems

- Android
- iOS

Please refer to any additional documentation about Bluetooth Low Energy Products for information not covered in this document.

## Operation

This section will describe in detail how to use the BLE Toolbox. The BLE toolbox is not distributed as an open application. It is only available for IOS or Android and must be downloaded from the [rink.hockeyapp.net](http://rink.hockeyapp.net) website. You will need to contact the Location Solutions Division Product Manager to obtain a USER\_ID and password to access the [rink.hockeyapp.net](http://rink.hockeyapp.net) website. Once you have access to the website and the app URL you can download the BLE Toolbox app to either your iPad or Android tablet. The screen below shows the how the BLE Toolbox app appears on an iPad once you have downloaded the app.



The Super Beacon App also shown on this screen. There is a separate app and User's guide for configuring the Super Beacon. You can now launch the app to proceed to next step.

# Settings Screen

When the BLE Toolbox application is launched, the first window to pop up is the settings menu.

3:55 PM Wed Oct 16

BLE Toolbox v1.0.2

Reset View

Current Settings:

Firmware:

CC2640-OAD-B-2.0.0.0-066R.bin

RssiLimit:

-60

Power:

-8

Mode:

3

Channel:

7

Interval:

200

Major:

757

Minor:


0


UUID:


FE913213-B311-4A42-8C16-47FAEAC938BE


Save Permanent

Reload

 Settings

 Beacons

 Detail

 Upgrade

The top banner shows the version of the BLE toolbox which for this screenshot is v1.0.2. One should occasionally check the [rink.hockeyapp.net](http://rink.hockeyapp.net) website to see if there is a newer version. The left hand column is marked Current Settings. This column shows the parameters that can be controlled using this toolbox. Some of these settings are for controlling what the toolbox does and some represent parameters that can be pushed to a beacon. The column on the right can be changed to reflect the new or old values being pushed to the beacon. You cannot selectively change a parameter, so if you are changing one or more parameters, you must set the parameters you don't want to change to be the same as those in the beacon you are updating. This following sections discusses each setting/parameter.

## Firmware

This points to firmware that the toolbox contains which can be downloaded to a Beacon. Each beacon may have one or more versions of code which can be downloaded to the Beacon over the air (OTA). If you are not using the toolbox to update firmware, you can ignore this setting. If you are going to update a beacon's code, you need to set this field to be the code you want the toolbox to use to update the beacon. OTA programming does not change the beacon parameters.

## RSSI Limit

The RSSI limit is a setting for the toolbox. This parameter is used by the toolbox to filter from the toolbox beacons that are below a certain RSSI level. This is so that if there are numerous other beacons in the area relative to the toolbox device, the toolbox will only pay attention to beacons whose RSSI is above the value in this field, which in this settings screen shows -60 dBm.

## Power

This parameter is a beacon setting that selects the transmit power the beacon will use to transmit non-connect beacons. Beacons support a range of power settings: most allow the user to set the power from 2 dBm to -21 dBm. This setting represents the TX power at the radio, it does not include any antenna gain and also does not consider any pads in the RF path. So if you set the TX power to 2 dBm and the beacon has an antenna gain of -5 dBm and a 10 dB pad, the actual TX power at the antenna is  $2 \text{ dBm} + \text{ant gain} (-5\text{dBm}) + \text{pad} (-10 \text{ dBm}) = -13\text{dBm}$ . We have provided a table at the end of this guide to show what these values are for each beacon type.

## Mode

The beacon software supports 4 different modes: Battery Save (1), IBeacon (2), MPACT (3), and Secure Cast (4). IBeacon mode duplicates the Apple IBeacon packet format. MPACT mode is the same as IBeacon except that one byte of the minor field is used to show the battery life. The Battery Save mode supports a smaller packet over the air conserving TX on time and helps reduce the drain on the batteries. The Secure Cast mode scrambles the MAC\_ID to provide an additional security level for the beacon packet. Setting a mode in the beacon must match the mode the BLE receiver is configured to operate in and also the Locationing Server.

## Channel

This channel variable allows the user to control which channels the beacon uses to transmit. This variable can be 0b000 to 0b111 (1-7). Bit zero represents channel 37, bit one represents channel 38 and bit 2 represents channel 39. If the bit is set, the beacon will be sent on that channel. If the bit is cleared, the beacon will not use that channel to send a beacon. Example: 0b010 (2) setting will have beacons only sent on channel 38.

## Interval

The Interval setting is the time between beacons in msec. The value for IBeacon is 100 msec. One second would be 1000. 2500 is 2.5 seconds. The max limit on the time is 10000 msec or 10 seconds.

## Major

This is a two byte field that the user can set to whatever is desired. One strategy might be to set this number to the same value for all Waypoint beacons in same area. Or you could set all the waypoint beacons on a given floor to the same value. This is a valuable concept because receivers have filters which allow them to only forward beacons they hear with restricted major fields. In this example the unique major setting for each floor helps receivers from forwarding beacons to the location server that are not on the same floor as the receivers.

## Minor

The Minor is the same type of field as the Major. Care must be used with this field as the MPACT mode uses this field to provide the receiver with battery life information. Some beacons also use the remaining byte in the minor field to transfer channel and version information.

## UUID

This is a 16 byte field that normally is used to identify the IBeacon format and to associate a beacon with an institution or company like Zebra. There are filtering modes in the receivers and even the SuperBeacon that will use this field to control what beacons are forwarded to the location server. The UUID parameter can be set or modified in the field directly below the UUID variable. Normally the UUID is used to separate asset beacons from Waypoint Beacons. This is help for debugging issues with the locationing system.

