

Aroco AC-BLE-T110W Wireless Beacon User Manual



Revision: v1.0

Updated: 1 Nov 2021

Amendment History				
Change Number	Revision Description	Pages Affected	Revision Number	Date
	First version	NA	1.0	1 Nov, 2021

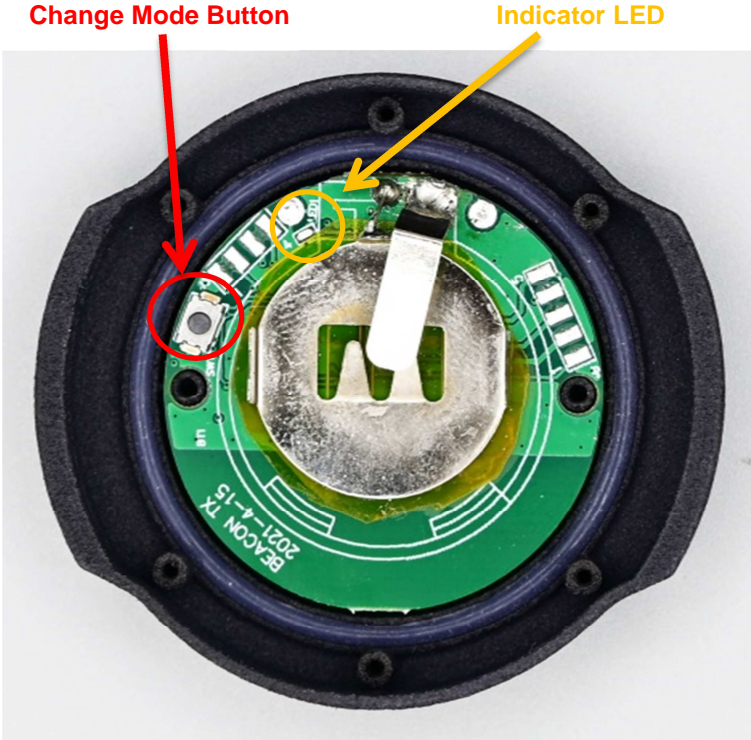
Technical support: bt.support@rodsum.com

Specification

AC-BLE-T110W:

Mechanics Data	
Size	Approx. 54.1 x 49.4 x 11.7 mm
Weight	Approx. 17 grams (without Battery) Approx. 20 grams (with Battery)
Electrics Data	
Bluetooth Chip	Nordic nRF52840
Frequency	2.4GHz
Memory	256kB Ram, 1MB Flash
BLE Version	Bluetooth 5 compatible iBeacon compatible BT4.2 Advertise Mode supported Long Range (PHY Coded) Mode supported
G-force	Build-in 12-bits 3-Axis Digital Accelerometer
Interface	I2C interface for external device
Battery	Non-rechargeable Battery CR2032 (3V 225mAh)
Life Time	Base on different interval and power setting
Transmission Range	Up to 200m (with Long Range PHY Coded Mode)

Function Description



LED Indicator Status

LED Status	Description
Stay Off	Beacon Power Off
Stay On	Beacon in Configuration Mode, connected with mobile
Flash 1600ms Off 400ms On	Beacon Under Configuring Mode, not connected with any mobile
Flash 4990ms Off 10ms On	Beacon Under normal Advertising Mode

LED Indicator description Table

Battery Level Reporting

User can enable/ disable the Battery Level Reporting by Aroco Beacon Config APP.

If the function is enabled, the upper 4 bits of **Major** will be covered by Battery Level in advertising data.

It will increase Beacon power consumption.

The Battery Level bits table is shown as below:

Battery Level	Upper Bits value
~10%	4096
~20%	8192
~30%	12288
~40%	16384
~50%	20480
~60%	24576
~70%	28672
~80%	32768
~90%	36864
~100%	40960

Battery Level bits value Table

Double Advertise Mode

User can enable/ disable the Double Advertise Mode by Aroco Beacon Config APP.

If the function is enabled, beacon will advertise same data packet twice to increase the data receiving stability.

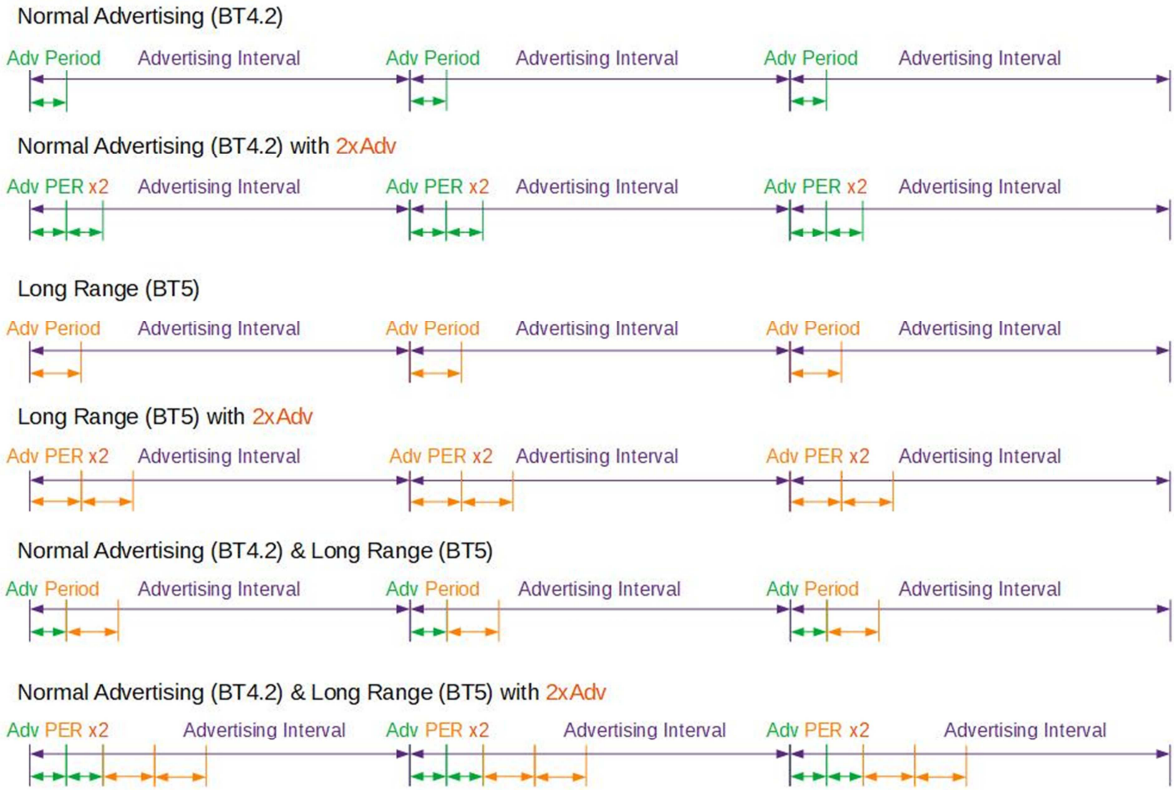
It will increase Beacon power consumption.

BT4.2 Advertise Mode

Normal Advertise Mode with Bluetooth 4.2 for around 50 meters transmission range.
 User can choose to advertise data by Normal BT4.2 Advertise Mode, Long Range (PHY Coded) Mode, or both Normal and Long Range Mode by Aroco Beacon Config APP.

Long Range (PHY Coded) Mode

Advertise Mode with Bluetooth 5 for long range (around 200 meters) transmission range.
 It request more transmission time per data and increase Beacon power consumption.

