Mapúa University

School of Electrical, Electronics and Computer Engineering

Introduction to Embedded Systems

COE185P/ E01

Digital Potentiometer

Experiment No. 10

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Submitted To:

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I. Introduction

A digital potentiometer is a digitally-controlled electronic component that mimics the function of a potentiometer and can be controlled through a program. It is often used for trimming and scaling analog signals by microcontrollers. It is integrated chip that accept input signals which means it modifies the resistance value through a digital input instead of manually changing the resistance value. The purpose of this experiment is to utilize the digital potentiometer wherein LabView was used for its digital input.

II. Objectives

After completing the activities in this chapter, you will be able to:

1. Adjust the digital potentiometer wiper position with SPI serial communications,
2. Porperly connect and operate the digital potentiometer as either a rheostat or as a potentiometer (voltage divider), and
3. Discuss the principles of the “virtual wiper” as implemented by an array of solid-state switches.

III. Materials and Components

- Digital Potentiometer
- Jumper Wires
- Small Screwdriver
- NI myRIO
- MXP

IV. PROCEDURE

Step 1. Open the Lab Manual then follow the diagram for the connections

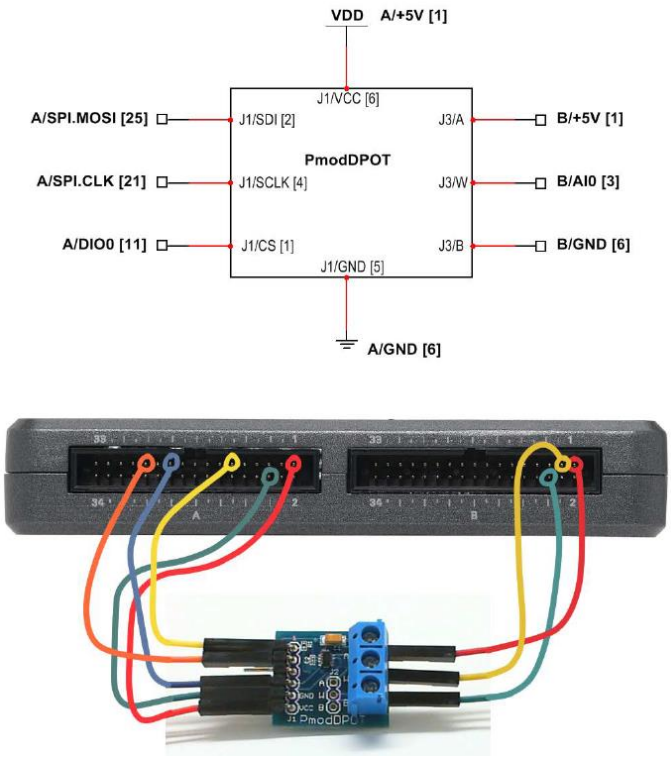


Figure 1. Connection Diagram of Digital Potentiometer and NI myRIO

Step 2. Open LabView and Digital Potentiometer Demo

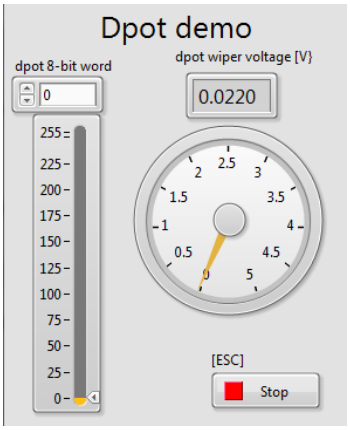


Figure 2. Digital Potentiometer Front Panel

Step 3. Run the Demo

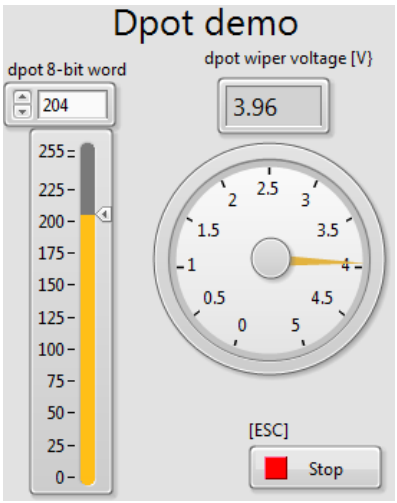
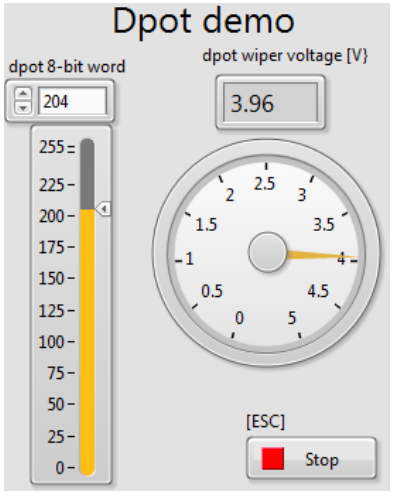


Figure 3. Runnig the Digital Potentiometer Demo

V. Results and Discussion

The first part of the experiment, the breadboard layout and the interface circuit were built based from the schematic provided by the manual. The demo provided a front panel and a slide control to control the digital potentiomter, As the potentiometer increases the voltage increase, they are directly proportional to each other.



VI. Conclusion

The digital potentiometer operates like a mechanical potentiometer, which is a variable resistor, except the digital potentiomter is an integrated chip (IC) that accepts signal input rather than the physical movement of a shaft or slide for adjustment. Potentiometers physically change the resistance value whereas digital potentiometers modify the resistance value via digital inputs rather than a physical slider or rotary wheel.