Executive Project Summary:

The task for the project was to create a variable DC power supply that could supply a range of 2V to 14V at up to 1.5A across two independent channels. The supply can be powered with any constant DC voltage that ranges from 17V to 28V. The DC power supply also had to be configurable through SCPI commands through user input on a PC. The output voltages had to be accurate, and be measured and displayed with 5% accuracy. Furthermore, the system had to be safe, meaning that in the implementation of the power supply, no explosions or such would occur. The system would also be put into an enclosure that would not allow outside parts to enter and interfere with the system.

To achieve these requirements our group broke down the project into six blocks that were assigned to each member. This was by creating a top level system block diagram. These blocks included designing and printing an enclosure, limiting the current going into the system, creating the circuit to step down the DC voltage and regulate it, configure a display to display the voltage measurements, and creating the code to interact with SCPI commands and button input through an Arduino system. Two blocks were tackled by each member to create the entire system and the system integration and verification was worked on together as an entire group.

We learned a lot through this project in terms of the usefulness of data sheets and the distinction between theory and practice. This was prominent in terms of the heat limitations of the ICs. We learned technical skills such as 3d modeling and printing, designing circuits and PCB, and working with the Arduino family. This project also taught us about buying more parts than necessary, just in case things are burnt out so there can be replacements quickly rather than needing to wait for more shipping time.



Project Timeline: