
WELCOME TO THE VANTAGE PRO 5

5

Vantage Pro Formats 5

Display & Keyboard 6

Console Modes 6

Multiple stations / Sensors 7

Optional Sensors 7

Optional Accessories 8

Vantage Pro Console Installation 9

Cabled Vantage Pro Console Installation 10

Powering your Vantage Pro 10

Connecting the Cabled Vantage Pro to the
Integrated Sensor Suite (ISS) 10

Wireless Vantage Pro Installation 11

Powering your Wireless Vantage Pro 11

Connecting the Wireless Vantage Pro console
to the Integrated Sensor Suite (ISS) 11

Displaying the Vantage Pro Console 11

Table & Shelf Display 12

Wall Display 12

Using the Vantage Pro Console
13

Chapter 3 13

Keyboard 14

Using the Navigation Keys 14

Display Features 15

Setup Mode 18

Current Weather Mode 18

Activating Weather Variables 18

Wind Speed and Direction 18

Temperature 18

Humidity 19

Wind Chill 19

Dew Point 19

Barometric Pressure 20

UV (Ultraviolet Radiation) 20

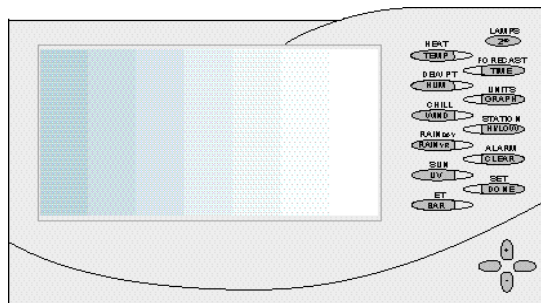
Heat Indices 21
Rain “Year”, Rain “Month”, and Rain Rate 21
“Daily” and “Storm” Rain 22
Solar Radiation 22
ET (Evapotranspiration) 23
Selecting Units 24
To change the units for any variable: 24
25
Highs and Lows Mode 25
Alarms Mode 26
Graph Mode 27
Troubleshooting 29
Display 30
TEMPERATURE 31
Humidity 31
Wind Speed 32
Direction 32
chill 32
Repair & Warranty information 33
One Year Limited Warranty 33
Questions? Call the Davis Service Center 33
FCC Part 15 Class B Registration Warning 34
Appendix:
Weather Data 35
Weather Conditions Measured/Calculated 35
EvapoTranspiration (ETo) 36
Temperature 36
Apparent Temperature Measures 36
Wind 38
Solar Radiation 38
UV (Ultra Violet) Radiation 39
Rainfall 40
Barometric Pressure 40
Relative Humidity 41
Dew-Point & Leaf Wetness 41
Time 42

AutoClear 42
42
Specifications 43
Function 43
Display Reading 43
Accuracy 43
Temperature 43

Welcome to the Vantage Pro 5

WELCOME TO THE VANTAGE PRO

1



Welcome to Davis Instruments' Vantage Pro weather station console. The Vantage Pro console, part of the comprehensive Vantage Pro system, displays a wealth of weather information -- up to ten weather variables simultaneously. The Vantage Pro console is also a powerful weather computer, collecting, storing, and displaying historical data, including highs and lows, in graphical and numerical formats.

The Vantage Pro also provides you with a forecast based on the latest meteorological algorithms. A quick glance at the graphical icons predicts the general weather trend. A detailed forecast scrolls across the bottom of the screen, including predicted xxx <!-- what? his and lows, sunny?, tornados?--!>.

Vantage Pro Formats

The Vantage Pro System is available in two formats: Cabled and Wireless.

- **Cabled Vantage Pro System**
The Cabled Vantage Pro system links the Integrated Sensor Suite (ISS) sensor array to the console with standard four-conductor cable. The Standard Vantage Pro system operates on AC power only.
- **Wireless Vantage Pro**
The wireless Vantage Pro console receives data transmitted by radio from the solar-powered ISS. Neither the sensor array, nor the console requires AC power in the wireless format.

Display & Keyboard

The Vantage Pro display and keyboard are designed for easy access to the most important weather information.

The keyboard allows you to interact with the station computer, view current and historical data, set and clear alarms, change station modes, enter calibration numbers, set up and view graphs, select sensors, read the forecast, and so on. To learn more about the keyboard, see “Keyboard” on page 26.

The Large LCD display is your window on current and past environmental conditions, as well as the place to find the forecast. The console LCD can display up to 12 weather variables at any one time. With the addition of Davis’ programmable weather ticker, a scrolling alphanumeric display, you can completely personalize the display to suit your needs, interests, and curiosities. To learn more about the display’s features, see “Display” on page 21.

Console Modes

The Vantage Pro console operates in five different modes designed to give you quick and easy access to the information you need:

- **Setup**
Setup mode is used to enter the time, date, calibration numbers, and other information required for the processing and display of the weather data.
- **Current Data**
Current data is the most common operation mode. In this mode you can read the current weather information and access any weather data not currently displayed using the keyboard.
- **High / Low**
The High and Low mode summaries are accessed using the High/Low key.
- **Alarm**
Alarm mode allows the user to set, clear, and review alarm settings.
- **Graph**
Graph mode allows the user to access the advanced graphing capabilities of the Vantage Pro weather computer.

For more information about using the console, see “Using the Vantage Pro Console” on page 13 and following sections.

Multiple stations / Sensors

The Wireless Vantage Pro system is capable of receiving transmissions from up to eight different transmitters. See “Optional Sensors” below.

OPTIONAL SENSORS

The Vantage Pro system is extremely flexible. The following optional sensors enable calculation and measurement of specialized weather information. All optional sensors are available from your dealer or may be ordered directly from Davis Instruments. Please be aware that some options are available only for wireless units.

- **Solar Radiation Sensor**
Enables you to measure and display solar irradiance and incident energy. Also required for calculating Evapotranspiration (see “Evapotranspiration (ET_o)” on page 11).
Available for Cabled and Wireless stations. Requires Solar Radiation / UV mounting shelf. See “Optional Accessories” on page 8.
- **Ultraviolet (UV) Radiation Sensor**
Enables you to measure and display UV wavelength irradiance. Required for calculating the burn index.
Available for Cabled and Wireless stations. Requires Solar Radiation / UV mounting shelf. See “Optional Accessories” on page 8.

