



Client Sensor Manual

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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@aquaterra.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.

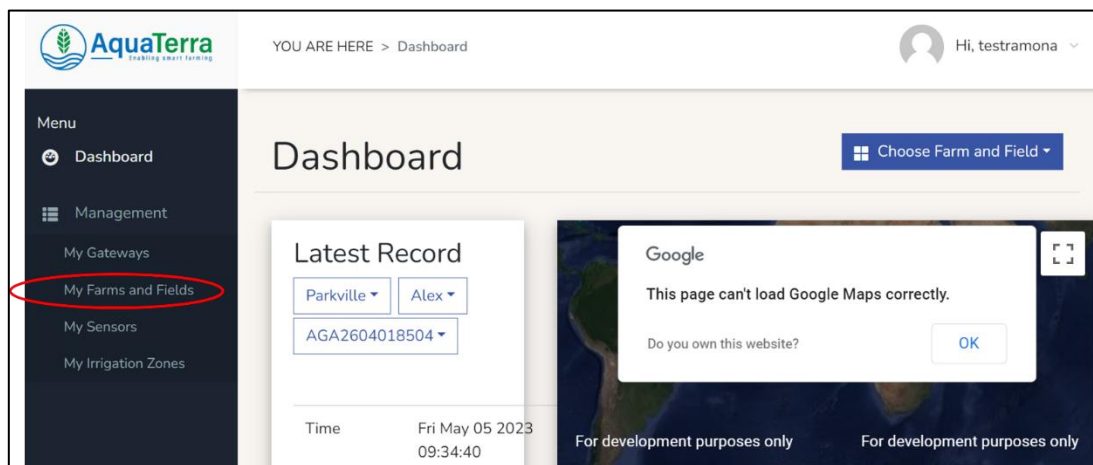
2. Web App

2.1 Website Address

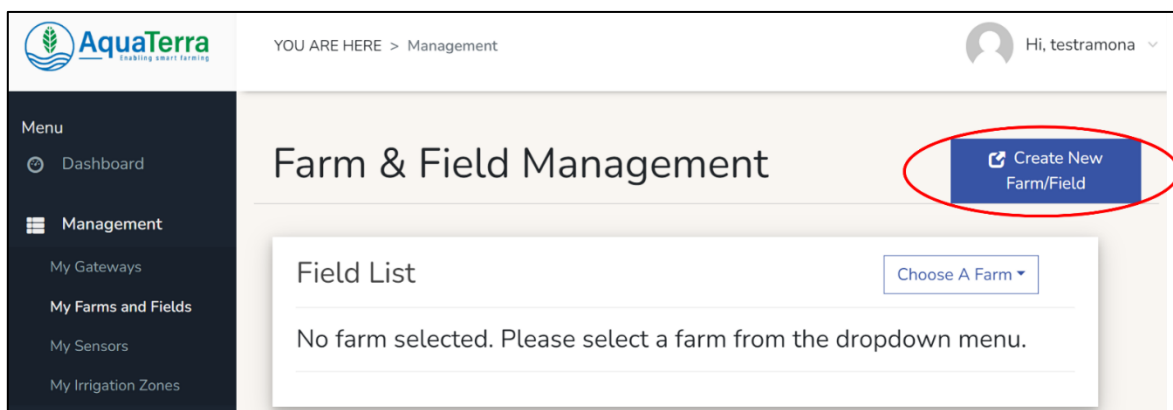
<https://webapp.aquaterra.cloud/#/login>

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.

1 Info 2 Plot 3 Submit

Farm Name Test


Field Name Create "Test"

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).

Field Registration

1 Info 2 Plot 3 Submit

Please draw a polygon shape on the map using the  to outline your field.

The field must be within 1000 metres from the gateway

Enter a location

Hand Tool

Polygon Shape

Melbourne

For development purposes only

Undo Next

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

Field Registration

1 Info 2 Plot 3 Submit

Please submit to finish registering your field:
TEST

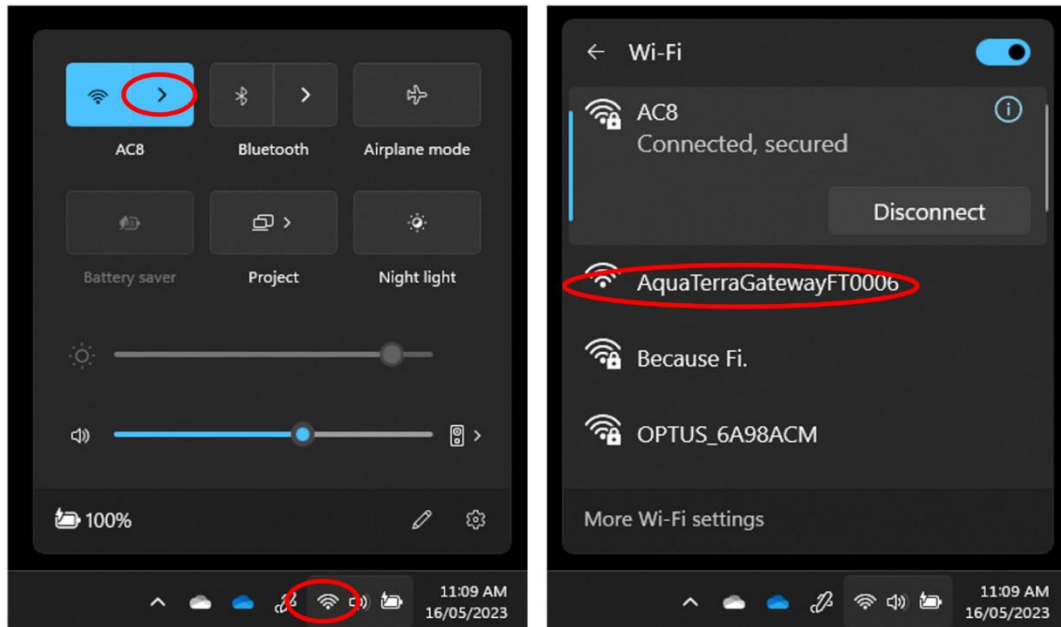
Submit

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.

