Client Sensor Manual

Updated: 03/07/2023

Contents

1. Introduction

1.1 General Introduction

Thank you for choosing AquaTerra. We are excited to be apart of your journey into the future. This document is designed to go through each step in great detail. If anything is unclear or could be done better, we would love to know! Our contact information is given below.

1.2 Contact Information

General Information

- Contact: Amir Orangi
- Email: amir@aqua-terra.com.au

Sensor Issues:

- Contact: Aidan Taylor
- Email: aidant1@student.unimelb.edu.au
- Phone: 0451 613 737

1.3 Terminology

- **Packet** = a block of information sent from the sensor to the server. This block of information contains the measured temperature and soil moisture data.
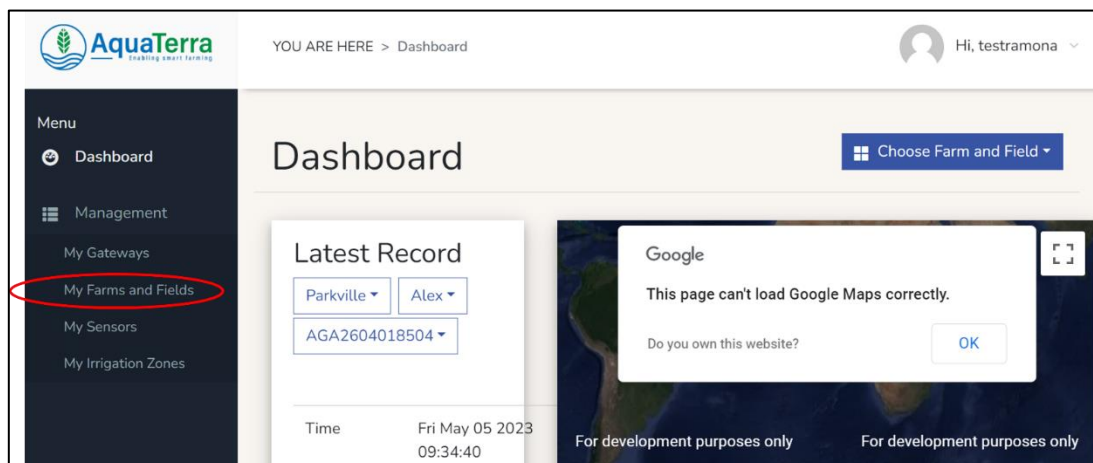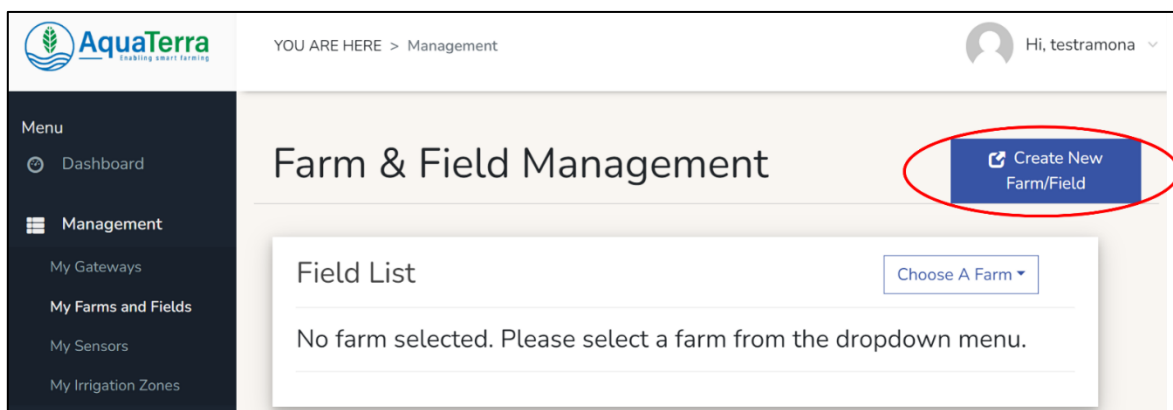
2. Web App

2.1 Website Address

https://webapp.aquaterra.cloud/#/login

2.2 Creating a Farm and Field

1. Go to the my "My Farms and Fields" tab located on the left panel.

2. Create a new farm by selecting the "Create New Farm/Field" button.

3. **Important:** when entering your farm name, you will need to click on the create farm button that drops down. An example of this is shown in the picture below. Then enter in your field name and click next.

4. You will then have to further register your field. You will get the following pop-up. The two key tools are highlighted below. The hand allows you to move the map around until you get to the location of your field. Then you can use the polygon shape icon in the top right of the map to trace the outline of your field. Note that your outline must loop back on itself (i.e., enclose some area).

5. Finally, you can conclude your field registration by clicking on the submit button in the following window.

3. Gateway

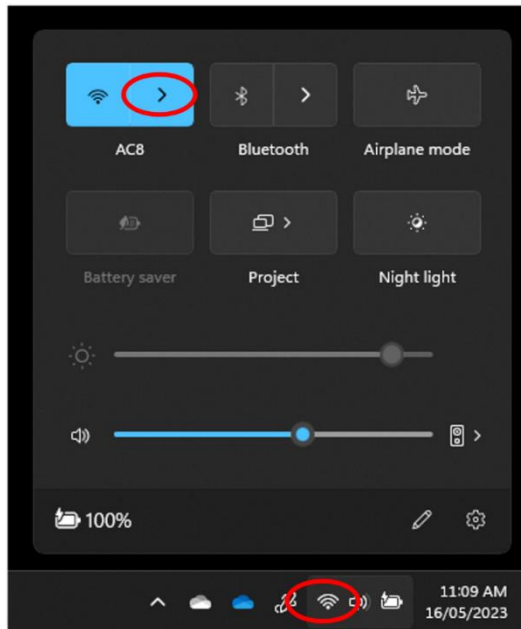## 3.1 Connecting Gateway to WIFI

1. Plug in the AquaTerra gateway
2. Click on the WiFi symbol on your computer OR phone. You should be able to see the gateway as a WiFi network, it will have a name similar to AquaTerraGatewayFT0XXX. An example of this part is shown below.