Note: The Wireless Vantage Pro console is capable of receiving signals from up to eight separate transmitter stations, including:

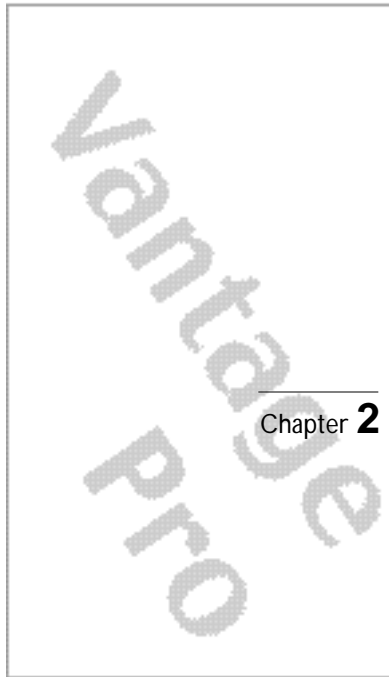
- **Wireless Integrated Sensor Suite**
A complete sensor package including Rain, Temperature, Humidity, Wind Speed and Direction, with options for Solar Radiation and UV sensors.
- **Wireless Wind Station**
Measures and transmits wind speed and wind direction to the console.
- **Wireless Rain Station**
Measures and transmits rainfall from a remote location to the console.
- **Wireless Temperature Station**
Measures and transmits air temperature from a remote location to the console.
- **Anemometer Transmitter Kit**
Allows separation of anemometer from ISS to capture wind speed and direction from a remote location.

OPTIONAL ACCESSORIES

The following accessories, designed for use with the Vantage Pro, are available from your dealer or may be ordered directly from Davis Instruments.

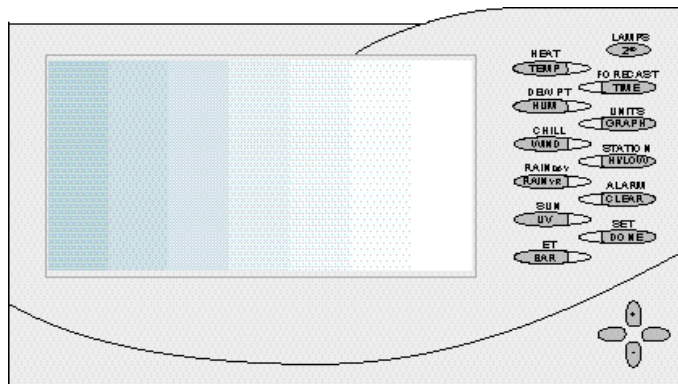
- **VantageLink™ Data Logger & PC Software**
Logs data gathered by the Vantage Pro, downloads it to your PC, and generates reports and graphical displays. Storage interval (1, 5, 10, 15, 30, 60, or 120 minutes) is set by the user. The data logger will store 4, 20, 40, 60, 120, 240, or 480 days worth of data depending on the selected storage interval. Windows™-compatible software lets you analyze, plot, print, sort, and summarize the data.
VantageLink™ includes data logger with attached eight foot cable, software, and manual. Requires IBM compatible PC running Windows 95 or 98 and one free serial port.
- **VantageLink™ 8' extension cord**
Extends the distance between Vantage Pro console and computer an additional 8 feet.
- **Solar Radiation Sensor/ UV Sensor Mounting Shelf**
Required for mounting the optional Solar Radiation and / or UV Sensors. The mounting shelf attaches to the ISS.
- **ConsoleLink™ Transmitter**
The ConsoleLink Transmitter allows a Cabled Vantage Pro console to broadcast to Wireless Vantage Pro Console Receivers located within 100 to 400 feet (800 line of site).
- **AC Power Adapter**
Allows Wireless Vantage Pro console to draw power from an AC plug. Useful if you would like to leave the backlights on all the time, or if you run more than three remote transmitter stations.
- **Cigarette Lighter Power Adapter**
Allows the Vantage Pro to draw power from a standard car cigarette lighter.

Warning: Do not use an older Davis AC Power Adapter or older Davis Cigarette Lighter Adapter. You will damage the circuitry inside the unit. Use only the Vantage Pro power adapters.



Chapter 2

VANTAGE PRO CONSOLE INSTALLATION



The Vantage Pro console is a precision instrument designed to give extremely accurate readings. As with any precision instrument, care must be used in its assembly and use. Although installation of the Vantage Pro console is relatively simple, following the steps outlined in this chapter-- and assembling the Vantage Pro correctly from the start-- will ensure that you will enjoy all of its features with a minimum of time and effort.

CABLED VANTAGE PRO CONSOLE INSTALLATION

The Cabled Vantage Pro is powered by 9-volt DC (direct current) with battery backup. Power may be supplied by an AC adapter (supplied with Cabled Vantage Pro stations), or with the optional 12 to 9-Volt Car/Boat/RV power adapter. (See “Optional Accessories” on page 8.)

• **WARNING:** The Vantage Pro system uses power differently from the way older Davis stations did. Use only a Davis Vantage Pro 9-volt power converter. Using an older Davis adapter will damage your Vantage Pro!

Powering your Vantage Pro

Because the Cabled Vantage Pro console supplies power to the sensor array through the connecting cable, you must use the AC power adapter or the optional Car/Boat/RV adapter to supply primary power. The three C-cell batteries provide backup power and will operate the station for only a few days.

1. Insert the power adapter plug into the jack located on the right side of the console, then plug the other end of the adapter into an appropriate power outlet.

The Vantage Pro should run through a brief self-test procedure. All the display segments on the LCD appear and the console will beep <!--number_!> times.

<!--Don Raime figure here--!>

2. Insert the C-cell battery backup.

Remove the access cover located on the back of the console. Insert 3 C batteries into the battery channel, negative (or flat) terminal first. Push gently on the last battery to seat all three in the channel and complete the circuit.

