Atlas Scientific™
Environmental Robotics

v 2.5

Updated 4/25

New Version

Atlas Desktop™

Monitoring Software

Installation and Users Guide

This is an evolving document, check back for updates.

Table of contents

For Advanced Users

Installation guide

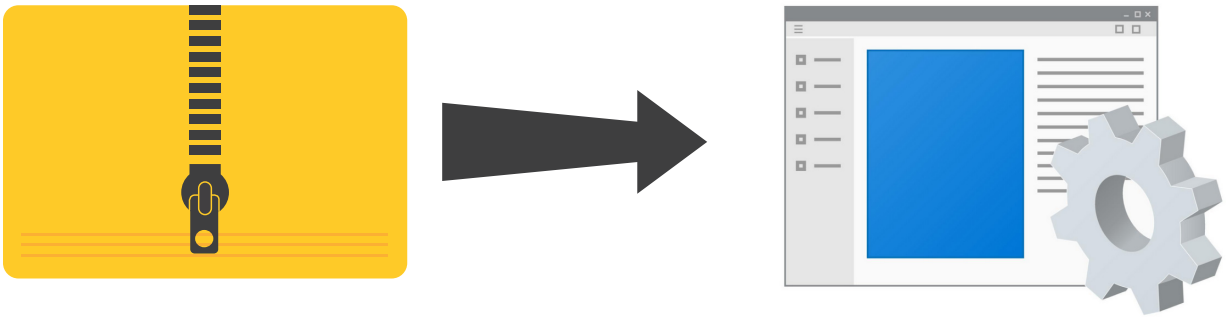
Step 1

The AtlasDesktop™ Monitoring Software is 100% free.

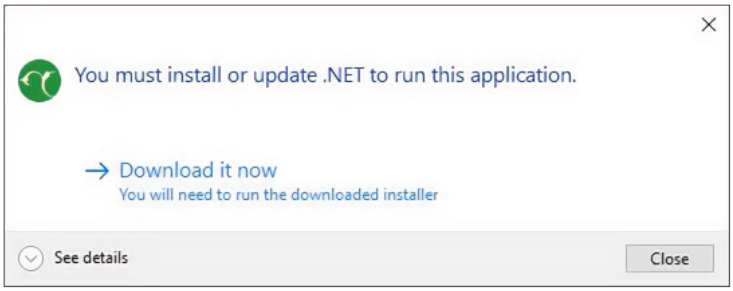
Click **HERE** to download the AtlasDesktop™ Monitoring Software for Windows. *(~101mb)*

Step 2

Once the *.zip file has been downloaded, open the *.zip and run the Setup file.



The Atlas Desktop Monitoring Software uses .NET Core; if you do not have it on your computer, the installer may request that you download and install .NET Core.



Continue following the on-screen instructions for the rest of the installation.

Step 3

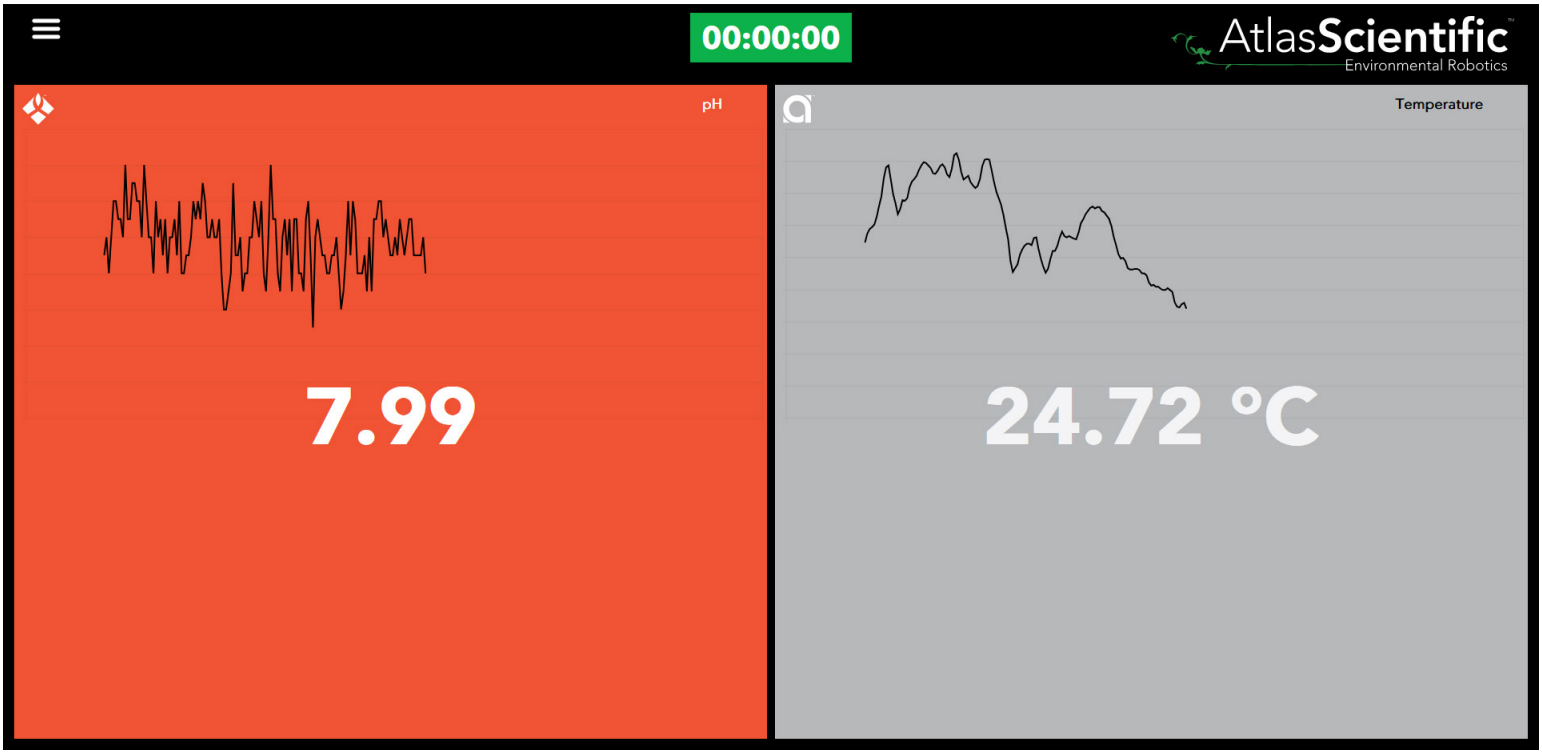
When the installation is complete, run the Atlas Desktop Icon on your desktop to launch the monitoring software. *(A web browser will open)*

Home screen

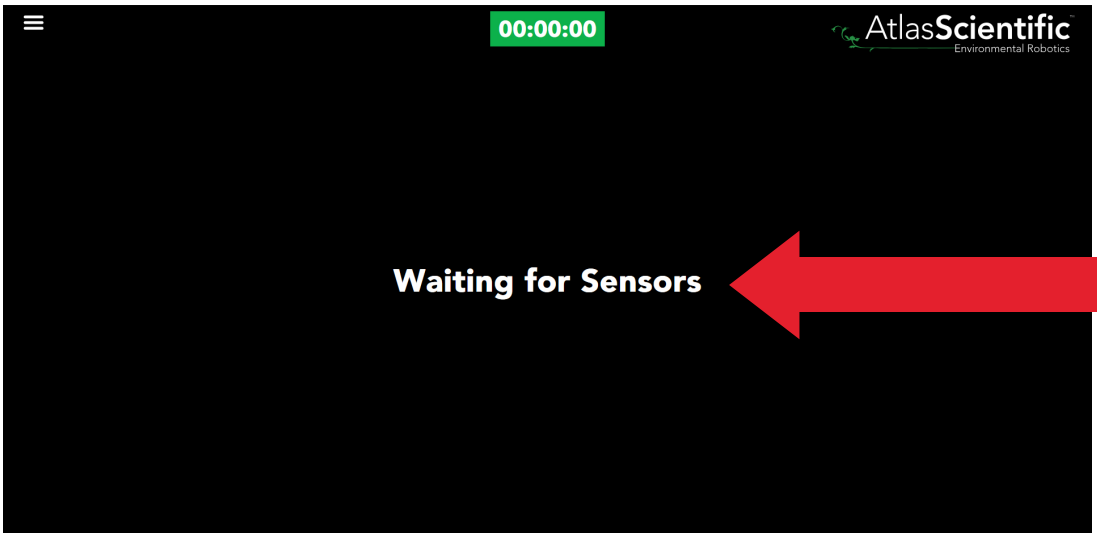
The AtlasDesktop™ Monitoring Software runs in a browser; when you run the software, the first page you'll see is the Home screen. Here you can see which EZO sensors have been connected to your PC, and their current readings.

In the image below, two EZO sensors are shown *(pH & Temperature)*. Each, taking its own readings and graphing the data as time passes. There is also timer on the top of the home page, click once to start and again to stop; Allowing you to run timed experiments from the home screen, should you wish to do so.

You can have up to ***9 sensors*** on the screen at one time; this includes multiple sensors of the same type.

