Orion 420™

WEATHER STATIONS

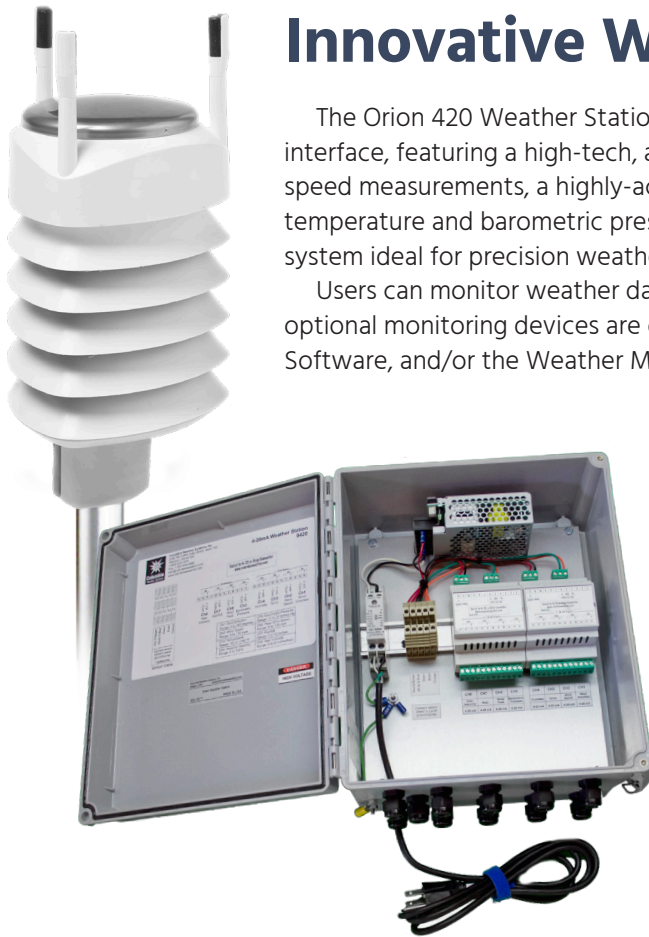*Wind | Temperature | Humidity | Pressure | Rainfall | 4-20 mA Output*

Columbia
Weather Systems

Innovative Weather Monitoring

The Orion 420 Weather Station™ offers a complete weather station for industrial PLC interface, featuring a high-tech, all-in-one sensor module with ultrasonic wind direction and speed measurements, a highly-accurate impact rain sensor, capacitive relative humidity, temperature and barometric pressure readings. High accuracy and fine resolution make this system ideal for precision weather monitoring.
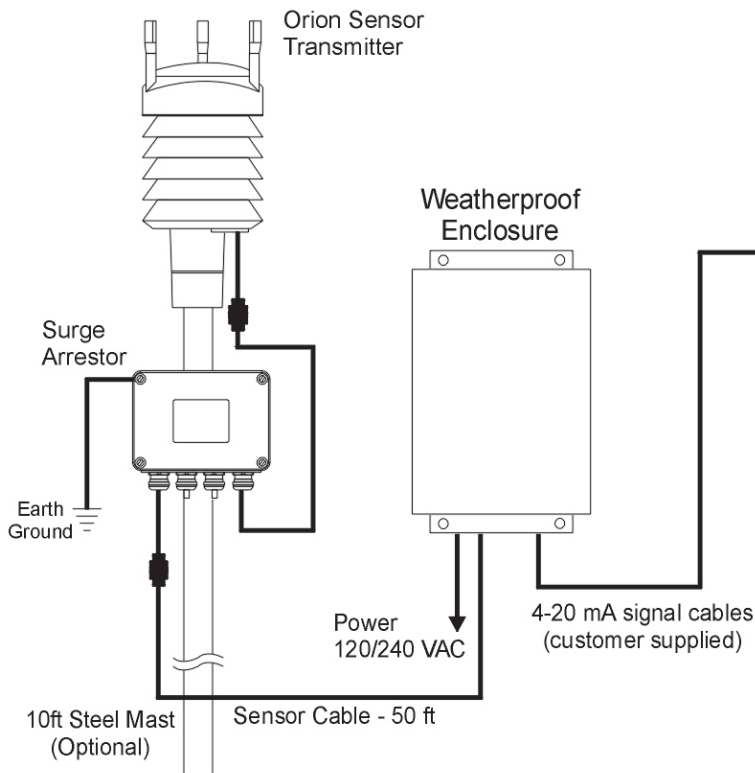
Users can monitor weather data using human-machine interface (HMI) software. Additional optional monitoring devices are our proprietary Weather Display Console, WeatherMaster™ Software, and/or the Weather MicroServer.

Orion 420 Weather Station Features

- Six most essential weather sensors in one unit (temperature, humidity, pressure, wind speed, wind direction, rain)
- 4-20 mA current output for parameters (see list below)
- Accurate and stable measurements
- Ultrasonic wind sensor, no moving parts
- Advanced impact rainfall sensor
- Fast and simple to install
- Low maintenance
- One-year warranty

System Diagram

Orion Sensor Transmitter

Surge Arrestor

Earth Ground

10ft Steel Mast (Optional)

Sensor Cable - 50 ft

Power 120/240 VAC

Weatherproof Enclosure

4-20 mA signal cables (customer supplied)

4-20mA Outputs

Ch1: Wind Direction Range: 0 to 360 degrees	Ch5: Barometric Pressure Range: 17 to 33 inches Hg
Ch2: Wind Speed Range: 0 to 135 mph	Ch6: Peak Wind Speed Range: 0 to 135 mph
Ch3: Temperature Range: -60 to +140 °F	Ch7: Rainfall Range: 0 to 10 inches.
Ch4: Relative Humidity Range: 0 to 100%	Ch8: Rain Intensity Range: 0 to 8 inches/hour

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
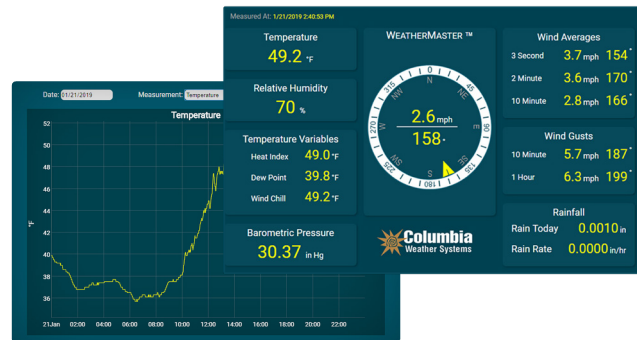
WeatherMaster™ Software

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.

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)

Barometric Pressure
Range: 17.50 to 32.50 InHg (600 to 1100 mbar)
Accuracy: ±0.015 InHg (0.5 mbar) at +32 to 86°F (0 to 30°C)
Resolution: 0.01 InHg (0.1 mbar)

Wind Speed
Range: 0 - 135 mph (0 - 60 m/s)
Accuracy: ±3% at 10 m/s
Resolution: 1 mph (1 m/s)

Wind Direction
Azimuth: 0 - 360°
Accuracy: ±2°
Resolution: 1°

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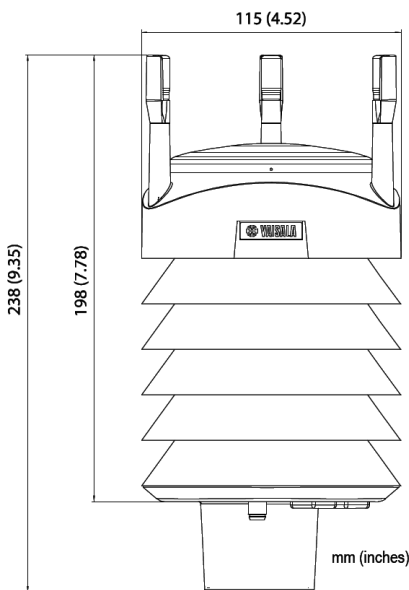Range: 0 - 100%RH
Accuracy: ±3%RH (0-90%), ±5% (90-100%)
Resolution: 1%RH

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

Weatherproof Enclosure Dimensions
13.46" x 12.2" x 6.71" depth

Parameter Measurements

Barometric Pressure, Temperature, and Humidity are combined in a tri-sensor module utilizing a capacitive measurement method for each parameter.

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

The internal sensor module is easily replaceable and available as a spare part. 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 in a wide range of environments.

Wind speed and direction are measured using advanced ultra-sonic technology. Three equally-spaced ultrasonic transducers on a horizontal plane ensure accurate wind measurement from all directions, without blind angles or corrupted readings.

Rainfall is measured with an impact sensor which detects the size and impact of individual rain drops. The resulting signals are proportional to the volume of the drops. Hence, the signal from each drop can be converted directly to the accumulated rainfall. This measurement method eliminates scattering, flooding and clogging, as well as wetting and evaporation losses.

System Includes:
– Orion Sensor Transmitter with 50-foot cable
– Weatherproof Enclosure with two 4-20 mA converter modules and power supply
– *Recommended: Bird Spike Kit, Lightning Arrestor*

Contact us today for a free quotation!

Orion Transmitter/Sensor

115 (4.52)
238 (9.35)
198 (7.78)
mm (inches)

Ø114 (4.49)

Ø30 (1.19)
68 (2.68)
22 (0.85)
47 (1.85)
NORTH