Computer (Windows 11):
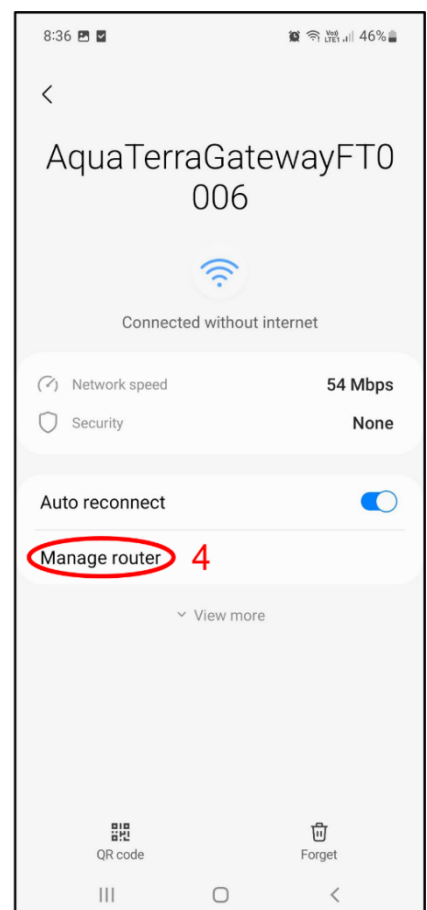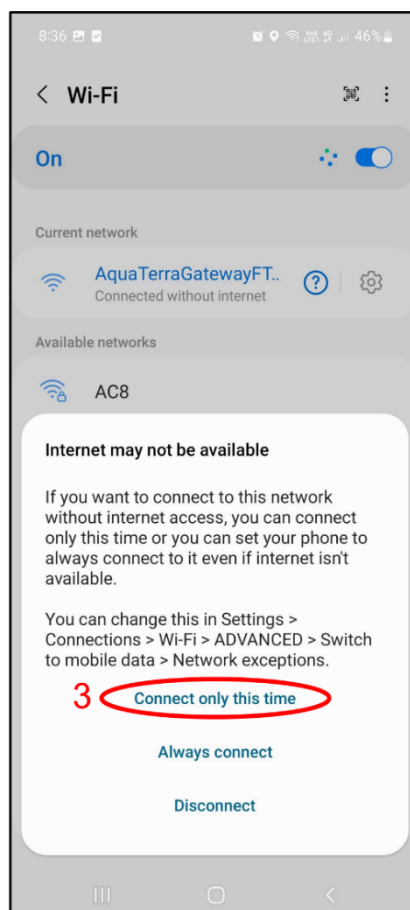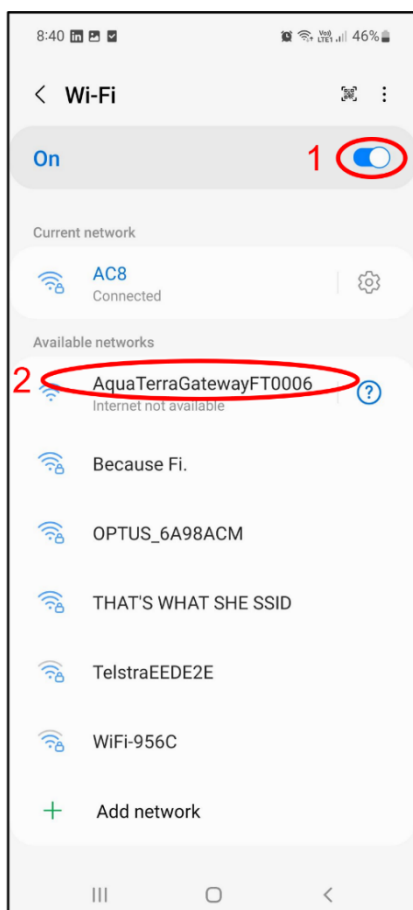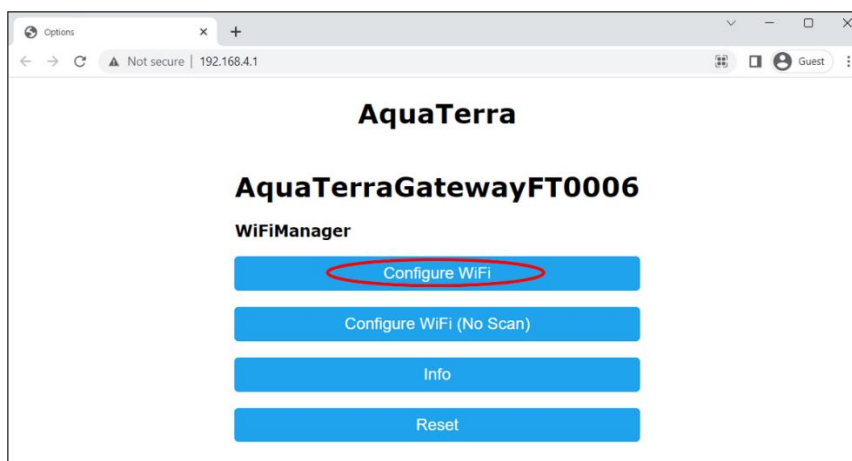

Step 1   Step 2

Phone (android):

3. Once the gateway has been selected the following screen within your default internet browser should show up.

4. Now select "Configure WiFi". This should then take you to a list of detectable WiFi networks. An example list is shown below.
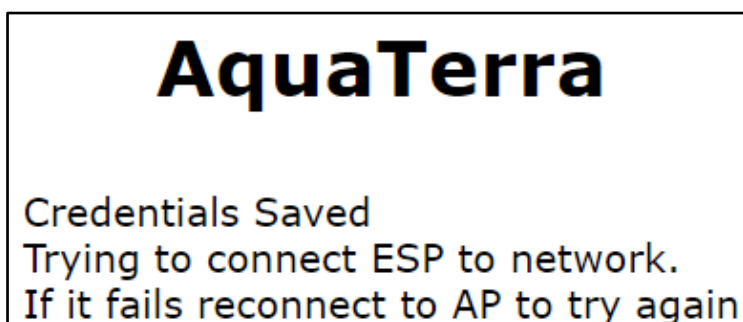

5. Either select the WiFi that you want to use OR type it manually into the SSID section. Then enter in the corresponding password and press save. You should be then presented with the following screen.


6. If the light at the front of the gateway does not remain on, it means that the attempt to connect the gateway to the WiFi was unsuccessful (and the process should be restarted from step 1). If the light is blinking, you will need to disconnect and reconnect the power. If the light is constantly on, this means you have successfully connected the gateway to your WiFi.

Note: if the gateway has successfully connected to your WiFi, it will now be undetectable by your phone or computer. If you want to connect the gateway to a new WiFi address, please first reset the gateway (Section 3.4).

3.2 Connecting Gateway to Web App

1. First you need to ensure that you have successfully connected the gateway to your WiFi. This can be done by following the steps in section 3.1. Note that the gateway's light will be constantly on if it has established a connection to your WiFi.

