Description

The BTG25 is a small portable device that can be used to monitor and track local conditions. Included within the BTG25 are an array of sensors including temperature, humidity, and pressure. With a Micro-SD sensor expansion card slot allowing the option for more sensors to be connected to the BTG25. The BTG25 is powered by a rechargeable lithium ion battery.

The BTG25 comes with a mobile app for Android (IOS coming soon) to access the data from the device. The mobile app comes with a clear and understandable user interface. The app allows for an easy and quick connection to the device.

Features

- 4 byte Chip UID (unique ID)
- Embedded 32 bit proprietary microcontroller
- Mesh connectivity
- Integrated TDK 7-Axis Motion sensor
- Multiple built in sensors
  - Temperature
  - Humidity (HS3001)
  - Pressure
- Ultra-Low IQ Buck-Boost Regulator with Bypass 3.3V
- Fuel Gauge
- ISL Battery Charger
- Micro-USB charge port
- Mobile app for Android and IOS(coming soon)
- Rechargeable Lithium Battery
- Operating temperature: -40℃~+85℃

Important Notes

Disclaimer

Integrated Device Technology, Inc. and its affiliated companies (herein referred to as "IDT") shall not be liable for any damages arising out of defects resulting from

(i) delivered hardware or software

(ii) non-observance of instructions contained in this manual and in any other documentation provided to user, or

(iii) misuse, abuse, use under abnormal conditions, or alteration by anyone other than IDT.

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Contents

1. Exterior

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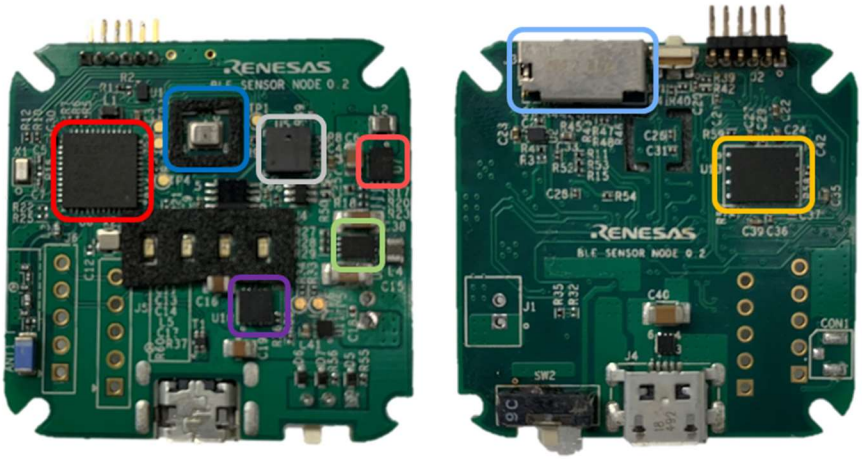
2. Interior



1. BLE 5 - is a multi-standard wireless SoC solution with internal Flash and audio support, which combines the features and functions needed for all 2.4GHz IoT standards into a single SoC. It's completely RoHS-compliant and 100% lead (Pb)-free. The BLE 5 supports concurrent multi-standards.

2. Humidity Sensor (HS3001) - is a highly accurate, fully calibrated relative humidity and temperature sensor. The MEMS sensor features a proprietary sensor-level protection, ensuring high reliability and long-term stability.

3. Battery Fuel Gauge – is used to monitor the battery level of the device.

4. TDK 7-Axis Motion Sensor - is a TDK InvenSense's unique 7-axis motion sensor with a 3-axis gyroscope and a 3-axis accelerometer on the same silicon die that offers performance on par with discrete parts.

5. ISL9122 Buck/Boost Regulator - is capable of working with ultra-small inductors and capacitors.

6. ISL9301 Battery Charger - is a fully integrated high input voltage single-cell Li-ion battery charger with power path management function.

7. Micro-SD Sensor Expansion Card – is used for connecting additional sensors.

8. M300x MRAM - stores data in magnetic domains.

3. Navigating the App

3.1 Download the App

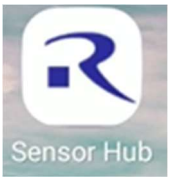
1. The app can be found using this link: Placeholder.

3.2 Connecting the BTG25

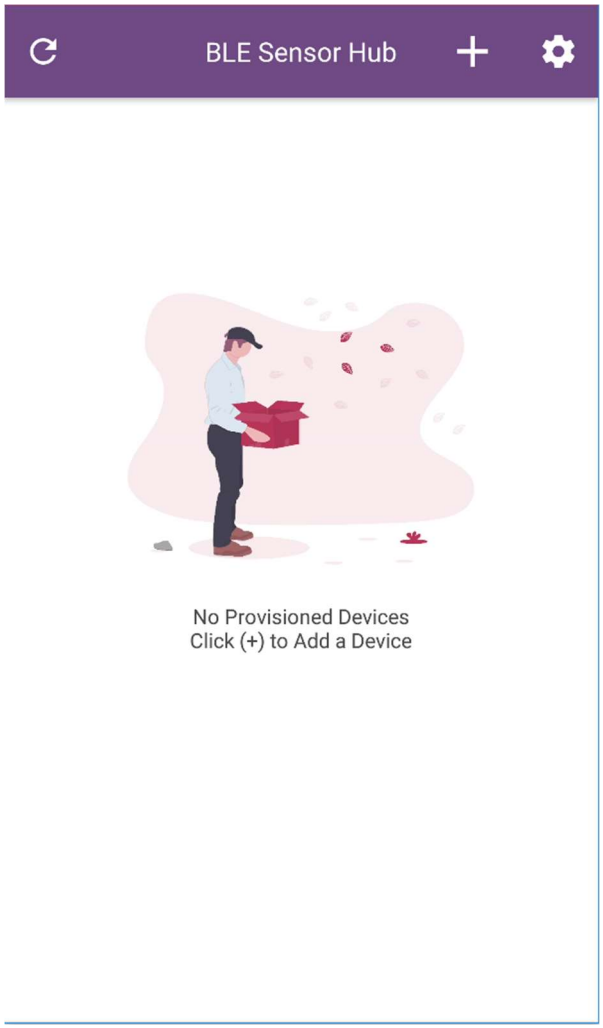
1. Turn on the BTG25. The on switch can be found on the side of the BTG25 that has a Micro-USB port.

2. A blinking yellow light on the BTG25 will turn on indicating that the tag is now powered on and ready to connect to the app.

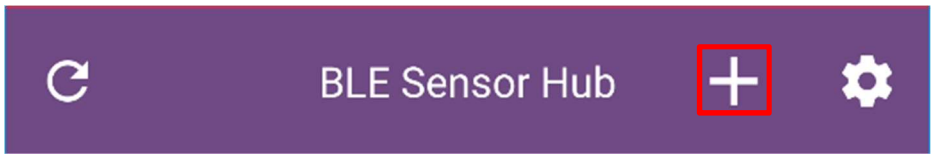
3. Open the app by tapping the app “Sensor Hub” icon on the mobile device.



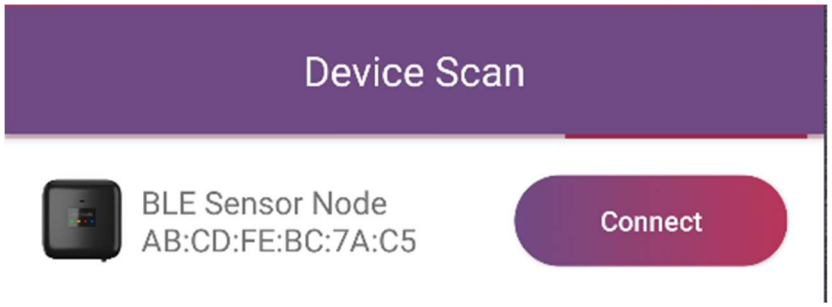
4. The app opens up with no devices connected.



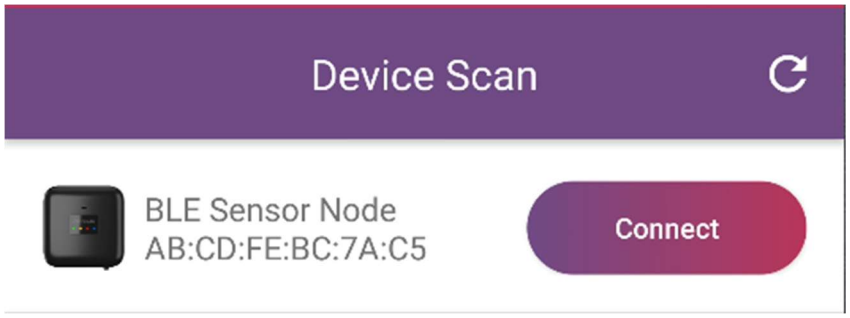
5. To add a BTG25 click the plus sign (+) in the top right side of the app.



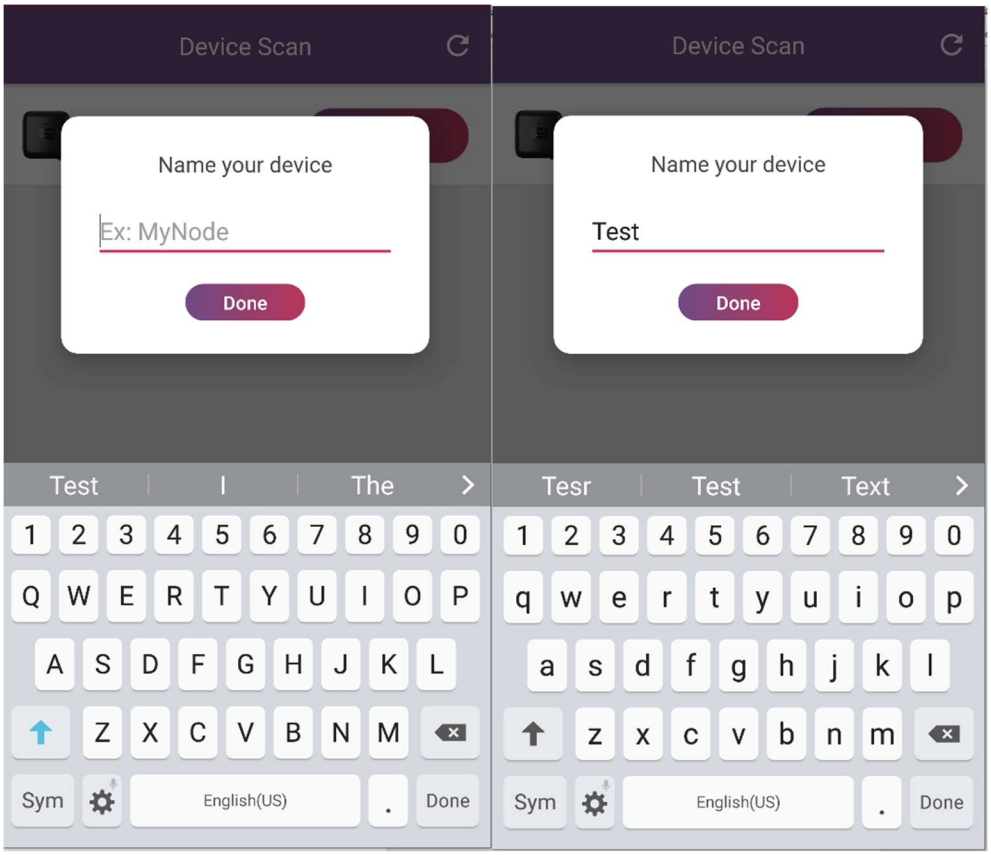
6. The next page will show the available tags that can be connected in the area.



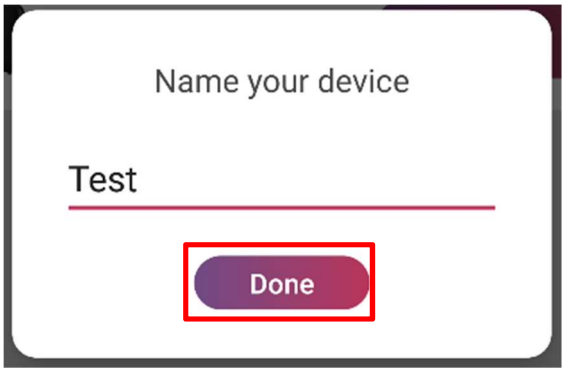
7. Click “Connect”.



8. A prompt will pop up asking to name the BTG25. Enter a name for the BTG25.

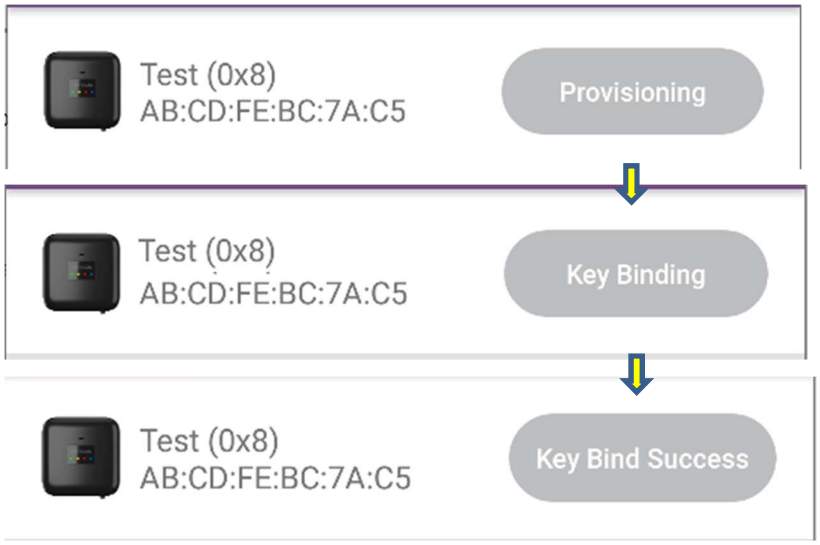


9. Click “Done”.



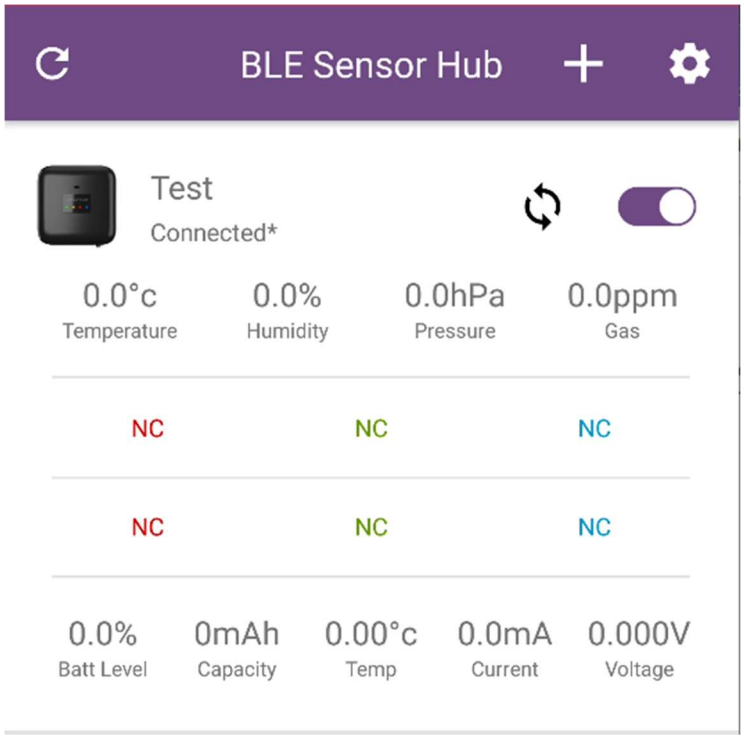
10. It will take a few seconds for the BTG25 to fully connect.

11. The app will cycle through being in a provisioning state to a key binding state. When the app displays “Key Bind Success” the process is finished.



