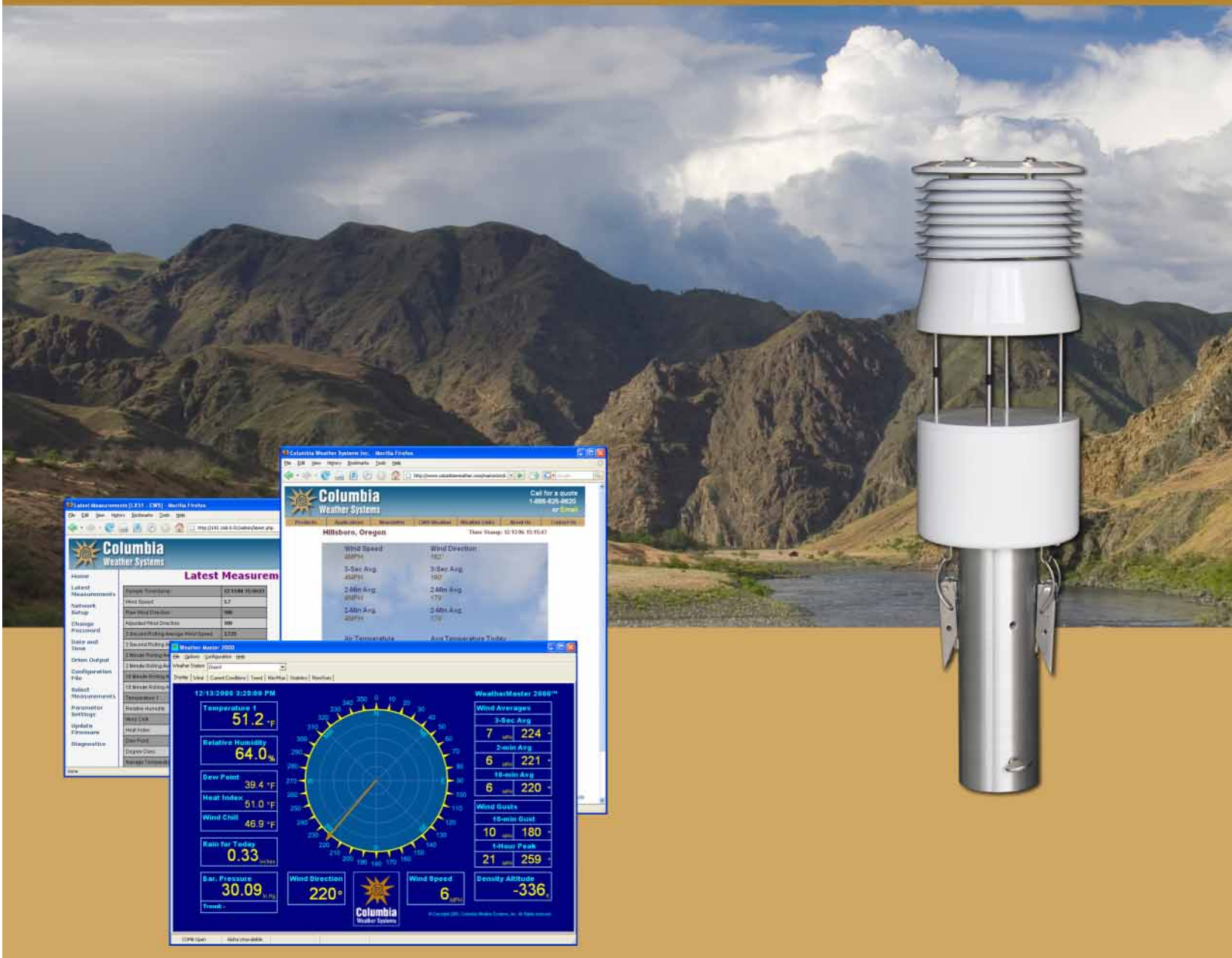
Columbia Weather Systems

Magellan™ Weather Stations

Sonic Wind | Temperature | Humidity | Barometric Pressure | Internal Compass



www.columbiaweather.com

Innovative Weather Monitoring

For cutting-edge weather monitoring in a harsh environment, the Magellan Weather Station combines a rugged multi-parameter weather sensor with an internal compass for automatic wind direction alignment.

