

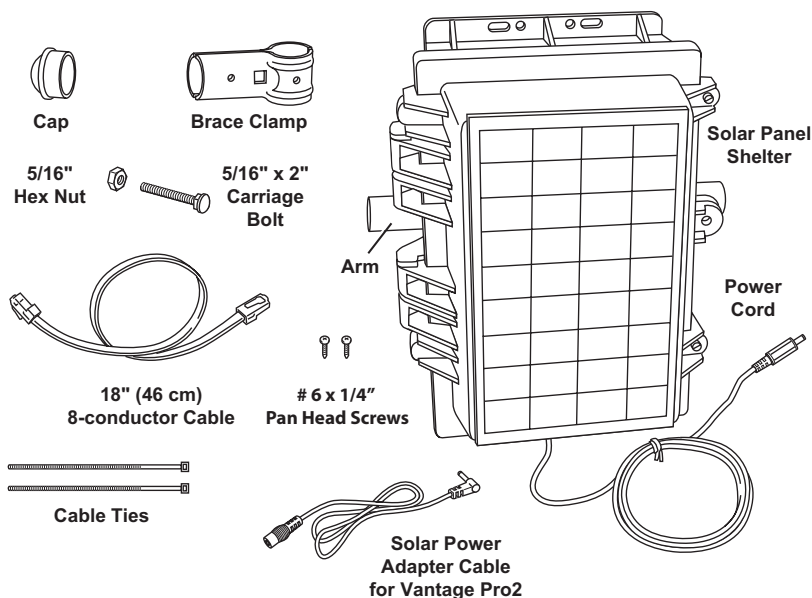
# Solar Power Kit

## For Cabled Weather Stations

This manual describes how to install and use the Solar Power Kit. The Solar Power Kit enables cabled Vantage Pro2™ stations, cabled Weather Envoys® to be stand-alone units, thereby eliminating the need to run a cable to a power outlet. The consoles/receivers can be mounted outdoors in the Complete System Shelter (#7724) or Multi-Purpose Shelter (#7728).

## Components

The Solar Power Kit includes the following components. Please be sure you have all listed components before beginning.



## Tools and Materials Needed

You may need the following for this installation:

- **Adjustable Wrench or a 1/2" and a 7/16" Wrench**
- **Flat Blade Screwdriver**
- **Phillips Screwdriver**
- **Wire Cutters or Scissors**
- **Protractor (optional)** - To adjust the solar panel to the correct tilt angle.
- **Magnetic Compass, Local Area Map, or Watch** - To align the solar panel to the south in the Northern Hemisphere (or north in the Southern Hemisphere). The watch may be used to set the panel facing the sun at solar noon.

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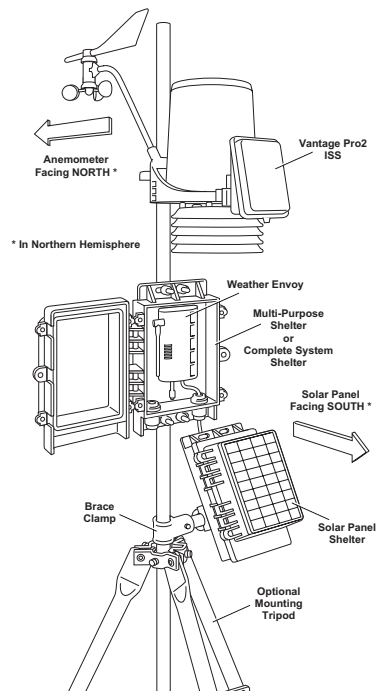
## Location Tips

The following tips should help you find the best possible location and position for your Solar Power Kit. If necessary, you may have to reposition your station to permit the solar panel sufficient access to the sun's rays.

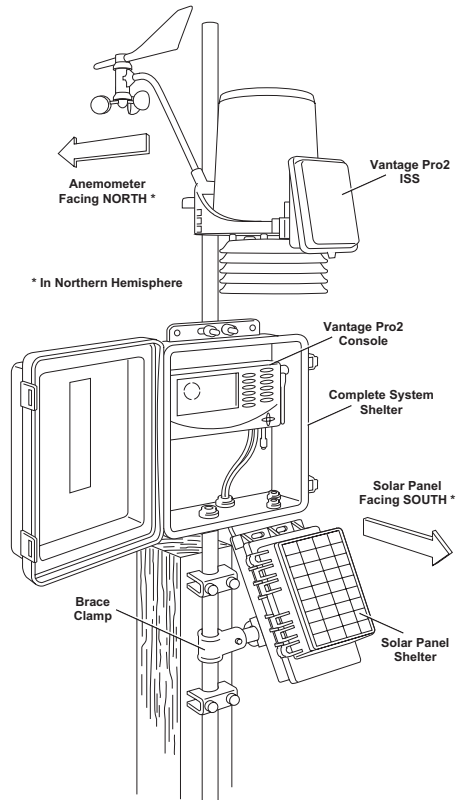
- The solar panel works best when the surface of the panel receives full sunlight.
- Mount the panel away from fences, buildings, trees or other obstructions that may cast shadows over the panel.
- The panel should be mounted facing south in the Northern Hemisphere and north in the Southern Hemisphere for maximum sun exposure.

## Mounting the Solar Power Kit With Vantage Pro2 Stations

Most people mount the Solar Power Kit on the galvanized steel tube in the Mounting Pole Kit (#7717) or Mounting Tripod (#7716) that is used to mount the weather station. For tripod installation, refer to your tripod manual (if necessary). The following are examples of different Solar Power Kit assemblies, one on a tripod, another mounted to a fence or post, using the Vantage Pro2 console and Weather Envoy. See the examples in the following pages for sample mounting options:



Sample Installation with Envoy and Tripod



Sample Installation With Console and Mounting Pole on a Fence or Post

1. Mount the ISS and desired shelter, if not already mounted.  
Refer to the ISS weather station or other weather station installation manual for instructions. Refer to the Complete System Shelter or Multi-Purpose Shelter for instructions on mounting and installing your console or Weather Envoy. If you are mounting the station on a fence, make sure the steel tube is on the side of the fence that receives the most sun (i.e., the southern side in the Northern Hemisphere or the northern side in the Southern Hemisphere).
2. Loosen the screws and saddles that hold the steel tube to the post.  
Loosen the screws enough to allow the steel tube to sit about 1/16" away from the wall so that the brace clamp (for the solar power kit arm) has room to clasp around the tube.
3. Identify where you want to position the solar power kit before you install it. For additional structural support, rest the arm on the lower mounting pole saddle or tripod collar.
4. Attach the brace clamp loosely to the mounting pole and insert the arm.

5. Assemble the brace clamp and loosely fasten it to the mounting pole.
6. While gripping the mounting pole/tripod end of the brace clamp with one hand, slide the arm in as shown below with your other hand and tighten.

The kit can be positioned to face in any direction depending on which end of the arm you insert into the brace clamp

7. Position the solar panel so that it can retain the maximum solar exposure.

The optimum tilt angle for the panel (measured from the horizontal) is determined by the site latitude. See Table 1 for tilt recommendations.

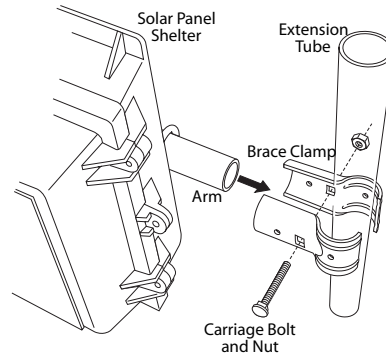


Table 1: Solar Panel Tilt Recommendations

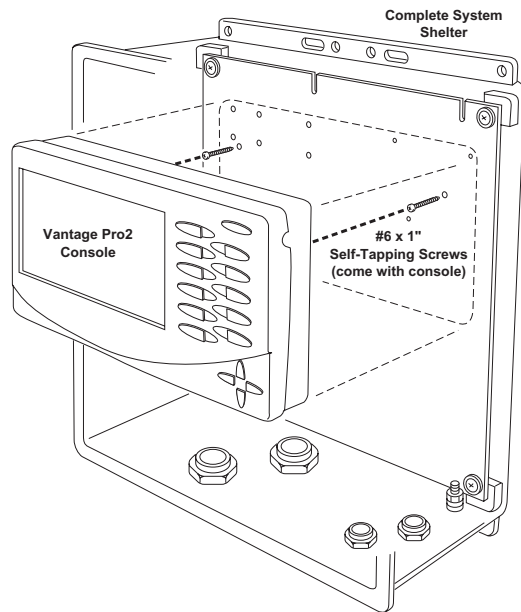
Site Latitude	Recommended Tilt Angle
0° to 4°	10°
5° to 20°	latitude + 5°
21° to 45°	latitude + 10°
46° to 65°	latitude + 15°
65° to 75°	80°

Using a protractor, adjust the tilt angle of the panel until the angle the panel makes with the horizontal matches the recommended tilt angle.

