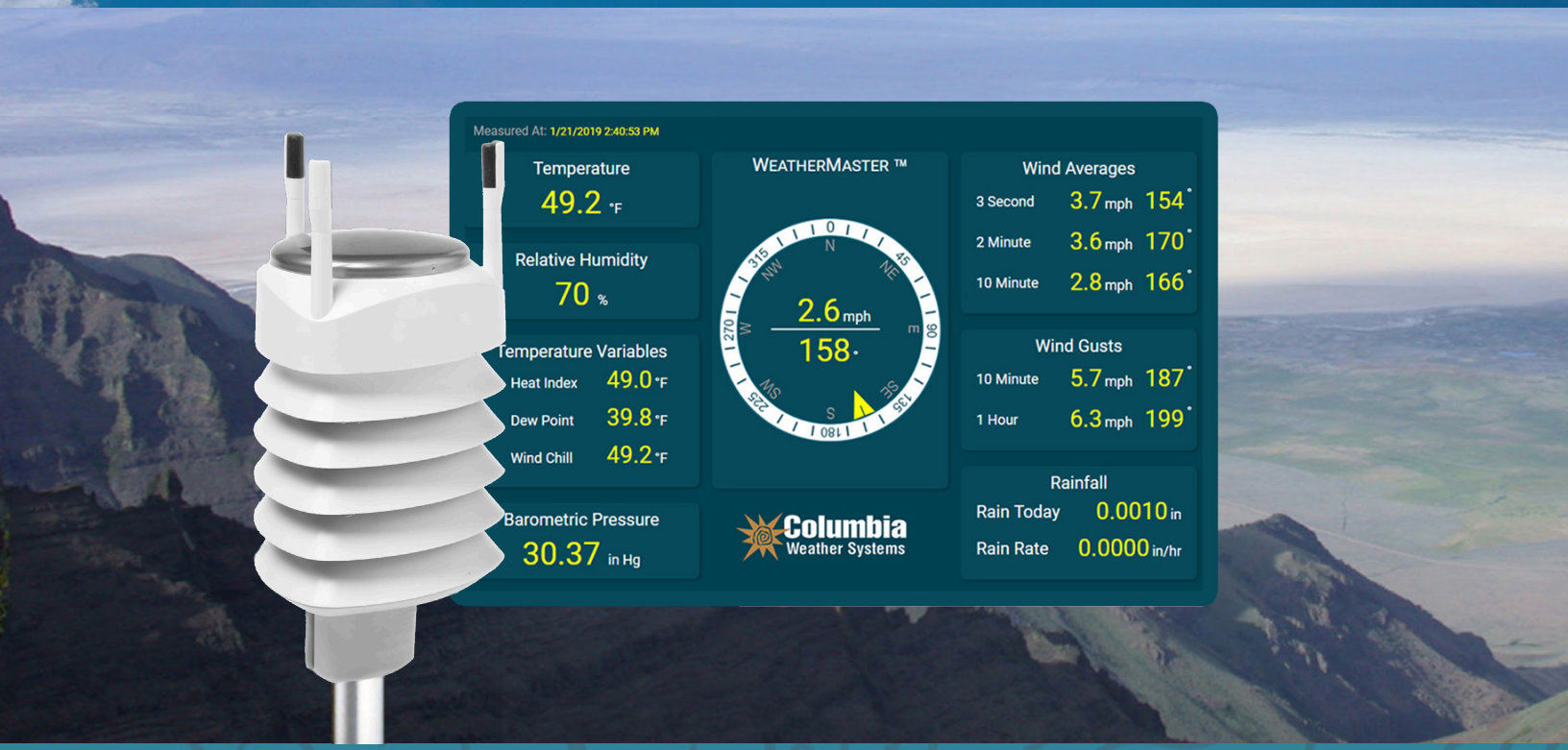
Orion™

WEATHER STATIONS

Ultrasonic Wind | Temperature | Relative Humidity | Rainfall | Barometric Pressure



Columbia Weather Systems

Professional All-in-One Weather Monitoring

Sensor Models

536

534/535

532/533

531

The Orion Weather Station™ includes a high-tech, all-in-one sensor module with ultrasonic wind direction and speed measurements, impact rain sensor, capacitive relative humidity, temperature and barometric pressure readings. High accuracy and fine resolution make this system ideal for precision weather monitoring.

Available in three configurations—fixed-mount, vehicle-mount, and the Orion Nomad™ portable weather station—Orion data can be monitored with our proprietary Weather Display Console™, WeatherMaster™ Software, CWS Weather Monitor App™ and/or the Weather MicroServer™ for Internet-ready output as well as industrial automation interfaces including Modbus TCP/IP.

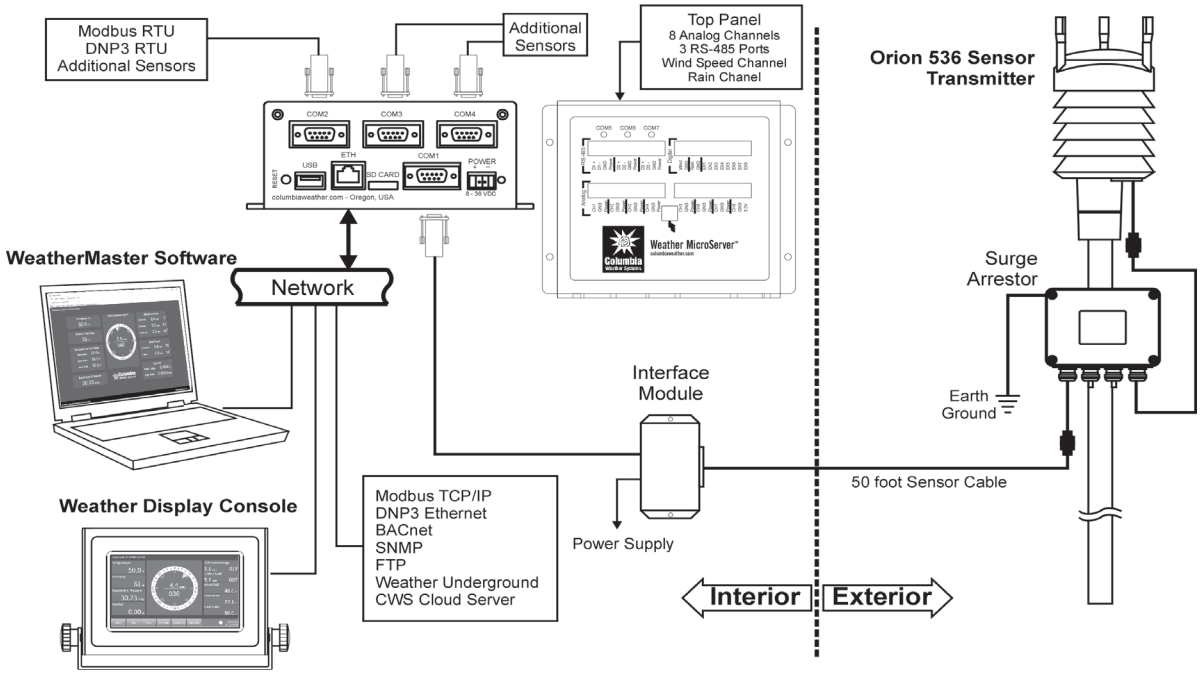
Orion Weather Stations Feature

- Most essential weather parameters measured in one instrument
- Accurate and stable measurement
- Ultrasonic wind sensor and impact precipitation sensor
- No moving parts means virtually no maintenance
- Low power consumption improves reliability and longevity
- Compact and lightweight with a single cable for quick and easy installation