## Save Permanent and Reload Buttons

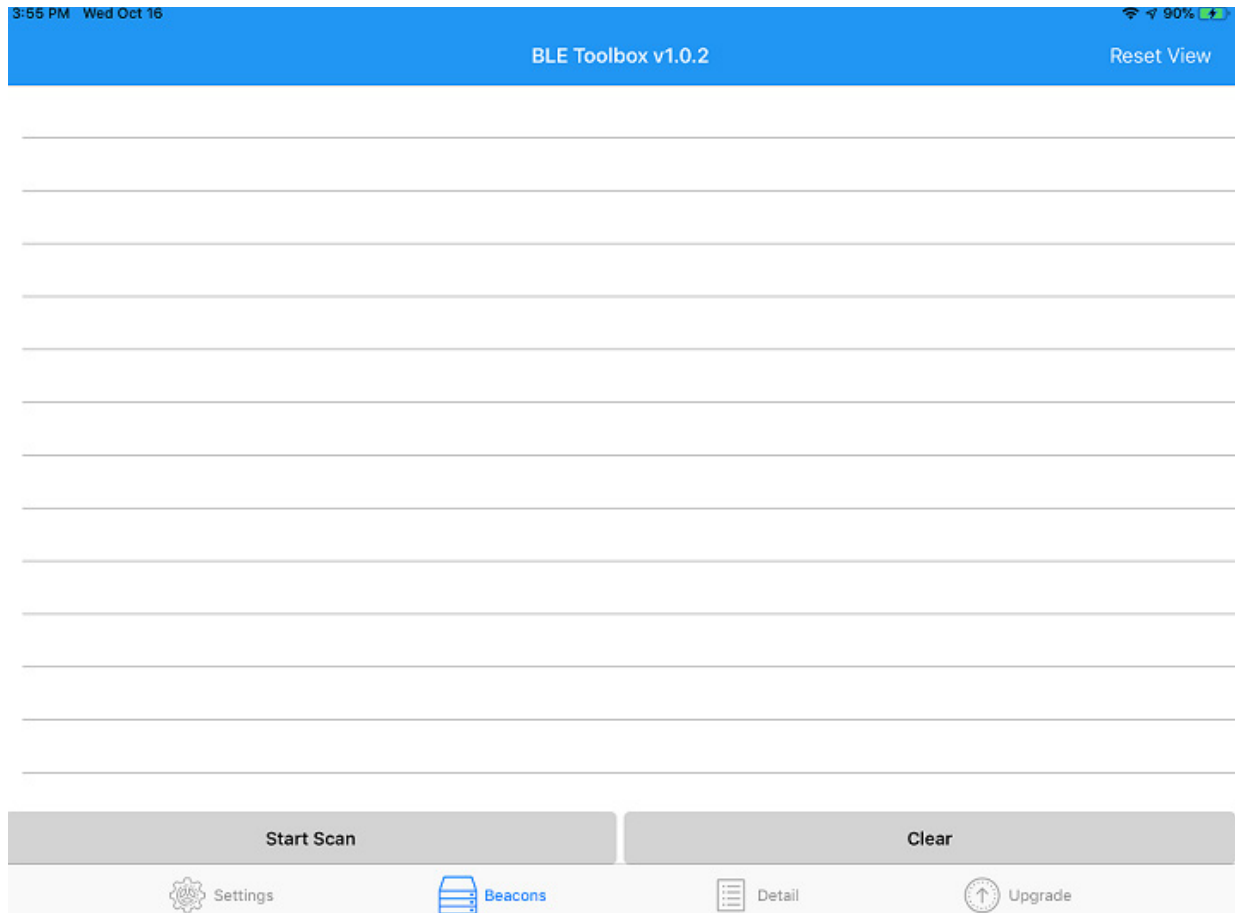
These buttons are used to save or recall the saved settings. If you are programming multiple beacons, you can set up all the parameters first and hit the "Save Permanent" button which will save the current values in the toolbox. You can continue to make changes to the settings and for other beacon types. Once you are finished with the minor changes, you can hit the "Reload" button and restore the current settings to those which you saved permanently.

## Screen Menu

The bottom banner allows the user to move from one screen to another. There are 4 screens in this toolbox. The “Settings” button on the bottom left selects this screen that we just reviewed in this section. The “Beacons” screen is to the right of this button which allows you to select which beacon you want to connect to for the purpose of reading or changing parameters or updating code. The “Details” button to the right of the “Beacons” button shows the parameters of a selected beacon and allows the user to read and write the beacon settings. The right most button “Upgrade” takes you to a screen for updating beacon code OTA.

## Beacons Screen

The Beacon screen is shown below. This screen is used to see what beacons have connected to the toolbox. You need to connect to a beacon before you can read or write need parameters.



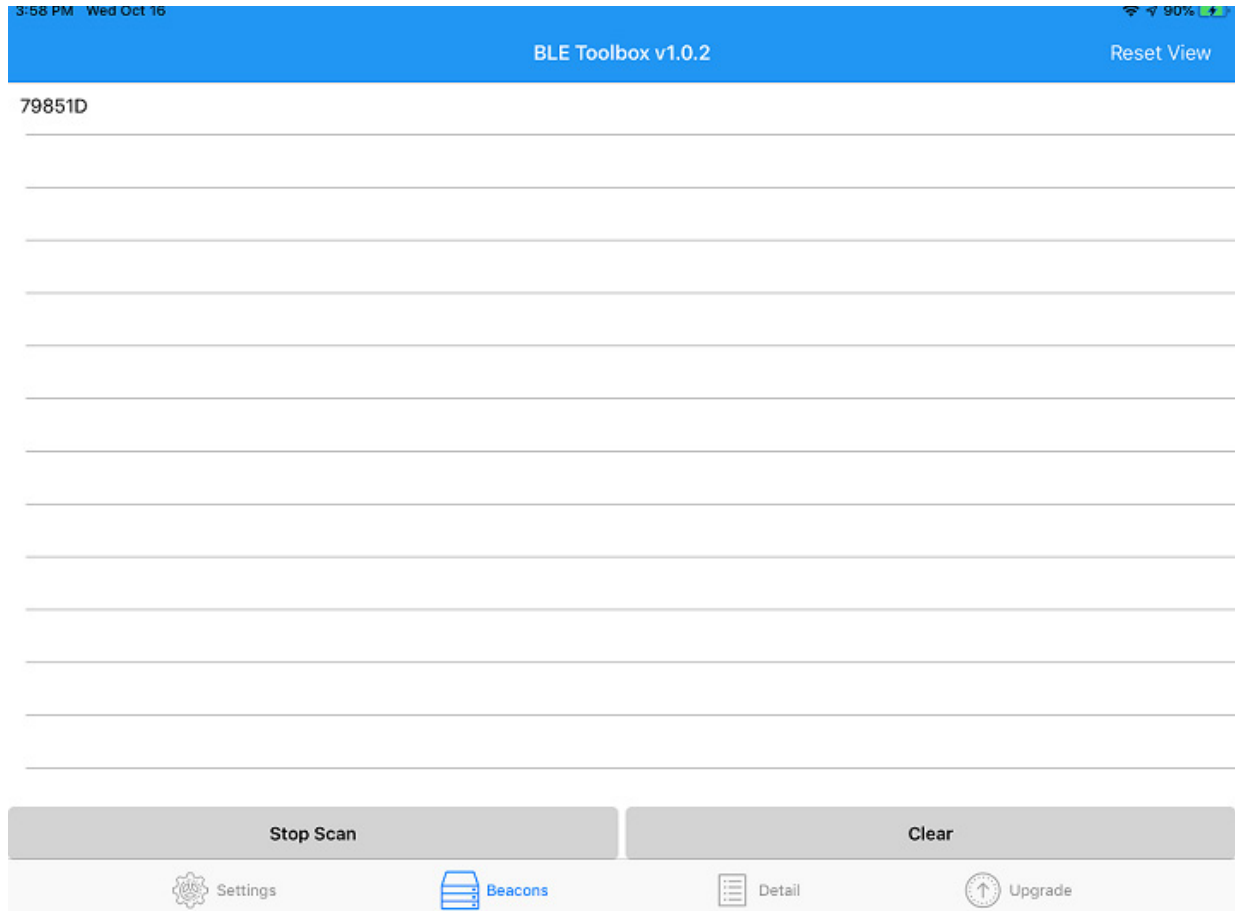
Right now, the screen is blank, the toolbox has not connected with any beacons. The first step to connect the toolbox to a beacon is to start the toolbox scanning.