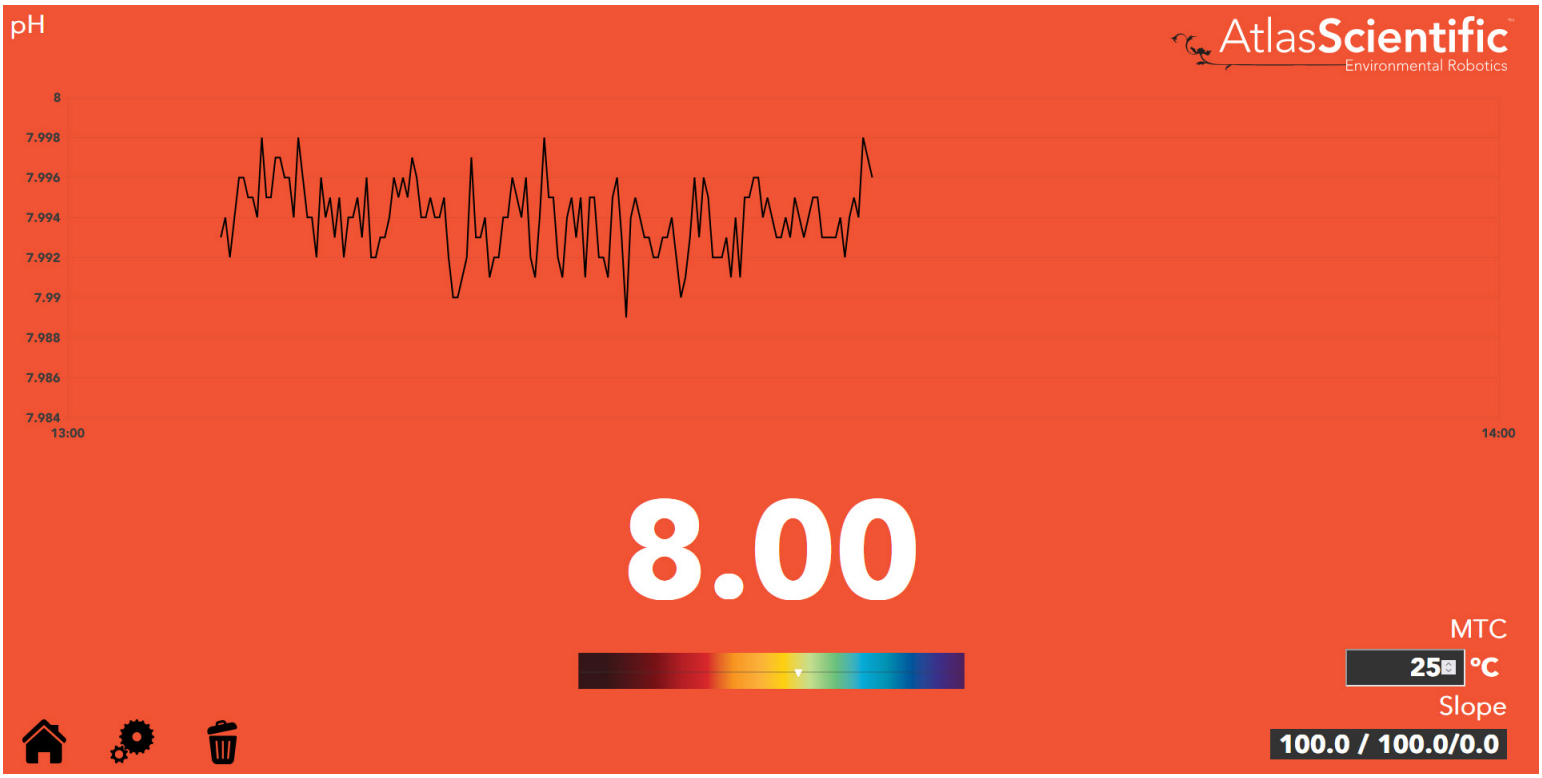


If the software cannot detect any Atlas Scientific EZO sensors, you'll see this message:



Reading screen

Clicking on one of the EZO sensors from the home screen, will take you to that sensors reading screen; Within this screen you will find the sensors current reading, graphed data, sensor setup and calibration page.



Home Button
Returns to home screen

Gears Button
Sensor calibration / Setup

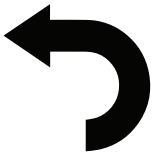
Trash Button
Clears graph data

Calibration screen

Clicking on the gears button will bring you to that sensors calibration screen *(not all sensors have a calibration screen)*. From here, you can re-calibrate the sensor, clear the sensors calibration, go back to home or enter the Senors setup / Alarms page.

Performing sensor calibration is easy to do, and very intuitive. Just follow the on-screen calibration steps.

Basic understanding of the sensor calibration is required.
For more information on calibration, see the specific sensors datasheet.



Back Button
Go back one screen

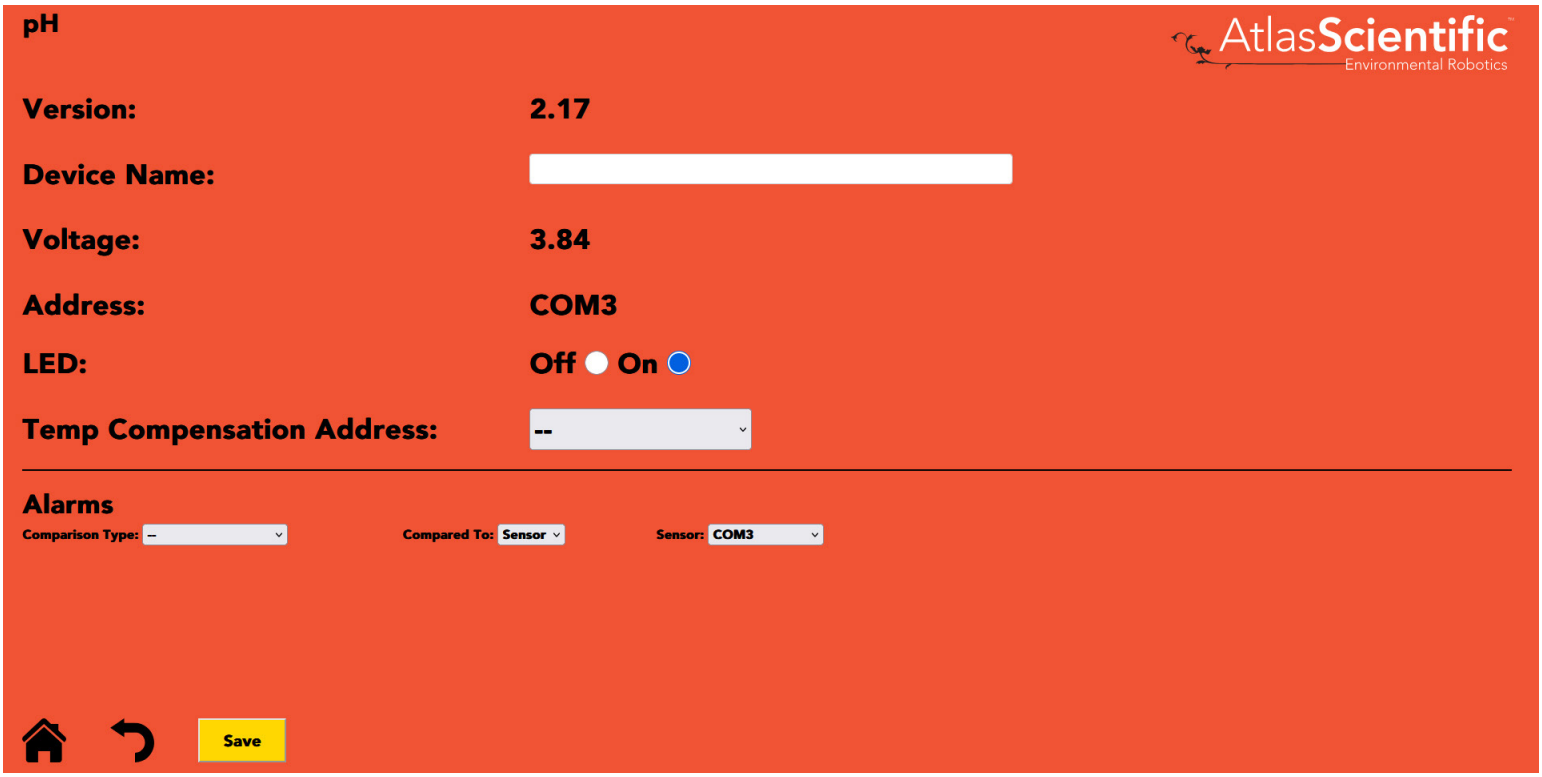
Gear & Wrench Button
Sensor setup / Alarms

Sensor setup / Alarms screen

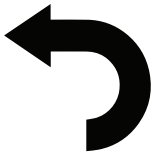
The sensor setup screen is mostly the same for all EZO sensors.

On this screen you can see the sensors version number, give the sensor a specific name *(if there are more than one of the same type)*, see the voltage being used, see the sensors I2C address, enable / disable the LEDs, and set the sensors temp compensation *(if a temperature sensor is also connected to the software)*.

You can also set an alarm for this sensor, which we'll cover in the next page.



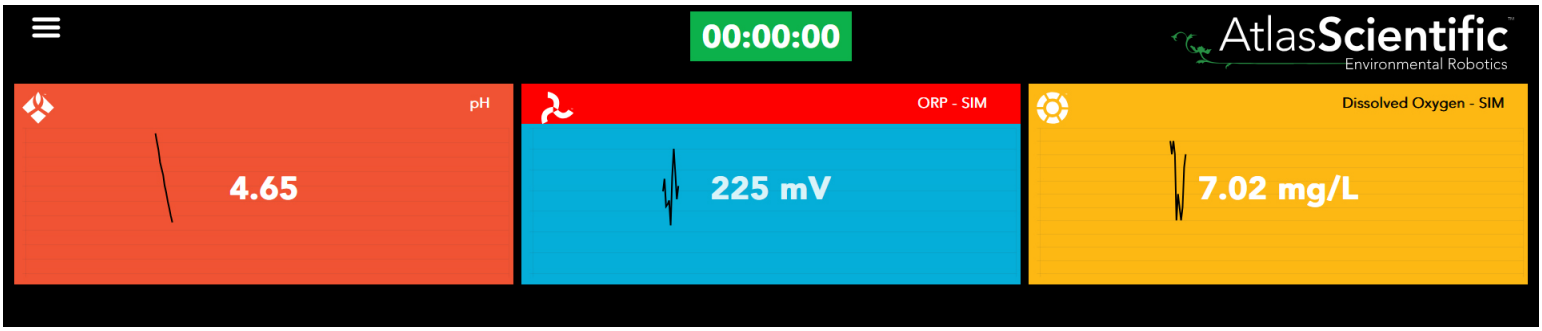
Home Button
Returns to home screen



Back Button
Go back one screen

Alarms

The alarm is a silent indication that an event has triggered. When an alarm has triggered, the top of that sensors window will turn red. As you can see in the example below; The top of the ORP window has turned red. Indicating an alarm has been triggered.