The all-in-one Magellan sensor module integrates:

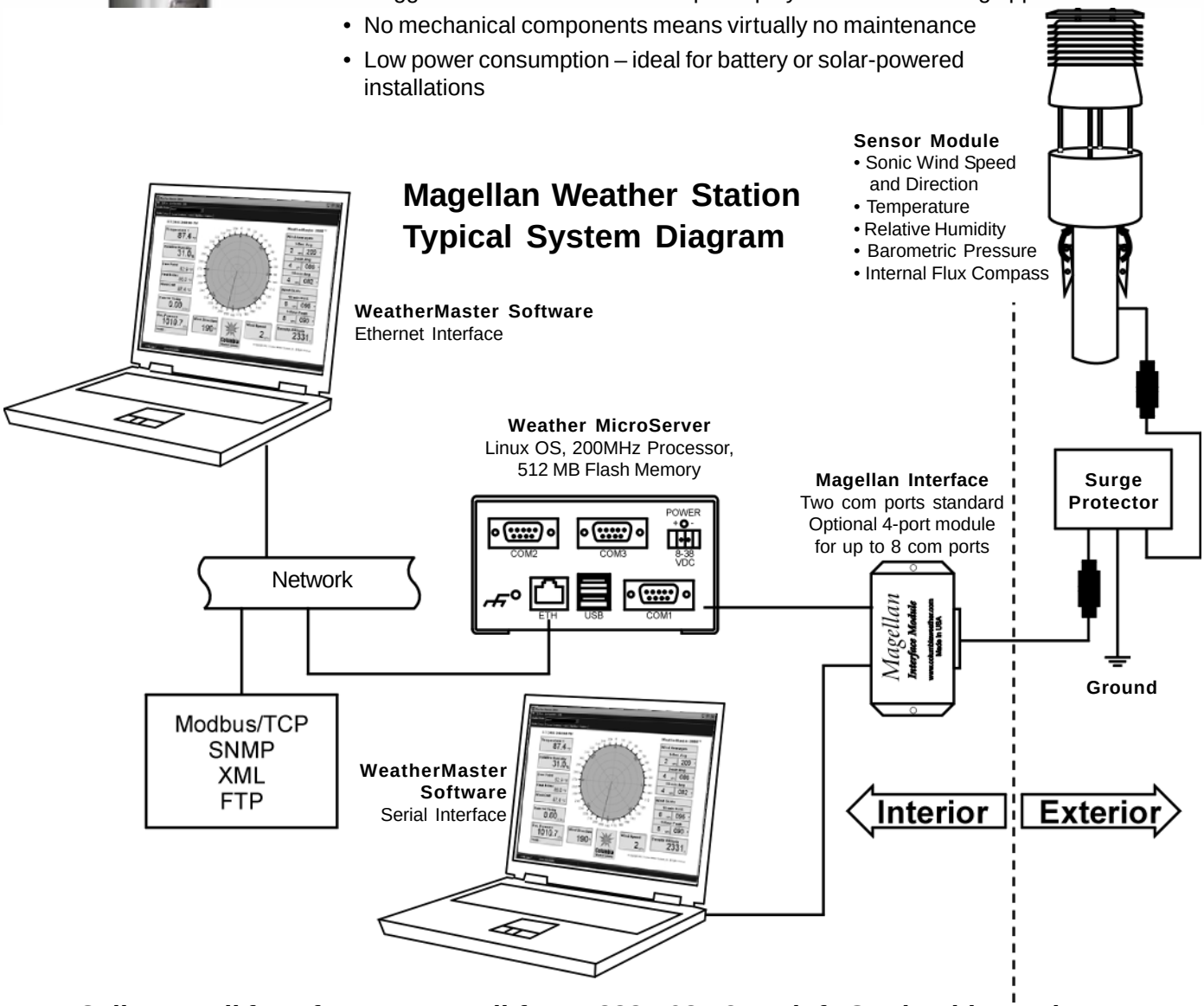
- a sonic anemometer for **wind speed** measurement
- multi-element sensor for highly accurate and stable **temperature** readings
- fast-response, capacitive relative **humidity** sensor
- state-of-the-art **barometric pressure** sensor
- internal fluxgate **compass** for automatic alignment of **wind direction**

Weather monitoring options include WeatherMaster™ Software and the Weather MicroServer™ for internet-ready weather data and industrial protocols.

