

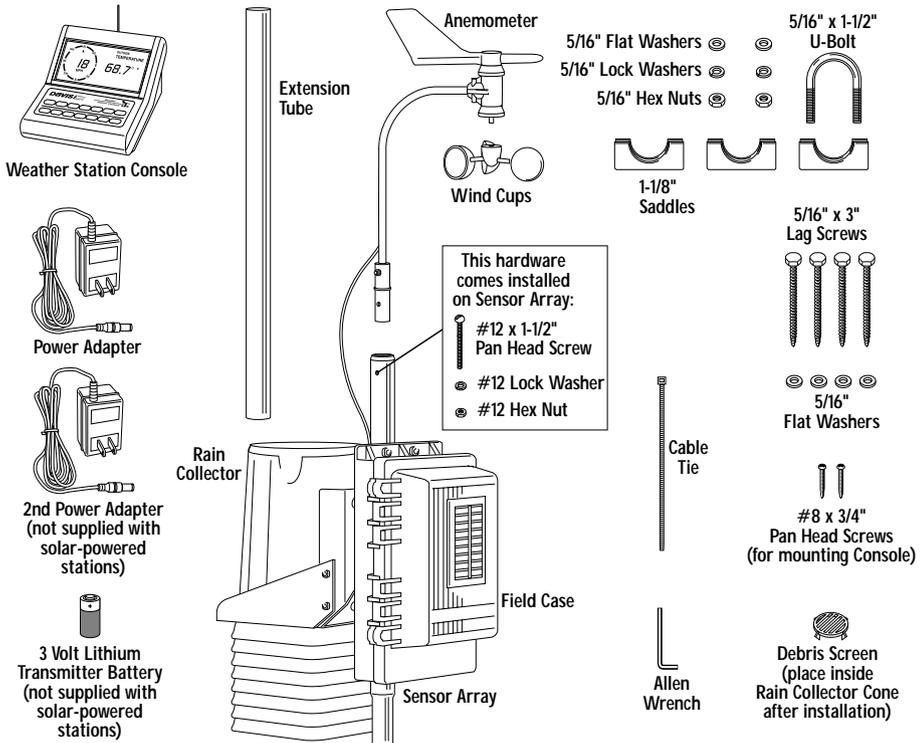
WIRELESS WEATHER STATION

INSTALLATION MANUAL

This manual covers installation of the wireless weather station. Some features discussed (such as barometric pressure and humidity) are only available with the Wireless Weather Monitor II[®]. This manual also shows installation with the solar power option, which may not be included in your wireless weather station. Other manuals included with the station cover the operation and maintenance of the console and sensors.

COMPONENTS

The wireless weather station includes the following components. Please make sure you have everything you need before beginning.



TOOLS AND MATERIALS NEEDED

In addition to the components listed above, you may need some of the following tools and materials.

- ◆ Flat-Bladed Screwdriver
- ◆ Phillips Screwdriver
- ◆ Adjustable Wrench
- ◆ Wire Cutter or Scissors
- ◆ Pencil or Other Pointed Object

INSTALLATION STEPS

This manual takes you through the step-by-step process of installing your weather station. These steps are indicated below, along with their page numbers for easy reference:

- ◆ Assemble and test the station, page 3
 - ◆ Detach the extension tube, page 3
 - ◆ Attach the anemometer, page 3
 - ◆ Attach the wind cups, page 3
 - ◆ Snip the cable tie in the rain collector, page 4
 - ◆ Apply power to the console, page 4
 - ◆ Apply power to the sensor array, page 6
 - ◆ Check that the console is working properly, page 7
- ◆ Choose locations for the sensor array and console, page 7
- ◆ Test the proposed locations, page 8
- ◆ Set dip switches to control ID code and operating mode, page 9
- ◆ Mount the sensor array, page 11
- ◆ Secure the sensor array and re-apply power, page 13
- ◆ Mount the console, page 13

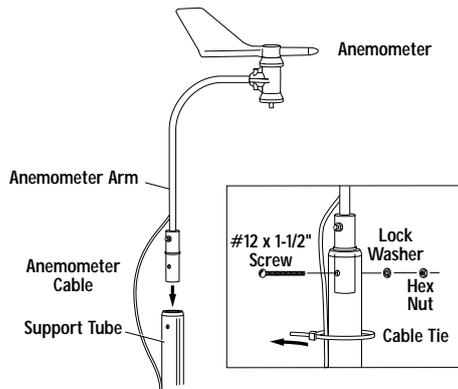
If, once installed, you encounter any problems with the station, please refer to the troubleshooting guide on page 14.

ASSEMBLING THE STATION

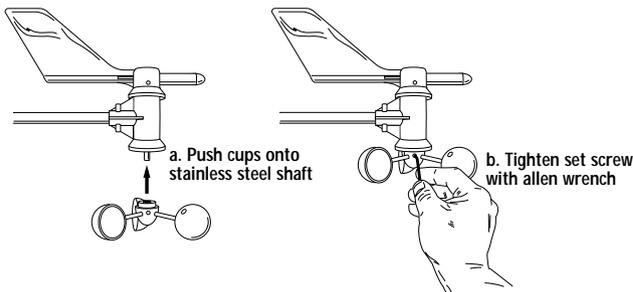
Getting Started

Follow the steps below to assemble your station. At various stages of this assembly, you will be advised to test the system to ensure proper functioning.

1. Detach and remove the extension tube from the support tube by cutting the two black cable ties.
2. Attach the anemometer arm to the support tube as shown below. Make sure that the anemometer is positioned over the white field case and NOT over the black rain collector cone.

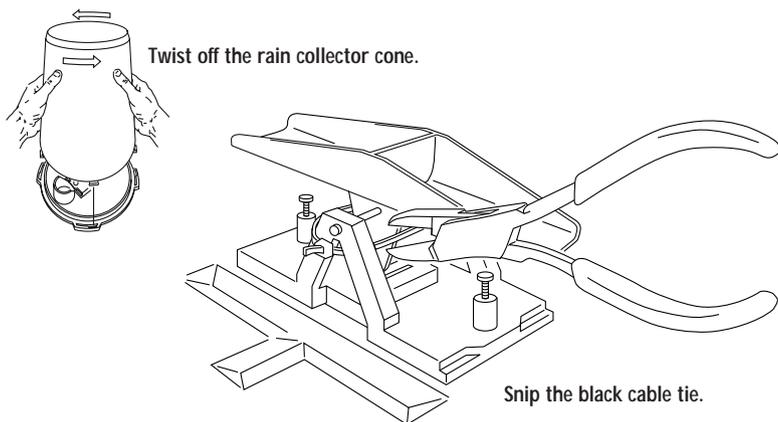


3. Attach the wind cups to the anemometer by pushing the wind cups onto the shaft as far as they will go, then tightening the set screw. The cups should drop slightly and into the ideal position automatically. Spin the wind cups. If they do not spin freely, loosen the set screw and lower the cups slightly. Repeat until the wind cups spin freely.



4. Prepare the rain collector for use.

Detach the black rain collector cone from its base by rotating the cone counter-clockwise until its latches line up with the latch openings in the base and then lift the cone off. (The cone fits tightly and may require extra pressure to remove it the first time.) *Carefully cut and remove the black cable tie which holds the bucket in place during shipping.*



Do not re-attach the rain collector cone at this point; you will need to test the tipping bucket before you complete the installation.