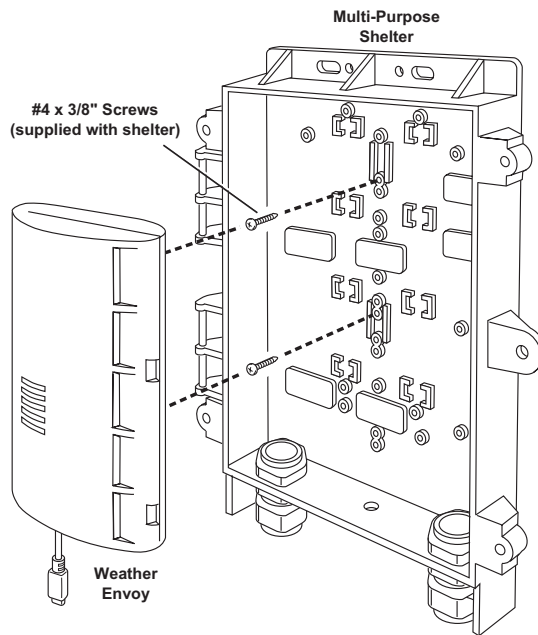
8. Tighten the brace clamp using a wrench.
9. Re-tighten the screws that hold the mounting pole to the post.
10. Fit the end cap onto the exposed end of the Solar Power Kit arm.

## Connecting the Cables - Cabled Vantage Pro2, Cabled Weather Envoy

1. If using a Multi-Purpose Shelter, open the shelter by using a flat head screwdriver on the two 10-32 flat head screws. If using a Complete System Shelter, unlatch the two latches on the side of the shelter.
2. Mount the console on the inside of the Complete System Shelter or the Envoy on the inside of the Multi-Purpose Shelter as shown on the following page. If you prefer to mount your console or Envoy elsewhere, see your owner's or shelter's installation manual for instructions and considerations.
3. Remove the protective vinyl cap from the power cord plug.
4. Connect the power cord adapter to the solar kit power chord.

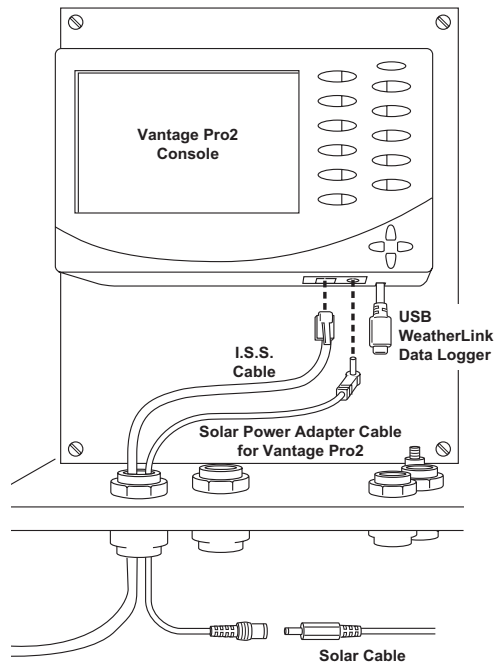


Installing the Console into a Complete System Shelter



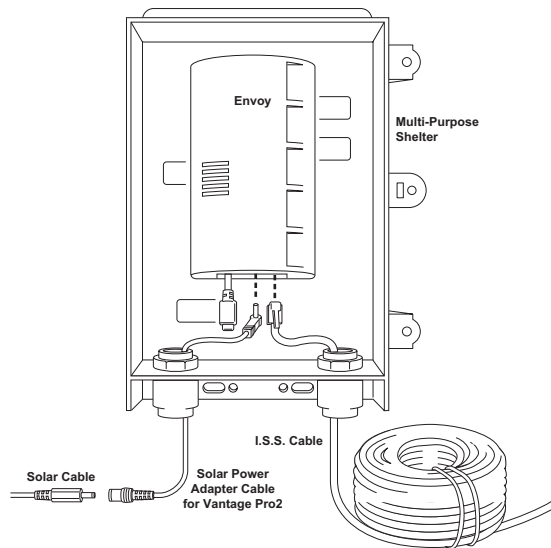
Installing the Envoy into a Multi-Purpose Shelter

5. Run the power cord from the kit up through one of the shelter openings at the bottom of the Complete System Shelter or Multi-Purpose Shelter.
6. Plug it into the console or Envoy's POWER slot. The console should beep three times within 10 seconds if the console is working properly. The Weather Envoy should beep twice within 10 seconds if the Envoy is working properly. The Envoy or console should beep three times within 20 seconds if it is connected to a computer with WeatherLink installed.



