

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION
ENGINEERING

UNIVERSITY OF MORATUWA

Electronic Design Realization

EN2160



Preliminary Design Report

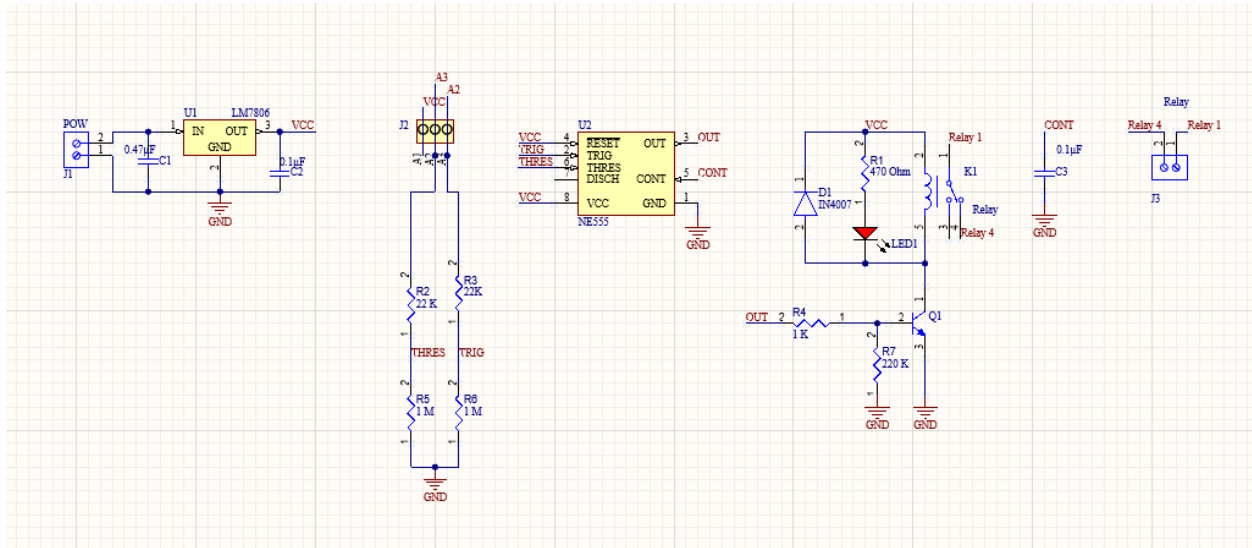
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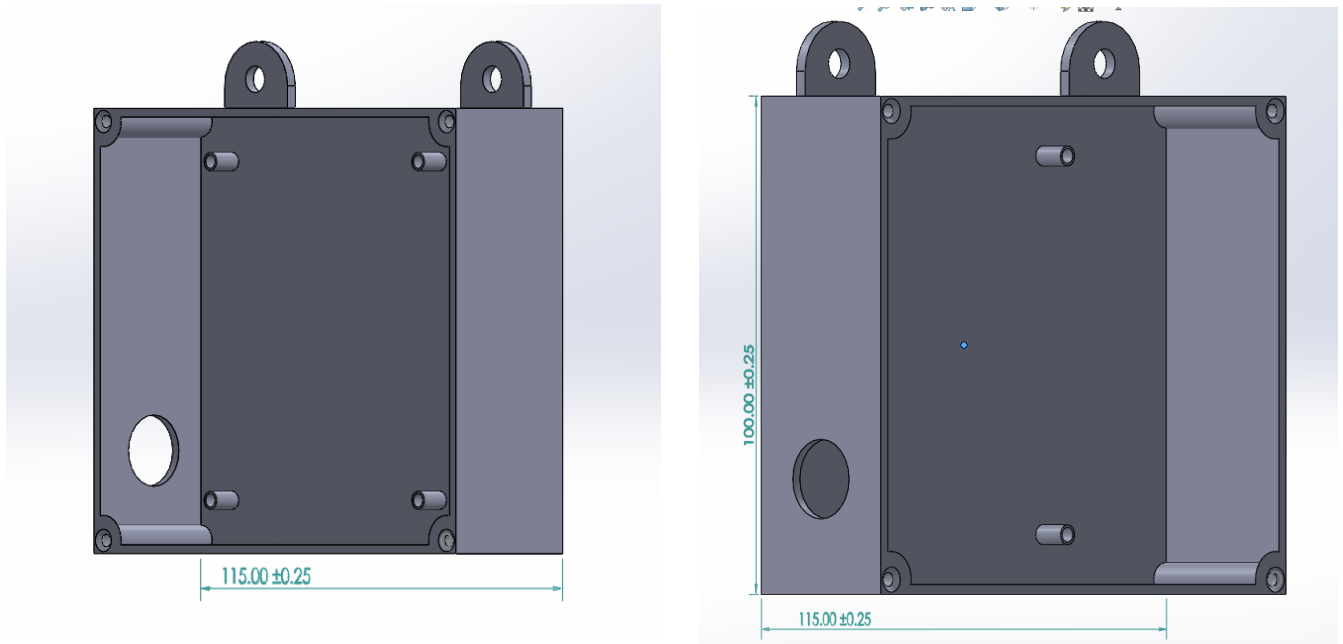
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Schematic design of the implemented design

