

Troubleshooting and Maintenance - CONSOLE

While your Vantage Pro2 weather station is designed to provide years of trouble-free operation, occasional problems may arise. If you are having a problem with your station, please consult this troubleshooting guide before calling technical support. You may be able to quickly solve the problem yourself.

TABLE D-1: TROUBLESHOOTING GUIDE

Area	Problem	Solution
Display	Display is blank	Unit is not receiving power. Check the power adapter connections and/or replace batteries.
	Display shows dashes in place of weather data	<ul style="list-style-type: none"> • Console not receiving – Refer to Check Console Reception (1) • Sensors not transmitting.(*) • A reading has exceeded the limits indicated in the specifications table. • Calibration numbers may be causing readings to exceed display limits.(*)
	Display “locks up”	If the console “locks up”, reset the console by removing AC and battery power then restoring power. If this occurs frequently in an Ac powered console, plug the AC power-adapter into a surge suppressor.
Humidity	Inside humidity seems too high or too low	<ul style="list-style-type: none"> • Make sure the console is not near a humidifier or de-humidifier. • Also make sure the console backlight is not on.
Wind Speed	Wind speed reads 0 either all the time or intermittently	<ul style="list-style-type: none"> • Check Console Reception (1) • The problem may be with the anemometer.(*)
Dew	Dew Point reading seems too high or too low	Remember, dew point depends on temperature and outside humidity. Make sure they’re working.
Temperature	Inside temperature sensor reading seems too high	<ul style="list-style-type: none"> • Move the console out of direct sunlight. • Make sure that the console or sensor is not in contact with an exterior wall that heats up in sunlight or when outside temperature rises. • Make sure the console or sensor is not near a heater or other internal heat source (lamps, appliances, etc.). • Also make sure the console backlight is not on.

	Outside temperature seems too low	Sprinklers may be hitting the ISS radiation shield. Relocate.
	Inside temperature sensor reading seems too low	<ul style="list-style-type: none"> • Make sure the console or other temperature sensor is not in contact with an exterior wall that cools down when outside temperature drops. • Make sure the console or other temperature sensor is not near an air conditioning vent.
Wind Direction	Wind direction reading is dashed out	• Wireless model - Refer to Check Console Reception (1)
	Wind direction always says north	Usually an ISS problem, especially if outside temperature is dashed out as well.(*)
Chill	Wind chill reading seems too high or too low	Remember, wind chill depends on temperature and wind speed. Make sure they are working.
Heat	Heat Index reading seems too high or low	Remember, the heat index depends on temperature and outside humidity. Make sure They are working.
Rain	No rain readings	Make sure cable-tie is removed from rain collector. Check and make sure no blockage.
Time	Incorrect times for sunrise and sunset	Check your latitude, longitude, time zone, and daylight savings time settings. Sunrise and sunset times are calculated from the console using all of these settings. Visit www.greenwichmeantime.com to synchronize date & time.

(*) Contact us.

Troubleshooting Reception Problems

While we have tested the Wireless Vantage Pro2 radio extensively, each site and each installation presents its own issues and challenges. Obstructions, particularly metallic ones, will often cut down your station's reception distance. Be sure to test reception between the console and ISS, in the locations you intend to install them, or before permanently mounting your ISS or other transmitter(s).

TROUBLESHOOTING GUIDE

Problem Solution

Console Diagnostic Screens

The console's reception status displays at the lower right corner of the screen.

- An "X" flashes for every data packet received by the console.
- An "R" is shown when the console is trying to re-establish a lost connection.
- An "L" is shown when the signal has been lost.
- When no data packets have been received for 10 minutes, the console dashes-out any missing sensor readings

(1) Check Console Reception

Enter Setup mode by pressing **<DONE>**, then pressing **↔** arrow. Wait a few moments while the console lists all the stations transmitting within range. If the console does not detect your transmitter, check the following:

- Adjust the console and ISS antennas to be in line of sight with each other.
- Try turning on the Gain. See "Diagnostic Screen Commands".
- Reduce the distance between the ISS and the console.
- If the console is directly beneath the ISS, then antennas should be horizontal.
- Try distancing your console from your ISS, at least 3m apart.

Console Diagnostic Screens

Console Diagnostics consists of two screens, the Statistical Diagnostic screen and the Reception Diagnostic screen. The Statistical Diagnostic screen applies for both cabled and wireless weather stations. The Reception Diagnostic screen applies only to wireless weather stations and is not accessible to a cabled weather station.

Note: Radio transmission data that is used by the diagnostic screens is cleared each day at midnight.

Diagnostic Screen Commands

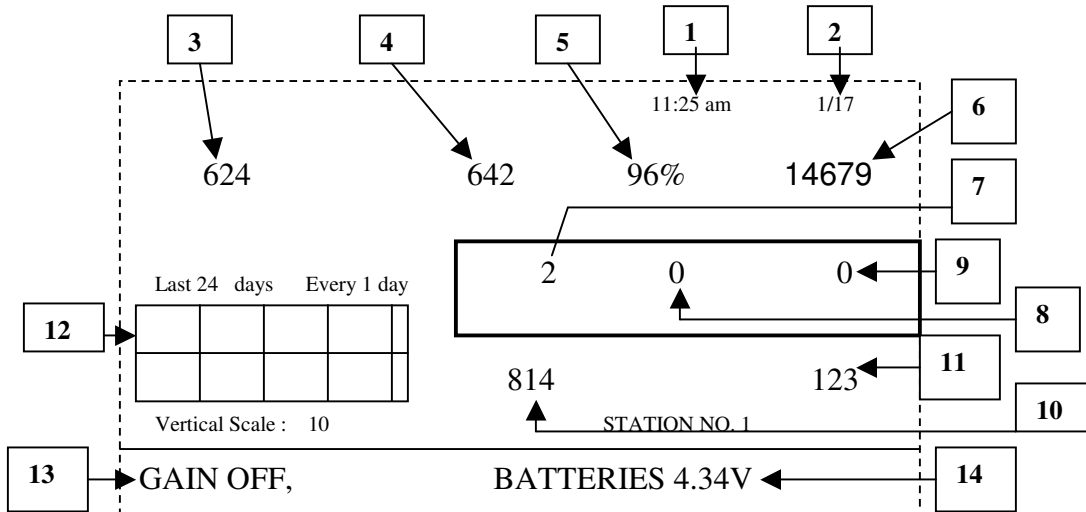
- Press and hold **<TEMP>**, then press **<HUM>** to display the Statistical Diagnostic screen.
- Press **<2ND>** and then press **<CHILL>** to toggle between the Statistical and Reception Diagnostic screens.

A degree (°) sign displays in field 1 of the Reception Diagnostic screen to differentiate which screen is currently being displayed.

- Press **<DONE>** to exit the diagnostic screen.