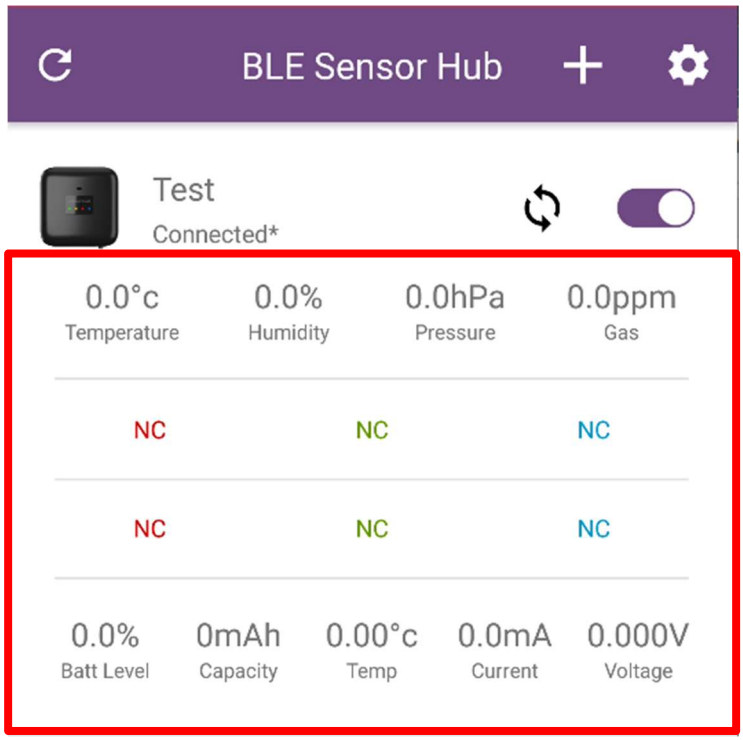
12. Click the back button on the mobile device when the “Key Bind Success” message is given. If the back button was pressed before the “Key Bind Success” message was given or the binding fails check section **7. Troubleshooting** for troubleshooting solutions.

13. After the bind was made successfully the app will then display the following page.

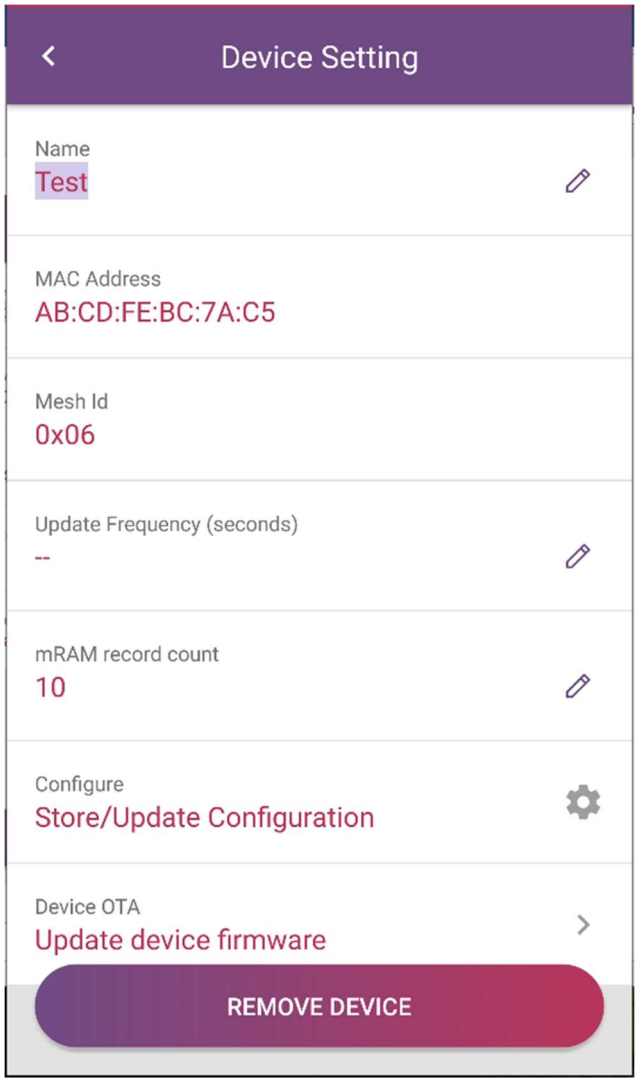


14. To display data the “Update Frequency” option in the device settings menu needs to be updated.

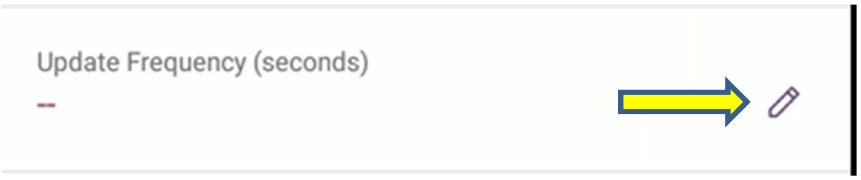
15. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



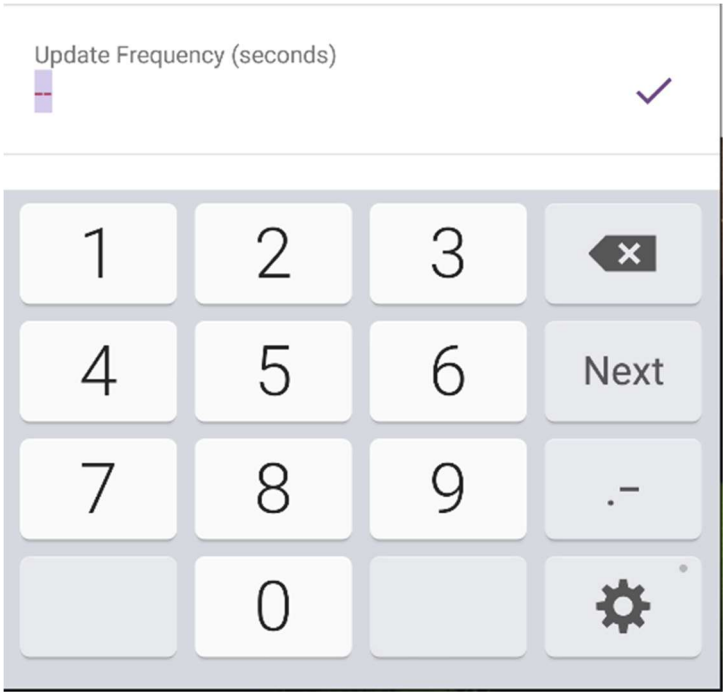
16. From the settings menu the options to change the device's name, view the MAC address, view the Mesh Id, change the update frequency, set the record count for the mRAM, configure what is stored and updated, and update the firmware can be found. This is also where the device can be removed from the app.



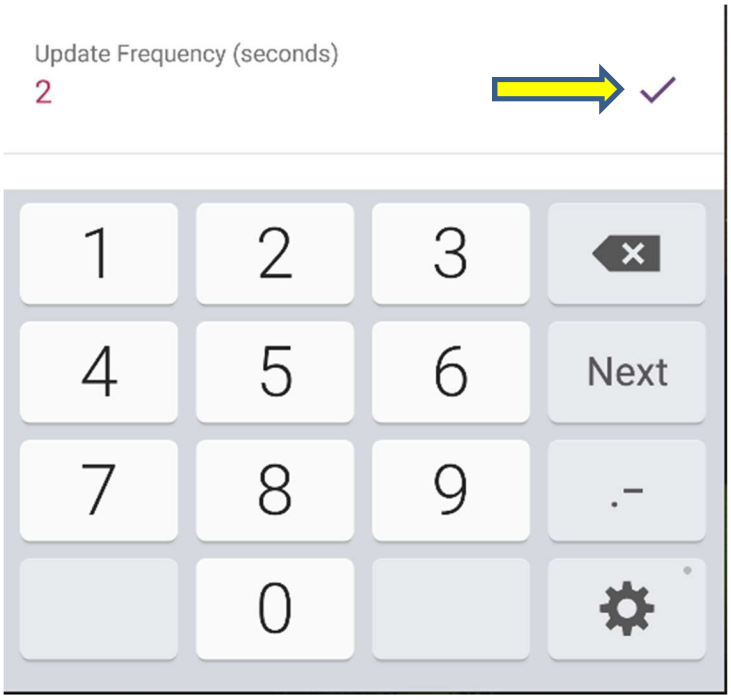
17. Click the pencil icon in the "Update Frequency" container.



18. A keyboard will appear and the option to change the frequency will become available.

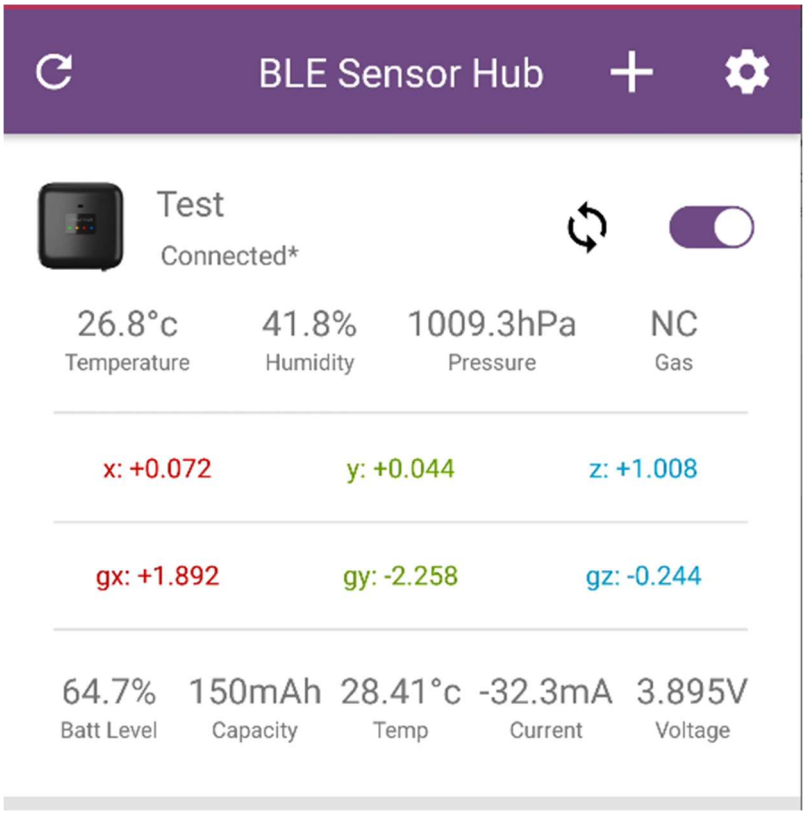


19. Type in the new desired frequency and click the check mark icon to save the new frequency. The updated frequency must be between 1 to 60 seconds. **Only by clicking the checkmark will the frequency change be saved.**



20. Click the back button in the upper left hand corner.

21. The data fields will now be populated.

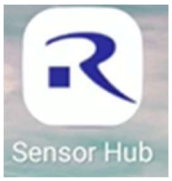


3.3 Connecting Multiple BTG25 Tags at the Same Time

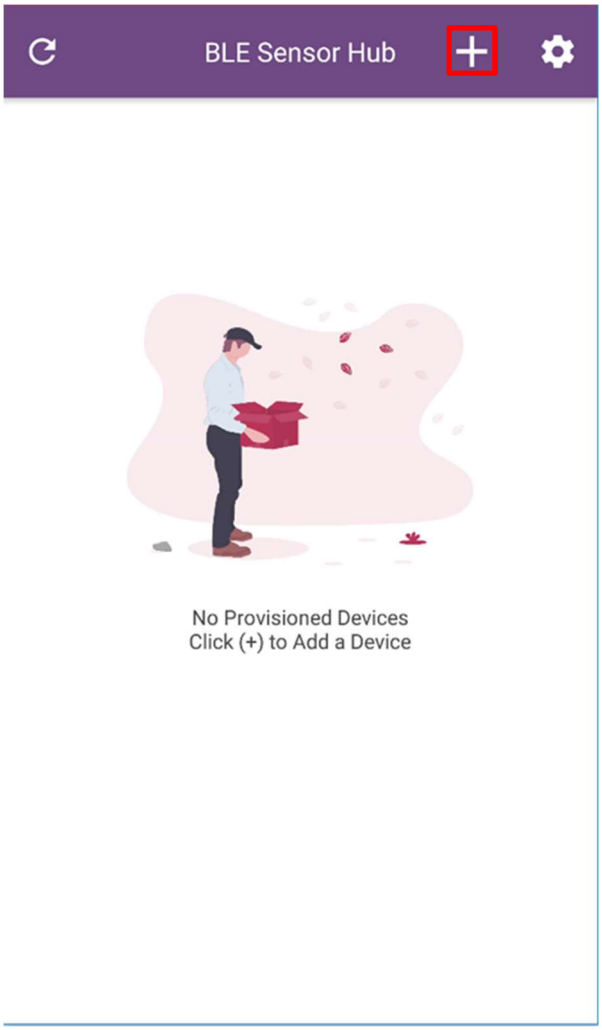
1. Turn on the BTG25 tags. The on switch can be found on the side of the BTG25 that has a Micro-USB port.

2. A blinking yellow light on the BTG25 will turn on indicating that the BTG25 is now powered on and ready to connect to the app.

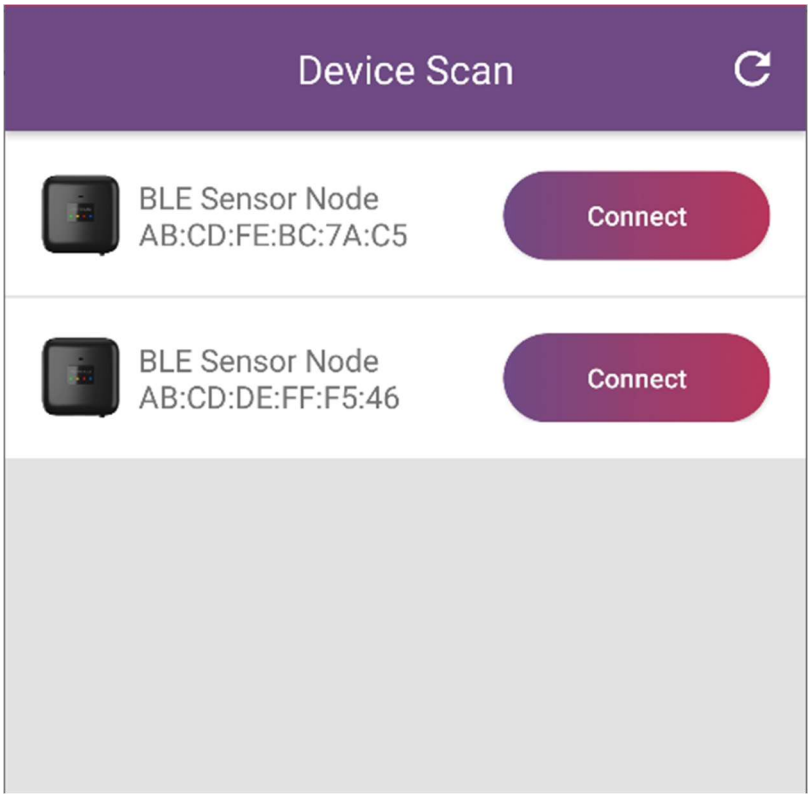
3. Open the app by tapping the app “Sensor Hub” icon on the mobile device.



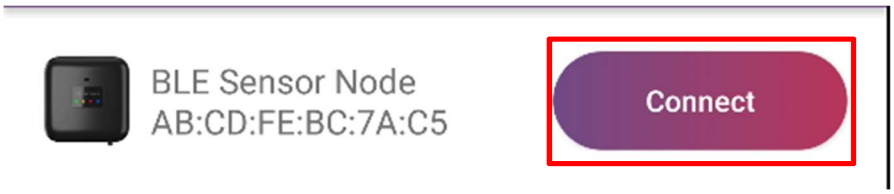
4. Press the plus sign (+) in the upper right hand side.



