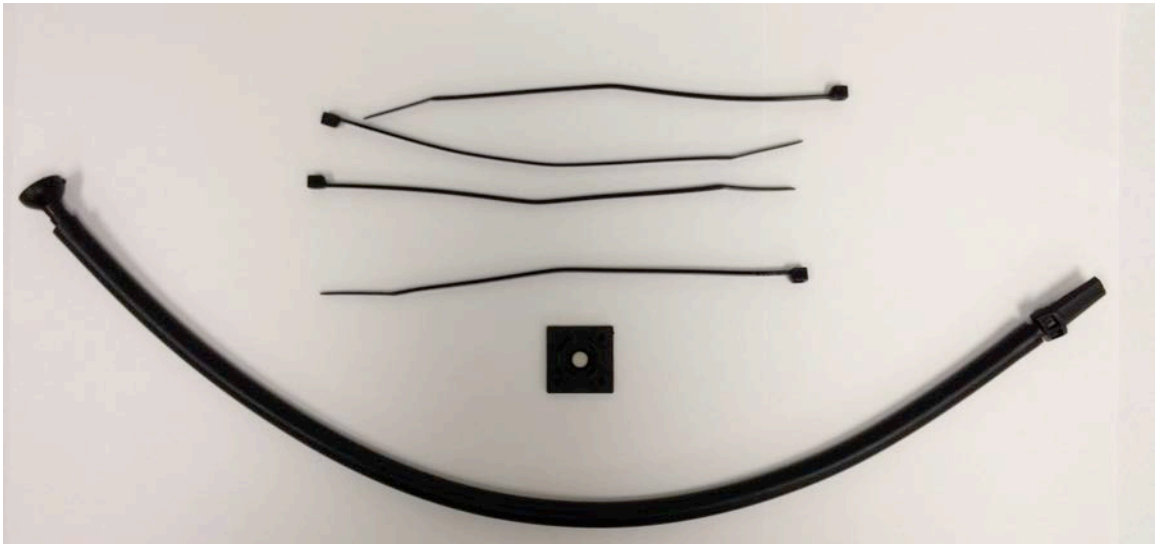
Remote Wind Sensor
for Newton® Power Cycling Computer

January 2016



Newton

What is the Remote Wind Sensor?

The Remote Wind Sensor (RWS) is an optional Newton® accessory that works with any the Newton Power Cycling Computer. The RWS consists of a specially-shaped plug that inserts into the Newton's wind port, a length of black flexible tube, and a wind port funnel. The plug and the funnel are connected together by the flexible tube that is cut to the appropriate length by the installer. The funnel is located and fastened by the installer at a place on the handlebars so that the funnel sees an unobstructed view of the opposing wind. That's all there is to it!

When is the RWS beneficial?

Below are the situations when the RWS can improve the wind measurement function of the Newton:

1) On bikes with aero bars. The RWS allows the opposing air to be measured far away from the turbulence caused by aero bars.
2) For TT cyclists who use aero-bar-mounted water bottles, the RWS provides an ideal means to locate the Newton on the stem, directly behind the water bottle, *and* to get great Newton wind measurement performance.
3) For riders who ride frequently in the rain, the RWS can help prevent water from entering the wind port. Keeping water away from the wind port improves the quality of the wind measurement in rainy conditions.
4) For specialty bikes such as recumbents or tandem bikes, the RWS provides a means to measure wind speed remotely, in front of the recumbent bike's fairings. For tandem bikes, the stoker can obtain total power readings simply by locating the RWS at the front of the bike, then snaking a long piece of flexible hose along the top tube of the bike, allowing its connection to the stoker's Newton.

If any of the above situations apply to you, then the RWS will improve the quality of your Newton's operation.

How to Install the Remote Wind Sensor

Before starting the installation of the RWS there are three things you must determine:

1) Decide where you will mount the Newton to your bike
2) Decide where you will place the wind port funnel
3) Determine the routing of the flexible tube between the funnel and the Newton

In making these three decisions, keep these factors in mind:

- You'll need to have about a 2 inch space between the front of the Newton and any adjacent obstructions (such as a TT water bottle). This space is needed for the RWS tube and flexible tube.

- You'll want to be sure the flexible tube is secured at each end: at the Newton end, so that the plug does not fall out of the Newton while traveling on rough roads, and at the funnel end, so that the funnel remains reasonably stationary and doesn't "flap in the breeze"

- You'll want to locate the flexible tube so that its installation is neat and free of kinks. Also, remember that the shorter the tube, the easier it is to fasten and keep in place.

