



# *Orion 420*<sup>TM</sup> *Weather Stations*

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



*[www.columbiaweather.com](http://www.columbiaweather.com)*

# Innovative Weather Monitoring

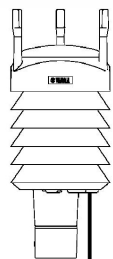
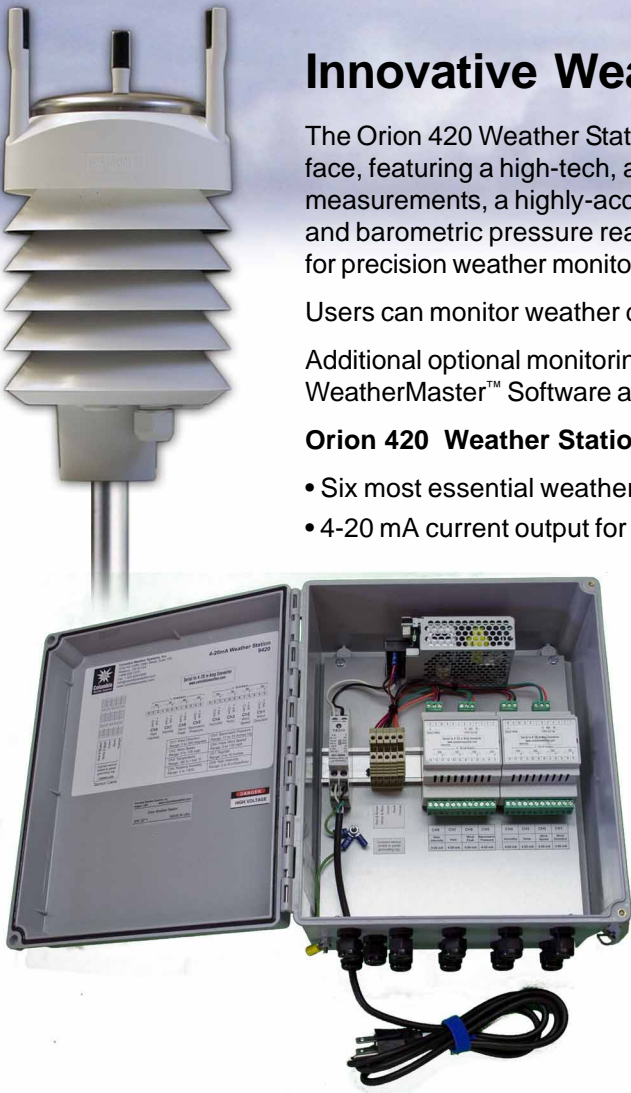
The Orion 420 Weather Station™ offers a complete weather station for industrial PLC interface, featuring a high-tech, all-in-one sensor module with ultrasonic wind direction and speed measurements, a highly-accurate impact rain sensor, capacitive relative humidity, temperature and barometric pressure readings. High accuracy and fine resolution make this system ideal for precision weather monitoring.

Users can monitor weather data on PLC software such as Wonderware®.

Additional optional monitoring devices are our proprietary Weather Display Console, WeatherMaster™ Software and/or the Weather MicroServer.