To simplify the process, every Atlas Scientific sensor has the same alarm settings.

Comparison Type

This field allows you to set how the alarm will trigger. Options within this field are:
< Less than, <= Less than or Equal, = Equal, => Greater than or Equal, and > Greater than.

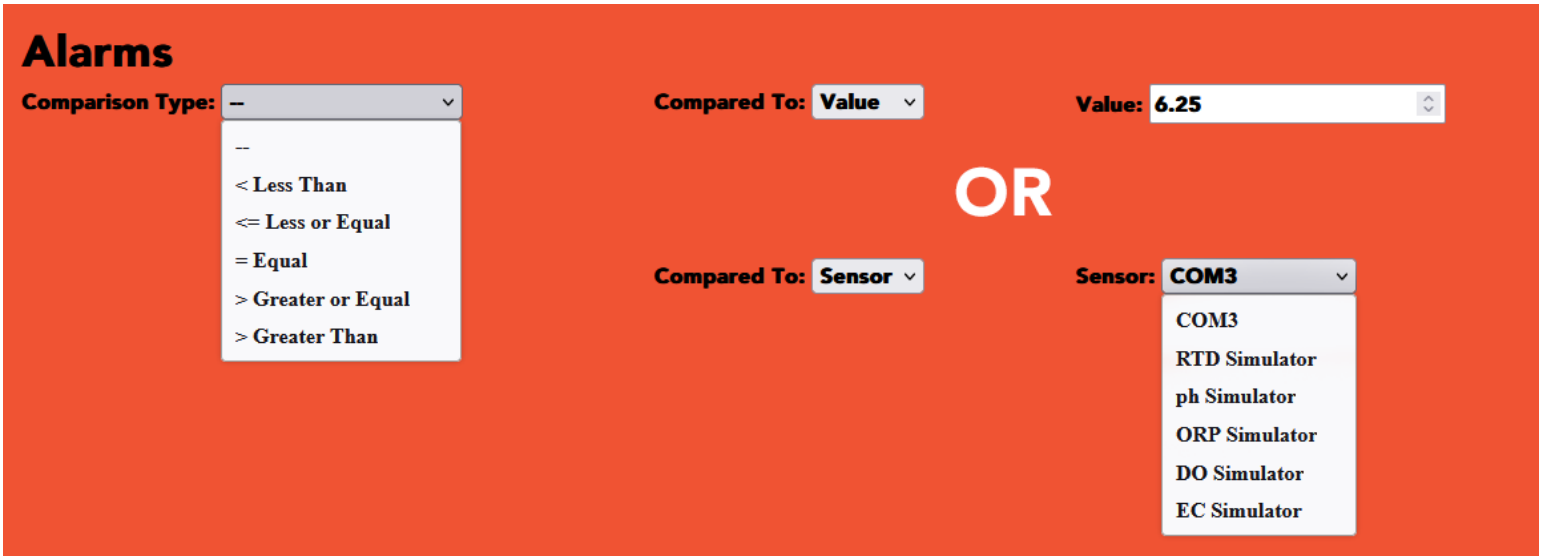
To disbale the alarm choose the "--" blank option.

Compared To

This field allows you to choose how to compare your readings; to a value or to a sensor.

Value / Sensor

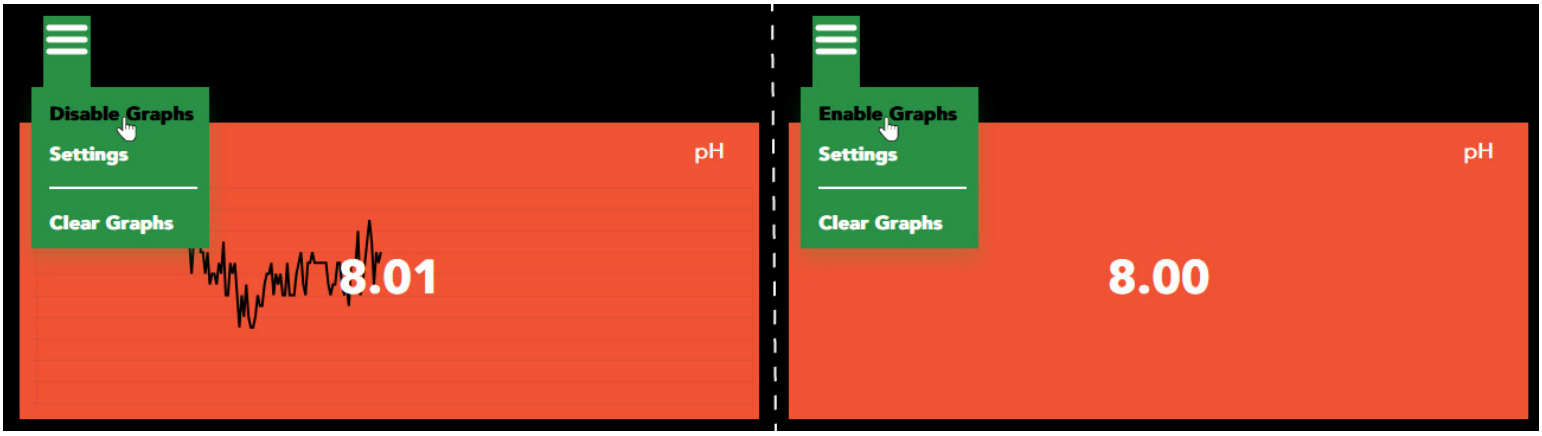
This field allows you to set a specific value or you can set it to a specific sensor.
This is great if you wanted to compare readings from two of the same type of sensor.



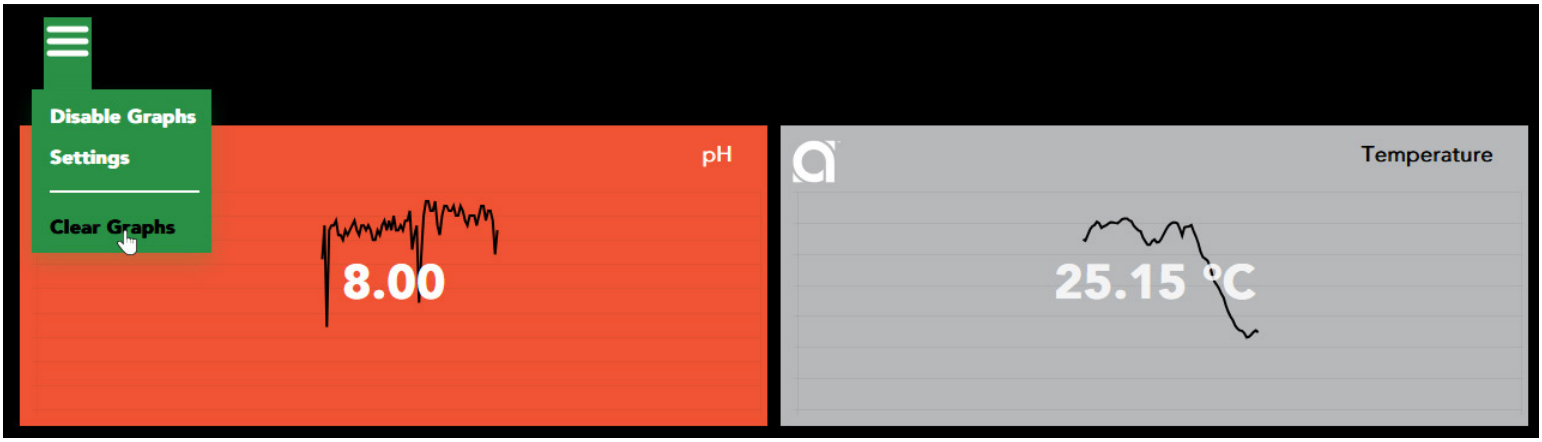
Disable / Enable graphs

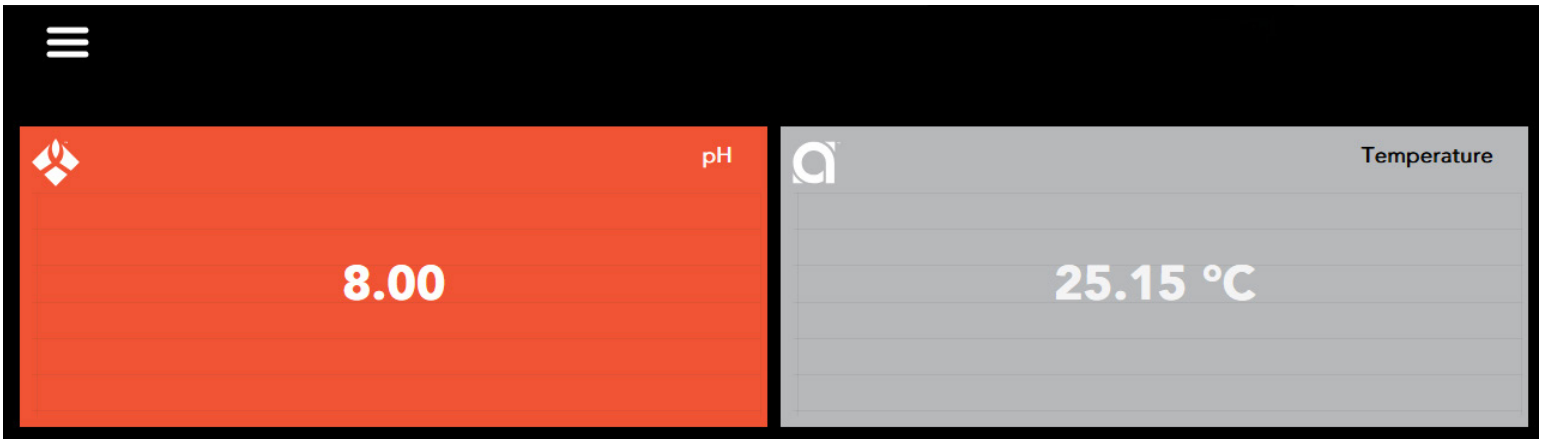
It's possible to disable the graphs on the home screen; Simply hover over the menu icon, on the home screen and click on "Disable Graphs". During this time the sensors are still gathering data and plotting points to the graphs, although it will not be visible to you.

