

# Annual maintenance instructions for a Davis Vantage Pro 2 weather station

Your Davis weather station is designed to provide you with accurate weather data for many years. To prolong the life of the station, Davis Instruments recommends doing a thorough cleaning and inspection of your station at least once a year. The following is a recommended annual maintenance routine to help you get the most out of your station. At the end of the document, you will find a recommended hardware replacement schedule, as well as an annual maintenance checklist you can use for record keeping.

What you will need:

- A mobile device with the Davis EnviroMonitor app installed on it. This app can be downloaded here: [https://www.davisinstruments.com/pages/download-apps?\\_pos=1&\\_psq=download&\\_ss=e&\\_v=1.0](https://www.davisinstruments.com/pages/download-apps?_pos=1&_psq=download&_ss=e&_v=1.0). You can log in with the same information you use to access the WeatherLink application.
- A Phillips head screwdriver to remove the radiation shield.
- A level for checking the pressure treated post.
- A ladder tall enough to reach your rain collector and nodes.
- Alcohol wipes for cleaning sensors and solar panels. You may also want a soft cloth and some water in case the panels are heavily soiled.
- Gloves, if your station has a lot of bird feces collected on it.
- Trimmers, to remove excess vegetation from the base of the station.
- 4 D-cell batteries for your node.
- A clean, dry paintbrush can be useful for cleaning debris out of the rain-tipping mechanism and mesh on sensors, but isn't essential.
- If your rain collection cone is difficult to remove, a leather belt or some WD40 can be useful.
- Socket wrench, in case levelling of ISS is needed.