<!-- Don Raime illustration here--!>

3. Replace the battery cover.

After power-up the Vantage Pro will automatically enter Setup Mode. Setup mode will lead you through setting up and calibrating your station. See “Setup Mode” on page 28.

Connecting the Cabled Vantage Pro to the Integrated Sensor Suite (ISS)

The Vantage Pro comes with 40 feet of cable. Maximum cable length from ISS to console is 1000 feet. See “Optional Accessories” on page 8 to purchase additional cable.

1. Remove access cover
2. Insert the console end of the 4 conductor wire running from the ISS into the console receptacle marked ISS.

<!-- Don Raime illustration required here.--!>

3. Replace access cover

Ensure that the ISS cable is threaded through the mouse hole on the access plate.

<!-- Don Raime illustration required here.--!>

4. Test the connections between the ISS and the console.
Spin the wind cups and change the direction of the vane. If the ISS is powered and the connection between the ISS and the console is correct, you should see the wind direction and speed fields changing. Look at the other data fields to ensure they're reporting data from the sensors.

WIRELESS VANTAGE PRO INSTALLATION

Powering your Wireless Vantage Pro

Because the Wireless Vantage Pro console does not supply power to the sensor array, an AC adapter is not required to operate the console. You may purchase the AC adapter separately. See "Optional Accessories" on page 8.

1. Remove the access plate from the back of the Vantage Pro console.
Insert 3 C-cell batteries as shown. Insert the negative (or flat) terminal first. The Vantage Pro should run through a brief self-test procedure. All the display segments appear and the console will beep <!--number_!> times. <!--same illustration as above--!>
2. Replace the battery cover.

Note: Regarding Battery Use. Under normal circumstances, 3 C cell alkaline batteries should power your wireless Vantage Pro console for approximately 1 year. Davis Instruments does not recommend using rechargeable NiCad batteries with the Vantage Pro, because the Vantage Pro will not recharge them and they will not last as long.

After powering up and running through its self-test mode, the Vantage Pro console will automatically enter Setup Mode. Setup Mode will lead you through setting up and calibrating your station. (See "Setup Mode" on page 28.)

Connecting the Wireless Vantage Pro console to the Integrated Sensor Suite (ISS)

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 Vantage Pro 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).

For more information about locating the sensor transmitter and testing reception, consult the ISS or other transmitter manual.

DISPLAYING THE VANTAGE PRO CONSOLE

You should place the Vantage Pro computer console indoors, in a location where the keyboard is easily accessible and the display is easy to read. For more accurate readings, follow these suggestions:

- Avoid placing the Vantage Pro console in direct sunlight. The casing heats up in direct sunlight. This may cause erroneous readings and / or damage to the unit.

- Avoid placing the Vantage Pro console near radiant heaters or heating / air conditioning ducts
- If you are mounting the Vantage Pro console on a wall, choose an inner or interior wall. Avoid walls that heat up or cool down depending on the weather.

By changing the orientation of the kickstand, you may display the Vantage Pro on a tabletop, set it on a shelf, or mount it on a wall.

Table & Shelf Display

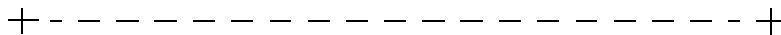
The kickstand may be set at five different angles appropriate for different display angles.

1. Lean the kickstand out.
2. Slide the catch to arrest the kickstand in the appropriate angle.
Choose low angles (settings 1 & 2) for display on a coffeetable or other low area. Choose higher angles (settings 3 - 4) for display on a desk or shelf.

<!--Don Raimo illustrations required here--!>

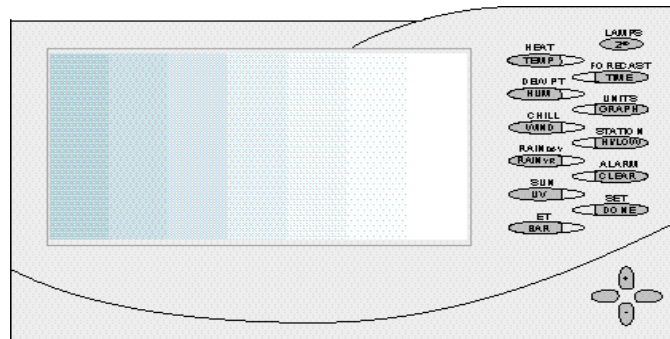
Wall Display

1. Hold the template provided here flat against the wall and use a pencil to mark the location of the two keyholes.
If you are installing a standard Vantage Pro console with sensor cable running inside the wall, attach the console over an empty switch box.
<!-- get dimensions and make template --!>
2. Use an electric drill with a #29 (.136" or 3.5mm) drill bit to make pilot holes in these locations.
3. Using a screwdriver, drive the two #8 x 3/4" pan head self-threading screws into the wall. Leave at least 1/8" between the wall the the heads of the screws.
4. Retract the kickstand into its upright and locked position.
5. Slide the keyholes on the back of the console over the two screw heads.



CHAPTER 3

USING THE VANTAGE PRO CONSOLE



The Vantage Pro display and keyboard are designed for easy access to the most important weather information. The large LCD display is your window on current and past environmental conditions, as well as the place to find the forecast. The keyboard allows you to interact with the station computer, view current and historical weather information, set and clear alarms, change station modes, enter calibration numbers, set up and view graphs, select sensors, read the forecast, and so on.

KEYBOARD

To access the station's many features, the Vantage Pro console possesses three kinds of keys:

- **Function keys**

The six primary function keys, TEMP (Temperature), HUM (Humidity), WIND (Wind speed and direction), RAIN yr (Total Year Rain), UV (Ultra-Violet irradiance), and BAR (Barometer) are used to access current weather information. They lie in the left side of the double key column.

- **Operation keys**

The six operation keys lie on the right side of the double column. 2ND, TIME, GRAPH, HI/LOW, CLEAR, and DONE are used to enter different console modes, set and clear alarm values, change measurement units, select station transmitters, and so on.

