



Mapúa University

School of Electrical, Electronics and Computer Engineering

Introduction to Embedded Systems COE185P/ E01

Potentiometer

Experiment No.5

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I. Introduction

The potentiometer is essentially a voltage divider used for measuring electric potential (voltage); the component is an implementation of the same principle, hence its name. Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment. The potentiometer is an adjustable resistor which has three terminals. One terminal is connected to the wiper and the other terminals into the fixed-resistance track. The amount of the current flowing can be controlled by varying the value of the resistance. Rotating the shaft of the potentiometer rotates the wiper also making a change in the resistance. The common used typed of the potentiometer is the single turn rotary potentiometer. The main objective of this experiment is to modify the function of a potentiometer based on the stated condition.

II. Objectives

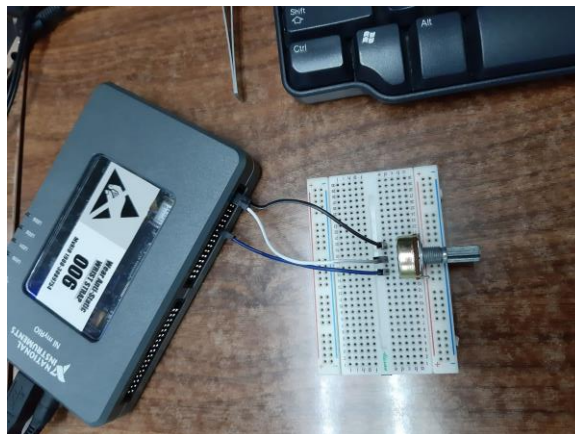
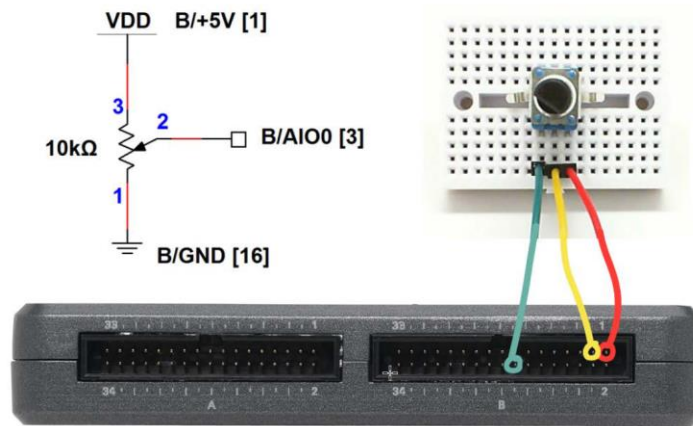
1. Discuss how the potentiometer can be used as either one variable resistor or two series-connected complementary variable resistors,
2. Connect a potentiometer as a voltage divider to produce a voltage proportional to the rotation angle, and
3. Select the potentiometer resistance to minimize power consumption and to minimize loading effects.

III. Materials and Components

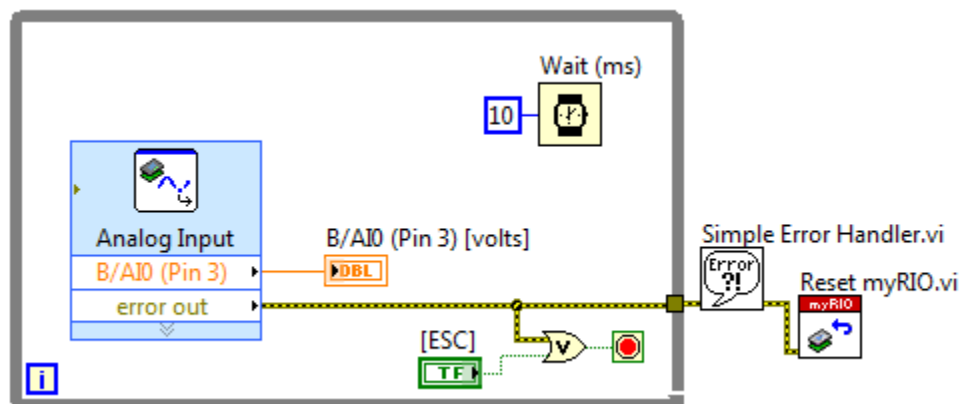
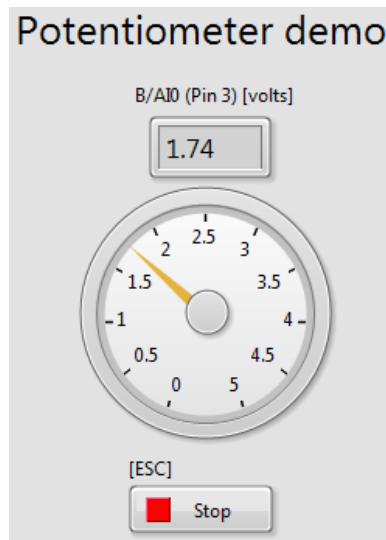
- Potentiometer, 10 k Ω
- Breadboard
- Jumper wires, M-F (3x)
- myRIO