5. Apply power to the station console.

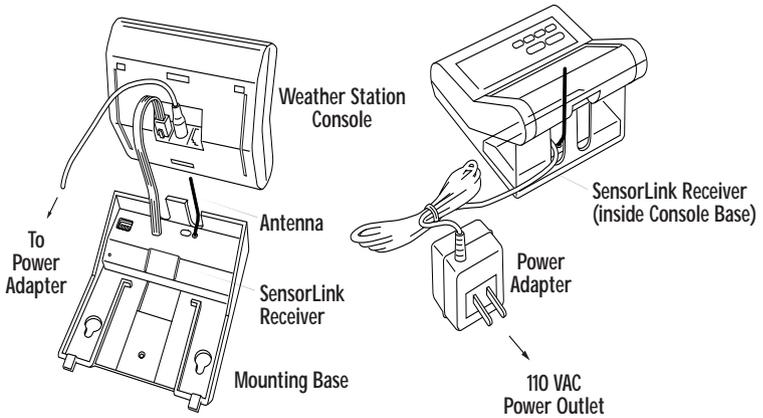
To power up the console, first remove the console's mounting base by pressing down on the large tab between the two oblong holes on the base's underside and pulling the base free. Plug the power adapter into the center "Power" slot, as shown in the following figure, and then plug the other end into a 110 VAC outlet.

Once power is applied, the console should beep three times within 20 seconds if the console and receiver are working properly. (Or, if you have the optional WeatherLink[®] installed, listen for four beeps within 30 seconds.)

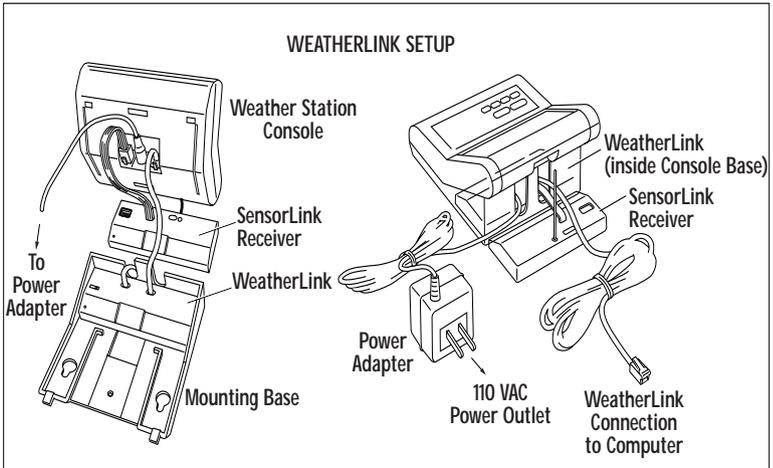
Note: *If you are going to use a battery as backup, make sure that you plug in the AC power before installing the battery. Powering up the console with the battery alone may cause the console to lock up due to insufficient power.*

6. If all is well, re-attach the mounting base as shown below.
Use the standard setup unless you have the optional WeatherLink.

STANDARD SETUP



WEATHERLINK SETUP

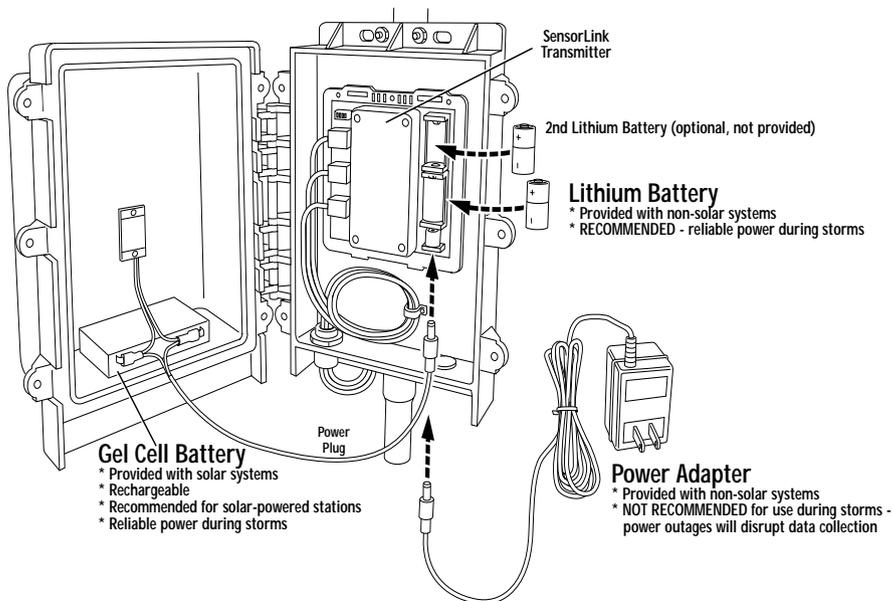


Note: As illustrated above, if you are using the WeatherLink in addition to the SensorLink Receiver, you will need to position the receiver outside the mounting base.

