NURAVINE

Precision Hydroponic Dosing

Aurora & Elixir

Installation and User Guide

Important Product Information

THIS DOCUMENT CONTAINS INFORMATION THAT IS SUBJECT TO CHANGE WITHOUT NOTICE.

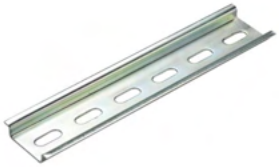
User Guide Version: 1.0 - Initial Release (January 8, 2021)
Aurora Firmware Version: 1.0.0

Table of Contents

What's in the Box?

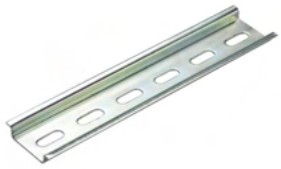
The Aurora system comes in a variety of configurations. Below you will find the components that will be found in each of our modules.

Aurora

 Aurora	 Power Cable	 pH Probe	 EC/Temp Probe
 4" Din Rail	 2x Din Rail Screws		

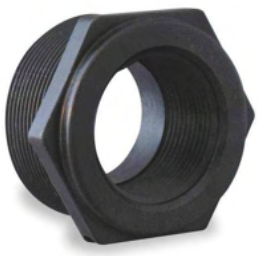
Elixir

 Elixir	 Power Cable	 Ethernet Cable	 6x Pump Tube Union Coupling

 100ft Tubing*	 8” DIN Rail	 2x Din Rail Screws	

*1 roll of tubing is provided per 2 Elixir units rounded up

Aurora Manifold:

 Plumbers Tape	 2x Ball Valve	 Sensor Manifold Tee (2,3,4 or Port)	 1” x 1” Manifold Nipple
 1” x ¾” Sensor Probe Bushing (2,3 or 4x)	 Sensor Probe Coupling (2,3 or 4x)	 2x Mounting Brackets	 2x Din Rail Screws

Elixir Manifold Extension:

 Pump Manifold Tee (3 Port)	 3x 1” x ¼” Pump Tube Bushing	 3x Pump Tube Coupling	 1x Mounting Bracket
 1x Wall Screw			

Additional Sensors:

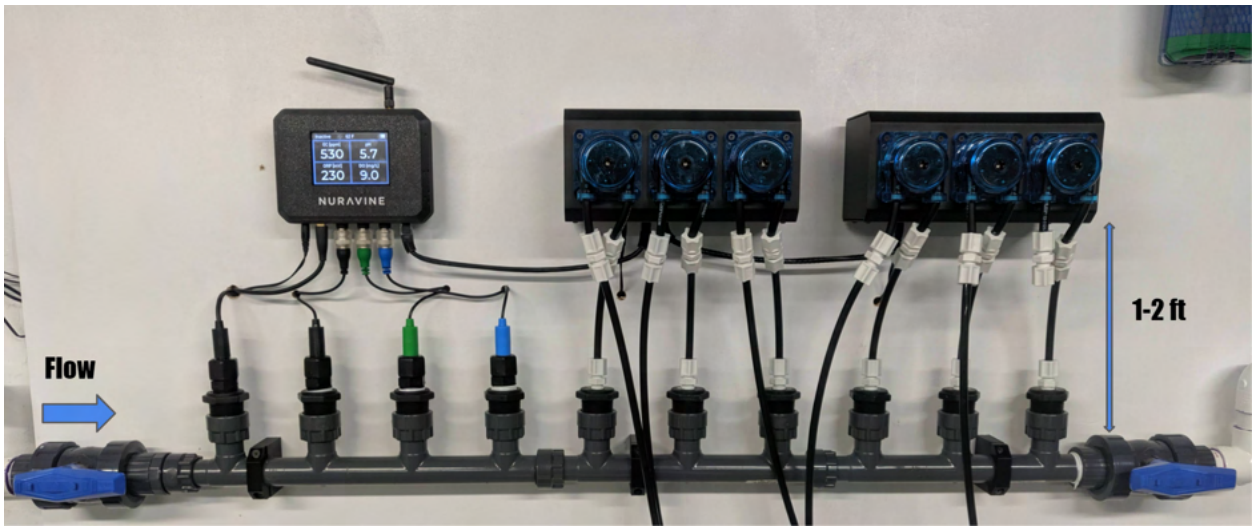
 DO Sensor	 ORP Sensor		

Bottle Cap Modification Kit:

 Nutrient Bottle Straw	 Bottle Cap Tube to Straw Union Bulkhead		

Installation

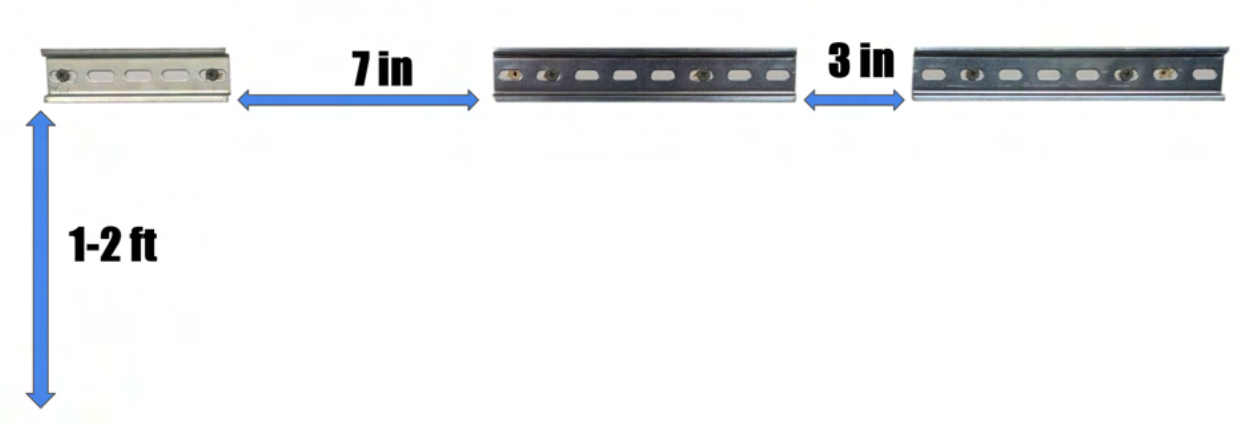
Placement



Everyone's placement will be unique to fit their hydroponic set-up. Here are some general guidelines and suggestions on where to place your Elixir system:

- We recommend placing the Aurora and your Elixir pumps on a flat surface or wall at eye or chest level to make monitoring and using the system as easy as possible.
- The Aurora should be placed upstream of your Elixir pumps so that the sensor readings don't spike during dosing.
- Try to avoid placing the doser in a place where water will drip onto the control units.
- If you are not using our manifold, make sure the Elixir is close enough to your epicenter or hydroponic reservoir so the probes will be able to reach the water.
- If you are using the manifold module, take some time to think about how the manifold will best be integrated into your system and place the Elixir approximately 1-2 feet above where the manifold will be.

Mounting



1) First mount the din rails on a wall where you want the Aurora and Elixir(s) to sit. Be sure that there is 1-2 feet of room below where the manifold will sit.
2) In the photo above there is 1 Aurora rail and 2 Elixir rails. There is 7” between the Aurora rail and the first Elixir rail. There are 3” in between the Elixir rails.
3) The included screws can work well if mounting to a plywood sheet or other rigid wall. If mounting to sheetrock or a more brittle wall you may want to use wall anchors or something that works better for your specific application.

4) Clip your Aurora and Elixir(s) onto the DIN rails starting by latching onto the bottom and clipping into the top of the rail.

5) Connect the included ethernet cables between the Elixir(s) and Aurora. Note Both ethernet ports are identical on the Elixirs.
6) Connect the included power supplies to the Aurora and Elixir(s). Note the power supply included with the Aurora is 12V and the one included with the Elixirs is 24V. Only use the power supply included with your unit!
7) Done!

Manifold Assembly

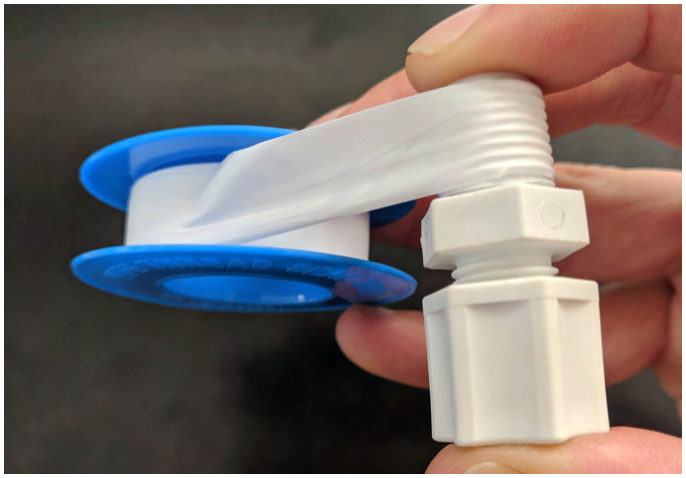
The precise configuration of your manifold will depend on whether you have 2, 3 or 4 probes with your Aurora and whether you have 1, 2, or more Elixir pump units. Here, we will describe the assembly of a system with four probes and one Elixir pump unit. The only difference for a two or three probe system is that you will use a dual or triple port manifold in place of a quad port manifold. In order to add additional Elixir pump units, simply attach additional triple port manifolds together.

1) Starting with the Quad Port Sensor Manifold. Screw the four 1” x ¾” Sensor Probe Bushings into the four ports on the manifold.

2) Apply 3 rotations of plumber’s tape to the threads on the four Sensor Probe Couplings. Start the tape where the thread starts and wrap the tape in the same direction as the thread.

3) Screw the couplings into the bushings on the Pump Manifold Tee. You may want to use an adjustable wrench to ensure you have a tight seal.
4) Attach the Manifold Nipple to the female end of the quad port and be sure that the rubber gasket on the nipple is facing outwards.
5) You are now done with the Aurora manifold assembly.

6) Next, assemble the triple port “Elixir Pump” manifold. Screw the three 1” by ¼” Pump Tube Bushings into the three ports on the pump manifold.



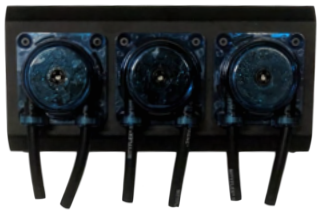
7) Apply 3 rotations of plumber's tape to the threads on the 3 Pump Tube Couplings. Again be sure to start the tape where the thread starts and then wrap in the same direction as the thread.
8) Screw the couplings into the bushings on the Pump Manifold Tee. You may need to use an adjustable wrench to do this.

9) Next connect the Aurora manifold to the Elixir manifold. Repeat process for each Elixir pump manifold.