(1a) Statistical Diagnostic Screen

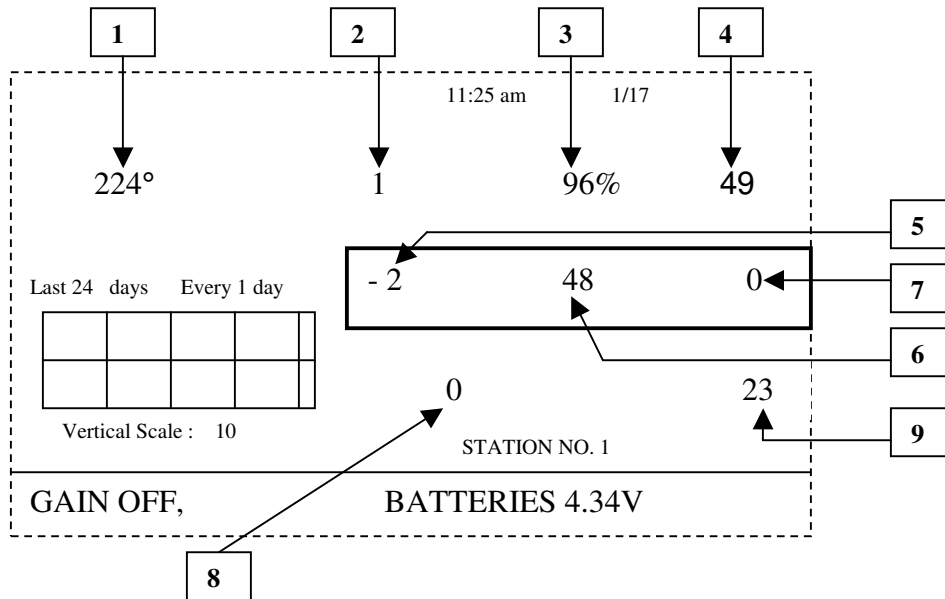
The Statistical Diagnostic displays information about how data is being received from the weather station to the console. The information that is displayed in this screen includes:



1. Time of day. When **<WIND>** is pressed, the number of times the reed switch was seen closed is displayed. The reed switch closes once each rotation. Use **<WIND>** to toggle between these two values.
2. Date. When **<WIND>** is pressed, the number of times the reed switch was seen open is displayed. Use **<WIND>** to toggle between these two values.
 Note: The time of day and date displays can be toggled in both statistical and reception diagnostic screens.
3. Number of packets containing errors that were received.
4. Number of missed data packets.
5. Percentage of packets received without errors.
6. Total number of packets received.
7. Number of times the console resynchronized with the transmitter.
8. Maximum number of packets missed in a row without resynchronization.
9. Current number of consecutive misses. The counter increments when the console is synchronized but the packet is missed. The console will attempt to resynchronize after 20 consecutive misses.
10. Longest streak of consecutive packets received.
11. Current streak of consecutive packets received.
12. Graph of the percentage of scheduled ISS data packets received over the last 24 days.
13. Receiver Gain status.
14. Current console battery voltage.

(1b) Reception Diagnostic Screen

The Reception Diagnostic screen displays information pertinent to the console's wireless reception. To view this screen from the Statistical Diagnostic screen, press **<2ND>** and then press **<CHILL>**. The information that is displayed in this screen includes:



1. 8-bit timer value of next reception. The degree sign displaying in the upper right hand corner next to this value verifies that the Reception Diagnostic screen is currently displayed.
2. Frequency error of the last packet received successfully.
3. Percentage of packets received without errors.
4. Signal strength of the last packet received. The values displayed in this field should generally be between 20 and 60. If a packet is not received successfully, the signal strength field is dashed out (--).
- Press **<HI/LOW>** to toggle Gain on and off. The message in the ticker indicates the current Gain status. The Receiver Gain setting provides some control over the receiver sensitivity. If you're having trouble with reception, try turning the Gain on.
- Gain can adversely affect performance when signal strength is high. Gain should generally not be turned on when signal strength is above 30.
5. Current frequency correction factor.
6. Frequency index of the next packet to be received.
7. Current number of consecutive packets missed.
8. The number of times that the Phase Lock Loop did not lock.
9. Current streak of consecutive packets received.
- Press **<DONE>** to exit the diagnostic screen.

Console Maintenance

Changing Batteries

Use this procedure to change console batteries without losing any stored weather data or console configuration settings.

CONSOLE will display message (LOW BATTERY ON CONSOLE)

1. Plug in the AC adapter or, if the AC adapter is not present, enter Setup Mode by pressing **<DONE>** and then the **(-)** down arrow.
Entering Setup Mode makes sure the station isn't writing any data to memory when power is removed.
2. Remove the battery cover located on the back of the console by pressing down on the two latches at the top of the cover.
3. Place the console face down on a flat, firm surface.
4. Insert a fingertip between the two exposed batteries then press the middle battery down toward the notch (toward the "hidden" battery). This will relieve tension on the first battery and allow you to remove it.
5. Remove the old batteries and install the new batteries.
6. Replace the battery cover and remove the AC power adapter, if it was used.