## Scanning

To put the toolbox in connect mode, touch the “Start Scan” button. This puts the toolbox into scan mode looking for a beacon to connect. Next, the user needs to place the beacon in the connect mode. All our beacons enter the connect mode by holding down the button on the beacon and watching the LED blinking. At first, the LED blinks slowly. Releasing the button during this slow blink period places the beacon back into beaconing mode. After the slow blink is on for about 5 second, as the user continues to hold the button down, the blink rate will change from slow to fast. When this happens, you can remove your finger from the button and the beacon will go into connect mode. When the beacon is in the connect mode and the toolbox is in the scan mode, the toolbox will pair with the beacon.

## Connecting the Toolbox to Beacon

The screen shot below shows a beacon that is now connected to the toolbox. The last 3 bytes of the MAC\_ID of the beacon are shown on the left hand of the “Beacon” screen.



Notice that the “Start Scan” button has changed to “Stop Scan”. You can use this to stop the capture process if desired. If not, you can continue to add more beacons to this list by performing the same connect button pushes described in the previous section.

## Clear Button

This button can be used to clear the beacon list on the left.

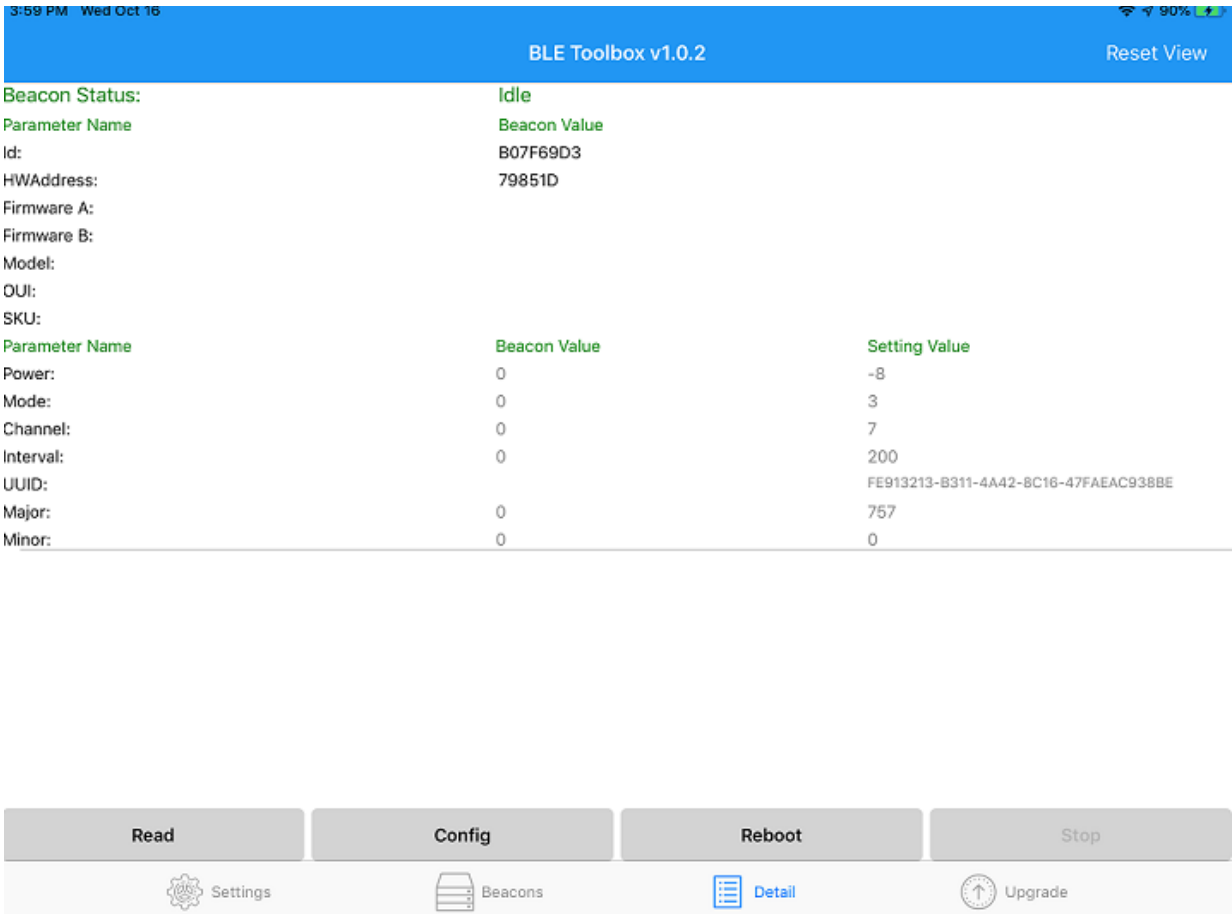
## Next Step - Details

You use this step to connect one or more beacons to the toolbox prior to reading the contents or writing out new settings to a beacon. Once you have connected to the beacon you want to read or modify, touch the ID on the left part of the screen of the beacon you want to work with and the toolbox will take you to the “Detail” screen.



