

# Wind Speed Smart Sensor (S-WSB-M003) Manual



## Wind Speed Smart Sensor

S-WSB-M003

### Item included:

- Mounting rod

### Accessories:

- Full cross arm (M-CAA)
- Half cross arm (M-CAB)

The wind speed smart sensor is designed to work with HOBO® stations. The smart sensor has a plug-in modular connector that allows it to be added easily to a HOBO station. All sensor parameters are stored inside the smart sensor, which automatically communicates configuration information to the logger without the need for any programming or extensive user setup.

## Specifications

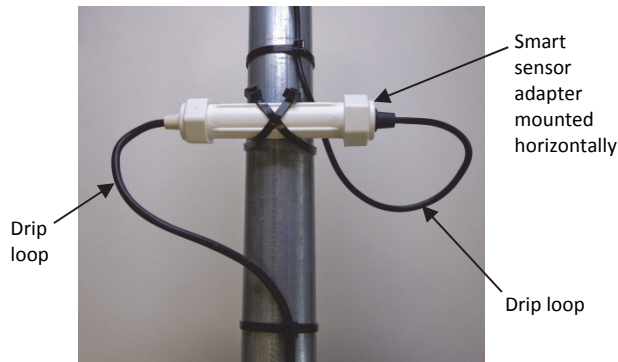
<b>Measurement Range</b>	0 to 76 m/sec (0 to 170 mph)
<b>Accuracy</b>	±1.1 m/sec (2.4 mph) or ±4% of reading, whichever is greater
<b>Resolution</b>	0.5 m/sec (1.1 mph)
<b>Service Life</b>	>5 year life typical, factory replaceable mechanism
<b>Distance Constant</b>	3 m (9.8 ft)
<b>Starting Threshold</b>	≤1 m/sec (2.2 mph)
<b>Maximum Wind Speed Survival</b>	76 m/sec (170 mph)
<b>Measurements</b>	Wind speed: Average wind speed over logging interval Gust: Highest 3-second gust during the logging interval See <i>Measurement Operation</i> for more information
<b>Operating Temperature Range</b>	-40° to 75°C (-40° to 167°F)
<b>Environmental Rating</b>	Sensor and Cable Jacket: Weatherproof
<b>Housing</b>	Three cup polycarbonate anemometer: Modified Teflon® bearings and hardened beryllium shaft with ice shedding design
<b>Dimensions</b>	41 x 16 cm (16 x 6.5 in.) including 1.27 cm (0.5 in) diameter mounting rod; 5.5 cm (2.1 in.) drip overhang
<b>Weight</b>	300 g (10 oz)
<b>Bits per Sample</b>	8 for each channel, 16 total
<b>Number of Data Channels*</b>	2
<b>Measurement Averaging</b>	Automatic averaging (see <i>Measurement Operation</i> )
<b>Cable Length Available</b>	3.5 m (11.5 ft)
<b>Length of Smart Sensor Network Cable*</b>	0.5 m (1.6 ft)
<b>CE</b>	The CE Marking identifies this product as complying with all relevant directives in the European Union (EU).

\* A single HOBO station can accommodate 15 data channels and up to 100 m (328 ft) of smart sensor cable (the digital communications portion of the sensor cables).

## Mounting

### Placement and Mounting Considerations

- The wind speed smart sensor should be mounted vertically in a location free of wind shadows.
- For accurate wind speed measurements, mount the sensor at a distance of at least five times the height of the nearest tree, building, or other obstruction.
- Be sure to secure the sensor cable with cable ties to protect the cable from damage.
- To provide long-term protection from moisture entry, the smart sensor adapter must be mounted horizontally and with the cable wires routed with drip loops so that water drains away from the cable entry point as shown in the example below. When mounted properly, the housing is weatherproof (but not waterproof).

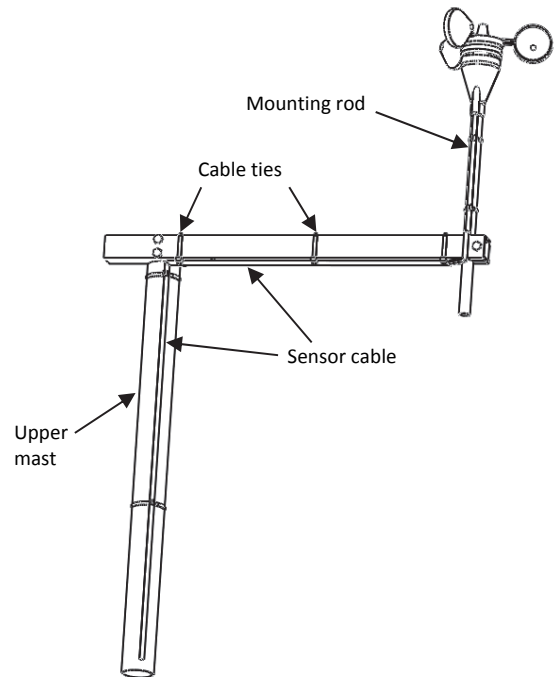


- The tripod or mounting mast must be properly grounded. For field installations, you can use Onset's grounding kit (M-GKA).
- Secure the mast the wind sensor is mounted on so that it does not vibrate. If you are using Onset masts or tripods, secure them with guy wires.
- Although the wind sensor is designed to operate in 100+ mph winds, it can be damaged with improper handling. Store the sensor in its shipping box until you are ready to install it.
- Refer to the Tripod Setup Guide for more information.