Specifications

See complete specifications for your Vantage Pro2 Station at our website: www.davisnet.com.

Console

Console Operating Temperature	..... +14° to +140°F (-10° to +60°C)
Display Temperature	..... +32° to +140°F (0° to +60°C)
Non-operating Temperature	..... -5° to +158°F (-20° to +70°C)
Console Current Draw	..... Wireless: 0.9 mA average, 30 mA peak, (add 80 mA for display lamps, add 0.125 mA for each transmitter station received by console) at 4 to 6VDC Cabled: 10 mA (average), 15 mA (peak) (+80 mA for illuminated display) at 4 to 6 VDC
Power Adapter	..... 5 VDC, 900 mA
Battery Backup	..... 3 C-cells
Battery Life (no AC power)	..... Wireless: up to 9 months; (Cabled: 1 month (approximately))
Connectors	..... Modular RJ-11
Housing Material	..... UV-resistant ABS plastic
Console Display Type	..... LCD Transflective
Display Backlight	..... LEDs
Dimensions:	
Console (with antenna)	..... (264 mm x 156 mm x 38mm)
Console (no antenna)	..... (244 mm x 156 mm x 38 mm)
Display	..... (151 mm x 86 mm)
Weight (with batteries)	..... (.85 kg)
Wireless Communication Specifications	
Transmit/Receive Frequency	..... US Models: 902 - 928 MHz Overseas Models: 868.0 - 868.6 MHz
ID Codes Available	..... 8

Output Power. 902 - 928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required
868.0 -868.6 MHz: CE-certified, less than 8 mW, no license required

Range

Line of Sight up to 1000 feet (300 m)
Through Walls 200 to 400 feet (60 to 120 m)

Console Data Display Specifications

Historical Data Includes the past 24 values listed unless otherwise noted; all can be cleared and all totals reset.

Daily Data. Includes the earliest time of occurrence of highs and lows; period begins/ends at 12:00 am.

Monthly Data Period begins/ends at 12:00 am on the first of every month.

Yearly Data. Period begins/ends at 12:00 am on January 1st unless otherwise noted.

Current Data Current data appears in the right most column in the console graph and represents the latest value within the last period of the graph; totals can be set or reset.

Graph Time Interval 1 min., 10 min., 15 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected).

Graph Time Span 24 Intervals + Current Interval (see Graph Intervals to determine time span).

Graph Variable Span (Vertical Scale) Automatic (varies depending upon data range); Maximum and minimum value in range appear in ticker.

Alarm Indication Alarms sound for 2 minutes (time alarm is 2 minute) if operating on battery power. Alarm message displays in ticker as long as threshold is met or exceeded. Alarms can be silenced, but not cleared, by pressing <DONE>.

Update Interval Varies with sensor - see individual sensor specs. Also varies with transmitter ID code - 1 = shortest, 8 = longest.

Forecast:

Variables Used Barometric reading & trend, wind speed & direction, rainfall, temperature, humidity, latitude & longitude, time of year.

Update Interval 1 hour

Display Format Icons on top center of display; detailed message in ticker at bottom.

Variables Predicted Sky condition, precipitation, Temperature Changes, Wind Direction and Speed Changes.

If you have any questions, or encounter problems installing or operating your Vantage Pro 2 weather station, please contact our Technical Support. We'll be glad to help.

Call : 6268 0100 (Monday - Friday, 9:00 a.m. - 5:30 p.m.) – Technical Service

Contact Persons : Mr Shetty, Miss Angie

Email : support@acez.com.sg

Maintenance and Troubleshooting- ISS

Maintaining UV and Solar Radiation Sensors

Make every effort to avoid touching the small white diffusers at the top of the sensors. Any skin oil will reduce the sensitivity of the sensors.

