 [How can measurements be made using a 107, 108, or 109 temperature sensor/probe with a measurement device other than a Campbell Scientific datalogger?](https://www.campbellsci.com/faqs?v=736)

The sensor/probe consists of a non-linear thermistor configured with a precision resistor in a half-bridge circuit, as shown in the product’s manual:

* [Model 107 Temperature Probe Instruction Manual](http://s.campbellsci.com/documents/us/manuals/107.pdf" \t "_blank)
* [Model 108 Temperature Probe Instruction Manual](http://s.campbellsci.com/documents/us/manuals/108.pdf" \t "_blank)
* [108-LC Temperature Probe for MetData1 Instruction Manual](http://s.campbellsci.com/documents/us/manuals/108-lc.pdf" \t "_blank)
* [Model 109 Temperature Probe Instruction Manual](http://s.campbellsci.com/documents/us/manuals/109.pdf" \t "_blank)

To measure the sensor/probe, the measurement device has to provide a precision excitation voltage (Campbell Scientific dataloggers use 2000 mV), measure the voltage across the precision resistor, determine the thermistor resistance (Ohm's law), and convert the resistance to temperature using the Steinhart-Hart equation.

The Steinhart-Hart equation is 1/*T* = *A* + *B*ln(*R)* + *C*(ln(*R*))3 where:

* *T* is the temperature in Kelvin
* *R* is the resistance at *T* in ohms
* *A, B,* and *C* are the Steinhart-Hart coefficients, which vary depending on the temperature range of interest, as well as the type and model of the thermistor

For the 107-L, 107-LC, 108-L, and 108-LC, the following are the coefficients for the Steinhart-Hart equation:

* *A* = 8.271111E-4
* *B* = 2.088020E-4
* *C* = 8.059200E-8

For the 109-L, the following are the coefficients for the Steinhart-Hart equation:

* *A* = 1.129241E-3
* *B* = 2.341077E-4
* *C* = 8.775468E-8