

# Testing 110S Temperature Sensor

## Introduction

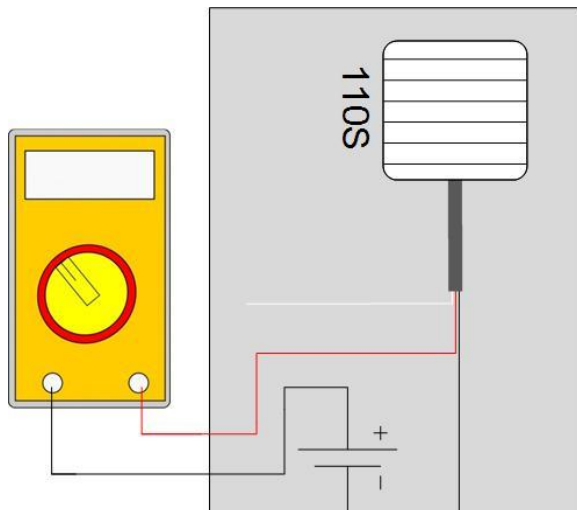
The 110S Temperature Sensor uses an integrated circuit to measure temperature. By checking the voltage output and current draw of the sensor its health can be determined. The 110S runs on an excitation voltage from 4 to 35 V DC and will draw no more than 300uA.

## Tools Required:

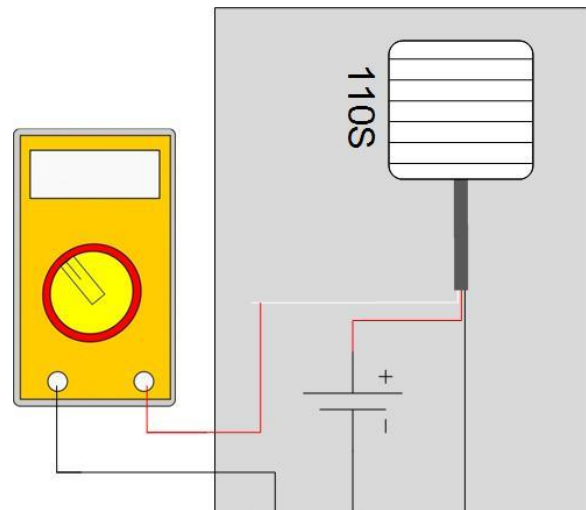
- 4V to 35V DC power supply (consider using an iPack's 12V battery)
- Digital voltmeter (DVM)
- Reference Temperature Probe (Thermometer)
- 2 sets of clip leads

## Test 1: Current check

- 1) Connect the DC supply in series with a current meter to power the 110S black (-) and red (+) leads. If the current is higher than 300uA, something is wrong and the sensor should be replaced.



Test 1: Current Check



Test 2: Voltage Check

**Test 2: Signal Output Check:**

- 1) Power the probe with the 9 V battery connected to the 110S black (-) and red (+) leads.
- 2) Read the output voltage between the black (-) and signal (clear) leads.
- 3) Convert that voltage into a temperature (using the formulas below) and compare against a reference thermometer.
  - a) Degrees F =  $(V_{out} \times 100) - 123.5$
  - b) Degrees C =  $(V_{out} \times 55.55) - 86.38$
- 4) If the 110S is within 2 degrees of the reference it is good. Sometimes the perceived problem is confusion regarding the conversion from volts to degrees.

**Example Degrees F:**

- An output reading of 2.140 Volts is taken across the white and black leads.
- Degrees F =  $(2.140 \times 100) - 123.5$
- Degrees F = 90.5

**Example Degrees C:**

- An output reading of 2.140 Volts is taken across the white and black leads.
- Degrees C =  $(2.140 \times 55.55) - 86.38$
- Degrees C = 32.5