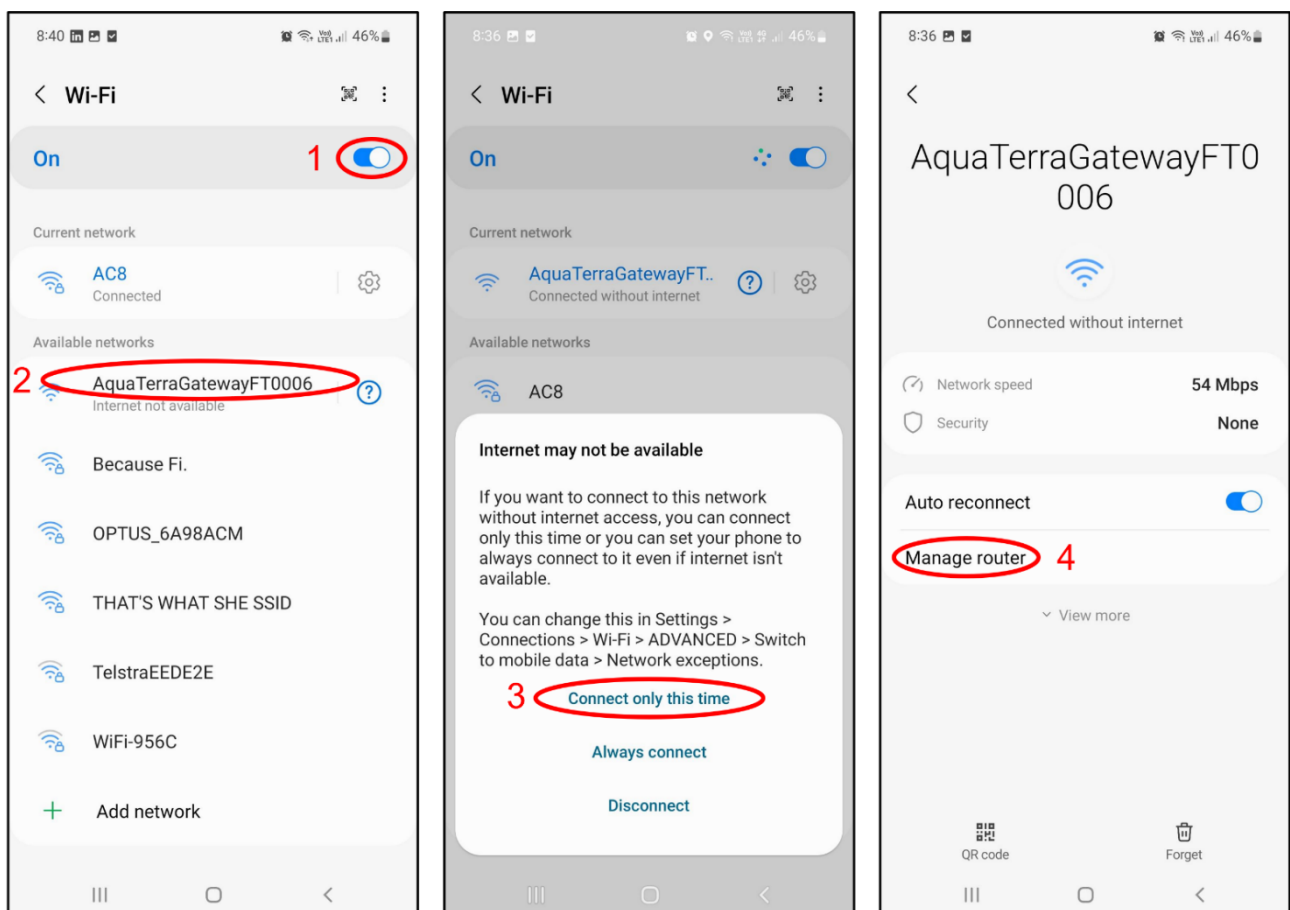
Computer (Windows 11):



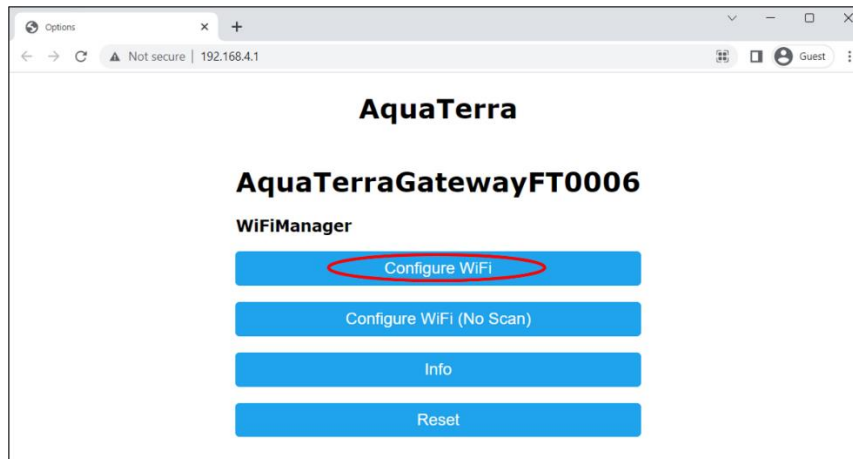
Step 1

Step 2

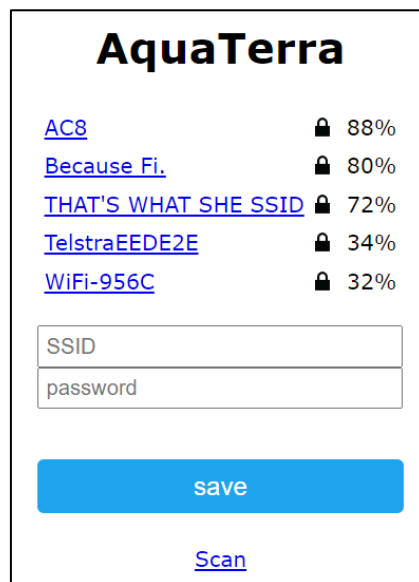
Phone (android):



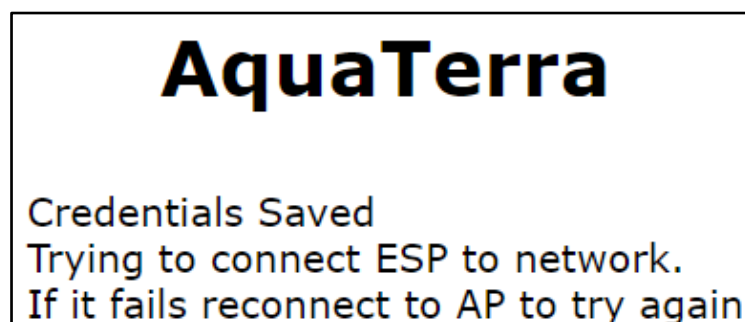
- Once the gateway has been selected the following screen within your default internet browser should show up.



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



- 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.

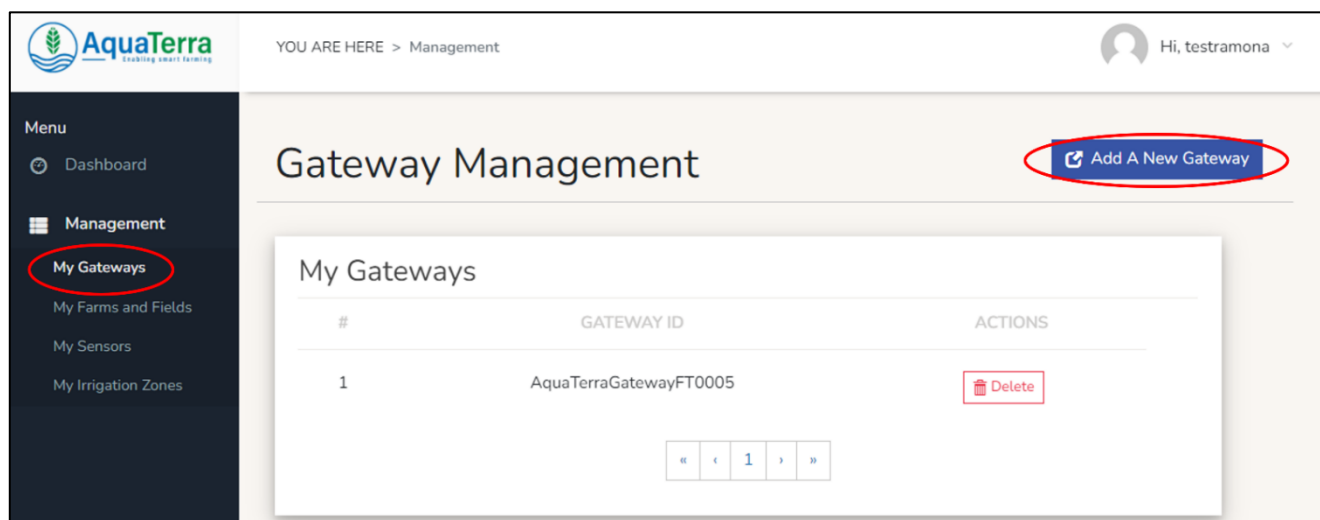


- If the light at the front of the gateway does not remain on, it means that the attempt to connect the gateway to the WiFi was unsuccessful (and the process should be restarted from step 1). If the light is blinking, you will need to disconnect and reconnect the power. If the light is constantly on,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