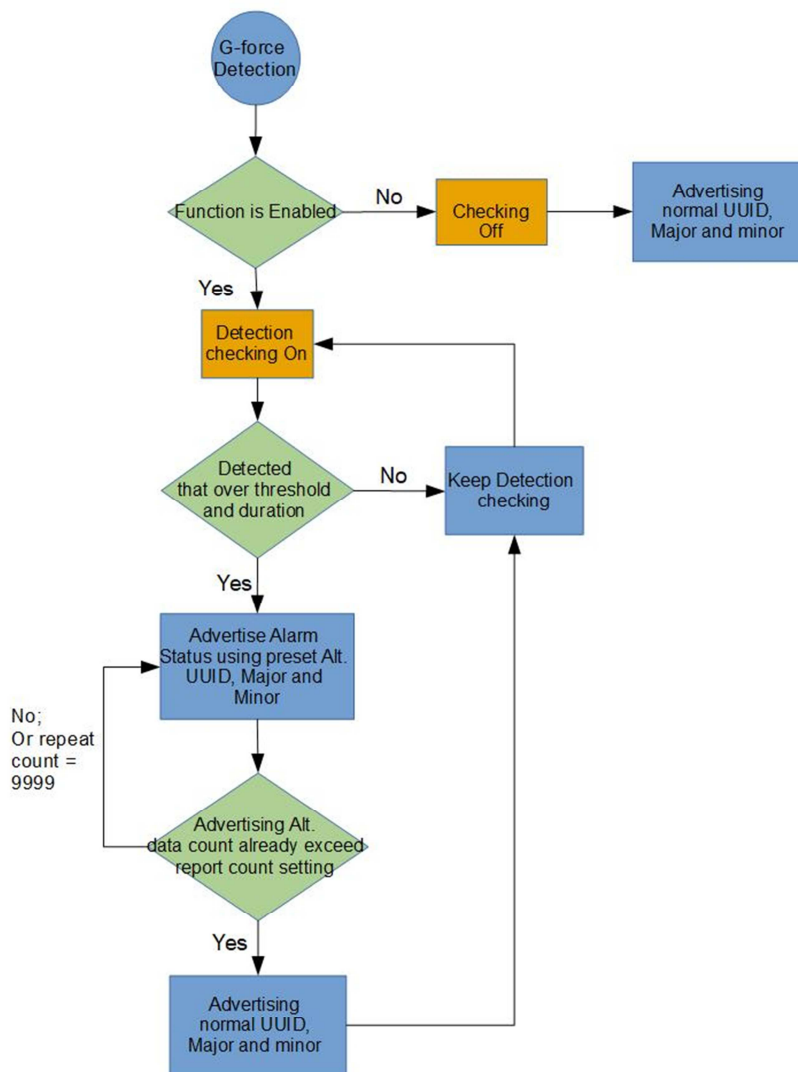


Advertising Time line in different mode

G-force Sensor Alarm

User can enable/ disable the Movement, Freefall, Pulse, Transient and Orientation Detection by Aroco Beacon Config APP.

If the function is enabled, beacon will monitor the status from Accelerometer with the threshold and duration setting. Alternative UUID, major and minor value will be reported instead of normal advertising.



Motion Detection Function flow chart

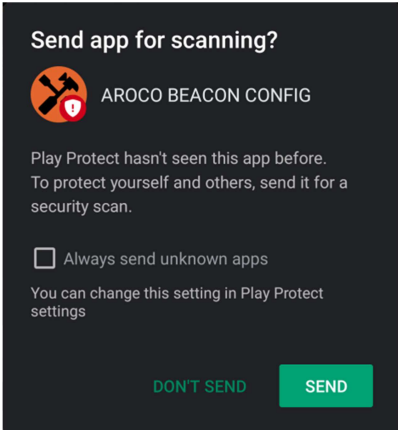
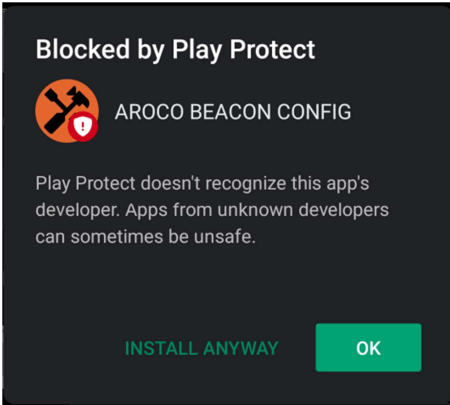
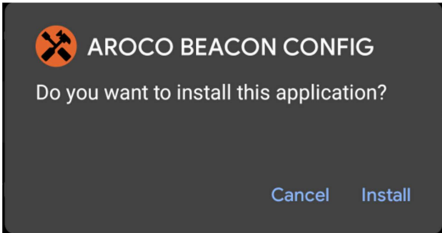
Software Configuration

Android App Start up Instruction

- 1. Download and install the AROCO BEACON CONFIG Android App (version 1.4.10) from following QR Code url:



Android version: 5.1 or upper



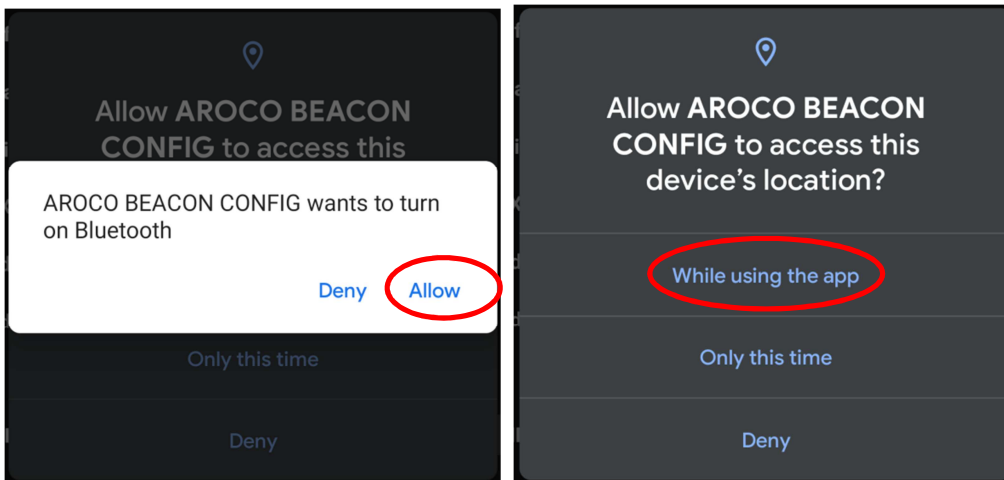
*Since the app is installed by APK, notice windows might appear while installation. Press "INSTALL ANYWAY" and "DON'T SEND" to finish the installation process.