2. Now click on "My Gateways" under "Management" on the left side panel. Then click on the "Add A New Gateway" button located on the top right of your screen.
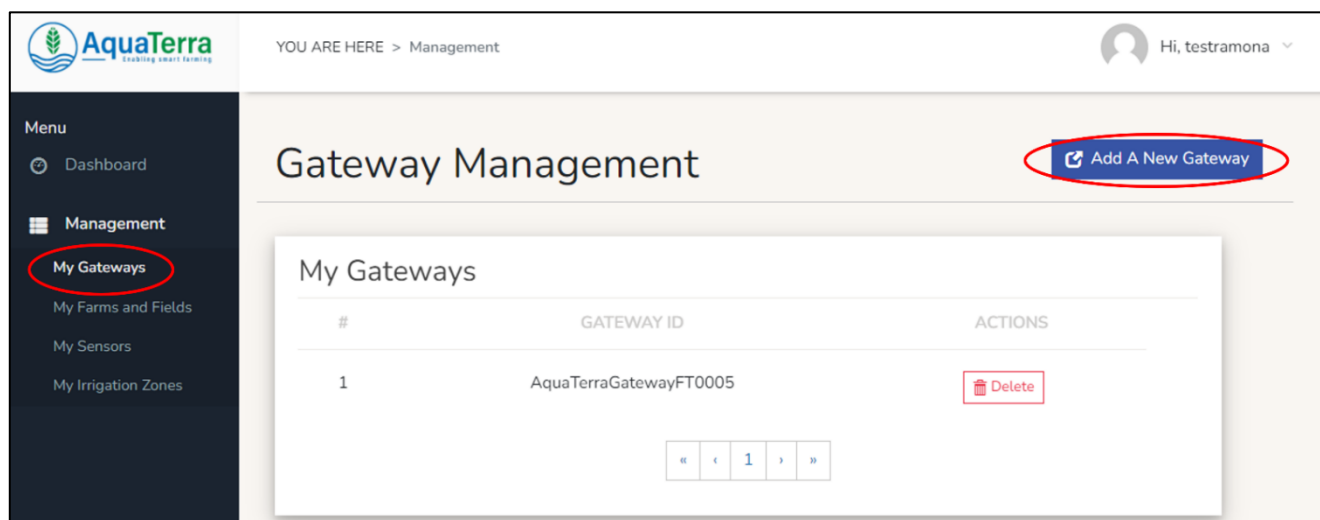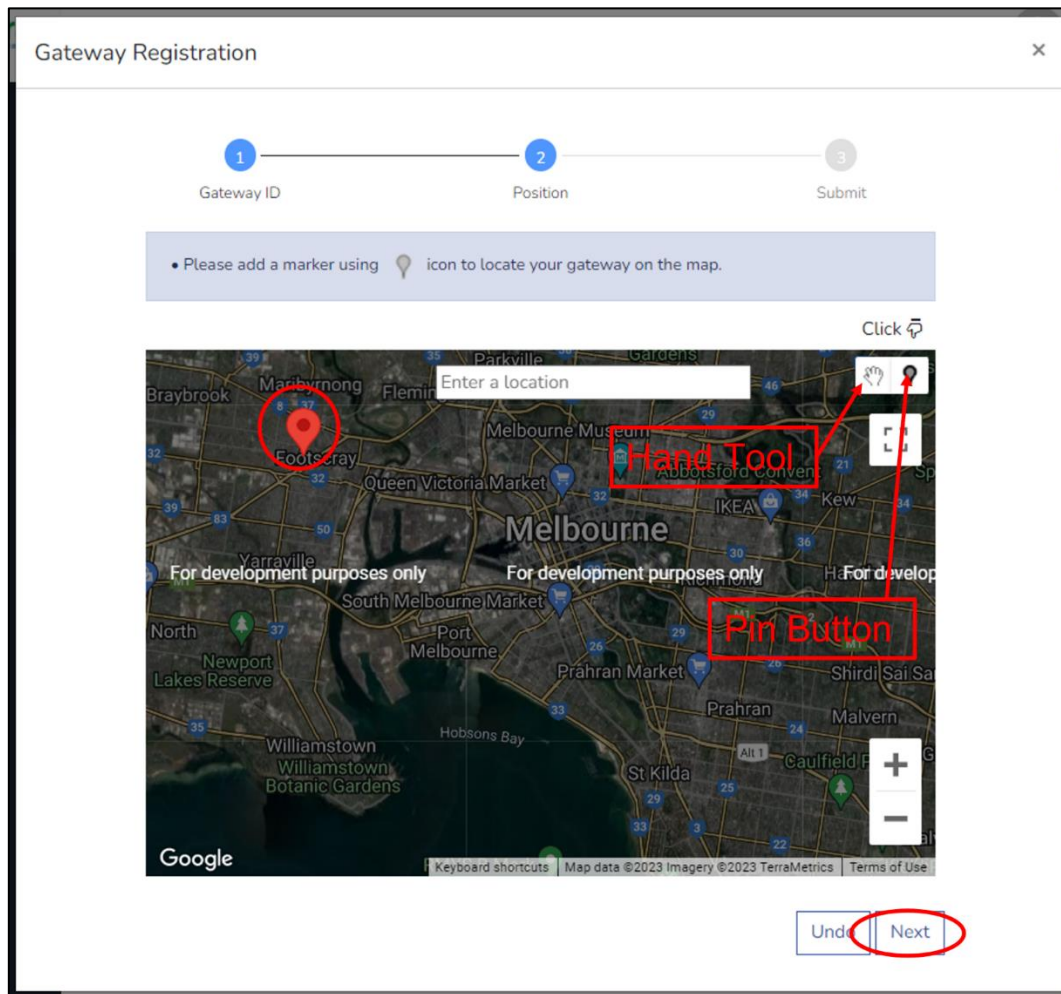

3. You will then be presented with the following pop-up. Please enter the gateway ID located on the front of your gateway. Then select the next button.
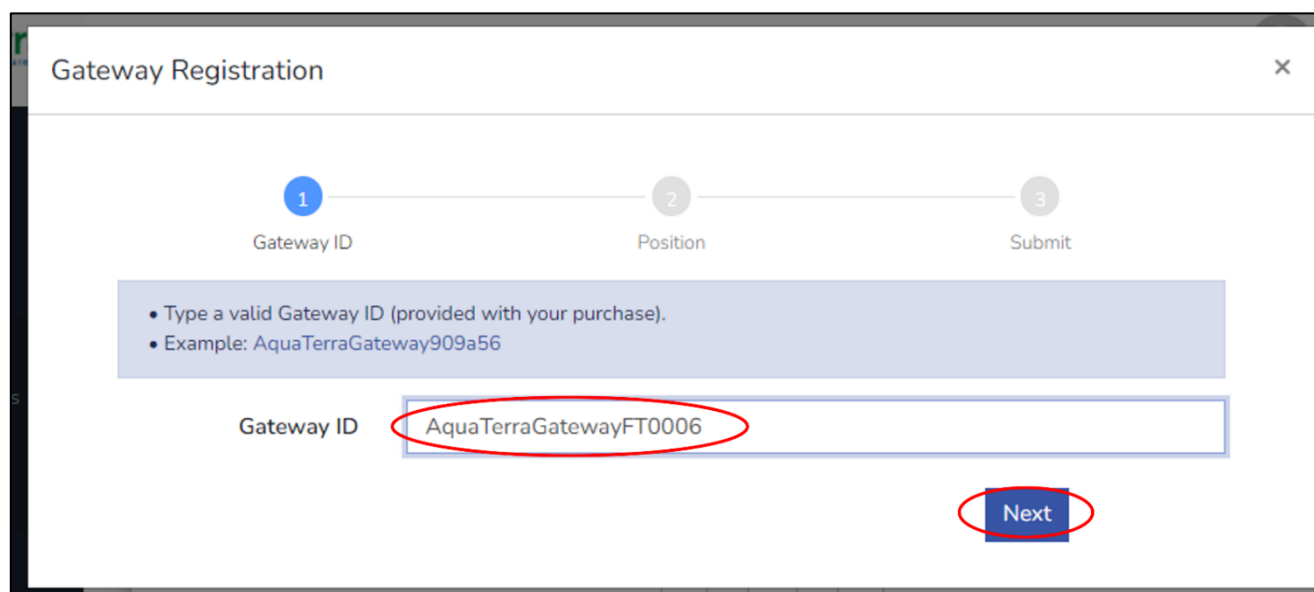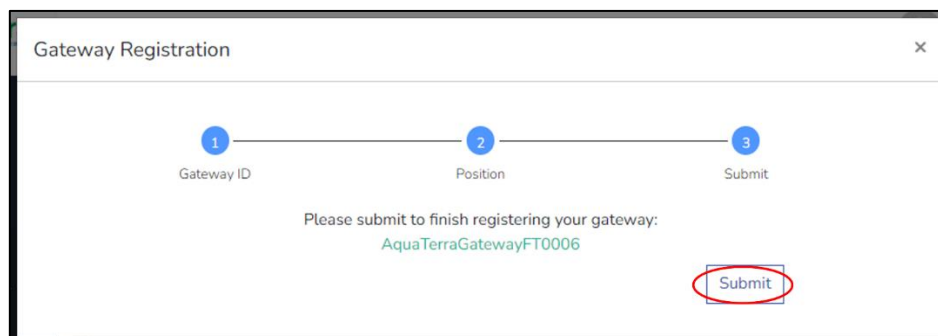
4. Now place the gateway's location on the map. First, use the hand tool to navigate to the location you want to place the gateway. Then select the pin button and click on the desired location on the map. Then select "Next".