Sample Installations

Here are photos of three different installations (photos taken with Gen III iBike and clear flexible tube), all of which produce excellent results. These are just suggestions; you'll likely want to customize things some for your own bike:

PHOTO COURTESY OF ANDY SHEN

PHOTO COURTESY OF JAMES LEWIS

Installation Steps

1) FOR NEWTON AND NEWTON 5: **REMOVE THE GREEN WIND VANE THAT IS LOCATED IN THE CENTER OF THE NEWTON'S WIND PORT (NEWTON 6 DOES NOT HAVE WIND VANE)**

   Use a pair of pliers to pull the vane out; it won't take much force.

2) Attach *loosely* one end of the flexible hose to the RWS plug. The plug is the piece that fits into the Newton wind port. At a later point in the installation process you may want to remove the tube from the plug, so don't push the hose all the way into the plug!
3) Attach your Newton to your mount.
4) Insert the plug into the wind port of the Newton. When the plug is inserted properly the tube will point straight ahead. Note that the plug fits in only one direction.
5) Locate your Newton mount on your bike such that the RWS plug can be removed easily from the Newton, and the tube can bend away gently from the Newton, without kinks or undue stress on the tube. If the angle of the bend is too severe it's likely that the plug will pop-out during riding. Here are examples of a correctly located Newton/plug combination:

6) Once you've got your Newton located appropriately, fasten its mount permanently to the bike. Next, snake your flexible tube along the path to where you've chosen to mount your funnel. The path locates the distant end of the tube out on the handlebars, where there is an unobstructed view of the wind. Here's an example of one possible path (two other paths are shown in the photos above). Note that there are no severe bends or kinks in the path selected:

PHOTO COURTESY OF ANDY SHEN

7) Once you've determined where your funnel will go, cut the flexible tube to the appropriate length.

TIP: IF THE SUPPLIED 24 INCH TUBING IS NOT LONG ENOUGH, YOU CAN PURCHASE 3/8 O.D BY ¼" I.D. TUBING AT ANY HARDWARE STORE.

8) Now, insert the funnel into the far end of the tube.
9) Next, use the enclosed zip ties sticker to attach the flexible hose to the handlebars. Here is an example of the funnel attached at the end of TT bars, held in place with yellow zip ties:

PHOTO COURTESY OF ANDY SHEN

10) Position the funnel so that it points into the wind, then tighten the zip ties so that the tube does not move, *but make sure the tube is not pinched shut.*

11) Next, snake the tube around the handlebars, using the zip ties and zip tie sticker as needed to hold the tube on the handlebars, making sure the tube's end is next to the Newton.

12) Now, press the wind port plug firmly into the tube, making sure the plug is rotated so that the plug will insert easily into the wind port of your Newton.

TIP: THE PLUG FITS PROPERLY INTO THE NEWTON WIND PORT IN ONLY ONE ORIENTATION. MAKE SURE YOU'VE ROTATED THE PLUG ON THE FLEXIBLE TUBING SO THE PLUG INSERTS EASILY, IN THE CORRECT ORIENTATION.

13) Finally, check to make sure your flexible hose is securely fastened, your funnel is reasonably level, and the plug inserts and remains in the the Newton wind port without difficulty.

Your installation is complete!

Calibrating your Newton with the Remote Wind Sensor

After you have installed your RWS, YOU MUST DO A NEW CALIBRATION RIDE.

The calibration procedure with the RWS is identical to a "typical" Newton calibration:

1) Select the profile number where you want your RWS profile number to be stored
2) Enter all appropriate bike and cyclist data, using Isaac software (Newton)
3) Perform Cal Ride

Using the Remote Wind Sensor

PRIOR TO EACH RIDE

Before starting a ride, make sure to plug in the RWS to the front port of your Newton and make sure it fits snugly into your Newton's wind port.

NOTICE: IF YOU FORGET TO PLUG IN THE RWS PRIOR TO YOUR RIDE, YOUR WATTS DATA LIKELY WILL BE INCORRECT.

RIDING IN THE RAIN

Don't worry if rain enters the flexible tubing. Because of the design of the RWS, you will still get good-quality wind speed readings as long as the rain water does not enter the wind port of the Newton.

DISCONNECTING THE RWS AFTER THE RIDE

Pull the RWS plug straight out from the Newton; don't twist it out or manhandle it unnecessarily.

TROUBLESHOOTING

Problem: *I get significantly different watts readings after installing the RWS.*

Solution: You MUST perform a new Cal Ride after installing the RWS. Make sure to create a new profile, do the calibrations, and use your correct RWS profile when you ride with the RWS.

Problem: *My wind speed readings are low and/or jumpy when I use the RWS.*

Solution: Make sure there are no kinks in the flexible tube, where airflow might be restricted. Also, make sure you've routed your flexible tubing in a manner such that you don't pinch the tube when your handlebars rotate, or you pinch the tube when you grab the handlebars.