

WX Series



## WX Ultrasonic WeatherStation® 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 and 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 point than any other weather monitoring system on the market today.



Actual  
Size

### 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 12-24 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: Better than 1° static compass accuracy 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 Calculated dew point Calculated heat index	✓	✓
Optional heater and upper ring	✓	✓
Output options include: NMEA 0183 NMEA2000®	✓	✓

## WeatherCaster™ Software

### Developer Assistance

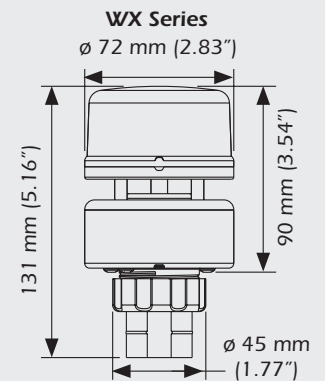
- Enable/disable functionality
- Optimize communications bandwidth  
NMEA 0183 (RS232, RS422)
- Change sampling rate (output interval)



### 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 (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; 1.1MPH + 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)  
(5 m/s to 40 m/s; 1 m/s 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° RMS Typical):

>8 knots (>9.2 MPH, >4 m/s)

### Compass Accuracy:

— 1° static heading accuracy; 2° dynamic heading accuracy—220WX only

### Pitch and Roll Range / Accuracy: ±50° / <1°—220WX

### Air Temperature Range\*\*\*: -40°C to 55°C (-40°F to 131°F)

### Air Temperature Resolution: 0.1°C (0.1°F)

### Air Temperature Accuracy:

±1.1°C (±2°F)\* @ >4 knots wind (>4.6 MPH wind) (>2 m/s wind)

### 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)—220WX

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

### Heater Operating Temperature Range: -40°C to 55°C

Heater cycles on when sensor reaches 1°C

### Supply Voltage: 12 VDC to 24 VDC

### Heater Supply Voltage: 24 VDC

### Supply Current (@ 12 VDC):

— (<85 mA) <1.0W, LEN 2 —120WX

— (<165 mA) <2.0W, LEN 4 —220WX

### Supply Current (@ 24 VDC):

— (<42 mA) <1.0W —120WX

— (<85 mA) <2.0W —220WX

### Heater Supply Current (@ 24 VDC):

— (2.5 A) <60W

### Weight: 300 grams (0.8 lb)

### Communication Interface: NMEA 0183 (RS422) 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, IEC60945

RMS—Root Mean Square LEN—Load Equivalency Number

\*When the wind speed is less than 2 m/s (4.6 MPH) and/or air temperature is below 0°C (32°F), wind, temperature, and relative humidity readings will be less accurate.

\*\*Wet conditions include moisture, rain, frost, dew, snow, ice and/or sea spray in the wind channel.

\*\*\*Temperature and relative humidity report invalid during heater operation.

\*\*\*\*Airmar 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.

## DATA OUTPUT PROTOCOL

### NMEA 0183 Sentence Structure

\$GPDTM ..... GPS Datum Reference

\$GPGLL ..... 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

### NMEA2000® Output Message Structure

59392 ..... ISO Acknowledgement

060928 ..... ISO Address Claim

12620 ..... 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

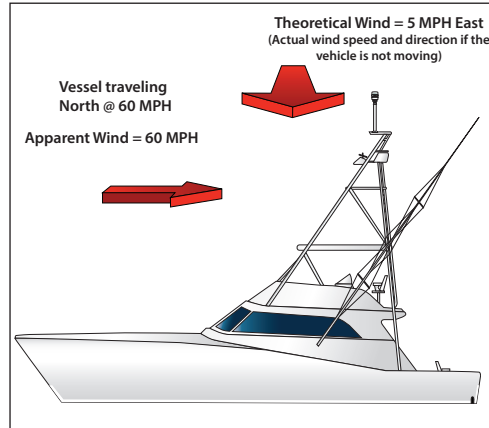


# Understanding Theoretical and Apparent Wind

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.

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.

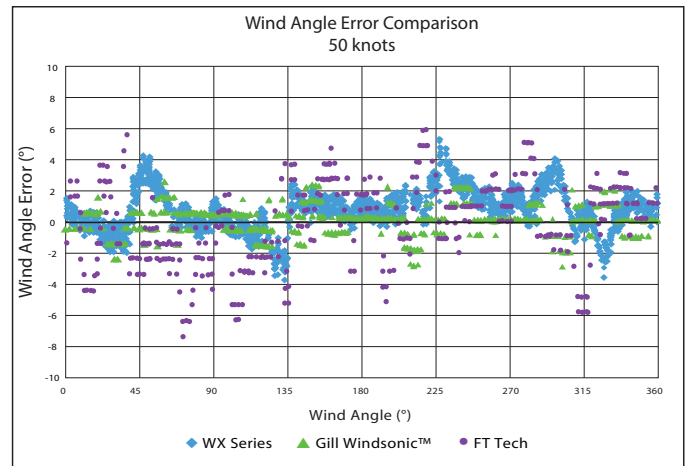
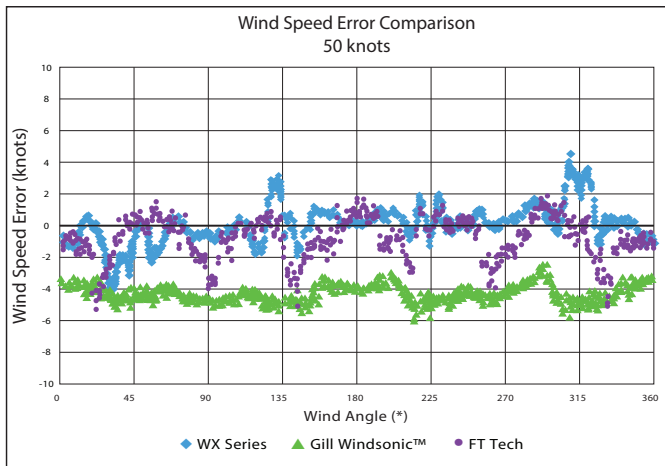


Airmar's WX Series products are the only all-in-one unit to offer theoretical and apparent wind speeds without additional sensors.

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)