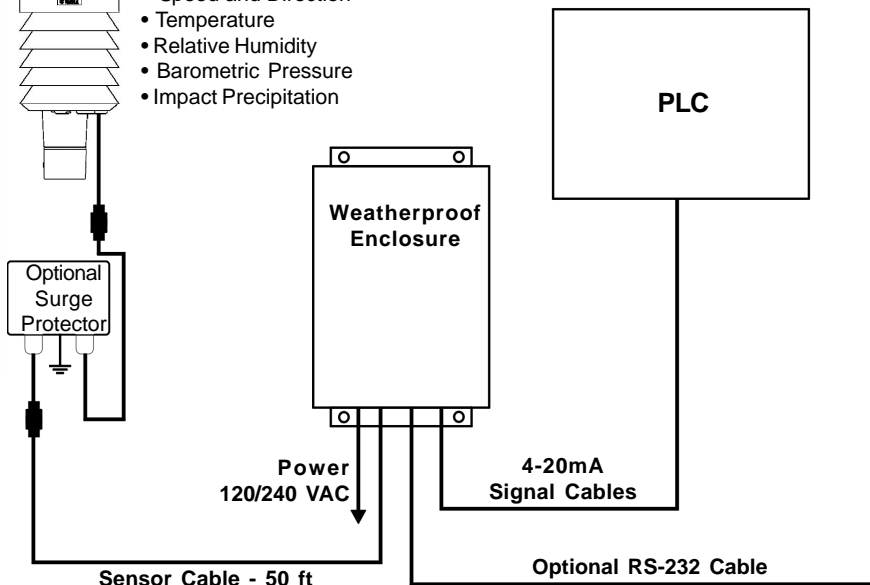
## Orion 420 Weather Station Features

- Six most essential weather parameters measured in one instrument
- 4-20 mA current output for all parameters
  - Triangular design ensures excellent data availability and 360 degree wind measurement accuracy
  - No moving parts means virtually no maintenance
  - Easy to install with no field calibration or maintenance
  - Compact and robust sensor in durable, corrosion-resistant housing
  - Starting threshold for wind speed and direction is virtually zero
  - Heated model is available



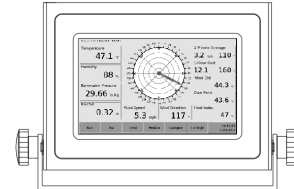
- Sensor Module**
- Ultrasonic Wind Speed and Direction
  - Temperature
  - Relative Humidity
  - Barometric Pressure
  - Impact Precipitation

## Orion 420 Typical System Diagram

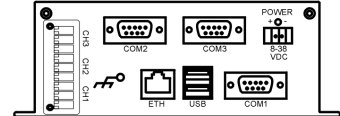


## Additional Monitoring Options

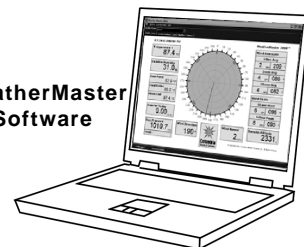
### Weather Display Console



### Weather MicroServer



### WeatherMaster Software



# Orion 420™

## Weather Stations

### Optional Monitoring Devices

#### Color Weather Display Console™

The Weather Display Console uses “intelligent” touch-screen technology. With its programmable microprocessor and abundant memory, the console displays weather information, performs complex computations, and stores data.

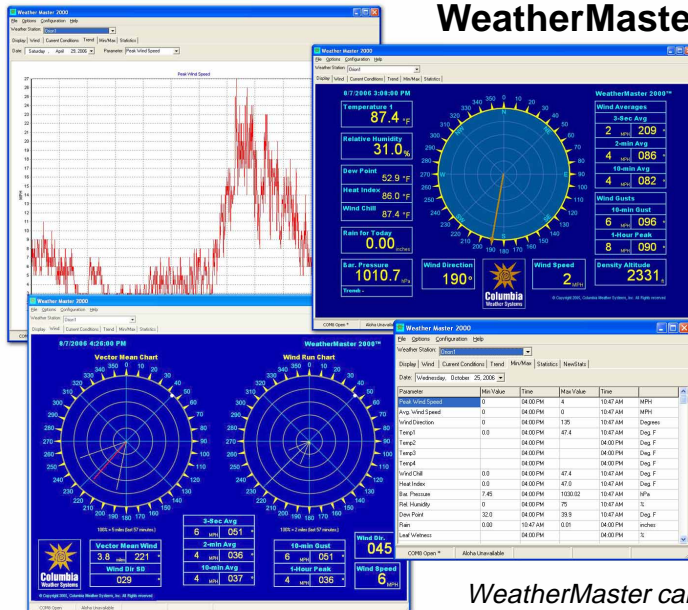
The Weather Display Console features a seven-inch, TFT color LCD panel with 800 x 480 pixels resolution. It can connect directly to the weather station with a serial port or to the Weather MicroServer utilizing existing Ethernet.

The display console is flexible and can be factory-programmed to suit specific market and industry requirements. It is available in three mounting options:

- Desktop/Wall-Mount
- Panel Mount/Flush Mount
- 19" Rack Mount



#### WeatherMaster™ Software



This professional-grade software is designed to optimize the capabilities of Orion Weather Stations. Providing real-time computer weather monitoring, WeatherMaster offers:

- Display and automatic logging of all measured and calculated parameters
- Downwind vector wind and wind character-plotting screens
- An open Microsoft Access® database for archival with easy retrieval and compatibility with other Windows® programs
- On-the-fly graphing and trend display of all parameters
- Alarm notification via computer, email, pager or cell phone
- Multi-station monitoring and data acquisition
- Quick-North orientation
- Interface with CAMEO/ALOHA software for plume modeling and evacuation corridor predictions

*WeatherMaster can be customized to meet specific industry requirements.*

#### Weather MicroServer™

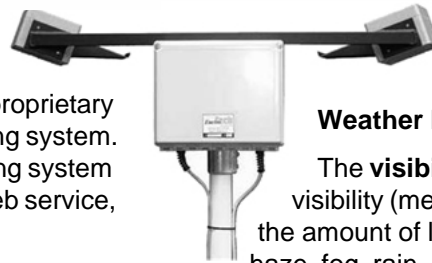
The Weather MicroServer is a self-contained, proprietary computer utilizing an embedded Linux operating system. It creates an “Internet-ready” weather monitoring system by automatically providing FTP output, XML web service, and Internet browser user interface.

