USER MANUAL

Anemometer

for Vantage Pro2™ and
EnviroMonitor®

Product number: 6410
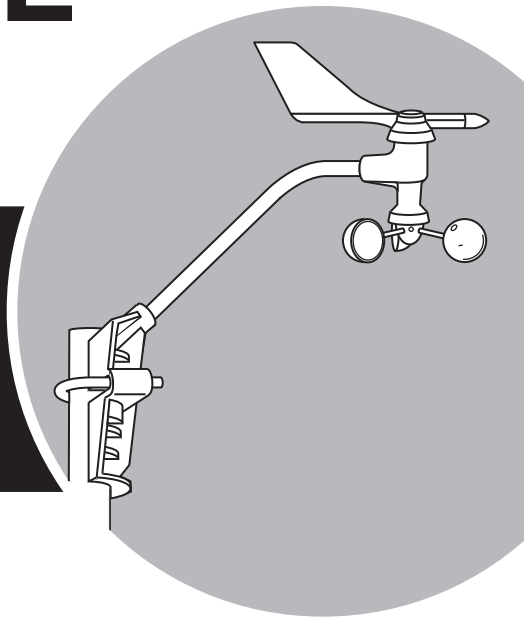
# Welcome to
Anemometer (6410)

The anemometer measures and displays wind speed and direction. The data is used to calculate other wind-related information such as wind run, wind chill, and the temperature-humidity-sun-wind index. This anemometer can be used with EnviroMonitor or any Vantage Pro2-compatible system. Installed in a Sensor Transmitter, it can be used to include additonal wind stations in your existing system when reporting to a WeatherLink Live.

Contents of Package
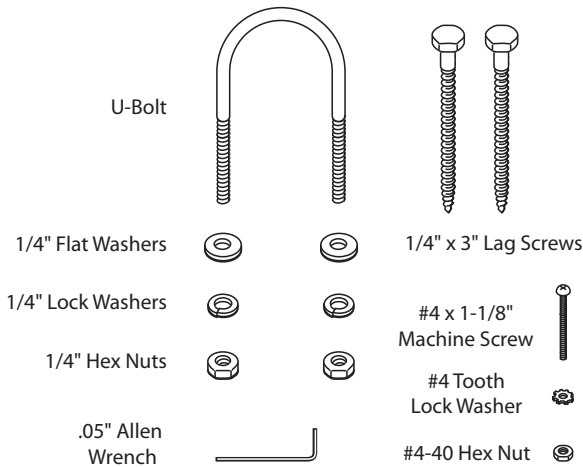
Wind Vane

Wind Cups

Anemometer Arm
with 40 feet (12.2 meters)
of cable
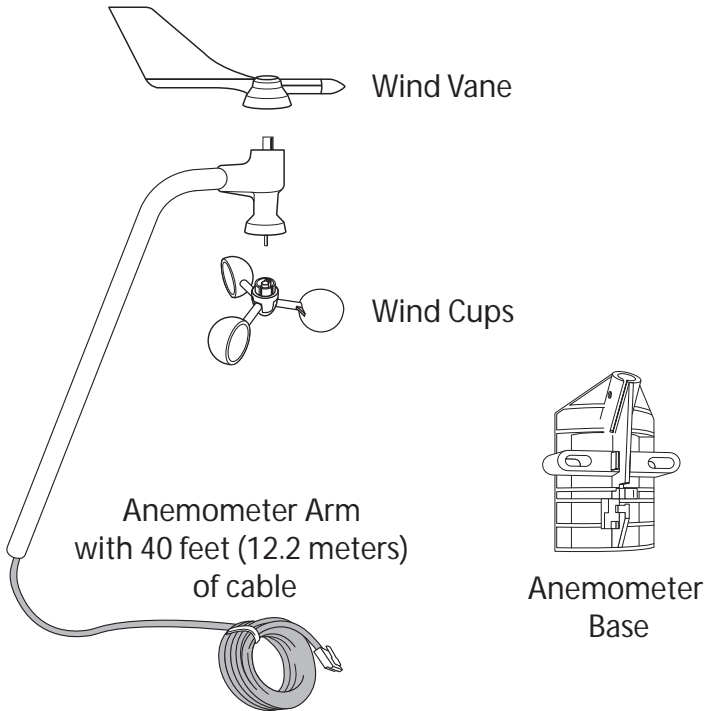
Anemometer
Base

