Digital Oscilloscope

Team 002-1

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Project Summary

There are many important parts of a system that need to be taken into consideration when first beginning the design process. There were several requirements that needed to be met for the digital oscilloscope to both function properly and go above and beyond in terms of design and user experience. Most of the requirements had to either do with user input capabilities or more technical aspects of the design. A few of the most important requirements were that a high sampling rate of at least 1 Mhz must be supported by the final oscilloscope. Finding a microcontroller unit that could support sampling at such a high speed was one of our very first hurdles.. After some time and discussion between the two of us. It was decided that a Teensy 4.0 microcontroller would perfectly fit all of our needs. The Teensy was capable of sampling at very high speeds, it had a lot of digital pins that we could use for the various user inputs , it had lots of online support and documentation, and it was compatible with the Arduino IDE which made the software side of the project a lot simpler. After the design was hammered out, we then needed to make a project timeline and decide on some important deadlines, and who would be taking what parts of the project. A picture of the timeline can be seen below. One of the largest areas of concern for the project was getting the PCB done on time and ordered for the system checkoff. There were complications throughout the term and getting the blocks done had their challenges. But overall, the system came along very smoothly and the final product worked better than we could have hoped for. Some of the most important lessons learned from this project were how to work as a team and effectively communicate with others. Additionally, being as vague as possible for project requirements or interface validations was very important as being vague meant we had more wiggle room in how we planned to prove the requirements.