# Wireless Vantage Pro2™ & Vantage Pro2™ Plus Stations

(Including Fan-Aspirated Models)



6152 6162 6153 6163

WIRELESS VANTAGE PRO2™

Vantage Pro2<sup>TM</sup> (6152, 6153) and Vantage Pro2 Plus (6162, 6163) Wireless Weather Stations include two components: the Sensor Suite which houses and manages the external sensor array, and the console which provides the user interface, data display, and calculations. The Sensor Suite and Vantage Pro2 console communicate via an FCC-certified, license-free, spread-spectrum frequency-hopping (FHSS) transmitter and receiver. User-selectable transmitter ID codes allow up to eight stations to coexist in the same geographic area. The frequency hopping spread spectrum technology provides greater communication strength over longer distances and areas of weaker reception. The Wireless Vantage Pro2 Plus weather station includes two additional sensors that are optional on the Vantage Pro2: the UV sensor and the solar radiation sensor.

The console may be powered by batteries or by the included AC-power adapter. The wireless Sensor Suite is solar powered with a battery backup. Use WeatherLink Live<sup>TM</sup> or a WeatherLink<sup>®</sup> data logger to let your weather station interface with a computer, to log weather data, and to upload weather information to the internet.

The 6152 and 6162 rely on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings. The Fan-aspirated 6153 and 6163 combine passive shielding with a solar-powered fan that draws outside air in over the temperature and humidity sensors, providing a much more accurate temperature reading than that available using passive shielding alone.

## **Sensor Suite**

(Includes product numbers: 6152, 6153, 6162, 6163, 6322, 6323, 6327 & 6328)

Operating Temperature	40° to +150°F (-40° to +65°C)			
Non-operating Temperature	40° to +158°F (-40° to +70°C)			
Current Draw (ISS SIM only)	t Draw (ISS SIM only)			
Solar Power Panel				
Battery (ISS SIM /Fan-Aspirated)				
Battery Life (3-Volt Lithium cell)				
Battery Life (NiMH C-cells, Fan-Aspirated).	Up to 2 years			
Fan Aspiration Rate (Fan-Aspirated only)				
Intake Flow Rate, full sun				
Intake Flow Rate, battery only				
Sensor Chamber Flow Rate, full sun				
Sensor Chamber Flow Rate, battery onl	y180 feet/min. (0.9 m/s)			
Connectors, Sensor				
Cable Type	4-conductor, 26 AWG			
Cable Length, Anemometer				
Note: Maximum displayable wind decreases as the le (60 m/s); at 240' (73 m), the maximum wind spe	ngth of cable increases. At 140' (42 m) of cable, the maximum wind speed displayed is 135 mph seed displayed is 100 mph (34 m/s).			
Wind Speed Sensor	Solid state magnetic sensor			
Wind Direction Sensor				
Rain Collector Type				
Temperature Sensor Type	PN Junction Silicon Diode			
Relative Humidity Sensor Type	Film capacitor element			



#### 2 Wireless Vantage Pro2<sup>™</sup>

ISS Dimensions (not including anemometer or bird spikes):

Vantage Pro2 Plus with Fan-Aspirated Rad Shield . . . . . . 21.1" x 9.7" x 16.0" (536 mm x 246 mm x 406 mm)

#### Console

(Includes product number 6312)

Console Operating Temperature .....+32° to +140°F (0° to +60°C) each optional wireless transmitter received by the console) at 4 - 6 VDC Console Display Type . . . . . . . . . . . . . . . LCD Transflective Display Backlight . . . . . . . LEDs **Console Dimensions** Console with antenna extended up (L x H x D) . . . . . 10.625" x 9.625" x 1.625" (270 mm x 245 mm x 41 mm) 

## Data Displayed on Console

Data display categories are listed with General first, then in alphabetical order.

#### General

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 the month
Yearly Data	. Period begins/ends at 12:00 am on the first of January unless otherwise noted
Current Display Data	. Current display data describes the current reading for each weather variable. In most cases, the variable lists the most recently updated reading or calculation. Some current variable displays can be adjusted so there is an offset for the reading
Current Graph Data	. Current graph data appears in the right-most column in the console graph and represents the latest value within the last period on the graph; totals can be set or reset. Display intervals vary. Examples include: Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low
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 only 2 minutes (time alarm is always 1 minute) if operating on battery power. Alarm message is displayed in ticker as long as threshold is met or exceeded. Alarms can be silenced (but not cleared) by pressing the DONE key.
Transmission Interval	. Varies with transmitter ID code from 2.25 seconds (#1=shortest), to 3 seconds (#8=longest)
Update Interval	. Varies with sensor - see individual sensor specs

#### **Barometric Pressure**

elevation to -999' when using feet as elevation unit.) Sea-Level Reduction Equation Used . . . . . . . . . . . United States Method employed prior to use of current "R Factor" method Equation Source . . . . . . . . . . . . . . . . . Smithsonian Meteorological Tables Elevation Accuracy Required . . . . . . . . . . . . . . . . ±10' (3m) to meet equation accuracy specification Change 0.02" (0.7hPa/mb, 0.5 mm Hg)= Slowly Update Interval . . . . . . . . . . . . . . . . . . 1 minute or when console BAR key is pressed twice Current Display ..... Instant Current Graph Data ...... Instant, 15-min., and Hourly Reading; Daily, Monthly, High and Low