The package contains the following:
- Anemometer arm with 40 feet (12.2 meters) of cable
- Wind vane
- Wind cups
- Anemometer base

Hardware Kit

U-Bolt

1/4" Flat Washers

1/4" x 3" Lag Screws

1/4" Lock Washers

#4 x 1-1/8"
Machine Screw

1/4" Hex Nuts

#4 Tooth
Lock Washer

.05" Allen
Wrench

#4-40 Hex Nut

Tools for Setup
- Cable Clips or Weather-Resistant Cable Ties

Note: Make sure the clips or ties you use to secure the anemometer cable have screw holes or other means for mounting the cable. Do not use metal staples to secure the cables.

- Small Screwdrivers
- Adjustable Wrench
- Hand-Held Compass or Local Area Map

Assemble the Anemometer

### Attach the Wind Vane

The wind direction has been calibrated in the factory so that the wind direction will be correct when the arm is installed pointing north and the vane is installed correctly.

1. Slide the wind vane onto the wind vane shaft. The shaft's cross section is D-shaped to ensure that the anemometer is installed correctly.
2. Tighten the set screw in the wind vane with the Allen wrench.

Attach the Wind Cups

1. Push the wind cups up onto the anemometer's stainless steel wind cup shaft.
2. Slide the wind cups up the shaft as far as possible.

Push cups onto stainless steel shaft

Wind cup shaft

Tighten set screw with Allen wrench
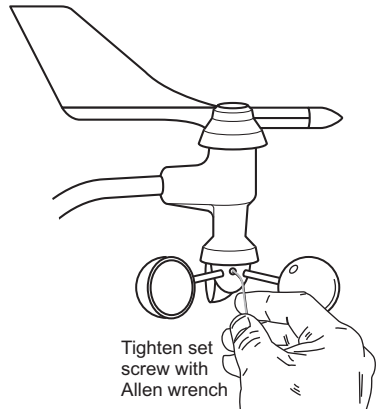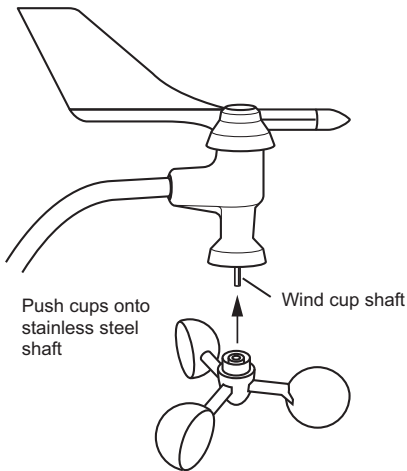
3. Use the Allen wrench provided to tighten the set screw on the side of the wind cups.
4. The wind cups should drop slightly when you let go.
5. Ensure that the set screw is screwed in fully and very tight. Failure to do so will cause the anemometer to function improperly.
6. Spin the wind cups.
7. If the wind cups spin freely, the anemometer is ready for installation.
   If the wind cups don't spin freely, take them off and repeat the wind cup installation process.

Attach the Anemometer Arm to the Base

1. Insert the anemometer arm into the base, sliding the cable through the notch in the base as shown in illustration.
2. Be sure to line up the small hole in the arm with the holes in the base.
3. Insert the machine screw through the holes in the base and arm.

