WX Ultrasonic WeatherStation® Instruments for Land Applications

Delivering a Compact, Affordable Instrument for Informed Decision-Making

Available Models:
110WX, 150WX, 200WX

Whether you are harvesting crops, operating equipment, preparing for bad weather or responding to a hazardous event; understanding the weather is important. The WX Series allows users to make informed decisions based on site specific information, resulting in improved efficiency, reduced risks and overall cost savings. Various model options are available depending on the application and requirements.

The WX Series WeatherStation Instruments offer a truly best-in-class solution at a better price point compared to any other weather monitoring system on the market today!

FEATURES

- Model 110WX – Measures apparent wind speed and angle, barometric pressure, air temperature, relative humidity, calculated dew point, heat index and wind chill temperature
- Models 150WX and 200WX – Includes all 110WX functionality plus internal compass and GPS (for theoretical wind speed and direction), GPS position, speed over ground, course over ground
- Model 200WX – Best-in-class dynamic stabilization via three-axis compass and three-axis rate gyro
- UV stabilized, compact housing
### Product Models to Satisfy Multiple Weather Needs

Now available on iTunes — OnSiteWX
The innovative App for real-time weather data!

<table>
<thead>
<tr>
<th></th>
<th>Apparent Wind Model</th>
<th>Apparent &amp; Theoretical Wind Models</th>
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<tbody>
<tr>
<td><strong>110WX</strong></td>
<td></td>
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<tr>
<td><strong>150WX</strong></td>
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<tr>
<td><strong>200WX</strong></td>
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<tr>
<td><strong>Apparent wind speed and angle</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Theoretical wind speed and direction</strong></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Barometric Pressure</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Ultrasonic wind readings up to 90 mph (78 knots, 40 m/s)</strong></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Air temperature plus calculated wind chill</strong></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>10 Hz GPS (Position, COG, SOG)</strong></td>
<td>✓</td>
<td>✓</td>
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<tr>
<td><strong>Two-axis solid state compass</strong></td>
<td>✓</td>
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<tr>
<td><strong>Three-axis accelerometer for pitch and roll</strong></td>
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<td>✓</td>
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<tr>
<td><strong>Three-axis solid-state compass with dynamic stabilization:</strong></td>
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<tr>
<td>Better than 1° static compass accuracy</td>
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<tr>
<td>Best-in-class 2° dynamic compass accuracy</td>
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<tr>
<td><strong>Three-axis rate gyros provide rate-of-turn data</strong></td>
<td>✓</td>
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</tr>
<tr>
<td><strong>Best-in-class pitch and roll accuracy</strong></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Optional field-serviceable relative humidity</strong></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calculated dew point</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Calculated heat index</td>
<td></td>
<td></td>
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<tr>
<td><strong>Output options include:</strong></td>
<td></td>
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<tr>
<td>NMEA 0183 (RS422) and NMEA2000® (CAN Bus)</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>NMEA 0183 (RS232) and NMEA2000® (CAN Bus)</td>
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### WeatherCaster™ Software

**Developer Assistance**
- Enable/disable functionality
- Optimize communications bandwidth NMEA 0183 (RS232, RS422)
- Change sampling rate (output interval)

**Field Installation Assistance**
- Enable/disable functionality
- Sensor orientation
- Compass calibration
- Temperature offset
- Select specific device on a NMEA2000® network
- Alarms for wind speed and barometric pressure
- Altitude offset
- More accurate GPS position in 2D mode
- More accurate BP reading
Achieving Best-in-Class Product Specifications

**SPECIFICATIONS**

**Wind Speed Range:**
- 0 knots to 78 knots (0 MPH to 90 MPH, 0 m/s to 40 m/s)

**Wind Speed Resolution:**
- 0.1 knot (0.1 MPH, 0.1 m/s)

**Wind Speed Accuracy @ 0°C to 55°C (32°F to 131°F), no precipitation:**
- Low Wind Speeds:
  - 0-10 knots: 1 knot RMS +10% of reading (0 MPH to 11.5 MPH, 1.1 MPH + 10% of reading)
  - (0 m/s to 5 m/s: 0.5 m/s + 10% of reading)
- High Wind Speeds:
  - 10-78 knots: 2 knots RMS or 5%, whichever is greater (11.5 MPH to 90 MPH, 2.3 MPH or 5%, whichever is greater)

**Wind Speed Accuracy in wet conditions:**
- 5 knots RMS (5.7 MPH RMS, 2.5 m/s RMS)

**Wind Direction Range:** 0° to 360°

**Wind Direction Resolution:** 0.1°

**Wind Direction Accuracy @ 0°C to 55°C (32°F to 131°F), no precipitation:**
- Low Wind Speeds (5° RMS typical):
  - 4-10 knots (4.6 MPH to 11.5 MPH, 2 m/s to 5 m/s)
- High Wind Speeds (2° RMS typical):
  - >10 knots (>11.5 MPH, >5 m/s)

**Wind Direction Accuracy in wet conditions:**
- 8 knots (>9.2 MPH, >4.5 m/s)

**Compass Accuracy:**
- 1° RMS when level—(150WX only)
- 1° static heading accuracy; 2° dynamic heading accuracy—200WX only

**Pitch and Roll Range / Accuracy:**
- 1° static heading accuracy; 2° dynamic heading accuracy—200WX only
- 1° RMS when level—(150WX only)

**Barometric Pressure Range:**
- 300 mbar to 1100 mbar (24 inHg to 33 inHg, 800 hPa to 1100 hPa)

**Barometric Pressure Resolution:**
- 0.1 mbar (0.029 inHg, 0.1 hPa)

**Barometric Pressure Accuracy:**
- ±1 mbar (±0.029 inHg, ±1 hPa) when altitude correction is available

**Relative Humidity Range:** 10% to 95% RH

**Relative Humidity Accuracy:**
- ±5% units RH

**GPS Position Accuracy:**
- 3 m (10') with WAAS/EGNOS (95% of the time)—150WX & 200WX

**Operating Temperature Range:** -25°C to 55°C (-13°F to 131°F)

**Supply Voltage:** 9 VDC to 40 VDC

**Supply Current (@ 12 VDC):**
- (<50 mA) <0.6W —110WX
- (<85 mA) <1.0W —150WX
- (<105 mA) <1.25W —200WX

**Weight:** 300 grams (0.8 lb)

**Communication Interface:** NMEA 0183 (RS422 or RS232) and NMEA2000® (CAN bus)**

**Mounting Thread Size on Base:** Standard 1”-14 UNS (3/4” NPT optional)

**Certifications and Standards:**
- CE, IPX6 (Relative Humidity/IPX4), RoHS, IEC61000-4-2, IEC60945
- IEC60950_1C, IEC60950_22A, ENS55022, ENS55024, EN15104982

**DIMENSIONS**

**WX Series**
- ø 72 mm (2.83”)
- 131 mm (5.16”)
- ø 45 mm (1.77”)
- 90 mm (3.54”)

**DATA OUTPUT PROTOCOL**

**NMEA 0183 Sentence Structure**
- $GPGGA.GPS Datum Reference
- $GPGGA.GPS Fix Data
- $GPRMC.....Geographic Position—Latitude and Longitude
- $GPGGA...GNSS DOP and Active Satellite
- $GPGSV.....Satellites in View
- $GPBMC.....Recommended Minimum GNSS
- $GPVTG.....COG and SOG
- $GPZDA.....Time and Date
- $HCHDG.....Heading, Deviation, and Variation
- $HCHDL.....True Heading
- $HCHTD.....True Heading and Status
- $TIROT.....Rate of Turn
- $SWMDC.....Meteorological Composite
- $WIMWD.....Wind Direction and Speed
- $WIMWW.....Wind Speed and Angle
- $WIMWR.....Relative Wind Direction and Speed
- $WIMWT.....Theoretical Wind Direction and Speed
- $YXKDR.....Transducer Measurements

**NMEA2000® Output Message Structure**
- 9392...ISO Acknowledgement
- 060928...ISO Address Claim
- 126208...Acknowledge Group Function
- 126464...PGN List
- 126992...System Time
- 126996...Product Information
- 126998...Configuration Information
- 127250...Vessel Heading
- 127251...Rate of Turn
- 127257...Attitude
- 127258...Magnetic Variation
- 129025...Position and Rapid Update
- 129026...COG and SOG, Rapid Update
- 129029...GNSS Position Data
- 129033...Time and Date
- 129044...Datum
- 129538...GNSS Control Status
- 129539...GNSS DOPs
- 129540...GNSS Sat in View
- 130306...Wind Data
- 130310...Environmental Parameters
- 130311...Environmental Parameters
- 130312...Temperature
- 130313...Humidity
- 130314...Actual Pressure
- 130323...Meteorological Station Data

**PART NUMBERS**

- 110WX: 44-820-1-01, RH, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 110WX: 44-823-1-01, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 110WX: 44-843-1-01, RH, NMEA 0183 (RS232) and AG (CAN Bus)
- 150WX: 44-832-1-01, RH, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 150WX: 44-833-1-01, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 150WX: 44-834-1-01, RH, NMEA 0183 (RS232) and AG (CAN Bus)
- 200WX: 44-835-1-01, RH, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 200WX: 44-837-1-01, RH, NMEA 0183 (RS422) and NMEA2000® (CAN Bus)
- 200WX: 44-847-1-01, NMEA 0183 (RS232) and NMEA2000® (CAN Bus)

*Cables sold separately

**RH—Relative Humidity**

*Airman has made the address claiming modifications to enable compatibility with the ISO 11783 communication protocol for the agriculture industry – that is based on the SAE J1939 protocol.*
Understanding Theoretical and Apparent Wind

Virtually all mechanical and ultrasonic anemometers report apparent wind speed and direction. The Airmar WX Series is unique because it calculates both theoretical and apparent wind speed and direction. These wind readings are the same if the unit is mounted in a fixed location. However, if the WX Series is mounted on a moving vehicle, the apparent wind is the wind you would feel on your hand if you held it out the window while going down the highway. Since the WX Series has a built in GPS and compass, it calculates the theoretical wind based upon the apparent wind, speed of the vehicle, and compass heading.

Theoretical wind information is significant for numerous applications on hazardous response vehicles. Theoretical wind speed and direction is also mission-critical. When enroute to an emergency situation, first responders can use the theoretical wind readings to predict wind conditions at the disaster site before they even arrive, giving vital information for planning operations and staging apparatus.

True Wind: True wind is the same as above BUT relative to True (or Magnetic) North. In the case of a moving vehicle, True wind is not relevant because the vehicle will (almost) never be aligned to True (or Magnetic) North. In a mobile application True wind is a meaningless value.

Performing Above and Beyond Competitive Products on the Market

Each WeatherStation Instrument is factory calibrated in a wind tunnel at our state-of-the-art facility located in Milford, New Hampshire, USA.