Magellan Weather Station Features

- Weather-protected sensor unit designed for maximum portability and utility
- Integrated sonic wind sensor
- Automatic self-alignment using internal fluxgate compass
- Rugged metal construction for rapid deployment in demanding applications
- No mechanical components means virtually no maintenance
- Low power consumption – ideal for battery or solar-powered installations

Magellan Weather Station Typical System Diagram



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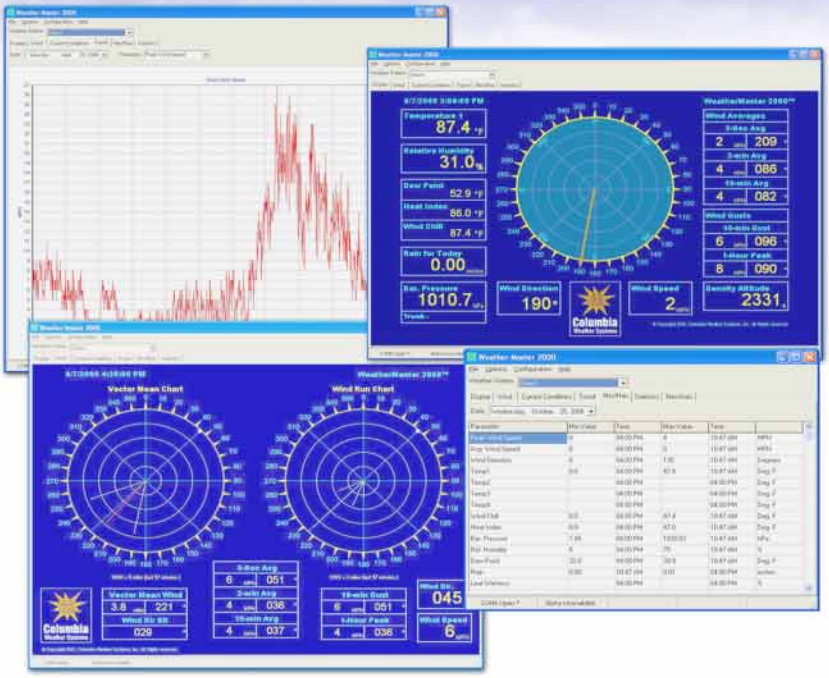
Magellan™ Weather Stations

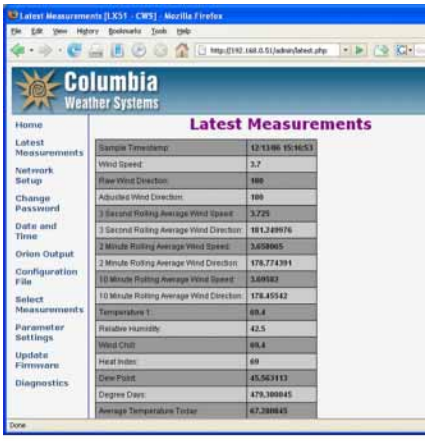


WeatherMaster can be customized to meet specific requirements.

WeatherMaster™ Software

Designed to optimize the capabilities of Magellan Weather Stations, this professional software provides real-time computer weather monitoring:

- 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



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 and the Orion LT wind-only 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:

For applications requiring additional **wind speed and direction**, the Orion LT wind-only sensor module offers ultrasonic technology for high accuracy and stability. Triangular design ensures excellent data availability and 360° measurement accuracy with a starting threshold of virtually zero. A heated model is available.

The pyranometer or **solar radiation** sensor is calibrated to measure the shortwave radiation reaching the Earth's surface, measured in Watts/m^2. Self-cleaning dome-shaped head prevents water accumulation. The sensor head is potted solid to prevent internal condensation in humid environments.