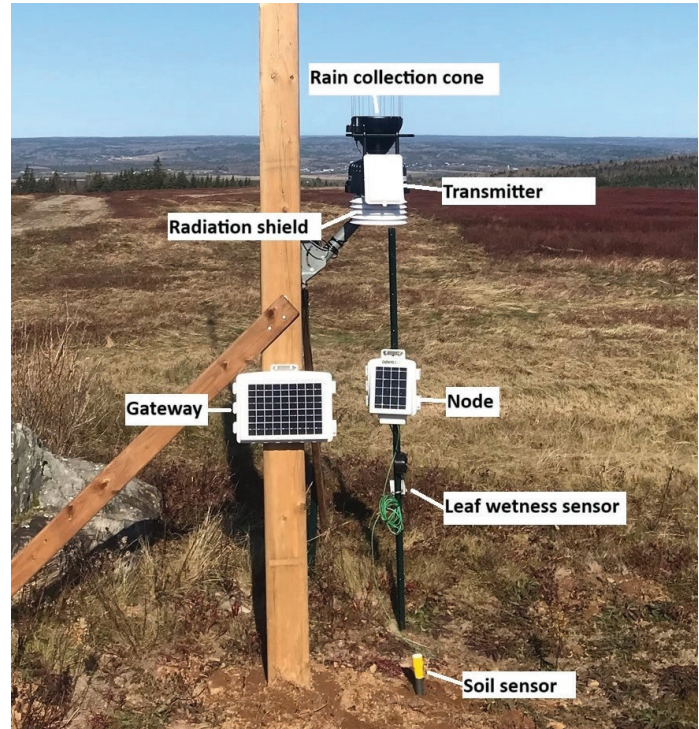


Figure 1: Components of a Davis Vantage Pro 2 weather station

1. Locate the gateway on your station (Figure 1). Firmware updates can take some time to install, so it is most efficient to start that process first. General firmware update instructions are below. More detailed instructions for firmware updates, including screenshots, can be found here: <http://farmdatatools.ca/wp-content/uploads/sites/20/2023/02/How-to-update-firmware-on-a-Davis-weather-stationV2.pdf>
  - a. Press the blue button or silver pad inside your gateway to activate the BLE light. Use the Davis EnviroMonitor app to select your station.
  - b. Click on the menu button, then select Firmware Update, and follow the directions on the screen.
  - c. The firmware on your node will likely also need an update. Follow the same process as above, but this time, you will first select your station, then your node, and then the menu button and Firmware Update.
2. Use your trimmers to remove excess vegetation from around the base of the station and node. Be careful not to accidentally clip any of the wires that connect the sensors.
3. Look up and ensure that the wind cups and weathervane on your anemometer can freely spin. If they can, there is no need to take the anemometer down at this point. If it looks like there is an issue, see the [How To Clean or Replace Your Anemometer fact sheet](#) for detailed instructions on taking the anemometer down. Clean any debris before putting it back in place.

4. Use your level to check the pressure treated pole (Figure 1) is still standing straight.
5. Use an alcohol wipe to clean off the solar panel on the front of your gateway. If the panel is heavily soiled, use a soft, non-abrasive damp cloth. Dry the panel afterwards to ensure there is no residue left behind.
6. Inspect the inside of the gateway:
  - a. Check for and clean up any pooled water, insects, or debris.
  - b. Check the rubber seal inside the door. This is what protects the inside of the gateway from rain and dust, so it should be replaced if it is cracking.
  - c. Check your battery for any bulges or damage. Damaged or bulging batteries must be replaced and safely disposed of.
  - d. Check all wiring to make sure it has not been damaged.
  - e. Check that the connections of all wires and plugs are secure.
  - f. Ensure gateway door is properly closed once finished.

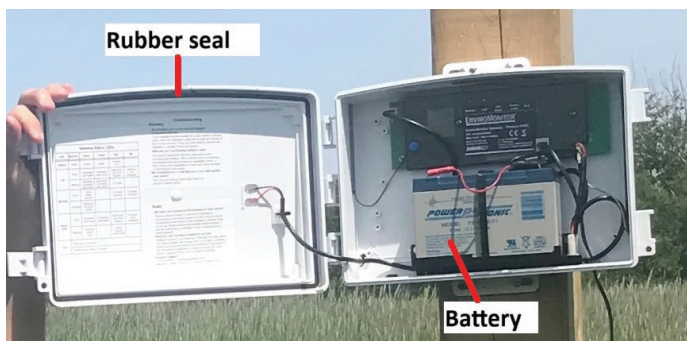


Figure 2: Inside of gateway

7. Locate your transmitter (Figure 1). Remove the cover by pulling out slightly on the tab at the bottom center and sliding upwards.
  - a. Check for and clean up any pooling water, insects, or debris.
  - b. Check your wiring for any damage.
  - c. Check the rubber seal around the transmitter and the foam insert in the hole that the cables exit through. These keep water and insects out of the transmitter and should be replaced if damaged (Figure 3).

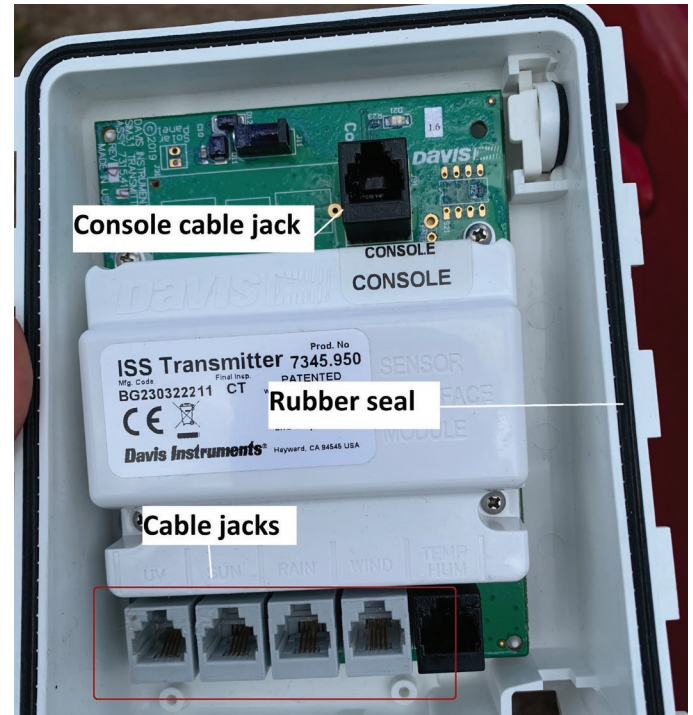
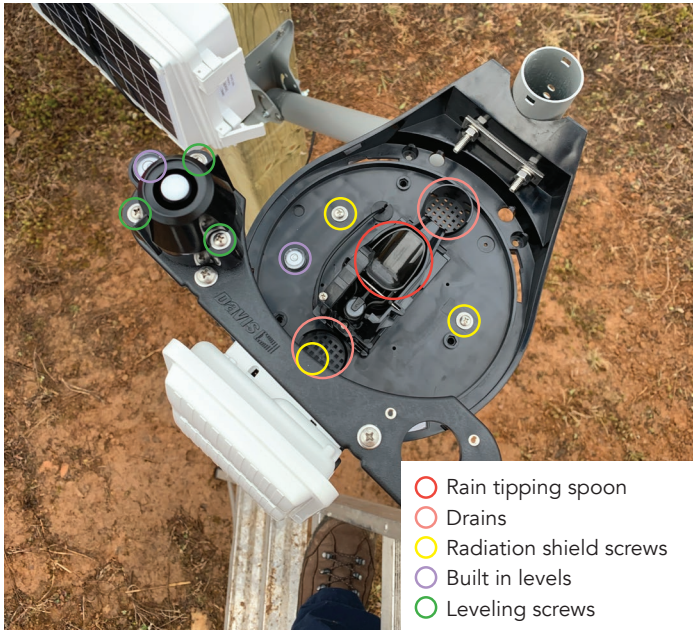


Figure 3: Inside of transmitter

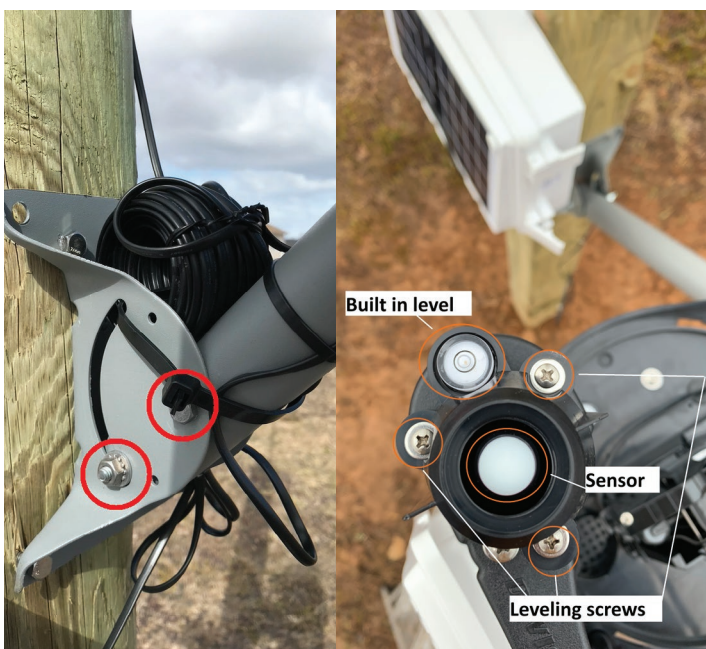
8. Unplug the Solar, Wind, Rain and Temp/Humidity sensor cables (Figure 3). This ensures you will not give any false readings when cleaning your station.
9. Set up your ladder so you can safely access your rain collection cone (Figure 1).
  - a. Grasp it by the base and turn it counterclockwise to remove it. These can sometimes be difficult to remove. Use a leather belt for grip, or carefully spray some WD40 along the tracks.
  - b. Once the rain collection cone has been removed, clean the inside of it with an alcohol wipe or a rag.
  - c. Remove, clean and replace the strainer.
  - d. Set the cone aside for now.
10. Clean all parts of the integrated sensor suite (ISS) (Figure 4) and check for any cracks:
  - a. Clean and inspect the platform under the rain collection cone. Make sure the drains are clear of debris.
  - b. Clean and inspect the rain-tipping spoon mechanism.
  - c. Make sure there is nothing under the spoon preventing it from tipping. Manually tip the mechanism a few times to ensure easy movement.
  - d. Clean the solar radiation sensor with an alcohol wipe or damp cloth. Try not to touch it with your fingers, as the oils from the skin can make readings inaccurate.



**Figure 4: Inside the integrated sensor suite (ISS)**

**11.** Check that the ISS and the solar radiation sensors are level using the built-in level indicators.

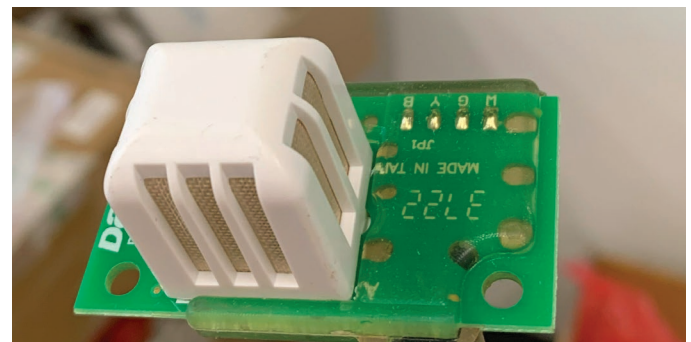
- a. If the ISS platform is not level, it can be adjusted by loosening the nuts holding the mounting bar in place (Figure 5 - left). Once they are loose, adjust the arm until the built-in level is in range. Retighten the nuts.
- b. If the solar radiation sensor is not level, it can be adjusted using the three levelling screws (Figure 5 – right). Loosen all three, adjust so the sensor is level, then gently retighten the screws. Do not overtighten, as the plastic can crack.



**Figure 5: Left - Bolts for levelling ISS. Right – Levelling screws for radiation sensor**

**12.** Next, disassemble the solar radiation shield so it can be cleaned and checked for damage. Your temperature/humidity sensor (Figure 6) is attached to the top panel.

- a. Support the shield from the bottom with one hand. With your other hand, use your Phillip’s screwdriver to remove the three long screws holding it in place.
- b. Carefully separate the layers of the shield. Keep them in order to make it easier to reassemble.
- c. Clean all the sections of the shield with alcohol wipes or a damp cloth.
- d. Wipe the temperature and humidity sensor with an alcohol wipe or a dry brush.
- e. Stack the layers of the shield back in the same order.
- f. Hold the shield in place with one hand and reinsert the long screws with the other hand. Do not over-tighten the screws, as this can crack the plastic.



**Figure 6: Temperature and humidity sensor will be attached to the top plate**

- 13.** Replace the rain collection cone.
- 14.** Inside your transmitter, reconnect the cables for Solar, Wind, Rain and Temp/Humidity. Both the cables and the ports are labelled to show you which goes where.
- 15.** Slide your transmitter cover back on by lining up the arrows on the cover and the case, then sliding down until it clicks into place.
- 16.** Locate your node (Figure 1), and clean the solar panel with an alcohol wipe or a non-abrasive damp cloth. Depending on your setup, the node(s) may either be located with the main station or distributed throughout your field.

**17.** Open the node door:

- a. Perform any firmware updates, if not already completed.
- b. Check for and clean up any pooled water, insects, or debris.
- c. Check the integrity of the rubber seal around the door (Figure 7).
- d. Change the 4 D-cell batteries located on the back side of the door. More detailed instructions for locating the batteries can be found here: <https://farmdatatools.ca/wp-content/uploads/sites/20/2023/02/How-to-find-and-change-node-batteries-3.pdf>.
- e. Check all wiring and cable connections.
- f. Ensure the node door is properly closed once finished.

