# Mapúa University

School of Electrical, Electronics and Computer Engineering

**Introduction to Embedded Systems**

COE185P/ E01

# DIP Switches

Experiment No.4

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**Submitted To:**

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# I. Introduction

DIP switches bundle multiple SPST switches together into a single component according to the book manual, DIP stands for “dual-in-line package”, the standard IC package style that is breadboard compatible.Two popular DIP switch style: a standard DIP switch containing eight SPST switches and a 16 position rotary DIP switch that manipulates the open-and-closed states of four SPST switches in a binary sequency.

# II. Objectives

1. Describ the following concepts related to switches and the NI myRIO interface:
   a. DIP switch bundles bundles N PST switches into a single component with each switch appearing as a short circuit in one position and as an open circuit in the other.
   b. 2N position rotary switch bundles N SPST switches into a single component, rotating the dial create a binary sequence of open-close switch states.
2. Interface a switch on any of the NI myRIO connectors without using additional components by using the DIO internal pull resistors.
3. Interpret the combined switch open-closed patterns as an interger numerical value, binary array, and individual bit fields.

# III. Materials and Components

- DIP Switch
- Rotary DIP switch
- Breadboard
- Jumper Wires, M-F (14x)
- Small srewdriver

# IV. PROCEDURE

Step 1. Download the DIP switch DEMO

Link: http://www.ni.com/academic/myrio/project-guide-vis.zip

Step 2. Open the DIP Switches DEMO

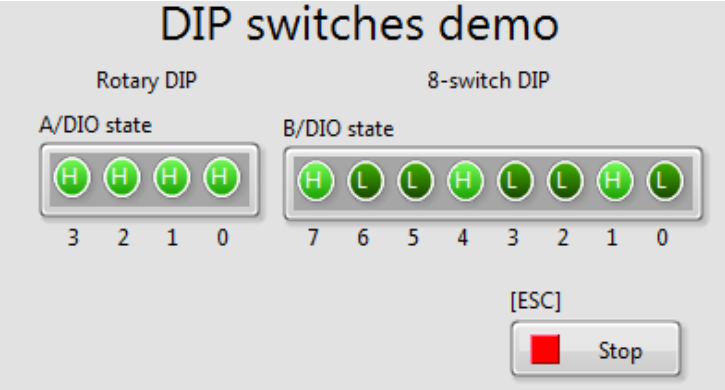


***Figure 1. DIP switches demo***

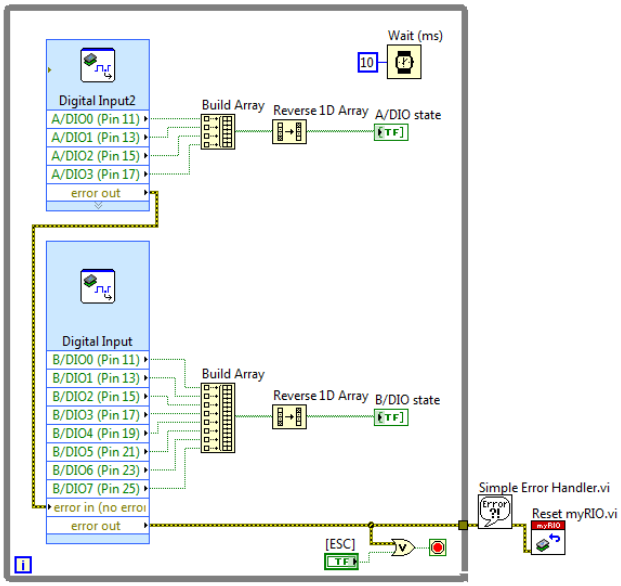


***Figure 2. DIP Switches Schematic***

## Step 3. Connect the Wires

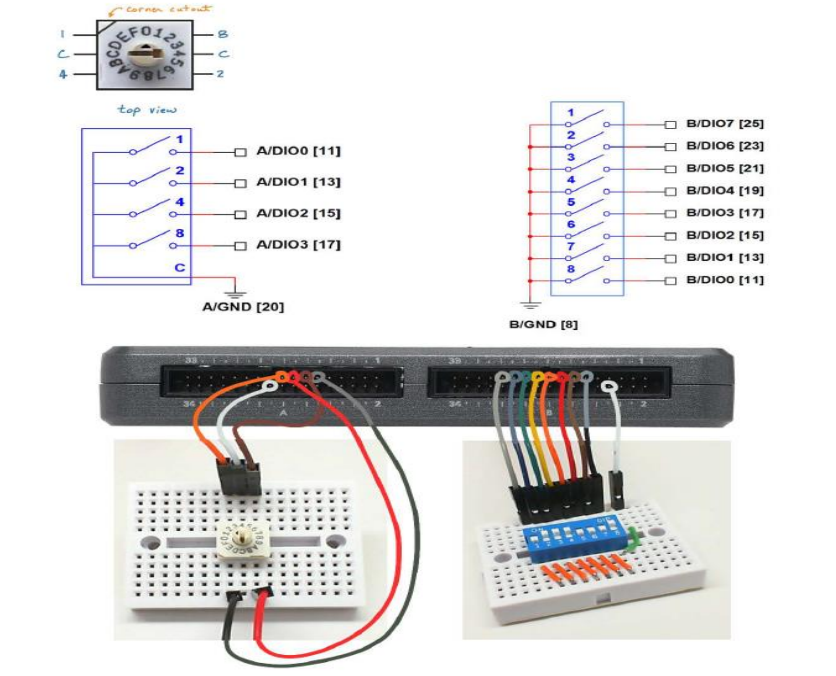


Figure 5.2: Demonstration circuit for DIP switches: schematic diagram, recommended breadboard layout, and connection to NI myRIO MXP Connectors A and B.

***Figure 3. Experiment Guide***

Step 4. Run the DEMO

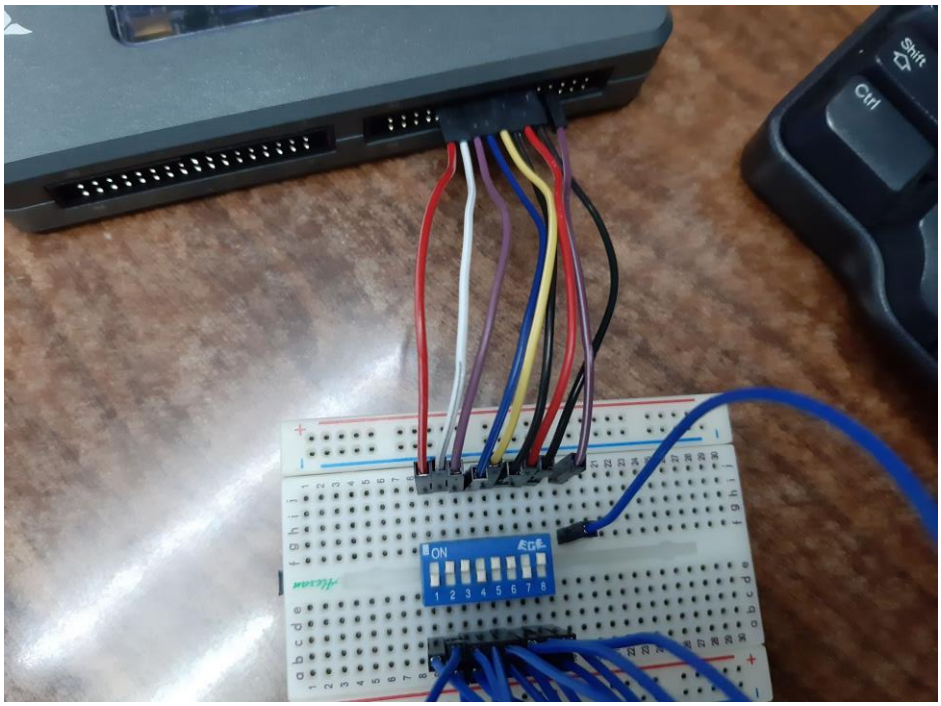


***Figure 4. Actual Setup of the Experiment***

# V. Results and Discussion

When the connections are complete we tested the experiment when the switch is ON the front panel indicate that it is HIGH when the switch is OFF the front panel indicate that is is LOW. We Did some modifications because when we are turning on the DIP switch it show LOW signal from the front panel, so we modify the schematic adding an INVERTER see figure 5.

