Mapúa University

School of Electrical, Electronics and Computer Engineering

Introduction to Embedded Systems

COE185P/ E01

Thermistor

Experiment No.6

Submitted By:

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Submitted To:

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I. Introduction

In this lab, it explores the principles of operation about thermistor. A thermistor is a temperature sensing element composed of sintered semiconductor material that exhibits a large change in resistance in proportion to a small change in temperature. There are two kinds of thermistor, one is its resistance increases with temperature and another one is its resistance decreases with temperature. Between these two, the most common is the latter one. The resistance decreases as the temperature increases. Thermistors are mostly used in digital thermometers and household appliances, such as ovens and refrigerators, and so on. Stability, sensitivity and time constant are the general properties of thermistors that make these thermistors durable, portable, cost-effective, highly sensitive and best for measuring single-point temperature.

II. Objectives

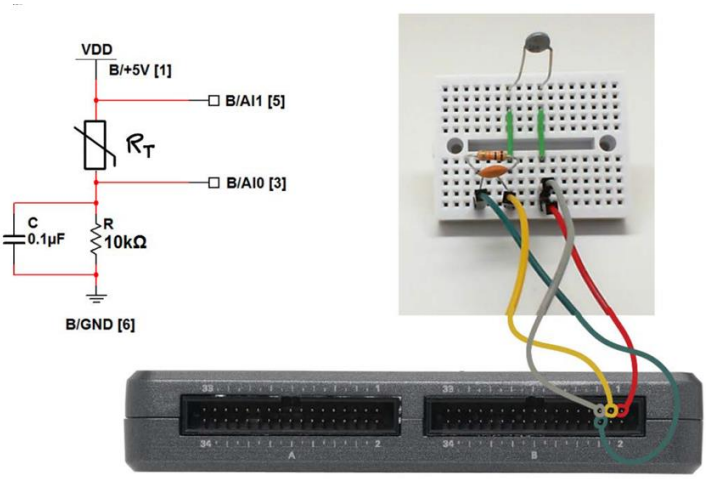
1. Explain the thermistor principles of operation,
2. Measure the thermistor resistance a voltage divider and analog input,
3. Convert the measured resistance to temperature with the Steinhart Hart thermistor equation, and
4. Size the voltage-divider resistor for the best measurement sensitivity and range.

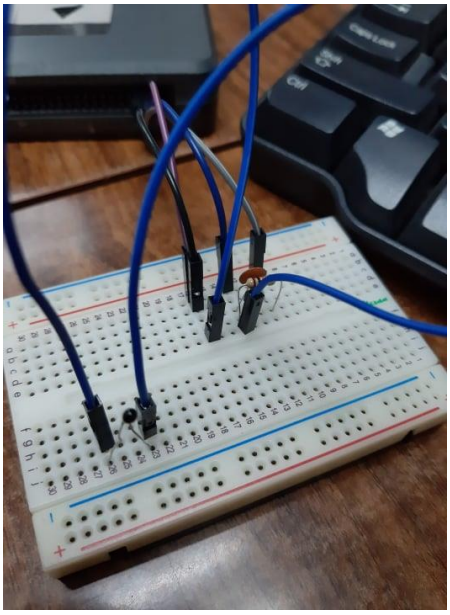
III. Materials and Components

- Breadboard
- Jumper wires
- Resistors
- Thermistor
- NI myRio kit
- MXP(myRio expansion port)

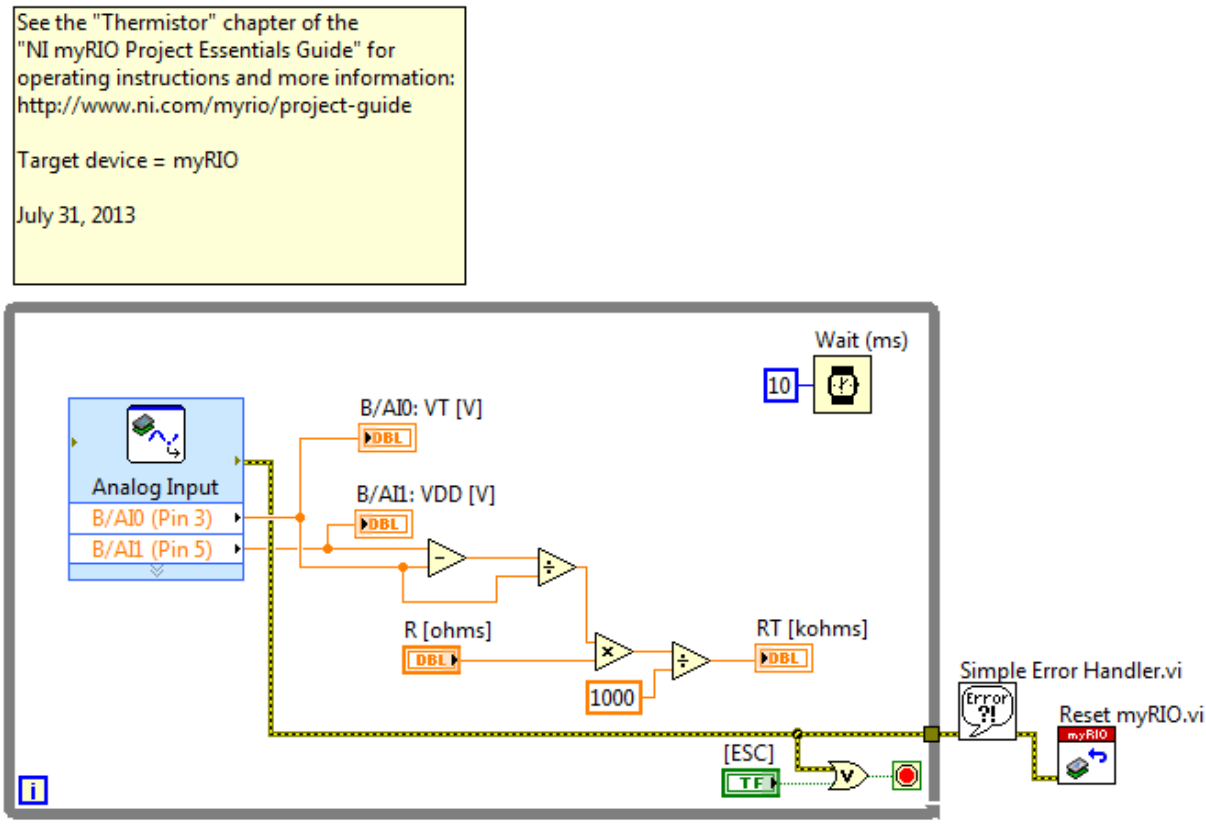
IV. PROCEDURE

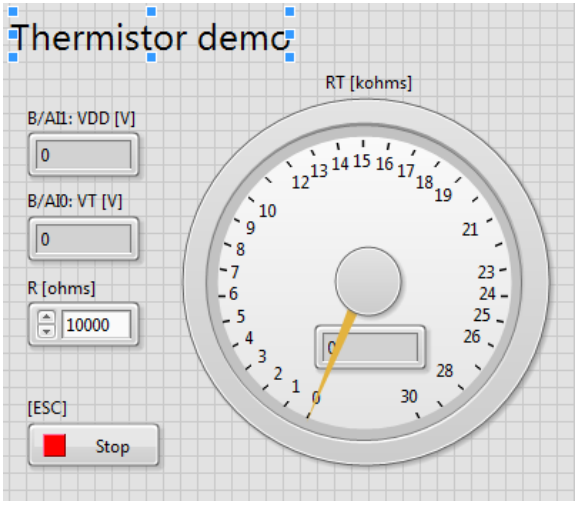
Step 1. Follow the diagram below and connect the parts.





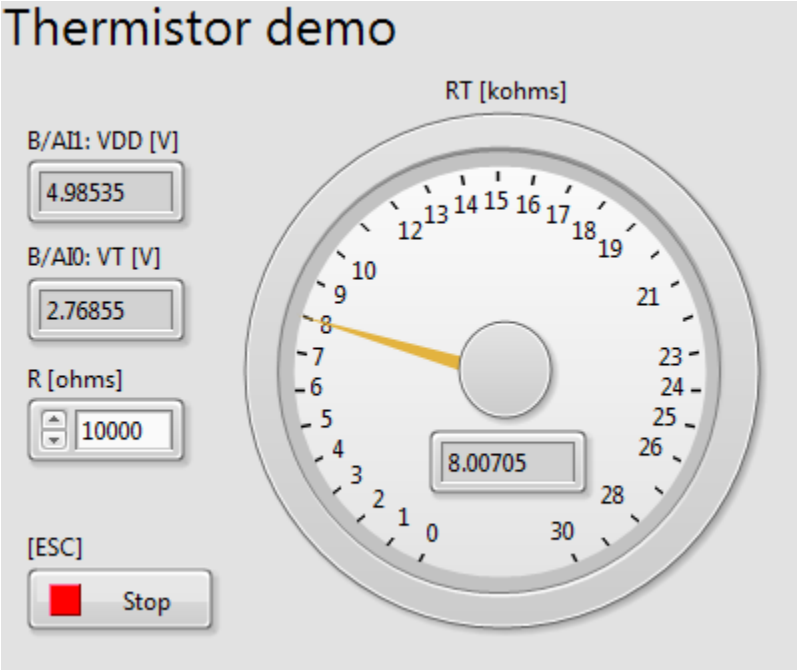
Step 2. Open LabView then execute the Demo





V. Results and Discussion

In this experiment, I didn't use all the provided materials like the myRio Expansion port because it didn't work so I manually connected it in the NI myRio kit. the measured resistance was able to convert to degrees Celsius. It was shown on the front panel. It was achieved by using a formula given on the video. in the computer, I open the LabView and select the thermistor demo file, and I execute the program. In the Front Panel, I can see the Total resistor is 8.00705K



VI. Conclusion

The purpose of this lab was to learn about the principles of a thermistor. A thermistor is a resistance thermometer or a resistor whose resistance is dependent on temperature. The term is a combination of “thermal” and “resistor”. It is made of metallic oxides, pressed into a bead, disk, or cylindrical shape and then encapsulated with an impermeable material such as epoxy or glass. We also learned how to convert the measured resistance to degrees Celsius and Fahrenheit using the given equation. Also, in this lab, we measured the thermistor resistance with the idea of the voltage divider. The voltage divider in the block diagram made voltage increases and the temperature high.