#4 Tooth
Lock Washer

Hex Nut

#4 x 1-1/8"
Machine Screw

Insert
anemometer arm
into base

Slide cable
through notch

IMPORTANT:
Make sure cable
is secure in channel
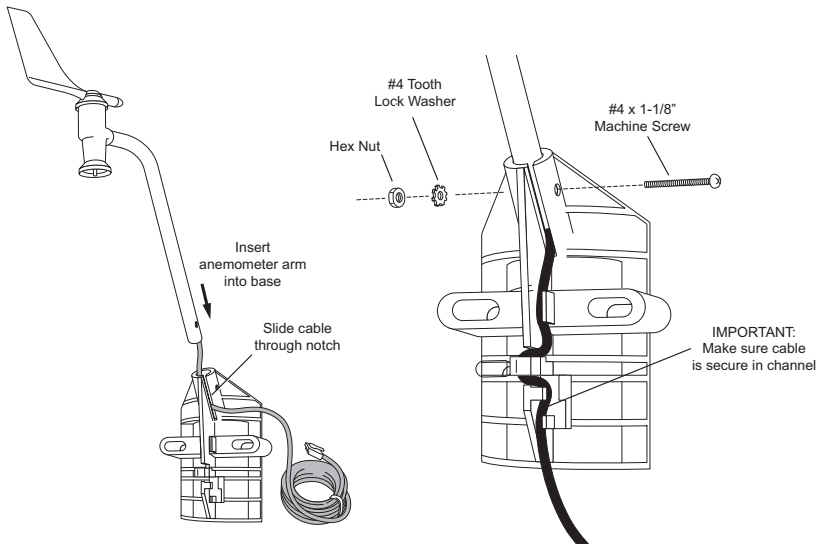
4. Slide the tooth-lock washer and hex nut onto the machine screw. Tighten the hex nut while holding the screw with a Phillips head screwdriver to prevent it from turning.
5. Press the sensor cable firmly and completely into the zig-zagging channel in the base, starting from the arm and progressing downward to the bottom of the base.

Installing the Anemometer

Orient the Wind Vane

The wind vane rotates 360° to display current and dominant wind directions on the compass rose of the console display. To obtain accurate readings, the vane must be *correctly oriented* when mounting the anemometer outside. By default, the wind vane reports the correct wind direction if the anemometer arm points true north.

To ensure correct orientation of the wind vane, mount the anemometer so that the arm points true north.

If your anemometer arm cannot be mounted aiming true north, you will need to calibrate the wind direction, either on your console for Vantage Pro2 or on your WeatherLink.com page for EnviroMonitor. See your *Vantage Pro2 Console Manual* or *Envoy Manual.*

Anemometer Siting Guidelines

- Mount the anemometer so that the arm is aimed true north.

Note: If your anemometer cannot be mounted aiming true north, you will need to calibrate the wind direction on your console to display accurate wind directions. See your console user manual

- For best results, place the anemometer at least 7' (2.1 m) above surrounding obstructions such as trees or buildings that obstruct wind flow.
- If mounting on a roof, mount the anemometer at least 7' (2.1 m) above the roof apex (when using a Mounting Tripod, install the anemometer at the very top of the pole).
- If mounting the ISS and the anemometer together, such as on a pole or a wooden post, mount the anemometer so it is at least 12" (0.3 m) above the top of the rain collector cone for best results.
- The standard for meteorological and aviation applications is to place the anemometer 33' (10 m) above the ground. Seek professional help for this type of installation.
- The standard for *agricultural applications* is to place the anemometer 6' (2 m) above the ground. This is important for evapotranspiration (ET) calculations.