If you would like to re-enable the graphs, return to the menu and click on "Enable Graphs"



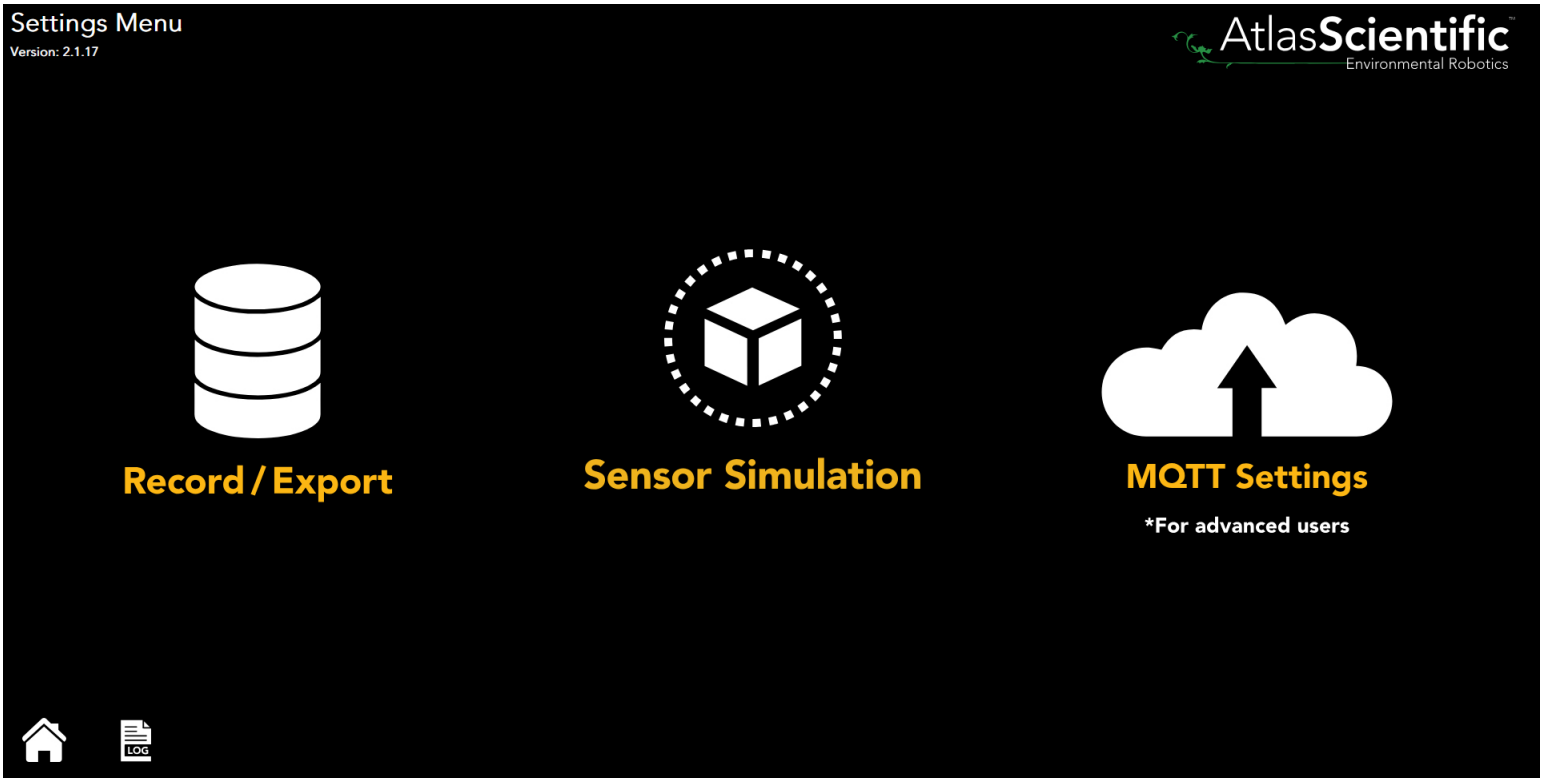
Within this menu, you can also clear all graphs and go to the software settings menu.





Settings menu

You can access the settings menu from the home screen, by hovering over the menu icon, and choosing "Settings"



**The software version number is displayed on the top left corner of this screen.*

Home Button
Returns to home screen

View Log Button
Opens log file

Within this screen you'll see three options:
Record / Export, **Sensor Simulation** and **MQTT Settings**.

Record / Export

Allows you to save and export all of your sensor readings.

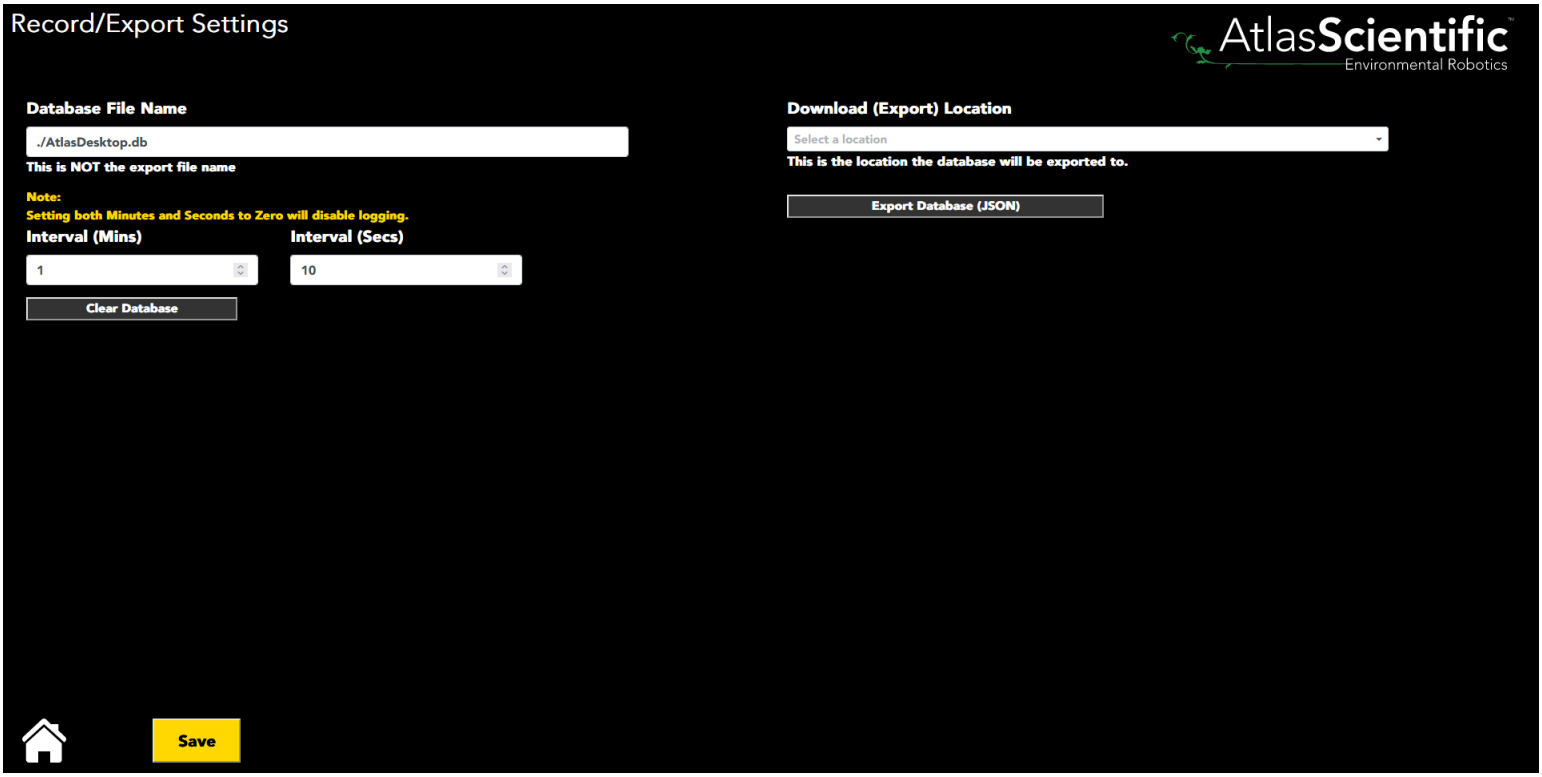
Sensor Simulation

Allows you to enable / disable simluation of all our compatible EZO sensors.

MQTT Settings*

Allows you to publish your readings to another device.
**this setting is for advanced users.*

Record / export settings



Database File Name - The file name and location of your recoreded readings.

AtlasDesktop.db - is the default file name.

Interval (mins) / (secs) - Sets how often the database is recoreded.

Example - 1 minute / 10 seconds

*Setting both minute and seconds to zero will disable data logging.

Download (Export) Location - Exports saved data to Documents or an external drive.