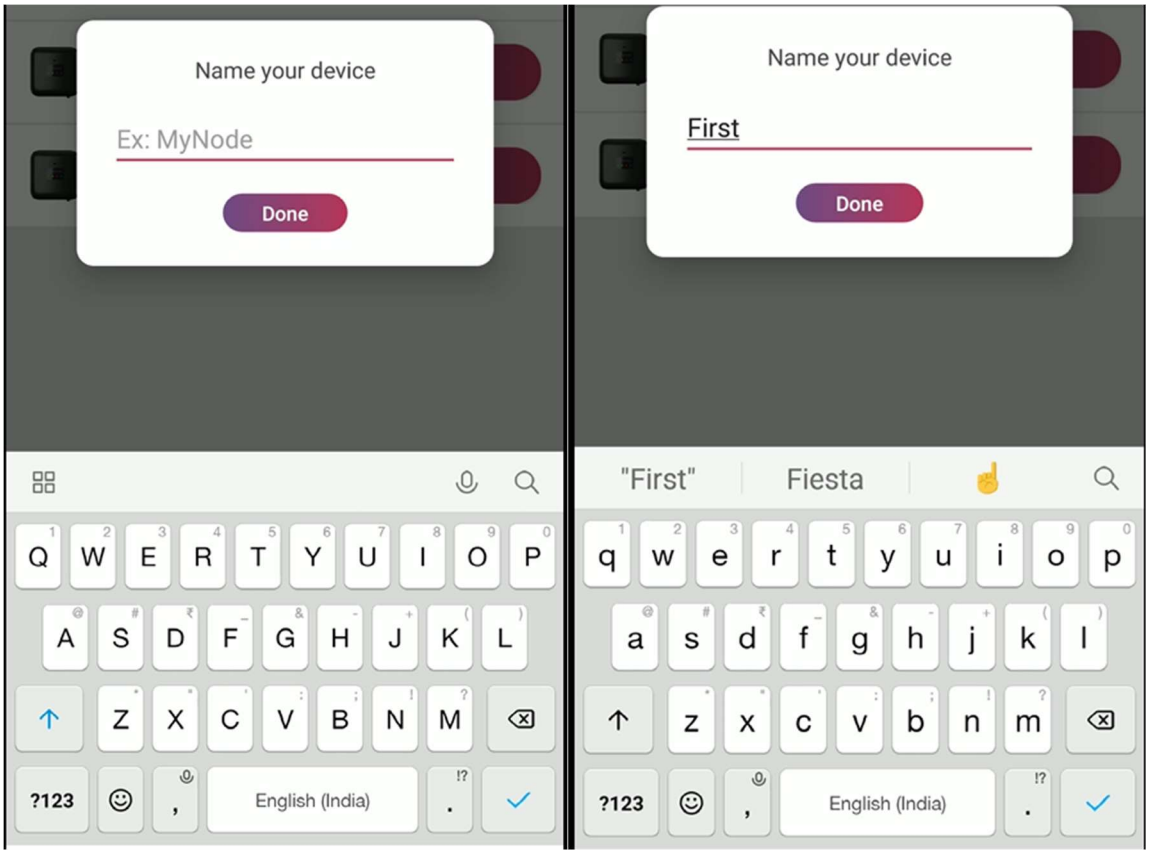
5. The next page will show the tags that are on and able to be connected.



6. Click “Connect” on the first available tag.

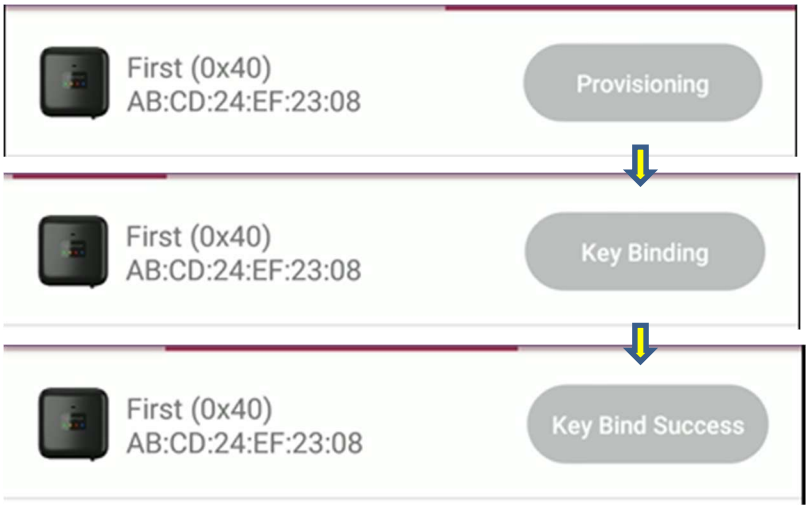


7. A prompt will pop up asking to name the BTG25. Enter a name for the BTG25.



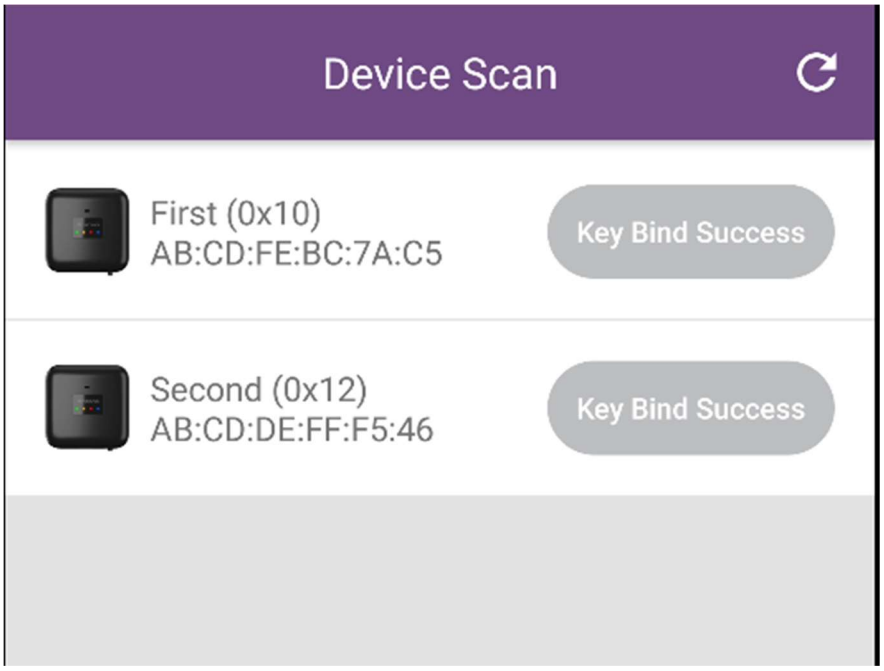
8. Click “Done”.

9. The app will cycle through being in a provisioning state to a key binding state. When the app displays “Key Bind Success” the process is finished.

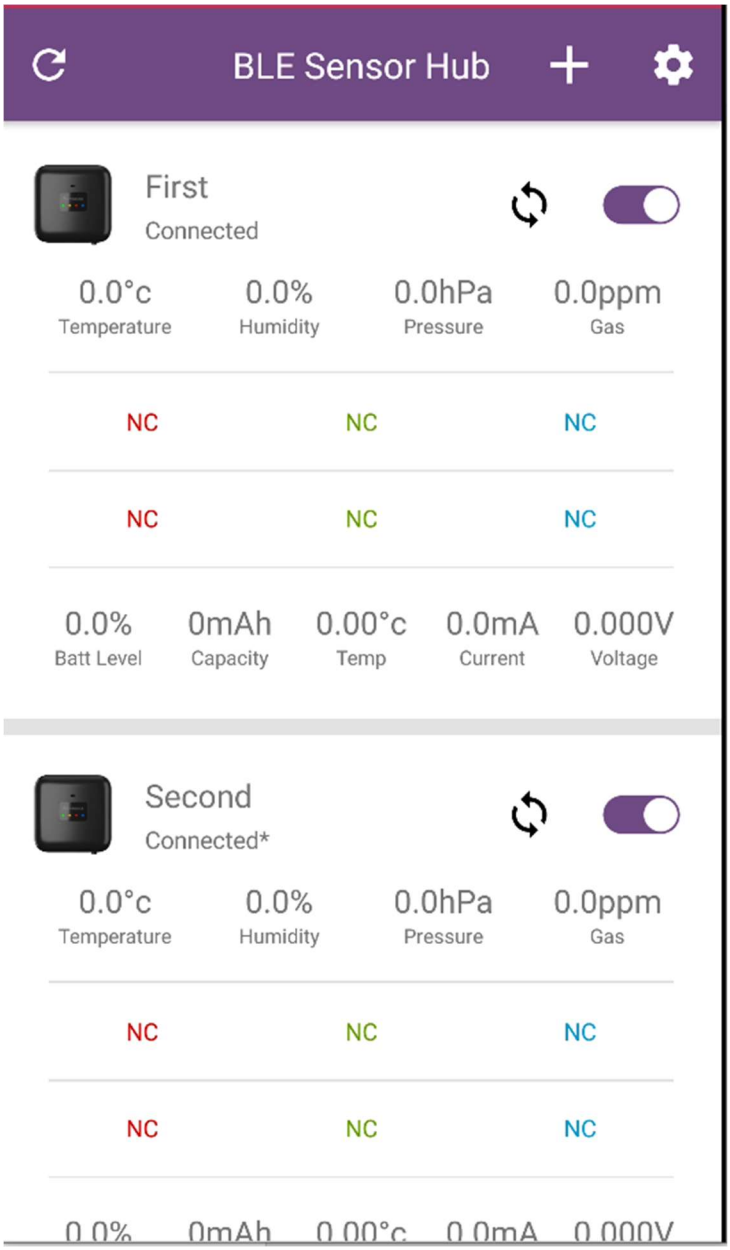


10. After the message “Key Bind Success” is given the next tag can be connected. Return to **step 6** and repeat till all the tags are connected. If the back button was pressed before the “Key Bind Success” message was given or the binding fails check section **7. Troubleshooting** for troubleshooting solutions.

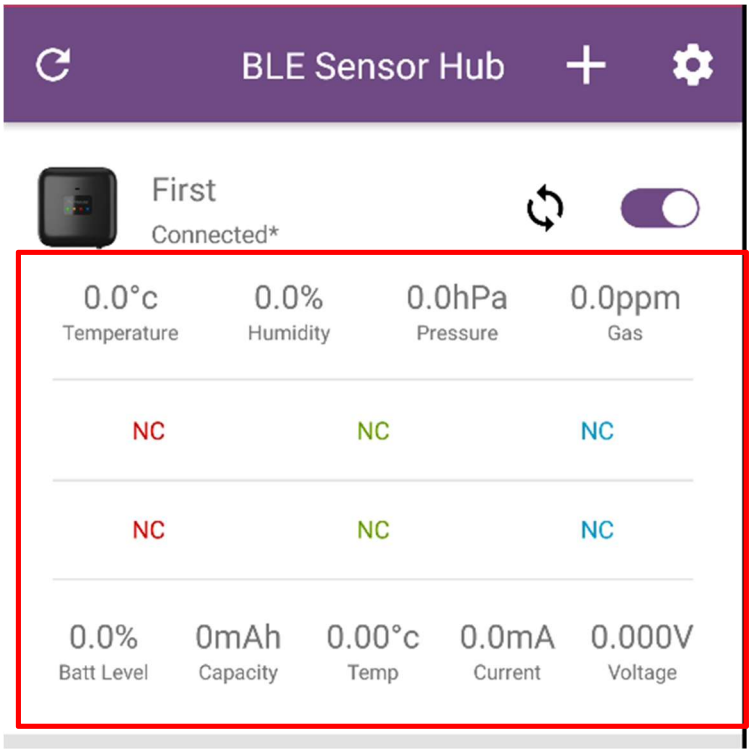
11. Once all the tags return the message “Key Bind Success” click the back button on the mobile device.



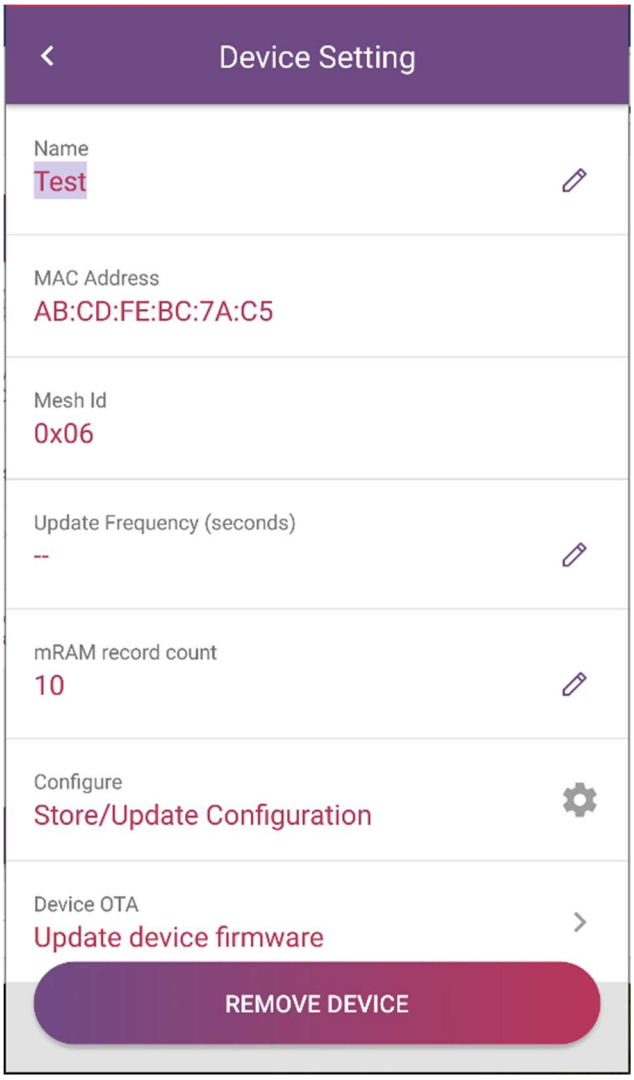
12. The “BLE Sensor Hub” will display the following page. No data will be shown till the frequency is updated in the device settings menu.



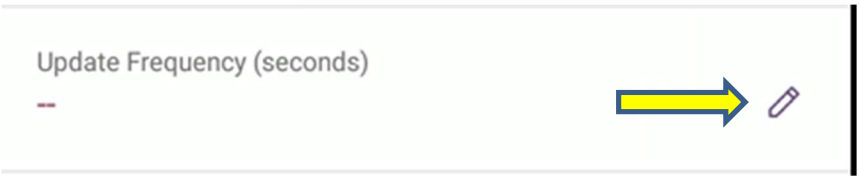
13. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



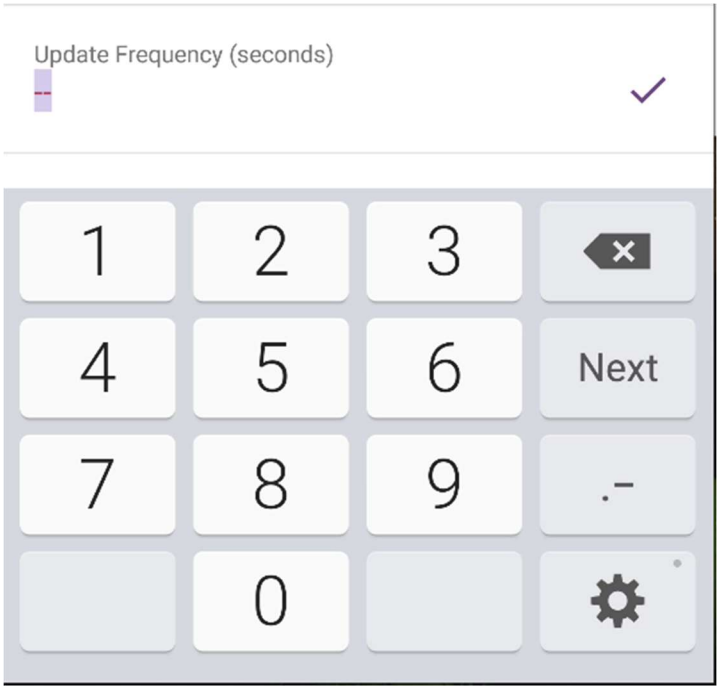
14. From the settings menu the options to change the device's name, view the MAC address, view the Mesh Id, change the update frequency, set the record count for the mRAM, configure what is stored and updated, and update the firmware can be found. This is also where the device can be removed from the app.



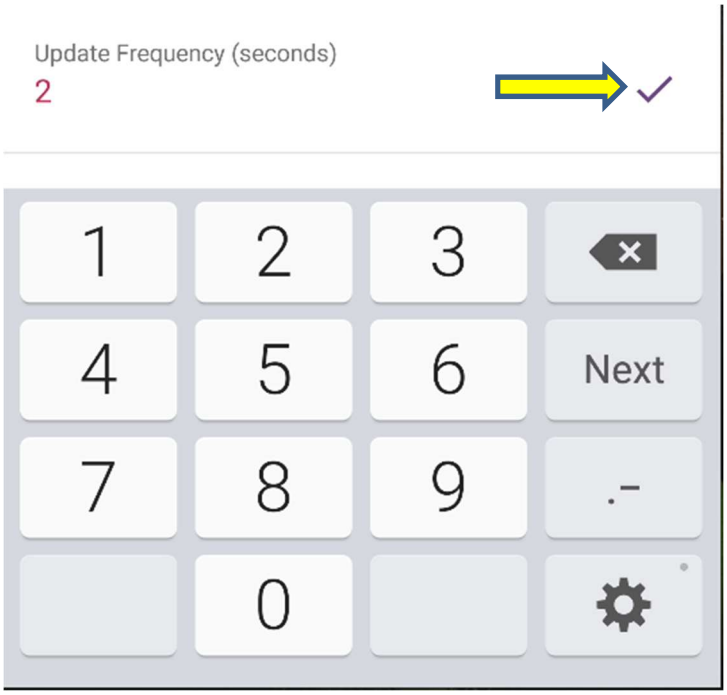
15. Click the pencil icon in the "Update Frequency" container.