5. You should now get the following screen. Select "Submit".

6. You will then get the following registration confirmation pop-up. Select "Close" to finish the process.
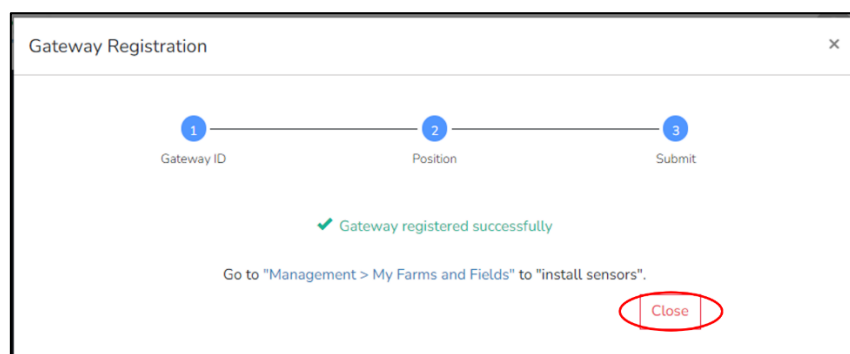
3.3 Deleting Gateway from Web App

Login and click on the "My Gateways" tab under "Management" on the left side panel. Then click the "delete" button next to the gateway that you would like to delete.


Note: when a gateway is deleted, all the corresponding sensors that are paired with the gateway will also be deleted from the web app.

3.4 Resetting Gateway

1. First delete the existing gateway from the Web App (section 3.3).
2. Now disconnect your WiFi so that it breaks the existing connection between the gateway and your WiFi
   a. It gets a little tricky here. You need to enter in a dummy WiFi and password to rewrite the existing WiFi and password that is stored in the gateway's memory. Note that you will need to use the same method that you first used to connect the gateway to the internet.
   b. This can be done by completing steps 1 to 4 in section 3.2.
   c. Once the dummy WiFi and password have been entered you can now connect to a new WiFi by following the steps 1 to 6 in section 3.2.

