

WX Series



## WeatherStation® Multisensor – Ultrasonic Instruments for Marine Applications

AIRMAR's best-in-class, all-in-one solution for real-time, site-specific weather information

### Available Models: 120WX, 220WX

From racing and cruising sailboats to yachting and commercial fishing, Airmar has WeatherStation® products specifically designed for your marine application.

The WX Series WeatherStation instruments meet a growing need for real-time, site-specific, weather information. For applications where theoretical and apparent wind are important, the 220WX is recommended. It includes a 10Hz GPS, three-axis solid-state compass, rate gyro and tilt sensors. This model features configurable NMEA 0183 and NMEA2000® digital data outputs, providing unparalleled versatility for all your weather monitoring needs.

Both models offer a truly best-in-class solution at a better price than any other weather monitoring system on the market today.



Actual  
Size



Wind  
Speed &  
Direction



Barometric  
Pressure



Temp



Relative  
Humidity



GPS



Compass

### FEATURES

- WeatherStation® instruments combine up to seven sensors, all with no moving parts, in one compact unit
- Wind readings are not affected by the common problems known in mechanical anemometers and weather measuring devices like bearing wear, salt and dirt build-up, or bird perching, which can all result in failure or data inaccuracy
- Units are easy-to-install either permanently, or as a portable system. They can be installed on a standard pole with 1"-14 UNS or 3/4" NPT threads.
- IPX6 waterproof rating (units with the relative humidity option added are IPX4 waterproof rated)
- Optional heater model available for colder climates under 1° C
- Operating voltage range of 9 VDC to 40 VDC



# Product Models to Satisfy Multiple Weather Needs



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



**120WX**



**220WX**

|   | Apparent Wind Model                     | Apparent & Theoretical Wind Model          |
|---|---|--|
|   | Recommended for Stationary Applications | Recommended for Moving Vessel Applications |
| Apparent wind speed and angle   | ✓                                       | ✓  |
| Theoretical wind speed and direction  |   | ✓  |
| Barometric Pressure   | ✓                                       | ✓  |
| IPX6 waterproof rating  | ✓                                       | ✓  |
| Air temperature plus calculated wind chill  | ✓                                       | ✓  |
| Internal GPS position, speed over ground, course over ground  |   | ✓  |
| Three-axis solid-state compass with dynamic stabilization:<br>Better than 1° static compass accuracy<br>Best-in-class 2° dynamic compass accuracy |   | ✓  |
| Three-axis accelerometer for pitch and roll   |   | ✓  |
| Three-axis rate gyros provide rate-of-turn data   |   | ✓  |
| Best-in-class pitch and roll accuracy   |   | ✓  |
| Optional field-serviceable relative humidity<br>Calculated dew point<br>Calculated heat index   | ✓                                       | ✓  |
| Optional heater and upper ring  | ✓                                       | ✓  |
| Output options include:<br>NMEA 0183<br>NMEA2000®   | ✓                                       | ✓  |

## WeatherCaster™ Software

### Developer Assistance

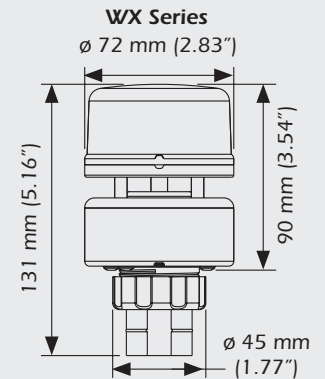
- Enable/disable functionality
- Optimize communications bandwidth  
NMEA 0183 (RS232, RS422)
- Change sampling rate (output interval)



### 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

### DIMENSIONS



# Achieving Best-in-Class Product Specifications

## SPECIFICATIONS

### Wind Speed

**Range:** 0 knots to 78 knots  
**Accuracy:** 5% @ 19 knots (@4 angles)  
**Resolution:** 0.1 knots  
**Units:** knots  
**Calculations:** User configurable damping

### Wind Direction

**Range:** 0° to 359.9°  
**Accuracy:** ±3° @ 10 m/s  
**Resolution:** 0.1°  
**Calculations:** User configurable damping

### Air Temperature

**Range:** -40° to 80°C  
**Accuracy:** ±1.1°C @ 20°C  
**Resolution:** 0.1  
**Units:** °C

### Relative Humidity

**Range:** 0-100% RH  
**Accuracy:** ±5% RH @ 0 to 90% RH @ 20°C  
**Resolution:** 0.1% RH

### Barometric Pressure

**Range:** 300 to 1100 hPa  
**Accuracy:** ±0.5 hPa @ 25°C (or better)  
**Resolution:** 0.1 hPa

### Three Axis Compass

**Range:** 0 to 359.9°  
**Accuracy:** 1° RMS when level, 1° static heading accuracy; 2° dynamic heading accuracy (220WX only)  
**Resolution:** 0.1°

### Pitch & Roll

**Measurement Type:** MEMS  
**Range:** 50°  
**Accuracy:** ±1° in range of ±30°  
**Resolution:** 0.1°  
**Units:** Degrees

### GPS Position Accuracy:

3 m (10') CEP

### Operating Temperature Range:

### Power

**Supply Voltage:** 9 VDC to 40 VDC  
**Supply Current (@ 12 VDC):**  
<55 mA (<0.7 W), LEN 2 — 120WX  
<75 mA (<0.9 W), LEN 2 — 220WX

### Output Rate:

User specified, 0.1 seconds – fastest interval

### Weight:

300 grams (0.8 lb)