Connecting the Solar Power Cable to the Console

7. Check all of the readings on your display to be sure they display correctly. Consult your owner's manual for instructions on displaying the various readings. Spin the wind cups, move the wind vane, and tip the rain bucket to verify wind speed and direction and rainfall readings. If the console is receiving power but is having problems reading the



Connecting the Solar Power Cable to the Weather Envoy

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sensors, please refer to your owner's manual. If your Envoy is connected to a computer, open WeatherLink and check the Bulletin feature to check the readings.

8. If everything is working properly, close the Complete System Shelter door and re-latch the latches or close the Multi-Purpose Shelter door and tighten the screws.
9. To avoid wind damage, stuff any extraneous cable length back into the shelter and use the two cable ties provided to strap any exposed cables to the mounting pole (or tripod). You have completed the installation.

## Understanding the Solar Power Kit

Aside from the installation hardware, the kit consists of three key elements:

- **Solar Panel** - Converts solar energy to electrical energy. The unit provided is rated at 2.5 Watts. It provides about 300 mA of current in bright sunshine (1000 W/m<sup>2</sup>). In 2 hours it will provide enough power to operate a cabled console or Envoy station for 48 hours. You can clean the solar panel with water spray, or with a soft cloth and soapy water followed by a clean water rinse.
- **Battery** - The kit is designed to use the 12 Amp-Hour battery provided, but any 6-volt rechargeable battery may be used. The 12-Amp-Hour battery, when fully charged, can supply power to a cabled Vantage Pro2 station or Weather Envoy station for 12 months assuming an average temperature of 68°F (20°C), or 10 months at 32°F (0°C), or 8 months at -4°F (-20°C).

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Note: The battery is sealed, but it should be assumed that it (and any other rechargeable battery) is capable of generating flammable gas. The battery should be located in a vented space, if possible. No spark, flame, or lighted cigarette should be allowed in the vicinity.

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- **Regulator Circuit** - In order to increase the efficiency and life of the battery, the circuit limits the voltage to which the battery is charged, and it adjusts this voltage according to the temperature at the rate of negative 7.5 mV per °C. This ensures that the battery is fully charged for the conditions, but never over-charged.

## Troubleshooting Guide

While the weather station and Solar Power Kit combination is designed to provide years of trouble-free operation, occasional problems may arise. If you experience a problem, please check the troubleshooting tips below before calling technical support.

Console locks up during power up or a power surge:

Insufficient power during power up or a power surge may cause the console to lock up. If this occurs, remove all power by disconnecting the solar power cord and batteries. Wait for 1 minute with all of the power removed. Then re-connect the solar power cord and listen for two or three beeps within 10 seconds. Once you receive the final beep, put the console back

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into service. If the console fails to power up, the Solar Power Kit battery may be low.

If the solar kit fails to power the station, try the following:

- Make sure the panel is not being shaded from the sun.
- Open the solar panel shelter and check that the wire connections are secure and that battery is free from corrosion and excessive deposits on the terminal.
- Clean the solar panel using a water spray, or a soft cloth and soapy water followed by a clean water rinse.
- Check the battery's voltage with a voltmeter; the battery must have at least 5.4V to power the station. (More than 6V indicates a charged battery. A lower voltage indicates the battery has been over discharged) Try exposing the kit (with console unplugged) to ample sunlight for a week, or use a charger designed to recharge a 6V gel cell battery.
- As the battery ages, it will lose capacity and may completely discharge. If this is the case, simply replace the battery. (Do not incinerate the used battery; it may burst. Arrange for proper recycling in your locality.)

## Contacting Davis Technical Support

If you have any questions, or encounter problems with your Solar Power Kit or any Vantage Pro2 weather station, please contact Davis Technical Support. We'll be glad to help.

**(510) 732-7814** — Monday - Friday, 7:00 a.m. - 5:30 p.m. Pacific Time. We are unable to accept collect calls.

**(510) 670-0589** — Technical Support Fax.

**support@davisnet.com** — E-mail to Technical Support.

**info@davisnet.com** — General e-mail.

**www.davisnet.com** — Davis Instruments web site. See the Weather Support section for copies of user manuals, product specifications, application notes, and information on software updates. Watch for FAQs and other updates.

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Solar Power Kit

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This product complies with the essential protection requirements of the EC EMC Directive 89/336/EC.

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