7. Open the sensor array field case with a flat-bladed screwdriver and apply one of the power options indicated below.

If you have a solar-powered system, connect the gel cell battery.

If you have a non-solar-powered system, decide whether you want to install the power adapter OR the lithium battery (the two will NOT work in tandem or as backup). Davis recommends the battery to ensure power during storms. If used as the primary power source, one *fresh* lithium battery should provide about six months of service. Use two *fresh* lithium batteries to double life (second is not provided).



Note: Be sure dip switch #4 is set to "Run" (rather than "Test") so that the LED indicator will not flash unnecessarily when not testing see "Testing Proposed Locations" on page 8 for instructions on setting dip switches).

Once power is applied, the console should start reading the values of the sensors installed in the sensor array.

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8. Check all of the readings on your display to be sure they appear correctly (i.e., not “dashed out”).

Consult your Monitor or Wizard 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. Note that some readings (e.g., wind direction, barometer, and 0.2 mm rain collectors) must be calibrated in order to read correctly; calibration instructions are contained in the Monitor or Wizard owner’s manual.

If the console is having problems reading the *outdoor* sensors, consult the troubleshooting guide at the end of this manual. If the problem is with the inside temperature, inside humidity or barometer, consult the Monitor or Wizard owner’s manual.

9. Re-attach the rain collector cone and lay the debris screen “feet-down” over the cone’s funnel hole.

CHOOSING LOCATIONS FOR THE SENSOR ARRAY AND CONSOLE

The range of the radio transmission depends on several factors. Try to position the sensor array and console as close together as possible for best results.

Typical maximum ranges:

- ◆ Line of Sight: 400 feet (120 m)
- ◆ Through Walls and Ceilings: 100 to 200 feet (30 to 60 m)
- ◆ Through Trees and Foliage: 100 to 200 feet (30 to 60 m)

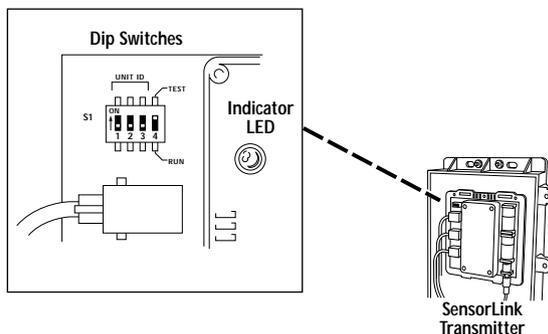
As you position your sensor array, try to avoid possible obstructions of rain and wind—look out for trees and nearby buildings. For roof mounting, and for ease of installation in other locations, we recommend using the optional Mounting Tripod (contact Davis for more information).

As you position your console, be aware of possible interference from cordless phones and other items. To prevent interference, maintain a distance of 10 feet between the console and the cordless phone (handset and base). Also, for best reception, avoid positioning the console near large metallic surfaces (e.g., most refrigerator surfaces).

TESTING PROPOSED LOCATIONS

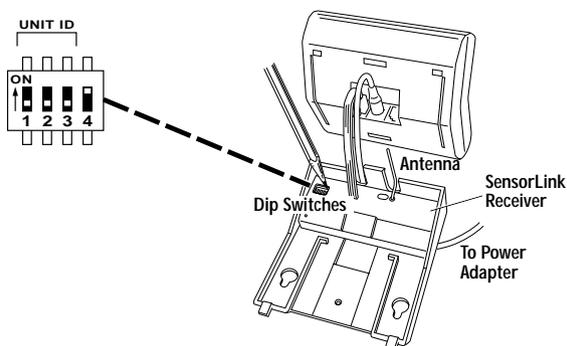
Test your proposed console and sensor locations to ensure successful data transmission.

1. Temporarily place the sensor array where you plan to mount it.
2. Apply power to the sensor array (see step 7 on page 6).
3. Set dip switch #4 on the transmitter to the TEST position, as shown below.
This puts the transmitter in *Test Mode*—the Indicator LED will flash to indicate that the sensor unit is transmitting.



4. Temporarily place the console where you plan to mount it.
5. Apply power to the console (see step 5 on page 4).
6. Flip dip switch #4 on the receiver to the position opposite its starting position to place the receiver in Test Mode as shown below.

Unlike Transmitter Test Mode, Receiver Test Mode is activated whenever dip switch #4 on the receiver is moved to the opposite position from where it was when the console was powered up. (See “Dip Switch Settings” on page 9 for more information.)



In Test Mode, the console will beep whenever it receives data from the transmitter (approximately every 2.5 seconds). If the two units are in range you should hear a beep about every 2.5 seconds. If not, try moving the sensor array closer to the display unit.

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- Once you are finished testing, flip dip switch #4 on both the transmitter and receiver back to their original positions to turn off Test Mode (and to prevent the LED from flashing unnecessarily on the transmitter).
 - Remove power from both the transmitter and receiver.

DIP SWITCH SETTINGS

The dip switches on the transmitter and receiver allow you to control the station's ID Code—the “channel” on which it transmits and receives data—and its operating mode—silent, warnings or test.

Setting the ID Code

The wireless weather station may be set to use any of eight selectable ID codes (the default is ID Code #1). The transmitter and receiver will only communicate with each other if they are both set to the same ID code. Use the default setting unless you have another Davis wireless weather station operating nearby which you want to work separately from the new system. The dip switch settings for the eight possible codes are shown below.

ID CODE	DIP SWITCH 1	DIP SWITCH 2	DIP SWITCH 3
#1 (default)	off	off	off
#2	off	off	ON
#3	off	ON	off
#4	off	ON	ON
#5	ON	off	off
#6	ON	off	ON
#7	ON	ON	off
#8	ON	ON	ON

To change to another ID, toggle dip switches 1, 2, and/or 3 on both the transmitter and receiver to the desired code (see the dip switch diagrams on pages 8 and 8). Remember that the transmitter and receiver must use the same ID code in order to communicate.

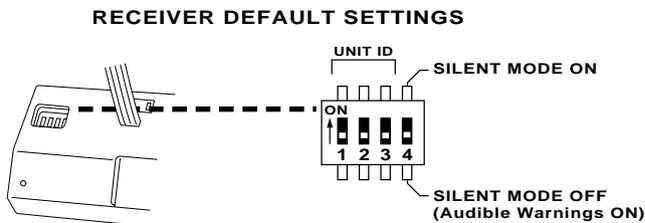
Note: *Dip switch #4 is used for testing and warnings, not for ID codes.*

Silent Operating Mode

Dip switch #4 on the receiver allows you to set the console to either emit audible warnings or stay silent. In *Silent Mode*, the console does not beep to indicate problems such as low battery or poor reception. The factory sets Silent Mode *off* as the default so that the console will warn you when problems occur. When Silent Mode is *off*:

- ◆ **Triple Beep Warns of Transmitter Battery Problem**
A triple beep every 10 minutes indicates that the transmitter battery is extremely low on power. If you hear a triple beep, replace the transmitter battery as soon as possible to prevent possible loss of data.
- ◆ **Double Beep Warns of Data Reception Problem**
A double beep indicates that the SensorLink has not received data for at least 30 minutes.

Dip switch #4 on the console's receiver controls Silent Mode (see figure below).



You can set your console to Silent Mode on or off. If you were to power up your console with dip switch #4 in the “OFF” position (as shown above), Silent Mode would be off and audible warnings would be on. On the other hand, if you were to power up your console with the dip switch in the “ON” position (not shown), Silent Mode would be on and audible warnings off.

The key is the position of dip switch #4 when you power up the console. Flipping the dip switch *without* repowering the console will take you in and out of Test Mode (see below for details), but will not change the Silent Mode setting.