2. Unscrew the screw and open the cover from the back. Fill in battery CR2032 to Turn On the Beacon.



- Battery positive side face to the board, negative side face up

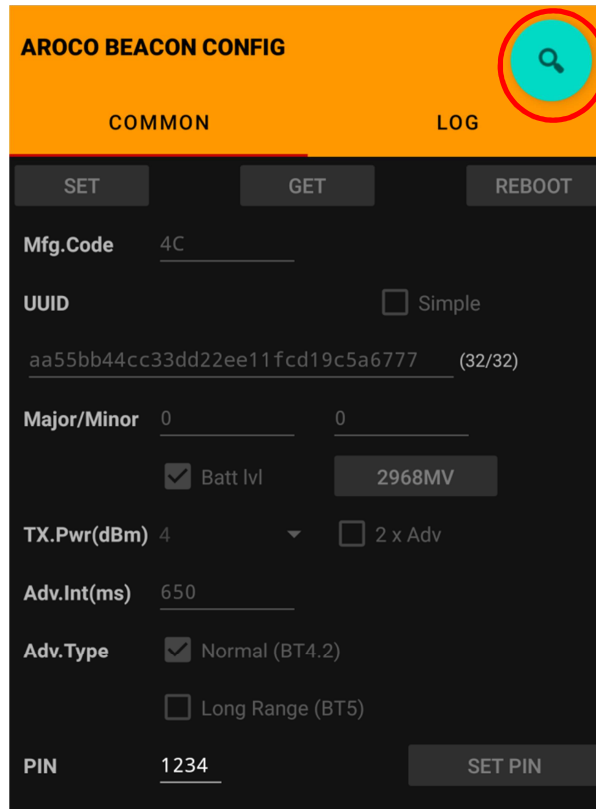
3. Start the App. Allow Device's Location permission, Enable Bluetooth and Location.



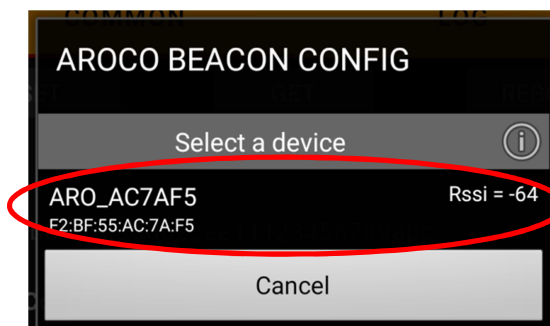
4. Press the Change Mode Button on the Beacon board. Beacon will enter configuring mode

- Beacon will back to Normal Mode for save energy while no any connection over 60 seconds; or press “Disconnect” Button in Mobile APP, press change mode button after Indicator LED flash.
- Press and Hold the Change Mode Button 5 seconds under Normal Mode to restore all above config to default.

