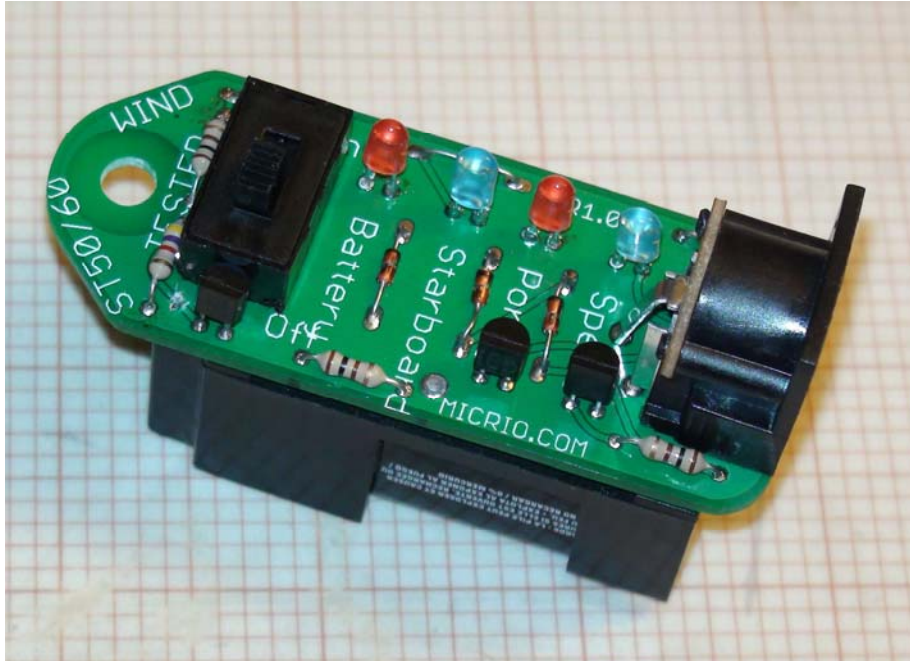# Micrio Tester
for the
Raymarine ST50, ST60, and ST60+ Wind Instruments.
Rev 1.1

The Micrio Wind Tester allows quick and easy testing of the Raymarine ST50/ST60/ST60+ masthead wind instrument.

The Micrio Wind Instrument Tester.

The Raymarine wind sensors can fail for a number or reasons; lightning, water corrosion, or mechanical damage.   Testing the masthead transducer is both difficult and tricky.

First you must use a bosun's chair, climb the mast, or un-step the mast before you can get at the masthead sensor.   After the masthead sensor is in hand you must perform a tricky analysis using voltmeters and power supplies.   A slipped wire can destroy the sensitive circuits inside.

The Micrio Wind Instrument Tester solves these problems.   If you climb the mast you can test the masthead sensor while at the top of the mast.   Simply plug the masthead instrument into the Micrio Tester and move the anemometer and the feather. The ultra-bright LED lights on the Tester will indicate the condition of the sensors inside the masthead instrument.   We use the highest brightness LEDs so that they can be seen in daylight.

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Using the Micrio Tester.

The Micrio Tester has a connector that will mate with the 5 pin connector on the Raymarine ST50, ST60, and ST50+ masthead instruments.   Power is supplied by a 9 volt battery.   There are 4 LED's to indicate the condition of the various circuits in the wind instrument.   Power is controlled with an On/Off switch.   To conserve the battery, the switch should be left off when not actually doing testing.

Old style masthead wind instrument.

The Micrio Tester is compatible with both the new and old style masthead instruments.   The old style was used with the ST50 and ST60 wind instruments.   The new style is used with the ST60+ wind instrument.

Micrio Tester with new style masthead instrument.

Micrio Tester with old style masthead instrument.

The Battery LED.

The red LED nearest the switch is labeled "Battery". This LED indicates two things; the condition of the battery and will detect short circuits in the wind instrument. If the battery voltage drops below a usable level then the battery LED will go out. You should check this before climbing the mast.

Climb the mast and remove the masthead wind speed/direction sensor by unscrewing the hand nut and pulling straight out on the arm. The sensor has a five pin connector that looks like this:

The Masthead Sensor Connector

The five male pins at the mast end of the sensor arm plug into the female connector on the tester.

Turn the tester switch to on. The Micrio Tester has a current limiting circuit so that a short circuit in the wind instrument will not cause any further damage. If this circuit detects a short circuit then the LED will go out. In this case no further testing can be done.

The Port and Starboard LEDs.

The middle two LEDs are labeled port (red) and starboard (blue). They indicate the status of the wind direction sensor. As the wind direction feather is rotated the two LEDs will flash on and off. They will not be in unison; they will be at peak brightness 90 degrees from each other. As you rotate the feather one LED will be at it's brightest. As you continue to rotate the feather that LED will fade and the other one will become bright. Continuing, the first LED will fade out as the second LED decreases in brightness. This process will continue cycling as you rotate the feather around multiple times. It is this pattern that indicates proper operation.

If one LED remains constantly bright or dim then the wind direction sensor circuit has failed. It is entirely possible that one LED will indicate proper operation and the other one will indicate failure.

The terms "port" and 'starboard" can be confusing in this context. These are the terms that Raymarine uses to describe the circuit so we also use them. The terms do not relate to the directions on a boat. They are used to describe signals that peak at 90 degrees from each other.

The position of the feather with respect to the position of any signal peak is not important. The only important consideration is that they move cyclically as the feather is rotated. The alignment of the feather with the axis of the boat is done during the calibration process as described in the Raymarine literature.

The Speed LED.

The blue LED nearest the connector is labeled speed. This is used to test the anemometer. The anemometer sends pulses to the wind display. There are two pulses for each rotation. The speed LED shows these pulses. As you rotate the anemometer the speed LED should flash on and off. If the LED remains on or off then there is a failure.

If the tester indicates that your masthead sensor is working properly, the problem is likely in the wind instrument or the wiring between the masthead sensor and the instrument.

The connector on the masthead sensor.

This is a view of the masthead transducer connector as you look at the pins.
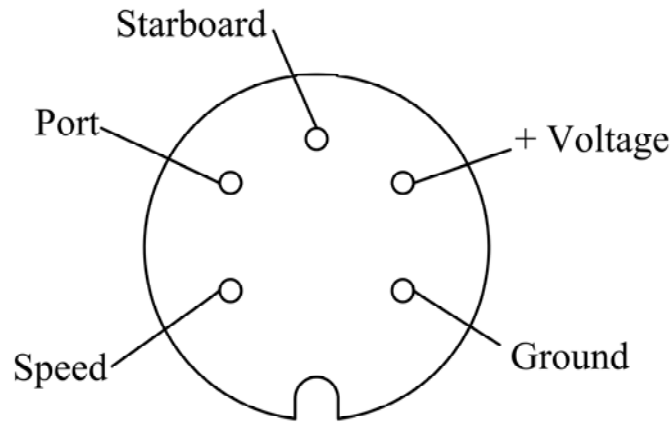
Masthead transducer connector

Maintenance Tip.

The wind speed anemometer is on the bottom of the masthead transducer. The anemometer hub forms a cup where rain will collect. Raymarine anticipated this and put a small hole in the bottom of the cup to let the rain out. However, over time dirt also collects in this cup and will block the hole. During a rain storm the cup fills with water causing the small ball bearing on the anemometer shaft to run under water. Actually, by now it is muddy water. The dirt will enter the bearing and cause it to lock-up and fail.

The solution is to clean this hole periodically. It might be a good idea to drill extra holes in some circumstances.