16. A keyboard will appear and the option to change the frequency will become available.

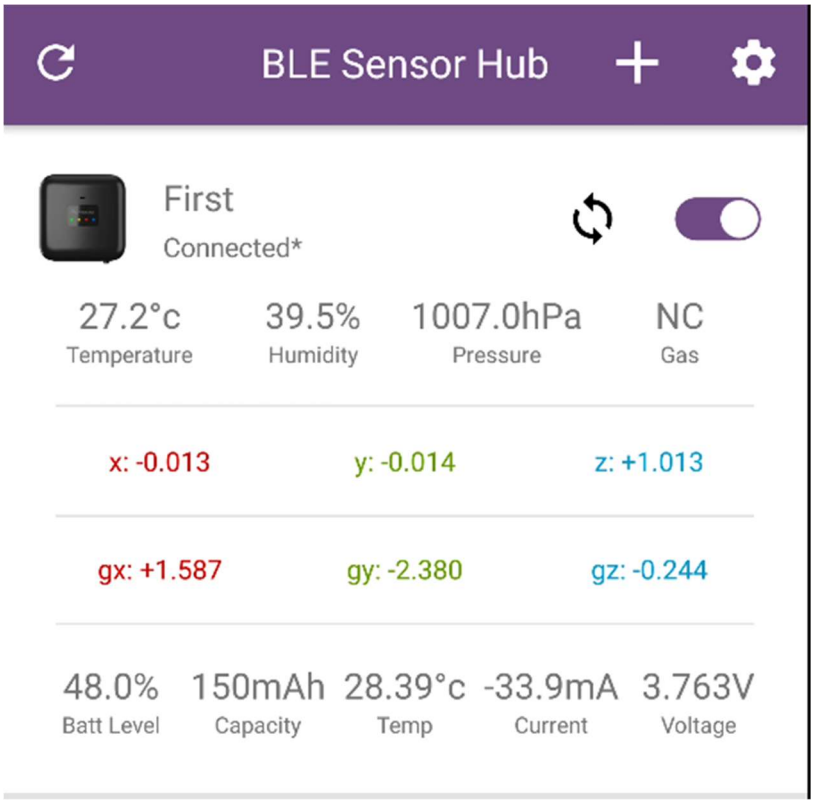


17. Type in the new desired frequency and click the check mark icon to save the new frequency. **Only by clicking the checkmark will the frequency change be saved.**



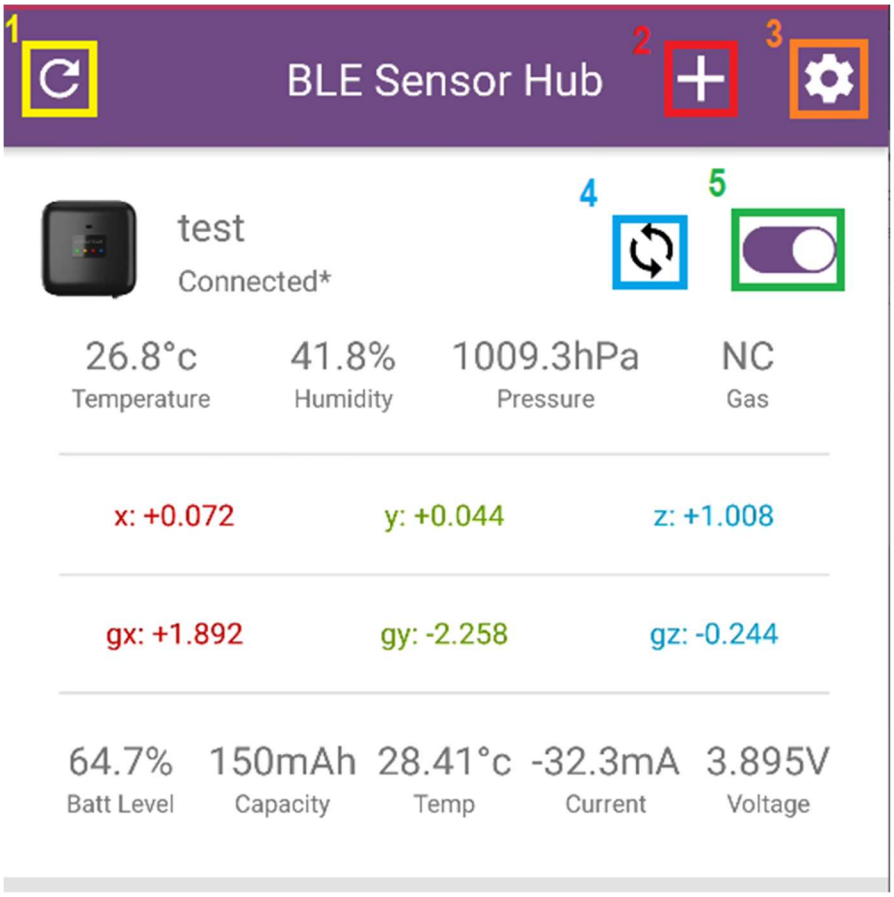
18. Click the back button in the upper left hand corner.

19. The data fields will now be populated.



20. Repeat the process starting with **step 13** to set up the remaining tags.

3.4 Navigating the BLE Sensor Hub

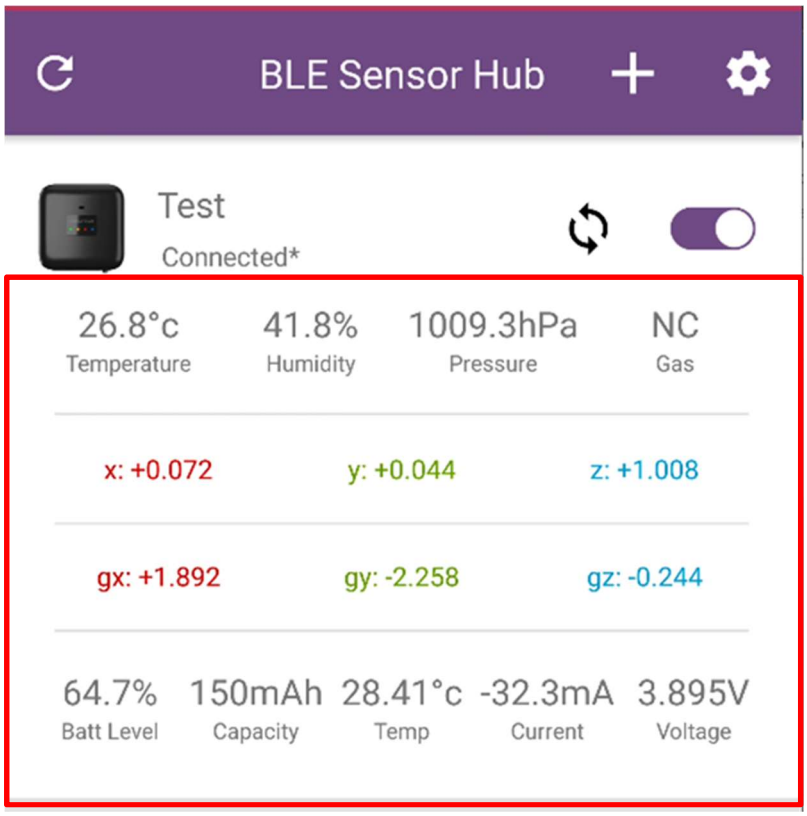


1. Refresh Button: This allows the user to refresh the page. By refreshing the page the user is able to test the connection to the tags and update the data that is being displayed.
2. Search/Add Button: This will begin a search for any tags in the area that can connect to the app. If a tag is already connected searching for other tags will not disconnect the tag already connected.
3. App Settings: Provides access to the security keys.
4. mRAM Data Button: This will record and store data collected by the sensors at a set interval and up to 100 counts can be saved using the mRAM.
5. Connection Switch: Pauses the data collection from the tag.

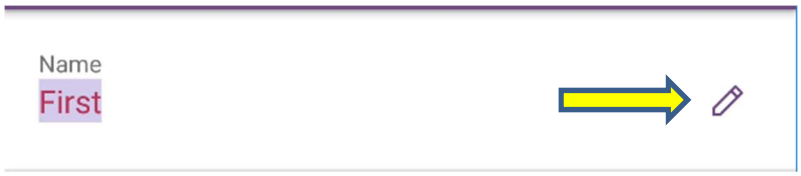
3.5 Change the BTG25 Tag Name

1. The name of the BTG25 tag can be changed in the device settings menu.

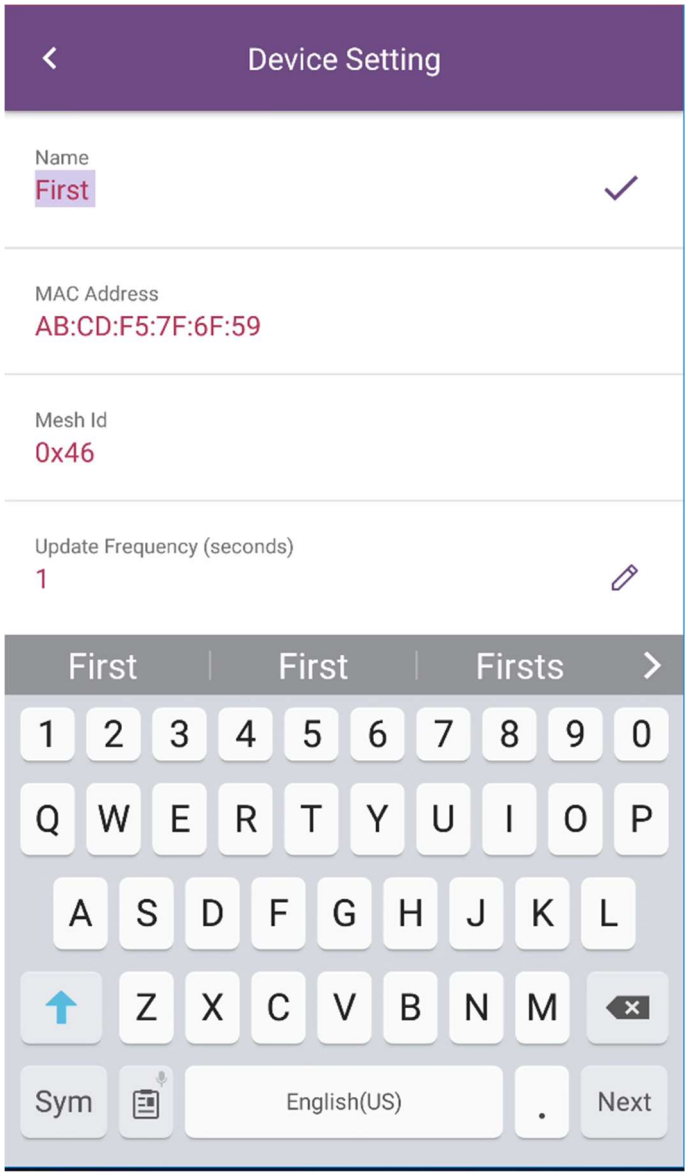
2. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



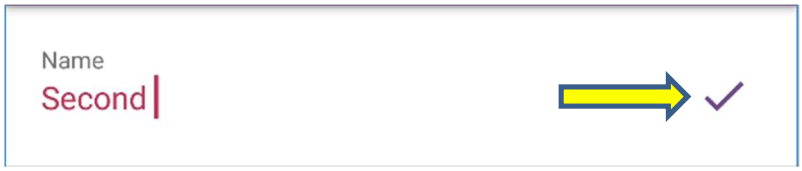
3. Click the pencil icon in the “Name” option container.



4. A keyboard will appear and the option to change the name will become available.



5. After changing the name click the checkmark icon to save the new name. **Only by clicking the checkmark will the name change be saved.**

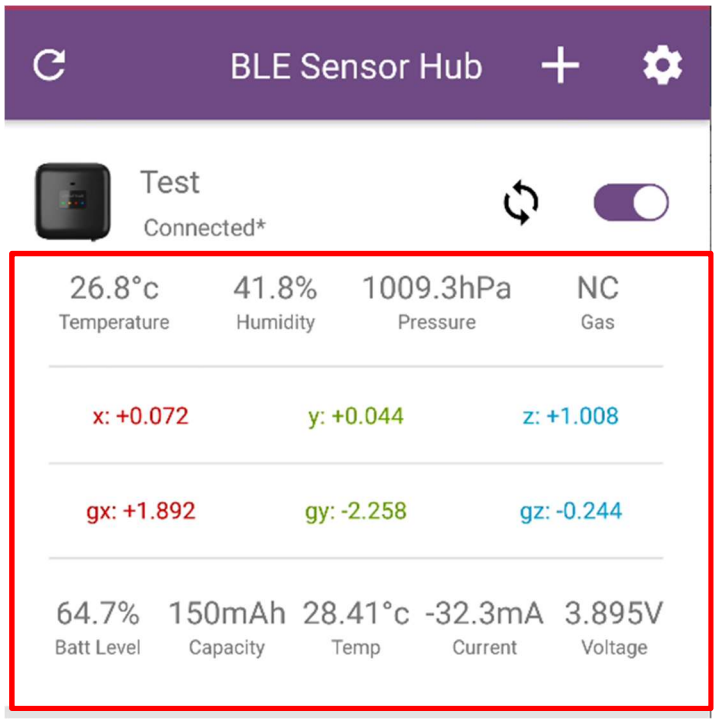


6. To return to the "BLE Sensor Hub" click the back arrow in the upper left hand corner.

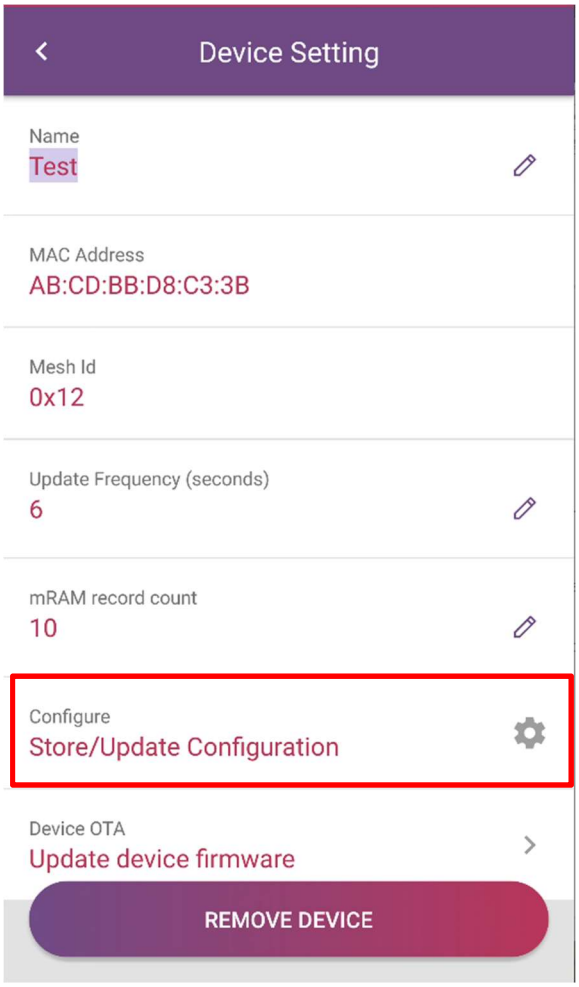
3.6 Configure Sensors

1. To configure which sensors are used to send and store data the "Store/Update Configuration" option must be updated.

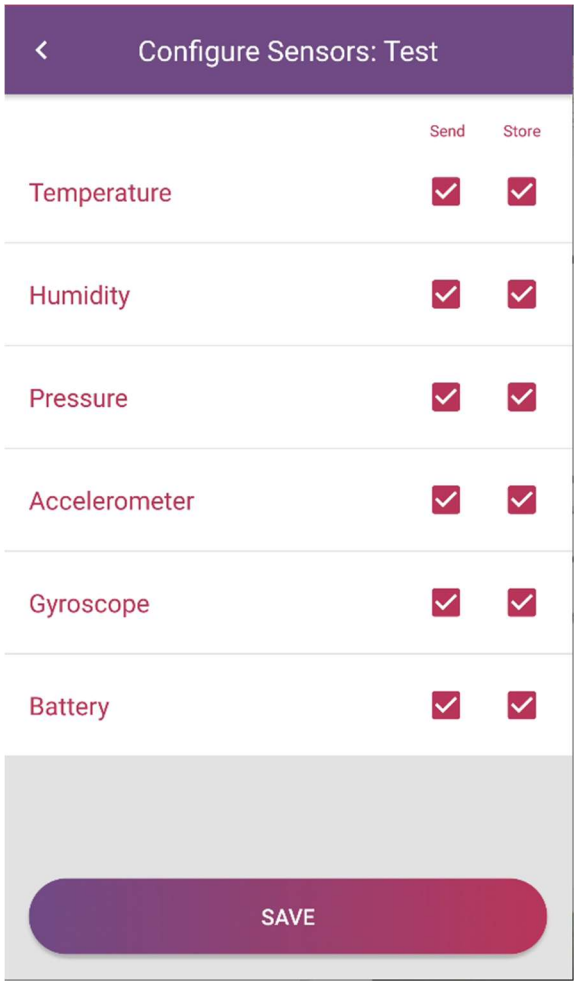
2. The "Store/Update Configuration" option can be found in the device settings menu. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