# 4. Generation 1 (Old) Sensors

4.1 How they work
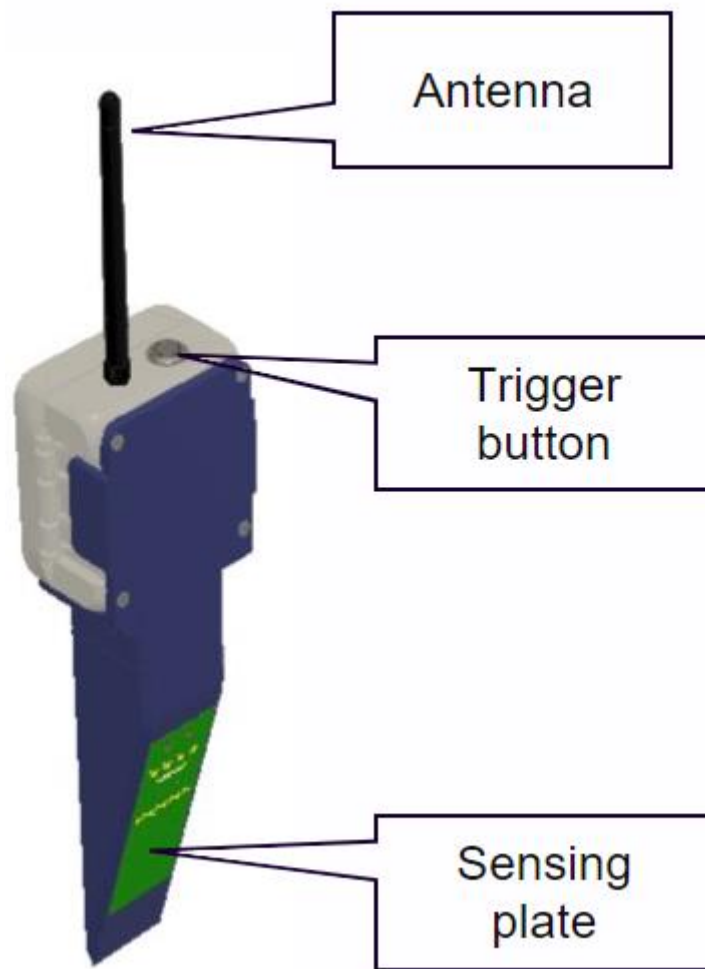
Interfacing:

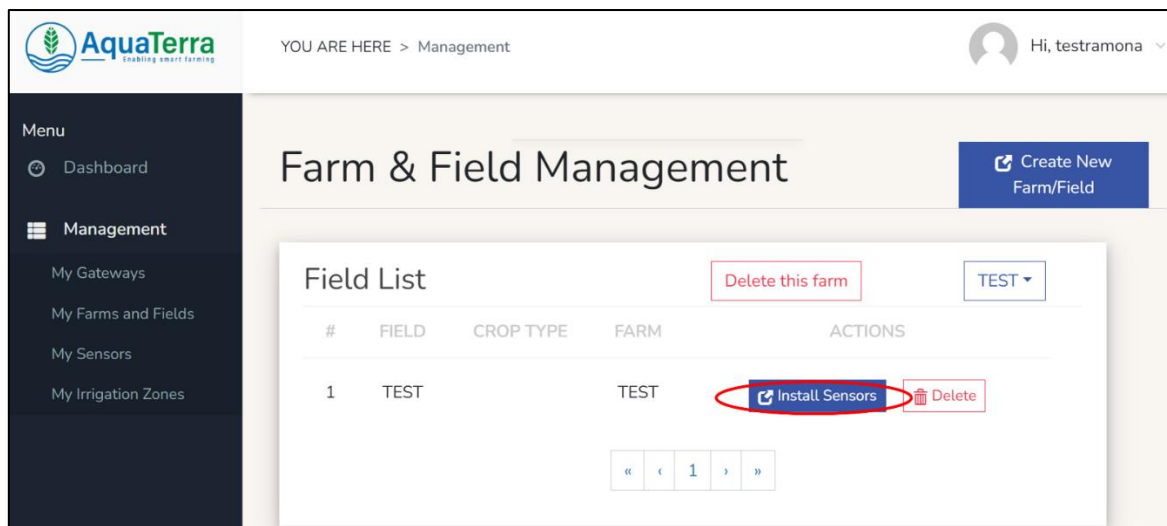- Short press = send packet/data
- Long press = pairs

Button:

- Blinking = pairing
- Very fast blinking = failed to pair OR failed to send packet (assume sensor has been paired).
- 2 slow blinks = paired successfully OR packet was sent successfully (assumes sensor has been paired).
- When pairing you should get rapid blinks then followed by 2 slow blinks (see note below for reason).

4.2 Connecting Old Sensor to Web App

1. Go to "My Farms and Fields" and then click "Choose A Farm" to select the farm you wish to place a sensor in.
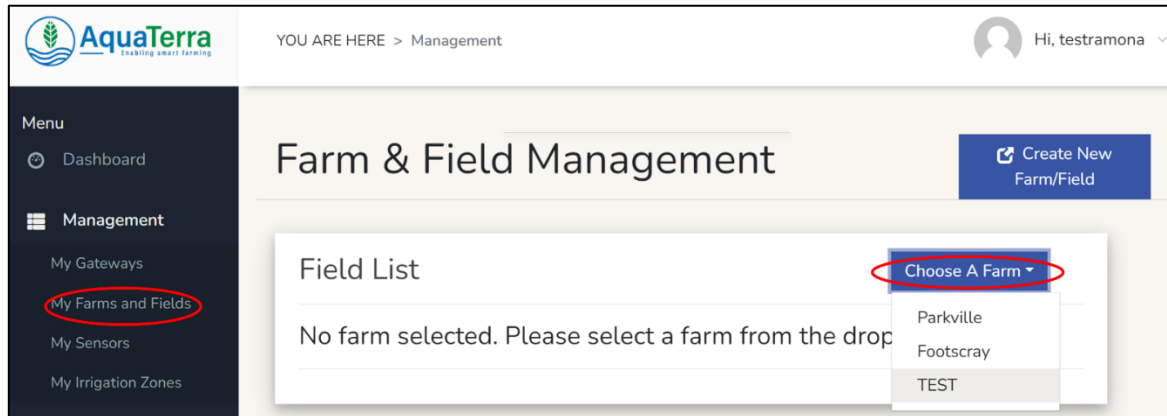
2. Once a farm has been selected, you will get a list of the fields that have been registered to that farm. Note you can always add another field by clicking the "Create New Farm/Field" and following the steps in section 2.2.

3. Click on the "Install Sensors" button for the corresponding field you wish to install the sensor in.

4. You should get the following pop-up specifying the gateways that are available to you. Click next if it shows you your gateway ID. Note that if there are no available gateways you will need to register a gateway with the Web-app (section 3.2).
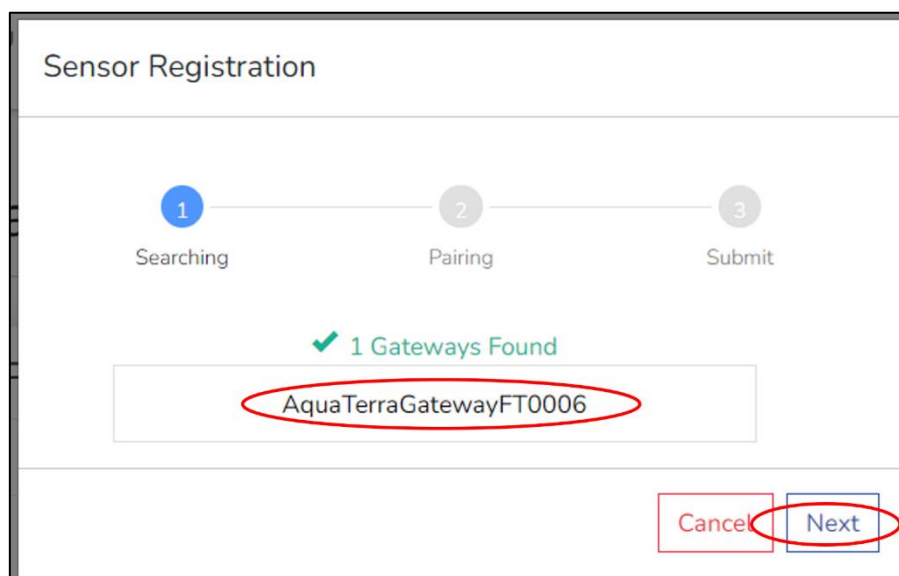
5. You will now get the following pop-up. Please follow the steps that it specifies whilst noting the meaning of the corresponding button blinks:
   a. Blinking = pairing
   b. Very fast blinking = failed to pair OR failed to send packet (assume sensor has been paired).
   c. 2 slow blinks = paired successfully OR packet was sent successfully (assumes sensor has been paired).
   d. When pairing you should get rapid blinks then followed by 2 slow blinks (see note below for reason).

Note: the sensor tries to establish TWO connections, the GPS and then the connection with the web-app. The sensors do not have the GPS chip in them at the moment. Therefore:

- **Correct pairing** of the device will result in fast flashes then followed by two slow blinks. This means that the GPS has failed to connect BUT the sensor has in fact connected with the web server. If you get the correct pairing, click the "Next" button.
- **Failed pairing** of the device results in fast flashes followed by another set of fast flashes. This means that the GPS AND the sensor have failed to connect. If this happens you will need to restart the pairing process (Repeat steps 1-5).