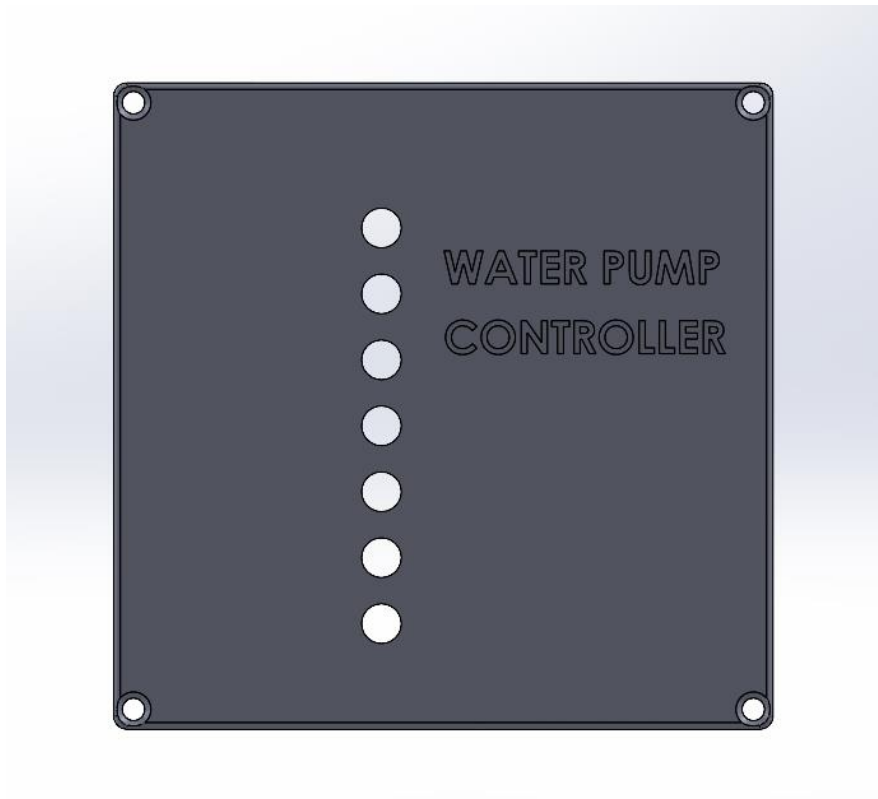


Solid works design of the implemented design

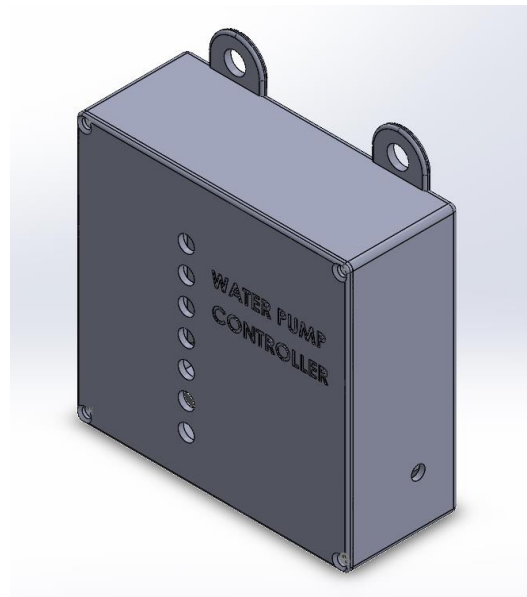
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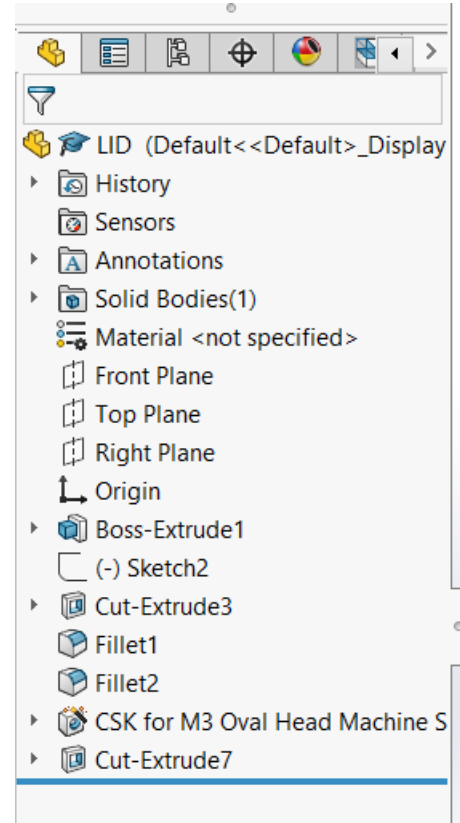
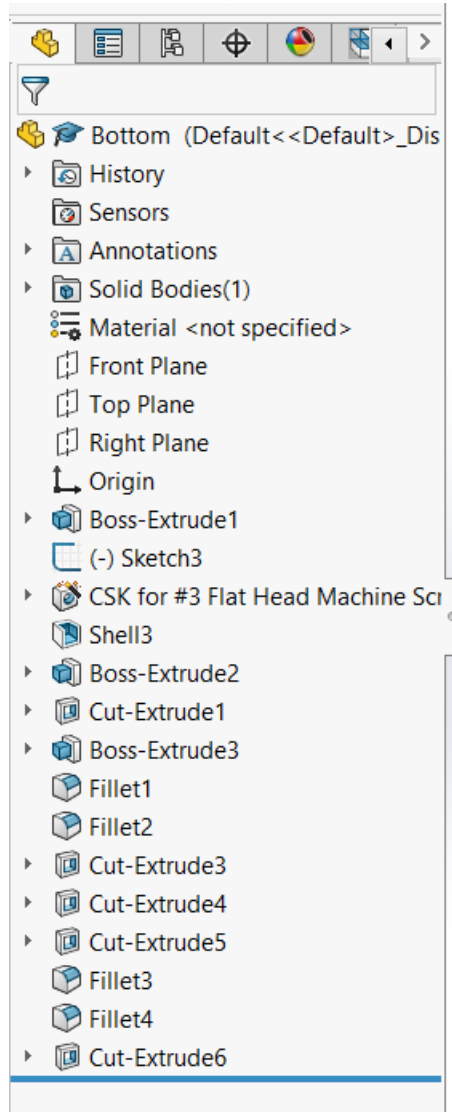
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Assembly



Model tree of the implemented design



Problems identified by considering the course content

Considering the course content there are several problems identified in my design.

Moldable Enclosure: Water level controller is intended for commercial production, so it is crucial to design the enclosure such that it facilitates molding. Adding draft angles makes it possible to mold.

Iterative design process: Designing a functional and aesthetically pleasing product typically requires multiple iterations. The design process should be viewed as an ongoing cycle rather than a one-time activity. Each iteration allows for improvements based on user feedback, performance testing and manufacturability concerns.

Aesthetically pleasing shape: Box shaped enclosure is aesthetically unpleasant and adding fillets and curves makes aesthetically better.