# Detail Screen

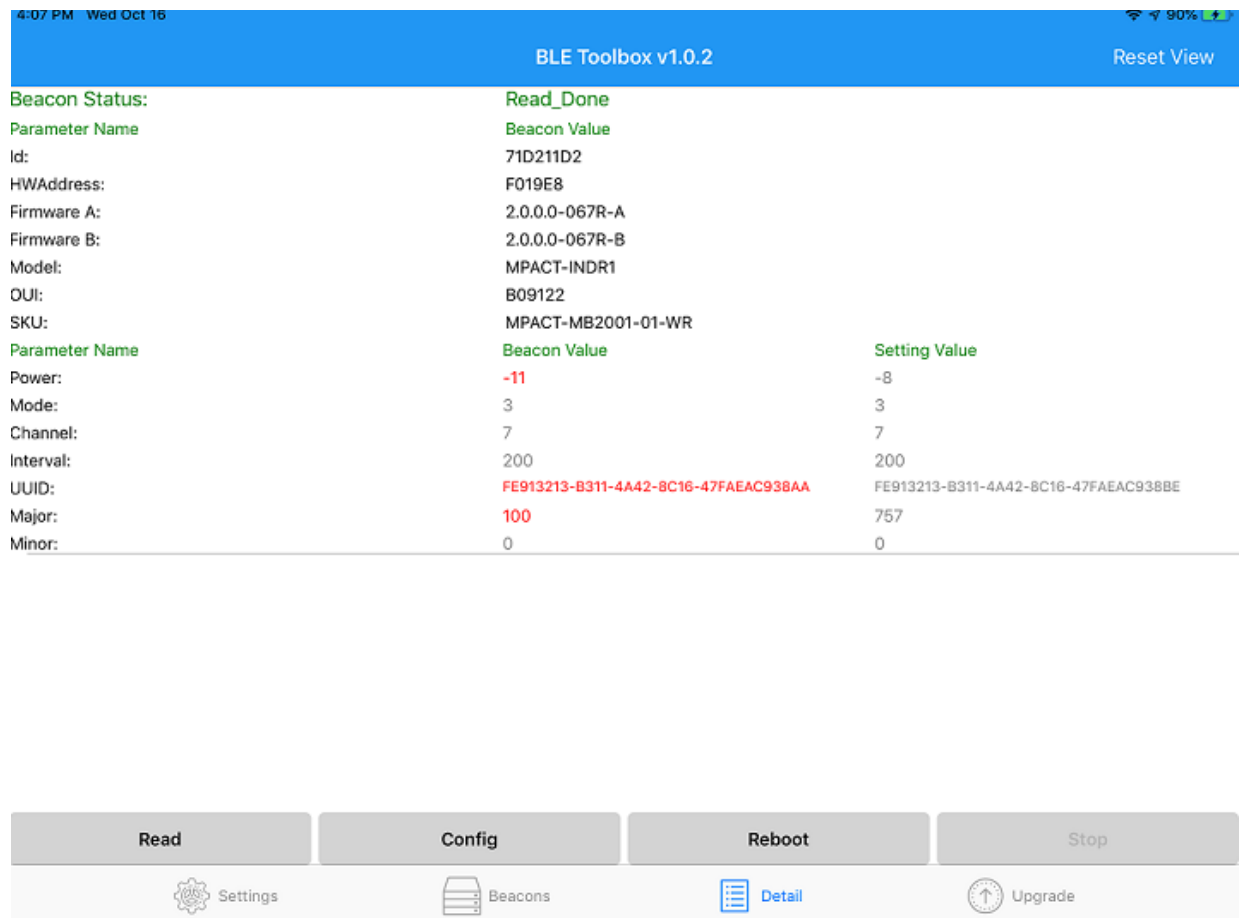
This screen shot shows the Detail screen. This is used to read and monitor the parameters in a beacon.



On the left side of this screen you can see names of various parameters and status indicators. On the bottom banner, you can see the buttons “Read”, “Config”, “Reboot”, and “Stop”. Stop is not highlight because the current Beacon Status is “Idle”. This button will highlight once one of the functions “Read”, “Config” or “Reboot are invoked. Notice that the Beacon Value column shows all zeros – this will change once the “Read” command is invoked. The Setting Value column displays the values that were setup when we started with the Settings screen. These values can be changed by going back to the Settings screen and changing the parameters on that screen.

## Read Button

To read the parameters on the selected beacon, the user needs to touch the “Read” button. The screen below shows the results of reading the values from the selected beacon.



This section will review these columns and what they mean. Notice that after the “Read” was completed, the middle column became filled in and highlighted. The current Beacon Status shows “Read Done”. Below the Read Done is the column header Beacon Value. This is separated into two parts, parameters that are fixed or cannot be modified by this screen and another Beacon Value section which has parameters that can be modified by this screen. To the right of this column is the values we initially set in the Setting screen. Notice that the values in red are parameters read from the beacon which do not match the parameters set in the Setting Value column. The beacon parameters will be updated to match those in the Setting Value column when the “Config” button is touched.

## ID

This is a random number which the beacon has.

## HW Address

This is the last three bytes of the MAC\_ID. This beacon MAC\_ID is B0:91:22:F0:19:E8.

## Firmware A, Firmware B

There are two firmware images in the Beacon, an A image and a B image. This shows the version of each of these images. Only the B image can be changed OTA. The A image can only be changed with a firmware upgrade which can only be done in the factory.

## Model Number

This is the model number of the Beacon which is “MPACT-INDR1. This is how the beacon is registered regarding Zebra’s regulatory certifications.