IV. PROCEDURE

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

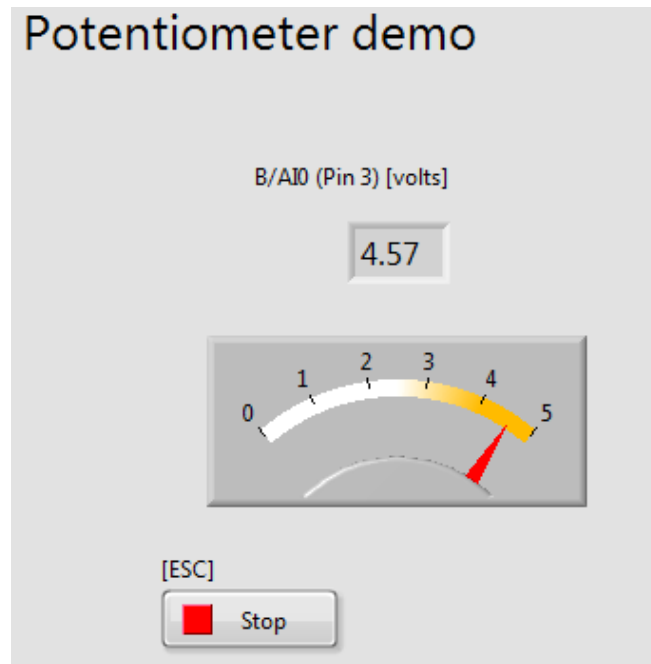


Step 2. OpenLab View then run the demo



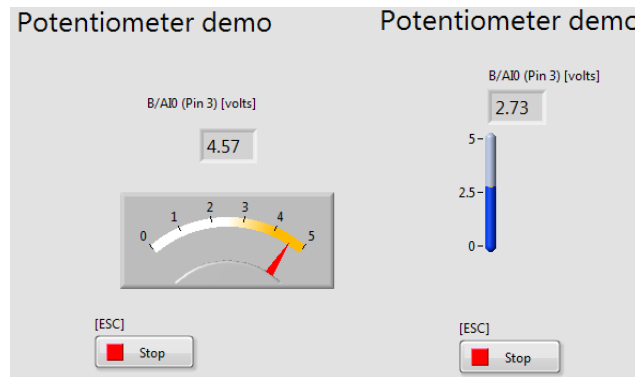
Basic Modifications

Step 1. Replace dial indicator with another type of indicator



V. Results and Discussion

In this experiment, I didn't use the myRio expansion instead I manually connected all the jumping wires from the NI myRio to the breadboard where the potentiometer placed. While the NI myRio is connected to the computer, I opened the Labview and executed the default program provided by the NI myRio. We used an indicator to easily observe the changes in voltage upon rotating the potentiometer. , there was a reading of change of voltage when I turned the knob clockwise and counterclockwise.



VI. Conclusion

The purpose of this experiment was to demonstrate the different modifications we do on potentiometer. A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat. The potentiometer can be used as one variable or two series-connected variable resistors. The two series-connected variable resistor works such that the middle terminal is connected to movable contact, then, the two other changes its value inversely with each other. The potentiometer voltage can be used to determine the input threshold.