6. If the pairing was successful, you should get the following pop-up. It should give you an overview of sensors you already have registered, the gateway ID and sensor ID used in the current registration, a map of the field and the sensor's location within this field. If the information is correct, click "Submit".
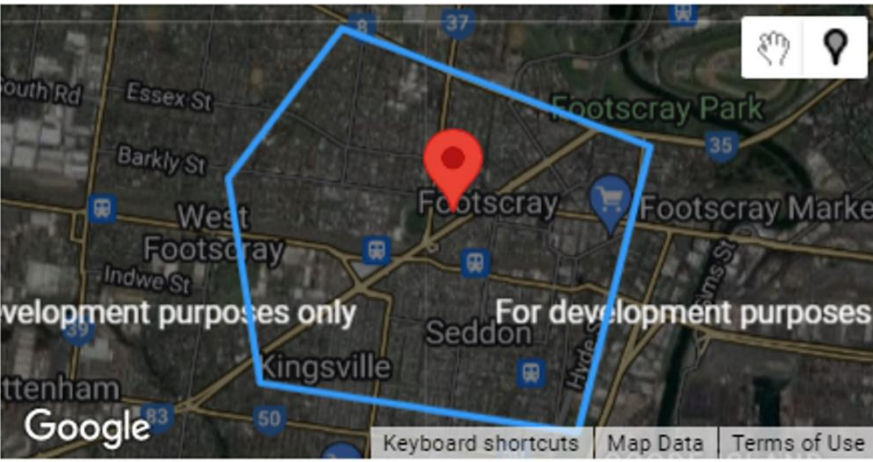
7. Once complete select submit. If the process was successful, you will get the following pop-up. Click "Close".
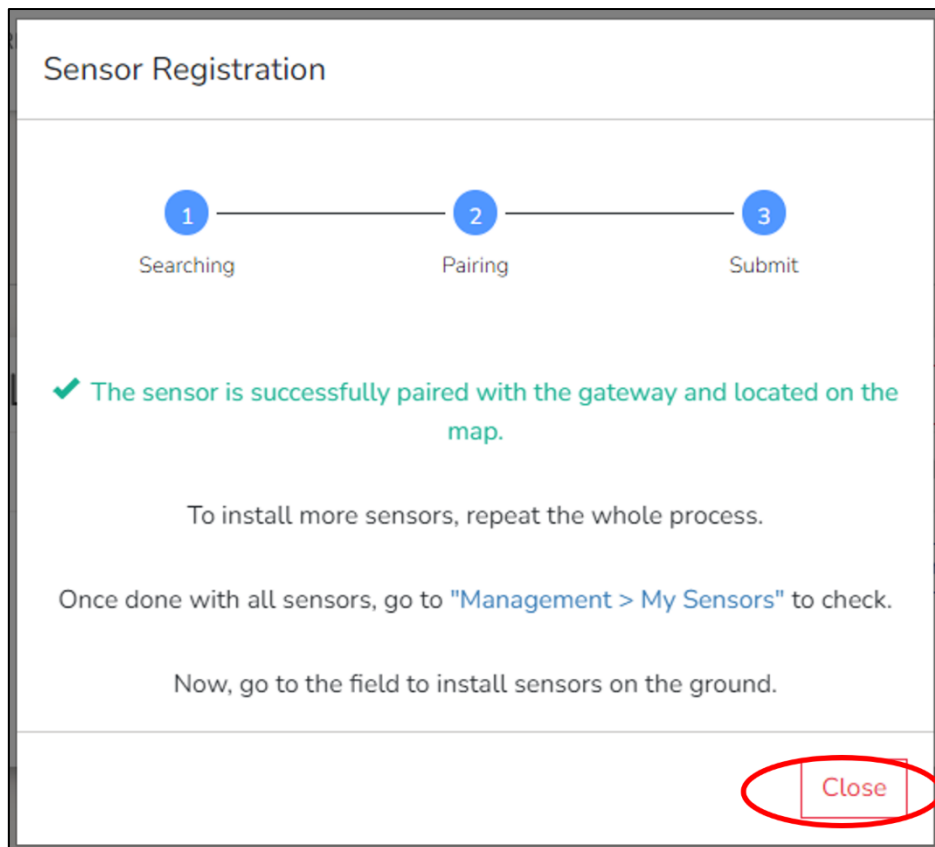
8. You can now test to see if the sensor has properly connected to the web-app. You can do this by trying to send a packet/sensor data (section 4.4).

4.3 Resetting an Existing Sensor

1. Go to the "My Sensors" tab under "Management" on the left panel. This will result in a list of sensors that are paired/registered to the selected field.
2. Delete the sensor that you wish to reset, then follow the steps given in section 4.2.

4.4 Manually Send Packet

Hold down the button until it lights up. Then let go. The button will either rapidly blink (which means the packet/sensor data failed to send) OR it will blink twice if the packet/sensor data was successfully sent to the web-app. If it fails, you will have to repeat the pairing process (section 4.2). If it was successful, you can check the most recently sent packet by going to your dashboard and selecting the corresponding farm, field and sensor ID. The process of this is shown below:
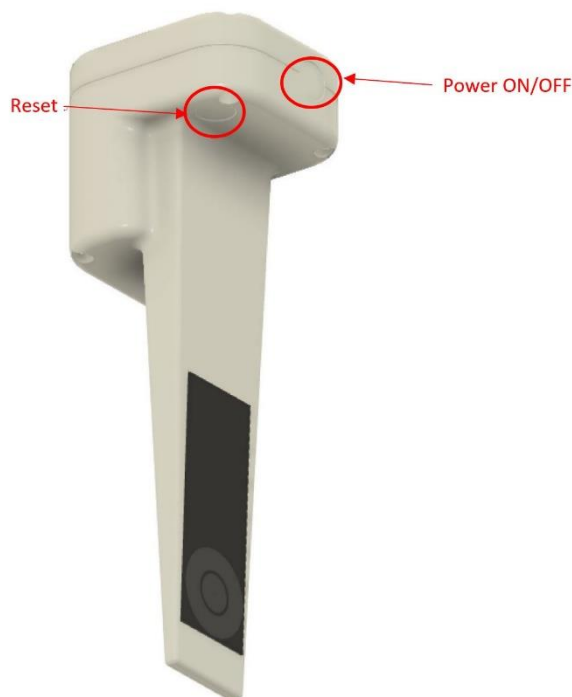
5. Generation 2 (New) Sensors

5.1 How they work

- Power switch at the front.
  - ON = one side of polarity magnet (you should hear a buzzing sound if done correctly).
  - OFF = other polarity of magnet.
- Reset switch on bottom.
  - Both sides of magnet triggers switch.
  - Used to reset product program.
- Both switches trigger a packet to be sent