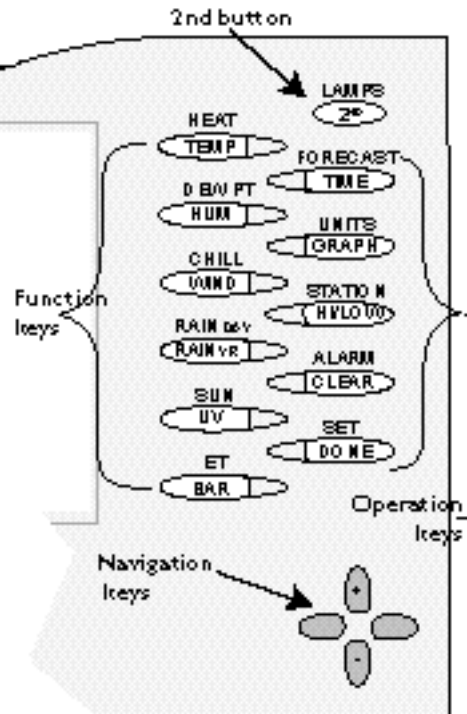
There is a special operation key, the 2ND key, located in the upper right hand corner of the keypad.

- **The 2nd key**

The second key is used in conjunction with other keys to access alternate functions. Above each function and operation key lies a legend identifying that key's alternate use. For example, FORECAST is listed above the TIME key. To access the Vantage Pro's forecast, press and release the 2nd key, then press and release the TIME/FORECAST key.

- **Navigation keys**

The four navigation keys, two horizontal and two vertical, are arrayed in a cross shape in the lower right corner of the console. The Navigation keys are used to enter or change data, and to scroll between displays.



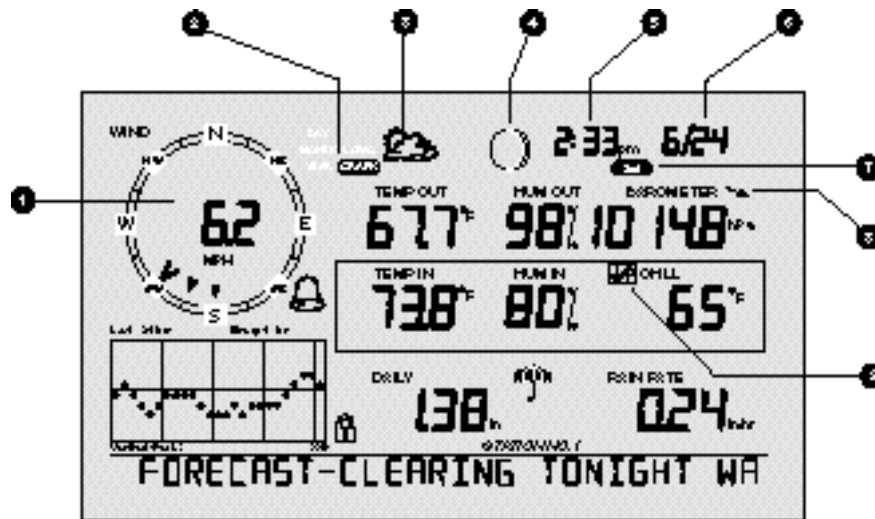
Using the Navigation Keys

You should become familiar with the use of these keys, since they serve many purposes in operating the Vantage Pro. The Navigation keys are used the same way, regardless of the current console mode.

Essentially, pressing the right or left navigation key activates the next (or previous) field on the screen. The up and down navigation keys scroll through digits or entries.

DISPLAY FEATURES

The large LCD display is your window on current and past environmental conditions, as well as the place to find the forecast.



Vantage Pro console display

The display is organized to maximize the information available to you. The following section explains some of the features that may appear on your console.

1. Compass Rose

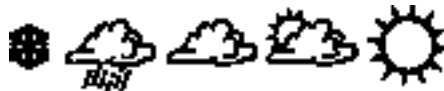
The wind rose displays the speed and direction of the current wind, as well as the variation in wind direction over the last three <!-- true?--> minutes

2. Graph and Hi / Low mode settings



Combinations of these indicators appear only when the Hi /Low or Graph modes are selected.

3. Forecast Icons



From left to right, these icons represent predicted snow, rain, clouds, partly sunny, and sun. The forecast is updated every three hours.

4. Moon Phase Indicator



The moon phase indicator depicts the current phase of the moon.

5. Time / Sunrise Time

Time may be displayed in 12 or 24 hour format. Time of sunrise is also displayed in this field. You must enter the correct correct latitude and longitude for your location for the time of sunrise to be accurate.

6. Date / Sunset Time

Date may be displayed in day / month or month.day format. Time of sunset is also displayed in this field. You must enter the correct latitude and longitude for your location for the time of sunset to be accurate.

7. 2nd button indicator



The 2nd indicator icon lights when the 2nd button is pushed.

8. Barometric Trend Arrow

The barometric trend arrow displays the pressure trend in five different positions: strongly rising, rising, steady, falling, and strongly falling.



The steeply rising (or falling) arrow indicates the pressure has increased (or decreased) 0.06" Hg or more in three hours.

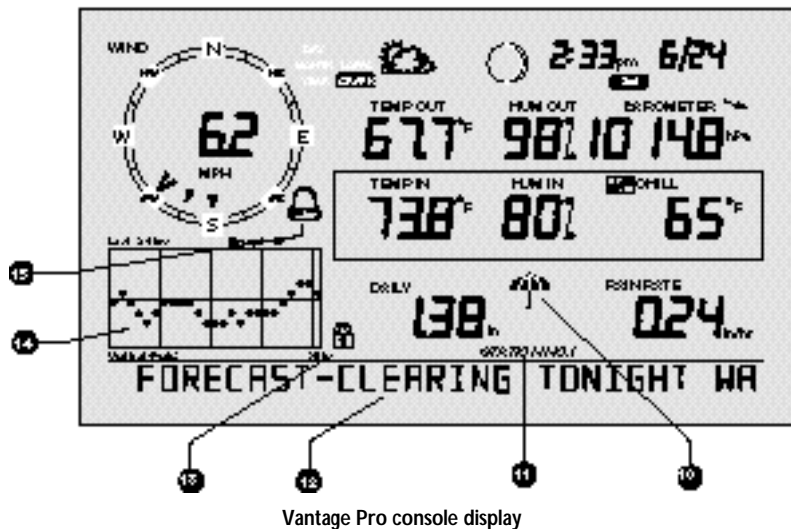
The shallow rising (or falling) arrow indicates the pressure has increased (or decreased) more than 0.02" Hg, but less than 0.06" Hg over three hours.