Test Mode

As in the “Testing Proposed Locations” section above, to test signal reception at any point, simply flip the receiver’s dip switch #4 to the opposite position from where it was when the console powered up. (You will hear a periodic beep if the transmitter is within range of the receiver and is also set to Test Mode.)

Therefore, to set the console’s operating mode (Silent Mode on or off), flip dip switch #4 to the appropriate side and then repower the console. Then, to place the receiver in Test Mode, simply flip the dip switch to the opposite side.

MOUNTING THE SENSOR ARRAY

The sensor array has been pre-assembled for easy installation. However, you will still need to provide a solid mounting for the sensor array. Mounting hardware has been included for the most common installations (see figures on page 12 for instruction).

For roof mounting, and for ease of installation in other locations, we recommend using the optional Mounting Tripod (contact Davis for information). Please refer to the tripod manual for tripod installation instructions.

Note: *If mounting on a roof, tower, or other elevated structure without the tripod, be sure to consider the effects of wind loading and vibration and design the installation accordingly.*

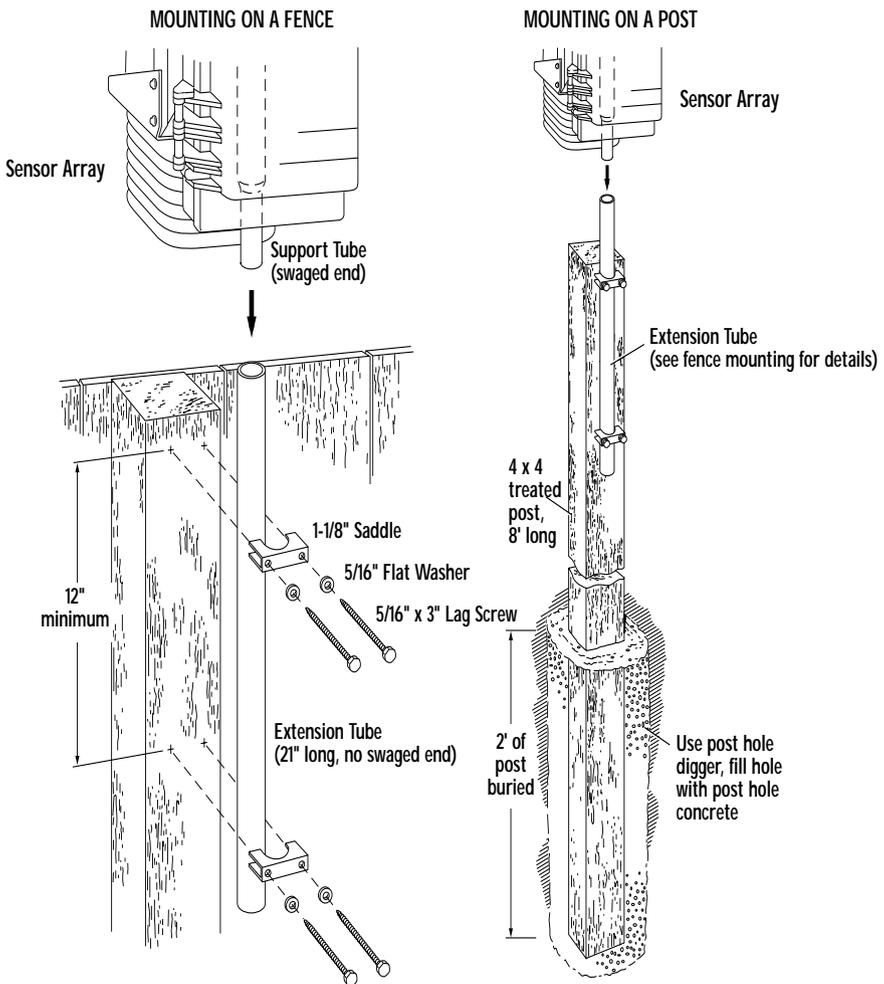
⚡ **CAUTION:** Any metal object can and may attract a lightning strike, including your weather station or tripod. If lightning strikes your station or strikes somewhere nearby, the station's internal electronics may suffer anywhere between little to extensive damage. The station itself has been designed with considerable surge protection, but to safeguard nearby equipment and structures, we recommend following local recommendations on properly *grounding* your installation. For more information, contact your local lightning protection authority and/or refer to the following articles:

- ◆ MIL-HDBK-419A: *Grounding, Bonding, and Shielding for Electronic Equipments and Facilities*, 29 Dec 1987.
- ◆ National Fire Protection Association, 1997: *Standard for Installation of Lightning Protection Systems*, 1997 ANSI/NFPA 780, National Fire Protection Association, Quincy, MA.
- ◆ NEC, *National Electrical Code, 1996 Edition*: National Fire Protection Information, Quincy, MA.

Important: Mount Station Pointing South

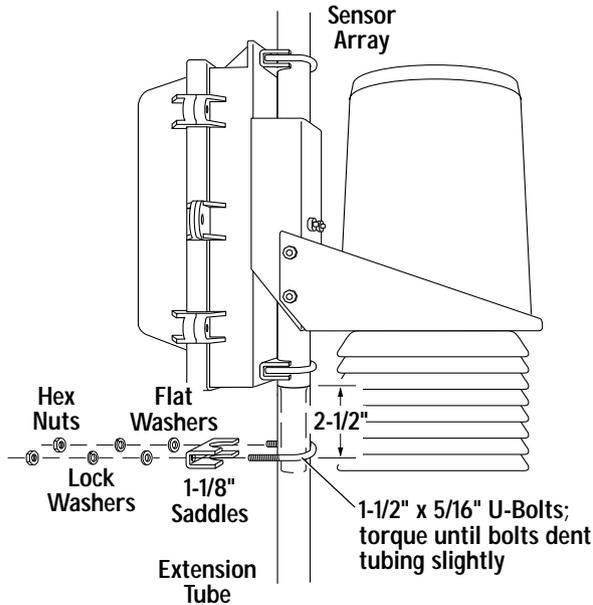
The station's wind direction is calibrated as if the horizontal part of the anemometer arm were pointing south. To take advantage of the station's preset wind direction, *be sure to mount your station with the anemometer arm pointing south*. On solar-powered stations, this means that the solar panel will also point south (the optimal direction in the Northern Hemisphere for solar reception).

Note: If you want to point your station in a direction other than south, (or need to point it north because you have a solar-powered station and you live in the Southern Hemisphere), consult your owner's manual for instructions on how to adjust the wind vane accordingly.



Securing the Sensor Array

After mounting the sensor array, secure the sensor array to the extension tube as shown below.



Powering the Sensor Array

To re-apply power to the sensor array, refer to the instructions on page 6.

MOUNTING THE CONSOLE

1. Apply power to the console using either the standard setup or the optional Weather-Link setup (see step 5 on page 4).
2. Consult the Monitor or Wizard owner's manual for instructions on mounting the console on a wall, desk, or shelf.

Because cordless phones may interfere with station reception, it is advisable to keep the cordless phone's handset and base at least 10 feet away from the console at all times. Also, avoid positioning the console near large metal surfaces, such as a refrigerator.

3. Consult the Monitor or Wizard owner's manual for instructions on installing a backup battery in the console.

TROUBLESHOOTING

Please check the troubleshooters listed below if you experience a problem with your station. Then, if you still are unable to solve the problem, we encourage you to call the factory at (510) 732-7814 for assistance. *Please do not return your unit for repair without prior authorization.*