### Mounting the Sensor to a Tripod Cross Arm

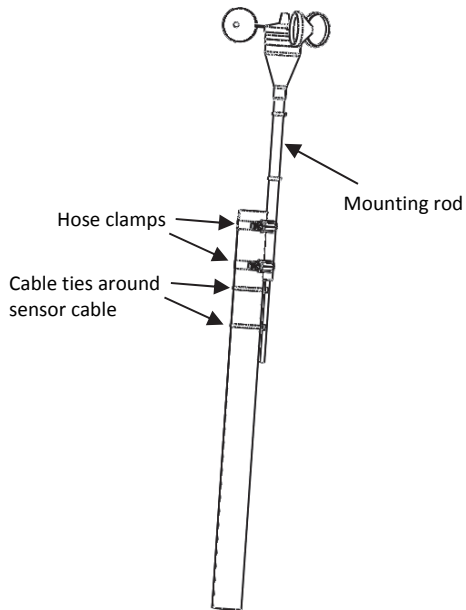
1. Insert a 1/4-20 x 1-3/4 inch hex head bolt with a flat washer on it through the 1/4 inch hole on the end of the cross arm. Tighten with a 7/16 inch wrench until snug.
2. Install another flat washer and nylock nut on the bolt, allowing the black mounting rod to protrude 1/2 inch (1.3 cm) from the bottom of the cross arm.
3. Insert the sensor mounting rod into the cross arm. Secure the ground wire to the lug nut on the cross arm.
4. Tighten the nut and bolt until the rod is clamped in place.
5. Adjust the height of the sensor in the cross arm as necessary using one of the following methods and then tighten the nut and bolt until the cross arm just starts to deform.

- a. Loosen the tri-clamp bolts and raise or lower the entire mast so that the wind sensor is close to the desired height. Make sure there is at least 5 cm (2 inches) of mast extending below the lower tri-clamp.
  - b. Make sure the upper mast dimple is still facing north (if in northern hemisphere) and then re-tighten the tri-clamps. Once the tri-clamp bolts are tight, tighten the lock nuts to lock the bolts in place. This requires two wrenches: one to hold the bolt and one to tighten the lock nut against the tri-clamp.
  - c. Loosen the bolt holding the wind sensor mounting rod and raise or lower it as necessary so the center of the wind sensor anemometer cups is at the desired height. Re-tighten the bolt.
6. Use cable ties to secure the sensor cables to the cross arm, bracket, and mast. The sensor cables should run below the cross arm and brackets to minimize the chance of birds pecking and damaging the cables. Cable ties should be spaced no more than .3 m (1 foot) apart. Make sure there are drip loops on both sides of the smart sensor housing, which must also be mounted horizontally, as described under *Placement and Mounting Considerations*.



### Mounting the Sensor to a Pole

1. Loosely secure the sensor mounting pole with two hose clamps (not included) as shown below. Adjust the height of the sensor as necessary, but make sure the hose clamps are separated by at least 4 inches (10 cm).
2. Secure the sensor cable with cable ties. See diagram on next page. Make sure there are drip loops on both sides of the smart sensor housing, which must also be mounted horizontally, as described under *Placement and Mounting Considerations*.



3. Tighten the hose clamps making sure the mounting rod remains vertical.

## Connecting the Sensor to a Station

To connect the sensor to a station, stop the station from logging and insert the smart sensor's modular jack into an available smart sensor port on the station. See the station manual for details on operating stations with smart sensors.

## Measurement Operation

Wind speed measurements are averaged over the logging interval or a 3-second timeframe (whichever is greater). If you set up the sensor to log faster than every 3 seconds, the same sensor reading will be recorded until a new 3-second average is calculated. For example, if the sensor is logging at a 1-second interval, the sensor will report the same wind speed (its calculated average) for three samples before calculating and reporting a new value for another three samples. Gust speed is the highest three-second wind recorded during the logging interval. Measurement averaging for this sensor is independent of the logger's measurement averaging. Therefore the automatic measurement averaging for this sensor is not affected by any sampling intervals entered for averaging on other sensors.

## Maintenance

The sensor does not require any maintenance other than an occasional cleaning. If dust, cobwebs, salt or other contaminants collect in the cups of the anemometer, rinse the sensor with mild soap and fresh water.

## Verifying Sensor Accuracy

Onset recommends that you check the accuracy of the sensor annually. The Wind Speed smart sensor cannot be calibrated. Onset uses precision components to obtain accurate measurements. If the smart sensor is not providing accurate data, then it may be damaged or possibly worn out if it has been in use for several years.