Cleaning the Radiation Shield

The outer plating of the radiation shield should be cleaned when there is excessive dirt and build up on the plating. Use a damp cloth to clean the outer edge of each ring.

Note: Spraying down or using water excessively to clean the radiation shield can damage the sensitive sensors or alter the data and readings the ISS is transmitting.

Check the radiation shield for debris or insect nests at least once a year and clean when necessary. A buildup of material inside the shield reduces its effectiveness and may cause inaccurate temperature and humidity readings. To thoroughly clean the radiation shield

1. Remove the rain collector cone.
2. Using a Phillips head screwdriver, loosen the three 4" (~100mm) bolts holding the radiation shield plates together.
3. Separate the plates as shown and remove all debris from inside the shield.
4. Reassemble the radiation shield plates and fasten them together using the bolts as shown in the illustration. Use a Phillips head screwdriver to tighten the bolts.

Cleaning the Rain Collector

To maintain accuracy, thoroughly clean the rain collector several times a year.

Note: Cleaning the rain collector and tipping buckets may cause false rain readings. Unplug the RAIN sensor from the SIM before cleaning so that no inaccurate readings are logged, or clear the weather data that was logged on the Vantage Pro2 console after cleaning is complete. See your *Vantage Pro2 Console Manual* for instructions on clearing weather data.

1. Separate the cone from the base by turning it counter-clockwise.
2. Use soapy water and a soft cloth to remove any debris from the cone, cone screen, and tipping bucket.
3. Use pipe cleaners to clear the funnel hole in the cone and drain screens in the base.
4. When all parts are clean, rinse with clear water.
5. Re-attach the cone and replace the debris screen.

Troubleshooting

If a Sensor Functions Intermittently

1. Carefully check all connections from the sensor to the ISS. Loose connections account for a large portion of potential problems. Connections should be firmly seated in receptacles and plugged in straight.
2. To check for a faulty connection, try jiggling the cable while looking at the display. If a reading displays intermittently on the console as the cable is jiggled, the connection is faulty. Try removing and then reinstalling the cable to correct the faulty connection. If the sensor still functions intermittently contact us.

Most Common Rain Collector Problem

If the rain collector seems to be under-reporting rainfall, remove the rain collector cone to clean the tipping bucket and clear out any debris. Make sure the cable tie around the tipping bucket has been cut and removed.

Most Common Anemometer Problems

“The anemometer head is tilted when I mount the anemometer.”

With Allen wrench provided in the supplied hardware, loosen the screws holding the anemometer head on the arm. (The screws are on the bottom of the anemometer head, by the wind cups.) Turn the anemometer head so it is straight and then tighten the screws.

“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. Remove the cups from the anemometer (loosen the set screw). Put the cups back onto the shaft and adjust them up or down 1/16 – 1/8 inch (1.5 – 3 mm). 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 or break 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.

“The wind cups don’t spin or don’t spin as fast as they should.”

First check for and clear out any spider webs. Also, 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 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 neighbour 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.

Specifications

Wireless ISS

Temperature range: -40 to 150° Fahrenheit (-40 to 65° Celsius)
Transmission frequency: 902 - 928 MHz FHSS for North America
868.0 -868.6 MHz FHSS for overseas versions: EU,
UK, and OV
Transmitter ID codes: 8 user-selectable
License: low power (less than 8 mW), no license required
Primary power: Solar power – Davis solar charger
Backup power: CR-123A 3-volt lithium battery (8 months without
sunlight-greater than 2 years depending on solar charging)
Alternate power AC power adapter

ISS Weather Variable Update Intervals

Wind speed: 2.5 to 3 seconds
Wind direction: 2.5 to 3 seconds
Accumulated rainfall: 10 to 12 seconds
Rain rate: 10 to 12 seconds
Outside temperature: 10 to 12 seconds
Outside humidity: 50 seconds to 1 minute
Ultraviolet radiation: 50 seconds to 1 minute
Solar radiation: 50 seconds to 1 minute

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