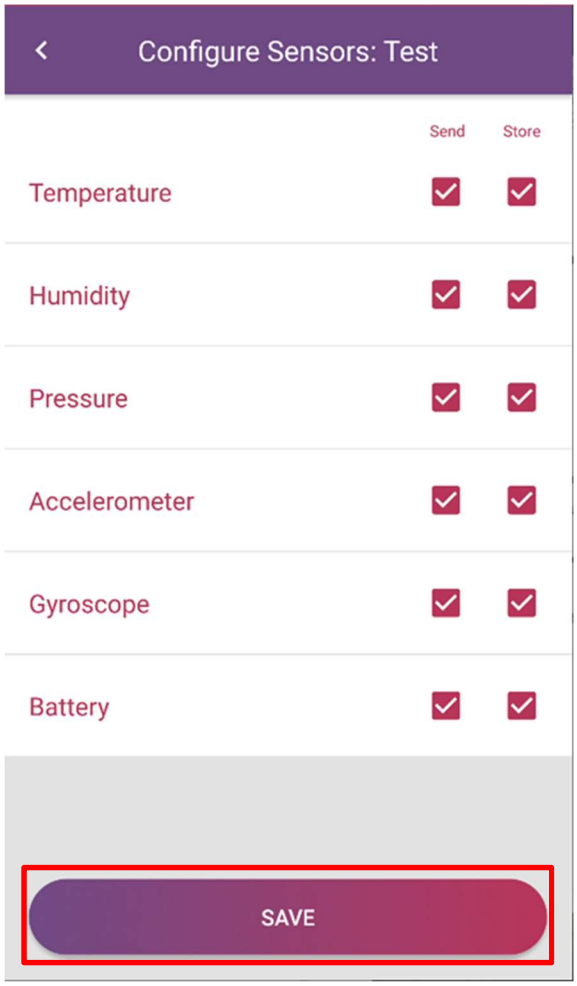
3. Once in the device settings menu click in the “Configure” container. This can be seen in the figure below.



4. In the “Configure Sensors” menu the options to either send or store specific data can be turned on or off.



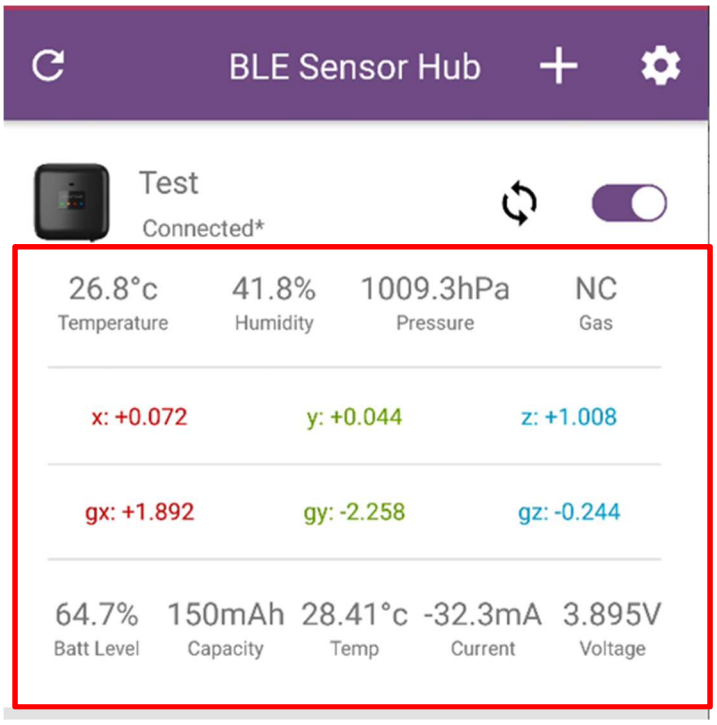
5. If any changes are made click the save button on the bottom of the page. If the user leaves without pressing the save button the changes will not be saved.



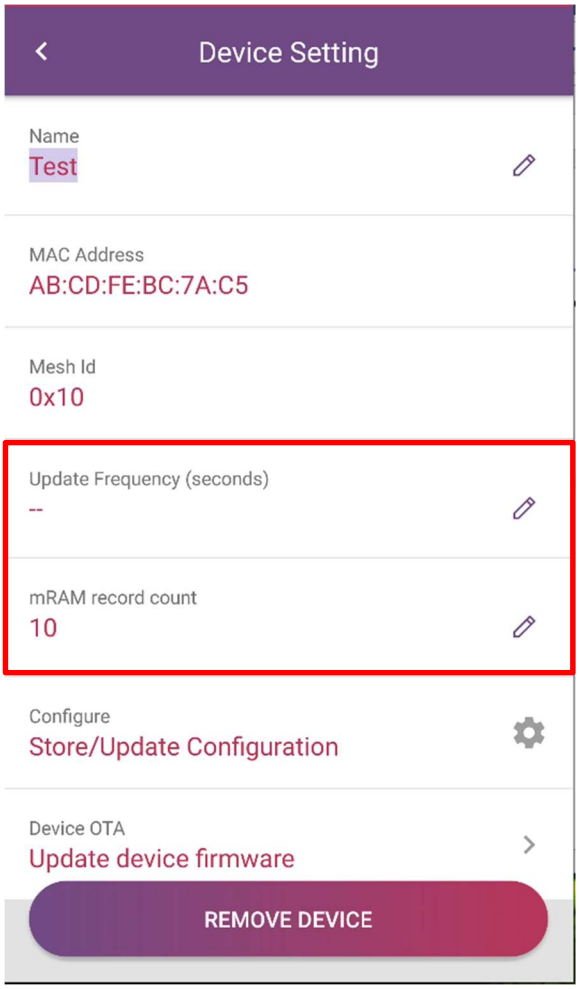
6. Click the back button on the mobile device to return to the “BLE Sensor Hub”.

3.7 Collecting Data

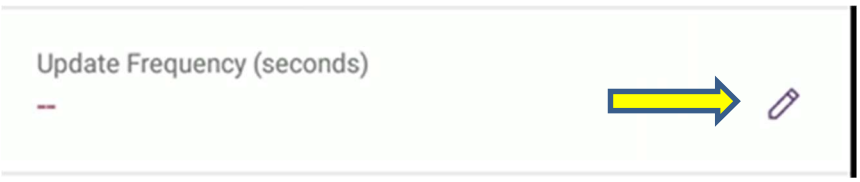
1. To start collecting data the desired frequency and record count must be set. To set the frequency and record count the device setting menu needs to be accessed. To access the device setting menu click in the white area on the “BLE Sensor Hub” menu. This area can be seen in the red square in the figure below.



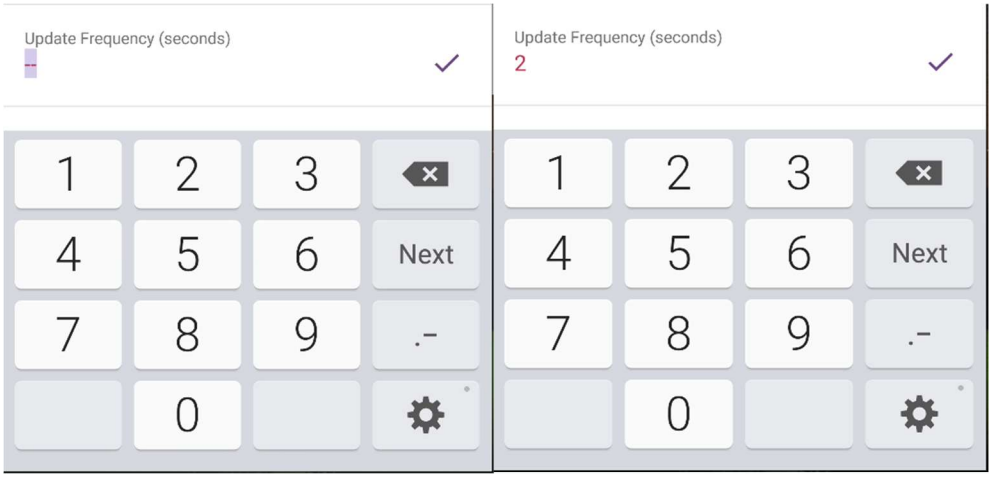
2. Once in the device setting menu the options to update frequency and to change the mRAM record count can be accessed.



3. To change the update frequency click the small pencil icon in the “Update Frequency” container.

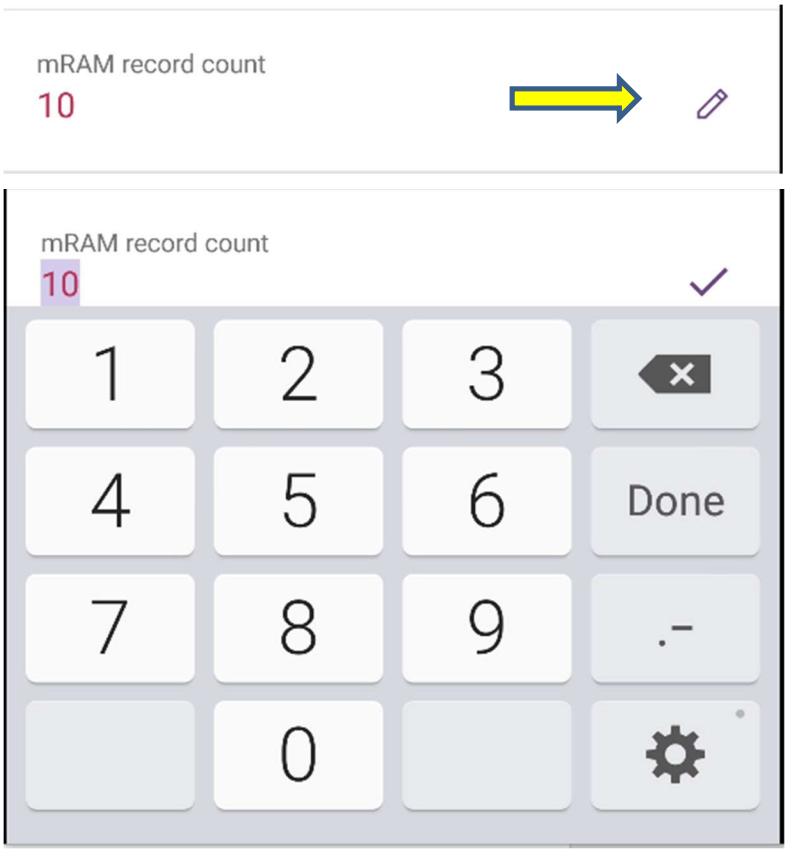


4. A keyboard will appear and the option to change the frequency will become available.

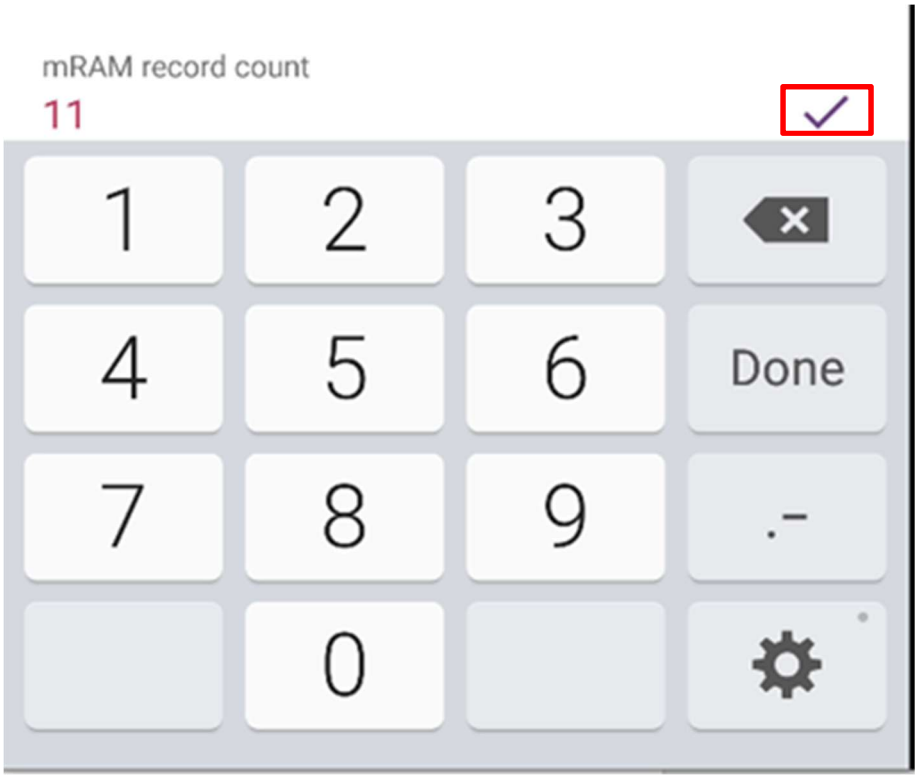


5. To save the changes click the checkmark symbol. **Clicking anything else or leaving this menu without clicking the checkmark will result in the changes not being saved.**

6. Click the pencil icon in the “mRAM record count” container to change the count. By default the count will be 10, but the count can be extended to 100 counts.