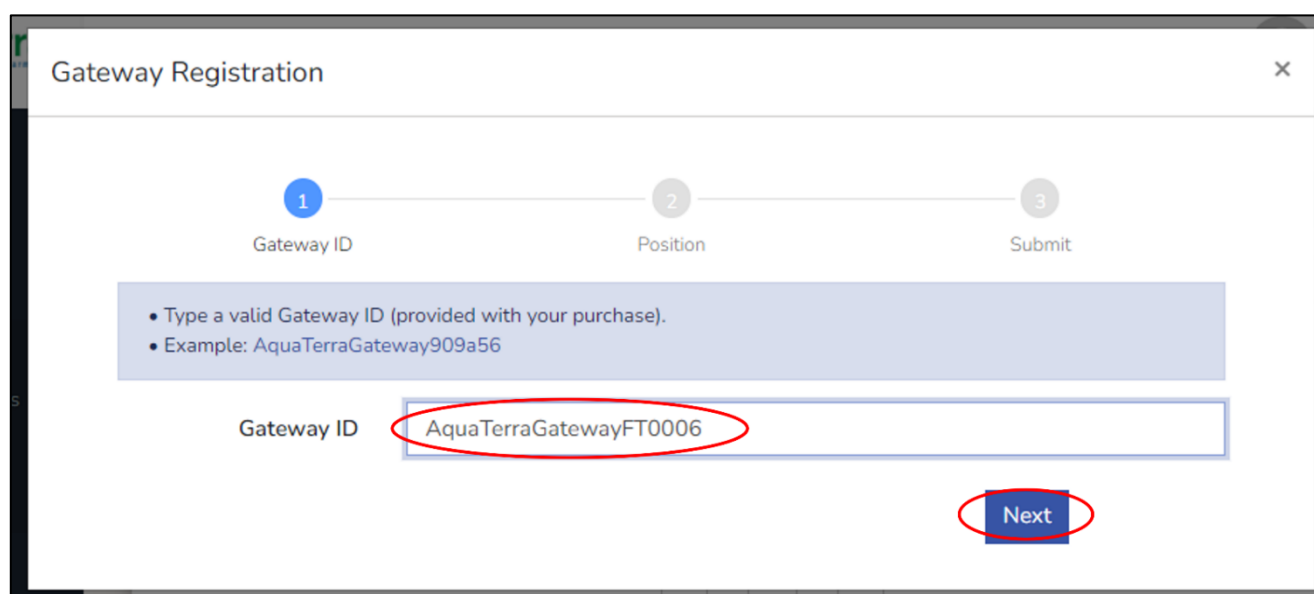
Note: if the gateway has successfully connected to your WiFi, it will now be undetectable by your phone or computer. If you want to connect the gateway to a new WiFi address, please first reset the gateway ([Section 3.4](#)).

3.2 Connecting Gateway to Web App

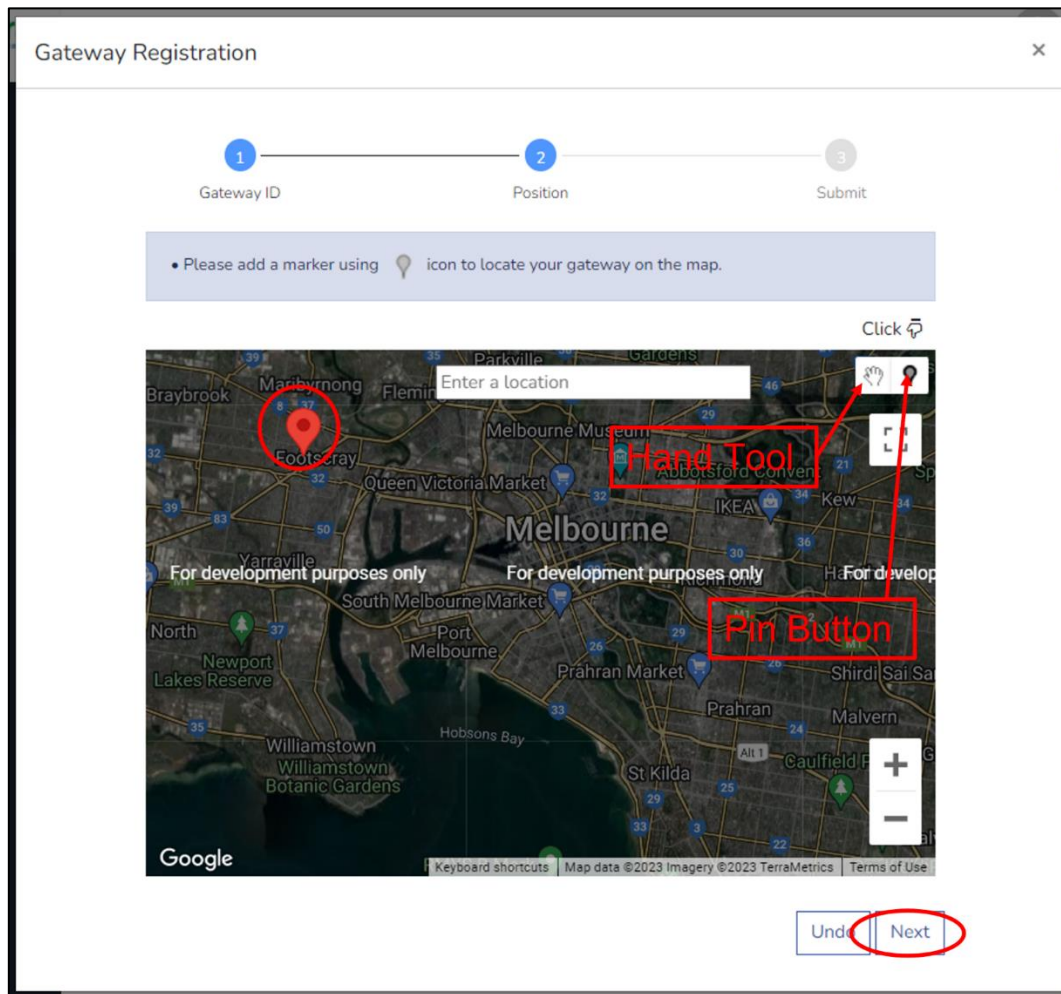
1. First you need to ensure that you have successfully connected the gateway to your WiFi. This can be done by following the steps in [section 3.1](#). Note that the gateway's light will be constantly on if it has established a connection to your WiFi.
2. Now click on "My Gateways" under "Management" on the left side panel. Then click on the "Add A New Gateway" button located on the top right of your screen.