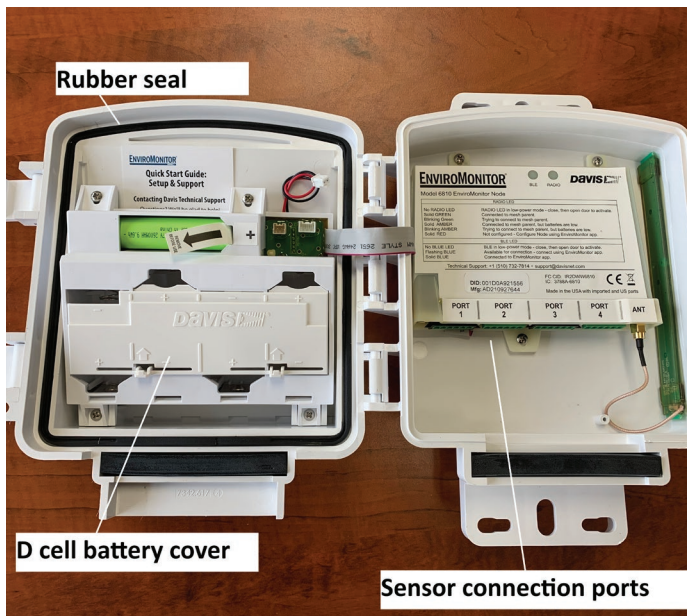
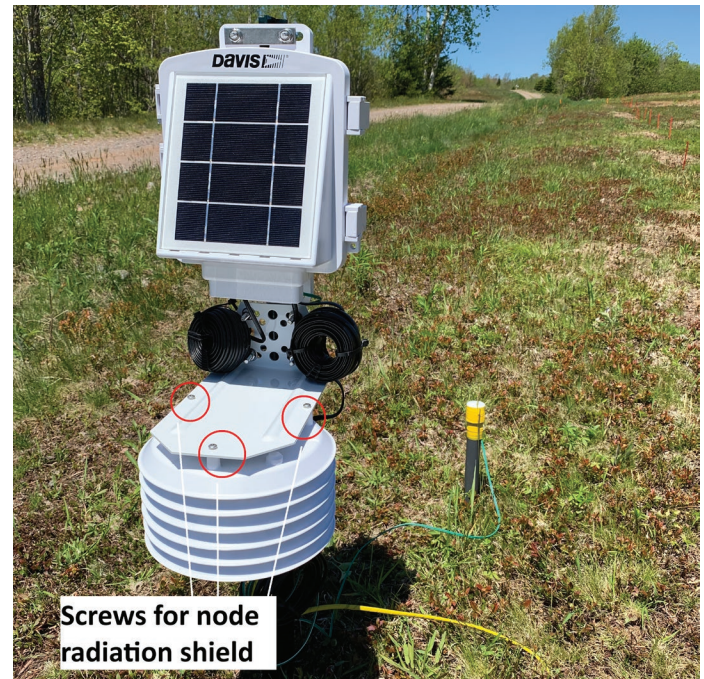


