

SPROJ1G5 Project Plan

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Goals and objectives

Features

- Voltage 0-20 VDC
- Current 0-500 mA
- Frequency 0-100 kHz
- Resistance 10 Ω -7 M Ω
- Temperature 10-60 °C
- Continuity test.

Goal

At the end of the project we are planning to have a fully integrated and functional multimeter. Along with the usual capabilities of a multimeter, we intend to implement a temperature sensor on top of that for maximizing and adding new functionality to it .

All the functionalities will be integrated on a single PCB with detachable test leads. The PCB will be fully enclosed in a custom enclosure. To ensure safety of the device, a separate input will be installed for the current measurement. Thus, three inputs in all.

The device will be powered by a common 9V-battery with a linear voltage regulator to bring the supply voltage to 5V. The battery voltage will be monitored via a voltage divider to the microcontroller, in which it can warn the user if a change of battery is needed.

Roles

Bence Tóth

Frequency Measurement PCB Design and code implementation for the whole functionality of the multimeter.

Michał Sulej

Voltage Measurement Design and Final PCB implementation.

Danial Jeddi

Temperature Measurement Design.

Theodor Erbs Dam Hansen

Resistance and current measurement design, enclosure and mechanical design for the multimeter.

Milestones

- 31/10/2023 - Implementation of working Measurement Prototypes based on a breadboard, and also PCB designs,
- 07/11/2023 - Review of the prototypes,
- 13/11/2023 - Integration – testing final design on a breadboard,
- 26/11/2023 - Design of the enclosure and PCB, building and testing out the Final Prototype,
- 09/12/2023 - Validation of the Final Prototype,
- 16/12/2023 - Excessive testing of the Final Prototype.

Risks

- The prototyping and testing phase could take longer than anticipated pushing back the integration and final testing phase.
- The final product may need a second iteration that will not be viable to complete timewise.
- PCB or parts not arriving on time will push back the project's end potentially exceeding the time limit.
- Integration failure, causing us to go back to the development stage delaying the project.
- Failure to implement circuitry required to perform certain type of measurements
- Failure to implement the final software.

Current project state

Regarding the status, the first stages of PCB design prototyping has been done and we have now moved on to testing the behaviors of elements on a breadboard. The bulk of the components needed are ordered and acquisition of the respective breakout boards as well.

We also have come to a conclusion for timing and deadlines of which every task should be completed. Plus, every task has been elaborated upon. Meaning, each task has been defined “crystal clear” to the group and the responsible party. Furthermore, each step is well-organized in a cloud based project management system, where the process can be tracked properly.

Timeline

[Jira timeline](#)

