REPORTS ON MECHATRONICS SYSTEM INTEGRATION

REPORT 6

DAQ INTERFACING

SECTION 1, SEMESTER 2, 23/24

Date of Experiment: 22/04/2024

Date of Submission: *27/04/2024*

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EXPERIMENT 6 : DAQ INTERFACING

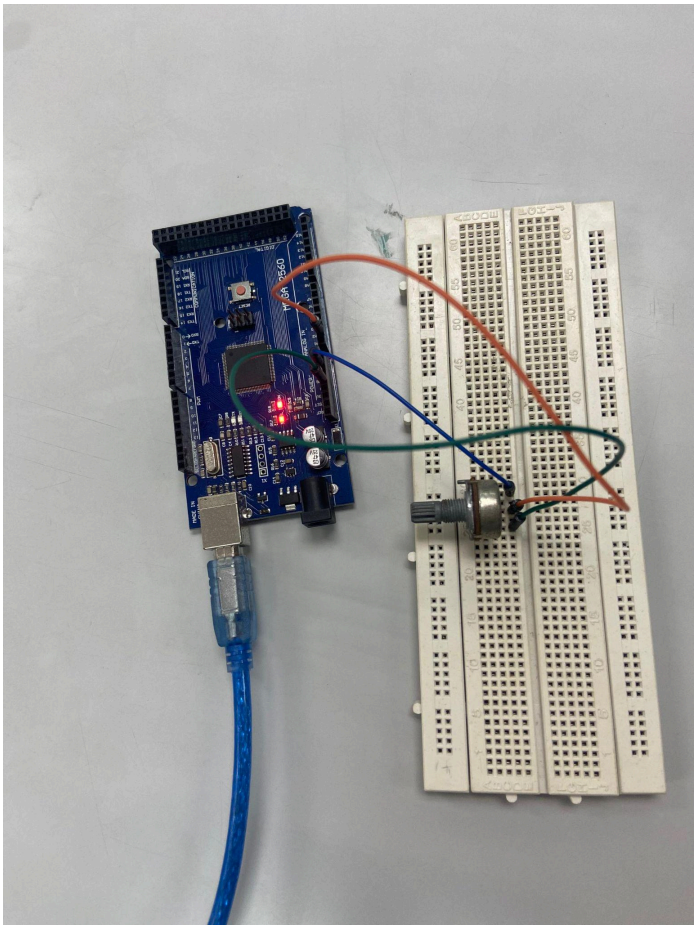
Introduction

The objective of this experiment is to study about the interfacing DAQ hardware devise that serves as the connection between the computer and the sensors , which in this experiment arduino Mega as DAQ that receives analog signal from sensor which is potentiometer and change them to digital signal so that computer can understand and display all the received through PLX DAQ.