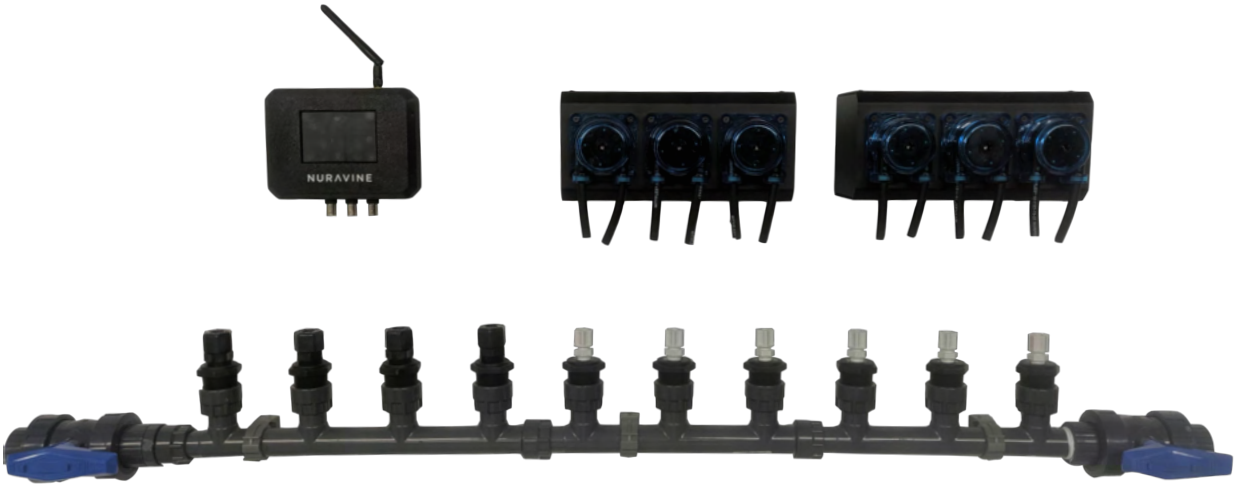
10) Apply plumber's tape to the exposed male end of the Elixir manifold. In this case you will need a lot of tape. Be sure to apply the tape by lining up with the beginning of the thread and wrap in the same direction as the thread.

11) Now you will be attaching the ball valves to the manifold. Start with the one that will attach to the end of the Elixir manifold. Note there are two different fittings that come with your ball valve (A threaded fitting and a slip fitting.) We need the threaded fitting on the side that will be attached to the manifold and the slip fitting on the other side. Also, for the Elixir connection, the orientation of the blue knob should be pointing away to indicate that the water is flowing away from the pumps (Assume the longer end is the pointing end.) When attaching the fitting make sure that its a very tight seal or water will leak out. If the fitting goes on too easily apply more plumbers tape.

12) Repeat for the end of the Aurora manifold, in this case you will not need plumbers tape because the nipple has a rubber gasket. Also the blue knob should be pointing towards the sensors to indicate the water is flowing into the sensors.
13) You are now done with the manifold assembly.



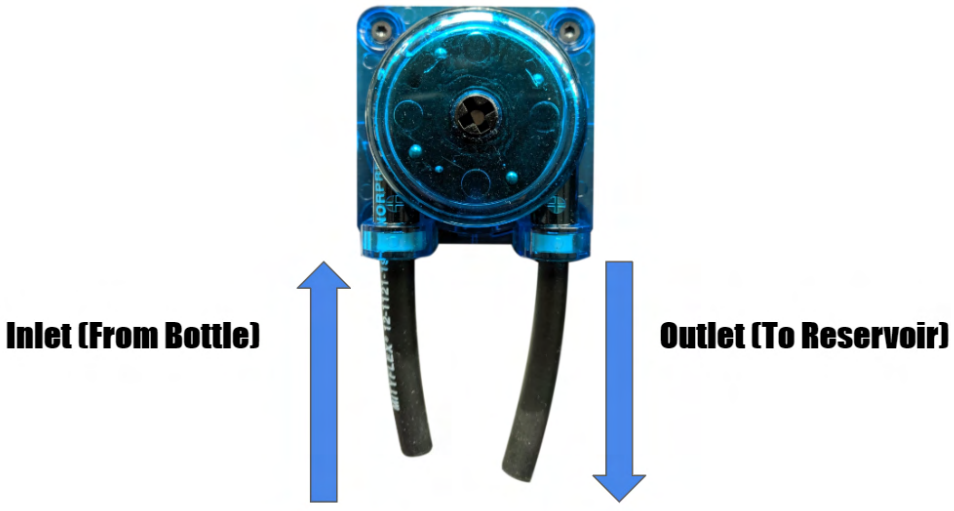
14) Measure and mark where the mounting brackets for your system will go on your vertical surface or wall below the Aurora and Elixir(s). A good way to do this is to hold the manifold on the wall and make sure that the sensors and pump inputs line up with the manifold. Then draw a dot above and below where you want to put the bracket.
15) Drill holes and screw the mounting brackets onto the wall.



16) Place the manifold into the bracket and secure it into place.

Elixir Installation

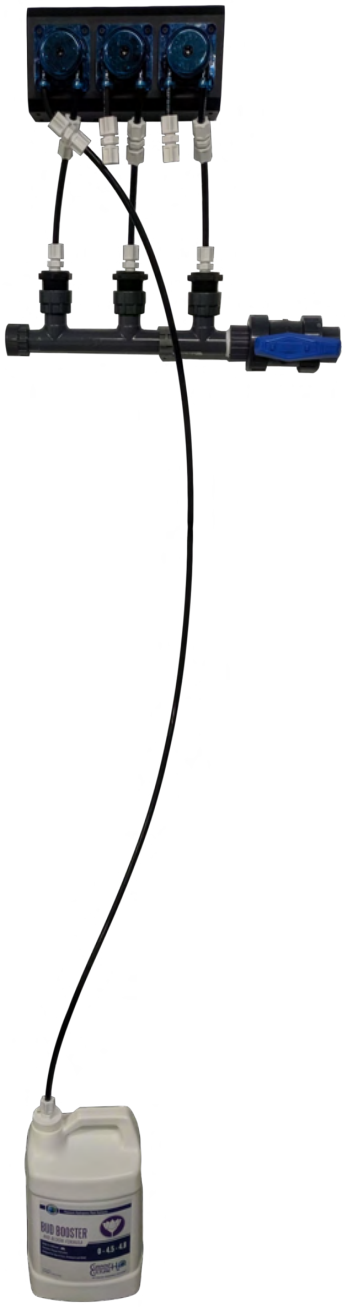
Now that you have mounted your Aurora and Elixir, we can join the tubing to the pumps and link the Elixir to your hydroponic reservoir! Below we describe the installation of a system with a single Elixir pump unit, if you are using additional Elixir units simply repeat this process for each Elixir you have.



The tubing on the left side is the inlet which is where you would pull the nutrients from. The tubing on the right side is the outlet tubing which will be injecting nutrients into your reservoir.

1) Tighten all 6 of the white tube couplings that have been provided with your Elixir pump onto the tubing. Make sure that it creates a tight seal.
2) From the 100ft of plastic tubing that was provided cut to desired lengths. The three on the left hand side should be long enough to reach your nutrient bottles (it's always a good idea to cut them a little longer than you think because it's easy to trim them shorter if necessary)

3) Now, place the input tubes (coming out of the left side of the pump) into whichever nutrient solutions you would like to use. (You can use our Bottle Cap Modification Kit to make sure that the input tubing is secure.)



4) The image on the left shows 1 inlet tubing attached to the bottle and 3 outlet tubings going into the manifold. Repeat this process for each solution you are using.

5) If you are not using one of the pumps be sure to install the tubing or else your manifold will not seal and water will shoot into the air!

Note: Before operating the Aurora & Elixir you will want to prime the pumps! When priming you will need to remove the output tubing from the manifold so you can see the liquid coming out before putting the tubing back into the manifold. The menu option for Pump Priming is described on page 36

Sensor Probe Installation

EC/Temperature Sensor

1) Remove the rubber cap on the end of the EC/Temp probe.
2) Plug the EC/Temp probe into the corresponding port on the Aurora.
3) Unscrew the cap of the leftmost sensor manifold coupling. Be careful not to drop any of the sealing components that go along with it.

4) Slip the cap and components over the EC/Temp probe in the order and orientation outlined in the image above.
5) Slide the EC/Temp probe into the manifold.
6) Done!

pH Sensor

1) The electrode is shipped in a plastic bottle containing a storage solution. The electrode should stay in this bottle until you are ready to place it in your reservoir, epicenter, or manifold. Do not let the electrode get dry!
2) Remove the pH probe from the bottle by loosening the plastic bottle top and then make sure to slide the cap and o-ring off the electrode.
3) Attach the pH probe to the Black BNC port on the Aurora.
4) During shipping the air bubble in the electrode's stem may move into the bulb area. If bubbles are seen in the bulb area, hold the electrode by its top cap and shake downward.
5) Repeat the same process for inserting the EC/Temp probe - this time into the second coupling from the left.
6) Again make sure the pH probe is not in the air for too long or it can be permanently damaged!
7) Done!

ORP Sensor

1) The process for installing the ORP probe is very similar to the process for installing the pH probe.

2) The differences are you will plug the ORP probe into the Green BNC port on the Aurora and into the third port on the manifold.

DO Sensor

1) The process for installing the DO probe has some important differences from the other probes!
2) Remove the rubber cap on the end of the probe.
3) Attach the DO probe to the Blue BNC port on the Aurora.
4) Unscrew the cap of the rightmost sensor manifold coupling. Be careful not to lose any of the sealing components that go along with it.
5) Next unscrew the remainder of the Sensor Probe Coupling from the manifold.
6) Hold the probe upside down to ensure the electrolyte solution doesn't leak out and then unscrew the top of the probe.
7) Keeping the probe upside down, slide the cap and components down the shaft of the DO probe then attach the rest of the Sensor Probe Coupling to the cap.
8) Now you can screw the top of the DO probe back on.

9) Finally screw the Sensor Probe Coupling into the Bushing.
10) Done!

Note: Before operating your system you will want to calibrate all of the probes. The menu option for Sensor Calibration is described on page 32

Bottle Cap Modification Kit

Your kit will come with the straw precut to your desired length!

1) Drill one ½” sized hole in the center of the bottle cap.
2) Drill one 1/16” sized air hole in the bottle cap.

3) Unscrew the cap and nut from one side of the Bottle Cap Bulkhead, only one nut will come off so remove that side.
4) Insert the Bottle Cap Bulkhead into the bottle cap then reattach the cap and nut.

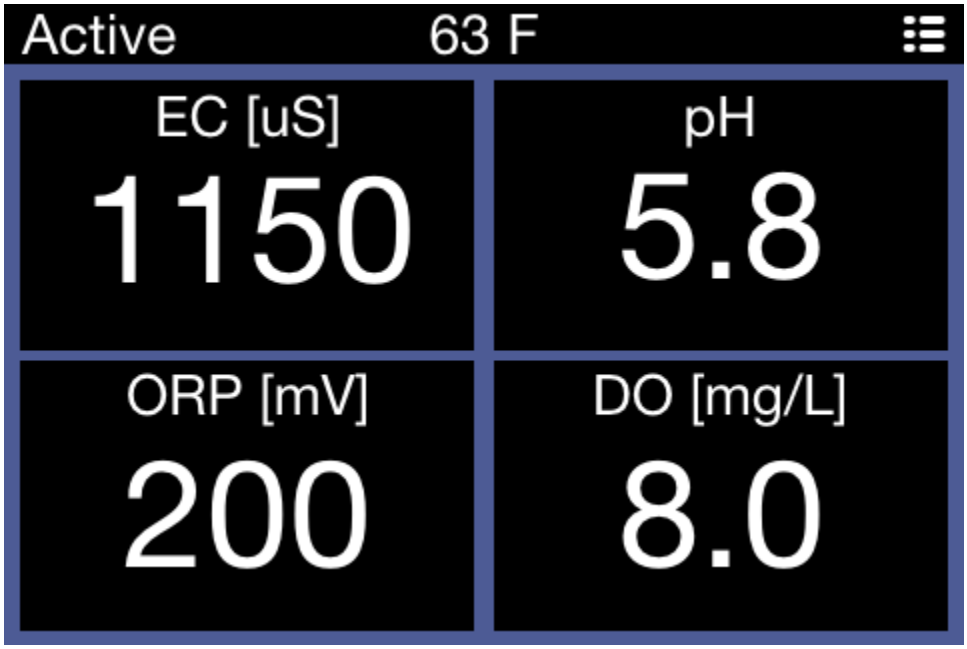
5) Loosen the bottom side of the Bulkhead and insert the acrylic tube.
6) Retighten until you have a tight seal.

7) Screw the bottle cap onto your nutrient bottle.
8) Done!

General Overview

The Aurora is equipped with a wide range of settings and features to ensure that you can fine-tune your system to precisely the parameters that you desire. In this section we will go over the interface to make sure that you can make full use of all these features.

The home screen of your Aurora displays all the sensor readings in real-time.



The top left of the display shows the current state of the Aurora. These are all of the states:

Inactive: The Aurora is not dosing or collecting data. This is the only state where the system is not collecting data or sending it to the cloud.
Logging: The Aurora is collecting data and sending to the cloud, but not dosing.
Initializing: The Aurora is preparing to go into Dosing mode by collecting several sensor readings.
Monitoring: The Aurora is waiting for a sensor reading to go out of range, once that happens it will go into Dosing mode.
Dosing: The Aurora is actively correcting a rule.

To change states press on the state and the options Inactive, Logging, and Dosing will appear.

On top right of the display is the menu button, from there you will be able to access all the rest of the settings. In order to enter settings the system must be in the Inactive state.

Once in the settings menu, there will always be a return arrow in the top left to bring you back to the previous page and a home button in the top right to quickly bring you back to the home page.

The main display will show all the different submenus of settings. You can scroll through to see all the options.

Operation Instructions

When first operating the system it's best to start with the Setup section of the menu.

Connecting to WiFi

1) Navigate to the Setup menu through the main settings menu.

2) Select **WiFi**.

3) Select **Set Up WiFi**.

4) Select the network you wish to connect to.
5) If it is a password protected network enter the password, otherwise leave the field blank.
6) Once you have entered the password press the ✓.
7) To switch networks return to the WiFi menu and select **Set Up WiFi** and choose the network to which you want to switch to.

Connecting to Cloud

1) Go to cloud.nuravine.com and create an account.
2) Navigate to the Setup menu through the main settings menu.

3) Select **Cloud**.
4) Follow the instructions on screen.

Inputting Reservoir Parameters

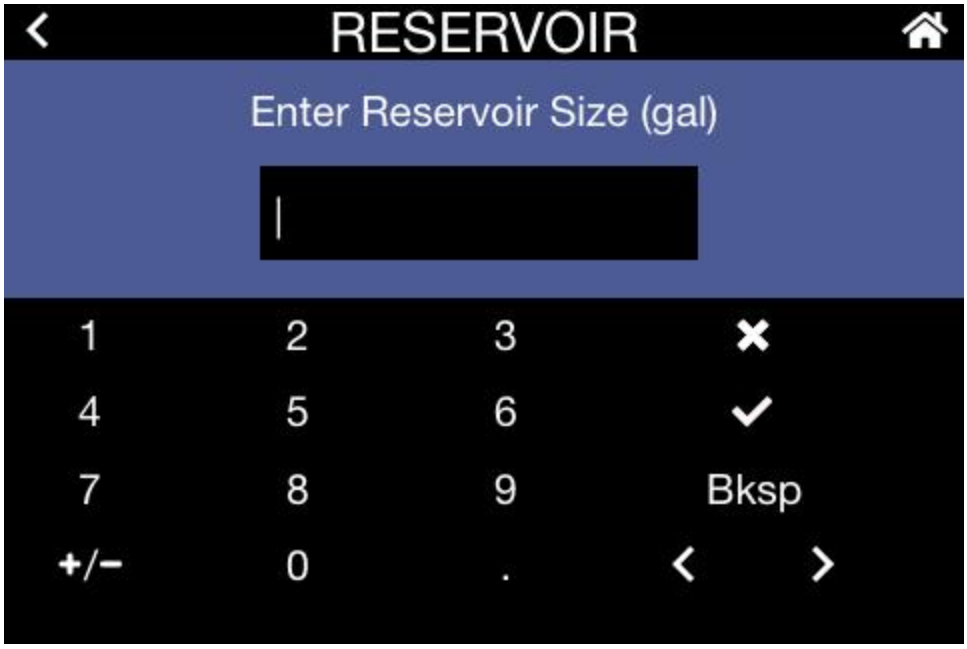
The size of your reservoir will multiply the dose that the system dispurses. For example if the recipe requires 5mL/gal and you enter 100. The system will assume that the amount needed to get from 0 EC to the desired EC is 500mL.

The mixing time is how long the Aurora will wait in between doses. If using a pre-built hydroponics system you may want to refer to the manufacturer to see how much time your particular system needs to become homogenized (mixed up). To be safe you can add a little more time than recommended. Also once you begin to analyze your data in the cloud you can see if the mixing time can be reduced.

1) Navigate to the Setup menu through the main settings menu.

2) Select **Reservoir**.

3) Select **Size: ## gal**.



4) Input the total volume of your reservoir. Then press the ✓.

5) Select **Mixing Time: ## gph.**
6) Input the mixing time of your reservoir. Then press the ✓.
7) Done!

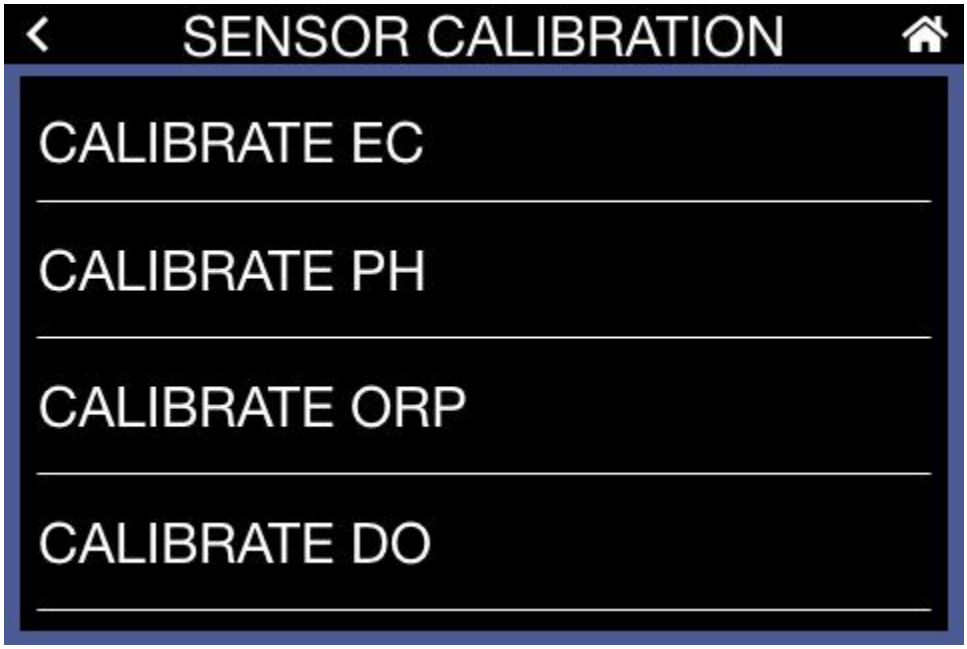
Calibrating the Sensors

To calibrate the sensors you will need to use the Nuravine Calibration Solutions which are provided in the box. Calibrating the sensors regularly (every 2-4 weeks), especially the pH

sensor is extremely important to ensure that the system is operating correctly. To ensure that you always have the calibration solutions when you need them we recommend signing up for the Nuravine Calibration Solution subscription service. [COMING SOON]

1) Navigate to the Sensors menu through the main settings menu.

2) Select **Calibrate**.

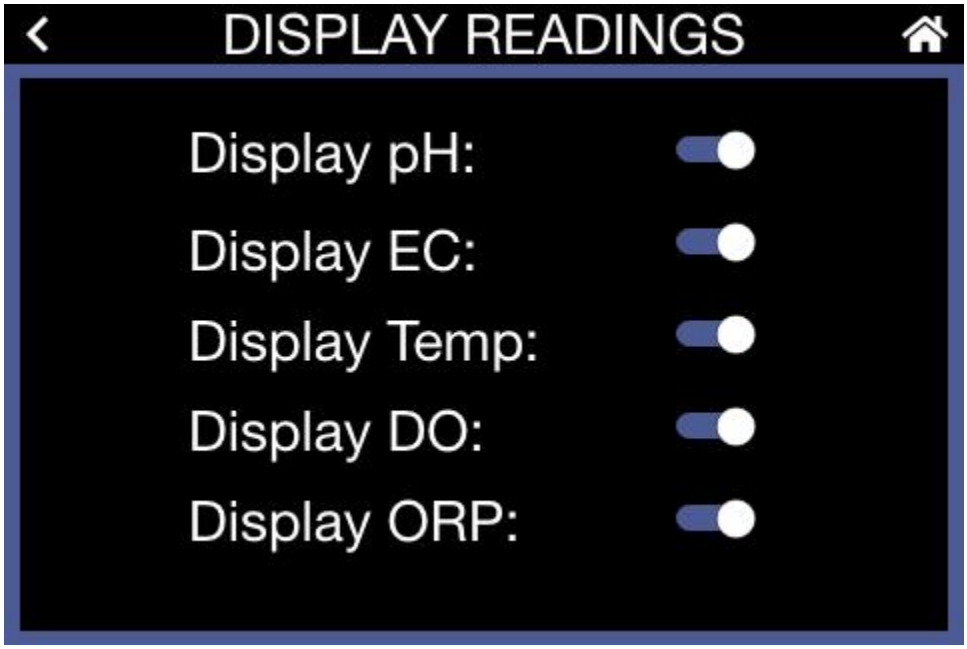


3) Select the sensor which you would like to calibrate.
4) Follow the on screen instructions.
5) Done!

Display Customization

1) Navigate to the Sensors menu through the main settings menu.

2) Select **Display Readings**.

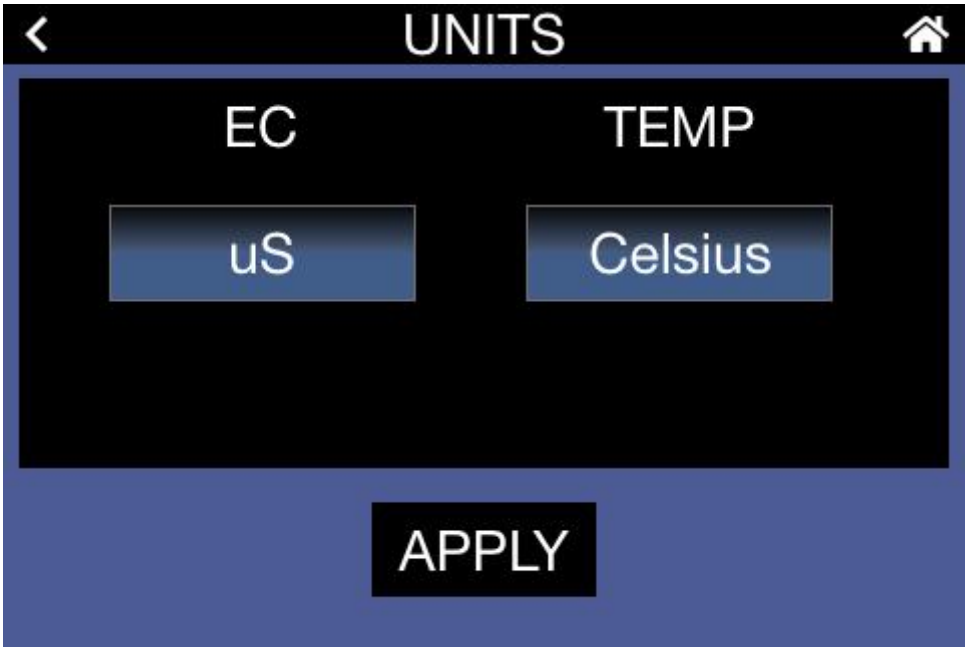


3) Out of the box, your Aurora will not display any sensors. A sensor display will become activated the first time you run the calibration process for that sensor.
4) For each sensor reading you can toggle whether you would like it to be displayed on your home screen.

Changing Units

1) Navigate to the Sensors menu through the main settings menu.

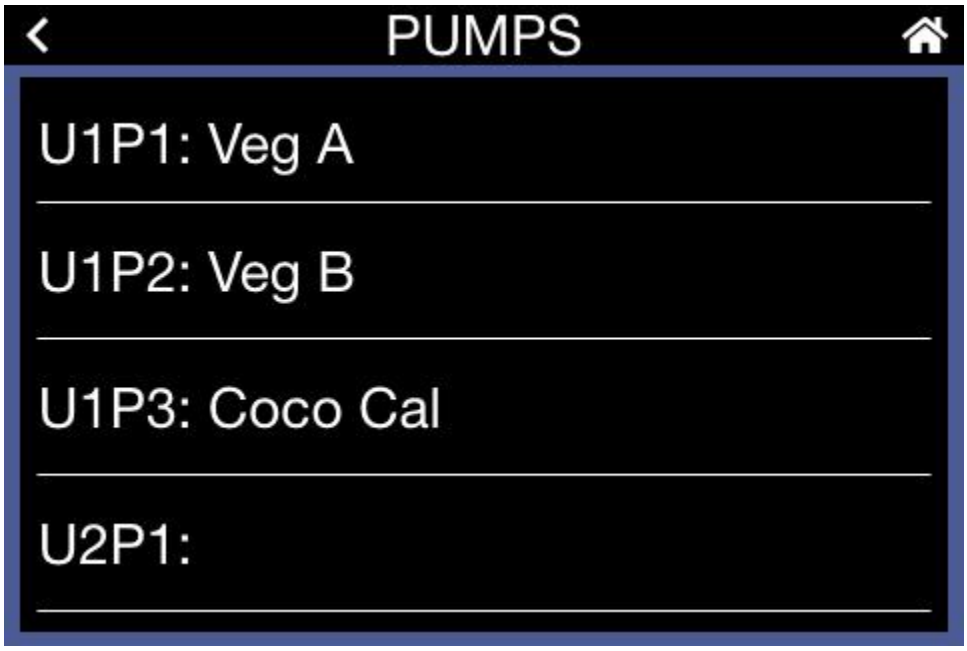
2) Select **Units**.



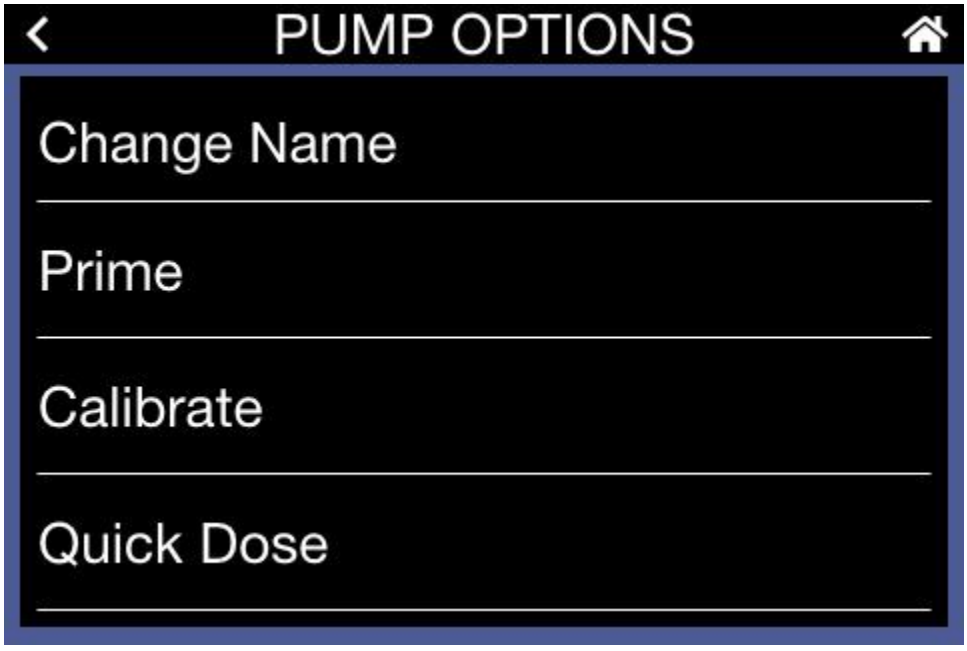
3) Select the units you would like to use by scrolling through the options.
4) Select **Apply** to apply your changes.

Renaming and Changing Pump Settings

1) Navigate to the Pumps menu through the main settings menu.



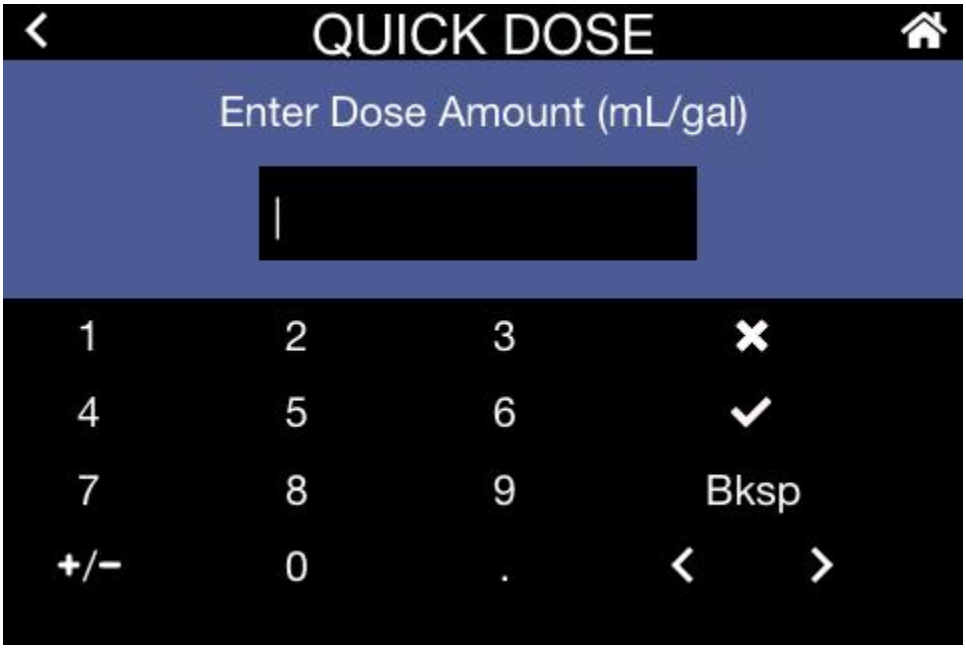
2) Select the pump you would like to adjust.



3) Next you will see a number of options:
    a) **Change Name** - allows you to customize the name of each pump
    b) **Prime** - select this option to prime the pump.

c) **Calibrate** - follow the on-screen instructions to calibrate your pump. Make sure to run the calibration using the solution that you are planning to use with that pump. Different viscosities will affect the flow rate of the pump.

d) **Quick Dose** - this function allows you to quickly dose a specified amount on command.



Enter your specified amount and hit the ✓**.** It will then tell you some more details about the dose including how long it will take. Select **Dose** to start the dosing or **Cancel** to return to the Pump options menu for that pump.

e) Lastly **Quantity Dosed** will give you a metric of how many mL that pump has dosed since you last reset it.

Establishing Rules

1) Navigate to the Rules menu through the main settings menu.

2) Select which rule you would like to implement. The EC and pH rules are slightly different.

3) EC Rule:
    a) Set your desired EC value.
    b) Select which pump or pumps this rule will apply to.
    c) Set your dosage amount for each pump in mL/gal. If you don't know this information, check with the nutrient provider.
    d) Once you have set the desired dosage for each pump, press **Done**.
4) pH (Up or Down) Rule:
    a) Set your desired pH level.
    b) Select which pump this rule will apply to.
    c) Enter the concentration ratio of your pH solution. We recommend using a solution that is diluted to a 1:5 or 1:10 ratio of pH solution to RO water. If you would like to use an undiluted solution (not recommended), you can enter a 0 value in the concentration ratio (1:0, being 1 part pH solution to 0 parts water).

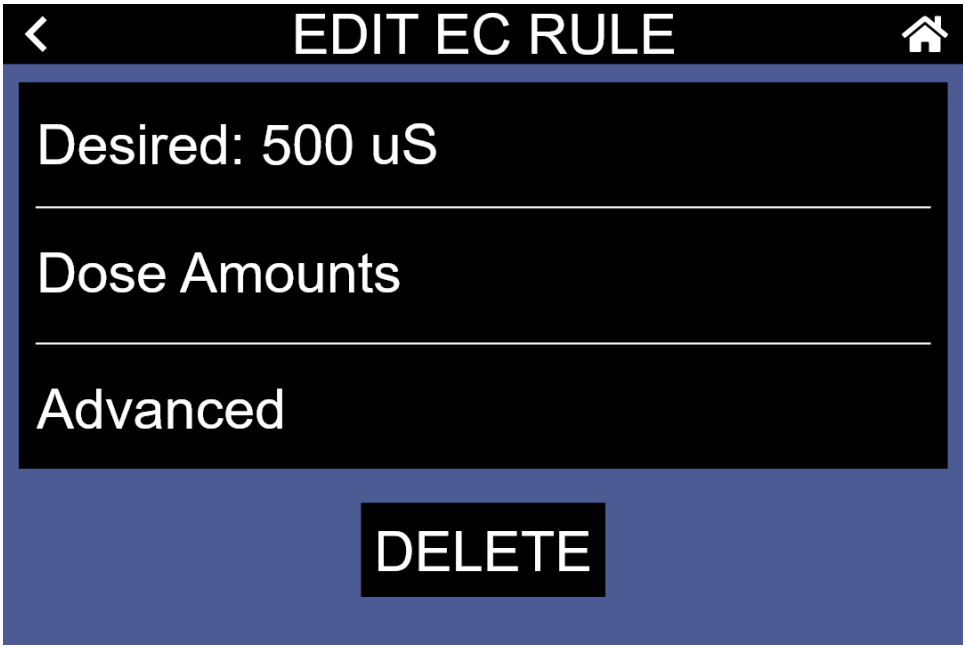
5) When a rule is created it will be highlighted in light blue and will go into effect when you set the system to Dosing!

