

VOLLRATHD'S SWITCHIR METER

As a refresher, these servo extensions are a very critical portion of our RC equipment. Any problems with these units can result in an untimely short life of a model airplane.

This test meter directly measures the resistance of the servo extension cable (or receiver switch harness) with a programmed resolution of one milli-Ohm, or 1/1000 of an Ohm. The Analog to Digital converter used on this project is capable of a resolution of 0.01 milliOhms.

The typical digital multimeter is limited to around one Ohm resolution which is not useful for checking these servo connectors. Even my \$400 Fluke digital multimeter can't do the job.

The typical resistance of a twelve inch #20 gauge servo extension is on the order of

55 milliOhms. (Or 0.055 Ohms) A 24 inch #20 gauge would be double that value, around 110 milliOhms.

I have found bad cables in brand new servo extensions purchased from Maxx products. The problem appears only with their #20 gauge servo extensions. Some of those cables measured over 500 milliOhms.

Pulling slightly on those bad #20 servo wires often drops the resistance by a factor of two, a direct indication of an improper crimping job. FYI, a proper terminal crimping job consists of squeezing the servo pin into the wire strands, resulting in a gas tight connection.

If that crimping job isn't proper, those wires are just laying in the pin, where just slightly tugging on the lead wires can dramatically change the resistance as measured by this meter.

Obviously, the resistance of a servo extension should never change by slightly pulling on its lead wires with a pound or so of force.

This meter is also useful for checking those receiver switch harnesses. With the switch closed, the black and red wires should show a very low resistance, on the order of 50 or 60 milliohms.

Flipping the receiver switch to its open position should result in the SwitchIR meter showing only the red wire as open.

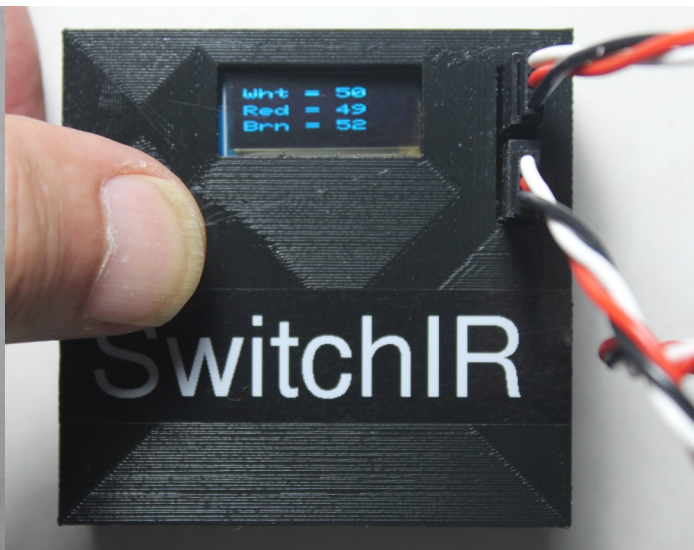
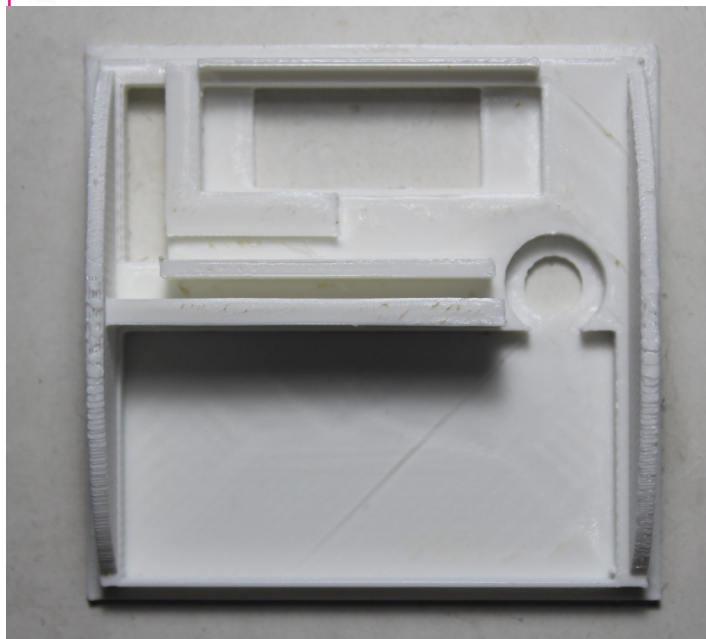
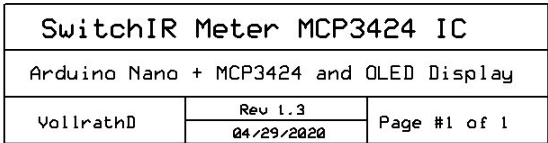
Normally, a quality receiver switch only opens the switch red wire, with the black wire running straight through the switch. If you ever find a switch that opens BOTH the red and the black wires, the switch manufacturer wired the two switch contacts in series like a cheap Christmas string of lights rather than the proper parallel wiring.

