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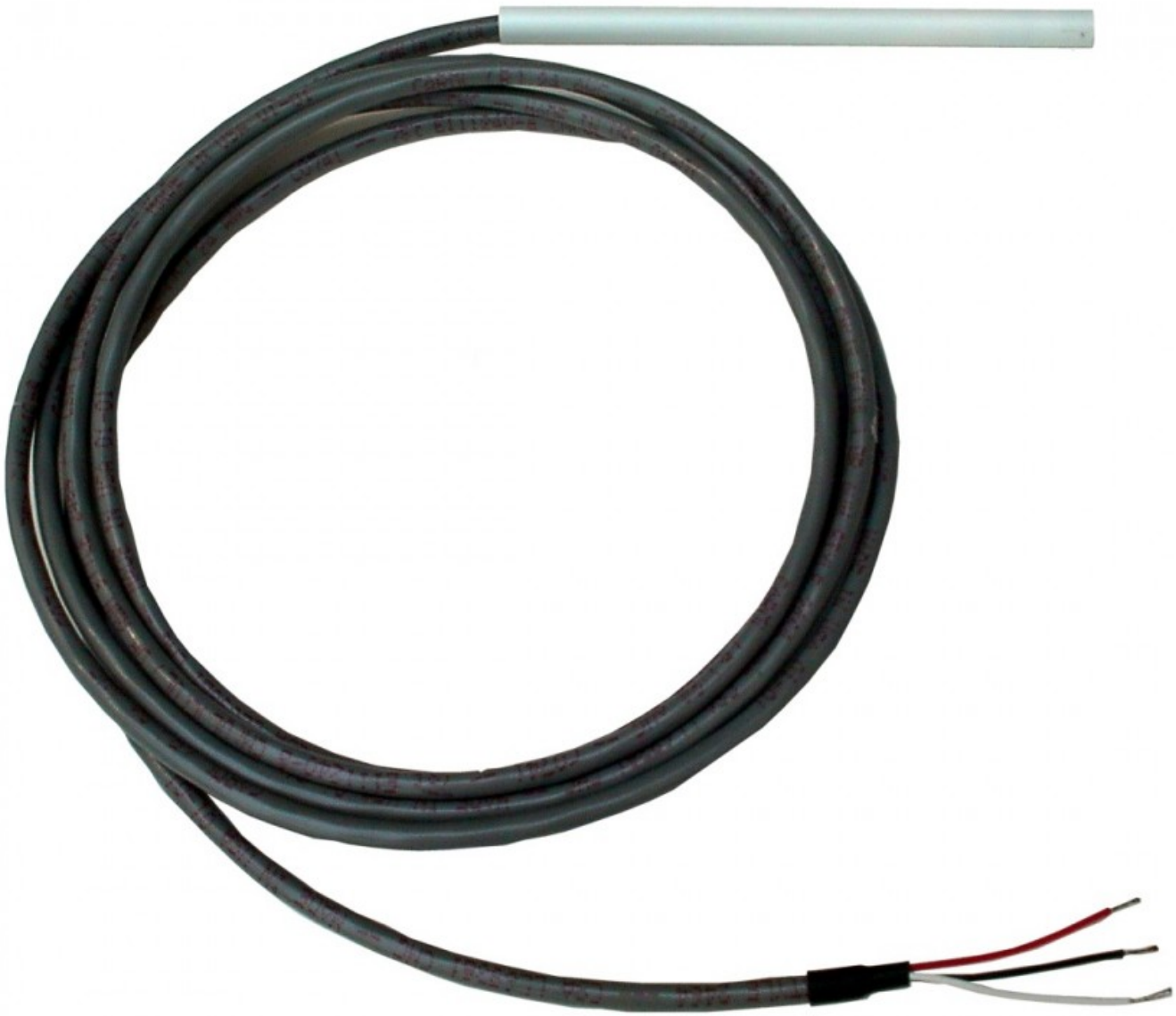
EI-1022 Datasheet



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.

Multiple probes can be connected to a single LabJack, up to the number of analog inputs available on the device.

Electrical Connections

Three wires require connections; they are +5 volts (red), ground (black) and output (white). These wires can be connected to the appropriate terminals on a LabJack or other 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 U12 Quickstart

Connect the red wire to +5V, black wire to GND, and white wire to AI0.

Run LJlogger. By default, the first row will be set to Channel = 0 SE, and the Voltage column should show something around 3.0 volts if the EI-1022 is at room temperature.

To improve resolution, you need to use gain which requires a differential channel. Add a jumper wire from AI1 to GND, then in the desired row of LJlogger set Channel = 0-1 Diff. Now you can adjust Gain so you are using the smallest range possible. For example, the +/-4V range would allow temperatures up to 400 degrees K.

To make LJlogger display degrees C, enter 100.0 for multiplier and –273.15 for offset in the appropriate row. To make LJlogger display degrees F, enter 180.0 for multiplier and –459.67 for offset. The scaled temperature will appear in the “Scaled Data” column.

UD Series and T Series Quickstart

Connect the red wire to VS, black wire to GND, and white wire to AIN0.

Run LJLogUD (UD series) or LJLogM (T series). By default, the first row will be set to +Ch=0 and -Ch=199 (single-ended), and the Voltage column should show something around 3.0 volts if the EI-1022 is at room temperature.

U3 Comment: If your max temperature will be less than 360 degrees K, you will get better resolution using a low-voltage channel (FIO or EIO) on the U3-HV, and that is the only option on the U3-LV. Connect the white signal wire to FIO4 rather than AIN0. In LJLog set +Ch=4, and since the "Special 0-3.6" volt range is needed set -Ch=32. In DAQFactory Express, put 32 in the QuickNote/Special/OPC column for a particular channel.

To make LJLog display degrees C, enter a scaling equation such as "y=100.0*c - 273.15" in the desired row. Note that "c" in this example means it will use the voltage from the 3rd row, so use the appropriate variable from "a" to "p". To make LJLog display degrees F, enter a scaling equation such as "y=180.0*c - 459.67" in the desired row.

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 µA 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

Special Notice Regarding The EI-1022 Cable

Although the temperature sensor and associated electronics are rated for 100 degrees C, the cable is only rated for 80 degrees C. We have tested the cable, probe at 150 degrees C, and have noticed the cable gets soft at the high temperatures but continues to function. When the cable and probe were returned to normal temperatures, no degrading was observed in the cable or probe. Also at the low temperatures, the cable is only rated to -20 degrees C where the sensor and associated electronics are rated lower. Testing the probe with the wire at the lower temperatures showed normal operation and no degrading of the cable when returned to normal temperatures. The user should be aware that even though the probe itself can operate at the rated temperatures the use of the cable in environments of over 80 degrees C and lower than 20 degrees C is at your own risk.

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