Note: For roof mounting, and ease of installation, we recommend using the optional mounting tripod (#7716). For other installations, use the Mounting Pole Kit (#7717).
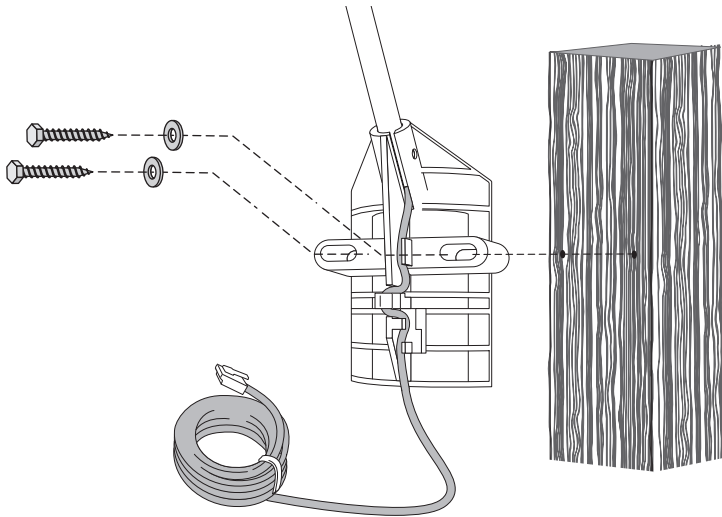
Note: For more detailed siting suggestions, see Application Note #30: Reporting Quality Observations to NOAA on the Davis Support web site (http://www.davisnet.com/support/weather).

## Installing the Base on a Wooden Post or Surface

1. Use a drill with a 3/16" (5-mm) drill bit to make pilot holes in these locations.
2. Drive the 3" lag screws through the flat washers and the holes in the anemometer base and into the wood.

Installing the Anemometer on a Pole or Pipe

• Use the Mounting Tripod (#7716) for easy roof-mounting.
• Use the Mounting Pole Kit (#7717) to raise the installation height by up to 37.5" (0.95 m).
• With the supplied U-bolts, the anemometer can be mounted on a pole having an outside diameter ranging from $1^1/_4$" to $1^3/_4$" (32 – 44mm).
• Larger U-bolts (not supplied) can be used to mount to a pole with a maximum outside diameter of $2^1/_2$" (64mm).

• To mount on a smaller pole, obtain a U-bolt that fits the base openings but that has a shorter threaded section.
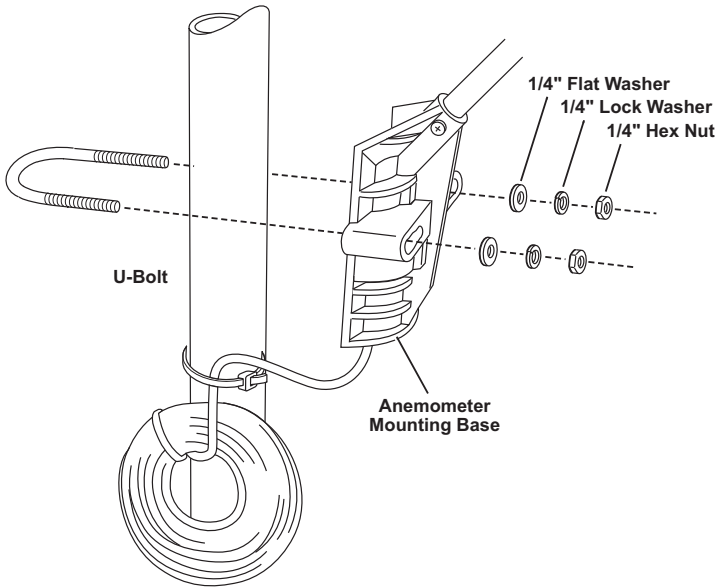
1. Place the U-bolt around the pole so that its two ends extend through the holes in the mounting base. Loosely secure with the flat washers, lock washers and hex nuts.
2. Raise the anemometer to the desired height on the pole and swivel it so the anemometer arm is pointing north.
3. Using an adjustable wrench or 7/16" wrench, tighten the hex nuts until the anemometer is firmly fastened on the pole.

