Vantage Vue®
Weather Station

6250 6357
6351

VANTAGE VUE®

The Vantage Vue® (#6250) wireless weather station includes two components: the Sensor Suite (#6357) which houses and manages the external sensor array, and the console (#6351) which provides the user interface, data display, and calculations. The Vantage Vue sensor suite and console communicate via an FCC-certified, license-free frequency-hopping transmitter and receiver. Frequency-hopping spread-spectrum (FHSS) technology provides greater communication strength over longer distances and areas of weaker reception. User-selectable transmitter ID codes allow up to eight stations to coexist in the same geographic area. (The Vantage Vue console can also receive and display data from any Vantage Pro2™ or Vantage Pro2 Plus sensor suite. The Vantage Pro2 Plus includes two additional sensors: 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™ or WeatherLink® data loggers to let your weather station interface with a computer, to log weather data, and upload weather information to the internet.

The Vantage Vue station relies on passive shielding to reduce solar-radiation induced temperature errors in the outside temperature sensor readings.

Integrated Sensor Suite (ISS)

Operating Temperature	-40° to +150°F (-40° to +65°C)
Non-operating (Storage) Temperature	-40° to +158°F (-40° to +70°C)
Current Draw	0.20 mA (average), 30 mA (peak) at 3.3 VDC
Solar Power Panel	0.5 Watts
Battery	CR-123 3-Volt Lithium cell
Battery Life (3-Volt Lithium cell)	8 months without sunlight - greater than 2 years depending on solar charging
Wind Speed Sensor	Wind cups with magnetic detection
Wind Direction Sensor	Wind vane with magnetic encoder
Rain Collector Type	Tipping spoon, 0.01" per tip (0.2 mm with metric rain cartridge, Part No. 7345.319), 18.0 in^2 (116 cm^2) collection area
Temperature Sensor Type	PN Junction Silicon Diode
Relative Humidity Sensor Type	Film capacitor element
Housing Material	UV-resistant ABS & ASA plastic
ISS Dimensions	12.95" x 5.75" x 13.40" (329 mm x 146 mm x 340 mm)
Package weight:	5.44 lbs (2.47 kg)

Console Specifications

Console Operating Temperature	+32° to +140°F (0° to +60°C)
Non-Operating (Storage) Temperature	+14° to +158°F (-10° or +70°C)
Console Current Draw	0.9 mA average, 30 mA peak, (add 120 mA for display lamps, add 0.125 mA for each transmitter station received by console) at 4.4 VDC
Power Adapter	5 VDC, 300 mA
Battery Backup	3 C-cells
Battery Life (no AC power)	Up to 9 months (approximately)
Housing Material	UV-resistant ABS plastic
Console Display Type	LCD Transflective
Display Backlight	LEDs
Dimensions:	
Console (with antenna)	7.5" x 5.75" x 4.5" (190 mm x 146 mm x 114 mm)
Console (with antenna) mounted on wall	7.5" x 7.0 " x 3.0" (190 mm x 178 mm x 76 mm)
Display	4.13" x 3.0" (105 mm x 76 mm)
Weight (with batteries)	1.48 lbs. (.67 kg)

Data Displayed on Console

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

General

Historical Data	Includes the past 25 values plus the current value 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 Data	Current 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
Graph Time Interval	10 min., 1 hour, 1 day, 1 month, 1 year (user-selectable, availability depends upon variable selected) (2.5 seconds for Last 25 Wind Speeds)
Graph Time Span	26 Intervals (Current Interval plus 25 past values included; 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 Weather Center
Alarm Indication	Alarms sound for only 2 minutes (except for time) if operating on battery power. Alarm message is displayed in Weather Center 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