Figure 7: Inside of node

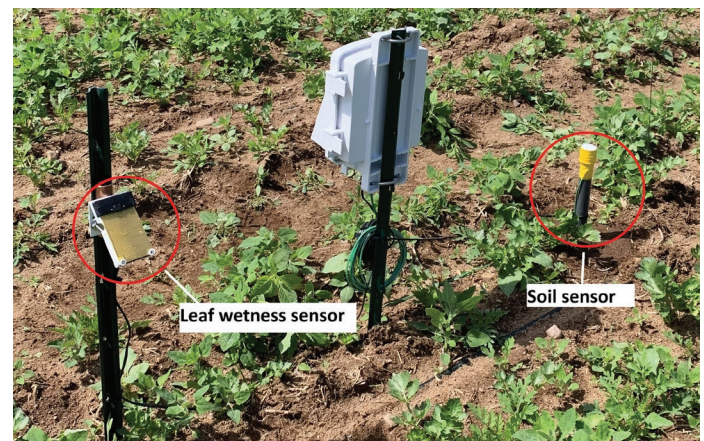
- 18.** If you opted for extra temperature/humidity sensors, your node(s) may also have a solar radiation shield with this sensor inside (Figure 8). If so, remove the screws holding it in place and clean as per step 12.



Screws for node radiation shield

Figure 8: Node with additional temperature and humidity sensor

- 19.** Carefully inspect the wiring that connects your leaf wetness and soil sensors to the node.
- 20.** Clean the leaf wetness sensor (Figure 9) with an alcohol wipe or damp cloth. Inspect for any damage.
- 21.** Ensure your soil sensors (Figure 9) are still in place and undamaged.



Leaf wetness sensor

Soil sensor

Figure 9: Soil and leaf wetness sensors

## DAVIS RECOMMENDED HARDWARE REPLACEMENT SCHEDULE

Part / Sensor	Recommended Replacement Schedule	Item #	Image
Anemometer for Vantage Pro2 & EnviroMonitor	4-5 years	6410	
Temperature /Humidity Digital Sensor Board for Vantage Pro2	2-3 years	7346.070	
Leaf Wetness Sensor, Vantage Pro2 and EnviroMonitor	5 years	6420	
Soil Moisture Sensor, Vantage Pro2 and EnviroMonitor	5 years	6440	
Lithium Battery, 18650, rechargeable	2 years	7011.026	
Vantage Pro2 Tipping Spoon Replacement Kit, 19" (0,5 m) Sensor Cable	5 years	7345.425	
Solar Radiation Sensor	5 years	6450	
EnviroMonitor Gateway LTE 6v Battery (12 Amp Hours)  Local source available at <a href="https://galaxybattery.ca">https://galaxybattery.ca</a> at Galaxy Battery 40 Thornhill Drive, Suite 3 Dartmouth, NS	5 years	6712	

## RECOMMENDED ANNUAL MAINTENANCE CHECKLIST FOR DAVIS WEATHER STATION

---

Date \_\_\_\_\_

- Carefully remove excess vegetation from the base of the station and nodes.
- Check for firmware updates on the EnviroMonitor Gateway (using the EnviroMonitor application).
- Check for firmware updates on all EnviroMonitor nodes (using the EnviroMonitor application).
- Check that the pressure treated post is level and adjust if necessary.
- Check that the rain gauge is level and adjust if necessary.
- Check that the solar radiation sensor is level and adjust if necessary.
- Disassemble and clean the solar radiation shield with an alcohol wipe or damp cloth. (If there is an extra solar radiation shield on the node, disassemble and clean this one as well)
- Clean the temperature and humidity sensor with an alcohol wipe. (If there is an extra temperature and humidity sensor with the node, clean this one as well)
- Clean debris from the strainer in the rain collection cone.
- Clean debris from inside the rain-tipping spoon mechanism.
- Clean the solar panel on the gateway and inspect for any damage.
- Inspect the rubber seal inside the gateway, node(s) and transmitter doors.
- Check the foam insert in the transmitter.
- Change the 4 D-cell batteries inside the node door.
- Clean the node solar panel and inspect for any damage.
- Inspect the leaf wetness sensor and associated cord for damage.
- Inspect the soil sensor and associated cord for damage.
- Inspect all wiring for damage.
- Ensure the wind sensor arm is pointing north.
- Ensure the wind cups can rotate freely.
- Ensure the wind vane is rotating freely.
- Replace hardware based on Davis's recommended schedule.