Note: The sensors use Telstra's 4G network (Telstra's LTE network kind of exists in between 3G and 4G but is considered to still be 4G). Therefore, it is important to check that the location of the farm has 4G access. This can be done by visiting the website given in section 5.2.
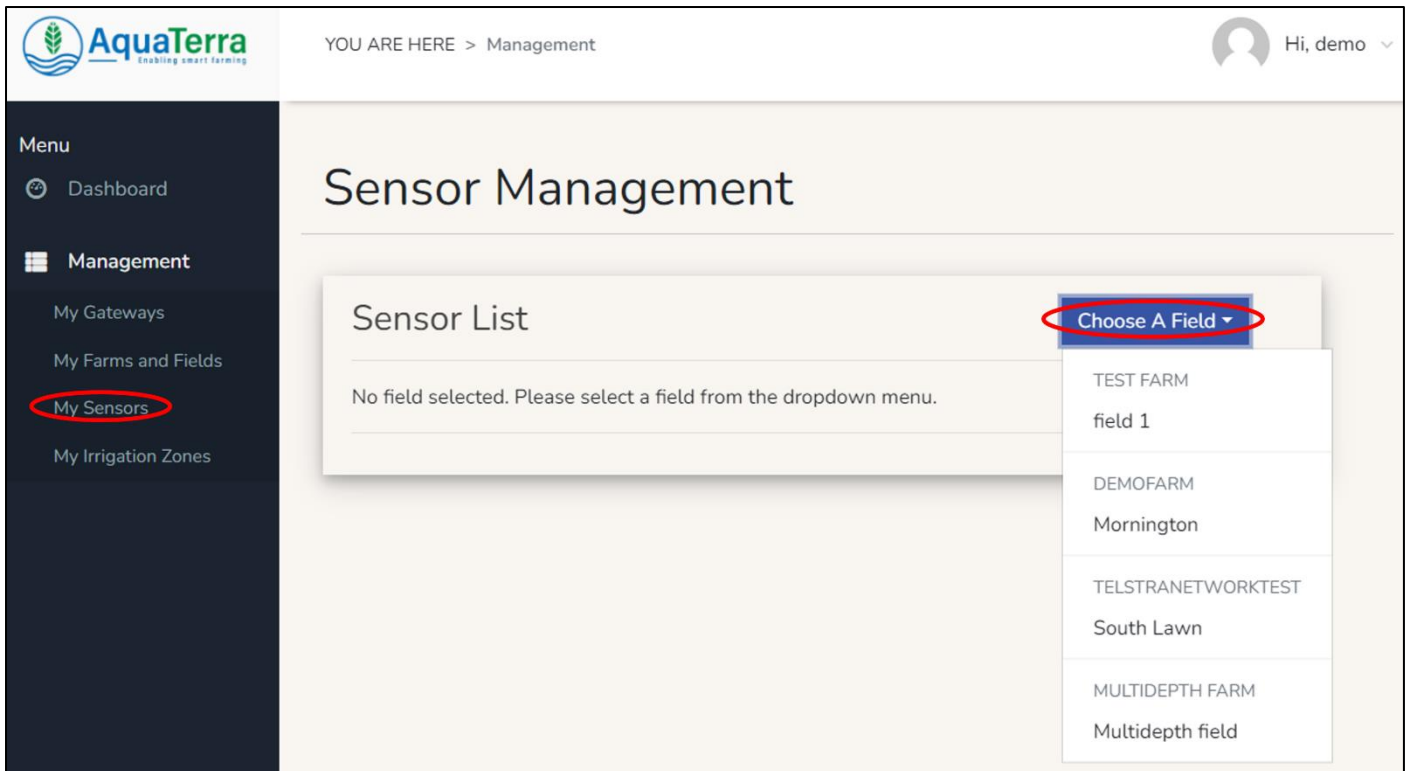
5.2 Checking to See if you have 4G

Test to see if you have Telstra 4G by entering your postcode on the following website: https://www.mobilecoverageaustralia.com/

5.3 Connecting New Sensor to Web App

1. Go to the "My Sensors" tab under "Management" on the left panel. Then click on "Choose A Field" and select the field you wish to install your sensor in. Note that if you have not created a field, you will first need to do so. This can be done by following the steps in 2.2.
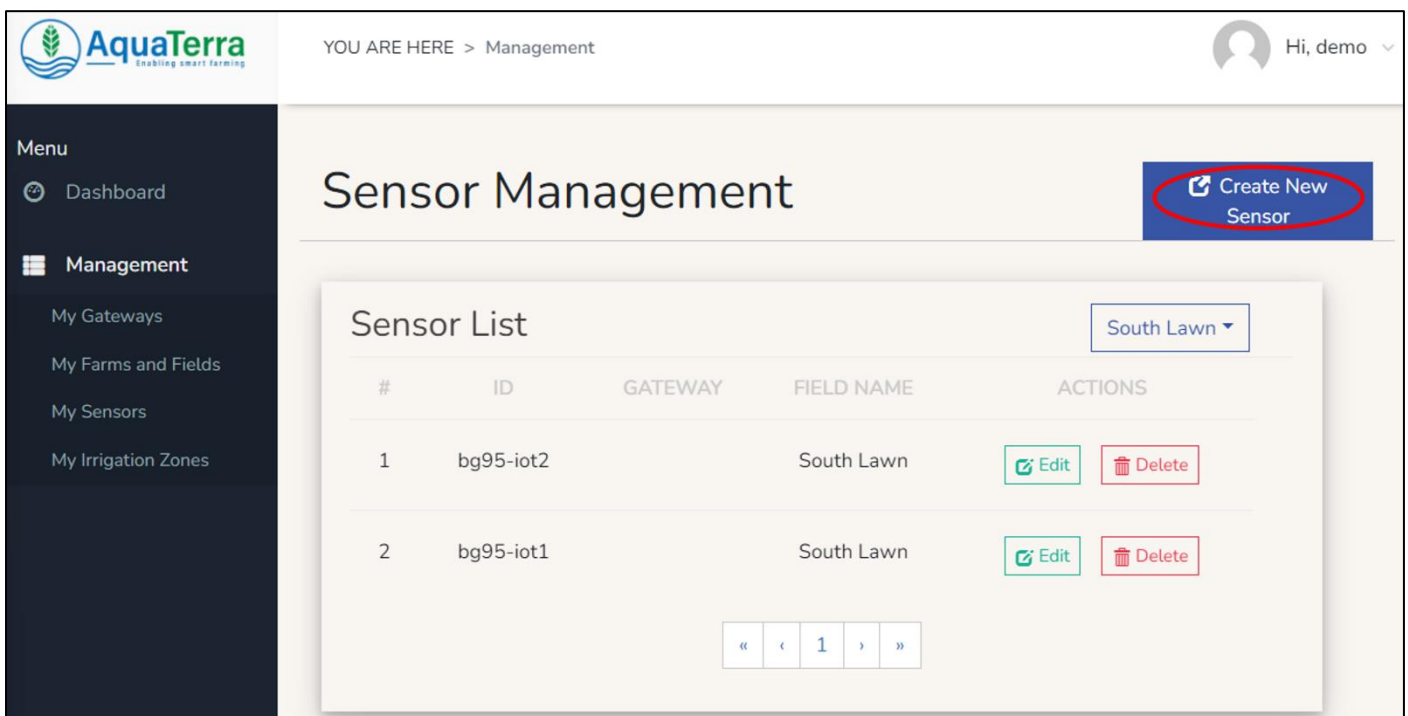
2. Once you select a field, you will be given a list of sensors that already exist in the selected field. To add another sensor to the selected field, click on "Create New Sensor".