All-in-One Sensor Modules

Model 536: Impact Rain Sensor, Ultrasonic Wind Speed and Direction, Temperature, Relative Humidity, Air Pressure
Model 531: Impact Rain Sensor
Model 532: Ultrasonic Wind Speed and Direction
Model 533: Impact Rain Sensor, Ultrasonic Wind Speed and Direction
Model 534: Air pressure, Temperature, Relative Humidity
Model 535: Impact Rain Sensor, Pressure, Temperature, Relative Humidity

System Diagram



Monitoring Options

Weather MicroServer™

Self-contained, proprietary weather data logger and powerful communication device. Compatible with all CWS weather stations and offers:

- Browser interface
- Data logging with 1-year capacity at 1-min interval
- "Internet-ready" weather monitoring with FTP output, XML, and Internet interfaces
- Industrial communication protocols (Modbus, DNP3, BACnet, and SNMP)

Four serial ports offer interface to the weather station and additional sensors such as visibility and ultrasonic wind sensors. Analog and digital channels available for additional sensor such as temperature, solar radiation, and rain gauge. The MicroServer provides real-time weather data to WeatherMaster software and the Display Console over the network. This allows users to simultaneously monitor the weather over the network.

Cloud Weather Server™

Free with the Weather MicroServer, this service offers real-time weather data monitoring on the Internet.

- View display screen remotely from any device using a web browser
- Data uploaded every five seconds
- Be alerted to critical weather conditions with alarm feature that generates email and push notifications
- For one or more weather stations

CWS Weather Monitor App™

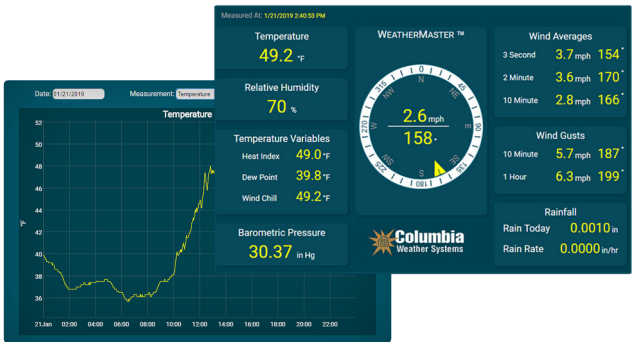
Check current conditions quickly from a hand-held mobile device for decision-making in the field. The CWS Weather Monitor App is compatible with all CWS weather stations that include the Weather MicroServer.

The app includes real-time weather monitoring screens, NWS forecasts, and custom alarm notifications. Access to a Cloud Weather Server account is required.

Weather Display Console™

This touchscreen weather monitoring device displays real-time meteorological data, plus computations for wind chill, heat index and other calculated parameters. Measurements are designed to be viewed clearly from a distance even in a darkened control room.

- Seven-inch, TFT color LCD panel with 800 x 480 pixels resolution
- Connect directly to the weather station with a serial port or to the Weather MicroServer utilizing existing Ethernet
- Three mounting options: Desktop/Wall-Mount, Panel Mount/Flush Mount, 19" Rack Mount



WeatherMaster™ Software

Professional-grade software providing real-time computer weather monitoring with display and automatic logging of all measured and calculated parameters.

- Expandable SQL database to archive measured and calculated parameters
- Graphing and trend display of all parameters
- Alarm notification via computer, email, and/or text
- Multi-station monitoring and data acquisition
- Interface with CAMEO/ALOHA software for plume modeling and evacuation corridor predictions
- Interface with Weather Underground

4-20 mA Signal Output

For industrial PLC interface, the Orion 420™ offers 4-20mA signal output to interface to PLC, DCS, and SCADA systems.