Example - Documents

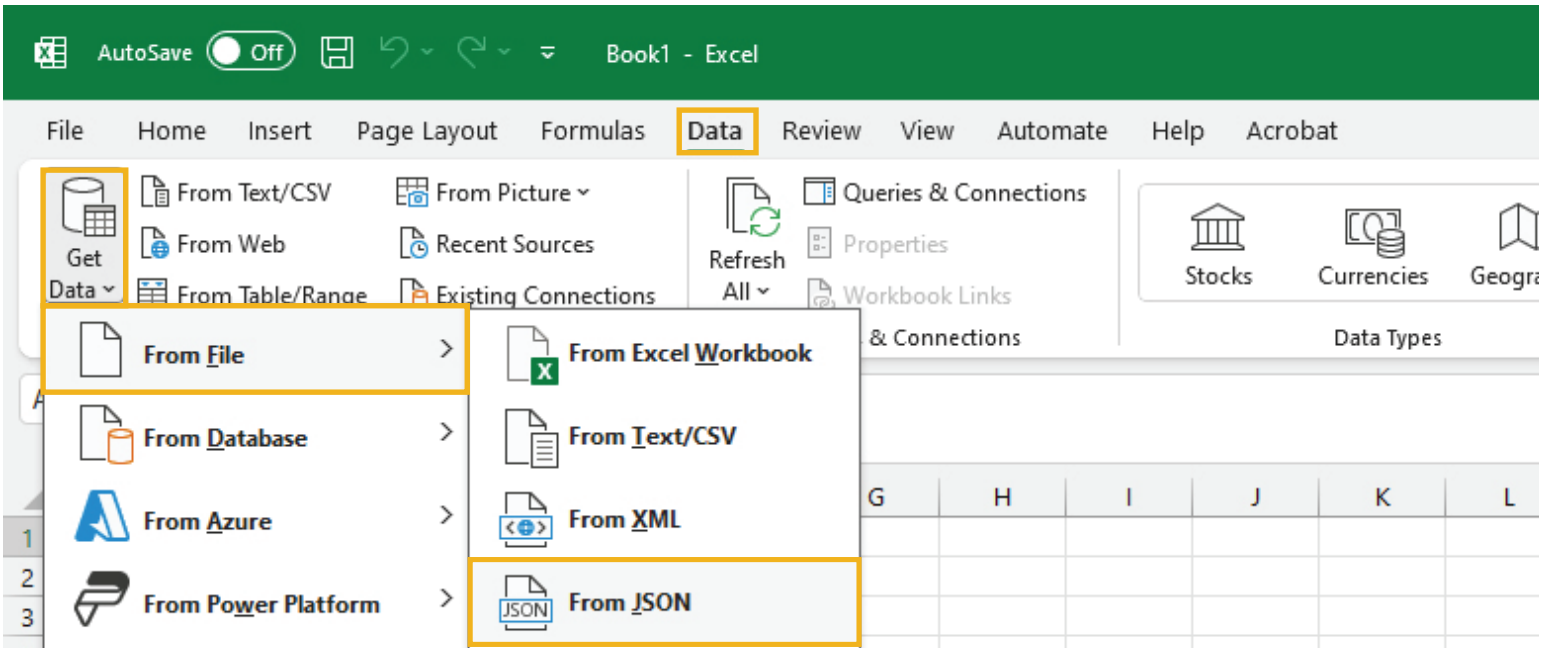
The exported file is a *.JSON file, and can be imported directly into Excel.

How to import the JSON file into Excel

After you have exported your readings into a JSON file, you can then import this file directly into Excel.

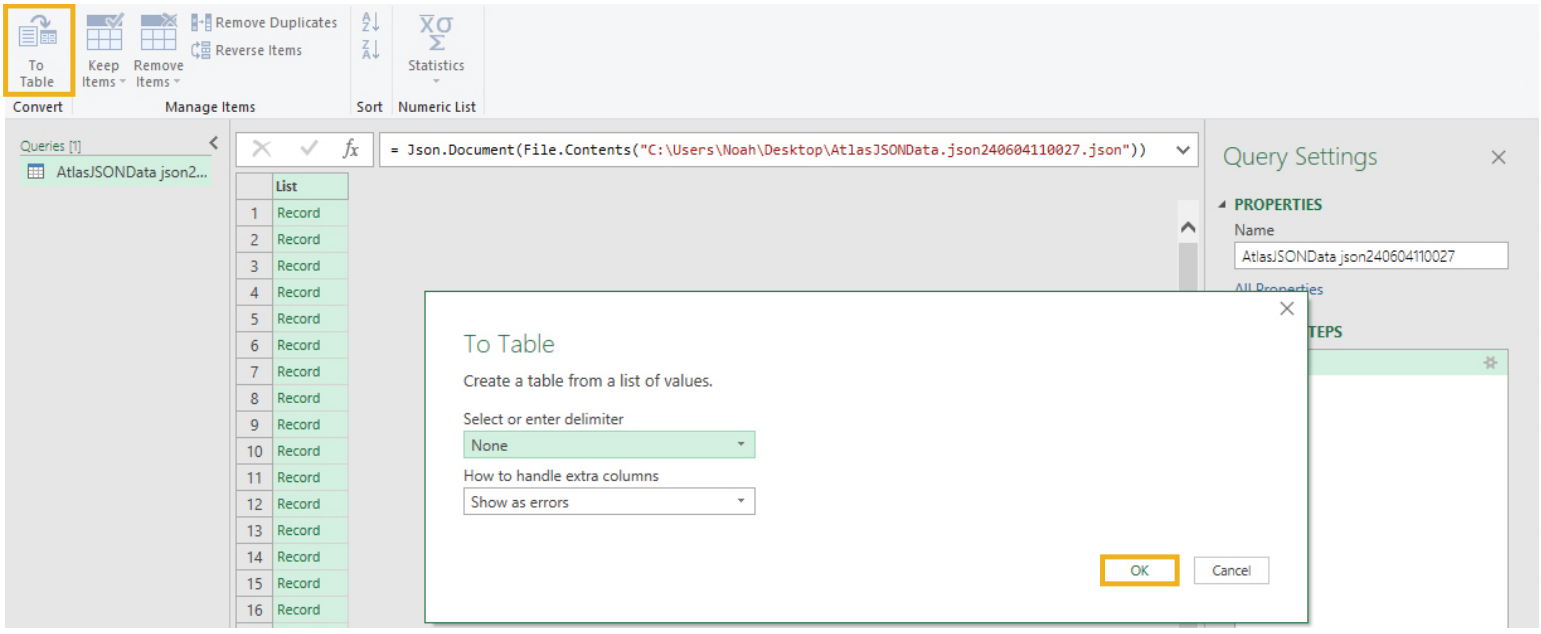
Step 1

Within Excel, click on the Data tab, and then click the "Get Data" button located at the top right coner. Then click on "From File" and then "From JSON".



Step 2

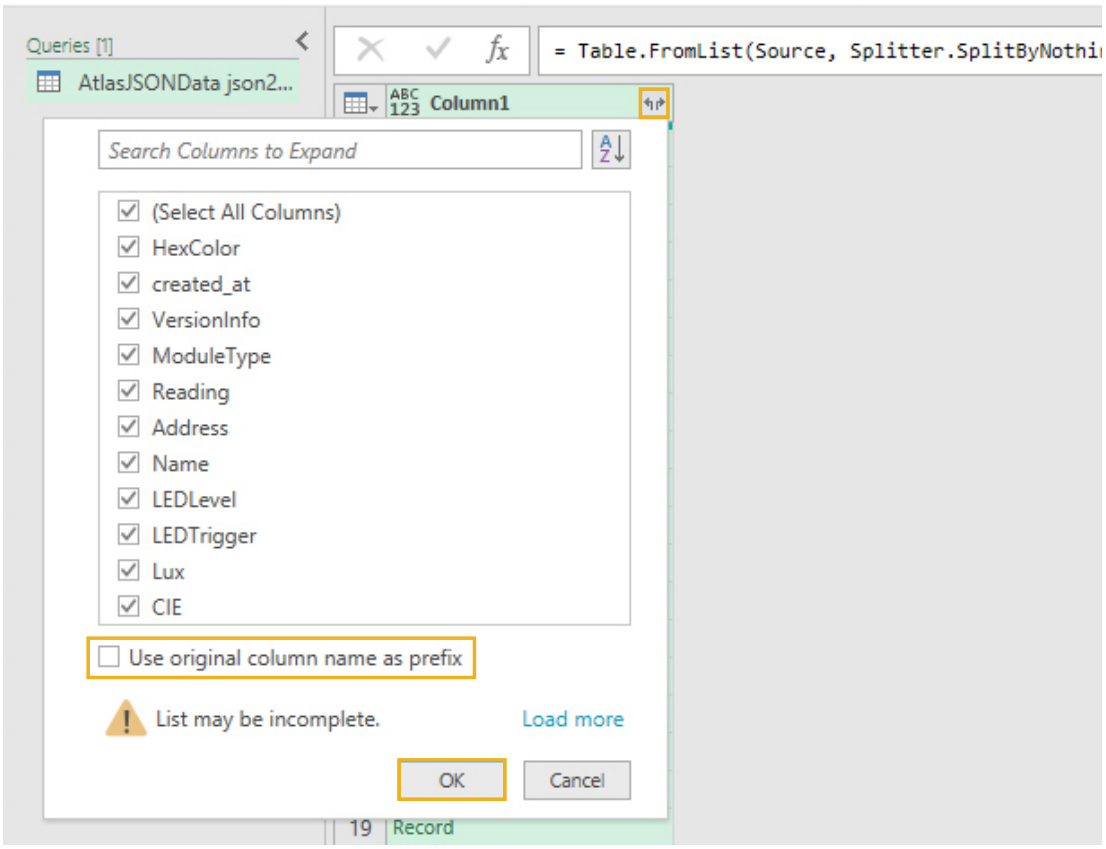
Choose the JSON file you want to open. After chosing the file, a new window will open in Excel. Click on the "To Table" Button, and then click "OK" within the new window.