**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, EN55022, EN55024, EN15014982

## COMMUNICATIONS

### Available Hardware Interfaces

Serial RS232, Serial RS422, CAN

### Available Protocols

Comma delimited ASCII, NMEA 0183, NMEA2000®

## SERIAL DATA OUTPUT PROTOCOL

### NMEA 0183 Sentence Structure – Comma Delimited ASCII Format

\$GPDTM..... GPS Datum Reference  
\$GPGGA..... GPS Fix Data  
\$GPGLL..... Geographic Position—Latitude and Longitude  
\$GPGSA..... GNSS DOP and Active Satellite  
\$GPGSV..... Satellites in View  
\$GPRMC..... Recommended Minimum GNSS  
\$GPVTG..... COG and SOG  
\$GPZDA..... Time and Date  
\$HCHDG..... Heading, Deviation, and Variation  
\$HCHDT..... True Heading  
\$HCTHS..... True Heading and Status  
\$TIROT..... Rate of Turn  
\$WIMDA..... Meteorological Composite  
\$WIMWD..... Wind Direction and Speed  
\$WIMWV..... Wind Speed and Angle  
\$WIMWR..... Relative Wind Direction and Speed  
\$WIMWT..... Theoretical Wind Direction and Speed  
\$YXXDR..... Transducer Measurements

## CAN DATA OUTPUT PROTOCOL

### NMEA2000® Output Message Structure

59392..... 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 Sats in View  
130306..... Wind Data  
130310..... Environmental Parameters  
130311..... Environmental Parameters  
130312..... Temperature  
130313..... Humidity  
130314..... Actual Pressure  
130323..... Meteorological Station Data

## PART NUMBERS

**120WX:** 44-858-1-01, NMEA 0183 (RS422) or NMEA2000® (CAN Bus)  
**220WX:** 44-854-1-01, NMEA 0183 (RS422) or NMEA2000® (CAN Bus)

**Field Serviceable RH Module:** 33-627-02

**120WXH:** 44-852-1-01, NMEA 0183 (RS422)<sup>1,2,3</sup>  
**220WXH:** 44-856-1-01, NMEA 0183 (RS422)<sup>1,2,3</sup>

<sup>1</sup> Relative Humidity (RH) not available on heater models

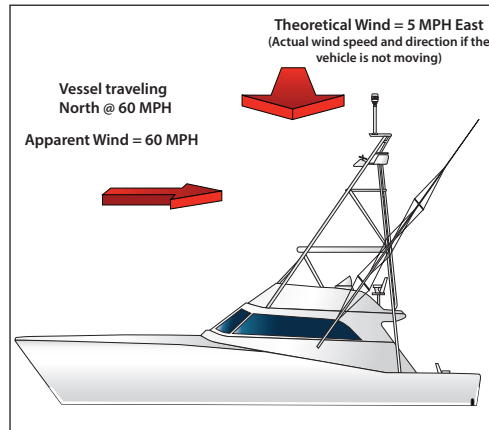
<sup>2</sup> Cables sold separately

<sup>3</sup> Heater requires 24VDC

# 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.

**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.

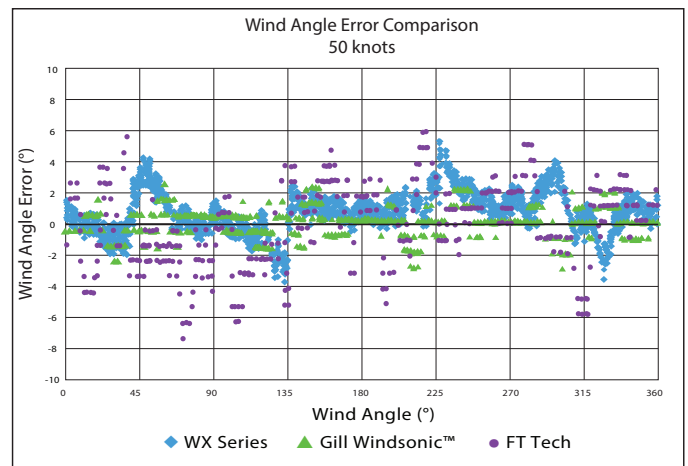
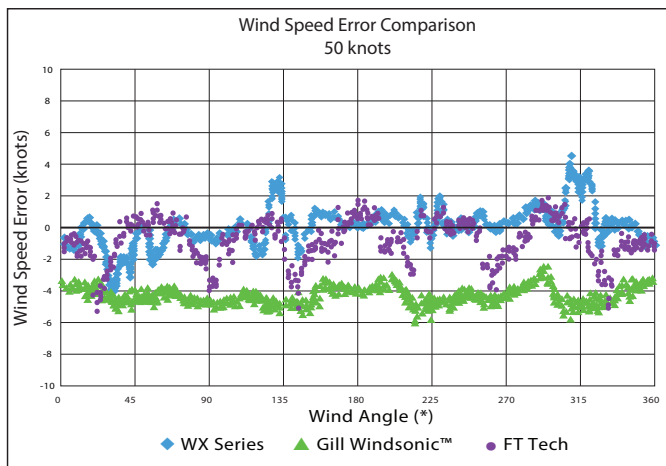


Airmar's WX Series products are the only all-in-one unit to offer theoretical and apparent wind speeds without additional sensors.

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



# Performing Above and Beyond Competitive Products on the Market



[www.airmar.com](http://www.airmar.com)