3. You will then be presented with the following pop-up. Please enter in your sensor ID (which can be found on the side of your sensor). Then use the hand tool to move around the map. Once your in the location of where you will place the sensor, use the pin button to place a pin in the desired location. Next click "Save"
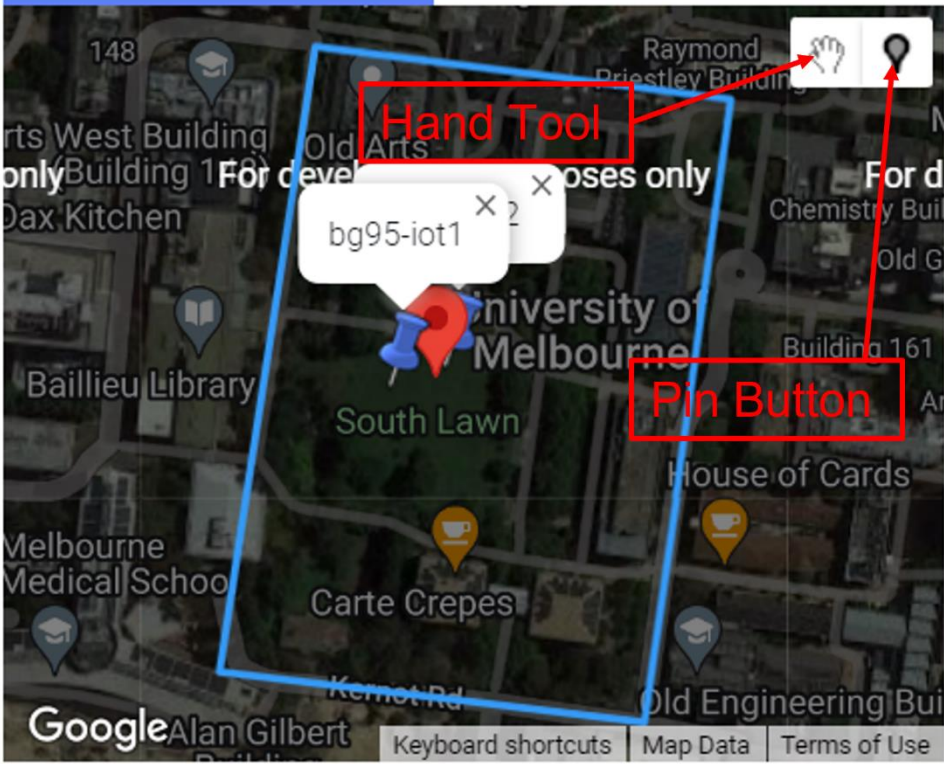
4. If done correctly, you will see a green notification pop-up on the top right of your screen. Note that you should also be able to see your new registered sensor on the "Sensor List".

5.4 Resetting an Existing Sensor

1. Go to the "My Sensors" tab under "Management" on the left panel. Then click on "Choose A Field" and select the field that contains the sensor you wish to reset.


2. You will be presented with a list of sensors that are in the selected field. Select the delete button for the sensor that you wish to reset. An example list and delete button is shown below.

3. You will be presented with a pop-up titled "Sensor Deletion". Click the delete button. Once you have done so you should be returned to the sensor list of the field. You should get a green pop-up message on the top right of your screen indicating that the sensor has been successfully deleted. Also, you should notice that the list no longer contains the deleted sensor. An example of the pop-up and success message are shown below.
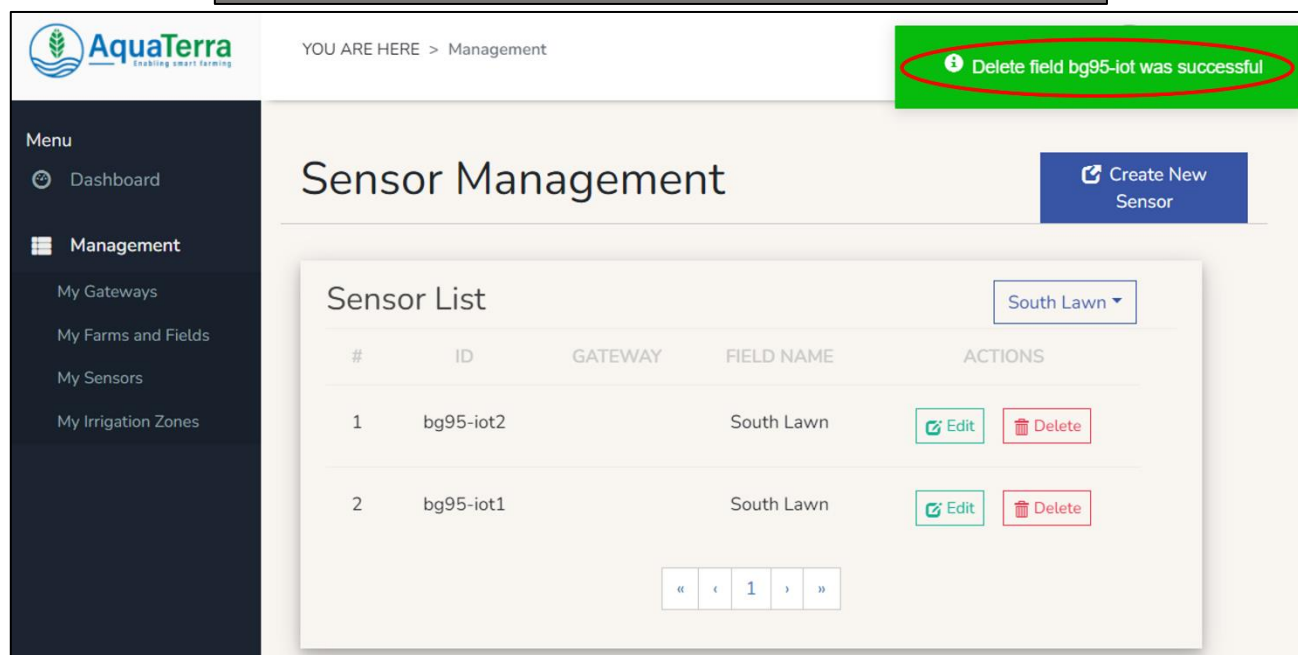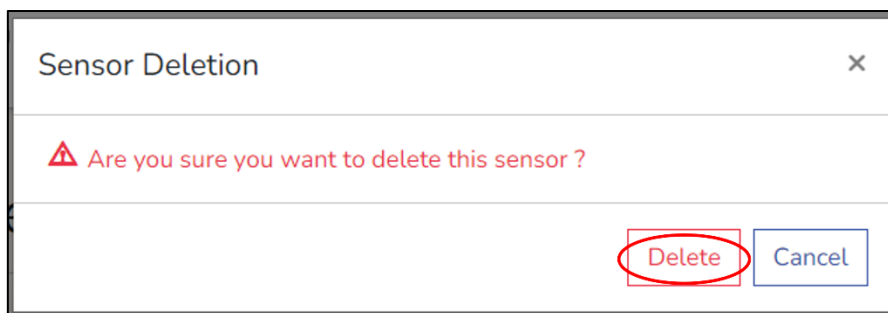
4. Now follow the steps in section 5.3 to connect the sensor to the webapp.

6. Installation

6.1 Installation Depth

Every sensor has an engraved line on its body. The sensor should be buried up to this line. An example of this is shown in the picture below:

Installation Line