How to import the JSON file into Excel

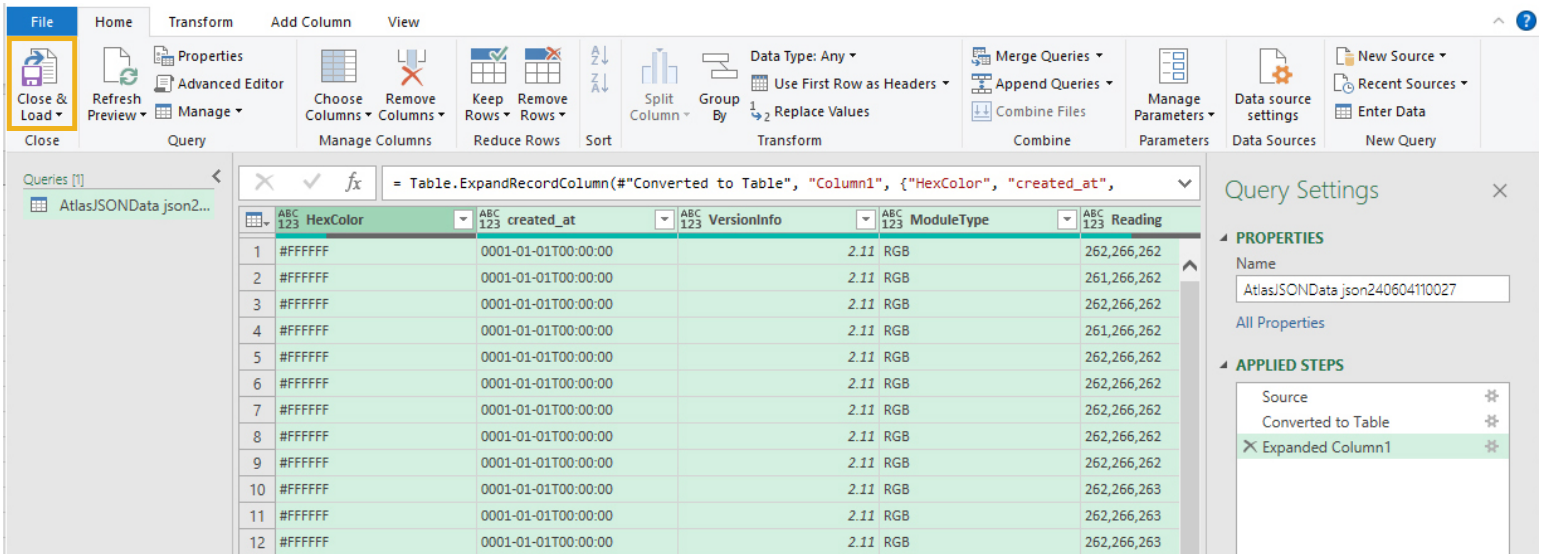
Step 3

Click on the ↤↦ icon, and uncheck the box that says "Use Original Column name as prefix", then click "OK".



Step 4

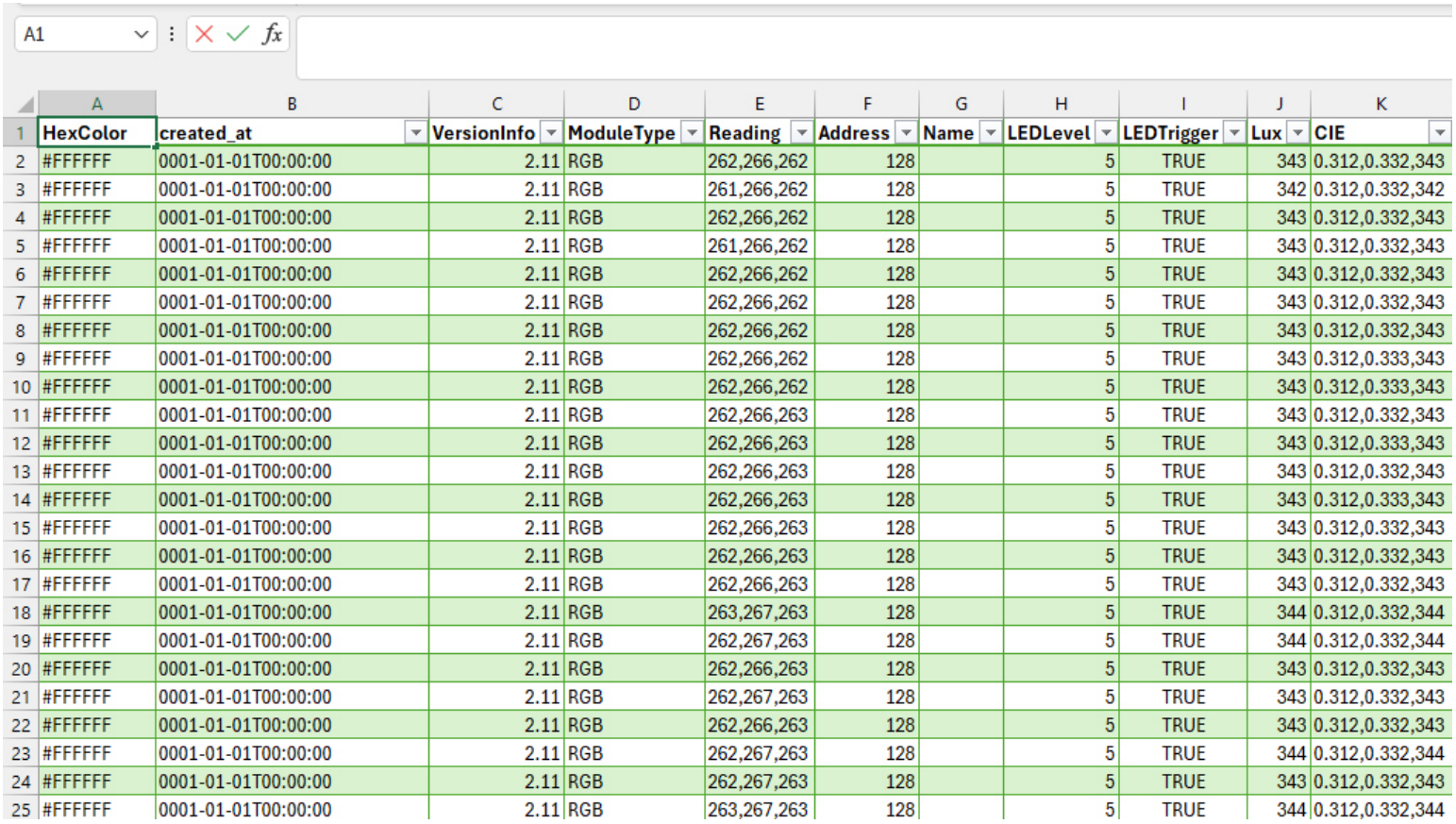
The window will now update with the readings you have saved. From here, click on the "Close & Load" button.



How to import the JSON file into Excel

Step 5

The readings will now import into Excel.