5. Press **Magnifier Icon** button on the App to scan and connect the Beacon.



6. Select the Beacon and Tap to connect. All current parameter will be read.

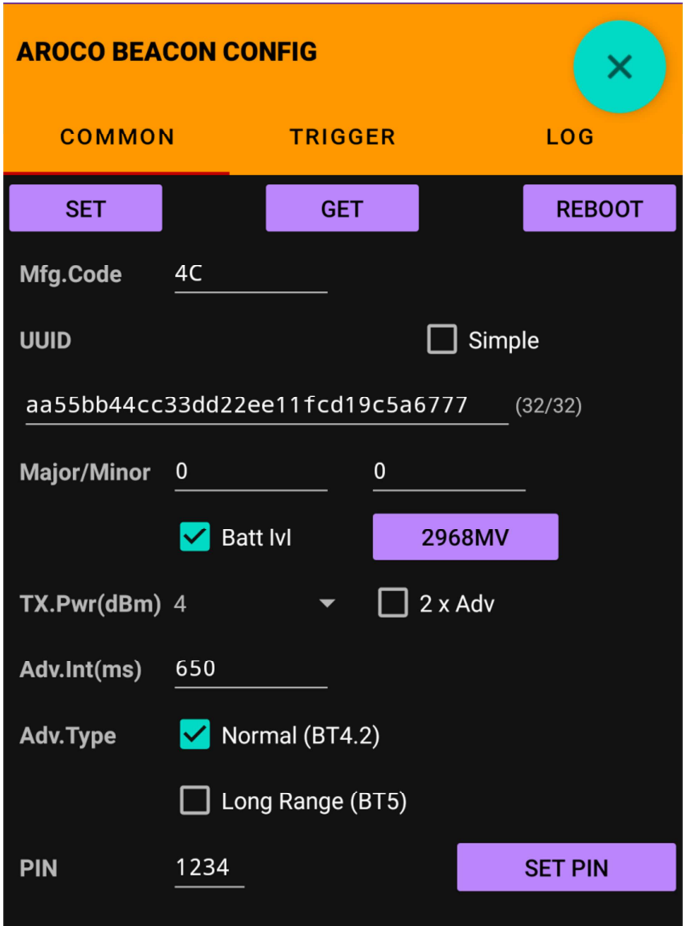


Common Setting Configuration

UUID, Manufacturing Code, Major, Minor, Battery Level reporting, TX Power, Advertising Interval, Advertising type and PIN setting can be checked and updated in this Tab page.

All current setting will be shown on the app once the beacon connection is made.

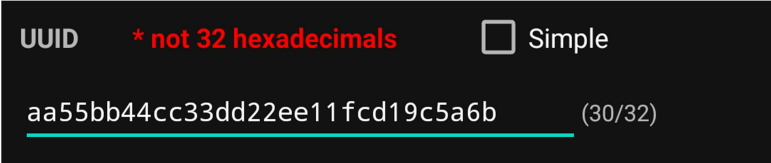
Beacon will advertising with those setting in normal status.



UUID: Simple 16 characters in simple (simple check box ticked) or 16 Bytes hexadecimal UUID data can be changed. (Default UUID: aa55bb44cc33dd22ee11+6 bytes Beacon MAC address)

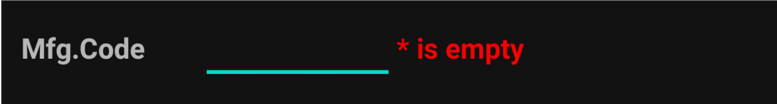
- Non-hexadecimal content will be blocked when Simple check box is un-ticked
- Simple allowed following characters
0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ-_/,*

- If new simple UUID length less than 16 characters, app will fill full stop at the end of new UUID to 16 characters length and updated the parameter when “SET” button pressed.
- If new UUID length not 32 in non-simple status, the notice will be shown as below when “SET” button pressed. All parameter cannot be updated.



Manufacturing Code: 2 Bytes Code data can be changed. Non-hexadecimal content will be blocked. (Default: 0x004C)

- If new Mfg. Code is empty, the notice will be shown as below when “SET” button pressed. All parameter cannot be updated.



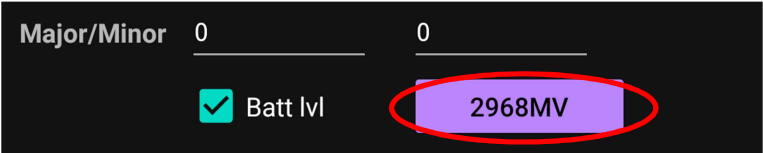
Major: Range 0 to 65535 (Default: 0)

Minor: Range 0 to 65535 (Default: 0)

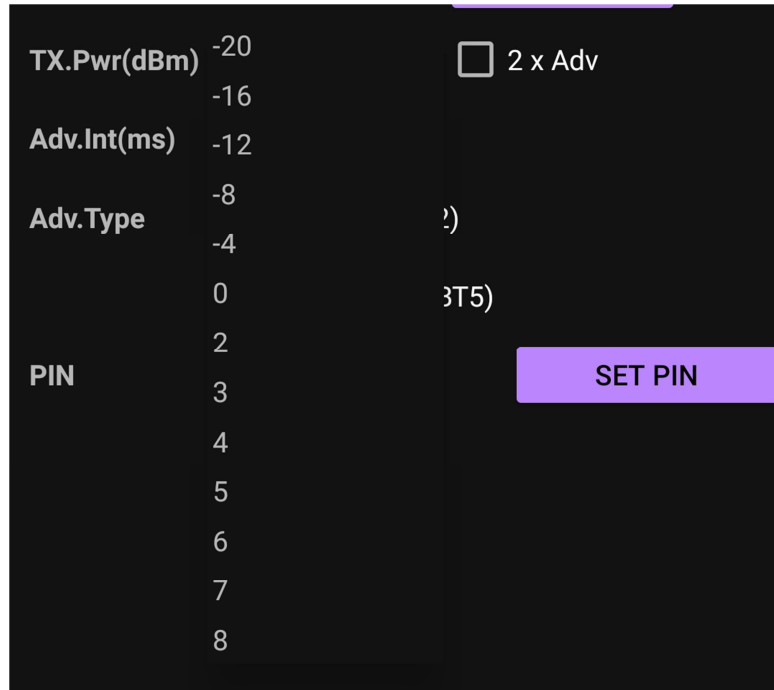
- Major and Minor fixed to 0 if UUID is in simple

