EE/CprE/SE 492
wDAQ (sddec24-19)
Status Report 4

October 4th- October 31st, 2024
Client: Avishek Das
Faculty Advisor: Manojit Pramanik

TEAM MEMBERS

Adam Shoberg [EE] - Circuit Design & Simulation, PCB Design, Team Communications Leader

Henry Chamberlain [EE] - PCB Design & Construction

Lisa Tordai [SE] - Software Development, Wireless Data Sharing

Vaughn Miller [CprE] - Computer Engineering

SUMMARY

During the past four weeks, our team achieved some considerable milestones with hardware and software testing. After the assembled PCBs for our ADC circuit arrived in a time frame of about two weeks, we soldered the remaining parts onto the boards that were not included with the original order (non-stock items that were ordered through DigiKey in a separate order from the PCBs). After the missing components were soldered onto one of the PCBs to create the full board, we tested the board for functionality. We discovered an issue with a certain trace on the board being shorted and were unable to obtain an accurate output from the circuit due to the lack of electrical connectivity. We are working to troubleshoot our schematic in the coming weeks and either order new PCBs or make modifications to the ones we have for testing purposes. On the software front, we were able to obtain a digital waveform for the output data of an ADC using Serial Peripheral Interface (SPI) protocol, and are hoping to use the same protocol to display output waveforms from our own ADC circuit once the problems have been fixed.

MILESTONES REACHED

Adam:

- Soldered ADC Board
- Tested ADC Board
- Troubleshot ADC circuit schematic

Henry:

- Ordered missing ADC components from Digikey through ETG
- Soldered ADC Board
- Tested and helped troubleshoot ADC Board

Lisa:

- Organized 492 professor, client, advisor meetings, and team work sessions
- Researched and initial design for ESP32 to STM32F interface

Vaughn:

- Programmed STM32F for 12 bit read
- Plotted digitized data from STM32F to Ardunio Via SPI

INDIVIDUAL CONTRIBUTIONS

Member	Contributions	Period Hours	Total Hours
Adam	Soldered, tested, and troubleshot ADC PCB with client	5	80
Henry	Soldered, tested, and helped troubleshoot ADC PCB	5	81
Lisa	Team planning and organization, Researched ESP32 to STM32F interface	6	80
Vaughn	Programmed STM32F for 12 bit read	6	76

PLANS FOR NEXT REPORTING PERIOD

Item	Member(s) Assigned	Desired Completion
Troubleshoot ADC board problems	Adam, Henry	11/07
Develop ESP32 to STM32F interface, to LabVIEW	Lisa, Vaughn	11/07
STM using ESP Wi-Fi to LabVIEW	Lisa, Vaughn	11/07

PROJECT WORK
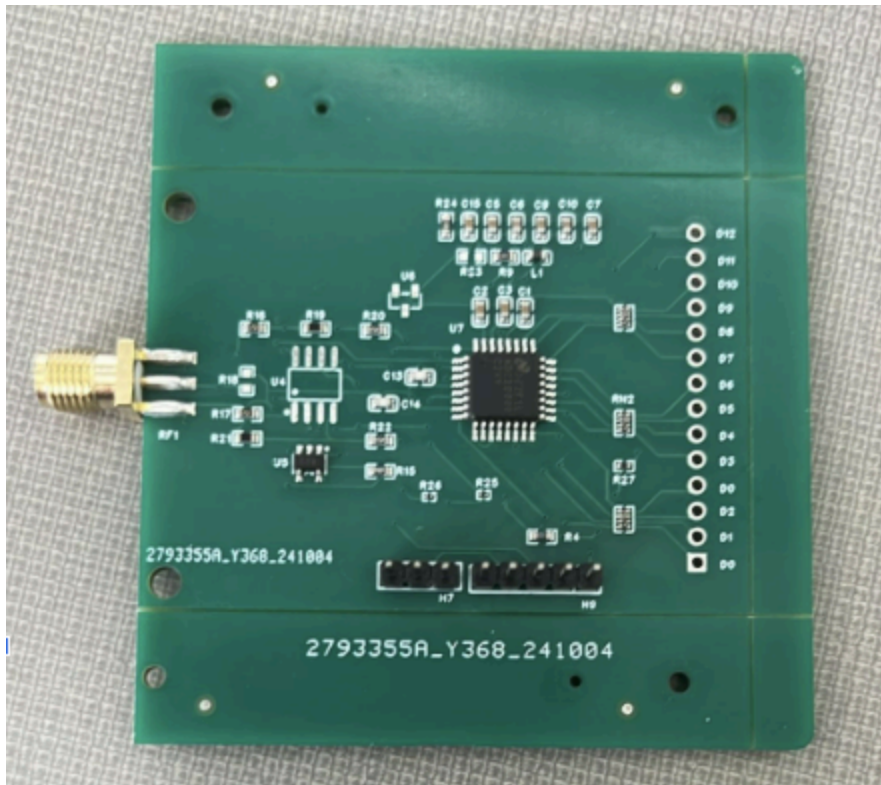
Figure 1: Preassembled ADC board from JLPCB

Note: In *Figure 1*, the ADC board is missing components due to the parts being out of stock/unavailable from JLCPCB.

SUMMARY OF MEETINGS

Biweekly Team/Advisor Meeting (10/15/2024):

- Briefly discussed team progress and plans for coming weeks (3-5 minutes)

Biweekly Team/Advisor Meeting (10/29/2024): Canceled by Faculty Advisor

Weekly Team/Client Workday (10/10/2024):

- Discussed team progress and options moving forward with STM32F and ADC
- Tested pins of AD9220 to determine pinout

Weekly Team/Client Workday (10/17/2024):

- Presented findings on ADC circuit and possible other options to explore
- Attempted to transmit data from STM32F to Arduino
  - Unable to successfully transmit data due to lack of proper equipment

Weekly Team/Client Workday (10/24/2024):

- Assembled ADC PCB with missing components
- Tested assembled PCBs
  - Current problem with the board shorting the ADC. Attempted to Identify the source of the problem to no avail.
  - Comment: If the ADC board cannot be fixed in time, a preassembled ADC can be used which is on hand and has been confirmed to work.
- Plotted 12 bit digitized data from STM32F to Ardunio
  - Waveform is not completely smooth, but the data is successfully being transmitted.
  - Method of transport from input register to output TX register must be looked at

Weekly Team/Client Workday (10/24/2024): Canceled due to unavailability of team