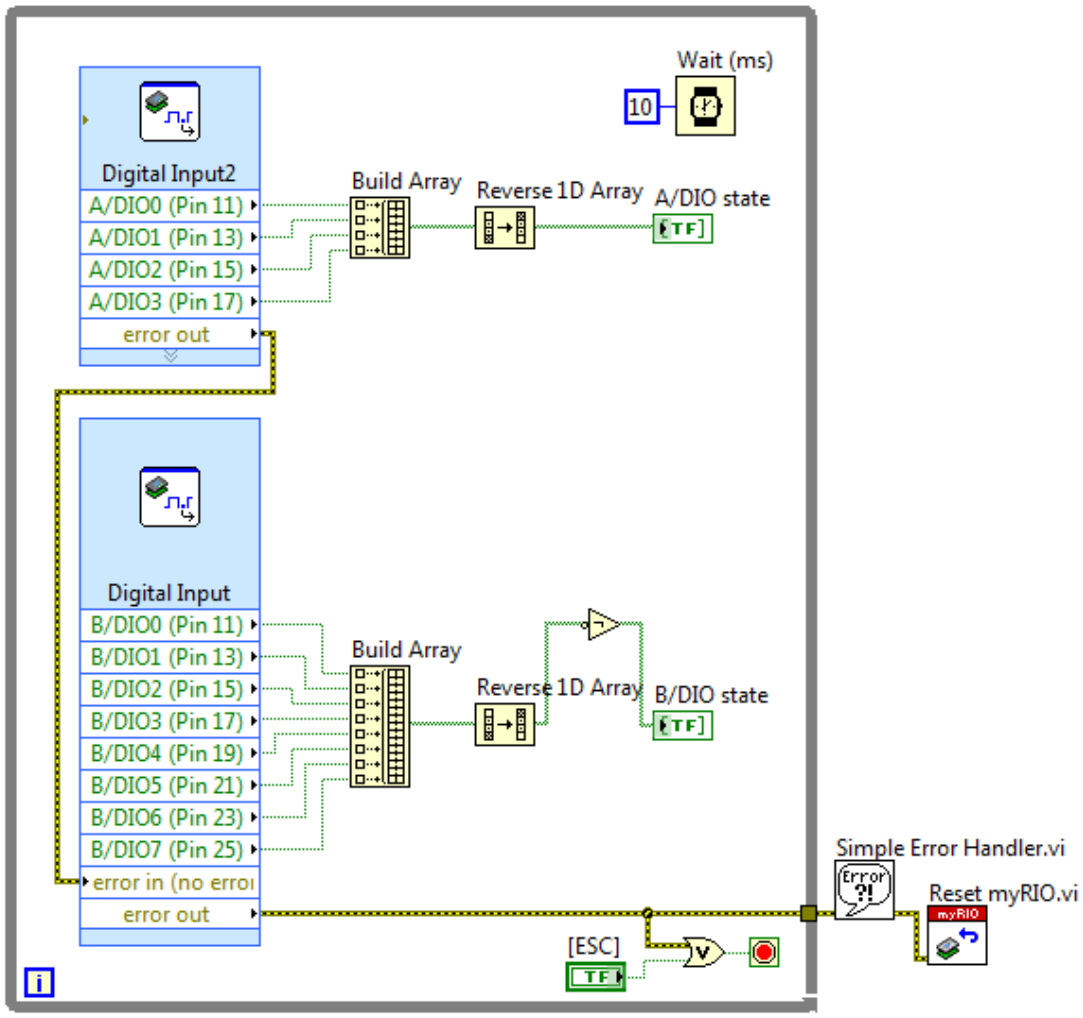


***Figure 5. inverter MOD***

# VI. Conclusion

In this experiment we used DIP switches, during the experiment there were some errors but we resolved it by putting an inverter in the schematic. As the DIP switch is turned on the LED in the front panel lights up indicating that it is ON, we can manipulate DIP switches in many ways like using it to make a binary and etc. The experiment activities were working therefore I conclude that this experiment was a successful one.