## OUI – Organization Unique Identifier

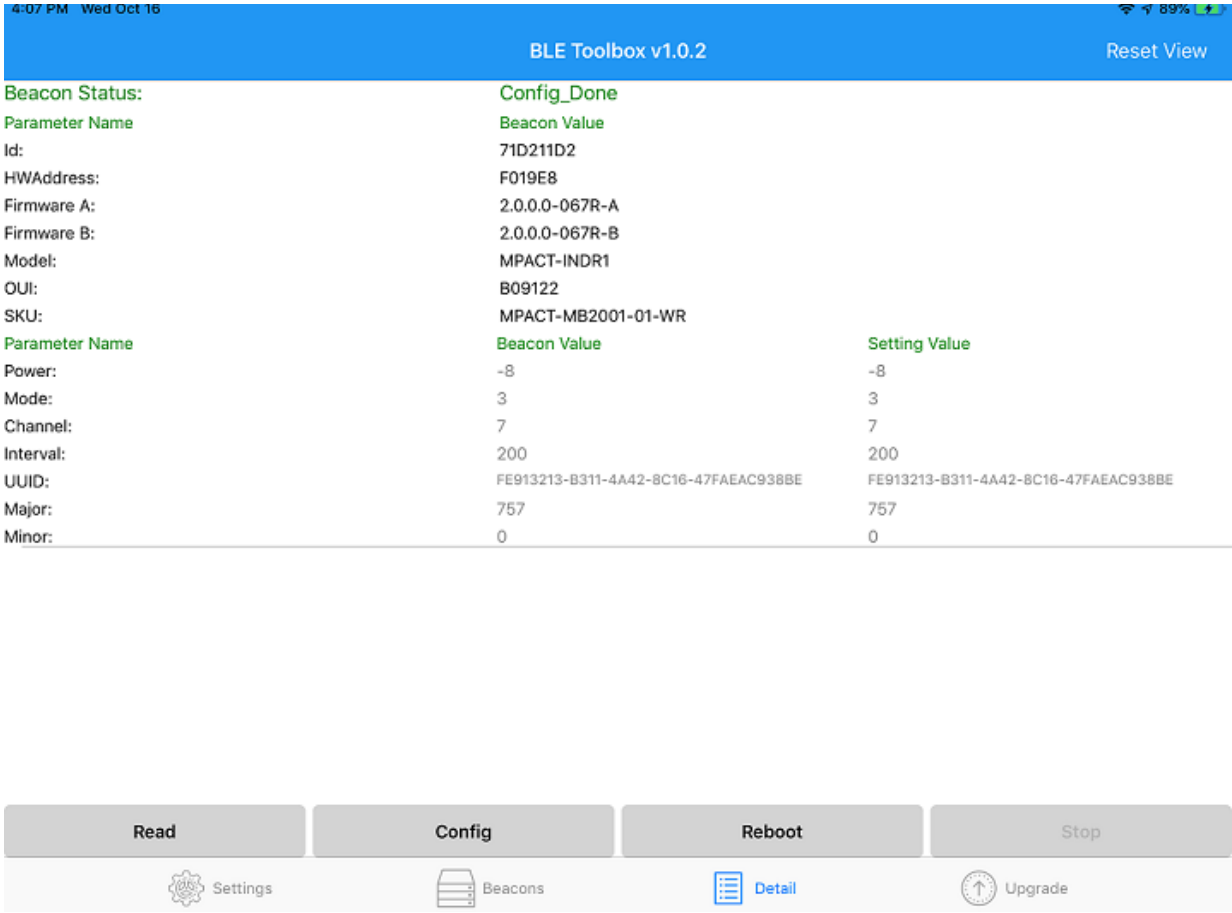
This is the first 3 bytes of the MAC\_ID. This block of MAC\_IDs were issued to Texas Instruments who design the BLE chip we are using. This beacon MAC\_ID is B0:91:22:F0:19:E8.

## SKU – Zebra’s Part Number

This field contains the Zebra part number for this beacon. There are many SKUs for this style of beacon but all of them share the same model number. The SKU difference can be in the software, the pad installed on the beacon or the logo or all three.

## Config Button

The “Config” button is used to push the parameters shown in the Setting Value column on the right. When you invoke the “Config” command, the screen will be as shown below.



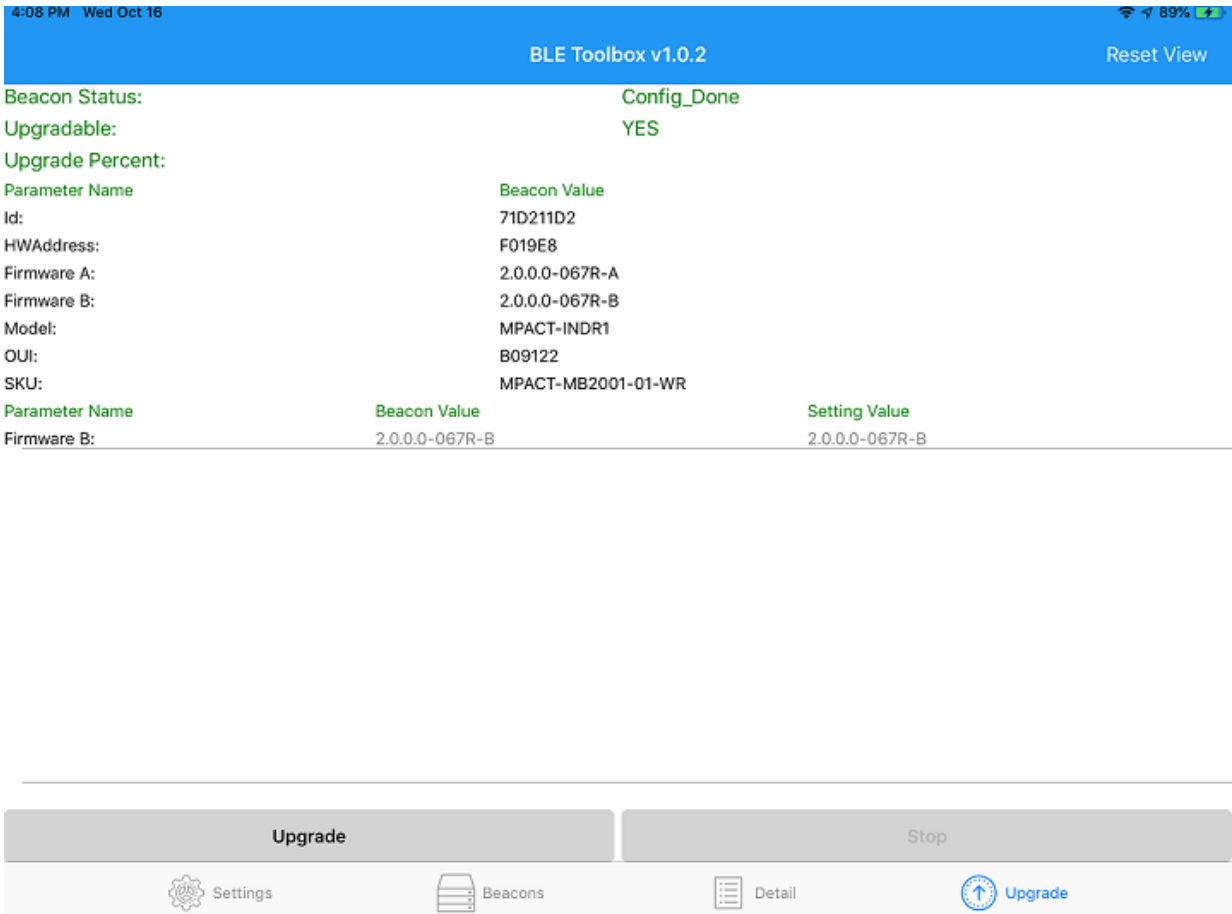
Notice the Beacon Status changes to “Config\_Done”. Also note that the values in the Beacon Value column now match the values in the Setting Value column. The toolbox will reboot the beacon after it has completed the configuration operation on the beacon. This places the beacon back into the beacon mode. You will need to go back to the scan “Beacons” screen to re-connect to the beacon and place the beacon back into the connect mode.

## Reboot Command

This button will reboot the beacon shown on the screen. Once the beacon reboots, it will come up in the beaconing mode. You will need to go back to the scan “Beacons” screen to re-connect to the beacon and place the beacon back into the connect mode if you wish to update the Beacon settings.