Battery Level (Batt lvl): Tick box for choose the data advertising of Beacon Battery Level; Click Button to show the current Battery Level in mV

- Battery Level reporting will cover the upper 4 bits of Major



TX Power (dBm): Combo Box choice include -20, -16, -12, -8, -4, 0, 2, 3, 4, 5, 6, 7, 8 (Default: -12)



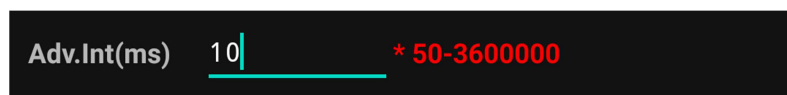
The screenshot shows a configuration menu with the following elements:

- TX.Pwr(dBm)**: A list of values from -20 to 8. The value -12 is selected.
- Adv.Int(ms)**: A list of values from -12 to 8. The value -12 is selected.
- Adv.Type**: A list of values from -8 to 8. The value 0 is selected.
- PIN**: A list of values from 2 to 8. The value 3 is selected.
- 2 x Adv**: A checkbox that is currently unchecked.
- SET PIN**: A purple button that is highlighted.

2 x Adv: Tick box for data advertising by Double Advertisement

Advertising Interval (ms): Range 50-3600000. (Default: 650)

- If new Adv. Interval is empty or less than 50, the notice will be shown as below when “SET” button pressed. All parameter cannot be updated.



The screenshot shows an error message in a black box with white text:

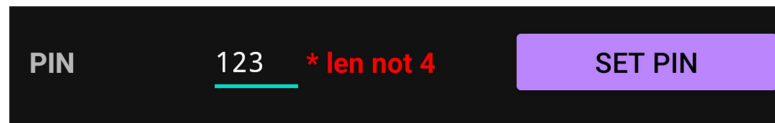
Adv.Int(ms) 10 * 50-3600000

Advertising Type: Tick Box to choice Normal Type (BT4.2) **or/ and** Long Range Type (BT5) (Default: Normal (BT4.2) Type only)

- Tick both box for choose the both type
- Power consumption will increase if BT5 Type or both type is chosen

PIN: 4 digits PIN (Alphabet or number) for Login when every connection create (Default: 1234)

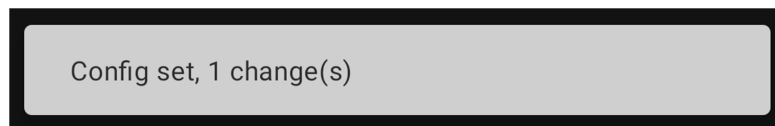
- If new PIN length not 4, the notice will be shown as below when “SET PIN” button pressed. PIN cannot be updated.



- If PIN value incorrect, the notice will be shown at the bottom as below when connecting the beacon. Those notice message will also be shown in the “LOG” Tab page.



Text notice box will be shown at the bottom if any CFG updated. Those notice message will also be shown in the “LOG” Tab page.



* CONFIG APP will updated all the above parameter to Beacon by press “SET” Button. No any parameter will be updated individually if any input error notice appear.

GET: All current setting value will be shown on this page when press the “GET” button

REBOOT: Request beacon reboot when press the “REBOOT” button.

Connection between beacon and mobile will be lost. Beacon will start will Normal mode after reboot.