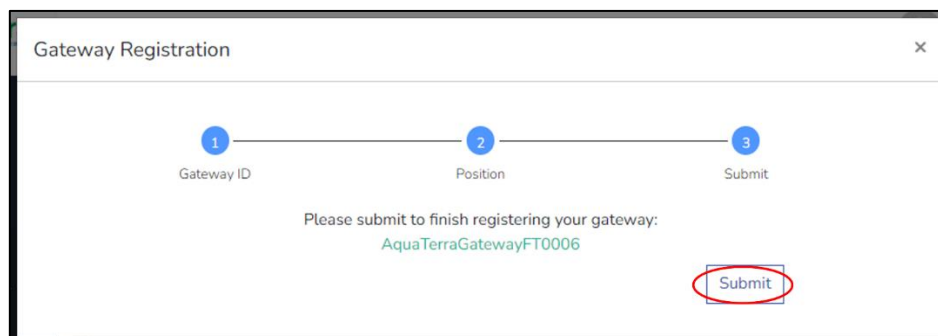
3. You will then be presented with the following pop-up. Please enter the gateway ID located on the front of your gateway. Then select the next button.



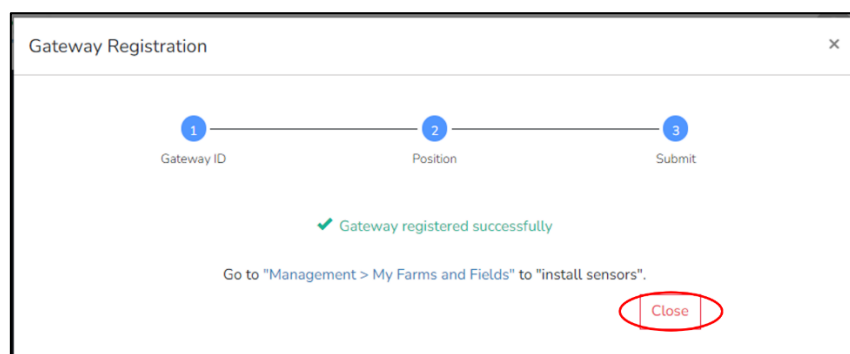
4. Now place the gateway's location on the map. First, use the hand tool to navigate to the location you want to place the gateway. Then select the pin button and click on the desired location on the map. Then select "Next".



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.

The screenshot shows the AquaTerra web application interface. The top header includes the AquaTerra logo, a breadcrumb trail 'YOU ARE HERE > Management', and a user profile 'Hi, testramona'. The left sidebar menu has 'Management' selected, with 'My Gateways' highlighted. The main content area is titled 'Gateway Management' and features a table of gateways. The table has columns for '#', 'GATEWAY ID', and 'ACTIONS'. Two gateways are listed, each with a 'Delete' button circled in red. A pagination control at the bottom shows '1' as the current page.

#	GATEWAY ID	ACTIONS
1	AquaTerraGatewayFT0005	Delete
2	AquaTerraGatewayFT0006	Delete

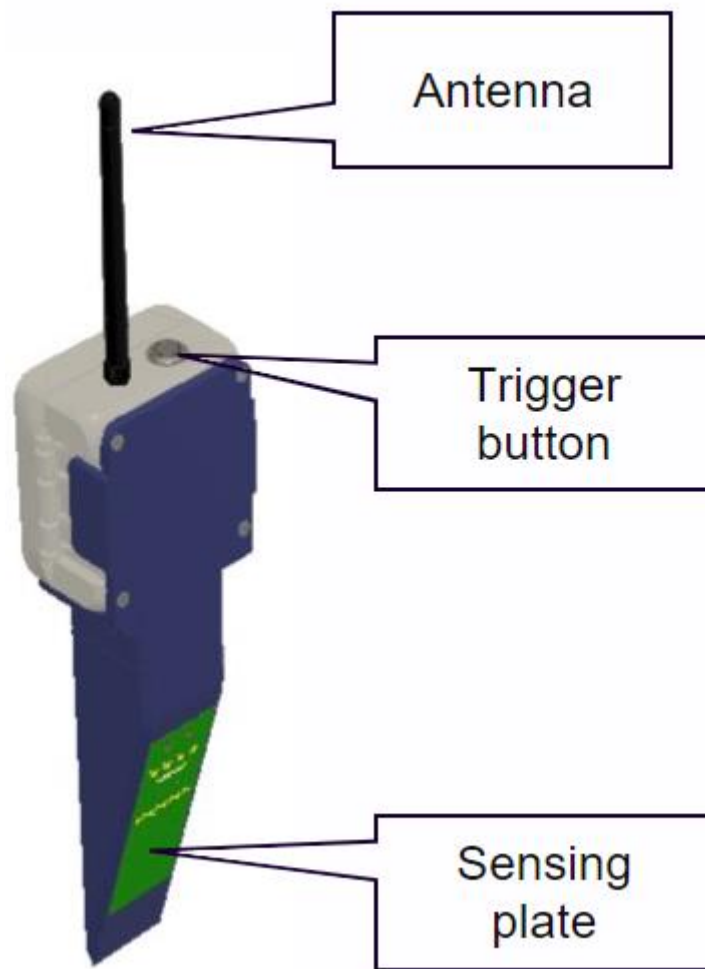
Note: when a gateway is deleted, all the corresponding sensors that are paired with the gateway will also be deleted from the web app.

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:

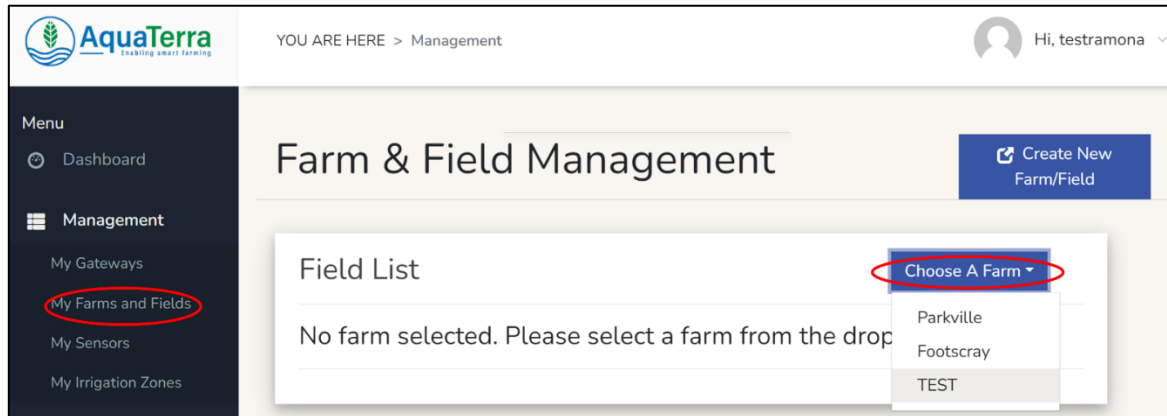
- Short press = send packet/data
- Long press = pairs

Button:

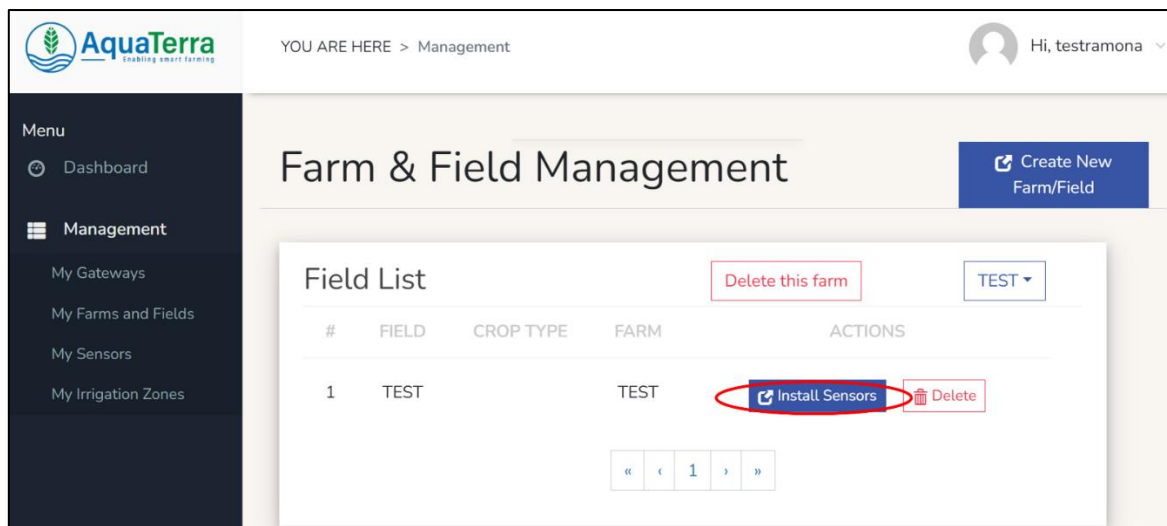
- Blinking = pairing
- Very fast blinking = failed to pair OR failed to send packet (assume sensor has been paired).
- 2 slow blinks = paired successfully OR packet was sent successfully (assumes sensor has been paired).
- When pairing you should get rapid blinks then followed by 2 slow blinks (see note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

4.2 Connecting Old Sensor to Web App

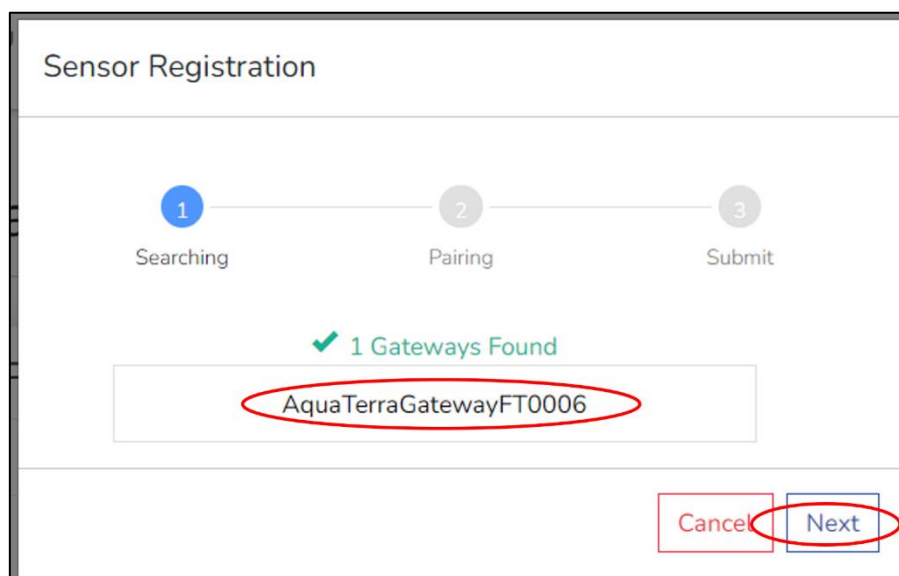
1. Go to “My Farms and Fields” and then click “Choose A Farm” to select the farm you wish to place a sensor in.



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:
- 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).

Sensor Registration


1

2

3

SearchingPairingSubmit

- Press and hold the physical sensor button until it flashes, one sensor at a time.
- Wait about 60 seconds and the sensor will flash twice after the sensor has successfully paired with the gateway.
- If pairing is unsuccessful, the sensor will flash rapidly, in that case, retry step 1 or contact AquaTerra support



CancelNext

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".

Sensor Registration

1

2

3

Searching

Pairing

Submit


You already have 1 sensor(s) registered.


- AGA2819515139

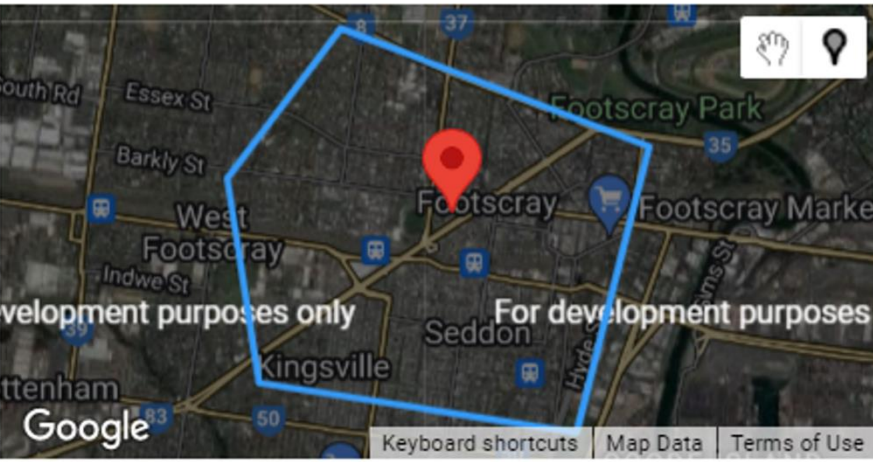
Please select a gatewayID, enter the new sensorID and click sensor location.

☒ AquaTerraGatewayFT0006

AGA2819515139

- Please place a marker using  icon to locate your sensor on the map.

Click 



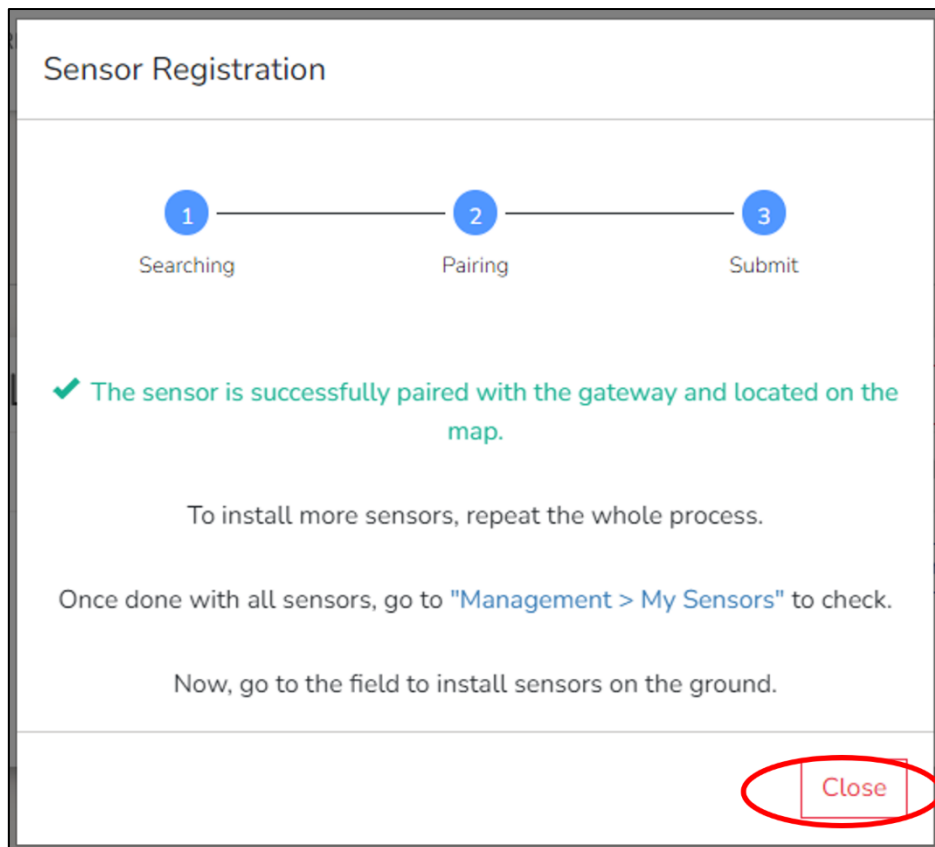
Keyboard shortcuts | Map Data | Terms of Use