Securing the Cable

To prevent fraying or cutting the anemometer cable where it is exposed to weather, secure it so it doesn't whip about in the wind. Use cable clips or weather resistant cable ties to secure the cable. Place clips or ties approximately every 3 to 5 feet (1 to 1.6 m).
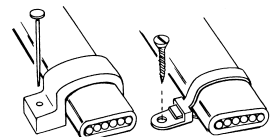

Securing cable

Note: Do not use metal staples to secure cables. Metal staples can cut the cables.

Optional: Anemometer Cable Length Considerations

- Your anemometer includes a 40' (12 m) cable. This can be extended up to 540' (165 m) using optional extension cables purchased from Davis Instruments.
- If most of the anemometer cable length is unused, the coiled cable length can be stowed once the anemometer has been installed on a site. Attaching the anemometer cable to the mounting pole using the supplied cable tie is the recommended option.
- Keep the anemometer cable coiled if possible during the anemometer assembly so that it is easily stowed once installation is complete.

Anemometer Cable

Cable Tie
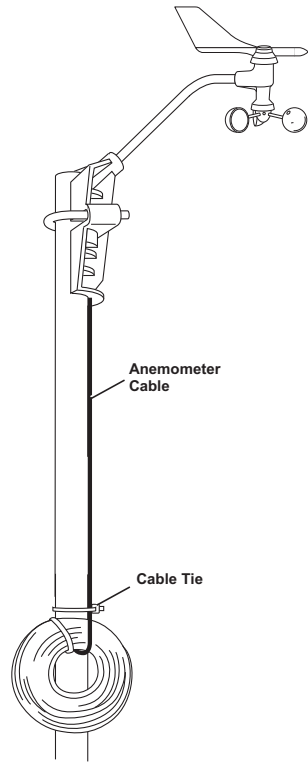
Maintenance

Your anemometer does not require any regular maintenance.

CAUTION: DO NOT attempt to lubricate the wind cup shaft and bearings or the wind vane shaft. Natural or synthetic lubricants will inhibit the normal operation of the anemometer.

Troubleshooting

? *"The wind cups are spinning but my console displays 0 mph."*

The signal from the wind cups may not be making it back to the display. Check your cables for visible nicks and cuts. Look for corrosion in the WIND connector on the SIM and on splices in the cable. If using an extension cable, remove it and test using only the anemometer cable. Contact Technical Support and ask for a wind test cable if the problem has not been resolved.

Note: If the anemometer is sending no data, the wind display indicates 0 speed and a north direction.

? *"The wind direction is stuck on north, or displays dashes."*

It is likely that there is a short somewhere between the wind vane and the display. Check the cables for visible nicks and cuts. Look for corrosion in the "WIND" jack on the SIM and on splices in the cable (if any). If possible, remove any extensions and try it with the anemometer cable only. If none of these steps get the wind direction working, contact Technical Support and ask for a wind test cable.

? *"The wind cups don't spin or don't spin as fast as they should."*

The anemometer may be located where wind is blocked by something, or there may be friction interfering with the cups' rotation. Remove the wind cups (loosen the set screw) and clear out any bugs or debris. Turn the shaft the cups rotate on. If it feels gritty or stiff, contact Davis Technical Support.

Note: Do not lubricate the shaft or bearings in any way. When replacing the cups, make sure they are not rubbing against any part of the anemometer head.

? *"Readings aren't what I expected them to be."*

Comparing data from your ISS to measurements from TV, radio, newspapers, or a neighbor is NOT a valid method of verifying your readings. Readings can vary considerably over short distances. How you site the ISS and anemometer can also make a big difference. If you have questions, contact Technical Support.

Contacting Davis Technical Support

For questions about installing or operating your Anemometer, please contact Davis Technical Support. We'll be glad to help.

Online **www.davisinstrumentscom**

See the Weather Support section for copies of user manuals, product specifications, application notes, and more.