Low Threshold from Current Trend for Storm Warning (Falling Trend)

Range for Rising and Falling Trend Alarms . . . . . . . . . 0.01 to 0.25" Hg (0.1 to 6.4 mm Hg, 0.1 to 8.5 hPa/mb)

#### Clock

that observe it in AUTO mode, MANUAL setting available for all other areas)

Date: Automatic Leap Year

Alarms . . . . . Once per day at set time when active

#### Dewpoint (calculated)

Range.....-105° to +130°F (-76° to +54°C)

Accuracy ..... ±2°F (±1°C) (typical) 

Source ...... World Meteorological Organization (WMO)

Variables Used . . . . . . . . . . . . . . . . . . Instant Outside Temperature and Instant Outside Relative Humidity

Current Display Data . . . . . . . . . . . . Instant Calculation

Current Graph Data . . . . . . . . . . . Instant Calculation; Daily, Monthly High and Low Historical Graph Data . . . . . . . . . . . . . . . . Hourly Calculations; Daily, Monthly Highs and Lows 

#### Evapotranspiration (calculated, requires solar radiation sensor)

Accuracy ....... Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a

CIMIS FT weather station

Management Information System) including Net Radiation calculation

Current Display Data ..... Latest Hourly Total Calculation

Current Graph Data ...... Latest Hourly Total Calculation, Daily, Monthly, Yearly Total

Historical Graph Data . . . . . . . . . . . . . Hourly, Daily, Monthly, Yearly Totals

## Wireless Vantage Pro2<sup>™</sup>

## **Forecast**

#### Heat Index (calculated)

## **Humidity**

Inside Relative Humidity (sensor located in console)

 Accuracy
 ±2%

 Update Interval
 1 minute

Outside Relative Humidity (sensor located in ISS)

Resolution and Units......1%

Range.....1 to 100% RH

Accuracy .....±2%

 Drift
 <0.25% per year</td>

 Update Interval
 50 seconds to 1 minute

Current Display Data . . . . . . . . . . . . . . . . . Instant (user-adjustable offset available)

Extra Outside Relative Humidity (sensor located inside Temperature/Humidity Station)

Resolution and Units......1%

Accuracy .....±2%

 Drift
 <0.25% per year</td>

 Update Interval
 50 seconds to 1 minute

## Leaf Wetness (requires leaf wetness sensor)

Range..... 0 to 15

Dry/Wet Threshold . . . . . . . . . . . . . . . . . User-selectable

Current Graph Data . . . . . . . . . . Instant Reading; Daily High and Low; Monthly High

Historical Graph Data . . . . . . . . . . . . Hourly Readings; Daily Highs and Lows; Monthly Highs

#### Moon Phase

resolution)

Range....... New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning

Gibbous, Last Quarter, Waning Crescent

#### Rainfall

spoon (0.01"/0.2mm), whichever is greater.

a storm event

Current Display Data . . . . . . . . . . . . . . Totals for Past 15-min

selectable) and Storm (with begin date); Umbrella is displayed when 15-minute

total exceeds zero

Historical Graph Data . . . . . . . . . . . . . . . . . Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm

(with begin and end dates)

24-Hour Total, Storm Total,

#### Rain Rate

Calculation Method . . . . . . . . . . . . . . . . Measures time between successive tips of tipping spoon. Elapsed time greater

than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.

Current Display Data ..... Instant

Alarm ...... High Threshold from Instant Reading

## Soil Moisture (requires soil moisture sensor)

 Resolution
 1 cb

 Range
 0 to 200 cb

## Wireless Vantage Pro2<sup>™</sup>

## Solar Radiation (requires solar radiation sensor)

Current Graph Data . . . . . . . . . . . . . . . . . Instant Reading and Hourly Average; Daily, Monthly High

#### **Sunrise and Sunset**

#### **Temperature**

Inside Temperature (sensor located in console)

°F rounded to the nearest 1°C

Historical Data and Alarms: 1°F or 1°C (user-selectable)

Range.....+32° to +140°F (0° to +60°C)

 Sensor Accuracy
 ±0.5°F (±0.3°C)

 Update Interval
 1 minute

Outside Temperature (sensor located in ISS)

 $^{\circ}\text{C}$  is converted from  $^{\circ}\text{F}$  rounded to the nearest 1  $^{\circ}\text{C}$  Historical Data and Alarms: 1  $^{\circ}\text{F}$ 

or 1°C (user-selectable)

(reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)

Radiation Induced Error (Fan-Aspirated Shield) . . . . +0.6°F (0.3°C) at solar noon (insolation = 1040 W/m², avg. wind speed ≤ 2 mph

(1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)

Extra Temperature Probes

nearest 1°C

Historical Data and Alarms: 1°F or 1°C (user-selectable)

Range.....-40° to +150°F (-40° to +65°C)

Moisture/Temperature Stations)

## Temperature Humidity Sun Wind Index (requires solar radiation sensor)

Range.....-90° to +165°F (-68° to +74°C)

 Accuracy
 ±4°F (±2°C) (typical)

 Update Interval
 10 to 12 seconds

Sources and Formulation Used . . . . . . . . . . . . United States National Weather Service (NWS)/NOAA

Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase

range of use and allow for cold weather use

Variables Used . . . . . . . . . . . . . . . . . . Instant Outside Temperature, Instant Outside Relative Humidity, 10-minute

Average Wind Speed, 10-minute Average Solar Radiation

Formulation Description . . . . . . . . . . . . . . . . . . Uses Heat Index as base temperature, affects of wind and solar radiation are

either added or subtracted from this base to give an overall effective temperature

## Ultra Violet (UV) Radiation Dose (requires UV sensor)

Current Graph Data ...... Latest Daily Total (user resettable at any time from Current Screen)

Historical Graph Data . . . . . . . . . . . . . . . . . Hourly, Daily Totals (user reset from Current Screen does not affect these values)

Alarm . . . . . High Threshold from Daily Total

Alarm Range. . . . . . . . . . . . . . . . . . 0 to 19.9 MEDs

## Ultra Violet (UV) Radiation Index (requires UV sensor)

Accuracy ...... ±5% of full scale (Reference: Yankee UVB-1 at UV index 10 (Extremely High))

Current Graph Data ...... Instant Reading and Hourly Average; Daily, Monthly High

## Wireless Vantage Pro2™

#### Wind

Wind Chill (Calculated)

Range.....-110° to +135°F (-79° to +57°C)

 Accuracy
 ±2°F (±1°C) (typical)

 Update Interval
 10 to 12 seconds

Current Display Data . . . . . . . . . . . . . . . . . Instant Calculation

Wind Direction

Accuracy .....±3°

Wind Speed

are converted from mph and rounded to nearest 1 km/hr, 0.1 m/s, or 1 knot.

High with Direction of High

Direction of Highs

Alarms ...... High Thresholds from Instant Reading and 10-minute Average

#### Wireless Communications

Transmit/Receive Frequency Range and Power Output:

REGION	FREQUENCY RANGE & POWER OUTPUT	
USA	902 - 928 MHz FHSS, <8mW	
EU	868.0 - 868.6 MHz FHSS, <8mW	
Australia, Brazil	918 - 926 MHz FHSS, <8mW	
New Zealand, Peru	921 - 928 MHz FHSS, <8mW	
India	865 - 867 MHz FHSS, <8mW	
Japan	928.15 - 929.65 MHz FHSS, <1mW	
Taiwan, Pakistan	920 - 925 MHz FHSS, <8mW	
Russia	868.7 - 869.2 MHz FHSS, <8mW	

License: ...... Low power (less than 8 mW), no license required

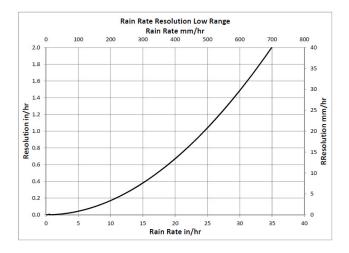
Range: All models except Japan

Range: Japan models

Sensor Inputs

## **Sensor Charts**

Figure1:Rain Rate Resolution



## Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6152 6152EU 6152UK	17.50" x 10.4" x 16.0" (445 mm x 264 mm x 406 mm)	11 lbs. 13 oz. (5.4 kg)	011698 00229 0 011698 00347 1 011698 00348 8
6162 6162EU 6162UK		11 lbs. 15 oz. (5.4 kg)	011698 00306 8 011698 00307 5 001698 00308 2
6153 6153EU 6153UK	14.9 x 12.9" x 23.4" (378 mm x 327 mm x 594 mm)	16 lbs. 11 oz. (7.6 kg)	011698 00335 8 011698 00336 5 001698 00337 2
6163 6163EU 6163UK		17 lbs. 5 oz. (7.9 kg)	011698 00341 9 011698 00342 6 001698 00342 3
6322 6322OV	17.50" x 10.4" x 16.0"	9 lbs 1 oz. (4.1 kg)	011698 00776 9 011698 00778 3
6327 6327OV	(445 mm x 264 mm x 406 mm)	11 lbs. 1 oz. (5.0 kg)	011698 00781 3 011698 00783 7
6323 6323OV	14.9" x 12.9" x 23.4"	15 lbs. 15 oz. (7.2 kg)	011698 00779 0 011698 00780 6
6328 6328OV	(378 mm x 327 mm x 594 mm	16 lbs. 8 oz. (7.5 kg)	011698 00784 4 011698 00785 1
6312 6312EU 6312UK	12.6" x 9.3" x 2.5" (320 mm x 235 mm x 64 mm)	2 lbs. 10 oz. (1.2 kg)	011698 00724 0 011698 00766 0 011698 00767 7