Cancel

Undo

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](#).

The screenshot shows the AquaTerra web application interface. The top navigation bar includes the AquaTerra logo, the text 'YOU ARE HERE > Management', and a user profile 'Hi, testramona'. The left sidebar contains a 'Menu' with options: 'Dashboard', 'Management', 'My Gateways', 'My Farms and Fields', 'My Sensors' (highlighted with a red circle), and 'My Irrigation Zones'. The main content area is titled 'Sensor Management' and features a 'Create New Sensor' button. Below this is a 'Sensor List' table with columns: '#', 'ID', 'GATEWAY', 'FIELD NAME', and 'ACTIONS'. The table lists two sensors, both with 'Alex' as the field name. The 'ACTIONS' column for each sensor contains 'Edit' and 'Delete' buttons, with the 'Delete' buttons circled in red.

#	ID	GATEWAY	FIELD NAME	ACTIONS
1	AGA2604018504	AquaTerraGatewayFT0005	Alex	Edit Delete
2	AGA0488375483	AquaTerraGatewayFT0005	Alex	Edit Delete

4.4 Manually Send Packet

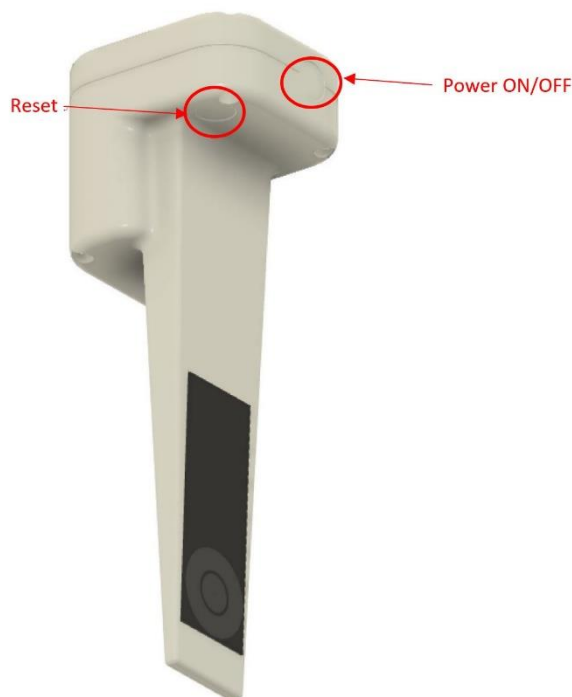
Hold down the button until it lights up. Then let go. The button will either rapidly blink (which means the packet/sensor data failed to send) OR it will blink twice if the packet/sensor data was successfully sent to the web-app. If it fails, you will have to repeat the pairing process ([section 4.2](#)). 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:

The screenshot shows the AquaTerra web application interface. The top navigation bar includes the AquaTerra logo, the text 'YOU ARE HERE > Dashboard', and a user profile 'Hi, testramona'. The left sidebar contains a 'Menu' with options: 'Dashboard' (highlighted with a red circle), 'Management', 'My Gateways', 'My Farms and Fields', 'My Sensors', and 'My Irrigation Zones'. The main content area is titled 'Dashboard' and features a 'Choose Farm and Field' button. Below this is a 'Latest Record' card. The card has two dropdown menus for 'Farm' and 'Field', both set to 'Footscray'. Below these is a dropdown for 'Sensor ID' set to 'AGA2819515139'. The card also displays a list of sensor data: Time (Tue May 15 2023 19:00:27), Moisture (22.7%), Temperature (19.5 °C), Battery (4.15 V), Sensor ID (AGA2819515139), and Alias (---). A 'View Detail' button is at the bottom. Red boxes and arrows highlight the 'Farm', 'Field', and 'Sensor ID' fields. A Google Maps error message is visible in the background.

Time	Moisture	Temperature	Battery	Sensor ID	Alias
Tue May 15 2023 19:00:27	22.7%	19.5 °C	4.15 V	AGA2819515139	---

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.

The screenshot shows the AquaTerra web application interface. The top header includes the AquaTerra logo, the text 'YOU ARE HERE > Management', and a user profile icon with the text 'Hi, demo'. The left sidebar contains a 'Menu' section with 'Dashboard', 'Management', 'My Gateways', 'My Farms and Fields', 'My Sensors' (highlighted with a red circle), and 'My Irrigation Zones'. The main content area is titled 'Sensor Management' and contains a 'Sensor List' box. Inside the 'Sensor List' box, there is a message: 'No field selected. Please select a field from the dropdown menu.' To the right of this message is a dropdown menu labeled 'Choose A Field' (highlighted with a red circle). The dropdown menu is open, showing a list of fields: 'TEST FARM field 1', 'DEMOFARM Mornington', 'TELSTRANETWORKTEST South Lawn', and 'MULTIDEPTH FARM Multidepth field'.

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”.

The screenshot shows the AquaTerra web application interface after selecting a field. The top header and left sidebar are the same as in the previous screenshot. The main content area is titled 'Sensor Management' and contains a 'Sensor List' box. In the top right corner of the 'Sensor List' box, there is a button labeled 'Create New Sensor' (highlighted with a red circle). Below this button is a dropdown menu labeled 'South Lawn'. The 'Sensor List' box contains a table with the following data:

#	ID	GATEWAY	FIELD NAME	ACTIONS
1	bg95-iot2		South Lawn	Edit Delete
2	bg95-iot1		South Lawn	Edit Delete


At the bottom of the table, there is a pagination control showing '« < 1 > »'.