Editing Rules/Advanced Settings

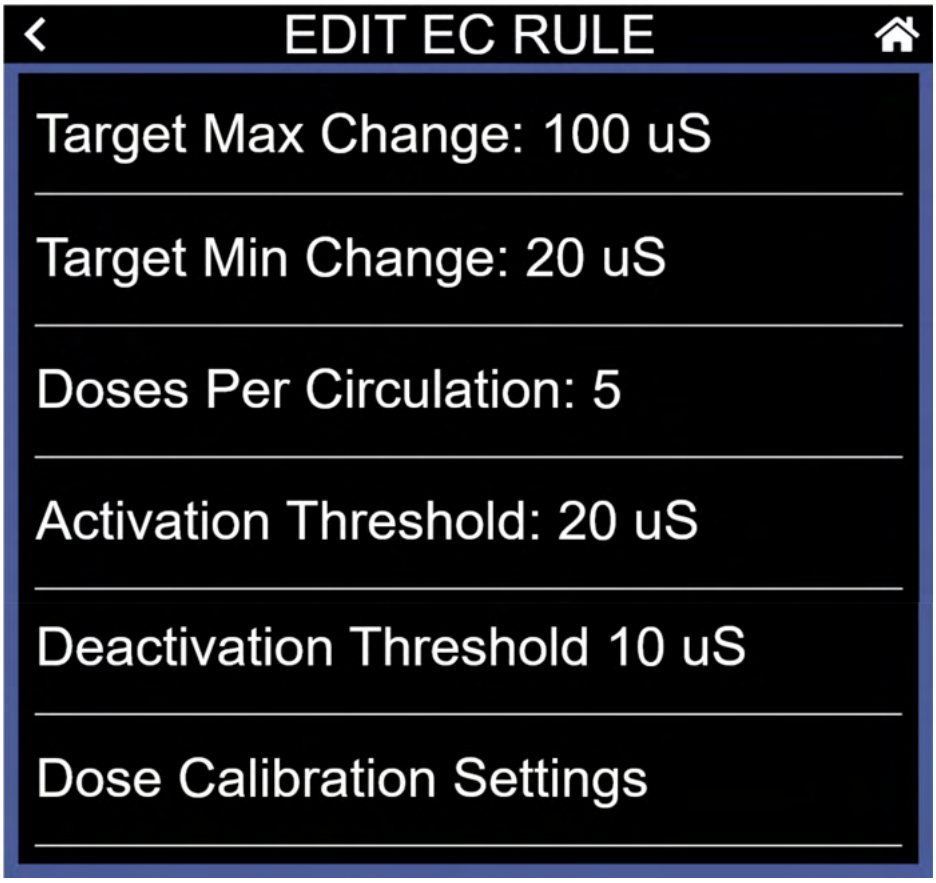
Once you have established a rule it is very easy to edit. Also there are more advanced settings that you can adjust. The default settings should work for most reservoirs, but you have the option to fine tune several other parameters to have more control over your system.

1) Navigate to the Rules menu through the main settings menu.

2) Select the rule which you would like to edit.



3) It will display the settings of the rule which you can edit by clicking on them.
4) For EC rules you can select **Dose Amounts** to change the pumps, add pumps, and change dose amounts for each pump.
5) For pH Rules you can select **Pump: "NAME"** to change the pump.
6) Select **Advanced** to access the advanced settings.



Here you can adjust the following settings:

a) **Max and Min Change** - Adjusts how gradually or rapidly the system will approach the target amount. Max change is the greatest dose size that the system will aim to dose at once if the system is far away from the target value. As the system approaches the target value it will reduce the dose amount, but will not dose less than the Min change.

b) **Doses Per Circulation** - To ensure that the nutrients are evenly distributed, you are able to select the number of doses that occur in one circulation. The circulation is the mixing time that you have chosen. For example, if the mixing time is 10 minutes and you set the Doses Per Circulation to 5, the system will add 1/5th of the dose every 2 minutes.

c) **Activation Threshold** - The activation threshold is the difference from the desired value at which the rule will be triggered. For example if the desired EC is 1000 uS and the Activation Threshold is 20 uS, the system will start dosing if the EC is 980 uS or below.

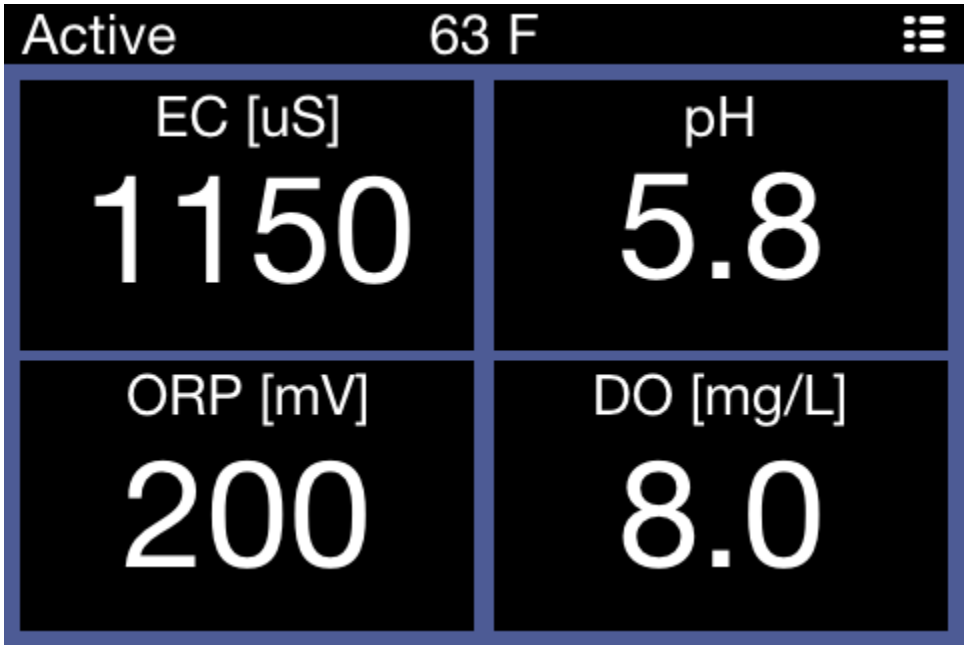
d) **Deactivation Threshold** - Similarly, the deactivation threshold is the difference from the desired value at which the rule will be satisfied. In the example where our desired EC is 1000 uS and the Deactivation Threshold is 10 uS the system

will stop dosing at 990 uS or above. This parameter can also be set to a negative value. If the threshold is -10 uS the system will stop dosing at 1010 uS

e) **Dose Calibration Settings** - This is very advanced and should not be touched in almost all cases!! Setting a constant that is too large can cause your system to dose way too much!! Here the dosing constant is displayed which is calculated by the Aurora and keeps updating as the Aurora learns from its doses. When it says Calibration Mode: YES the system is updating the constant through each dose. When it reads Calibration Mode: NO the system has calculated the constant successfully and is no longer updating. Resetting the constant will bring the constant back to its original value when it was calculated during the creation of the dosing recipe.

Activating the System

1) Once you have finished adjusting any settings and have established all the rules you wish to at this time we can go ahead and activate the system so that it will start monitoring your reservoir and dosing appropriately.
2) Navigate to the **Home Page.**

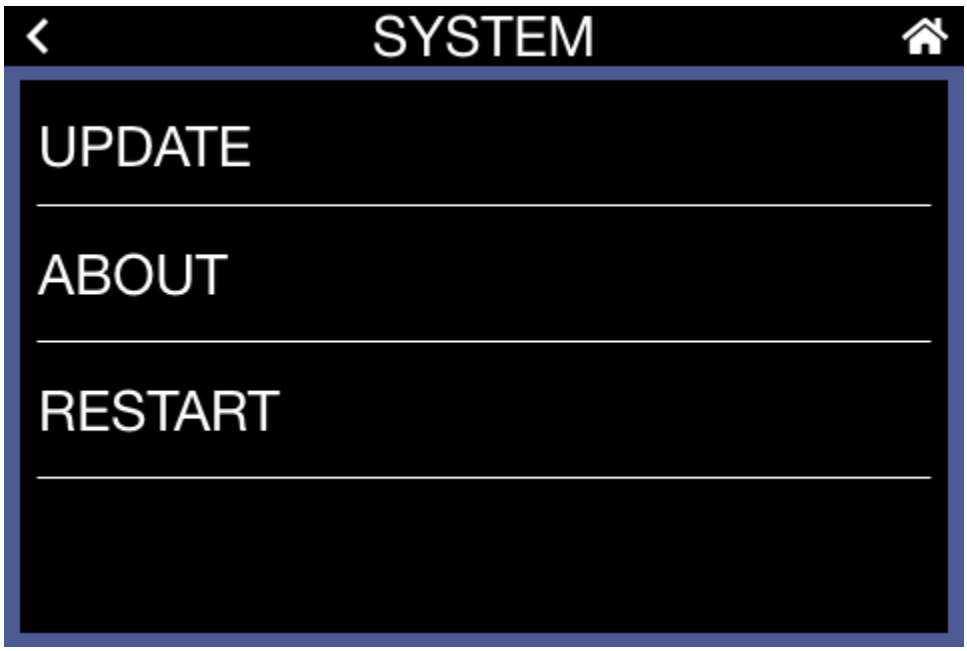


3) Select **Inactive** in the top left of the display.
4) Select **Dosing** to activate.
5) Once you confirm the system will go through a short process of initialization before it begins monitoring your reservoir.

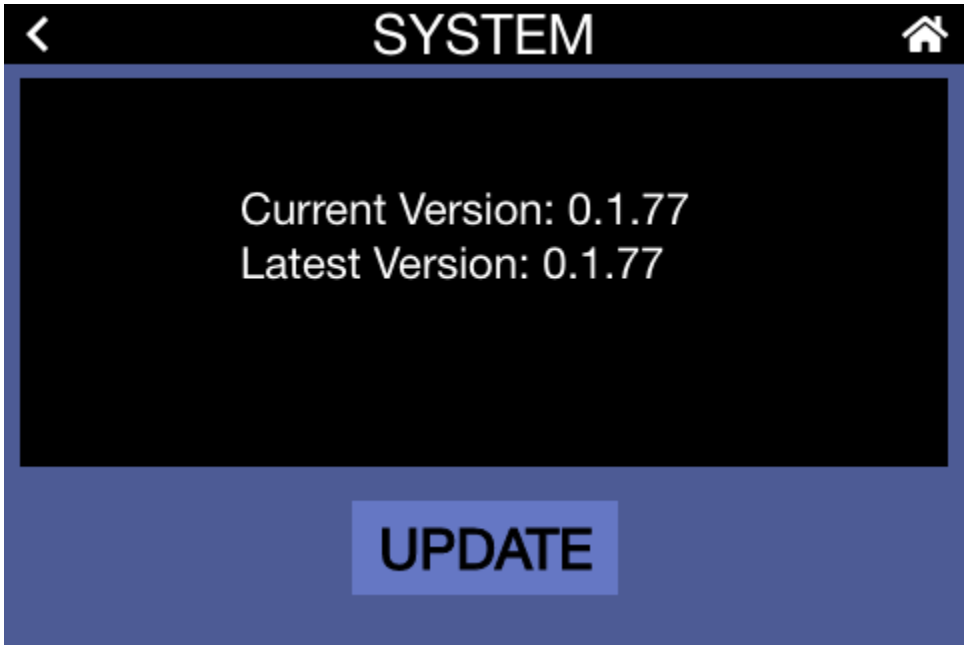
Updating Firmware

Periodically, we will be updating the software of the Elixir with new features and improvements! You will be notified any time there is an update available. Here's how to ensure your Elixir is running the latest version.

1) Navigate to the System menu from the main settings menu.