Resolution and Units	0.01" Hg, 0.1 mm Hg, 0.1 hPa/mb (user-selectable)
Range	16.00" to 32.50" Hg, 410 to 820 mm Hg, 540 to 1100.0 hPa/mb
Elevation Range	-999’ to +15,000’ (-600 m to +4570 m). (Note that console screen limits entry of lower elevation to -999’ when using feet as elevation unit.)
Uncorrected Reading Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb) (at room temperature)
Sea-Level Reduction Equations Used	United States Method employed prior to use of current "R Factor" method ("NOAA"), Altimeter Setting
NOAA Equation Source	Smithsonian Meteorological Tables
NOAA Equation Accuracy	±0.01" Hg (±0.3 mm Hg, ±0.3 hPa/mb)
NOAA Elevation Accuracy Required	±10’ (3m) to meet equation accuracy specification
Overall Accuracy	±0.03" Hg (±0.8 mm Hg, ±1.0 hPa/mb)
Trend (change in 3 hours)	Change 0.06" (2 hPa/mb, 1.5 mm Hg) = Rapidly Change 0.02" (0.7hPa/mb, 0.5 mm Hg)= Slowly
Trend Indication	5 position arrow: Rising (rapidly or slowly), Steady, or Falling (rapidly or slowly)
Update Interval	1 minute
Current Data	Instant and Hourly Reading; Daily, Monthly, Yearly High and Low; Barometer change 24-hour
Historical Data	15-min. and Hourly Reading; Daily, Monthly Highs and Lows
Alarms	High Threshold from Current Trend for Storm Clearing (Rising Trend 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

Resolution	1 minute
Units	Time: 12 or 24 hour format (user-selectable)
Date	US or International format (user-selectable)
Accuracy	±8 seconds/month
Adjustments	Time: Automatic Daylight Savings Time (for users in North America and Europe 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)

Resolution and Units	1°F or 1°C (user-selectable)
Range	-105° to +130°F (-76° to +54°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	World Meteorological Organization (WMO)
Equation Used	WMO Equation with respect to saturation of moist air over water
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Data	Instant Calculation; Daily, Monthly High and Low
Historical Data	Hourly Calculations; Daily, Monthly, Yearly Highs and Lows
Alarms	High and Low Threshold from Instant Calculation

Evapotranspiration (calculated, requires Vantage Pro2 ISS with solar radiation sensor)

Resolution and Units	0.01" or 0.1 mm (user-selectable)
Range	Daily to 32.67" (999.9 mm); Monthly & Yearly to 199.99" (1999.9 mm)
Accuracy	Greater of 0.01" (0.25 mm) or ±5%, Reference: side-by-side comparison against a CIMIS ET weather station
Update Interval	1 hour
Calculation and Source	Modified Penman Equation as implemented by CIMIS (California Irrigation Management Information System) including Net Radiation calculation
Current Data	Latest Hourly Total Calculation, Daily, Monthly, Yearly Total
Historical Data	Hourly, Daily, Monthly, Yearly Totals
Alarm	High Threshold from Latest Daily Total Calculation

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; displays weather conditions that may occur for the next 12 hours.
Variables Predicted	Sky Condition, Precipitation

Heat Index (calculated)

Resolution and Units	1°F or 1°C (user-selectable)
Range	-40° to +165°F (-40° to +74°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	United States National Weather Service (NWS)/NOAA
Formulation Used	Steadman (1979) modified by US NWS/NOAA and Davis Instruments to increase range of use
Variables Used	Instant Outside Temperature and Instant Outside Relative Humidity
Current Data	Instant Calculation; Daily, Monthly High
Historical Data	Hourly Calculations; Daily, Monthly, Yearly Highs
Alarm	High Threshold from Instant Calculation

Humidity

Inside Relative Humidity (sensor located in console)

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±2%
Update Interval	1 minute
Current Data	Instant (user adjustable) and Hourly Reading; Daily, Monthly High and Low
Historical Data	Hourly Readings; Daily, Monthly, Yearly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Outside Relative Humidity (sensor located in ISS)

Resolution and Units	1%
Range	1 to 100% RH
Accuracy	±2%
Drift	±0.25% per year
Update Interval	50 seconds to 1 minute
Current Data	Instant (user adjustable) and Hourly Reading; Daily, Monthly, Yearly High and Low
Historical Data	Hourly Readings; Daily, Monthly Highs and Lows
Alarms	High and Low Threshold from Instant Reading

Moon Phase

Console Resolution	1/8 (12.5%) of a lunar cycle, 1/4 (25%) of lighted face on console
WeatherLink Resolution	0.09% of a lunar cycle, 0.18% of lighted face maximum (depends on screen resolution)
Range	New Moon, Waxing Crescent, First Quarter, Waxing Gibbous, Full Moon, Waning Gibbous, Last Quarter, Waning Crescent
Accuracy	±38 minutes

Rainfall

Resolution and Units	0.01" or 0.2 mm (user-selectable) (1 mm at totals ≥ 2000 mm)
Range	0 to 199.99" (0 to 6553 mm)
Accuracy	For rain rates up to 10"/hr (250 mm/hr): ±4% or one tip of the spoon (0.01"/0.2 mm), whichever is greater
Update Interval	20 to 24 seconds
Storm Determination Method	0.02" (0.5 mm) begins a storm event, 24 hours without further accumulation ends a storm event
Current Data	Totals for Past 15-min, Past 24-hour, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin date); Umbrella is displayed when 15 minute total exceeds zero
Historical Data	Totals for 15-min, Daily, Monthly, Yearly (start date user-selectable) and Storm (with begin and end dates)
Alarms	High Threshold from Latest Flash Flood (15-min. total, default is 0.50", 12.7 mm), 24-hour Total, Storm Total,
Range for Rain Alarms	0 to 99.99" (0 to 999.7 mm)

Rain Rate

Resolution and Units	0.01" or 0.1 mm (user-selectable) at typical rates (see Fig. 1)
Range	0 to 30"/hr (0 to 762 mm/hr)
Accuracy	±5% when rate is under 10"/hr (254 mm/hr)
Update Interval	20 to 24 seconds
Calculation Method	Measures time between successive tips of rain collector. Elapsed time greater than 15 minutes or only one tip of the rain collector constitutes a rain rate of zero.
Current Data	Instant and Hourly, Daily, Monthly and Yearly High
Historical Data	Hourly, Daily, Monthly and Yearly Highs
Alarm	High Threshold from Instant Reading

Solar Radiation (requires Vantage Pro2 ISS with solar radiation sensor)

Resolution and Units	1 W/m^2
Range	0 to 1800 W/m^2
Accuracy	±5% of full scale (Reference: Eppley PSP at 1000 W/m^2)
Drift	up to ±2% per year
Cosine Response	±3% for angle of incidence from 0° to 75°
Temperature Coefficient	-0.067% per °F (-0.12% per °C); reference temperature = 77°F (25 °C)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Data	Instant Reading and Hourly Average; Daily, Monthly High

Sunrise and Sunset

Resolution	1 minute
Accuracy	±1 minute
Reference	United States Naval Observatory

Temperature

Inside Temperature (sensor located in console)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) 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
Current Data	Instant Reading (user adjustable); Daily, Monthly, Yearly High and Low
Historical Data	Hourly Readings; Daily and Monthly Highs and Lows; Highs and Lows for Last 25 Days; Temp change per hour, Temp change for last 24 hours.
Alarms	High and Low Thresholds from Instant Reading

Outside Temperature (sensor located in ISS)

Resolution and Units	Current Data: 0.1°F or 1°F or 0.1°C or 1°C (user-selectable) nominal (see Fig. 1) Historical Data and Alarms: 1°F or 1°C (user-selectable)
Range	-40° to +150°F (-40° to +65°C)
Sensor Accuracy	±1°F (±0.5°C) above +20°F (-7°C); ±2°F (±1°C) under +20°F (-7°C) (see Fig. 2)
Radiation Induced Error (Passive Shield)	+4°F (2°C) at solar noon (insolation = 1040 W/m^2, avg. wind speed ≤ 2 mph (1 m/s)) (reference: RM Young Model 43408 Fan-Aspirated Radiation Shield)
Update Interval	10 to 12 seconds
Current Data	Instant Reading (user adjustable); Daily, Monthly, Yearly High and Low
Historical Data	Hourly Readings; Daily, Monthly, Yearly Highs and Lows
Alarms	High and Low Thresholds from Instant Reading

Ultra Violet (UV) Radiation Index (requires Vantage Pro2 ISS with UV sensor)

Resolution and Units	0.1 Index
Range	0 to 16 Index
Accuracy	±5% of full scale (Reference: Yankee UVB-1 at UV index of 10 (Extremely High))
Cosine Response	±4% (0° to 65° incident angle); 9% (65° to 85° incident angle)
Update Interval	50 seconds to 1 minute (5 minutes when dark)
Current Data	Instant Reading

Wind

Wind Chill (Calculated)

Resolution and Units	1°F or 1°C (user-selectable)
Range	-110° to +135°F (-79° to +57°C)
Accuracy	±2°F (±1°C) (typical)
Update Interval	10 to 12 seconds
Source	United States National Weather Service (NWS)/NOAA
Equation Used	Osczevski (1995) (adopted by US NWS in 2001)
Variables Used	Instant Outside Temperature and 10-min. Avg. Wind Speed
Current Data	Instant Calculation; Hourly, Daily, Monthly, Yearly Low
Historical Data	Hourly, Daily and Monthly Lows
Alarm	Low Threshold from Instant Calculation

Wind Direction

Display Resolution	16 points (22.5°) on compass rose, 1° in numeric display
Range	1-360°
Accuracy	±3°
Update Interval	2.5 to 3 seconds
Current Data	Instant Reading (user adjustable); 10-min. Dominant; Hourly, Daily, Monthly Dominant
Historical Data	Past 6 10-min. Dominants on compass rose only; Hourly, Daily, Monthly Dominants

Wind Speed

Resolution and Units	1 mph, 1 km/h, 0.5 m/s, or 1 knot (user-selectable)
Range	0 to 200 mph, 0 to 173 knots, 0 to 89 m/s, 0 to 322 km/h
Update Interval	Instant Reading: 2.5 to 3 seconds, 10-minute Average: 1 minute
Accuracy	±2 mph (2 kts, 3 km/h, 1 m/s) or ±5%, whichever is greater
Current Data	Instant Reading; 10-minute and Hourly Average; 10-minute High Gust with Direction of Gust; 2-minute Average; Hourly High; Daily, Monthly and Yearly High with Direction of High; Beaufort Scale
Historical Data	2.5 sec., 10 min. and Hourly Averages; Hourly Highs; Daily, Monthly and Yearly Highs with Direction of Highs
Alarms	High Thresholds from Instant Reading and 10-minute Average

Wireless Communication Specifications

Transmit/Receive Frequency

US Models	902 - 928 MHz FHSS,
EU Models	868.0 - 868.6 MHz FHSS
Japan Models	928.1 - 928.9 MHz FHSS
NZ Models	921 - 928 MHz FHSS
India Models	865.0 - 867.0 MHz FHSS
Russia Models	868.7 -869.2 MHz FHSS

ID Codes Available	8

Output Power

US Models	902 - 928 MHz FHSS: FCC-certified low power, less than 8 mW, no license required
EU Models	868.0 - 868.6 MHz FHSS. CE-certified, less than 8 mW, no license required.
Japan Models	928.1 - 928.9 MHz FHSS, less than 1 mW, no license required.
NZ Models	921- 928MHz FHSS, less than 10mW, no license required.
India Models	865.0 - 867.0 MHz, less than 10mW, no license required.
Russia Models	868.7 - 869.2 MHz, less than 8mW,no license required

Range: All models except Japan

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

Range: Japan models

Line of Sight	up to 300 feet (100 m)
Through Walls	50 to 200 feet (15 to 60m)

Sensor Inputs

RF Filtering	RC low-pass filter on each signal line

Sensor Charts

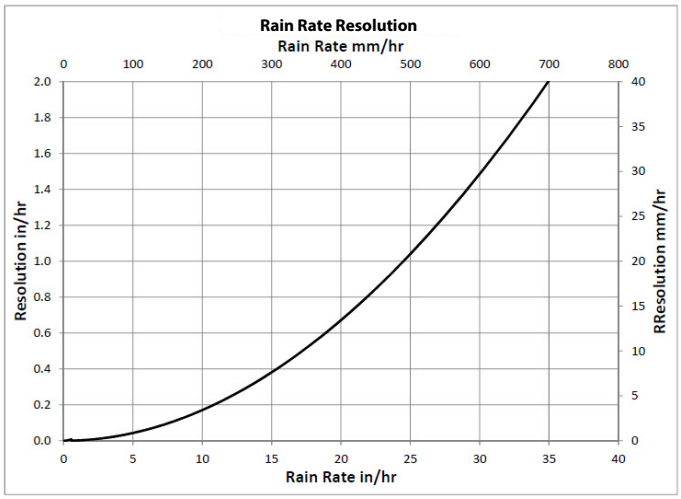

Figure 1. Rain Rate Resolution

Package Dimensions

Product #	Package Dimensions (Length x Width x Height)	Package Weight	UPC Codes
6250 Complete Station	18.25" x 7.25" x 15.25" (46.4 cm x 18.4 cm x 38.7 cm)	6.88 lbs (3.12 kg)	0 11698 00912 1
6351 Console	8.0" x 8.0" x 4.0" (20.3 cm x 20.3 cm x 10.1 cm)	1.76 lbs .80 kg	0 11698 00913 8
6357 ISS	18.25" x 7.25" x 15.25" (46.4 cm x 18.4 cm x 38.7 cm)	5.44 lbs (2.47 kg)	0 11698 00914 5