A flat arrow indicates the pressure has changed less than 0.02" Hg in three hours.

9. Graph Icon

The graph icon is always displayed next to the active weather variable. The graph will always show that variable's history according to your settings.





10. Current Rain Indicator

The umbrella icon announces that it is currently raining.



11. Station Number Indicator

The station number indicator shows which sensor transmitter the console is currently displayed.



Note: Multiple sensors are available for the wireless Vantage Pro system only.

12. Weather Ticker

The Davis Weather Ticker is a unique and useful addition to the weather station console. The ticker displays a broad spectrum of messages to the console user, including instructions during console setup.

ENTER LONGITUDE

The ticker also displays detailed forecast messages.

KITE FLYING WEATHER

13. Graph Lock mode indicator

This padlock icon activates to show that you have locked the graph in a particular setting (see “Graph Mode” on page 27).



14. Graph Field

The graph features an astounding array of features that I haven’t quite finished thinking about and will write later.

15. Alarm icon

The bell icon is active when an alarm is set. <!-- What about when alarm going off?--!>

SETUPMODE

<!--Not yet written--!>

CURRENTWEATHERMODE

The Current Weather screen is the heart of the display and where you'll likely spend most of your time. Up to ten weather variables are displayed simultaneously on the Vantage Pro's LCD screen. Some of these variables are always displayed: Barometric pressure, Outside Temperature, and Outside Humidity, as well as Wind Direction. Other variables share display space and must be accessed through keypresses.

Activating Weather Variables

Displaying any current weather information is straightforward. Press any function key to display that weather variable's current value. Selecting a variable also activates that variable's graph.

Note: The graph icon is always displayed next to the active weather variable.

You can also select any variable currently displayed on the LCD screen using the navigation keys. Pushing the left, right, up, or down arrows will move the graph icon to the next data field in the selected direction.

Wind Speed and Direction

- **Wind Speed**

Press the WIND / CHILL key to select the wind speed field. Wind speed may be displayed in miles per hour (mph), kilometers per hour (kph), meters per second (m/s), and knots (knots).



- **Wind Direction**

The large arrow within the wind rose graphically displays the current wind direction. Smaller arrows display the range of wind direction within the last 3 minutes.



To activate a digital readout of the wind direction, press the WIND / CHILL key again. The digital wind direction is displayed in degrees. See "Wind" on page 34.

Temperature

- **Outside Temperature**

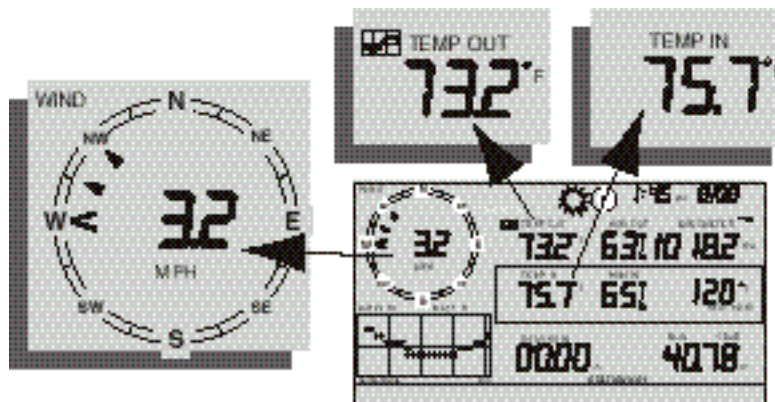
Press the TEMP / HEAT key to select the outside temperature field. Note that the graph icon appears next to the data field.

Temperature data may be displayed in both degrees Fahrenheit (°F) and Centigrade (°C).



- **Inside Temperature**

Press the TEMP / HEAT key again to activate the inside temperature field. Again, the graph icon appears next to the data field.



Humidity

Press the HUM / DEW PT key to select the outside humidity field.

Press the HUM / DEW PT key again to activate the inside humidity field.

Humidity is displayed in percent relative humidity. See “Relative Humidity” on page 37.



Wind Chill

- **Current Wind Chill**

Press and release the 2ND key, then press the WIND / CHILL key to select the Wind Chill field.

Wind Chill is displayed either degrees Fahrenheit (°F) or Centigrade (°C). See “Apparent Temperature Measures” on page 32.



Dew Point

- **Current Dew Point**

Press and release the 2ND key, then press the HUM / DEW PT key to select the Dew Point field.



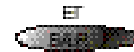
Dew Point is displayed in either degrees Fahrenheit (°F) or Centigrade (°C). See “Dew-Point & Leaf Wetness” on page 37.

Barometric Pressure

- **Current Barometric Pressure**

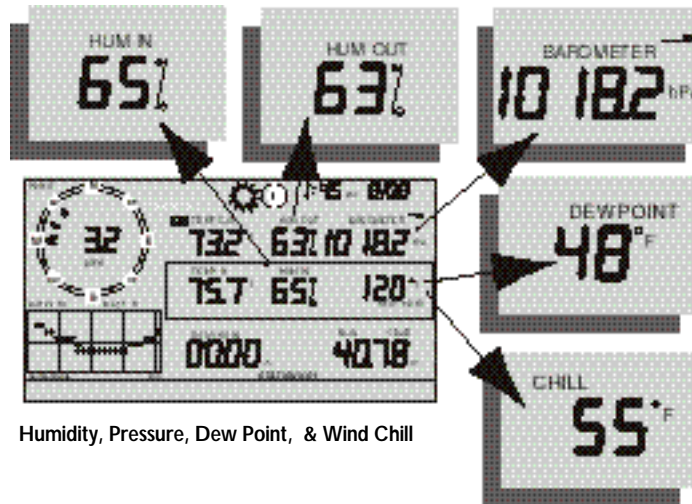
Press the BAR / ET key to select the barometric pressure.