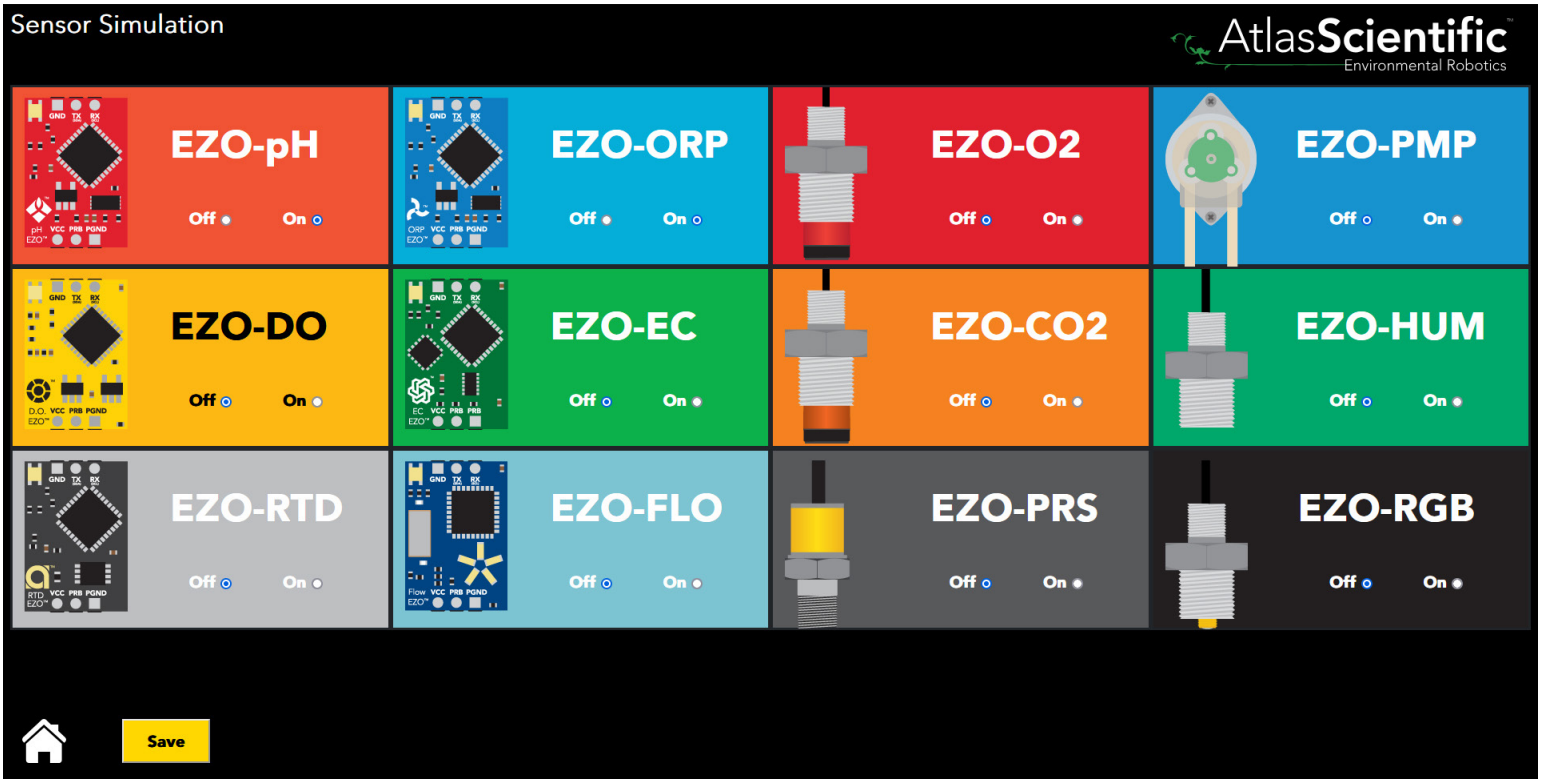


	A	B	C	D	E	F	G	H	I	J	K
1	HexColor	created_at	VersionInfo	ModuleType	Reading	Address	Name	LEDLevel	LEDTrigger	Lux	CIE
2	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.332,343
3	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	261,266,262	128		5	TRUE	342	0.312,0.332,342
4	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.332,343
5	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	261,266,262	128		5	TRUE	343	0.312,0.332,343
6	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.332,343
7	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.332,343
8	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.332,343
9	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.333,343
10	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,262	128		5	TRUE	343	0.312,0.333,343
11	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
12	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.333,343
13	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
14	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.333,343
15	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
16	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
17	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
18	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	263,267,263	128		5	TRUE	344	0.312,0.332,344
19	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,267,263	128		5	TRUE	344	0.312,0.332,344
20	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
21	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,267,263	128		5	TRUE	343	0.312,0.332,343
22	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,266,263	128		5	TRUE	343	0.312,0.332,343
23	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,267,263	128		5	TRUE	344	0.312,0.332,344
24	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	262,267,263	128		5	TRUE	343	0.312,0.332,343
25	#FFFFFF	0001-01-01T00:00:00	2.11	RGB	263,267,263	128		5	TRUE	344	0.312,0.332,344

Import Complete!

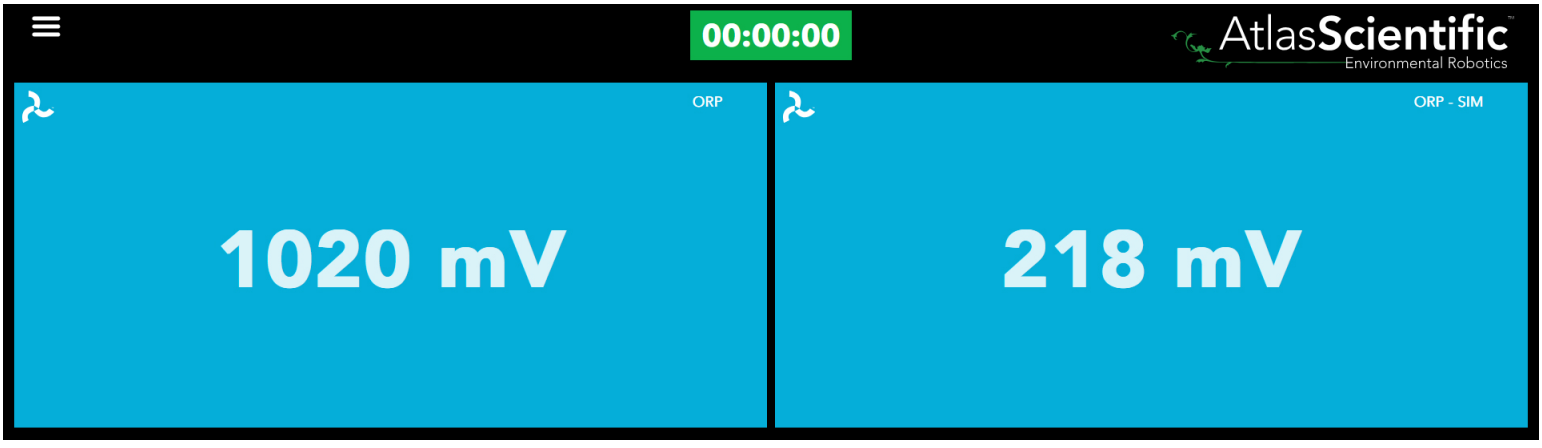
Sensor Simulation

Simulating our line of EZO sensors is incredibly easy to do. Simply choose the sensor you would like to simulate by clicking **on** to enable, or **off** to disable; Then click save.



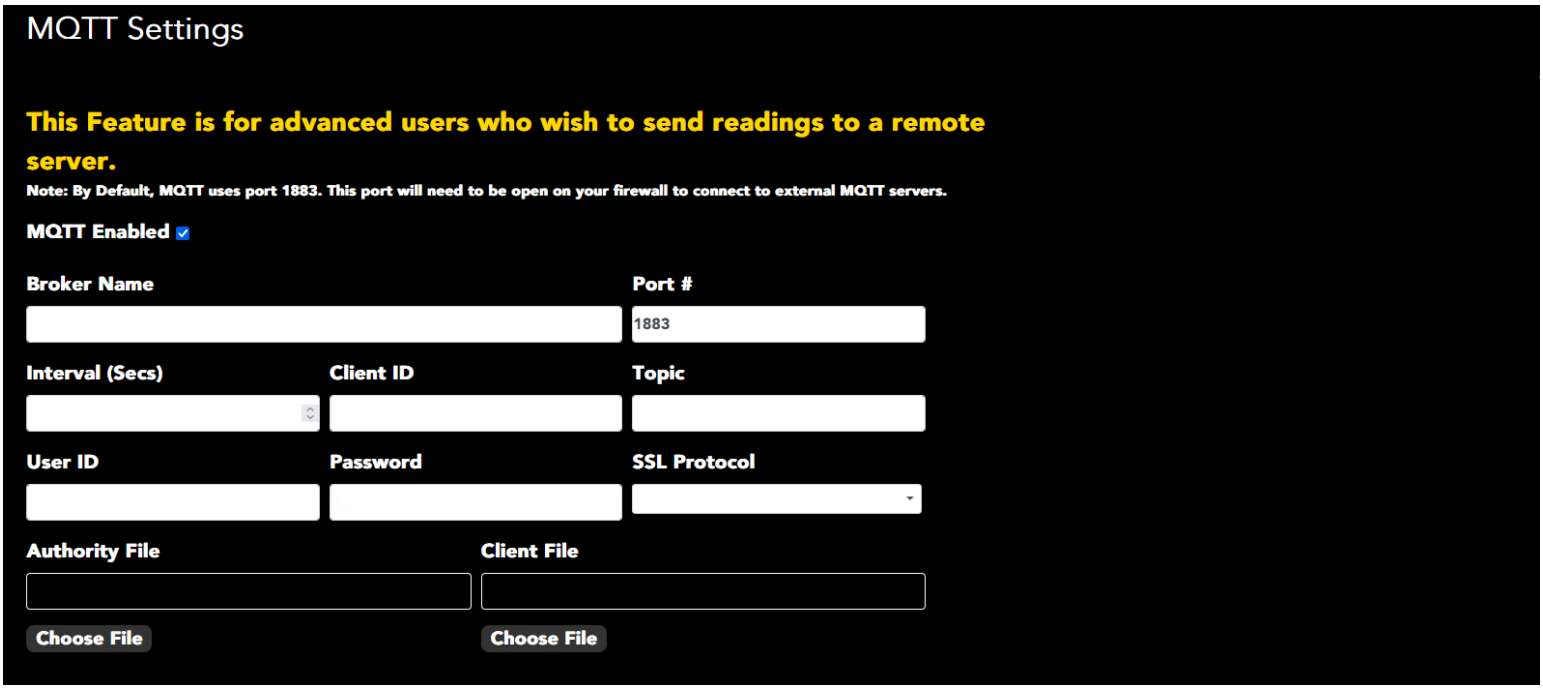
These simulated sensors funtion exactly like their real counterparts, however you cannot adjust their reading values. You can however, configure the settings, adjust calibration and get comfortable the functions of each sensor.

You can also have real EZO sensors running along simulated ones.
All simulated sensors will have the tag "**- SIM**" next to their sensor type.



MQTT Settings

For Advanced Users



Broker Name - The web address of your MQTT broker.

Example - io.adafruit.com

Port # - This port will need to be opened on your firewall to connect to an external MQTT server.

Default - 1883

Interval (Secs) - How often the software should send to data to the broker.

Example - 60

Client ID - A random Client ID. ***(no spaces)***

Example - My_device

Topic - The MQTT topic the data will be sent out under.

Example - /RTD/add_102/MyName

If there is no name set, we leave off that subtopic.

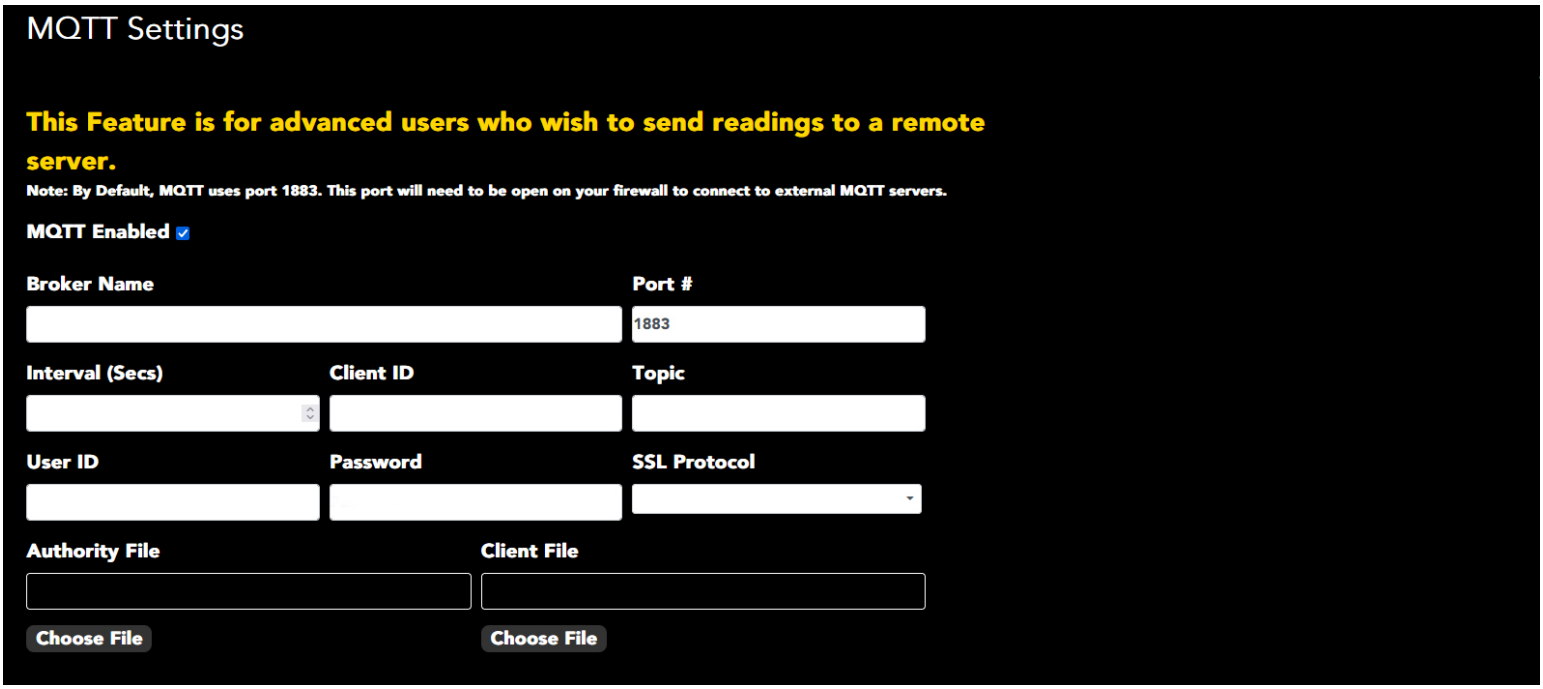
Note We append on some subtopics /SensorType/Add_(SensorAddress)/SensorName

See http://www.steves-internet-guide.com/understanding-mqtt-topics/

Atlas Scientific™ Environmental Robotics

MQTT Settings

For Advanced Users



User ID - If your broker requires a login, this is where your user ID goes.

Example - myUserID

Password - If your broker requires a login, this is where your password goes.

Example - mypassword

SSL Protocol - The SSL protocol can be set to any of the following:

Example - None *(default if an error is made)*
sslv3
tlsv1_0
tlsv1_1
tlsv1_2

Authority File - Set the path of your Certificate Authority file.

Example - YourPathHere

Client File - Set the path of the Client Key file.

Example - YourPathHere

MQTT with Mosquitto

For Advanced Users

Note: By default, MQTT uses port 1883. This port will need to be open on your firewall to connect to external MQTT servers.

Mosquitto is an open source MQTT broker that works quite well and is easy to trouble-shoot. It can be found at https://mosquitto.org and is well supported.

If you assume your mosquitto broker is on a computer called **MyComputer.**
Your settings for the Atlas Desktop Monitoring Software would be

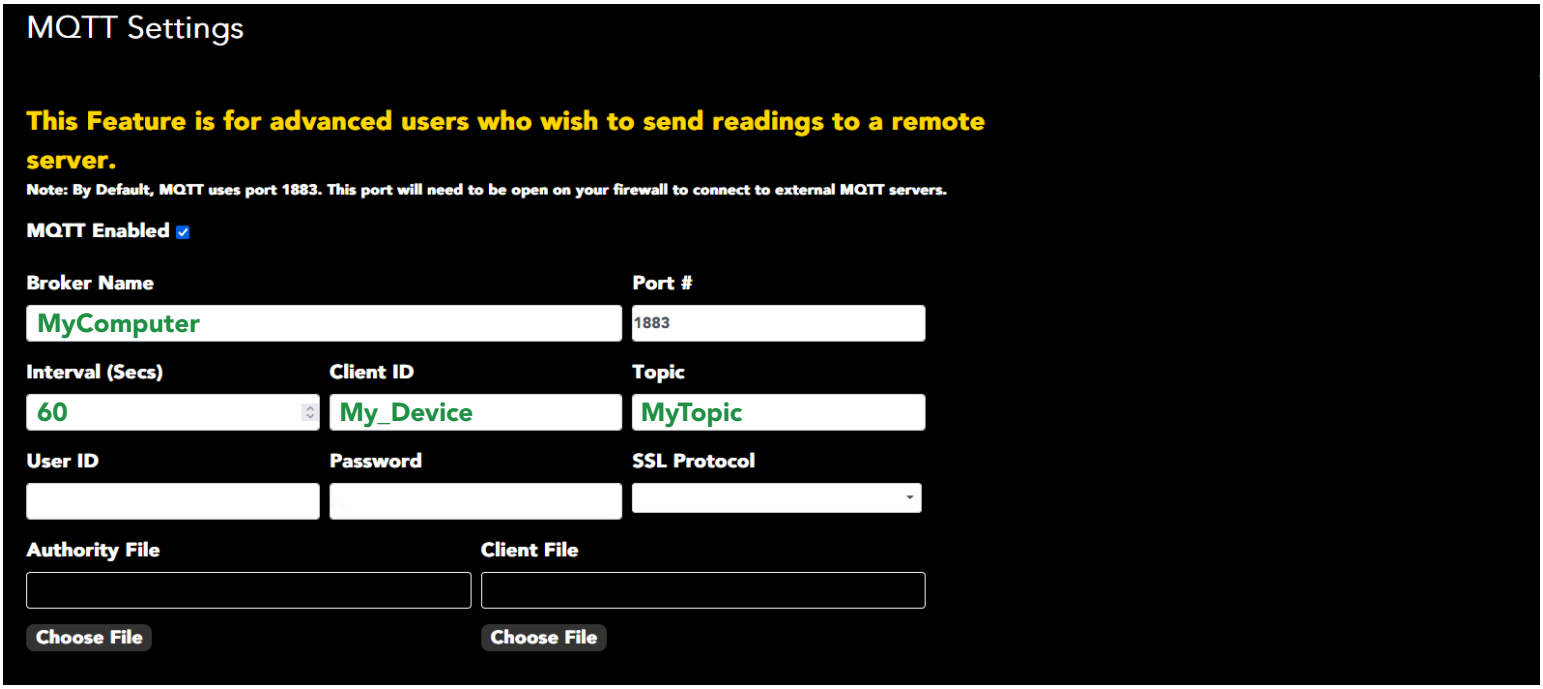
Broker Name	MyComputer
Interval (Secs)	60 is a good place to start
Client ID	My_Device *(No spaces)*
Topic	MyTopic *(I usually do NOT put the starting "/")*
User ID	leave blank, if you did not setup a user ID
Password	leave blank, if you did not setup a password

We will append a series of subtopic onto your topic

Example
If you are running an EZO RTD Temperature Circuit on the default address, and have named it, mosquitto will receive the topic **MyTopic/RTD/add_102/SensorName**

If the circuit is unnamed (default) it will be **MyTopic/RTD/add_102**

If you have multiple sensors, there will be multiple topics, all underneath **MyTopic**.
You should see them in your mosquitto_sub session



Troubleshooting

If we assume that you have installed mosquitto on a computer called **MyComputer** (see their website https://mosquitto.org for ports to open, etc),

You can monitor all traffic to that broker with a program call **mosquitto_sub** *(comes in the install package)* The Manual can be found by clicking HERE

Assuming you have not setup mosquitto for login, the command would be **mosquitto_sub -v -h MyComputer -t '#'**

That command subscribes to ALL topics (**'#'**) in a verbose manner.

API Settings

For Advanced Users

We've added web API support to the Atlas Desktop Monitoring software.

Simply go into your web browser and enter in:

[Your raspberry pi address]/api/values/

Displayed in your browser will be a JSON containing all of the connected EZO™ circuits and senors, along with their readings, device name, and device addresses.

Example


```
[{"created_at":"2021-07-23T17:08:39.4038617Z","ModuleType":"CO2","value":"1005","Address":77,"Name":"test)co2"},{"Temperature":24.7,"Humidity":35.25,"THI":69.79,"HeatIndex":75.46,"created_at":"2021-07-23T17:08:38.8037542Z","ModuleType":"HUM","value":"35.2","Address":111,"Name":""}]
```


From the example above, you can see the readings from two EZO™ sensors:
EZO-CO2™ and **EZO-HUM™**


```
[{"created_at":"2021-07-23T17:08:39.4038617Z","ModuleType":"CO2","value":"1005","Address":77,"Name":"test)co2"},{"Temperature":24.7,"Humidity":35.25,"THI":69.79,"HeatIndex":75.46,"created_at":"2021-07-23T17:08:38.8037542Z","ModuleType":"HUM","value":"35.2","Address":111,"Name":""}]
```


You can also display the readings of a specific EZO™ circuit or sensor, by entering their I2C or USB address after the API command in your web browser.

[Your raspberry pi address]/api/values/77

Example


```
[{"created_at":"2021-07-23T17:08:39.4038617Z","ModuleType":"CO2","value":"1005","Address":77,"Name":"test)co2"}]
```


You will only see the readings from the **EZO-CO2™** as this sensors I2C address is 77.