Materials and Equipment

Arduino Board	X 1
Potentiometer	X 1
Jumper Wires	X 3
Breadboard	X 1

Experimental Setup

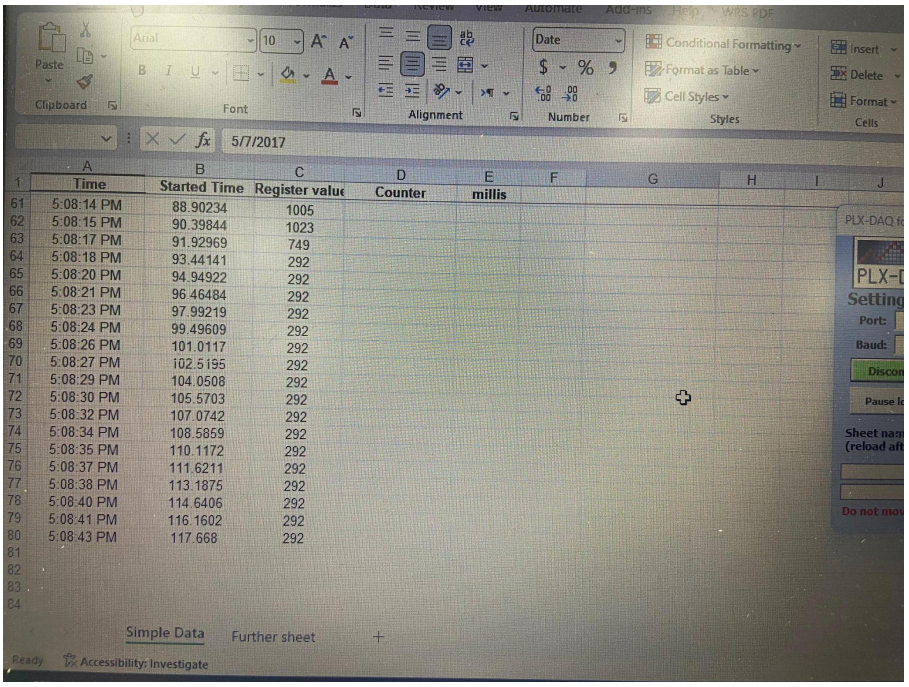


Methodology/Procedures

1. Set up arduino code to read data from the potentionmeter
2. Connect the potentiometer to the arduino board correctly
3. Connect the arduino to the laptop via usb cable and run the code
4. Launch PLX DAQ, there should be an exel spreadsheet with pop-out GUI window in folder
5. You should see the potentiometer readings displayed in the PLX DAQ, as you turn the potentiometer knob, the reading will change over time.
6. Read Real-Time Data: As you turn the potentiometer knob, the PLX DAQ will display the potentiometer readings in real-time,you can see how the values change as you adjust the potentiometer.

Results

The results of this experiment were acquired by constructing a basic circuit using a potentiometer . The potentiometer reads the value, which is then value is then received by arduino and do the signal conditioning that convert the analog wave to digital wave so that that the data can be read.This value is then transferred to the laptop to be display through PLX -DAQ that show the data analysis in real time.

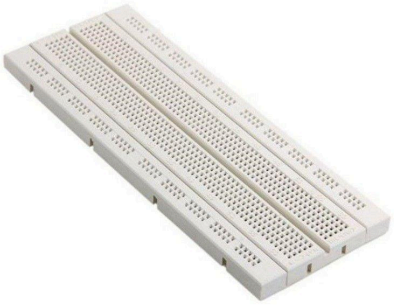


	A	B	C	D	E
1	Time	Started Time	Register value	Counter	millis
61	5:08:14 PM	88.90234	1005		
62	5:08:15 PM	90.39844	1023		
63	5:08:17 PM	91.92969	749		
64	5:08:18 PM	93.44141	292		
65	5:08:20 PM	94.94922	292		
66	5:08:21 PM	96.46484	292		
67	5:08:23 PM	97.99219	292		
68	5:08:24 PM	99.49609	292		
69	5:08:26 PM	101.0117	292		
70	5:08:27 PM	102.5195	292		
71	5:08:29 PM	104.0508	292		
72	5:08:30 PM	105.5703	292		
73	5:08:32 PM	107.0742	292		
74	5:08:34 PM	108.5859	292		
75	5:08:35 PM	110.1172	292		
76	5:08:37 PM	111.6211	292		
77	5:08:38 PM	113.1875	292		
78	5:08:40 PM	114.6406	292		
79	5:08:41 PM	116.1602	292		
80	5:08:43 PM	117.668	292		

Discussion

Hardware

1) Breadboard



Breadboard is used to connect components with arduino through wire connection.

2) Arduino Mega 2560

Microcontroller used for our experiment is Arduino Mega 2560.

3) Male to male jumper wires

Male to male jumper wires are used to connect all of the components on the breadboard with Arduino Mega.

4) Potentiometer

a manually adjustable variable resistor with 3 terminals

Electrical

In this experiment, the electrical setup consisted of a potentiometer interfaced with an Arduino Mega that act as DAQ. The potentiometer served as a variable resistor, allowing for the adjustment of resistance by turning its knob. This variation in resistance was crucial as it facilitated the generation of analog voltage signals corresponding to the position of the potentiometer knob.

The potentiometer was connected to the Arduino board in a simple configuration: one leg was linked to the 5V power supply, another to the ground (GND), and the middle leg (wiper) to an analog input pin, in this case, A0. This arrangement created a voltage divider circuit, with the analog voltage at the middle leg varying between 0V and 5V based on the potentiometer's position.

The arduino that we used ad DAQ then will received data from the pontentionmeter and convert the analog signal form the sensor into digital signal so that the data can be display in the laptop through the PLX

Software

Arduino code

```
void setup()
{
Serial.begin(9600);
Serial.println("CLEARDATA");
Serial.println("LABEL, Time, Started Time, Register value'
Serial.println("RESETTIMER");
```

```
}

void loop()
{
int sensor Value analogRead (A1);
Serial.print("DATA, TIME, TIMER, ");
Serial.println(sensorvalue);

delay (1500);
}
```

Conclusion

In conclusion, the given code demonstrates a basic but effective configuration using a potentiometer controlled by an Arduino board. The Arduino reads the analogue input from the potentiometer, the value is then sent via serial transmission to the laptop running on the GUI PLX - DAQ.. The PLX - DAQ accepts the data and outputs the potentiometer value, demonstrating bidirectional connection between the Arduino and the PC.