Barometric pressure may be displayed in inches (in), millimeters (mm), millibars (mb) or hectoPascals (hPa). See “Barometric Pressure” on page 36.



- **Pressure Trend Arrow**

The Barometric Trend Arrow depicts the current barometric trend, measured over the last 3 hours. The trend arrow is always displayed, whether the barometric pressure is selected or not.



Humidity, Pressure, Dew Point, & Wind Chill

UV (Ultraviolet Radiation)

- **Current UV**

Press the UV / SUN key to display the current UV reading.

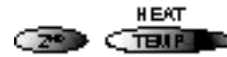


UV may be displayed as an index (1-7) or in MEDS. See “UV (Ultra Violet) Radiation” on page 35.

Heat Indices

- **Heat Index**

Press and release the 2ND key, then press the TEMP / HEAT key to display the Heat Index. See “Apparent Temperature Measures” on page 32.



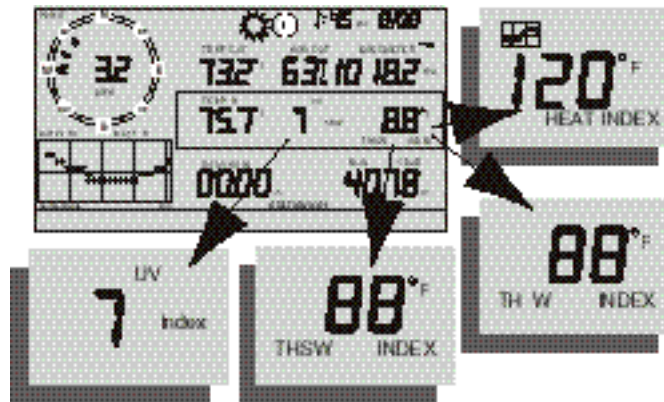
- **THW Index**

Repeat the sequence, (i.e. 2ND, TEMP / HEAT) to display the THW (Temperature - Humidity - Wind Index) (See “Apparent Temperature Measures” on page 32).

- **THSW Index**

If you have installed the optional Solar Radiation Sensor, repeat the sequence one more time to display the THSW (Temperature - Humidity - Sun - Wind Index). See “Apparent Temperature Measures” on page 32.

All heat indices appear in the same place on the screen and may be displayed, like temperature and wind chill, as either degrees Fahrenheit (°F) or Centigrade (°C).



Rain “Year”, Rain “Month”, and Rain Rate

- **Rain Rate**

Press the RAINYR / RAINDAY key to display the current rain rate.

Rain Rate may be displayed as either inches per hour (in/hr) or millimeters per hour (mm/hr).

- **Month-to-date precipitation**

Press the RAINYR / RAINDAY again to select the month-to-date precipitation record. Monthly rain displays the precipitation accumulated over the last 30 days.

- **Year-to-date precipitation**

Press the RAIN_{YR} / RAIN_{DAY} key a third time to display the year-to-date precipitation record. Yearly rain displays the precipitation accumulated since XXXX. Year-to-date precipitation is displayed in inches (in) or millimeters (mm).



Note: The "Year-to-date" and "Month-to-date" registers record precipitation accumulation for 1 year and 1 month respectively; however, you may clear start each counting period at whatever date you wish.

"Daily" and "Storm" Rain

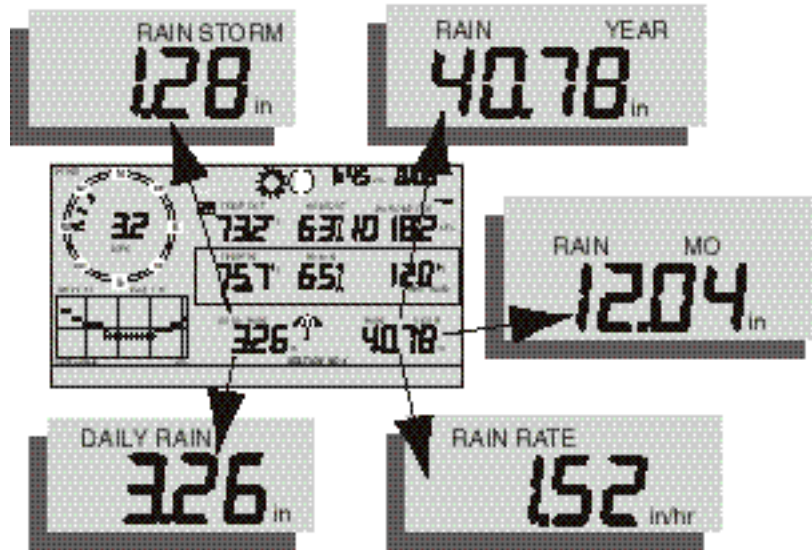
- **"Daily" Rain**

Press and release the 2ND key, then press the RAIN_{YR} / RAIN_{DAY} key. Daily Rain displays the rain accumulated over the last 24 hours.



- **"Storm" Rain**

Repeat the above sequence: press and release the 2ND key, then press the RAIN_{YR} / RAIN_{DAY} key.



Daily Rain, Rain Storm, Rain Year, Rain Month, & Rain Rate

All rain accumulation may be displayed as either millimeters (mm) or inches (in).

Solar Radiation

- **Current Solar Radiation**

Press and release the 2ND key, then press the UV / SUN key to display the current solar radiation reading.



Solar radiation is displayed as Watts per square meter (W/m^2). See “Solar Radiation” on page 34.

Note: To display solar radiation readings, you must have installed the optional Solar Radiation sensor. (XREF)

ET (Evapotranspiration)

- **Current ET**

Press and release the 2ND key, then press the BAR / ET key to display the current evapotranspiration reading. See “EvapoTranspiration (ETo)” on page 32.