# Upgrade Screen

The screen shot below shows the Upgrade screen.



This is rather simple. You can see in the Beacon Value column the Firmware B: is 2.0.0.0-067R-B and the Setting Value is also 2.0.0.0-067R-B. The Setting Value is from the Setting screen. To change the firmware which is downloaded you will need to enter a new firmware version in the Settings screen.

## Changing the Firmware in the Settings Window

The screen shot below shows the Setting screen which you will need to use to select a version of firmware you may want to download to a given beacon. When the user touches the firmware version on the first line, the lower screen comes up.

4:03 PM Wed Oct 16

BLE Toolbox v1.0.2

Reset View

Current Settings:

Firmware:

CC2640-OAD-B-2.0.0.0-067R.bin

RssiLimit:

-60

Power:

-8

Mode:

3

Channel:

7

Interval:

200

Major:

757

Minor:

0

UUID:

FE913213-B311-4A42-8C16-47FAEAC938BE

Done

CC2640-OAD-B-2.0.0.0-066R.bin

CC2640-OAD-B-2.0.0.0-067R.bin

This screen shot shows that the toolbox only has two versions of the beacon code. The one selected is the 067R.bin file. Note above that the current firmware version is the 066R.bin file which is an earlier version. Beacon versions only exists as part of the BLE toolbox. You cannot add additional beacons versions yourself. The versions only exist as part of the BLE Toolbox. If you need a version that is not current shown as a toolbox selection, then you will need to contact the Locationing Systems Product Manager and ask for an updated version of the BLE toolbox that includes the version you want to use as an update.

# BLE NFC Toolbox

This section describes how to use the BLE NFC Toolbox with NFC-enabled beacons like the MPACT-SB1100-01-WR. The BLE NFC toolbox is only available in Android and must be downloaded from the [appcenter.ms](http://appcenter.ms) website. You will need to contact the Location Solutions Division Product Manager to obtain a USER\_ID and password to access the [appcenter.ms](http://appcenter.ms) website. Once you have access to the website and the app URL you can download the BLE NFC Toolbox app to your Android phone or tablet. The screen below shows the how the BLE NFC Toolbox app appears on an Android phone once you have downloaded the app.

## Settings Screen

When the BLE NFC Toolbox application is launched, the first window to pop up is the settings menu. This window is shown below.

4:21 100%

BLE NFC Toolbox v1.0.12 RESET VIEW

SETTINGS BEACONS DETAIL NFC

**Beacon Parameters:**

RssiLimit: -60

Power: -11

Mode: 3

Channel: 7

Interval: 100

Major: 0

Minor: 0

UUID: FE913213-B311-4A42-8C16-47FAEAC938DB

**Extra Parameters for NFC:**

NFC Password: ZebraNFCBeacon20

Channel Feature: 0

RssiAt1M 37: -73

RssiAt1M 38: -73

RssiAt1M 39: -73

SAVE PERMANENT RELOAD

The top banner shows the version of the BLE NFC toolbox which for this screenshot is v1.0.12. One should occasionally check the [appcenter.ms](http://appcenter.ms) website to see if there is a newer version. The upper part is marked Beacon Parameters. It shows the beacon parameters that can be controlled by both BLE and NFC using this toolbox. These parameters can be pushed to a beacon via BLE or NFC.

The lower part is marked Extra Parameters for NFC. It shows the beacon parameters that can only be controlled by NFC. These parameters can be pushed to a beacon via NFC.

The “Save Permanent” button can save the current parameter values to the device so when next time the app is open, these values are loaded automatically.

The “Reload” button is to load the last saved parameter values.

The following sections discusses each parameter.

RSSI Limit, Power, Mode, Channel, Interval, Major, Minor, UUID: Please refer to section 2.1.

## NFC Password

The NFC Password is the seed to generate a secret between the App and the NFC beacon. The secret is used during all the read and write communications between the App and NFC beacon. The password must be 16 characters. The default password is ZebraNFCBeacon20.

To ensure security it is recommended to create and record a new, unique password, and to update the beacons accordingly prior to deployment.

## Channel Feature

The Channel Feature setting is to enable or disable broadcasting different packets for channels 37, 38, 39. Value 0 means disable. Value 1 means enable. If enabled, the difference in the BLE packets for different channels are the RSSI at 1 meter values. Enabling the Channel Feature can help improve the range/locate accuracy but will have an effect on battery life.

## RssiAt1M 37, RssiAt1M 38, RssiAt1M 39

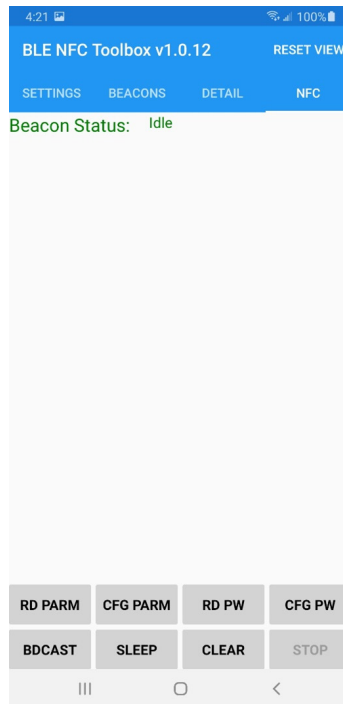
These are the Rssi at 1 meter settings for different channels 37, 38 and 39. When Channel Feature is enabled, they are all effective. When Channel Feature is disabled, only the RssiAt1M 37 is effective.

## NFC Screen

### Default NFC screen

The default NFC screen is empty display without reading any NFC beacon.

On the bottom banner, you can see the buttons “Rd Parm” (Read Parameters), “Cfg Parm” (Config Parameters), “Rd Pw” (Read Password), “Cfg Pw” (Config Password), “BDcast”(Broadcast), “Sleep”, “Clear” and “Stop”. Stop is not highlight because there is no NFC action started. This button will highlight once one of the functions is invoked.



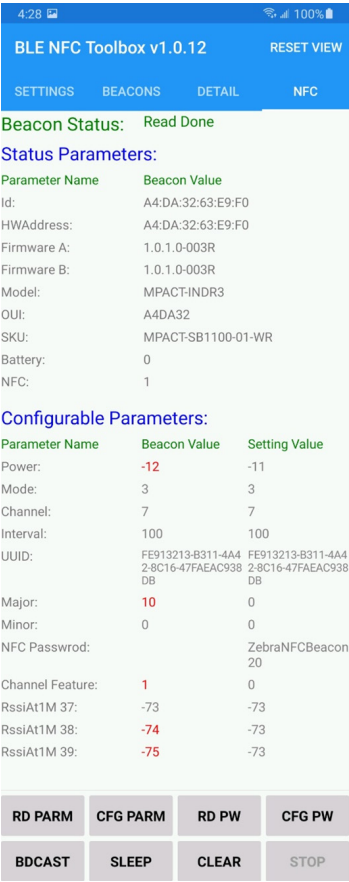
## Read Parameter Button

To read the parameters on the selected beacon, the user needs to touch the “Rd Parm” button. The Beacon Status shows “Read Done”. The screen below shows the results of reading the values from the selected beacon.