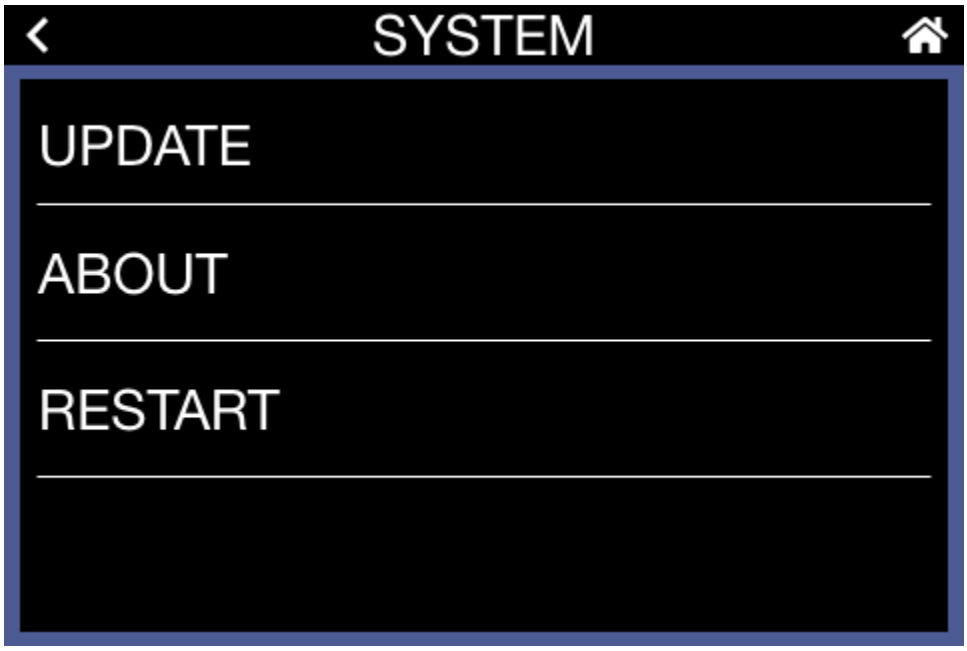
2) Select **Update**



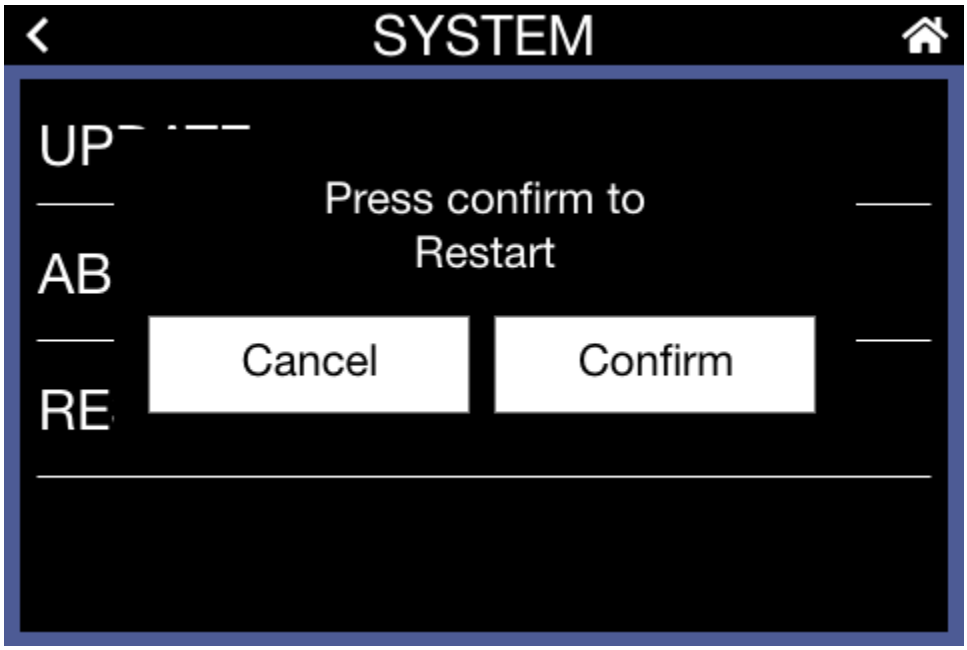
3) If your system is not running the latest version, select **Update** and wait for the system to restart.
4) Done!

Restarting the System

1) In order to restart your system, navigate to the System menu from the main settings menu.



2) Select **Restart**.



3) Press Confirm. Restarting the system does not delete any rules or reset any of the settings.
4) Done!

Maintenance

Cleaning Aurora and Elixir

The exterior of the Aurora and Elixir can be wiped clean with a damp cloth with a mild cleaning solution and then wiped dry.

Replacing Pump Heads

The pump heads on your Elixir should be replaced when the tubing starts to wear out from extended use. They will typically last 12-24 months depending on the volumes being dispensed. In order to replace the pump head follow these steps.

1) Loosen the sides of the Pump Tube Union Couplings attached to the Pump Head.
2) Remove the pump head tubing from the couplings.
3) Rotate the Pump Head 1/8th turn counter-clockwise.
4) Slide the Pump Head off the motor.
5) Slide your new Pump Head onto the motor shaft and rotate 1/8th turn clockwise until it locks into place.
6) Reattach your input tubing and tighten the Pump Tube Union Coupling.
7) Before reattaching your output tubing calibrate and prime the pump.
8) Reattach your output tubing and tighten the Pump Tube Union Coupling.
9) Done!

Cleaning Sensors

The probes will have to be periodically cleaned in order to remove any coatings and ensure proper readings. Avoid using a brush or abrasive surface on your probes unless it is truly needed, this can damage the probe.

1) For soft coatings, stir the probe in water or use a spray bottle.
2) For chemical and hard coatings, soak the probe in 5-10% hydrochloric acid solution for 5 minutes and then rinse the probe in tap water.

pH Sensor Care

The pH probe is very delicate so it's recommended to follow the guidelines below to get the most out of your probe.

- Every two weeks, test the pH probe by placing it in a buffer solution of pH 4 or 7. If the reading is off, recalibrate.

- Monthly, recondition the pH probe by leaving it in a buffer solution of pH 4 or 7 or a KCL solution for 2 to 3 hours. If the probe is covered in a biofilm, place it in a hot bleach solution for 30 minutes before reconditioning the probe in the buffer solution.

- Only clean the pH probe with bleach or hydrogen peroxide solution.

- Store the pH probe in KCl solution when not in use.

- If the tip requires removal of heavy contamination, brush around the glassware with a few drops of mild detergent and a very soft toothbrush.

- Always calibrate the probe after cleaning.

- Don’t let the probe dry out. If a probe does happen to dry out, place the probe in KCl solution for at least 4 hours and then attempt to recalibrate it. It's still possible that the probe is beyond repair and must be replaced.

- Don’t store the probes in water, especially DO, deionized, distilled or pure water! Although water is better than nothing, it is best to store them in KCl solution since that is what is inside the probe. This keeps the probe in equilibrium, increasing its lifespan.

- Don’t touch the glass bulb of the pH probe with your fingers or dry off the probe with a towel. If you are moving the probe in between solutions during the calibration process, for example, rinse the probe in freshwater.

- Don’t put the probe into two liquids of different temperatures very quickly.

- Don’t put too much force on the probe or it will break.

Troubleshooting

pH Sensor Troubleshooting:

Sensor is not reading at all or is displaying a reading that is very inaccurate.

Place the probe in a pH buffer solution of known value. If the reading is still not accurate, recalibrate your probe.

Make sure all of the cable connections are fully secured to the device. Next, inspect the bulb of the probe and the wires to ensure there is no damage to the probe. If the probe is damaged, it will need to be replaced.

This could be caused by electrical noise from high current electrical devices, such as water pumps. To test if this is the case, place your probe in a cup of still water and see if the readings are stable. Then place your probe in a buffer solution of known value to ensure the reading is accurate. If everything seems good you know the issue is the pump. The best way to combat this is to put the pump as far away from the sensors as possible.

The reading of the pH probe is unstable when in RO water.

Ionically low liquids such as RO, distilled, deionized, or pure water, do not have enough ions for the pH probe to read properly. Once you dose your nutrients into the system, there will be more ionic activity and the accuracy of the pH probe will be restored.

It's not recommended to leave the pH probe in ionically low liquids for a long time because the pH probe will start to leach ions into the water as it tries to reach an equilibrium state. When starting a reservoir using RO water, it’s recommended to dose the nutrients promptly to extend the life of your probe.

See the “pH Sensor Care” section above for best practices on how to get the longest life out of your pH probes.

After calibration, my pH doesn't appear to be reading properly.

When calibrating the pH make sure that the EC/Temp probe is in the solution as well (this is because the pH needs the temperature to calibrate properly).

If you feel that you followed the procedure correctly, try to calibrate another time. Be sure to clean both of your probes thoroughly before placing them into the calibration solution and when switching from one solution to another. When placing the probes in the solution, stir them around for a few seconds before letting them sit.

I have two sensors in different systems and they have different readings, but I think they should be the same.

Take a sample from one of the systems and measure it with the probe from the other system to see if both probes, in fact, give the same reading. If they are still giving different readings, recalibrate both probes using the same calibration solution. Afterwards, check if they give the same reading in the same solution.

My probe is taking a long time to change its reading after being put in a new solution.
OR
My probe always needs to be calibrated.
OR
I've tried everything and the pH still doesn't read properly.

As pH probes get older, they will become slower to respond because there is a salt bridge between the reference liquid inside the probe and the liquid they are sitting in. Over time the liquid they are sitting in creeps into the reference liquid making it less accurate. This is why these probes must be replaced every 6 to 12 months.

EC/Temperature Sensor Troubleshooting:

EC Probe is reading 0 or not accurate at all.
OR
Temperature is much different than expected.

Check the probe to see if the rubber cap is still on. If it is, remove the rubber cap. If not, make sure that there is no air or liquid trapped in the eye of the probe tip. If it still doesn't read properly, recalibrate the sensor.

Sensor is not reading at all / displaying a reading that is very off.

Place the probe in a solution of known EC value, if the reading is still not accurate recalibrate your probe.

Make sure all of the cable connections are fully secured to the device. Also inspect the wires to ensure there is no damage to the probe. If there is, the probe will need to be replaced.

This could be from electrical noise from high current electrical devices such as water pumps. To test if this is the case place your probe in a cup of still water and see if the readings are stable, also place in a buffer solution of a known value to ensure the reading is accurate. If everything seems good you know the issue is the pump. The best way to combat this is to put the pump as far away from the sensors as possible.

After calibration, my EC doesn't appear to be reading properly.

Try to calibrate your probe another time. Be sure to clean your probe thoroughly before placing it into the calibration solution and when switching from one solution to another. When placing the probe in the solution, stir it around for a few seconds before letting it sit.

I have two sensors in different systems and they have different readings, but I think they should be the same.

Take a sample from one of the systems and measure it with the probe from the other system to see if both probes, in fact, give the same reading. If they are still giving different readings, recalibrate both probes using the same calibration solution. Afterwards, check if they give the same reading in the same solution.

ORP Sensor Troubleshooting:

I have ORP probes that are reading competently different values in the same solution.
OR
I have two sensors in different systems and they have different readings, but I think they should be the same.

This is normal if the solution the probes are in has very few electrons available for transfer. To test if things are working properly, place the probe in a buffer solution of known ORP or place it in a cup of water and add a few drops of an oxidizing agent such as bleach, UC Roots, etc.

If they are still giving different readings, recalibrate both probes using the same calibration solution. Afterwards, check if they give the same reading in the same solution.

Sensor is not reading at all / displaying a reading that is very off.

Make sure all of the cable connections are fully secured to the device. Also inspect the tip of the probe and the wires to ensure there is no damage to the probe. If there is, the probe will need to be replaced.

This could be from electrical noise from high current electrical devices such as water pumps. To test if this is the case place your probe in a cup of still water and see if the readings are stable, also place in a buffer solution of a known value to ensure the reading is accurate. If everything seems good you know the issue is the pump. The best way to combat this is to put the pump as far away from the sensors as possible.

After calibration my ORP doesn't appear to be reading properly.

Try to calibrate your probe another time. Be sure to clean your probe thoroughly before placing it into the calibration solution and when switching from one solution to another. When placing the probe in the solution, stir it around for a few seconds before letting it sit.

My probe is taking a long time to change its reading after being put in a new solution.
OR
My probe always needs to be calibrated.
OR
I've tried everything and the ORP still doesn't read properly.

As ORP probes get older, they will become slower to respond because there is a salt bridge between the reference liquid inside the probe and the liquid they are sitting in. Over time the liquid they are sitting in creeps into the reference liquid making it less accurate. This is why these probes must be replaced every 6 to 12 months.

DO Sensor Troubleshooting:

Reading is not accurate or drifting rapidly.

The dissolved oxygen probe consumes a small amount of oxygen. So, if it's left in still water it will consume the oxygen around it and alter the reading. It's best to have a steady stream of water flowing around the probe. The reading is also noisier than other sensors so drifts between ± 0.5 mg/L are normal. The best way to get a picture of the DO levels is to analyze the trends over time using our web application.

If this is still not working it's possible that the electrolyte solution is depleted (contact us if that is the case and we can send you more electrolyte solution).

I can't get the DO probe in the manifold.

In order to put the DO probe in the manifold, it's necessary to unscrew the cap of the probe. Make sure that you keep the probe with the tip facing upward to ensure none of the electrolyte solution spills out of the probe. Once you slip the probe through the manifold fitting, screw the top back on.

Sensor is not reading at all / displaying a reading that is very off.

Make sure all of the cable connections are fully secured to the device. Also, inspect the tip of the probe and the wires to ensure there is no damage to the probe. If there is, the probe will need to be replaced.

This could be from electrical noise from high current electrical devices such as water pumps. To test if this is the case, hold your probe in the air and see if the readings are stable. If everything seems good you know the issue is the pump. The best way to combat this is to put the pump as far away from the sensors as possible.

I have two sensors in different systems and they have different readings, but I think they should be the same.

Dry off both probes and hold them in the air to see if both probes give the same reading. If the temperature is different by a degree on both systems then the system with the lower temperature will have a higher DO reading. If they are still giving different readings, recalibrate both probes. Afterwards, check if they give a similar reading.

Technical Specifications

Aurora Specifications

Supported Sensors	pH, EC/Temp, DO, ORP
EC Units	uS, mS, ppm(500), ppm(640), ppm(700)
DO Units	mg/L
ORP	mV
Temperature	°F,°C
Power	12V 1A DC
WiFi	2.4 Ghz
Modules Supported	127 (Supports pumps currently, but if you are looking for anything else [flow rate sensors, solenoid valves] lets us know!)
Display	3.5” Capacitive Touch LCD
Mounting	35mm DIN Rail (2” minimum rail width)
Enclosure	3D Printed PETG
Return Policy	30 Day Full Refund (Although we doubt we could pry the Elixir out of your hands after 30 days of freedom)
Manufactured Location	New York, USA

Elixir Specifications

Pump Type	Peristaltic
Pumps Per Unit	3
Connection Protocol	Proprietary
Ports	2 (Daisychain)
Material	Black powder coat finish sheet metal enclosure
Power	24V 1A DC
Tube Type	TYGON (Industrial Grade Tubing) *According to the Chemical technicians' ready reference handbook the tubing is* ***"so resistant to chemical attack that it will handle practically any chemical"****, whether liquid, gas, or slurry.*
Tube Lifetime	500+ hours
Tube Wall	1.6mm (1/16")
Tube Inner Diameter	4.8mm (3/16")
Pump Head Material	Polycarbonate
Pump Head Type	4 Roller
Tool Free Head Replacement	Yes
Flow Rate	Variable 55-200 mL/min
Mounting	35mm DIN Rail (6" minimum rail width)
Pump Lifetime	10,000 hours
Dispensing Resolution	0.5 mL

pH Sensor Specifications

Diameter	12mm
Length	150mm
Reference	Sealed
Junction Material	Pellon
Junction Number	Double
Reference Solution	3.5 M KCl/AgCl (gel)
pH Range	0-14
Response	95% in 1 second
Isopotential Point	7.00 pH
Offset	± 0.20 pH
Cable Length	2m (78.74”)
Product Lifetime	1 year
Glass Shape	Bulb
Body Material	Polycarbonate
Temperature Range	0-60°C (32-140°F)
Connection Type	BNC
Calibration	Double Point (7.0, 4.0 pH Solutions)

EC/Temperature Sensor Specifications

Cell Constant	k=1.0
Body Material	Epoxy
Measuring Surface	Graphite

Temperature Range	0-70°C (32 - 158°F)
Max Pressure	100 psig (7.5 Bar)
Temp Comp	Yes - 10k NTC
Cable Length	2m (78.74”)
Connection Type	USB-B
Inline Compatible	Yes (½” or ¾” mount)
Min Immersion Depth	12.7mm (0.5”)
Calibration	Single and Double Point (Dry + Solution) Or (Dry + Solution Low + Solution High)

DO Sensor Specifications

Reading Range	0-20 mg/L
Body Material	Epoxy and Noryl
Response Time	After Equilibration, 1 minute for 2mV
Max Temperature	50°C (122°F)
Max Pressure	100 psig (7.5 Bar)
Calibration	Single Point (Air)
Cable Length	2m (78.74”)
Connection Type	BNC
Inline Compatible	Yes (½” or ¾” mount)
Saturated Power Output	47mV +/- 9mV

ORP Sensor Specifications

Body Material	Polycarbonate
Product Lifetime	1 year
Diameter	12mm
Length	150mm
Reference	Sealed
Junction Number	Double
Junction Material	Pellon
Reference Solution	3.5 M KCl/KNO_3
Temperature Range	0-60°C (32-140°F)

License Agreement and Limited Warranty

Nuravine LLC, Inc.

READ THE TERMS OF THIS LICENSE AGREEMENT AND LIMITED WARRANTY ("AGREEMENT") GOVERNING THE USE OF THE SOFTWARE AND RELATED FIRMWARE AND DOCUMENTATION (COLLECTIVELY, THE "SOFTWARE") PROVIDED TO YOU BY NURAVINE ("NURAVINE") CAREFULLY BEFORE USING THE APPLICABLE NURAVINE PRODUCT (SUCH HARDWARE, TOGETHER WITH THE SOFTWARE, REFERRED TO AS THE "PRODUCT"). BY OPENING THIS PACKAGE, INSTALLING AND USING THE PRODUCT, YOU ARE (1) REPRESENTING THAT YOU ARE OVER THE AGE OF 18, (2) REPRESENTING THAT YOU HAVE THE RIGHT AND AUTHORITY TO LEGALLY BIND YOURSELF OR YOUR COMPANY, AS APPLICABLE, AND (3) CONSENTING TO BE LEGALLY BOUND BY ALL OF THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO ALL THESE TERMS OR CANNOT MAKE SUCH REPRESENTATIONS, DO NOT USE THE PRODUCT. IF YOU ELECT NOT TO ACCEPT THE TERMS OF THIS AGREEMENT, YOU MAY RETURN THE NEW, UNUSED PRODUCT WITHIN THIRTY (30) DAYS OF PURCHASE TO THE RETAIL LOCATION WHERE YOU PURCHASED IT, WITH ALL ORIGINAL PACKAGING FOR A FULL REFUND.

1. **Grant of License**

(a) Subject to the terms and conditions of this Agreement, Nuravine LLC grants to You a worldwide, non-exclusive, non-transferable, personal license (without the right to sub-license) to (i) use the Software as embedded in the Product for the purpose of operating the Product, and (ii) use the desktop application portion(s) of the Software on any personal computer owned or controlled by You during the Term. Except as provided above, You may not transfer the Software to any other computing device or otherwise remove the Software from the Product. Notwithstanding any license granted herein by Nuravine, You acknowledge and agree that it is Your sole responsibility to comply with U.S. and international copyright laws with respect to Your use of the Software.

(b) You agree not to copy, modify, reverse engineer, decompile or disassemble the Product to the extent that such restriction is not prohibited by law. Except for the limited license granted herein, Nuravine and its suppliers hereby retain all right, title and interest in and to all worldwide intellectual property rights embodied in the Software. All other rights are reserved by Nuravine. You acknowledge and agree that the technology embedded in and used to create the Product constitute the valuable trade secrets and know-how of Nuravine, and to the extent you discover any such trade secrets, You will not disclose them to any third party.

(c) Nuravine shall have no obligation to provide any updates or upgrades to the Product, but in the event that it does, such updates, upgrades and any documentation shall be deemed the "Product", and shall be subject to the terms and conditions of this Agreement.

2. Term of Agreement

(a) You may terminate this Agreement at any time by notifying Nuravine, discontinuing use of the Product and purging the Software from Your computing device.
(b) This Agreement will automatically terminate if You violate any of its terms.
(c) Sections 1(b), 3, 4, and 6(c) shall survive termination or expiration for any reason.

3. Nuravine Privacy Policy

Use of Nuravine Products is subject to the Nuravine Privacy Policy, which can be found at ***www.nuravine.com/legal/privacy_policy.htm*** and by reference is made a part of this Agreement. The Nuravine Privacy Policy outlines the type of information that may be collected from you by Nuravine and how such information may be used by Nuravine. It is important that you read and understand the terms of the Privacy Policy.

4. Third Party Consent and Technologies Support

From time to time, Nuravine may provide access to third party content providers via the Product. In addition, Nuravine may support certain third party technologies, such as integration with other controllers. Nuravine reserves the right to discontinue access to and/or support for such third party content or technologies at any time, and for any reason. Nuravine makes no representations or warranties whatsoever regarding the selection of, or continuing support for, any such third party content or technologies.

5. Warranty and Disclaimer

(a) Limited Warranty. Nuravine warrants to You that for a period of one (1) year after the date of original purchase of the Product, the Product will be free from defects in materials and workmanship. NURAVINE DOES NOT WARRANT THAT THE PRODUCT WILL OPERATE WITHOUT INTERRUPTION OR WILL BE ERROR-FREE, OR THAT ALL ERRORS MAY BE CORRECTED. EXCEPT AS SET FORTH IN SECTION 6(C), NURAVINE'S SOLE LIABILITY, AND YOUR SOLE REMEDY, FOR BREACH OF THE FOREGOING WARRANTY WILL BE, AT NURAVINE'S SOLE DISCRETION, REPAIR OR REPLACEMENT OF THE PRODUCT, OR, IF NEITHER OF THE FOREGOING ARE REASONABLY AVAILABLE, A REFUND OF THE AMOUNT YOU PAID, LESS AMOUNTS ATTRIBUTABLE TO YOUR PRIOR USE.

