EE/CprE/SE 492
wDAQ (sddec24-19)
Status Report 2

September 6th- September 19th, 2024
Client: Manojit Pramanik and 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

Our team accomplished a wide range of technical goals this week. The first was PCB work, a goal from the previous status report. The ADC board, which was developed in EE491, was modified with the addition of male header pins for breadboard insertion and easy testing. The 12 digital output pins also had 100-ohm buffer resistors added in series to limit noise. The last piece of work with the board involved cleaning up traces, adding labels, and modifying the components of the ADC circuit to meet the specifications outlined in the datasheet.

Another critical technical aspect of the project that saw significant progress was the STM32F. Using an Arduino Uno, data could be transmitted to the STM32 using a serial port. The STM32F was able to interpret and display the data. This proof of concept will be expanded upon in the following weeks. The next step will involve replacing the serial cable with the ESP32 to transmit data via Wi-Fi.

The team was also able to meet on two occasions. The first was on 09/12/2024 at the ASC, where the team conducted most of the technical work with the client. Then on 09/17/2024 the team met the advisor, Manojit Pramanik, where we discussed progress, goals, and action plans to meet intended goals.

MILESTONES REACHED

Adam:

- Extracted frequency response of LNA using Loopinator
- Modified ADC PCB
- Modified ADC schematic to include output resistors to limit noise on digital output pins

Henry:

- Extracted frequency response of LNA using Loopinator
- Updated team goals and priorities following initial faculty advisor meeting

Lisa:

- Coordinated day & time for biweekly recurring faculty advisor meeting
- Programed arduino to simulate 8 bit and 12 bit pulses to test STM32F board

Vaughn:

- Worked with team to implement proof of concept functional uC setup
- Read mock ADC values and displayed them to serial

INDIVIDUAL CONTRIBUTIONS

Member	Contributions	Period Hours	Total Hours
Adam	Modified ADC PCB and Schematics. Extracted frequency response of LNA	10	65
Henry	Extracted frequency response of LNA	10	65
Lisa	Programed arduino to simulate 8 bit and 12 bit pulses to test STM32F board	10	69
Vaughn	Completed initial setup firmware and input code essentials	8	62

PLANS FOR NEXT REPORTING PERIOD

Item	Member(s) Assigned	Desired Completion
Transmit data using the ESP32 & STM32F to LabVIEW	Lisa, Vaughn	9/27/2024
Test ADC Board	Adam, Henry	Upon arrival of ADC boards
Revise input code to read full ADC data point	Vaughn	9/27/2024

PROJECT WORK

ADC PCB Revision (9/19)

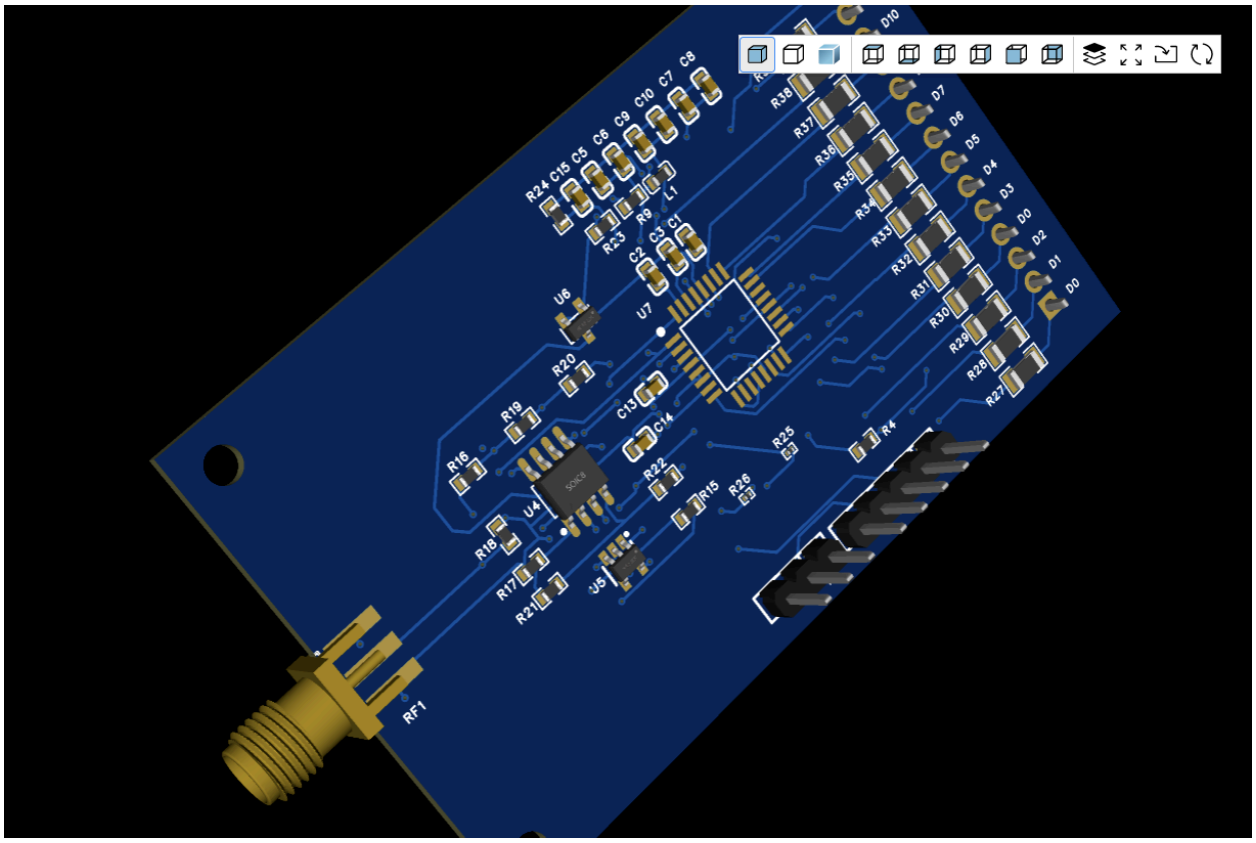

Figure 1: Updated ADC board with resistors on digital output pins.

SUMMARY OF MEETINGS

Team Collaboration (09/11/2024):

- Lisa and Vaughn met to configure Arduino to simulate pulses for faster development with the STM32F board

Weekly Team/Client Workday (09/12/2024):

- Demonstrated STM32F communication with Arduino to interpret ADC data
- Modified ADC schematic and PCB
- Discussed progress plans for coming weeks
- Discussed the necessity to order ADC PCBs
- Demonstrated Arduino and STM32F code adjustments

Biweekly Team/Advisor Meeting (09/17/2024):

- Touched base and reviewed goals for the semester

Weekly Team/Client Workday (09/19/2024):

- Made further modifications to ADC schematic and PCB
    - Adjusted resistor values on output pins according to similar circuit schematic and implemented 4-resistor network/array chips to reduce size of schematic
    - Reduced resistor footprints on schematic from 1206 to 0402 to reduce PCB size
    - Decided to outsource PCB component assembly to JLCPCB
- Discussed progress with STM32F and necessary changes to code