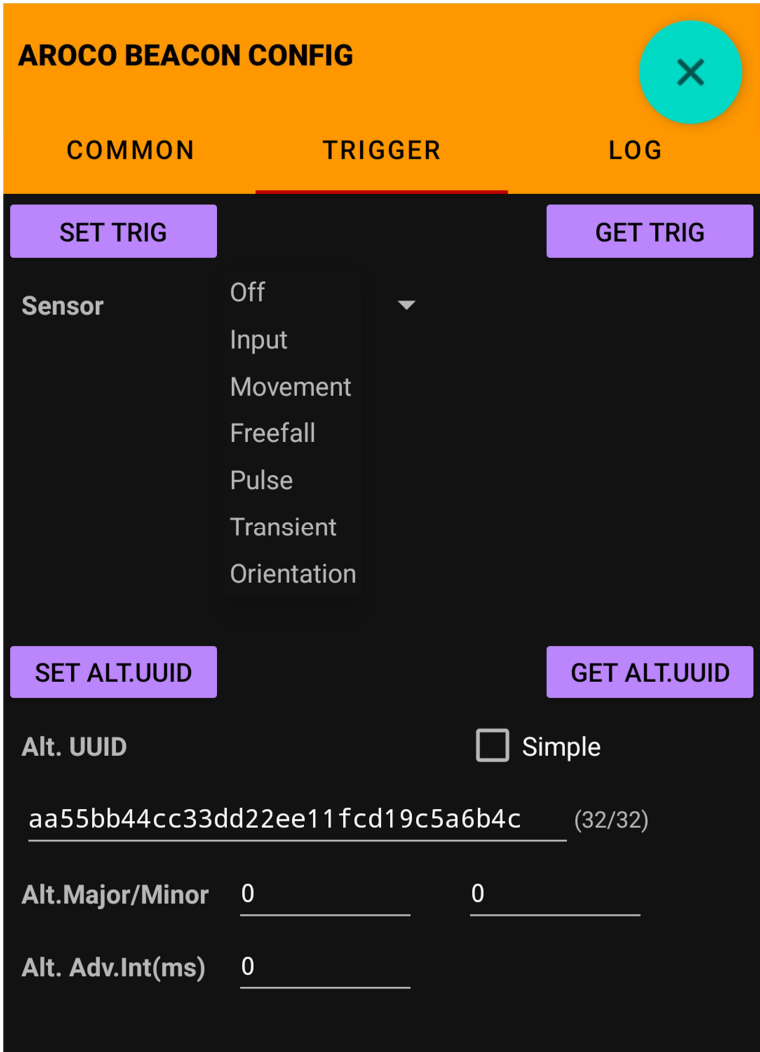
Trigger Setting Configuration

Beacon with G-force Accelerometer (AC-BLE-T110W) will show this Tab page.

Sensor ON/OFF, alarm type, Threshold, Duration, Repeat Count, Alternative UUID, Alternative Major, Alternative Minor and Alternative Advertising Interval setting will be shown, can be checked and updated.

All current setting value will be shown on the app once the beacon connection is made.

Beacon will trigger the Alarm by advertising with Alternative UUID, Major, Minor and Advertising Interval according those trigger setting.



Sensor:

Combo Box for On, Off and alarm type selection. Additional setting such as Threshold, P/L mask, duration, Digital Input Debounce time, repeat count and Action setting will be shown when any sensor type selected.

- Input Alarm is reserved for other Rodsum Wireless Beacon Product.

Threshold (mg): (For Movement, Freefall, Pulse and Transient)

Threshold value for trigger the alarm detection

Range: 63-8000

P/L Mask: (For Orientation)

Portrait/ Landscape detection mask for Orientation alarm

Range: 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F

Duration (ms): (For Movement, Freefall, Pulse, Transient and Orientation)

Consecutive time for trigger the Alarm

Range: 160-20400

DIN Deb.(ms): (For Reserved Input Alarm Only)**Repeat Count:** Beacon advertise Alternative information times when alarm triggered

Range: 1-5000, or 9999

Range: 0-5000, or 9999 (For Orientation and Reserved Input Alarm Only)

Action: Tick Box for beacon action when alarm triggered

User can choose Alt.Uuid (Alternative UUID data advertising) or/ and Dout (Digital Output, which is reserved)

(Default: Alt.Uuid)

- "Movement" detection is often used to simply alert the main processor that the device is currently in use. When the acceleration exceeds a set threshold, the motion interrupt is asserted.
- The detection of "Freefall" involves the monitoring of the X, Y, and Z axes for the condition where the acceleration magnitude is below a user-specified threshold for a user-definable amount of time.

- “Pulse” Detection is used for Device Tap detection by customizing times and thresholds.
- The detection of “transient” can be used in the same manner as the motion detection feature, by bypassing the high-pass filter.
- The detection of “Orientation” detect Portrait/Landscape, Up/Down, Left/Right, Back/ Front position identification and active when the device upright from the flat position.

Orientation Alarm will be triggered when device position status = any P/L Mask.



Tilt Beacon 90 degree from Top: Orientation -> 0;
Turn back to flat: Orientation -> 8

Tilt Beacon 90 degree from Bottom: Orientation -> 1;
Turn back to flat: Orientation -> 9

Tilt Beacon 90 degree from Left (Blue arrow): Orientation -> 2;
Turn back to flat: Orientation -> A

Tilt Beacon 90 degree from Right (Green arrow): Orientation -> 3;
Turn back to flat: Orientation -> B



Tilt Inverted Beacon 90 degree from Bottom: Orientation -> 4
 Turn back to Inverted: Orientation -> C

Tilt Inverted Beacon 90 degree from Top: Orientation -> 5
 Turn back to Inverted: Orientation -> D

Tilt Inverted Beacon 90 degree from Left (Blue arrow): Orientation -> 6
 Turn back to Inverted: Orientation -> E

Tilt Inverted Beacon 90 degree from Right (Green arrow): Orientation -> 7
 Turn back to Inverted: Orientation -> F

For example: Set P/L Mask to 01234567CDEF

Orientation Alarm will be triggered when it is not on front flat side.