(b) Limitations. The foregoing warranty does not extend to problems in the Product that result from: (i) Your failure to implement all bug fixes or error corrections to the Product which are made available by Nuravine; (ii) any use of the Product in a manner for which it was not designed or as not authorized under this Agreement; (iii) Your failure to install the system(s) as defined by the installation instructions; or (iv) any use of the Product with other products, hardware or products not supplied by, and/or inconsistent with the documentation provided by, Nuravine.
(c) Disclaimer. EXCEPT AS EXPRESSLY SET FORTH ABOVE, NURAVINE MAKES NO WARRANTIES, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, WITH RESPECT TO THE PRODUCT. NURAVINE AND ITS SUPPLIERS HEREBY SPECIFICALLY DISCLAIM ALL OTHER EXPRESS, STATUTORY AND IMPLIED WARRANTIES AND CONDITIONS, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT AND THE IMPLIED CONDITION OF SATISFACTORY QUALITY. EXCEPT AS EXPRESSLY STATED IN SECTION 6(A), THE PRODUCT IS SUPPLIED ON AN "AS IS" BASIS WITHOUT WARRANTY. YOU ASSUME ALL RESPONSIBILITIES FOR SELECTION OF THE PRODUCT TO ACHIEVE YOUR INTENDED RESULTS, AND FOR THE INSTALLATION AND USE OF THE PRODUCT. Some jurisdictions do not allow a limitation on implied warranties, and so the foregoing disclaimer may not apply to You. In any event, any implied warranties that may exist under the laws of Your jurisdiction are limited to the one (1) year period set forth in the limited warranty given under subsection (a) above.

6. Limitation of Liability

(a) TO THE MAXIMUM EXTENT ALLOWED UNDER LAW, IN NO EVENT WILL NURAVINE OR ITS SUPPLIERS BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO, INCIDENTAL, SPECIAL, CONSEQUENTIAL, EXEMPLARY, OR INDIRECT DAMAGES, AND INCLUDING BUT NOT LIMITED TO, COST OF COVER, LOSS OF DATA, LOSS OF PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR OTHER PECUNIARY LOSS ARISING FROM THE USE OF (OR INABILITY TO USE) THE PRODUCT, NO MATTER HOW CAUSED AND ON ANY THEORY OF LIABILITY. BECAUSE SOME STATES/ JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SOME OF THE ABOVE LIMITATIONS MAY NOT APPLY TO YOU, BUT THEY SHALL APPLY TO THE MAXIMUM EXTENT PERMITTED BY LAW.
(b) IN NO EVENT SHALL NURAVINE'S TOTAL LIABILITY TO YOU FOR ALL DAMAGES IN ANY ONE OR MORE CAUSES OF ACTION EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT.

7. Miscellaneous

You acknowledge that the Product is subject to the export control law and regulations of the United States, and any amendments thereto. You warrant that You will comply in all respects with United States exports laws and regulations. This Agreement shall be governed by the laws of the State of Delaware, without reference to its conflict of law principles. You consent to the jurisdiction of the federal and state courts sitting in the State of Delaware. This Agreement constitutes the entire agreement between You and Nuravine with respect to the subject matter hereof, and supersedes all prior oral or written understandings, communications or agreements not specifically incorporated herein. If any provision of this Agreement is found to be invalid or unenforceable pursuant to judicial decree or decision, the remainder of this Agreement shall remain valid and enforceable according to its terms. You may not assign this Agreement, or any of its rights or obligations hereunder, whether by operation of law or otherwise, without the prior written consent of Nuravine. Any attempted assignment by You without prior written consent shall be void.

For inquiries or questions regarding this Agreement, please send an e-mail to support@nuravine.com.

Returns, Replacements, and Refunds

Products purchased directly from Nuravine or from an authorized Nuravine dealer may be returned under two different circumstances:

- Within 1 year of the date of original shipment for a manufacturer's defect*; or
- Within 30 days of the date of original shipment for any reason**

* The Nuravine product warranty does not apply to Nuravine Products that are purchased from an unauthorized seller, unless the warranty is explicitly transferred from the original purchaser.
** The 30 day return policy applies only to Nuravine Products that are purchased directly from Nuravine (either via phone or the online store).The following information governs returns of products purchased directly from Nuravine (either via phone or the online store).

Warranty Returns

If you discover what you believe is a product defect for any Nuravine product, please contact Nuravine Support at support@nuravine.com. Our customer support personnel will assist you in diagnosing and fixing any problems you may encounter in the use of your Nuravine product. In the event we cannot help you fix the problem, you may be entitled to a replacement product under the terms of Nuravine's limited warranty. Replacement products may include refurbished Nuravine products that have been recertified to conform with product specifications.

Warranty Coverage and Exclusions

The Nuravine limited warranty covers defects in materials and workmanship in every Nuravine product you purchase during the applicable warranty period, subject to certain exceptions. Nuravine's warranty period is one year from the date we ship the applicable Nuravine product to you, as determined by the date on the packing slip or invoice. The warranty period is not extended if we repair or replace a warranted product. Nuravine may change the availability of limited warranties, at our discretion, but any changes we make will not be applied retroactively. For more detailed information related to the limited warranty, please refer to the license agreement in the supporting documentation that came with your product. Please note that we do not provide warranty coverage for:

- Problems that result from external causes such as accident, abuse or misuse
- Usage that is not in accordance with Nuravine's product instructions
- Products that are used outside of North America (i.e. U.S. and Canada)
- Products with missing or altered serial numbers
- Products which have had their housings opened or otherwise tampered with
- Problems caused by using third party accessories, parts, or components

Nuravine does not warrant that its products will operate without interruption or will be error-free, or that all errors may be corrected. Nuravine's sole liability, and your sole remedy, for breach of the limited warranty will be repair or replacement of the applicable product, or, if neither of the foregoing are reasonably available, a refund of the amount you paid, less amounts attributed to your prior use.

Except as expressly set forth in the license agreement, Nuravine makes no warranties, whether express, implied, statutory or otherwise, with respect to its products. Nuravine and its suppliers hereby specifically disclaim all other express, statutory and implied warranties and conditions, including the implied warranties of merchantability, fitness for a particular purpose, non-infringement and the implied condition of satisfactory quality. Except as expressly stated in the license agreement, products are supplied on an "as is" basis without warranty. You assume all responsibilities for selection of a product to achieve your intended results, and for the installation and use of the product. Some jurisdictions do not allow a limitation on implied warranties, and so the foregoing disclaimer may not apply to you. In any event, any implied warranties that may exist under the laws of your jurisdiction are limited to the one (1) year period set forth in the limited warranty.

Instructions for Warranty Returns

To return a product, please follow these simple steps:

1. Please contact Nuravine support
2. Request an RMA:

   If in the diagnosis of reported performance issues with your Nuravine product(s) our customer support personnel determine that your product(s) qualifies for a Warranty Return, a Return Merchandise Authorization (RMA) request will be initiated and a unique RMA number will be sent to you via email. Every limited warranty return must have an associated (RMA) number.
3. Use the Original Nuravine Boxes:

   All products must be returned in the original packaging with all contents included. Please ensure that any previous shipping labels or other markings have been removed or covered completely. Please note that failure to return all items included with your product, or returning the product without the manufacturer packaging may result in the product(s) being shipped back to you at your own expense.
4. Use a Nuravine Prepaid Returns Electronic Shipping Label:

   To ensure successful delivery, ship returned products using the prepaid returns shipping label emailed to you by Nuravine. Nuravine will not be responsible for

returned products sent using an alternate carrier or shipping label. It is the sender's responsibility to retain a copy of the shipping label with the applicable tracking number signed by an agent of the carrier as proof that the possession of the returned product shipment was transferred to the carrier. You have 14 days from the date of the RMA request to return your original product.

5. Email Your Return Shipment Tracking Number to support@nuravine.com:
   Please include "Shipment Notification: RMA# (please include your RMA# here)" in the email subject line and the returns shipment tracking number and the time of pick-up in the email body.
6. Receive your Replacement:
   a. If your product(s) qualifies for advanced replacement, your replacement product(s) will ship within 24-48hrs hours of RMA request, excluding weekends and holidays, and the shipment of your returned product is not required until your replacement product(s) has been received.
   b. If your product(s) does not qualify for Advanced Replacement, your product(s) will ship upon receipt and inspection of your original product(s) and, we may require a valid credit card number to ship your replacement product(s). As part of our returns process, you will receive an email notifying you that your replacement order has been placed and another email notifying you that your product has shipped.
   c. You will not be charged for the replacement product as long as (i) you return the original product to us within 14 days after issuance of the RMA or 14 days after the shipment date of your replacement order, if your product(s) qualifies for Advanced Replacement, and (ii) the problem you reported with the product(s) proves to be covered by the terms of the limited warranty.
   d. If we do not receive the original product(s) within 14 days, or if we determine that the problem with your product(s) is not covered by the limited warranty, we will charge the then-current standard price for the applicable product(s) to your credit card or the original form of payment used at the time you placed your original order.

Transfer of Limited Warranty

Limited warranties on Nuravine products may be transferred during the warranty period if the current owner transfers ownership of the products and records the transfer with us. The products must be registered by both the previous and new owner in order to effect the transfer of limited warranty.

Problems Outside of Warranty Coverage

If we determine that the problem is not covered under the limited warranty, we will notify you and inform you of service or replacement alternatives that are available to you on a fee basis.

30 Day Return Right

If you are not completely satisfied with your Nuravine product at any time during the 30 day period following the original shipment date, please contact Nuravine Support. Our customer support personnel are available during support hours to make sure you have every opportunity to enjoy the benefits of the Nuravine Digital Music System. If, however, you are dissatisfied for any reason with your purchase, please follow the steps below for a refund of your purchase price.

The 30 day return policy applies only to Nuravine Products that are purchased directly from Nuravine (either via phone or the online store).

Please note that only products in the original packaging with all materials and in new or as-new condition are eligible for the 30 Day refund.

Instructions for 30 Day Returns

To return a product, please follow these simple steps:

1. Please contact Nuravine support:

   Every 30 Day return must have an associated Return Merchandise Authorization (RMA) number. A RMA may be obtained from Nuravine by calling our customer support. Nuravine must receive the returned item within fourteen (14) days after a RMA number has been issued. An assigned RMA number is valid for 14 days only and will expire on the 15th day after the date of issuance, at which time any returned products will be refused.
2. Use the Original Nuravine Boxes:

   All products must be returned in the original packaging with all contents included. Please ensure that any previous shipping labels or other markings have been removed or covered completely. Please note that failure to return all items included with your product, or returning the product without the manufacturer packaging may result in the product(s) being shipped back to you at your own expense.
3. Ship the Product Back to Us:

Once you have received your RMA number, please write it clearly on the outside of the package to be returned. Please ensure that previous shipping labels or other markings have been removed or covered completely. It is the customer's responsibility to arrange shipment pickup, prepay shipping (and any duty) charges, and insure the shipment or accept the risk if the product is lost or damaged in shipment. We advise that you ship the product back to us via UPS or FedEx to ensure proper delivery. It is the customer's responsibility to retain a sender's copy of the shipment invoice and the shipment tracking number in the event of a lost shipment until the return product has been received. Nuravine reserves the right to refuse any product returned under the 30-Day return right that does not meet these criteria.

4. Email Your Return Shipment Tracking Number to support@nuravine.com:
   Please include "Shipment Notification: RMA# (please include your RMA# here)" in the email subject line and the returns shipment tracking number and the time of pick-up in the email body.
5. Receive Your Refund
   Once the return is received and verified to meet all of the above conditions, please allow 10-15 business days from the date of receipt for the credit to appear on your account. Credit will be issued to the payment method or credit card used for your original purchase only. Nuravine will not refund original or return shipping costs or duties.