- ◆ **Console is receiving erratic data from the sensor array**
Enable the “Test” mode on the sensor array (see “Testing Proposed Locations” on page 8). If two beeps or more are heard in a 2.5-second interval, then another Davis wireless system may be operating nearby on the same ID (or a cordless phone may be operating within 10 feet of the receiver). Try changing to a different ID code on both the console and the sensor array (or try moving the phone). Repower the console to activate the new ID code.
- ◆ **Console is not receiving any data from the sensor array**
The sensor array and the console may be too far apart, or something in their path may be interfering, such as foliage, furnishings or cordless phones. Enable Test Mode on sensor array to see if it is receiving data (see “Testing Proposed Locations” on page 8). Try moving the console closer to the sensor array or vice versa; or eliminating possible path interferences.
- ◆ **Console is emitting beeps**
If you hear *single beeps*, flip dip switch #4 to turn off Test Mode in both the transmitter and receiver.
If you hear a *double beep*, the SensorLink Receiver in the console is not receiving data. This occurs when the SensorLink Receiver has not received data for 30 minutes. Try moving the console closer to the sensor array or vice versa; or eliminating possible path interferences.
If you hear a *triple beep*, the SensorLink Transmitter in the sensor array is extremely low on power—replace battery immediately.
- ◆ **Data from the optional WeatherLink program shows temperature, humidity, or wind values that were constant over some period**
The SensorLink Receiver in the console did not receive new data during this period and passed the last good data to the WeatherLink. Try moving the console closer to the sensor array or vice versa; or eliminating possible path interferences.
- ◆ **Battery(ies) are not lasting the expected 6 months (for 1 battery) or 1 year (for 2)**
Make sure dip switch #4 in the transmitter is set to OFF to prevent the LED from flashing unnecessarily when not testing (see “Testing Proposed Locations” on page 8). If you are using two batteries, also make sure that both are fresh when installed.
- ◆ **Console is not registering any rainfall.**
Double check that you have cut the cable tie that secures the rain bucket during shipping. See step 4 on page 4 for instructions.
- ◆ **Console does not register wind direction correctly**
Check that you have mounted the sensor array with the anemometer arm

pointing south. Or, if your station points in a direction other than south, check that you have recalibrated the weather vane correctly. See the “Installing the Anemometer” section of your owner’s manual for instructions.

◆ **Console locks up**

Insufficient power during power up or a power surge may cause the console to lock up. If this occurs, remove all power by disconnecting any battery backup and the AC/DC power cord. Wait for 1 minute with all of the power removed. Then re-connect the AC/DC power cord and listen for 3 beeps within 20 seconds (or, with the optional WeatherLink, 4 beeps within 30 seconds). Once you have received the final beep, install a fresh backup battery, if desired, and put the console back into service.

SPECIFICATIONS

SensorLink Receiver

Receive frequency: 916.5 MHz
ID codes: 8 user-selectable
Temperature range: 0 to 60 °C

Update interval

Wind speed: 2.5 seconds
Wind Direction: 2.5 seconds
Outside Temperature: 16 seconds
Outside Humidity: 1 minute
Rain: 10 seconds (rain counts are saved in the transmitter until successfully received by the console)

SensorLink Transmitter

Transmit frequency: 916.5 MHz
ID codes: 8 user-selectable
License: Low power (less than 1 mW), no license required
Sensor connections: Telephone modular for Anemometer, Temp/Hum Sensor, and Rain Collector
Temperature range: -40 to 60 °C

Power Input Options

Battery power: CR-123 3- volt lithium or equal; one or two cells
AC power adapter: Davis adapter or equal (5 to 10 VDC output @ 1mA)
Solar Power Kit: Davis solar charger (Optional, product #7709. Offers the added capability of replacing current power with a rechargeable solar power supply.)

FCC PART 15 CLASS B REGISTRATION WARNING

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- ◆ Reorient or relocate the receiving antenna.
- ◆ Increase the separation between the equipment and receiver.
- ◆ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- ◆ Consult the dealer or an experienced radio/TV technician for help.

Shielded cables and I/O cords must be used for this equipment to comply with the relevant FCC regulations. Changes or modifications not expressly approved in writing by Davis Instruments may void the user's authority to operate this equipment.

Product Numbers: 7425W, 7425WM, 7425WS, 7425WSM, 7440W, 7440WM, 7440WS, 7440WSM

Davis Instruments Part Number: 7395-300
Wireless Weather Station Installation Manual
Rev. F Manual (7/16/99)
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