SNMP and Modbus/OPC communication protocols are standard for Industrial Management applications.

The Weather MicroServer has datalogging capability. It connects to your network with an included Ethernet cable.

Two serial ports offer interface to both the Weather Display Console and additional peripheral devices or sensors such as visibility, solar radiation, and the Orion LT wind sensor.

The Weather MicroServer can provide real-time weather data to WeatherMaster Software over the network. This allows users to simultaneously monitor the weather using WeatherMaster on any network computer.



#### Weather MicroServer Optional Sensors:

The **visibility** sensor measures atmospheric visibility (meteorological optical range) by determining the amount of light scattered by particles (smoke, dust, haze, fog, rain, and snow) in the air that pass through the optical sample volume. A 42-degree forward scatter angle ensures performance over a wide range of particle sizes.

The **solar radiation** sensor measures the shortwave radiation reaching the Earth's surface.

Self-cleaning convex lens to measure even low-angle radiation directly from the sun in the morning and evening. Dome-shaped head prevents water accumulation.

Also Available: **Orion LT Wind-Only Sensor**



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## Sensor Specifications

### Temperature

Range: -60 to 140°F (-52 to +60°C)  
Accuracy:  $\pm 0.5^\circ\text{F}$  ( $\pm 0.3^\circ\text{C}$ ) at 68°F (+20°C)  
Resolution: 0.1°F (0.1°C)  
Units Available: °F, °C

### Barometric Pressure

Range: 17.50 to 32.50 InHg (600 to 1100 mbar)  
Accuracy:  $\pm 0.015$  InHg (0.5 mbar) at +32 to 86°F (0 to 30°C)  
Resolution: 0.01 InHg (0.1 mbar)  
Units Available: KPa, mbar, InHg, hPa

### Wind Speed

Range: 0 - 135 mph (0 - 60 m/s)  
Accuracy:  $\pm 3\%$  at 10 m/s  
Resolution: 1 mph (1 m/s)  
Units Available: knots, mph, km/hr, m/s

### Wind Direction

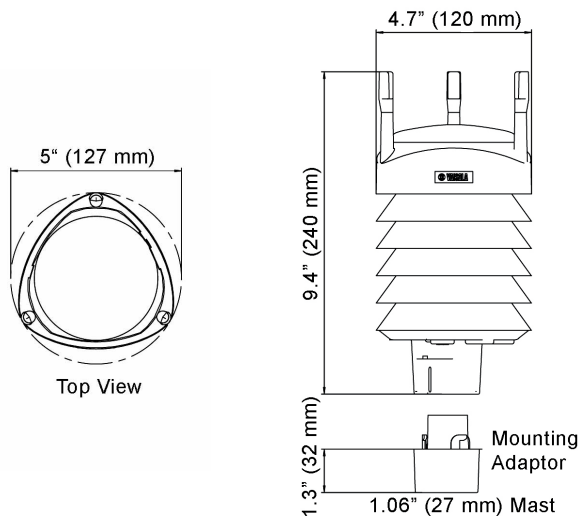
Azimuth: 0 - 360°  
Accuracy:  $\pm 2^\circ$   
Resolution: 1°

### Relative Humidity

Range: 0 - 100%RH  
Accuracy:  $\pm 3\%$ RH (0-90%),  $\pm 5\%$  (90-100%)  
Resolution: 1%RH  
Units Available: %RH

### Rainfall

Range: cumulative  
Collection Area: 60 cm<sup>2</sup>  
Accuracy:  $\pm 5\%$  (spatial variations may exist)  
Resolution 0.001 in. (0.0254mm )  
Units Available: mm, inches



## Orion 420™ Weather Stations

### 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 Measurement

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 Measurement

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 and mounting adapter
- Weatherproof Enclosure with two 4-20 mA converter modules and power supply

Recommended: Bird Spike Kit, Surge Suppressors

**Please contact us today for a free quotation!**



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