On the left side of the screen you can see names of various parameters and status indicators. “Status Parameters” shows read-only parameters of the beacon. “Configurable Parameters” means changeable parameters.

For the “Configurable Parameters” part, the “Setting Value” column displays the values that were setup when we started with the Settings screen. These values can be changed by going back to the Settings screen and changing the parameters on that screen.

The parameter values under column “Beacon Value” are displayed in red when they are different with the values under column “Setting Value”. After configuring and reading again, the colors will be changed to gray as others.



For Status Parameter ID, HW Address, Firmware A, Firmware B, Model, OUI, SKU, please refer to section 2.3.2 to 2.3.7.

Battery: Remaining percent of the current battery

NFC: NFC hardware is ready



## Config Parameter Button

To configure the parameters on the selected beacon, the user needs to touch the “Cfg Parm” button. The Beacon Status shows “Config Parameter Done”. The toolbox will reboot the beacon after it has completed the configuration operation on the beacon. This places the beacon back into the beaconding mode.

The screen on left shows the results of configuring the values to the selected beacon. The screen on right shows the results after reading parameter again.

4:31

BLE NFC Toolbox v1.0.12

RESET VIEW

SETTINGSBEACONSDETAILNFC

Beacon Status: Config Parameter Done

Status Parameters:

Parameter Name	Beacon Value
Id:	A4:DA:32:63:E9:F0
HWAddress:	A4:DA:32:63:E9:F0
Firmware A:	1.0.1.0-003R
Firmware B:	1.0.1.0-003R
Model:	MPACT-INDR3
OUI:	A4DA32
SKU:	MPACT-SB1100-01-WR
Battery:	0
NFC:	1

Configurable Parameters:

Parameter Name	Beacon Value	Setting Value
Power:	-12	-11
Mode:	3	3
Channel:	7	7
Interval:	100	100
UUID:	FE913213-B311-4A42-8C16-47FAEAC938DB	FE913213-B311-4A42-8C16-47FAEAC938DB
Major:	10	0
Minor:	0	0
NFC Passwrod:		ZebraNFCBeacon20
Channel Feature:	1	0
RssiAt1M 37:	-73	-73
RssiAt1M 38:	-74	-73
RssiAt1M 39:	-75	-73

RD PARM

CFG PARM

RD PW

CFG PW

BDCAST

SLEEP

CLEAR

STOP

4:32

BLE NFC Toolbox v1.0.12

RESET VIEW

SETTINGSBEACONSDETAILNFC

Beacon Status: Read Done

Status Parameters:

Parameter Name	Beacon Value
Id:	A4:DA:32:63:E9:F0
HWAddress:	A4:DA:32:63:E9:F0
Firmware A:	1.0.1.0-003R
Firmware B:	1.0.1.0-003R
Model:	MPACT-INDR3
OUI:	A4DA32
SKU:	MPACT-SB1100-01-WR
Battery:	0
NFC:	1

Configurable Parameters:

Parameter Name	Beacon Value	Setting Value
Power:	-11	-11
Mode:	3	3
Channel:	7	7
Interval:	100	100
UUID:	FE913213-B311-4A42-8C16-47FAEAC938DB	FE913213-B311-4A42-8C16-47FAEAC938DB
Major:	0	0
Minor:	0	0
NFC Passwrod:		ZebraNFCBeacon20
Channel Feature:	0	0
RssiAt1M 37:	-73	-73
RssiAt1M 38:	-73	-73
RssiAt1M 39:	-73	-73

RD PARM

CFG PARM

RD PW

CFG PW

BDCAST

SLEEP

CLEAR

STOP

## Read Password Button

To read the password on the selected beacon, the user needs to touch the “Rd Pw” button. The Beacon Status shows “Read Done”. The screen below shows the results of reading the password from the selected beacon. The “NFC Password” row is updated. As it is different with the current settings, its value is displayed in red.

4:34

BLE NFC Toolbox v1.0.12

RESET VIEW

SETTINGSBEACONSDETAILNFC

Beacon Status: Read Done

Status Parameters:

Parameter Name	Beacon Value
Id:	A4:DA:32:63:E9:F0
HWAddress:	A4:DA:32:63:E9:F0
Firmware A:	1.0.1.0-003R
Firmware B:	1.0.1.0-003R
Model:	MPACT-INDR3
OUI:	A4DA32
SKU:	MPACT-SB1100-01-WR
Battery:	0
NFC:	1

Configurable Parameters:

Parameter Name	Beacon Value	Setting Value
Power:	-11	-11
Mode:	3	3
Channel:	7	7
Interval:	100	100
UUID:	FE913213-B311-4A42-8C16-47FAEAC938DB	FE913213-B311-4A42-8C16-47FAEAC938DB
Major:	0	0
Minor:	0	0
NFC Password:	ZebraNFCBeacon20	ZebraNFCBeacon21
Channel Feature:	0	0
RssiAt1M 37:	-73	-73
RssiAt1M 38:	-73	-73
RssiAt1M 39:	-73	-73

RD PARM

CFG PARM

RD PW

CFG PW

BDCAST

SLEEP

CLEAR

STOP

## Config Password Button

To configure the parameters on the selected beacon, the user needs to touch the “Cfg Pw” button. The Beacon Status shows “Config Password Done”. The toolbox will reboot the beacon after it has completed the configuration operation on the beacon. This places the beacon back into the beaconing mode.

The screen on left shows the results of configuring the password to the selected beacon. The screen on right shows the results after reading password again.