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 is used to ensure performance over a wide range of particle sizes.

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Sensor Specifications

Temperature

Range: -50 to +50°C (-58 to +122°F)
Accuracy: ±0.2°C (0.36°F)
Resolution: 0.1°C (0.1°F)
Operating Temperature: -50 to +70°C

Barometric Pressure

Range: 600 to 1100 mbar (17.72 to 32.48 inHg)
Accuracy: ±0.35 mbar (±0.01 inHg)
Resolution: 0.1 mbar (0.01 inHg)

Wind Speed

Range: 0 to 50 m/sec (0 to 112 mph)
Accuracy: ±0.5 m/s or 5% of reading
Resolution: 1 m/s (1 mph)

Wind Direction

Range: 0 to 360°
Accuracy: ± 5° @ wind speed > 2.2 m/s
Resolution: 1.0°

Relative Humidity

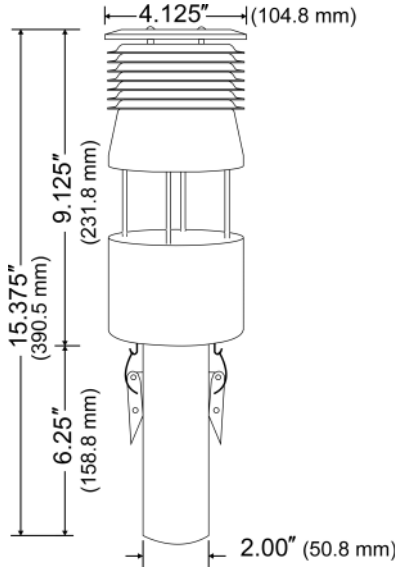
Range: 0 to 100%
Accuracy: ±3%
Resolution: 1.0%

Compass

Accuracy: ±2°
Resolution: 1°

Physical

Construction Materials:
Anodized aluminum and stainless steel
Weight: 0.91 kg (2.0 lbs)
Mounting: Accepts 1" (25.4mm) OD pole
Color: Gloss white powder coat



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Magellan™ Weather Stations

Parameter Measurements

Temperature

The temperature sensor in the Magellan uses a precision triple-element thermistor. This provides highly accurate and stable temperature readings.

Humidity

The relative humidity sensor is a capacitive polymer sensor. The humidity sensor elements' construction provides excellent resistance to wetting, dust, dirt, oils, and common environmental chemicals.

Barometric Pressure

The barometric pressure sensor is a stable transducer using nano-technology, yielding a linear and repeatable sensor with low hysteresis. The piezoresistive pressure sensor module is mounted on a small electronic circuit board.

A microcontroller controls the operation of the sensor and the data interface. The microcontroller polls the pressure sensor module once per second for the barometric pressure and ambient temperature. The raw readings are temperature corrected by the microcontroller.

Wind Measurement

A unique folded-path, low-power sonic anemometer operates on the principle that the speed of the wind affects the time it takes for sound to travel from one point to a second point. If the sound is traveling in the direction of the wind, then the transit time is decreased. If the sound is traveling in a direction opposite the wind, then the transit time is increased.

Fluxgate Compass

The internal compass module is low power and compact. It employs a pair of magneto-inductive sensors which change inductance with varying magnetic field strengths, to sense the Earth's magnetic field.

The microprocessor measures the output of the internal compass and then corrects wind direction data for the orientation of the sensor. The output of the wind direction is relative to magnetic North. A user programmable value of Magnetic Declination may be entered through terminal mode to enable output relative to True North rather than Magnetic North.

Additional Calculated Parameters

Through WeatherMaster Software or the Weather MicroServer, 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

Magellan weather stations are available in Fixed-Mount, Vehicle-Mount and Portable system configurations.

Fixed-Mount Weather Stations include 50-ft cable. Optional accessories:

- Sensor mast and mounting hardware options
- Extra cable length
- Wireless Transceivers

Vehicle-Mount Weather Stations include a detachable 8-ft telescoping sensor mast and mounting hardware.

Portable Weather Stations include wireless transceivers, batteries, transportation case and tripod with telescoping mast.

Please contact us today for a free quotation!