Specifications

Temperature
Range: -60 to 140°F (-52 to +60°C)
Accuracy: ±0.5°F (±0.3°C) at 68°F (+20°C)
Resolution: 0.1°F (0.1°C)
Units Available: °F, °C

Barometric Pressure
Range: 14.77 to 32.48 InHg (500 to 1100 hPa)
Accuracy: ±0.015 InHg (0.5 mbar) at +32 - 86°F (0-30°C)
Resolution: 0.01 InHg (0.1 mbar)
Units Available: KPa, mbar, InHg, HPa

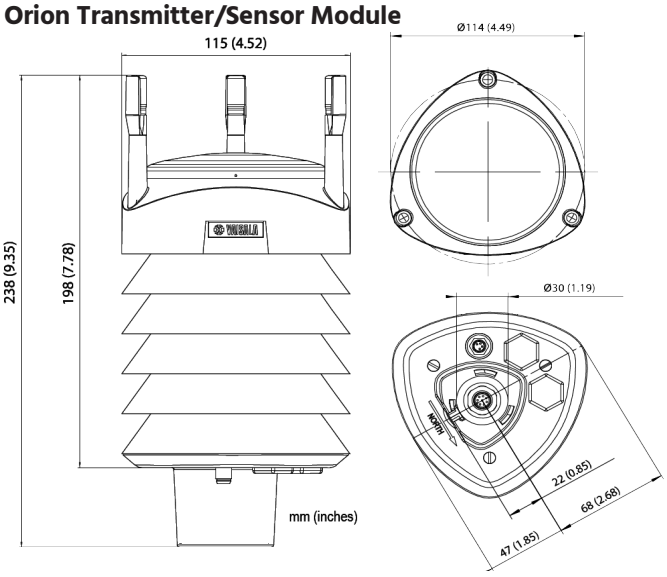
Wind Speed
Range: 0 - 168 mph (0 - 75 m/s)
Accuracy: ±3% at 10 m/s - 0-135mph (0-60 m/s)
Resolution: 0.1 mph (0.1 m/s)
Units Available: knots, mph, km/hr, m/s

Wind Direction
Range: 0 - 359°
Accuracy: ±3°
Resolution: 1°

Relative Humidity
Range: 0 - 100%RH
Accuracy: ±3%RH (0-90%), ±5% (90-100%)
Resolution: 1%RH
Units Available: %RH

Rainfall
Range: cumulative
Collection Area: 60 cm^2
Accuracy: ±5% (spatial variations may exist)
Resolution 0.001 in. (0.0254mmw)
Units Available: mm, inches

Orion Transmitter/Sensor Module



Parameter Measurements

Barometric pressure, temperature, and humidity are combined in a tri-sensor module utilizing a capacitive measurement method for each parameter. The internal sensor module is easily replaceable and available as a spare part.

A radiation shield protects the sensors from sunlight and precipitation. The composite material offers excellent thermal characteristics and UV stabilized construction. The white outer surface reflects radiation, while the black inside absorbs accumulated heat.

Barometric pressure is measured using a silicon-based sensor. The temperature sensor is ceramic. Relative humidity measurement is highly accurate with negligible hysteresis and excellent long-term stability.

Wind speed and direction are measured with three equally-spaced ultrasonic transducers on a horizontal plane, ensuring accurate wind measurement from all directions.

Rainfall is measured with an impact sensor which detects the size and impact of individual rain drops. Resulting signals are proportional to the volume of the drops, thus converting directly to accumulated rainfall. This method eliminates scattering, flooding and clogging, as well as wetting and evaporation losses.

Additional calculated parameters: Data from these sensors are computed to provide calculated parameters including Dew Point, Heat Index, Wind Chill, Degree-Day Temperatures and Density Altitude.

System Configurations

All Orion weather station systems include:
- Orion Transmitter/Sensor Module (select model)
- Interface Module with dual communication ports
- Select the desired monitoring option(s) from the previous page
- One-year warranty, extended warranty available

Fixed-Base Weather Stations include 50-ft cable. Optional sensor mast, mounting hardware, and extra-cable length are available.

Vehicle-Mount Weather Stations include a detachable 9-ft telescoping sensor mast and mounting hardware.

Orion Nomad Portable Weather Stations include transportation case, tripod sensor mast, and batteries. Available in two configurations: Wireless (with transceivers), and Datalogging (with MicroServer).

Contact us today for a free quotation!

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