4:35100%

BLE NFC Toolbox v1.0.12RESET VIEW

SETTINGSBEACONSDETAILNFC

Beacon Status: Config Password Done

Status Parameters:

Parameter Name	Beacon Value
Id:	A4:DA:32:63:E9:F0
HWAddress:	A4:DA:32:63:E9:F0
Firmware A:	1.0.1.0-003R
Firmware B:	1.0.1.0-003R
Model:	MPACT-INDR3
OUI:	A4DA32
SKU:	MPACT-SB1100-01-WR
Battery:	0
NFC:	1

Configurable Parameters:

Parameter Name	Beacon Value	Setting Value
Power:	-11	-11
Mode:	3	3
Channel:	7	7
Interval:	100	100
UUID:	FE913213-B311-4A42-8C16-47FAEAC938DB	FE913213-B311-4A42-8C16-47FAEAC938DB
Major:	0	0
Minor:	0	0
NFC Passwrod:	ZebraNFCBeacon20	ZebraNFCBeacon21
Channel Feature:	0	0
RssiAt1M 37:	-73	-73
RssiAt1M 38:	-73	-73
RssiAt1M 39:	-73	-73

RD PARM

CFG PARM

RD PW

CFG PW

BDCAST

SLEEP

CLEAR

STOP

4:35100%

BLE NFC Toolbox v1.0.12RESET VIEW

SETTINGSBEACONSDETAILNFC

Beacon Status: Read Done

Status Parameters:

Parameter Name	Beacon Value
Id:	A4:DA:32:63:E9:F0
HWAddress:	A4:DA:32:63:E9:F0
Firmware A:	1.0.1.0-003R
Firmware B:	1.0.1.0-003R
Model:	MPACT-INDR3
OUI:	A4DA32
SKU:	MPACT-SB1100-01-WR
Battery:	0
NFC:	1

Configurable Parameters:

Parameter Name	Beacon Value	Setting Value
Power:	-11	-11
Mode:	3	3
Channel:	7	7
Interval:	100	100
UUID:	FE913213-B311-4A42-8C16-47FAEAC938DB	FE913213-B311-4A42-8C16-47FAEAC938DB
Major:	0	0
Minor:	0	0
NFC Passwrod:	ZebraNFCBeacon21	ZebraNFCBeacon21
Channel Feature:	0	0
RssiAt1M 37:	-73	-73
RssiAt1M 38:	-73	-73
RssiAt1M 39:	-73	-73

RD PARM

CFG PARM

RD PW

CFG PW

BDCAST

SLEEP

CLEAR

STOP

## Broadcast Button

This button will reboot the selected beacon into the beaconing mode.

## Sleep Button

This button will put the selected beacon into sleep mode. The beacon stops broadcasting and enters into low power mode.

## Clear Button

This button will clear the selected beacon on the App user interface (UI).

Note: even if there is no beacon displayed on UI, user can still configure parameters and password from the current settings to a NFC beacon by a NFC touching action.

## NFC Power Consumption

When the NFC circuit is engaged (i.e., when the mobile device application is very close to the beacon and making a circuit) battery power is consumed; engaging the NFC circuit for extended periods of time will reduce battery life. As battery power is consumed over the life of the product, the effective operational range of the NFC circuit will shrink. This means physical contact with older beacons may be required to conduct NFC communication. The speed of the NFC communications may also be reduced with units nearing the end of its battery capacity.

It is recommended the mobile device not be in contact with the beacon for any longer than is necessary to perform the NFC communication, and then should be removed from contact with the beacon to ensure the NFC circuit does not remain engaged.

## LED Blinks

When the NFC application interacts with an NFC-enabled beacon, its LED will flash to indicate its status. If enabled, you may also hear a notification sound from the Android device as well as seeing the LED blink.

App/NFC Action	# of LED Blinks	Blink Speed
Read Parameters	1	Quick
Config Parameters	6	Slow
Read Password	1	Quick
Config Password	6	Slow
Broadcast	6	Slow
Sleep	2	Quick

**Note •** The LED blinks when the NFC circuit between the beacon and the App is broken (i.e., they are no longer connected). If none of the App's NFC action buttons are enabled and the App connects to a beacon's NFC circuit a single LED blink will occur and a notification sound on the App will sound (if NFC notification sounds are enabled) .

# Appendix

Below are important parameters for each current Zebra Beacon SKU.

Name	SKU	Antenna Type	Antenna Gain (dBm)	Pad (dBm)	RSSI at 1m	RSSI at 1m	UUID Last 4 Bytes	Default Chirp (ms)	BLE Power Default	BLE EIRP Default (dBm)	BLE RSSI@1M Default (dBm)	BLE Power Min (dBm)	BLE EIRP Min (dBm)	BLE RSSI@1M Min (dBm)	BLE Power Max (dBm)	BLE EIRP Max (dBm)	BLE RSSI@1M Max (dBm)
Negril (ASSET)	GE-MB1000-01-WR	omni	1	-10	-78	-62	38EF	2000	-12	-21	-69	-21	-30	-78	2	-7	-55
Montego (Indoor GE)	GE-MB2001-01-WR	Patch	-5	-20	-93	-77	38EF	200	-13	-38	-85	-21	-46	-93	2	-23	-70
Outdoor GE	GE-MB4000-01-WR	Down (red)	-4.8	-10	-81	-65	38EF	200	-13	-27.8	-73	-21	-35.8	-81	5	-9.8	-55
Negril MPact (ASSET)	MPACT-MB1000-01-WR	omni	1	-10	-78	-62	38DB	1000	-12	-21	-69	-21	-30	-78	2	-7	-55
Indoor	MPACT-MB2000-01-WR	Patch	-5	0	-73	-57	38DB	100	-21	-26	-73	-21	-26	-73	2	-3	-50
Indoor	MPACT-MB2001-01-WR	Patch	-5	-20	-93	-77	38DB	100	-11	-36	-83	-21	-46	-93	2	-23	-70
Outdoor UPS	MPACT-MB4000-01-WR	Down (red) Patch	-4.8	-10	-81	-65	38DB	200	-13	-27.8	-73	-21	-35.8	-81	5	-9.8	-55
Outdoor UPS	MPACT-MB4001-01-WR	Side (Black) Patch	-4.8	-10	-81	-65	38DB	200	-13	-27.8	-73	-21	-35.8	-81	5	-9.8	-55
USB_US Only	MPACT-MB3000-01-WR	omni	-5.2	-10	-83	-67	38DB	100	-13	-18.2	-75	-21	-26.2	-83	0	-5.2	-62
USB Beacon	MPACT-MB3100-01-WR	omni	-5.2	-10	-83	-67	38DB	100	-13	-18.2	-75	-21	-26.2	-83	0	-5.2	-62
USB Hub	MPACT-MB3200-01-WR	omni	-5.2	-10	-83	-67	38DB	100	-13	-18.2	-75	-21	-26.2	-83	0	-5.2	-62
Negril NFC (ASSET)	MPACT-SB1100-01-WR	Omni	1	-10	-78	-62	38EF	2000	-13	-22	-70	-21	-30	-78	2	-7	-55
SuperBeacon	MPACT-SB2000-01-WR	Patch	-5	0	-73	-57	38EF	NA	2	-3	-50	-21	-26	-73	2	-3	-50