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 you're 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"


View and Edit Sensor

Sensor Id

bg95-iot1

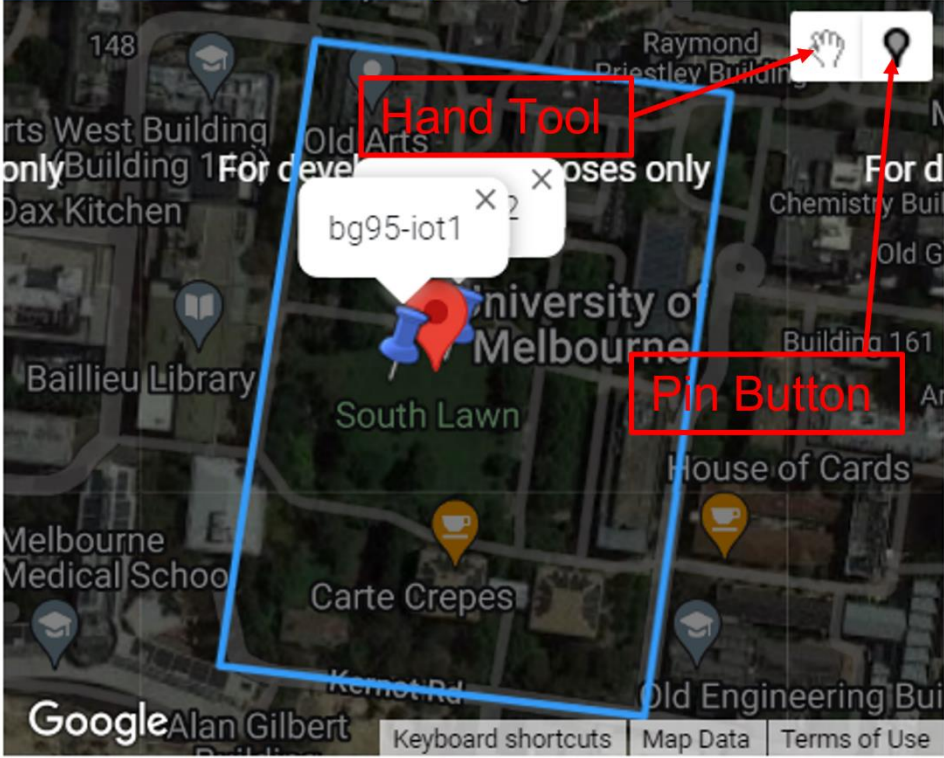
- Please place a marker using  icon to locate your sensor on the map.

Show Installed Sensors

Click 

Hand Tool


Pin Button



Close

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”.

 **AquaTerra**
enabling smart farming

YOU ARE HERE > Management

Inserting new sensor succeeded

Menu

- Dashboard
- Management
 - My Gateways
 - My Farms and Fields
 - My Sensors
 - My Irrigation Zones

Sensor Management

Create New Sensor

Sensor List

South Lawn ▾

#	ID	GATEWAY	FIELD NAME	ACTIONS
1	bg95-iot		South Lawn	<div>Edit</div> <div>Delete</div>
2	bg95-iot2		South Lawn	<div>Edit</div> <div>Delete</div>
3	bg95-iot1		South Lawn	<div>Edit</div> <div>Delete</div>

«

«

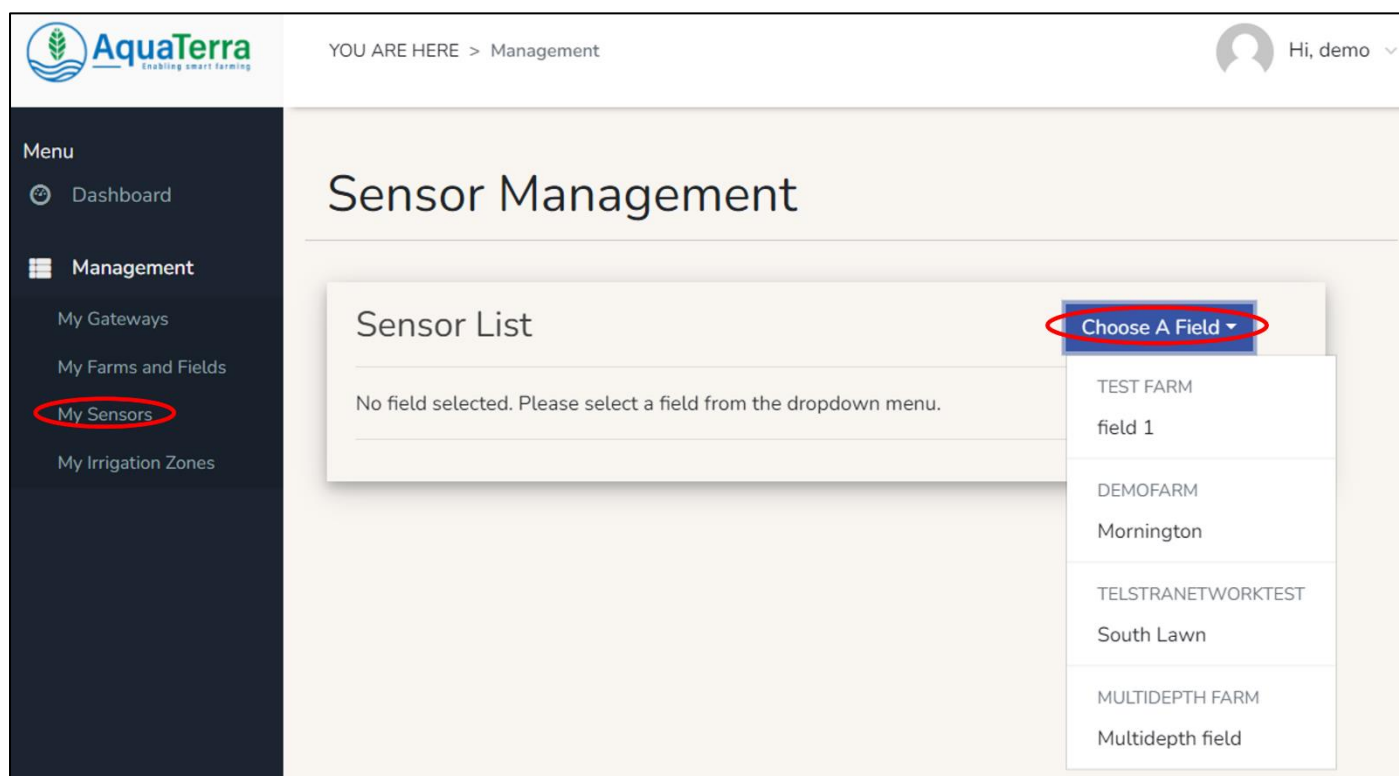
1

»

»

