Universal Temperature Probe MODEL EI-1022

Instruction Manual

July 25, 2007

Description

The EI-1022 is a universal temperature probe that consists of a National Semiconductor temperature sensor mounted in a plastic tube with a current limiting resistor. This probe when connected to 5 volts DC will output a nominal 3.0 volts at room temperature. The probe is suitable for air and surface applications.

The EI-1022 is intended to be connected to a LabJack for 5 volt power but can be used as a stand-alone temperature sensor when connected to a DVM and a 5 volt source.

Electrical Connections

Three wires require connections; they are +5 volts (red), ground (black) and output (white). These wires can be connected to the appropriate terminal on the LabJack or DVM/power-supply in the case of using the sensor as a stand-alone unit. The output wire will normally output a voltage of approximately 3 volts at room temperature.

LabJack Setup

U12, LJlogger

If the temperature probe is used with the LabJack U12, it may be desirable to use the LJlogger program to display temperature in degrees F or C. In order to make the LJlogger readout in degrees C simply enter 100 for the multiplier and –273.15 for the offset in the appropriate row corresponding to the temperature sensor. In order to make the LJ Logger readout in degrees F simply enter 180 for the multiplier and –459.67 for the offset. The temperature will appear in the “scaled data” column.

U3 Special Considerations

The probe outputs 10 mV per degree K. That means that at room temperature, the probe outputs about 3 volts, but the normal single-ended range of the U3 is about 0-2.44 volts.

The solution is simply to use the "Special 0-3.6" volt range which is mentioned in Section 2.6.1 of the U3 User's Guide. To get this range, use a differential channel where the negative channel is set to the special internal value of 32. The analog input pseudo code in Section 4.3.3 shows a request using the 0-3.6 volt range. To get this range in DAQFactory Express, put 32 in the QuickNote/Special/OPC column for a particular channel.

Specifications

Range: -40°C to 100°C (-40°F to 212°F)
Output: 10 mV per °K absolute
Sensor device in probe: LM335A
Cable length: 6 ft supplied, 500 ft user extended
Probe dimensions: 4 in x 0.25 diameter
Power: +5 VDC at .001 Amp
Output Load: 50K or greater or 100 uA max

Accuracy:

+/- 1°C Typical	**Room Temperature**
+/- 3°C Max	**Room Temperature**
+/- 2°C Typical	**-40°C to 100°C**
+/- 5°C Max	**-40°C to 100°C**

FORMULAS TO CALCULATE TEMPERATURE FROM MEASURED PROBE VOLTAGE

°C= 100*volts – 273.15

°K= 100*volts

°F= ((100*volts)-273.15)*1.8 +32

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