

NAME	
REG #:	

EXPERIMENT NO 03:

Objective: **Analog Input**

- Understanding of PWM Analog Signal and Analog Input from Sensor.
- Able to write the code for Analog Input.

Apparatus:

- TIVA C Board
- ENERGIA IDE
- Potentio – Meter
- USB Cable
- PC

Theory:

TM4C123 micro-controller is a multi-functional device. In order to fade your LED off and on, gradually increase your PWM value from 0 (all the way off) to 255 (all the way on), and then back to 0 once again to complete the cycle. In the sketch below, the PWM value is set using a variable called brightness. Each time through the loop, it increases by the value of the variable fadeAmount. If brightness is at either extreme of its value (either 0 or 255), then fadeAmount is changed to its negative. In other words, if fadeAmount is 5, then it is set to -5. If it's -5, then it's set to 5. The next time through the loop, this change causes brightness to change direction as well. analogWrite() can change the PWM value very fast, so the delay at the end of the sketch controls the speed of the fade. We can also read input from sensor in order to calculate voltage. For this purpose rheostat is used which provide resistance to the flow of voltage.

PWM Analog Input:

Procedure:

- Connect TIVA C Board to PC using USB Cable.
- Now write code for PWM analog input for fading effect.
- Then, upload this code to TIVA C Board.
- Now check the result.

Lab Exercises:

Task 1.1: Control LED by using PWM analog signal.

Code

```
void setup() {  
  
  Serial.begin(9600);  
  
  pinMode(RED_LED, OUTPUT);  
  
  pinMode(A0, INPUT);  
  
}  
  
void loop() {  
  
  int fadeValue=analogRead(A0);  
  
  Serial.println(fadeValue);  
  
  analogWrite(RED_LED, fadeValue  
/16);  
  
  delay(10);  
  
}
```

Analog Input Read from Sensor:

Procedure:

- Do setup as shown in figure 1.1.
- Potentiometer attached to analog input.
- Center pin of the potentiometer to the analog pin A2.
- One side pin (either one) to ground.
- The other side pin to +3.3V.
- Build in LED is controlled by sensing analog input.

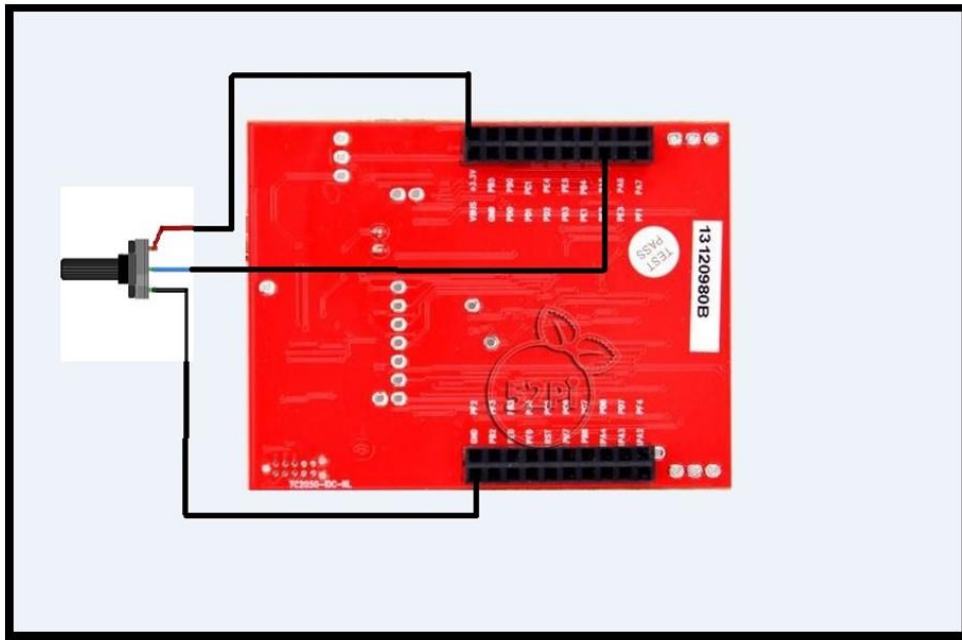


Figure 3: Analog sensor input

Lab Exercises:

Task 1.2: Read analog input from analog sensor.

Code:

```
//int sensor_pin = PA_5;
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
}

void loop() {
  // put your main code here, to run repeatedly:
  int value = analogRead(A0);
  //Serial.println(" ");
  Serial.print("Potentiometer Value = ");
  Serial.println(value);
  delay(1);
}
```

Conclusion