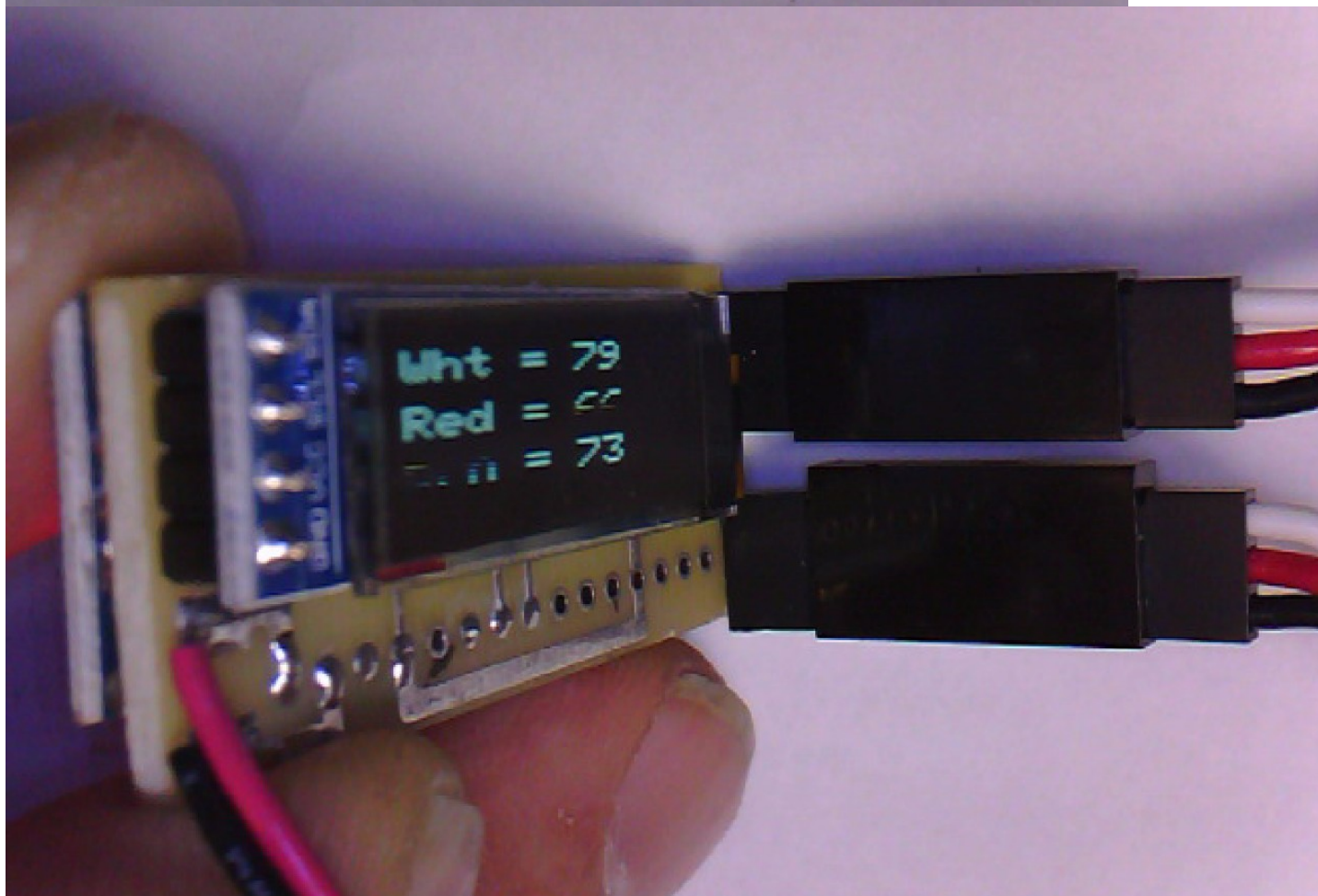
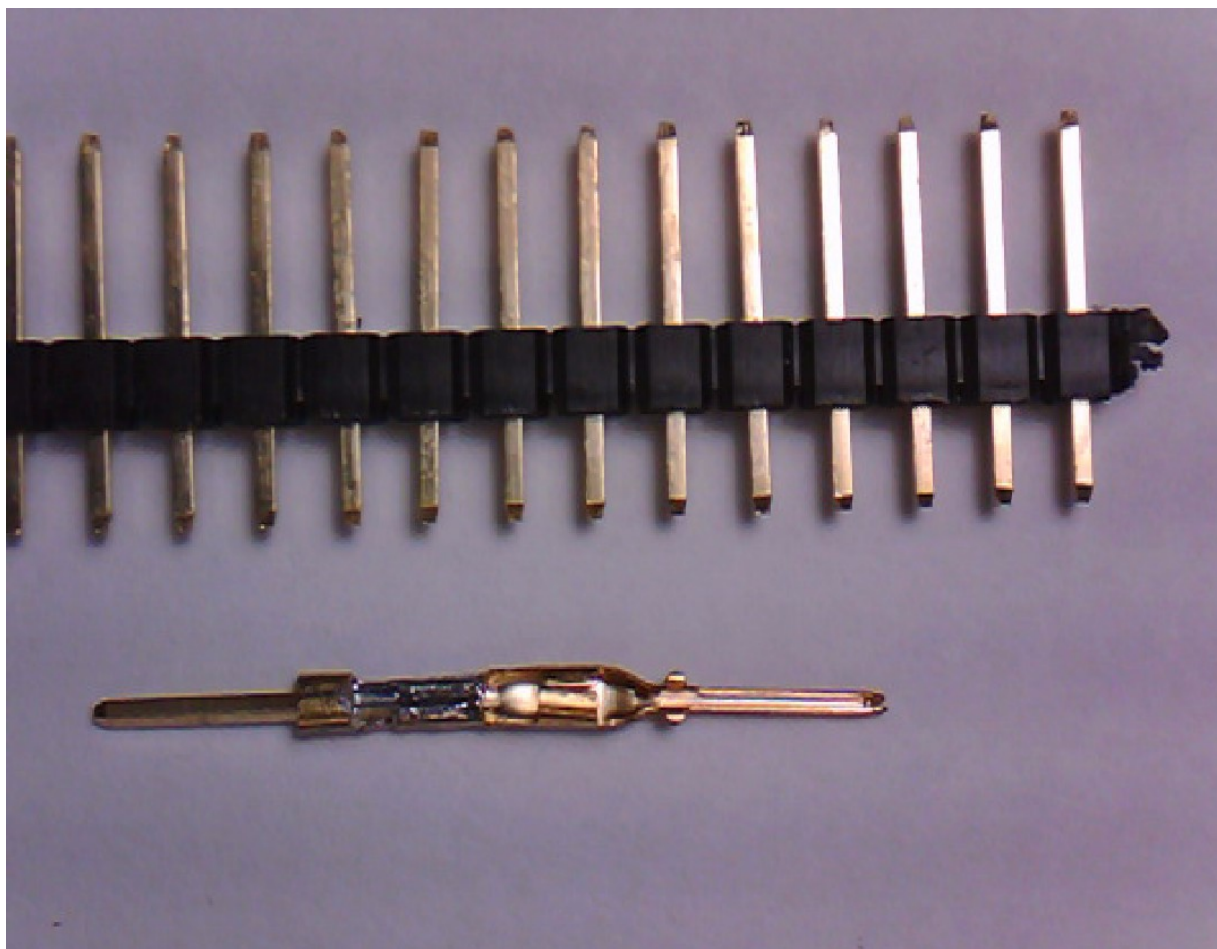
And, yes, previous versions of this SwitchIR meter has found bad receiver switches.

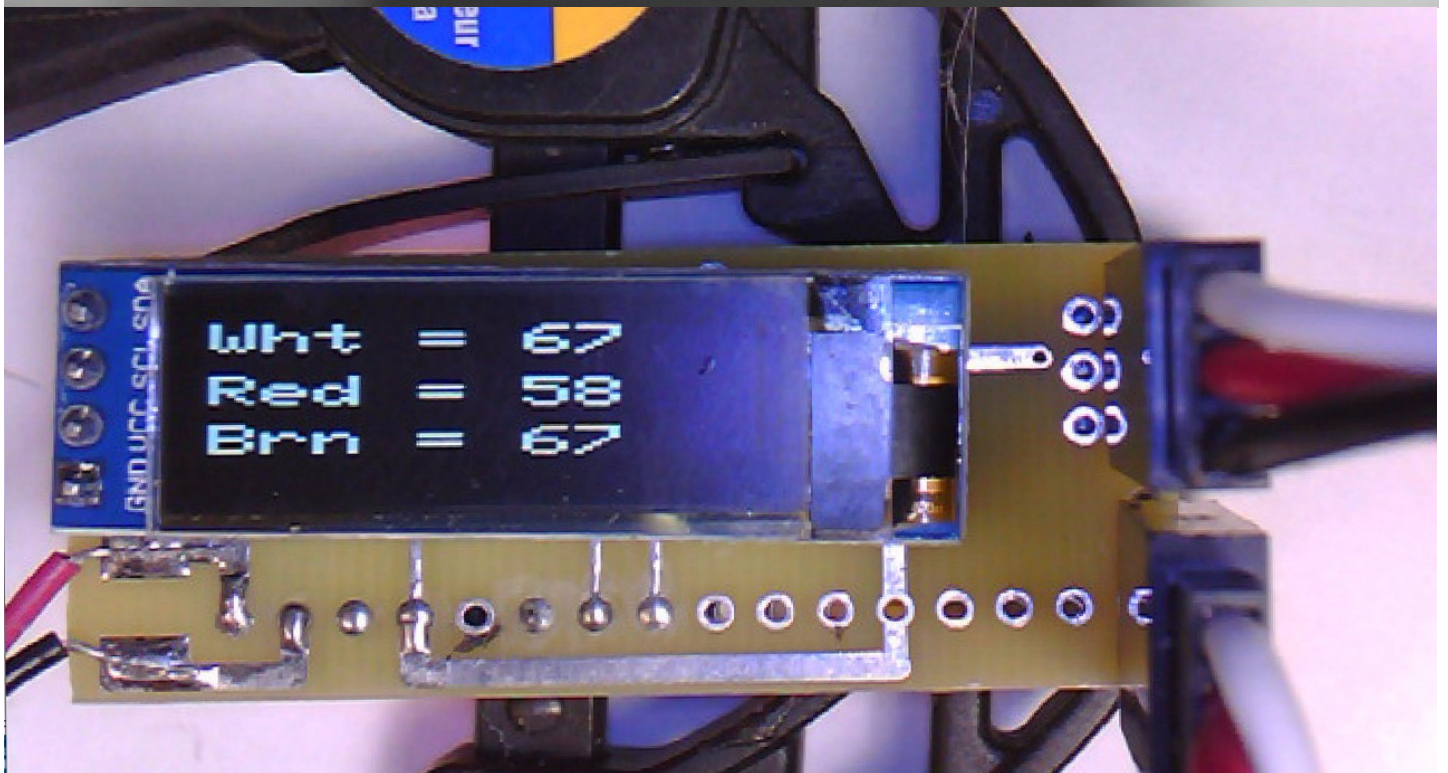
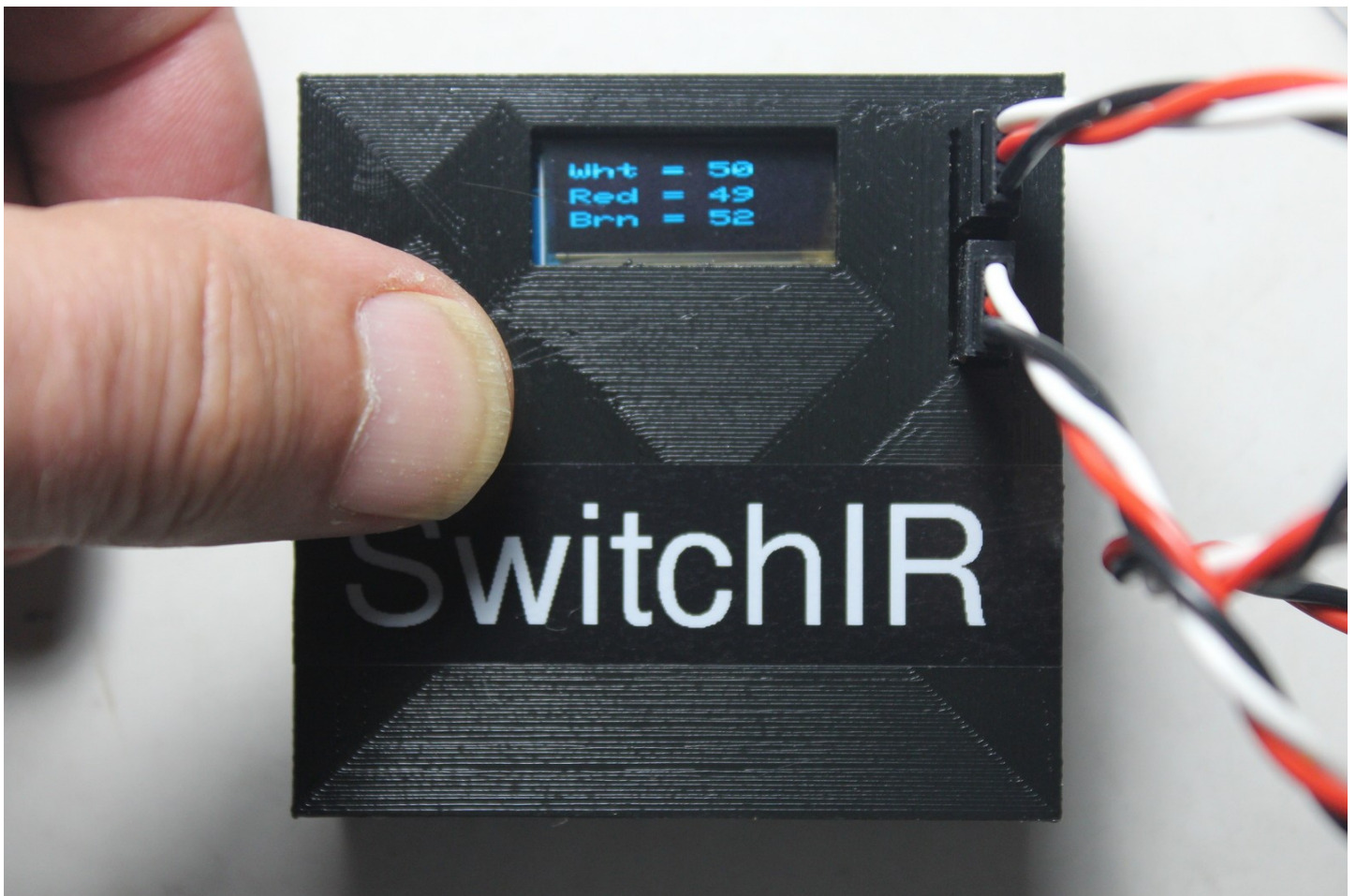
With parallel switch contact wiring, both contacts must fail before the model is lost. Some quality switches use four poles in parallel.

With the series wiring, if either switch contact fails, your model has little time left to live. The proper thing to do is cut off its lead wires so no one else uses it, and junk it.

If you want a surprise on your receiver slide switches, connect it up to this SwitchIR meter, move the switch to the "ON" position. Then, very slowly, move the switch to the "Off" position, noting how far the switch slider moves before the switch is in the open position. Those slide switches only move around 10 times the thickness of a piece of paper between closed and open.







NOTE! Not all of the Arduino Nano pins
are installed or used!