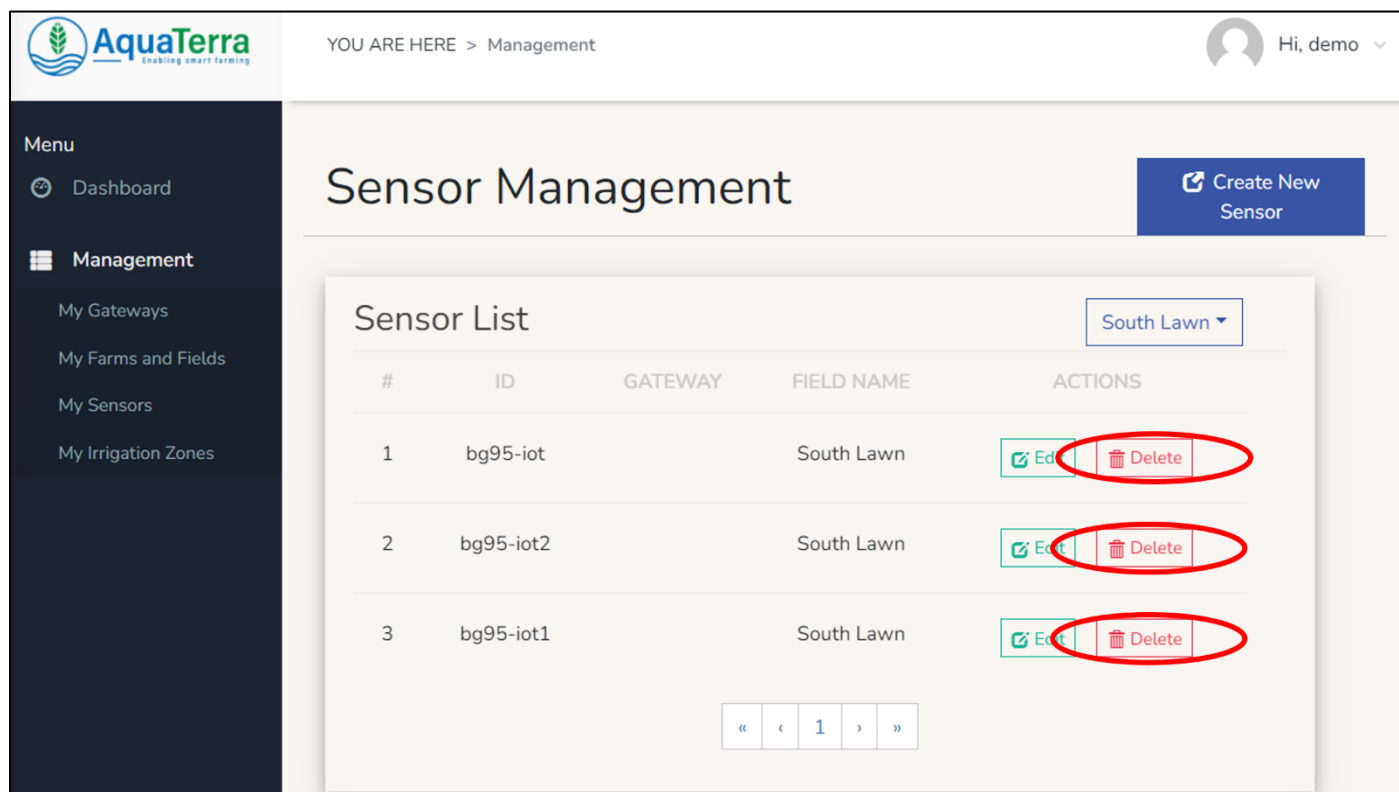
5.4 Resetting an Existing Sensor

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.



The screenshot shows the AquaTerra web application interface. The left sidebar contains a 'Menu' with 'Management' selected, and 'My Sensors' highlighted with a red circle. The main content area is titled 'Sensor Management' and features a 'Sensor List' section. A dropdown menu labeled 'Choose A Field' is open, showing a list of fields: TEST FARM, field 1, DEMOFARM, Mornington, TELSTRANETWORKTEST, South Lawn, MULTIDEPTH FARM, and Multidepth field. The 'Choose A Field' button is also circled in red.

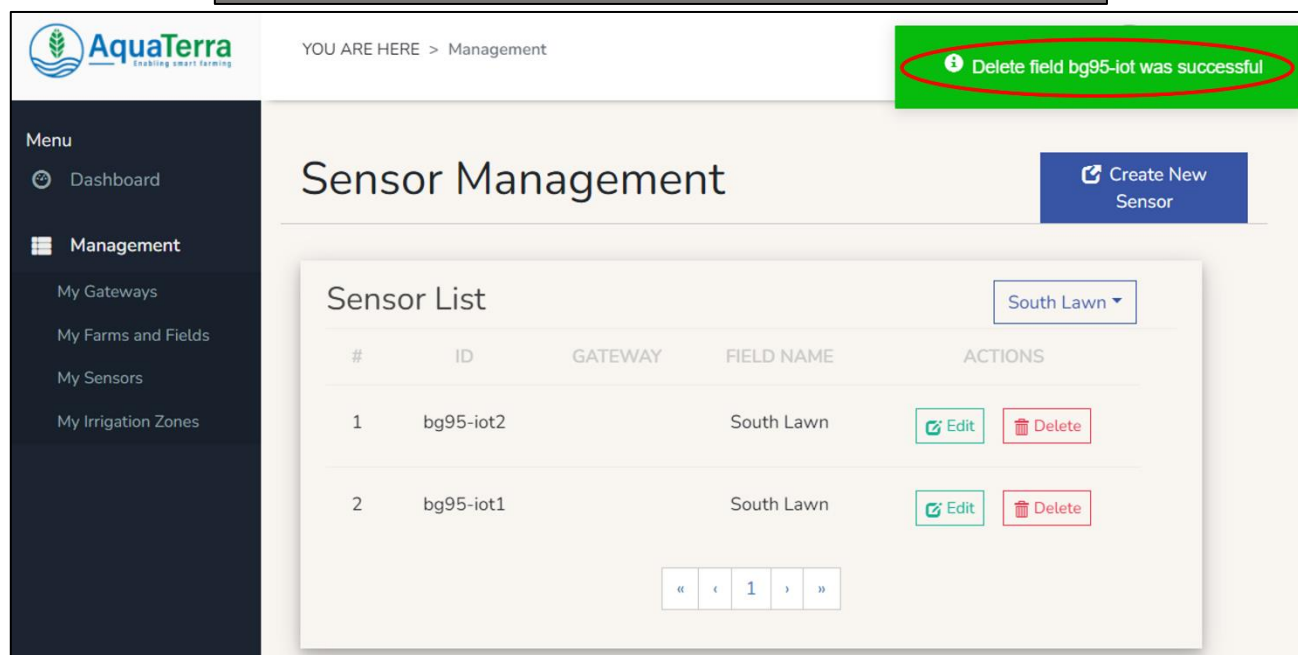
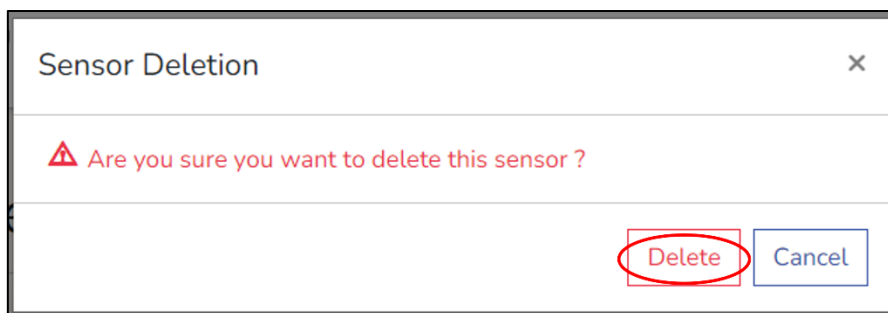
2. You will be presented with a list of sensors that are in the selected field. Select the delete button for the sensor that you wish to reset. An example list and delete button is shown below.



The screenshot shows the AquaTerra web application interface with 'South Lawn' selected in the dropdown. The 'Sensor List' table displays three sensors, each with a 'Delete' button circled in red. The table has columns for #, ID, GATEWAY, FIELD NAME, and ACTIONS. A 'Create New Sensor' button is visible in the top right corner.

#	ID	GATEWAY	FIELD NAME	ACTIONS
1	bg95-iot		South Lawn	Edit Delete
2	bg95-iot2		South Lawn	Edit Delete
3	bg95-iot1		South Lawn	Edit Delete

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:

