

Ætrium System Maintenance
Sensor Calibration

SOP2

Calibration ensures your equipment is compatible with industry-recognized metrics and scales, and that all aspects of operation are within spec for maximum efficiency, longest life, and highest yield. When growing plants using the AEtrium-4, calibration is performed by comparing your sensor output to the known output of a standardized solution. This allows for shared units of measurement and the highest degree of repeatability from grow to grow.

Calibration of all sensors needs to be done at commissioning of new equipment. We also recommend recalibrating sensors once every two weeks for best results.

Bi-weekly calibration improves sensor accuracy and precision. In addition, proper plant nutrition programs depend on correct sensor measurements. Finally, over time, sensor components foul and may drift or lose accuracy. Calibration is the best way to catch performance degradation and to get everything back into optimal working specifications as soon as possible.

Periodic calibrations help to minimize the risk of damaging the plants, plus calibration helps to keep readings reliable so you can see problems before your plants experience problems. Calibration alerts growers to membrane cracks, electrode degradation, etc., before these things lead to unhealthy plants.

Required Equipment

- Independent thermometer (alcohol or mercury)
- pH calibration solution (4.01 and 7.01)
- EC calibration solution (84 µS/cm, 1413 µS/cm, 5000 µS/cm)
- Clean water
- Plastic Cups
- Lint-free cloth or paper towel

IMPORTANT!

The pH and EC sensors are temperature compensated so it is important that the temperature sensor is always calibrated before the other sensors.

Calibrating Sensors in the Ætrium SmartFarm and Ætrium-4

1. Pause the Growth Plan

a. Pause the Growth Plan from the **Device Page** (fig. 1)

b. In the **Pause Growth Plan** (fig. 2) pop-up window select the ***Pause Time*** (choose from options in blue or enter custom time in window), select ***Pause Water Pump*** check box (only pauses water pump and does not interrupt light cycle), and click ***Commit***. You will then see a ***Pause Successfully*** notification. The system will automatically resume after the amount of time specified.

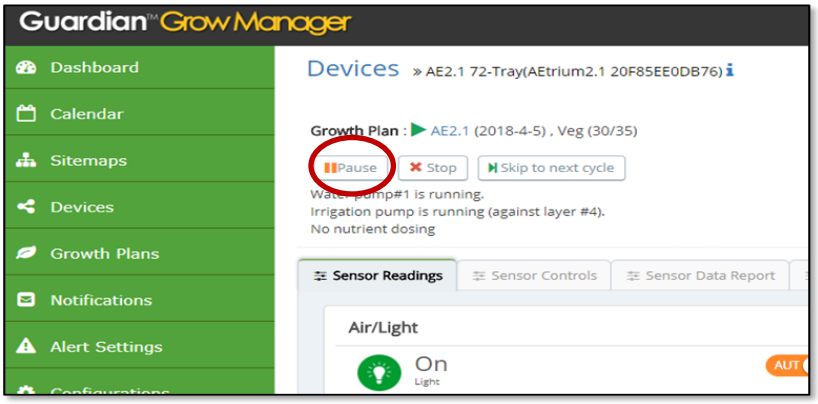


Fig. 1: Device pause prompt.

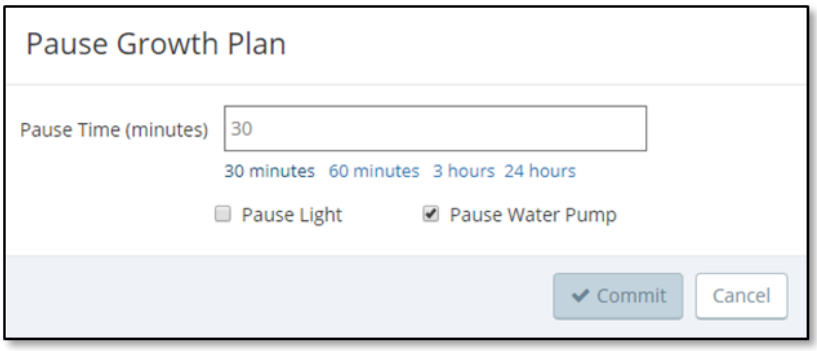


Fig. 2: Pause Growth Plan duration

2. Access Calibration window

a. Click on the **Devices** tab on the side bar menu.

b. Click on the **Calibration** button for the unit to be calibrated

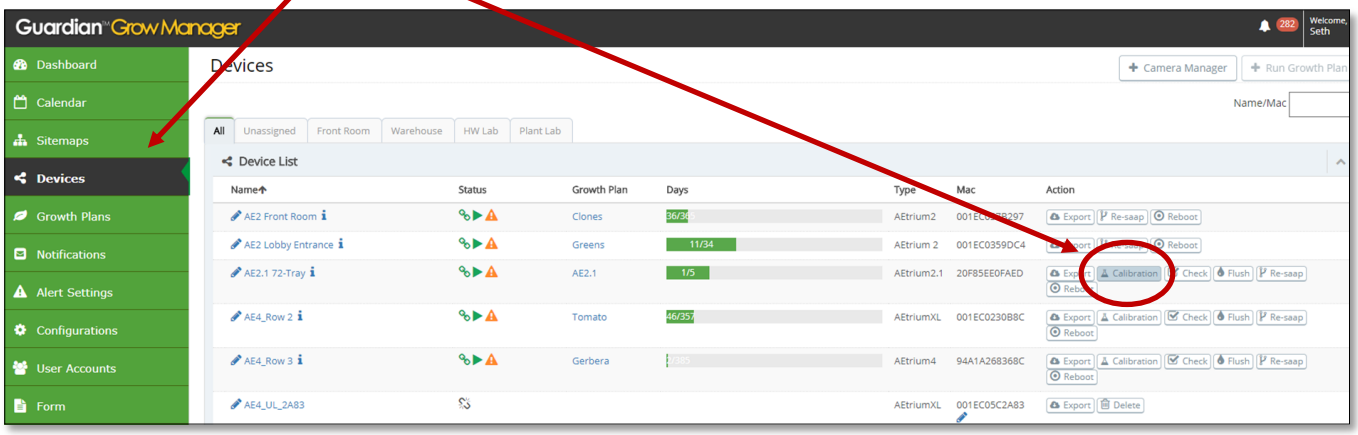


Fig. 3: Calibration button on device page in Guardian Grow Manager software

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3. **Temperature Calibration**

   a. Fill a small cup with room temperature water

   b. Place independent (alcohol or mercury) thermometer and ***Ætrium temperature*** sensor into the room temperature water sample.

   c. With both sensors in room-temperature water, record the reading from the independent sensor into the ***Calibration Point*** textbox on the **Device Calibration** page (fig. 4), and click ***Set***.

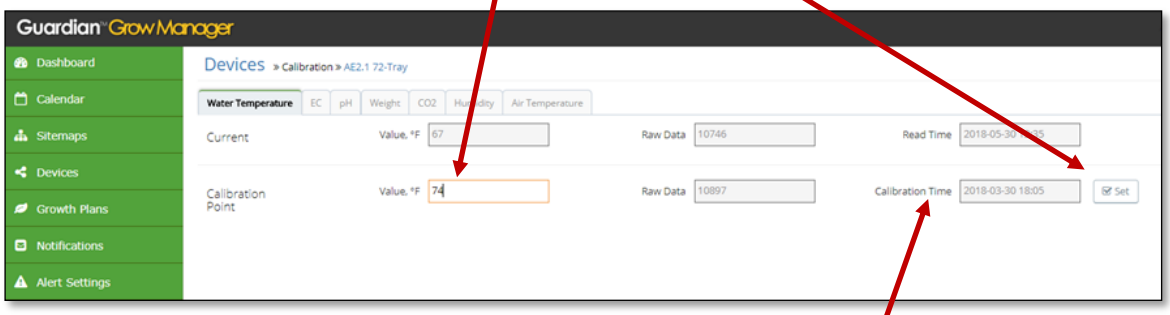


Fig. 4: Water temperature tab on Device Calibration page

   d. You will be prompted to confirm calibration setting in **Calibration Set** window. Select ***Commit*** to confirm.

   e. The date of latest calibration will be stored on **Device Calibration** page.

IMPORTANT!

Make sure that both temperature sensors are full submerged in the water

Be sure to enter the temperature in the correct units of measurement (Fahrenheit or Celsius)

4. **Electrical Conductivity (EC) Calibration**

   a. Pause **Growth Plan** (step 1).

   b. Fill one plastic cup with clean water and place both ***Ætrium EC AND temperature sensors*** into clean water sample together (fig. 5).

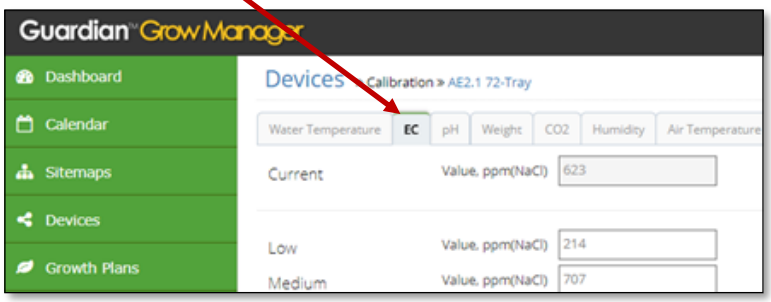


Fig. 6: EC tab on Device Calibration page



Fig. 5: Temperature sensor (l) and EC sensor (r) in clean water sample

c. Select ***EC*** tab on **Device Calibration** page

d. Pour three EC calibration solutions (Low, Medium, High) into three clean plastic containers. Label each.

e. Place the **Temperature and EC sensors** into the lowest level EC solution, enter the value in the ***Low*** text box on the EC Calibration page (fig. 7) and click ***Set***.

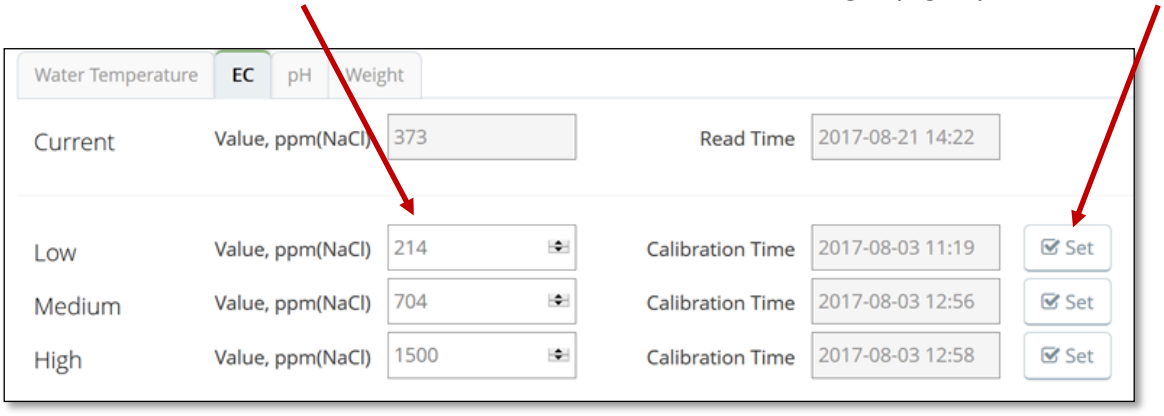


Fig. 7: EC calibration page

f. You will be prompted to confirm calibration setting in **Calibration Set** window. Select ***Commit*** to confirm.

g. Rinse **Temperature and EC sensors** in clear water sample and dry.

h. Repeat process with Medium and High EC calibration solutions.

i. Place **EC sensor** back in Sensor Float when calibration is complete.

IMPORTANT!

You must wait at least **1 minute** for the reading to stabilize in each solution calibrating. Be sure to enter EC in the units displayed; for example, ppm (NaCl). The system has the ability to display the EC readings in different scales. Calibration solutions have different scale values on the bottle's label. Make sure to use the same value for both the reading and the calibration solution.



Fig. 8: pH sensor (l) and Temperature sensor (r) in clean water sample

5. pH Calibration

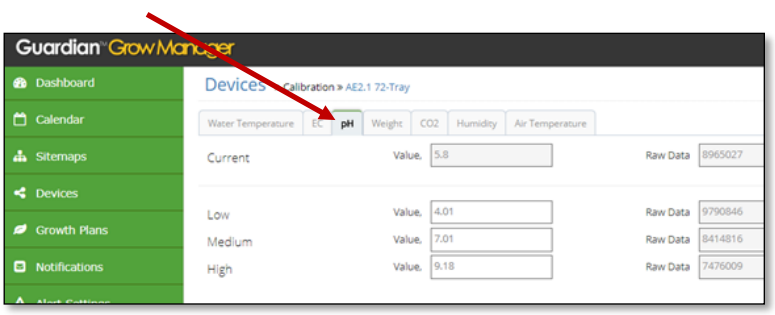


Fig. 9: pH calibration page

a. Fill a plastic cup with clean water.

b. Pour the two pH reference solutions (4.01 and 7.0) into individual plastic cups. Make sure to label each.

c. Select ***pH*** tab on **Device Calibration** page

d. Dip the **Temperature and pH** sensors into clean water, remove, and dry with paper towel.

e. Before calibration, be sure **pH** sensor is clean. Probes should be brushed gently (fig. 10) once every two weeks with a toothbrush to remove salt buildup and any material that may cause inaccuracy.



Fig. 10: Cleaning pH sensor with soft bristled brush

f. Place **Temperature and pH sensors** into plastic cup with 4.01 calibration solution.

g. Once the reading has stabilized, input the value of 4.01 into the ***Value*** text box for the ***Low*** setting.

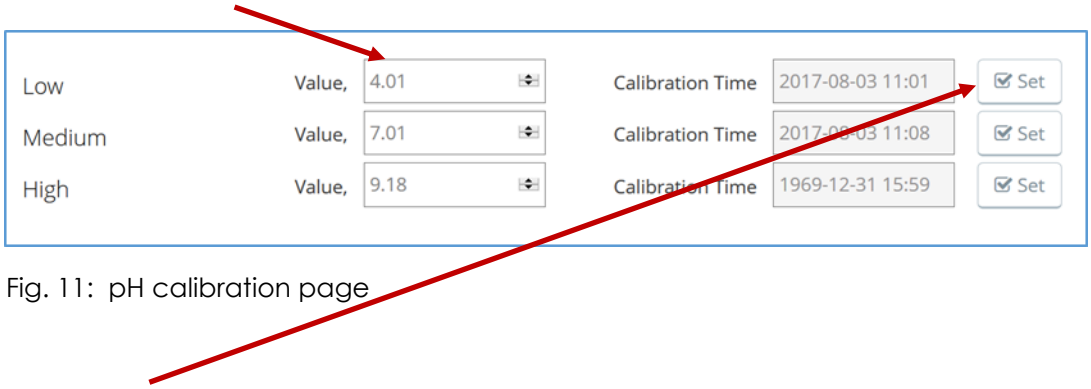


Fig. 11: pH calibration page

h. Click the ***Set*** button.

i. You will be prompted to confirm calibration setting in **Calibration Set** window. Select ***Commit*** to confirm.

j. Rinse the sensors in clean water and dry them with paper towel or a lint-free cloth. Repeat the process for the pH 7.0 calibration solution.

k. Return **pH and Temperature sensors** to Sensor float once complete.

IMPORTANT!

You must wait at least **2 minutes** for the reading to stabilize in each solution calibrating.

6. Resume Growth Plan

a. System will resume **Growth Plan** after the set amount of time has expired.

b. Or, resume system manually by selecting the **Resume** button (fig. 12) on the device page.

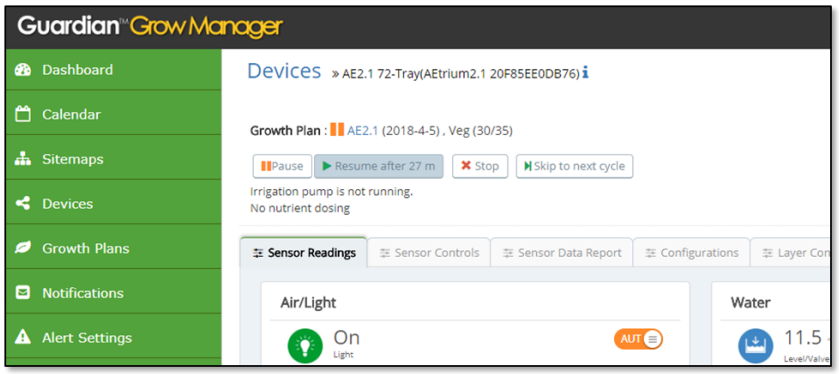


Fig. 12: Resume growth plan in Guardian Grow Manager

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