E-mail **support@davisinstruments.com**

Telephone (510) 732-7814

Monday - Friday, 7:00 a.m. - 5:30 p.m. Pacific Time.

Note: Please do not return your unit for repair without prior authorization.

Specifications

Operating Temperature. . . . . -40° to +149°F (-40° to +65°C)
Wind Direction
    Display Resolution . . . . 16 points (22.5°) on compass rose, 1° in numeric display
    Accuracy. . . . . ±3°
Wind Speed
    Range . . . . 2 - 200 mph, 3 - 322 kph, 2 - 173 knots, 1 - 89 m/s
    Accuracy . . . . ±2 mph (3 kph, 2 kts, 1 m/s) or ± 5%, whichever is greater

Anemometer for Vantage Pro2 and EnviroMonitor

Product Numbers 6410

Document Number: 07395.277 Rev. C, 6/18/19

DavisE⁄⁄⁄⁄⁄®
Davis Instruments

Anemometer
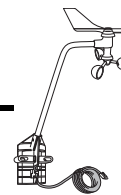
Vantage Pro2™ Accessories

Includes both wind speed and wind direction sensors. Rugged components stand up to hurricane-force winds, yet are sensitive to a light breeze. Includes sealed bearings for long life. The range and accuracy specifications have been verified in wind-tunnel tests. In areas where icing of the anemometer is a problem, drip rings deflect water from the joint between moving parts.

General

Operating Temperature. . . . . -40° to +149°F (-40° to +65°C)
Sensor Type
    Wind Speed . . . . Solid state magnetic sensor
    Wind Direction . . . . Wind vane and potentiometer
Attached Cable Length . . . . 40' (12 m)
Cable Type . . . . 4-conductor, 26 AWG
Connector . . . . Modular connector (RJ-11)
Maximum Cable Length. . . . . 240' (73 m)

Note: Maximum displayable wind speed decreases as cable increases. At 140' (42 m) of cable, maximum displayable wind speed is 135 mph (60 m/s); at 240' (73 m), maximum wind speed displayed is 100 mph (45 m/s).

Material
    Wind Vane and Control Head. . . . . UV-resistant ABS
    Wind Cups. . . . . Polycarbonate
    Anemometer Arm. . . . . Black-anodized aluminum
Dimensions (length x width x height) . . . . 15.0" x 1.5" x 18.0" (381 mm x 38 mm x 457 mm)
Weight . . . . 1 lbs. 4 oz. (1.332 kg)

Sensor Output

Wind Direction

Display Resolution . . . . 16 points (22.5°) on compass rose, 1° in numeric display
Accuracy . . . . ±3°

Wind Speed

Resolution and Units . . . . Measured in 1 mph. Other units are converted from mph and rounded to nearest 1 km/h, 0.1 m/s, or 1 knot
Range . . . . 1 to 200 mph, 1 to 173 knots, 0.5 to 89 m/s, 1 to 322 km/h
Accuracy . . . . ±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Maximum Cable Length . . . . 240' (73 m). Maximum wind speed reading decreases as length of cable from Anemometer to ISS increases. At 140' (42 m), maximum speed is 135 mph (60 m/s). At 240', the maximum is 100 mph.

Input/Output Connections

Black. . . . . Wind speed open drain to ground
Red. . . . . Ground
Green . . . . Wind direction pot wiper (20KΩ potentiometer)
Yellow. . . . . Pot supply voltage
Wind Speed Translation Formula . . . . 1600 rev/hr = 1 mph
    $V = P(2.25/T)$ *(V = speed in mph, P = no. of pulses per sample period T = sample period in seconds)*
Wind Direction Translation . . . . Variable resistance 0 - 20KΩ; 10KΩ = south, 180°

Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6410	17.75" x 10.50" x3.00" (451 mm x 267 mm x 76 mm)	2.0 lbs. (.9 kg)	011698 00237 5