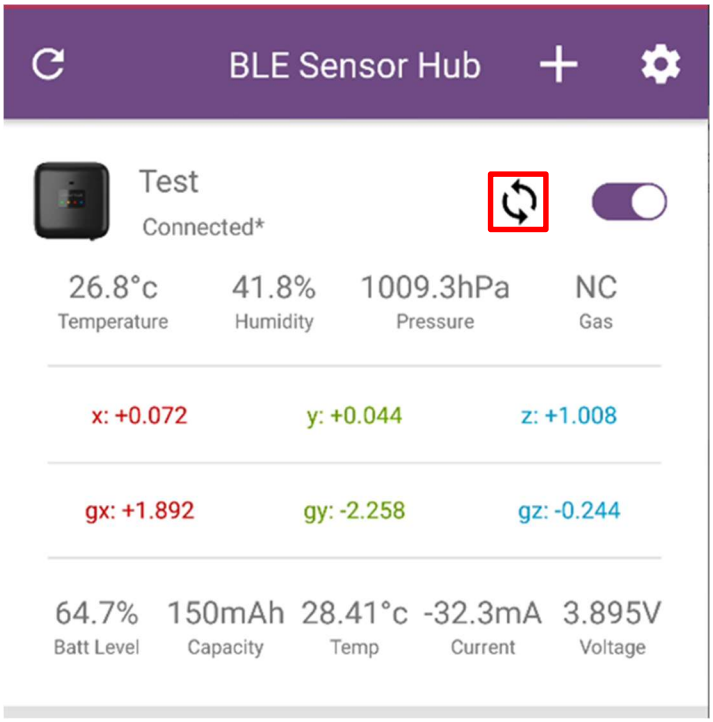


7. To save the changes click the checkmark symbol. **Clicking anything else or leaving this menu without clicking the checkmark will result in the changes not being saved.**

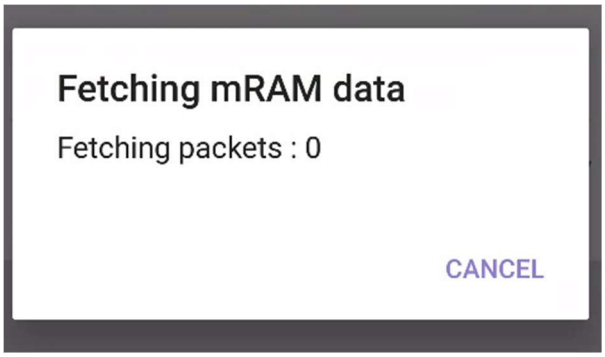


8. Click the back button in the upper left hand corner.

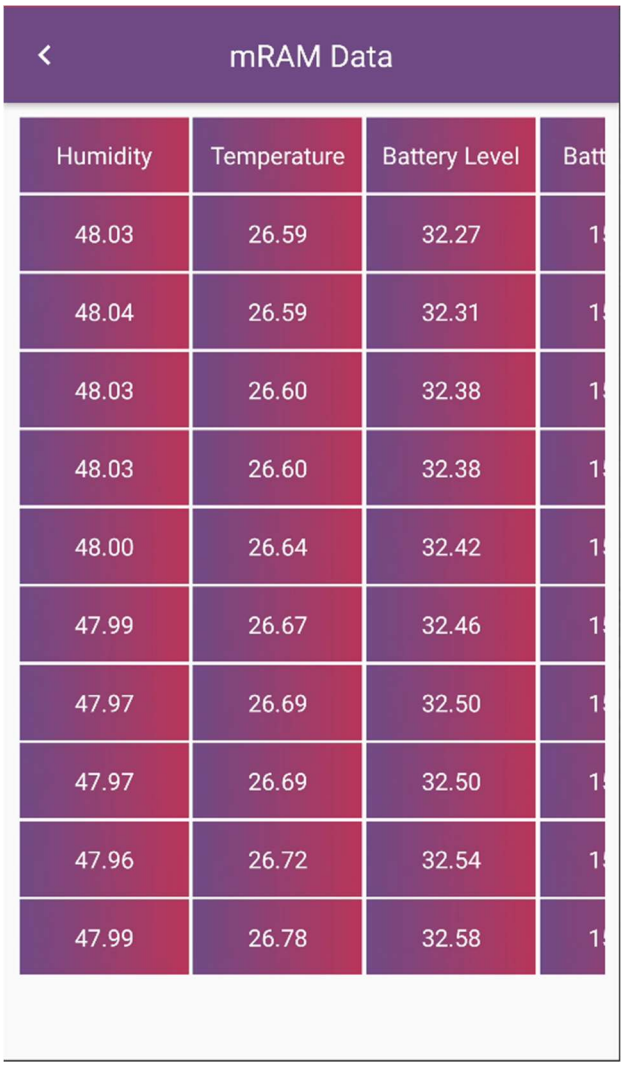
9. Click the icon with two arrows in a circle.



10. The data will now be fetched.

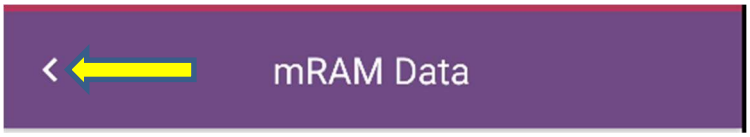


11. After a few moments the data will be presented.



Humidity	Temperature	Battery Level	Batt
48.03	26.59	32.27	1
48.04	26.59	32.31	1
48.03	26.60	32.38	1
48.03	26.60	32.38	1
48.00	26.64	32.42	1
47.99	26.67	32.46	1
47.97	26.69	32.50	1
47.97	26.69	32.50	1
47.96	26.72	32.54	1
47.99	26.78	32.58	1

12. When done observing the data click the back button in the upper left hand side.



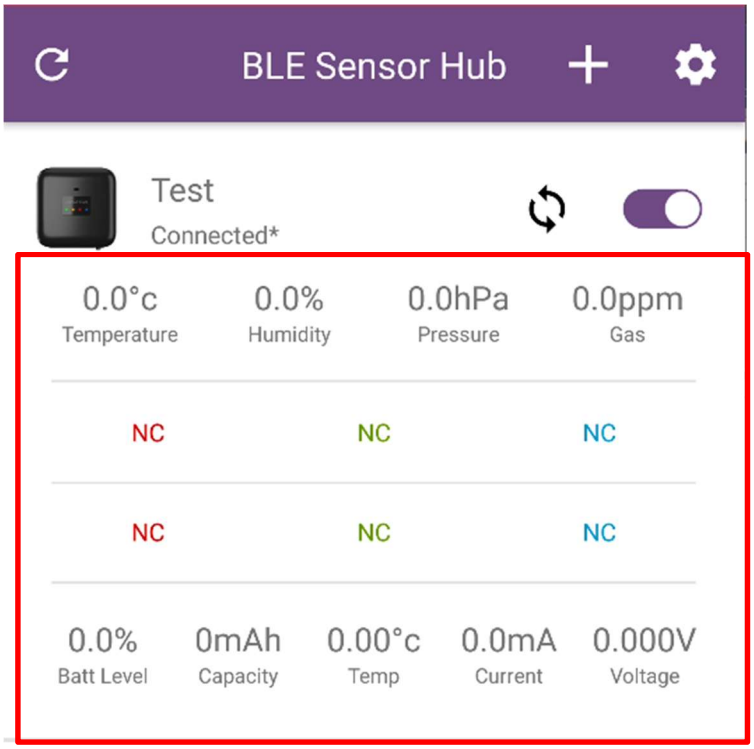
3.8 Over the Air Firmware Updating

1. The most recent firmware can be found at: Placeholder

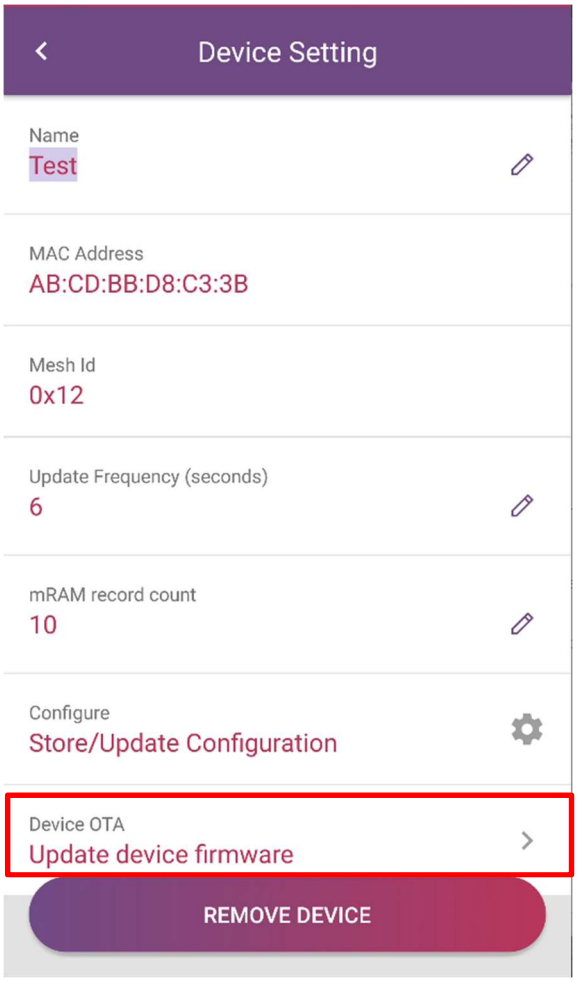
2. Save the download in a location that can be found easily. If the location is not selected the default location will be the "Download" folder.

3. Updating the firmware can be done in the device settings menu.

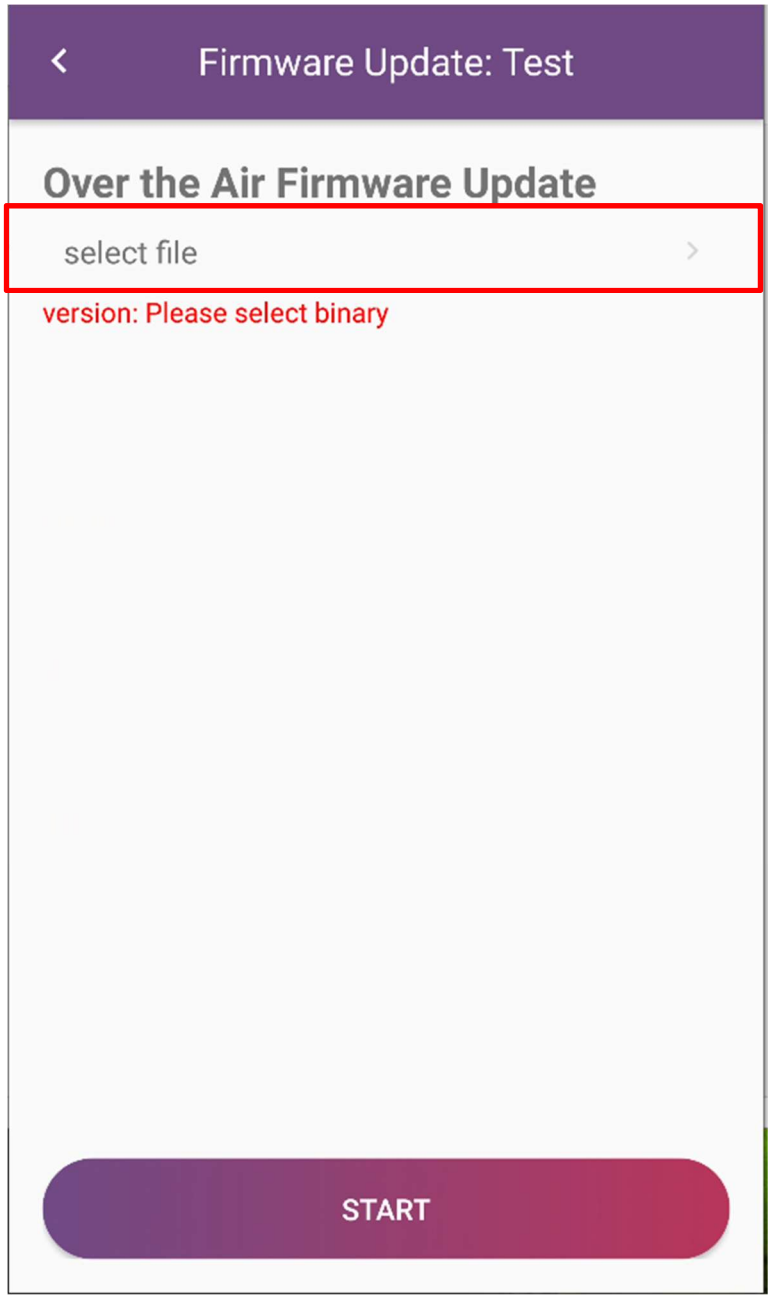
4. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



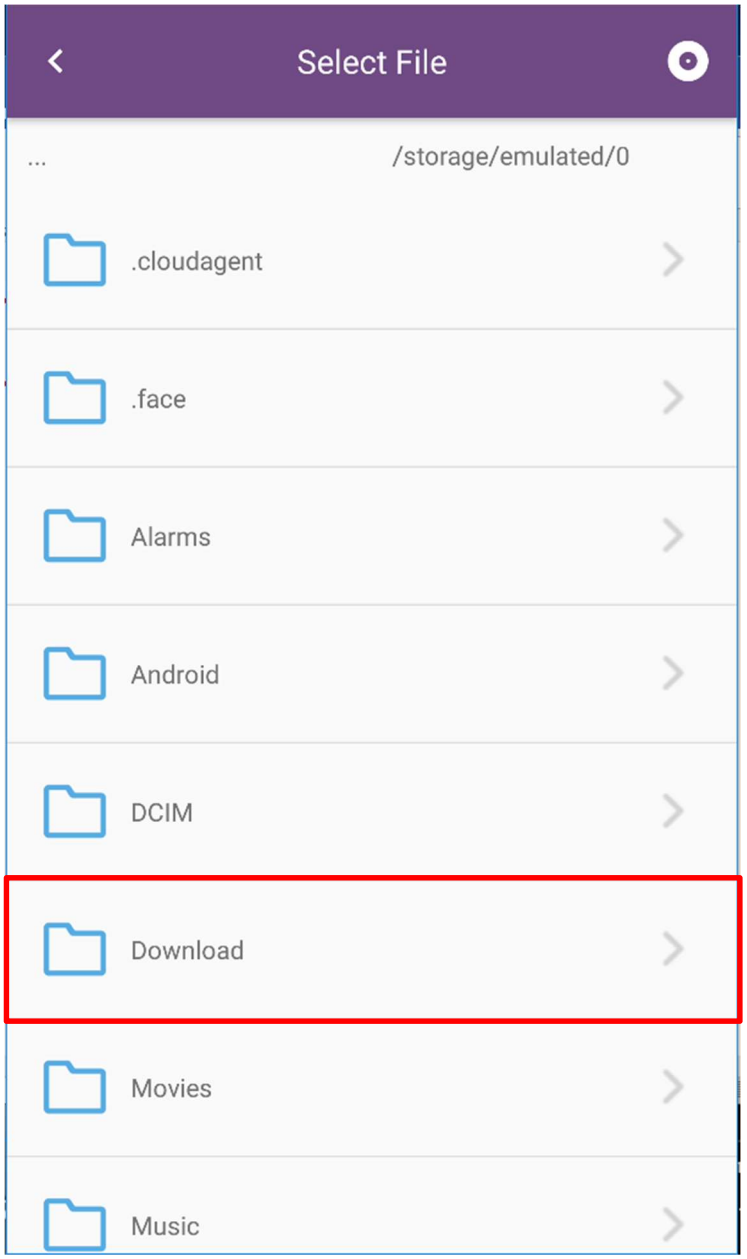
5. In the device setting menu click “Update device firmware”.



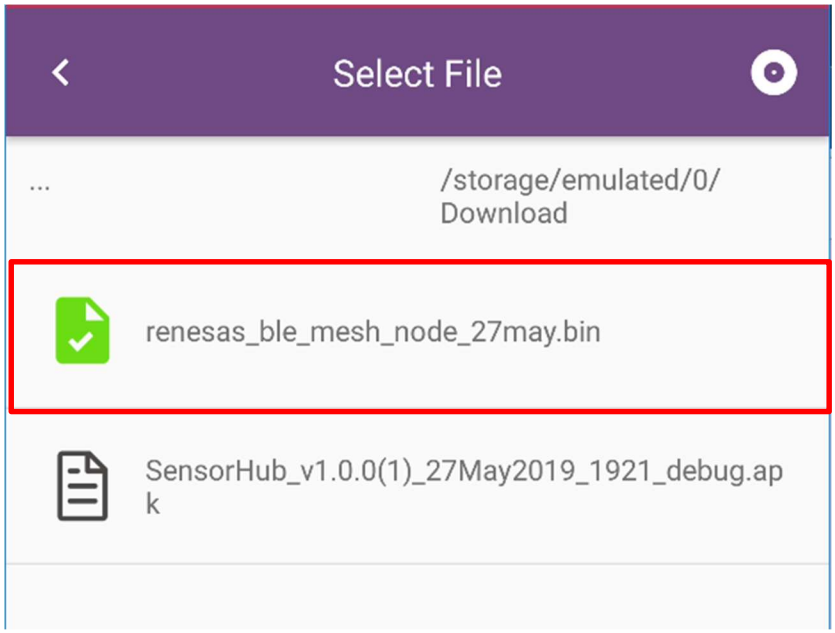
6. On the next page click “select file”.



7. On the following page the internal storage files of the phone can be found. Select the folder that the firmware was stored in. Unless saved to a different location the file will be found in the “Download” folder.

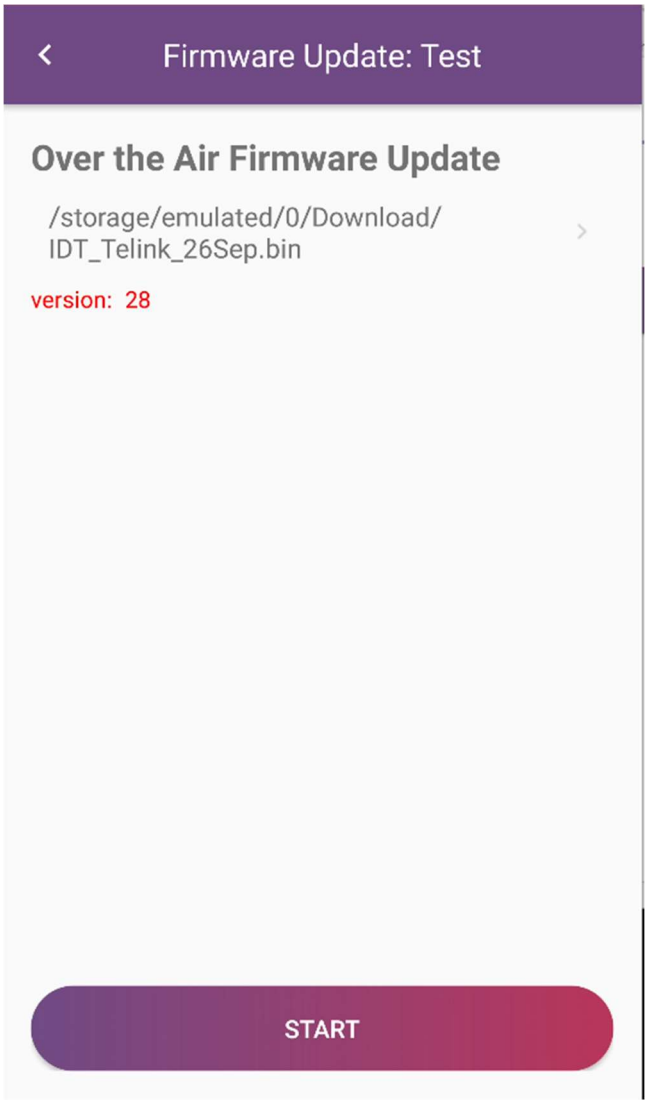


8. In the folder the firmware will be shown as a bin file (e.g. xxxx.bin).



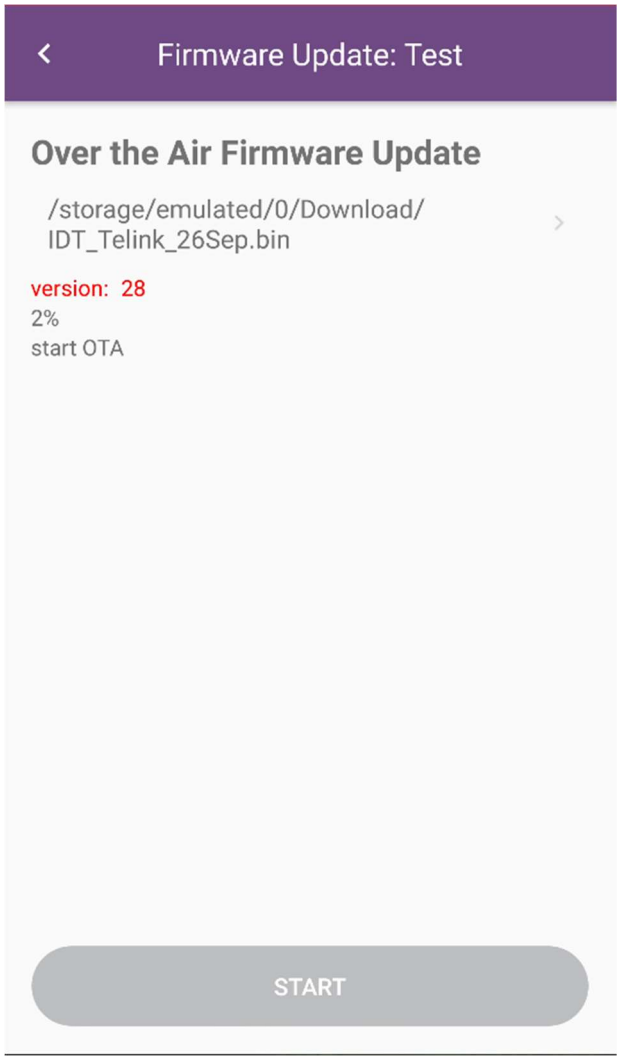
9. Click the bin file.

10. After the bin file has been selected the application returns back to the “Firmware Update” menu. The selected bin file will now be shown along with the version number of the file.

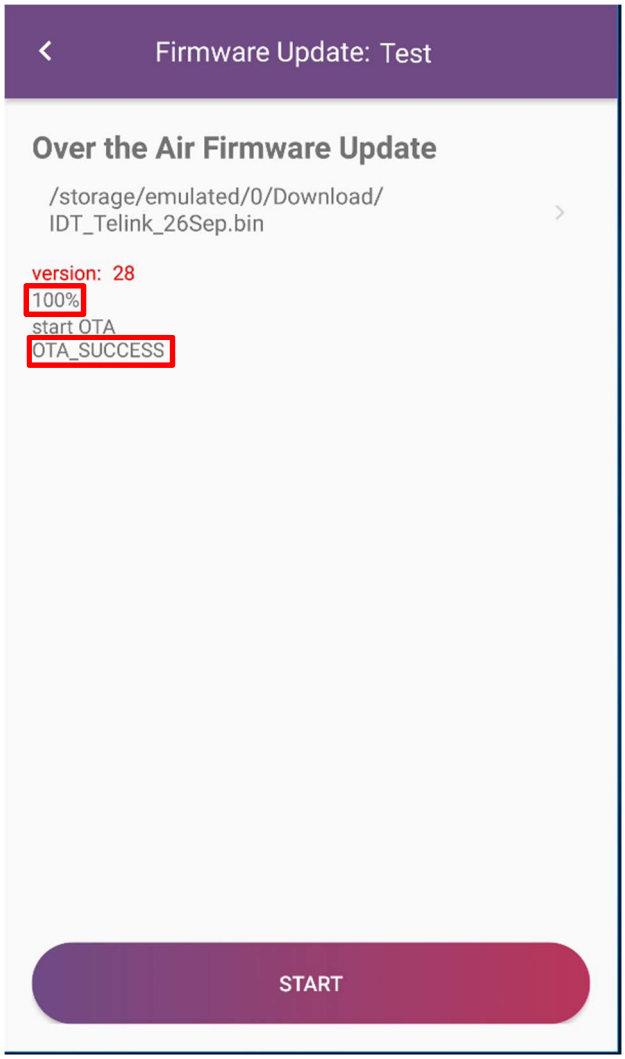


11. Click the “START” button at the bottom of the page.

12. The download will now begin.



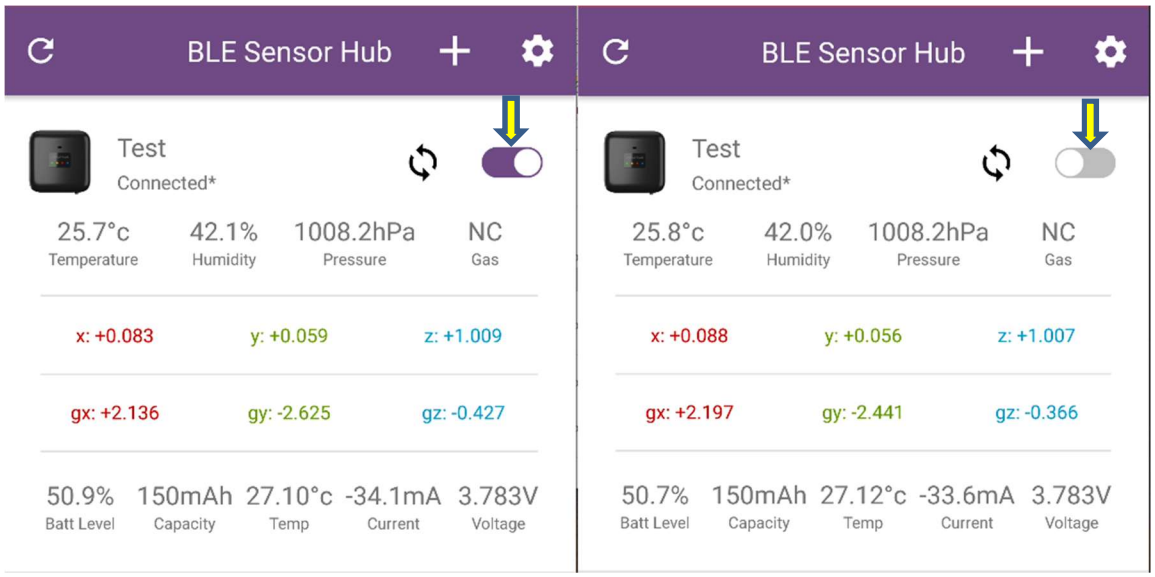
13. The download will be complete when the download percentage reaches “100%” and the “OTA_SUCCESS” message appears.



3.9 Pause Data Tracking

1. To pause data tracking the tag can be turned off by using the off switch on the bottom of the tag.

2. Tracking can also be paused by turning off the connection to the app by tapping on the connection switch on the “BLE Sensor Hub” menu. This will result in only one light remaining lit on the BTG25 tag as shown below and the previously blinking green light will remain off.

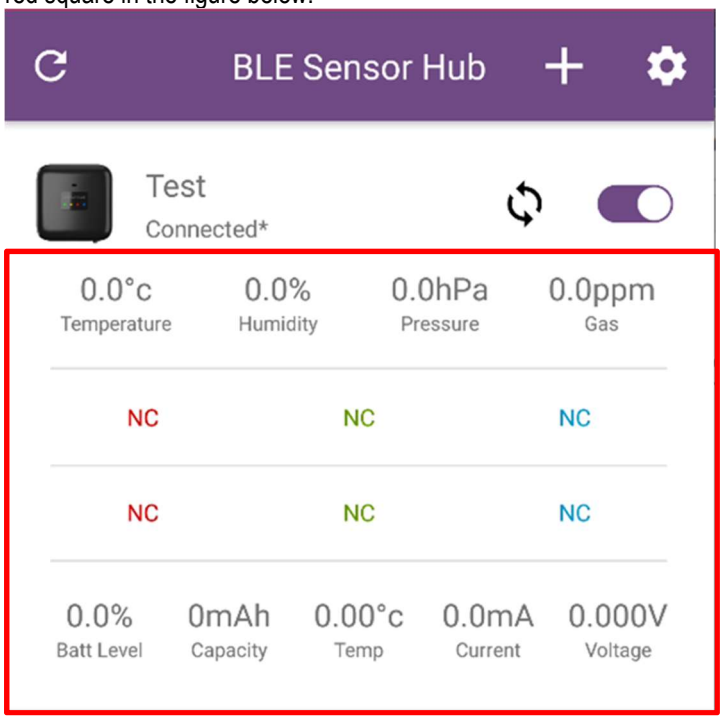


***Note**: Doing either methods will still allow the tag to be reconnected when the connection is reestablished by turning on the tag or turning on the connection switch, depending on which method was used to pause the connection originally. To completely remove the tag from the app see section **3.10 Remove the BTG25.**

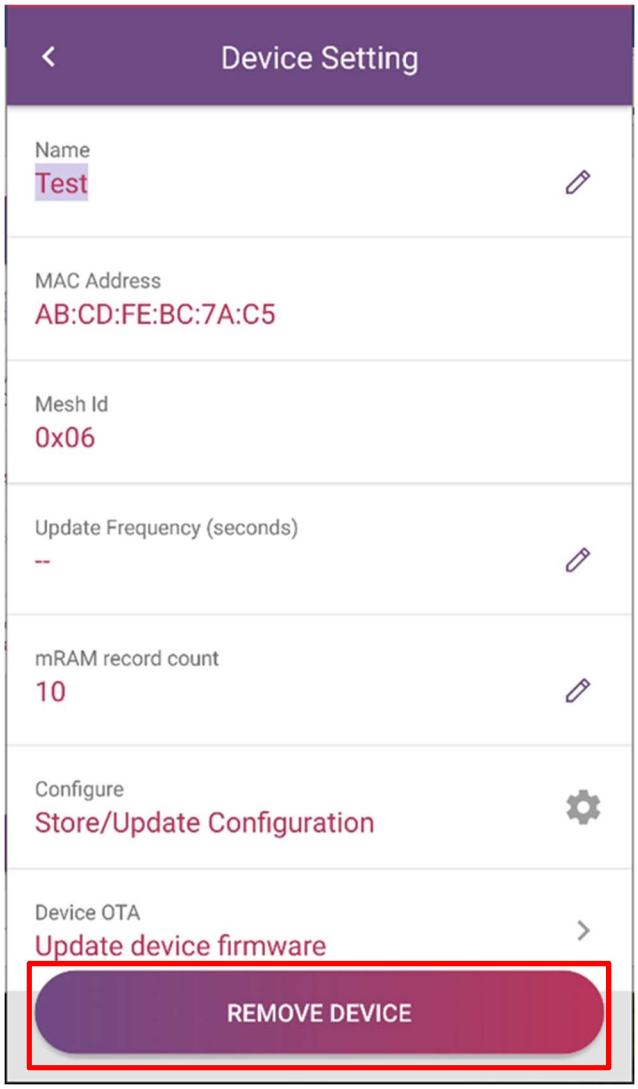
3.10 Remove the BTG25

1. The BTG25 can be removed completely from the app by accessing the device setting menu.

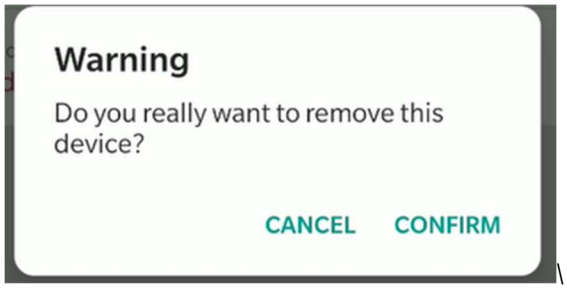
2. To access the device settings menu press anywhere in the white area where the data is being shown. This area can be seen in the red square in the figure below.



3. Click the “Remove Device” button at the bottom of the device settings menu.

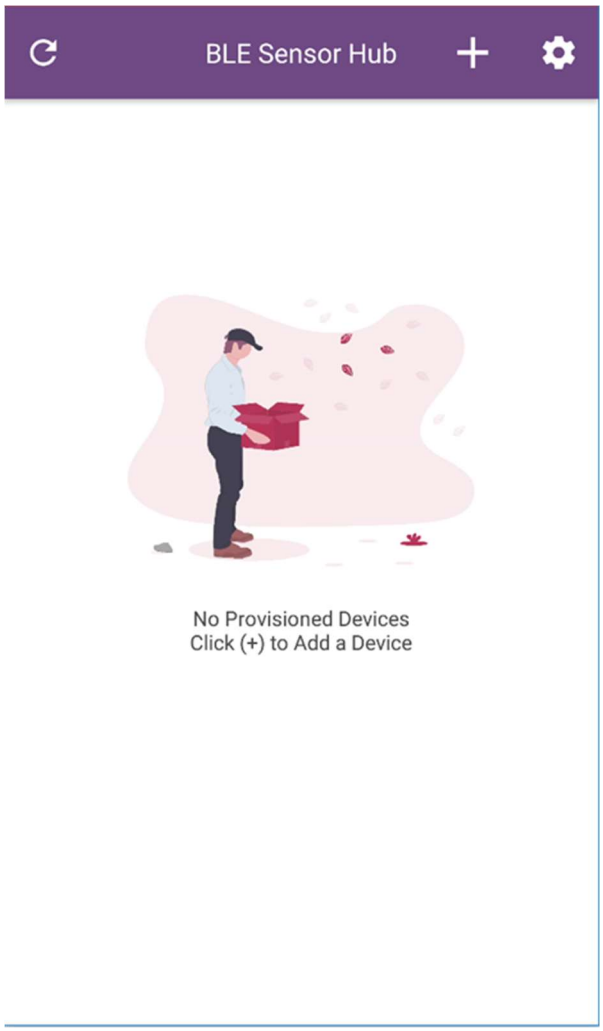


4. A warning will appear asking to confirm the request to remove the device.



5. Click “Confirm” to disconnect the tag from the app.

6. The display will change to show the BTG25 no longer connected to the app.



4. Un-Provision the BTG25

1. If the user is unable to disconnect the BTG25 through the app. The BTG25 can be un-provisioned from its current mobile device allowing it to be connected to a new mobile device.

2. On the top of the BTG25 (shown in the picture below), a small port can be seen that has a un-provision button. Use a small slim object, for example a thumb tack, to press the button inside the port.

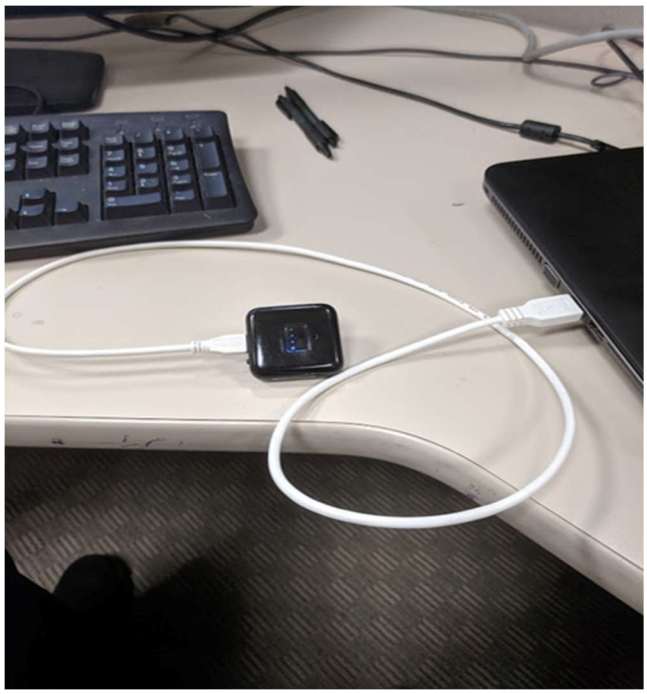
3. Wait a few seconds until the solid yellow light on the BTG25 changes to a blinking yellow light. The blinking yellow light means that the BTG25 has been un-provisioned from the previous device and is ready to be paired to a new device.

4. Return to section **3.2 Connecting the** to continue connecting the BTG25 to a new mobile device.

5. Charging the BTG25

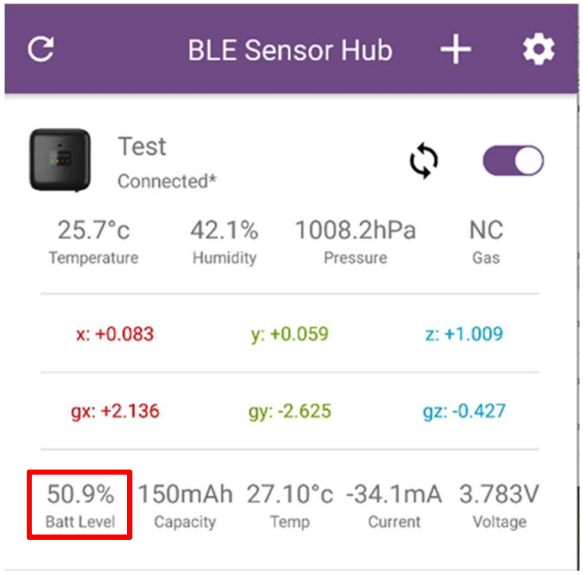
1. When the BTG25 begins to show a red light, similar to the image shown below, the BTG25 is running low on power.

2. To charge the BTG25 connect the BTG25 to a computer using a USB to Micro-USB cord. The setup is shown below. When this is done the tag is turned on even if the tag was not on previously.



3. When a blue light on the front side of the BTG25 turns on the BTG25 has begun to charge. An example is provided below.

4. The charge rate and the current battery can be seen using the app.



5. When the battery level reaches the ideal percentage disconnect the BTG25 from the charge cable.

6. LED Definition

By default the LED display signify the following:

1. The BTG25 is off

2. The BTG25 is on (Solid yellow light-device has been provisioned
   Blinking yellow light- device has not been provisioned)

3. BTG25 is on(Blinking green light- device is connected to the app and is sending data to the app)

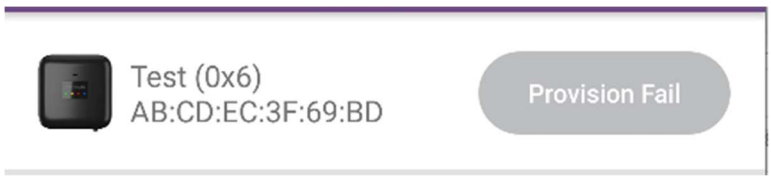
4. The BTG25 is running on low power.

5. The BTG25 is charging.

7. Troubleshooting

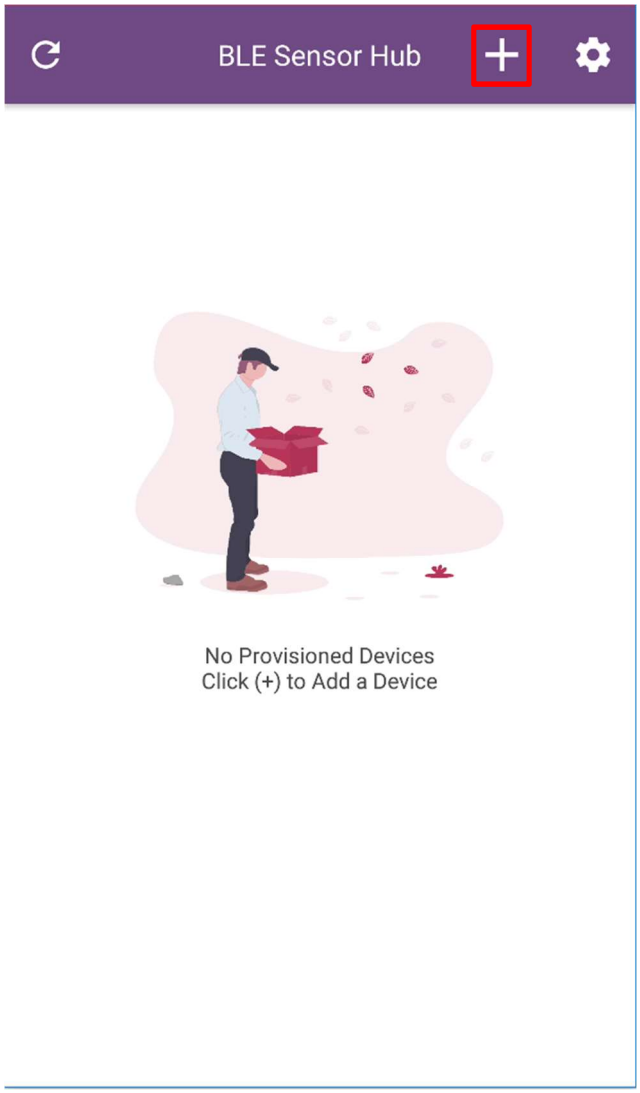
7.1 The Provision Fails

1. If the binding fails during the set up phase as seen below.



2. Press the back button on the mobile device.

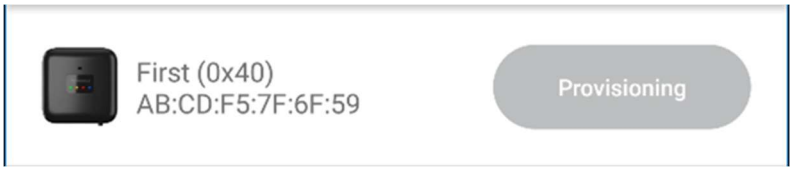
3. Press the plus symbol (+) and continue the process from section **3.2 Connecting the .**



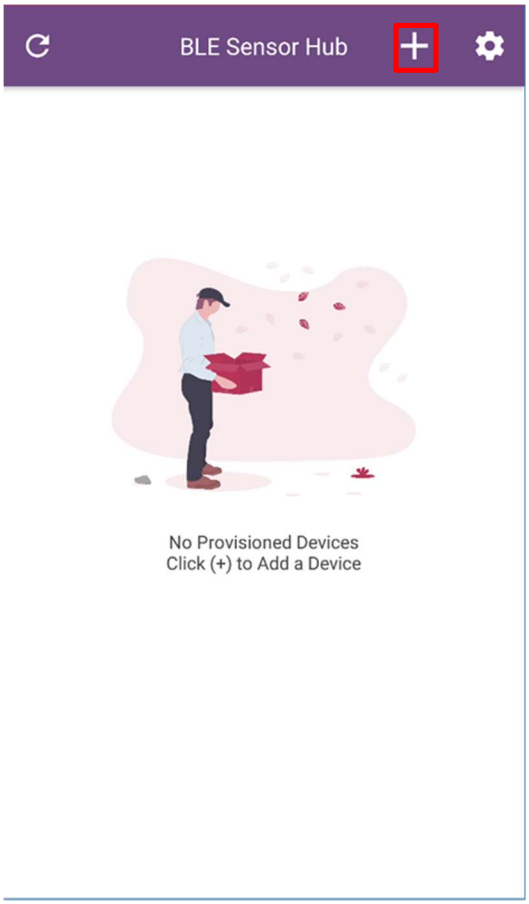
7.2 Pressing the Back Button before the Bind was Successful

7.2.1 During the Provisioning phase

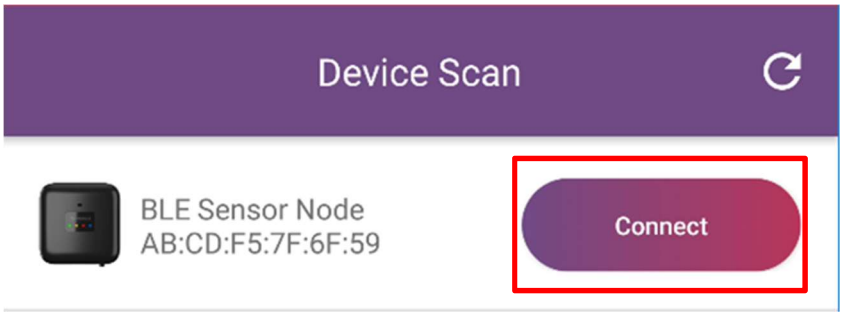
1. If the back button is pressed before the “Key Bind Success” message was given and while the “Provisioning” message is seen. The BTG25 will not be connected to the app and the BTG25 will need to be connected again.



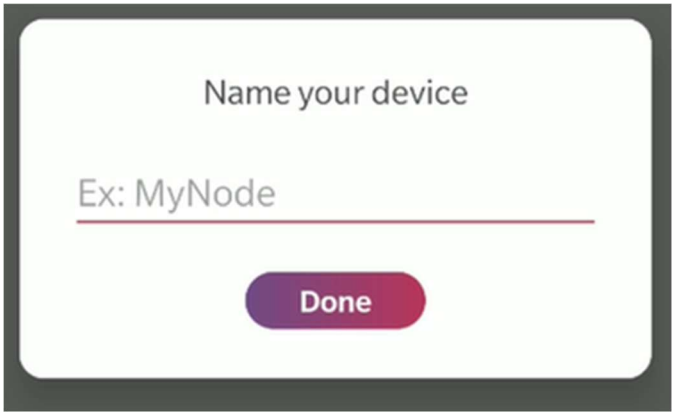
2. On the “BLE Sensor Hub” menu press the plus symbol (+) in the upper right hand corner. This will trigger a search for available tags in the area.



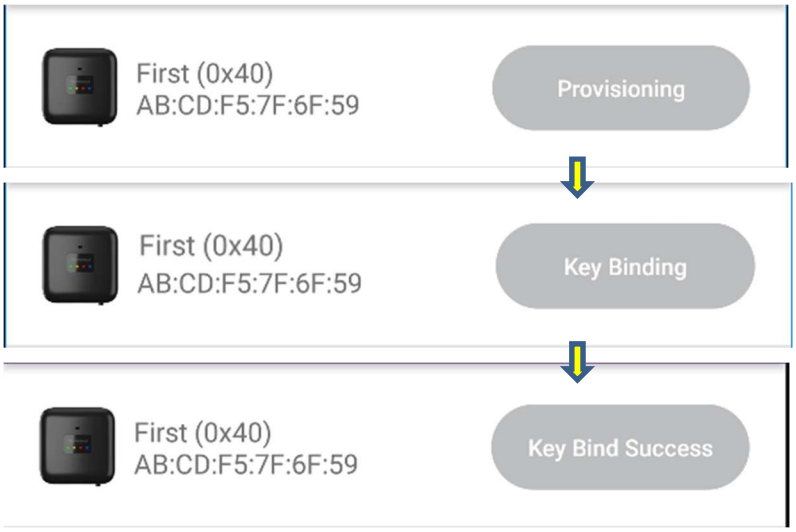
3. When the “BLE Sensor Node” appears click “Connect”.



4. Name the BTG25 and click “Done”.



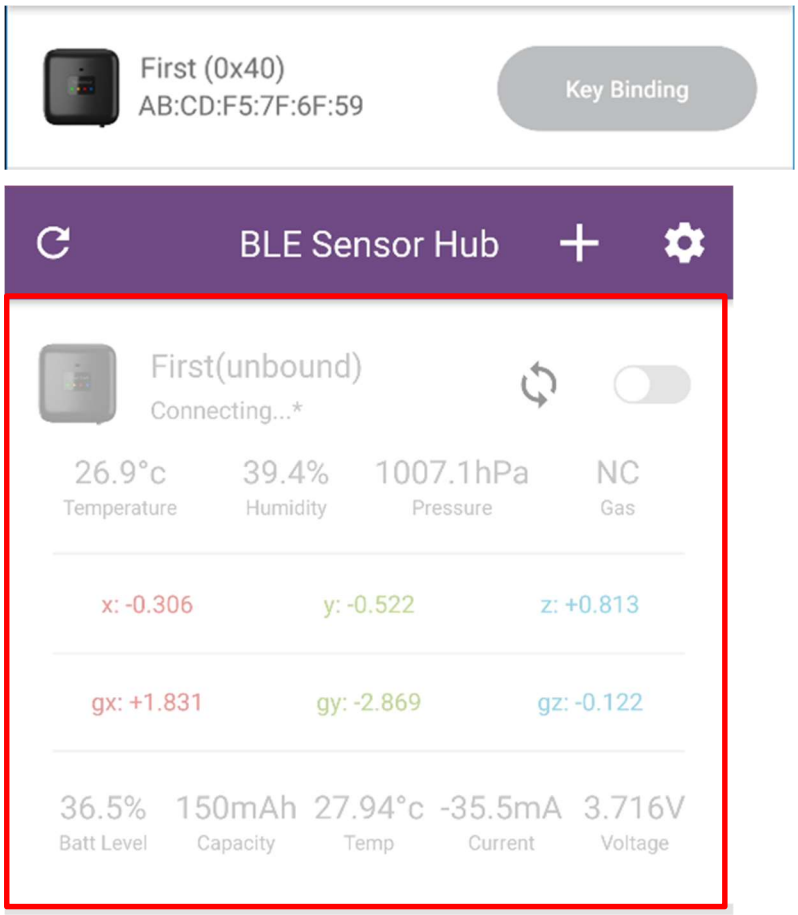
5. Wait till the “Key Bind Success” message appears.



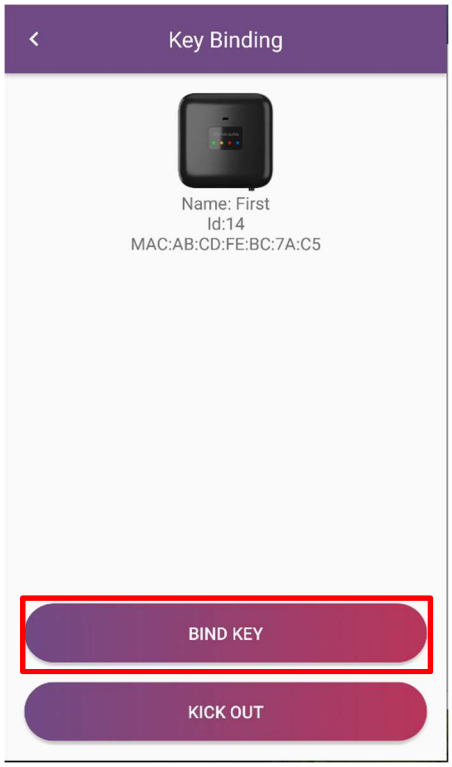
6. Return to **step 13** in the “Connecting the BTG25” section.

7.2.2 During the Key Binding phase

1. If the back button is pressed before the “Key Bind Success” message was given and while the “Key Binding” message is seen. The BTG25 will appear “unbound” and will need to be bound. Press anywhere in the white area where the current data is meant to be shown. This area can be seen in the red square in the figure below.



2. Click the “Bind Key” button to continue the connection process.



3. Return to **step 13** in the “Connecting the BTG25” section.

8. FCC Statement

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.

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 an industrial or 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 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 the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Caution: Any changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna and transmitter.

This equipment should be installed and operated with the minimum distance 20 cm between the radiator & your body

9. EU – Declaration of Conformity

Integrated Device Technology a Renesas Corp company declares that BTG25 complies with the essential requirements and other relevant provisions of Directive 1999/5/EC. A copy of the Declaration of conformity is available on request.

10. Revision History

[Insert the revision history entries in reverse chronological order. Verify that the revision date here matches the revision date in the footer.]

Revision Date	Description of Change
November 23, 2015	Initial release.

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