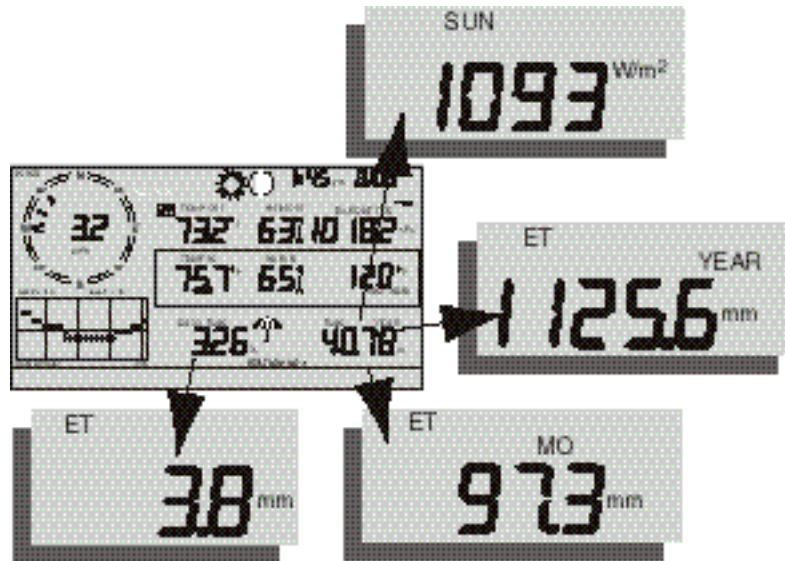
- **Monthly ET**

Repeat the sequence (i.e. Press and release the 2ND key, then press the BAR / ET key) to display Monthly ET.

- **Yearly ET**

Repeat the sequence a third time to display Yearly ET.

Note: To display ET readings, you must have installed the optional Solar Radiation sensor and the optional Leaf Wetness sensor.



Current ET, ET Month, ET Year, & Solar Radiation

Selecting Units

Most weather variables may be displayed in at least two different units, typically the English and Metric systems, although some variables feature more possibilities. Barometric pressure, for example, may be displayed in millibars, millimeters, inches, or hectoPascals.

You may change the units display at any time.

To change the units for any variable:

1. Activate the variable using the keypress sequences described above. (See "Activating Weather Variables" on page 18.)
2. Press and release the 2nd key.
3. Press the Graph / Units key.

The selected variable's units will change. Repeat steps 2 and 3 until the desired units appear.

For example, to select Barometric pressure units, activate the Barometric pressure by pushing BAR. Next, press and release the 2nd key, then press the Graph / Units key. The units field will display millibars, millimeters, inches, or hectoPascals. Repeating these steps cycles through all four selections. Stop when the the desired unit appears.



Barometric Pressure: millibars (mb), millimeters (mm) and inches (in)

HIGH AND LOWS MODE

<!--This section doesn't jibe with Vantage Pro - because we don't know how the alarms mode will work yet--!> The Vantage Pro records highs and lows for many weather conditions. All highs and lows represent the maximum or minimum reading since the last time you cleared each individual high/low register. If you have enabled the AutoClear for a particular high/low (see "Enabling/Disabling AutoClear" on page 51), this reading will represent the high/low since the time of the AutoClear. In other words, it will track highs and lows over a 24 hour period. If you do not use AutoClear, you may track daily, weekly, monthly, or yearly values, depending on how often you manually clear them.

For most highs and lows, the time and date at which they occurred is stored along with the value. Please note, however, that the date is only stored as long as it falls within 14 days of the current date. After 14 days, the Vantage Pro displays only the high/low reading and the time; the date appears as a series of dashes.

Note: (<!--Using Barometric Pressure not yet written --!> for details on the stored barometric pressure.

The table below summarizes the highs and lows stored by the Vantage Pro.

| <u>CONDITION</u> | <u>HIGH</u> | <u>LOW</u> | <u>TIME &
DATE</u> | <u>AUTOCLEAR</u> | <u>ADDITIONAL
INFORMATION</u> |
|-------------------|-------------|------------|----------------------------|------------------|-----------------------------------|
| Air Temperature | Yes | Yes | Yes | Yes | |
| Soil Temperature | Yes | Yes | | Yes | |
| Temp/Hum Index | Yes | | Yes | Yes | |
| Wind Chill | | Yes | Yes | Yes | |
| Wind Speed | Yes | | Yes | Yes | Direction of Gust |
| Rate of Rainfall | Yes | | Yes | Yes | |
| Relative Humidity | Yes | Yes | Yes | Yes | |

ALARMS MODE

The Vantage Pro features a set of alarms which can be programmed to sound whenever a reading exceeds a set value. With the exception of barometric pressure, dew-point, and time, all alarms sound when a reading reaches the alarm threshold and will continue to sound until the reading returns to within the threshold. This means that for all high alarms, the alarm sounds when a reading reaches the alarm threshold continues to sound until the reading drops below the alarm threshold. On all low alarms, the alarm sounds when a reading reaches the alarm threshold and continues to sound until the reading rises above the alarm threshold.

The table below summarizes the Vantage Pro's alarms.

| <u>CONDITION</u> | <u>HIGH
ALARM</u> | <u>LOW
ALARM</u> | <u>SPECIAL ALARM OR FEATURE</u> |
|------------------------------|-----------------------|----------------------|---|
| "Daily" ETo | Yes | | Hourly Update, Resets "Daily" ETo |
| Total ETo | Yes | | |
| Total Degree-Days for Period | Yes | | |
| Air Temperature | Yes | Yes | |
| Soil Temperature | Yes | Yes | |
| Temp/Hum Index | Yes | | |
| Wind Chill | | Yes | |
| Wind Speed | Yes | | |
| "Daily" Rainfall | Yes | | |
| Barometric Pressure | | | Rate of Change per Hour |
| Relative Humidity | Yes | Yes | |
| Dew-Point | | | Temperature within 2 °F (1 °C) of Dew-Point |
| Time | | | Standard "Alarm Clock" |

The three special alarms are described below:

- **ETo**

ETo is updated only once an hour, on the hour. If during a given hour the ETo value exceeds the alarm threshold, that information causes the ETo alarm to sound *at the end of that hour*. This is true for both the “daily” and Total ETo alarms.

In addition, for the “daily” alarm, the Vantage Pro automatically subtracts the ETo alarm threshold value from the “daily” ETo amount after the alarm is triggered. (This subtraction effectively clears “daily” ETo once the alarm is triggered.) Thus, if you are using the “daily” ETo alarm (at any threshold), do *not* use the ETo AutoClear feature because: (1) there is no need, the value resets automatically, and (2) setting the ETo AutoClear may interfere with triggering the alarm at the appropriate time.

