Group #12 **Fall ECGR 4101/5101 Lab #07 Report** **10/20/2022**
Naseeruddin Lodge
nlodge@uncc.edu
Srikar Thakkallapally
sthakkal@uncc.edu

Lab Objective:

The objective of is to use UART to communicate between two MSP430G2553 IC. A potentiometer was connected to chip 1. Using ADC, a value from potentiometer was generated and this ADC value was sent to Chip 2 using UART transmission. Chip 2 was responsible for receiving UART sent by Chip 1 and then displayed that value onto the quad digit seven segment LED.

Tables, Figures:

	Pins
UART Tx	P1.2
Potentiometer	P1.3
Identifier Pin	P1.4

Table 1 – Connection for Chip 1

Quad digit 7-segment display	Pins
A	P2.0
B	P2.1
C	P2.2
D	P2.3
E	P2.4
F	P2.5
G	P2.6
DP	P2.7
D1	P1.0
D2	P1.5
D3	P1.6
D4	P1.7

Table 2 - Quad digit 7-segment display connections for Chip 2

	Pins
UART Rx	P1.1
Identifier Pin	P1.4

Table 3 – Other pins connected to chip 2

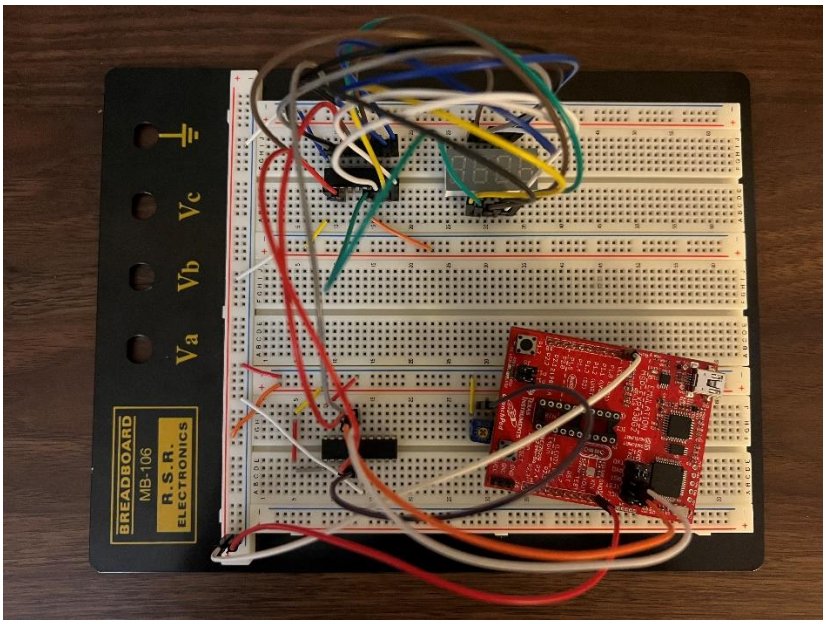

Figure 1 – Circuit Connection

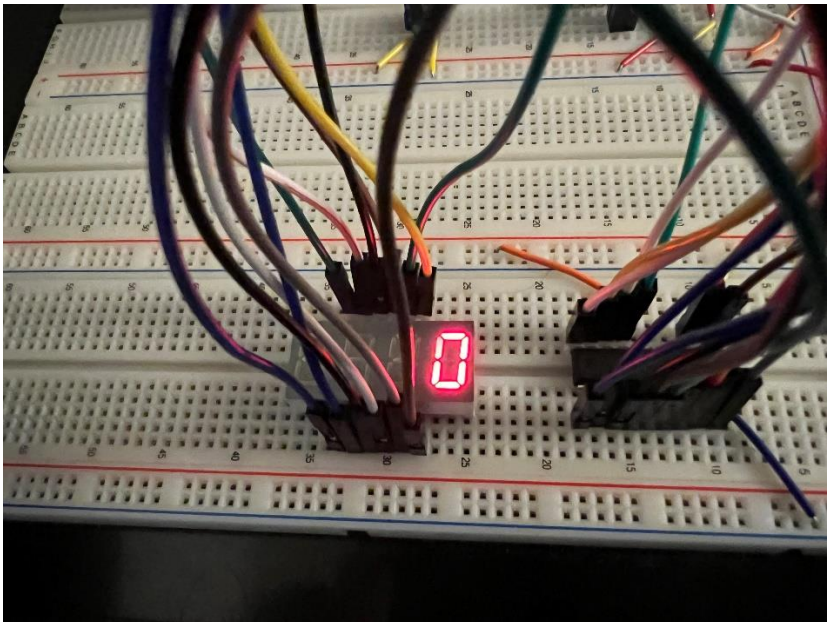

Figure 2 – Quad Digit 7-segment LED displaying ADC Value 0

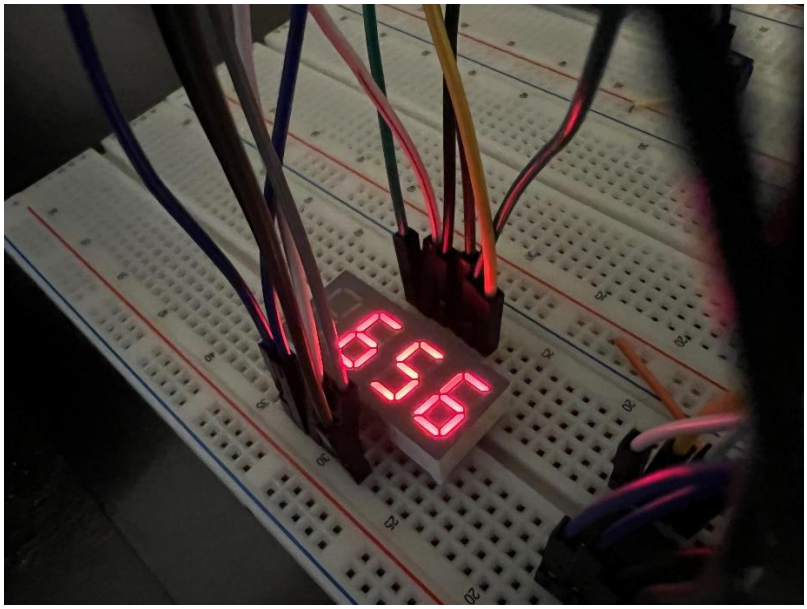

Figure 3 – Quad Digit 7-segment LED displaying ADC Value 656

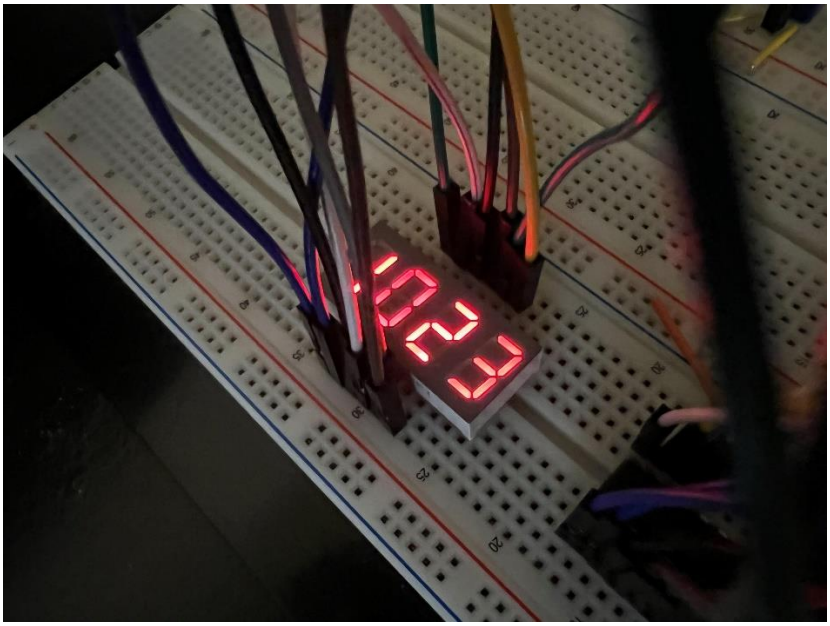

Figure 4 – Quad Digit 7-segment LED displaying ADC Value 1023

Commentary and Conclusion:

The very first difficulty occurred during the lab was connecting both the chips together. It is a very simple problem but took us some time to figure out. Finally, after some testing, it was found that the test and reset pins of the micro controllers and the chips needed to be connected together. The next difficulty occurred was setting up hardware flags. Again, it was a simple process but took some time to figure out. Chip1 was connected to GND and Chip 2 to VCC. Bit masking was used to identify which pins were connected to GND and VCC. The hardest challenge was setting up and using the UART. Setting up the UART was challenging but after some tries setup was successful but the transmission and receiving was quite challenging. After a lot of research and trial and errors the best method that worked out for us

was to use math to reduce the ADC value to a smaller number and then transmit it. Then receive the ADC value to turn it back to its original number. Overall, a very challenging lab but pushed us to problem solve and learnt a great deal about when, how, and where to use UART.