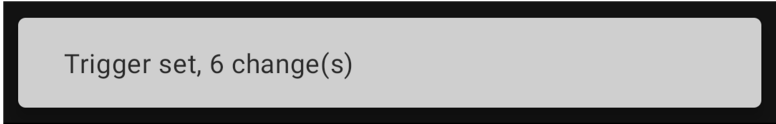
- If one of Threshold, Duration, Repeat Count out of range, the notice will be shown as below when "SET TRIG" button pressed. All TRIG parameter cannot be updated.

Sensor	Movement	
Threshold(mg)	30	* 63 to 8000
Duration(ms)	5	* 160 to 20400
Repeat Cnt	6000	* 1-5000, or 9999
Action	<input checked="" type="checkbox"/> Alt.Uuid	<input type="checkbox"/> Dout

Sensor	Orientation	▼
P/L Mask	0123CDEF	
Duration(ms)	50	* 160 to 20400
Repeat Cnt	6000	* 0-5000, or 9999
Action	<input checked="" type="checkbox"/> Alt.Uuid	<input type="checkbox"/> Dout

- If Repeat count = 9999, Beacon will keep advertise alternative information instead of normal information until the beacon reboot.
- If Repeat count = 0, Beacon will keep advertise alternative information instead of normal information until the beacon reboot.
-

All current TRIG setting value will be shown when press the "GET TRIG" button
 Text notice box will be shown at the bottom if any TRIG CFG (Motion Detection) updated.
 Those notice message will also be shown in the "LOG" Tab page.



*Threshold setting will be auto corrected to nearest greater value of multiple of 63 when value set to beacon.

**Duration setting will be auto corrected to nearest greater value of multiple of 80 when value set to beacon.

Alternative Information:

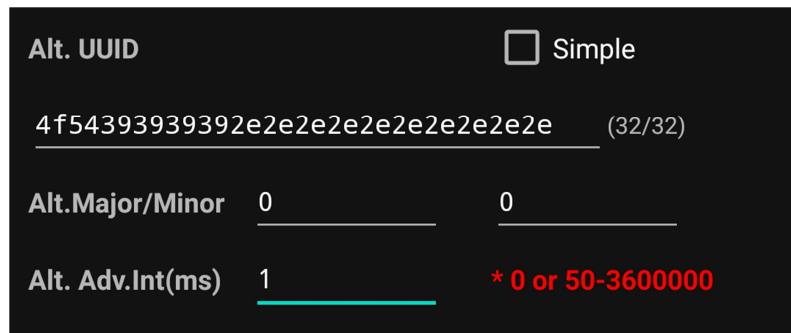
Include UUID, Major, Minor and Advertising Interval. Beacon will advertise those alternative information instead of normal information when alarm triggered.

Alt. UUID: Simple 16 characters in simple (simple check box ticked) or 16 Bytes hexadecimal UUID data can be changed. (Default alt. UUID: aa55bb44cc33dd22ee11+6 bytes Beacon MAC address)

Alt. Major: Range 0 to 65535 (Default: 0)

Alt. Minor: Range 0 to 65535 (Default: 0)

- Non-hexadecimal content will be blocked when Simple check box is un-ticked
- Simple allowed following characters
0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ-_/,*
- If new simple UUID length less than 16 characters, app will fill full stop at the end of new UUID to 16 characters length and updated the parameter when “SET” button pressed.
- If new UUID length not 32 in non-simple status, the notice will be shown as below when “SET” button pressed. All parameter cannot be updated.
- Major and Minor parameter fixed to 0 if UUID is in simple

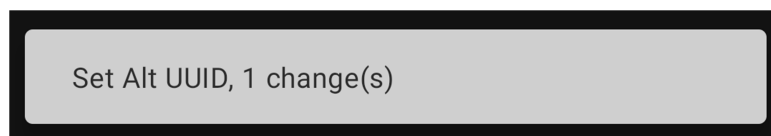


Alt. Adv. Int(ms): Range 0 or 50 to 3600000 (Default: 0)

- Alternative Advertising Interval = 0, Beacon will use normal advertising interval setting on Alternative advertising

All current Alternative information setting value will be shown when press the “GET ALT. UUID” button

Text notice box will be shown at the bottom if any Alt UUID CFG updated.
Those notice message will also be shown in the “LOG” Tab page.



Finish Configuration

Please go to “COMMON” tab page and press “REBOOT” button when every setting is updated. Beacon will reboot immediately, disconnect with mobile APP, and ready to start the beacon normal operation.

Log

All activity will be logged with time and shown on this log tab page.