A new feature in the Vantage Pro allows you to set the station to generate a signal for every hundredth-inch of ETo. For example, if in an hour, three-hundredths of an inch ETo is returned to the air, at the end of the hour 3 discrete signals will be generated by the station. For this application, set the alarm threshold to 0.01”, and attach an Alarm Output Module (AOM) to receive the signal. Any other threshold (other than 0.01”) will cause the alarm to function as normal (giving just one signal at the end of the hour when the alarm threshold is exceeded).

Note: In order for the alternative (0.01”) setting to work, you must have an AOM connected to your system, otherwise the ETo alarm will sound continuously. Also, make sure you set the alarm threshold in inches (even if you are displaying total ETo in millimeters).

- **Barometric Pressure**

The barometric pressure alarm alerts you to changes in barometric pressure. You may select a rate of change per hour (0.2”/0.4”/0.6”, 0.5 mm/1.0 mm/1.5 mm, 0.7 hPa/1.4 hPa/2.0 hPa) and the Vantage Pro’s alarm will sound if the rate of change (in either direction) exceeds your threshold.

- **Dew-Point**

The Dew-Point alarm alerts you when the temperature comes within 2°F (1°C) of the dew-point.

- **Time**

The time alarm is a standard “alarm clock” type of alarm. It will sound for one minute.

GRAPH MODE

<!-- Not yet written --!>



TROUBLESHOOTING

While the Vantage Pro is designed to provide years of trouble-free operation, occasional problems may arise. If you are having problems with your unit, please check the following guide before sending the unit in for repair. You will be able to solve many of the problems yourself. If, after checking this guide, you are unable to solve the problem, please call the factory at 1-510-732-7814 for further instructions. Please do not return your unit for repair without prior authorization.

| | Problem | Solution | PG. |
|----------------|--|--|-----|
| DISPLAY | Display is flashing | Cabled Vantage Pro is operating under battery power. Check to be sure that the power adapter had not come unplugged from the console or outlet. | |
| | Display is blank | Unit is not receiving power. Check to be sure the power adapter has not come unplugged from the console or outlet.

If power is interrupted, battery may be installed incorrectly. Check and re-install.

Battery may be run down or old. Replace. | |
| | Display shows a series of dashes in place of function reading | ISS not plugged in (Cabled Vantage Pro)

Sensors not transmitting. (Wireless Vantage Pro) See transmitter manual.

Console not receiving. (Wireless) Check reception.

A reading has exceeded the limits indicated in the specifications table.

For temperature, wind speed, or rainfall: calibration numbers may be causing readings to exceed display limits. Check calibration number and adjust if necessary. | |
| | Display is sluggish or computer does not work at low temperatures | The console, LCD display, and internal components may not work below 32° F (0° C). Use the External Temperature sensor in low-temperature locations and keep the Vantage Pro console in a warmer location. | |
| | Display “locks up” | The Vantage Pro console may “lock up” if there is a power surge. To restore the unit, remove all power (including battery backup) and then restore power. If “lock ups” occur frequently, add a surge suppressor to the power line. | |
| | | | |

| | Problem | Solution | PG. |
|--------------------|--|---|-----|
| TEMPERATURE | Outside temperature sensor reading seems too high | Check calibration number and adjust if necessary. | |
| | Inside temperature sensor reading seems too high | <p>Move the Vantage Pro console (or other temp sensor if you have installed additional wireless temperature sensors) out of direct sunlight.</p> <p>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.</p> <p>Make sure the console or sensor is not near a heater or other internal heat source (lamps, appliances, etc.).</p> <p>Check calibration number and adjust if necessary.</p> | |
| | Outside temperature seems too low | Check calibration number and adjust if necessary. | |
| | Inside temperature sensor reading seems too low | <p>Make sure the the console or other temperature sensor is not in contact with an exterior wall that cools down when outside temperature drops.</p> <p>Make sure the console or other temperature sensor is not near an air conditioning vent.</p> <p>Check calibration number and adjust if necessary.</p> | |
| HUMIDITY | Inside humidity seems too high or too low | <p>Make sure the Vantage Pro console is not near a humidifier or de-humidifier.</p> <p>Check calibration number and adjust if necessary.</p> | |
| | | | |

| | Problem | Solution | PG. |
|------------------|---|---|-----|
| WINDSPEED | Wind speed reading seems lower than expected | Check installation by spinning wind cups. If you get a reading, the wind cups are installed correctly. They should spin more freely after an initial break-in period of one or two weeks. | |
| | Wind speed reads 0 either all the time or intermittently | Check installation by spinning wind cups. If you do not get a reading, try moving the wind cups down about 1/16" (1.5mm) on the shaft.

If you still do not get a reading, the problem may be with the anemometer. Call factory for return authorization. | |
| | Wind speed reading seems too high or too low. | Check calibration number and adjust if necessary. | |
| DIRECTION | Wind direction reading is dashed out | Possibility 1

If these steps do not reveal the problem, the anemometer may be faulty. Call the factory for return authorization. | |
| CHILL | Wind chill reading seems too high or too low | Check calibration number for temperature and wind speed. Adjust if necessary. | |
| | | | |



REPAIR & WARRANTY INFORMATION

ONE YEAR LIMITED WARRANTY

For details on Davis' warranty policy, please refer to the *Maintenance, Service, and Repair Information* brochure included with your station.

QUESTIONS? CALL THE DAVIS SERVICE CENTER

If you have any questions about our products, please call our Service Center at 1-510-732-7814. We'll be glad to help. Most questions can be answered while you're on the phone. Sorry, we're unable to accept collect calls.

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 on and off, 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 must be used for this equipment to comply with the relevant FCC regulations. [Previous sentence necessary?] Changes or modifications not expressly approved in writing by Davis Instruments may void the user's authority to operate this equipment.

Product Numbers: xxxx, xxxx, xxxx, xxxx

David Instruments Part Number: xxxx-xxx

Vantage Pro Console Manual

Rev. A Manual (8/20/99)

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

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