Problems/Improvements identified/proposed by members of my group

After discussing the initial design with my group members, I have received several suggestions to make the product better.

Water level indication: They suggested me to add a water level indication part as it would be a value addition to the product.

Message alert integration: The device would be able to send the water level of the tank when it goes pass the thresholds.

Mobile app integration: It is suggested to make the device compatible with a mobile app to show the current water level and to manually control the water pump.

Automatic Maintenance Reminders: Implement a maintenance reminder feature that prompts you to perform regular maintenance tasks, such as cleaning sensors or checking pump functionality. This ensures the system remains in optimal condition.

Placing the input probes inside the tank: They raised their concerns about how to place the input probes inside the tank at fixed water levels. If the probes were to move in the tank then the system would not properly function.

Problems/Improvements identified/proposed by users

Based on the conducted survey, following feedback was received.

Backup power: Install a backup power source, such as a battery or generator, to ensure the water level controller continues to function during power outages. This helps maintain proper water levels even during emergencies.

Remote monitoring and control: Connect the water level controller to a remote monitoring system or mobile app, allowing you to monitor and control the water level from anywhere. This adds convenience and flexibility to the system.

Alarm System: Integrate an alarm system to alert you in case of any malfunction or abnormal water levels. This can help prevent potential system failures.

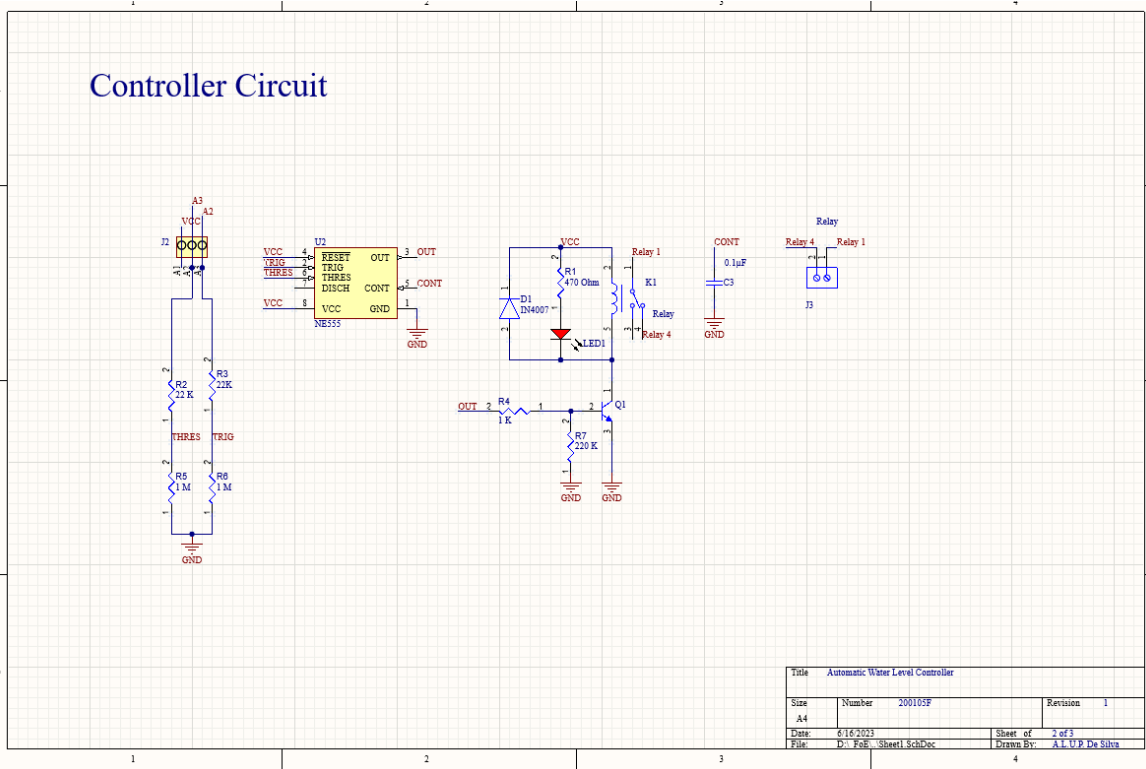
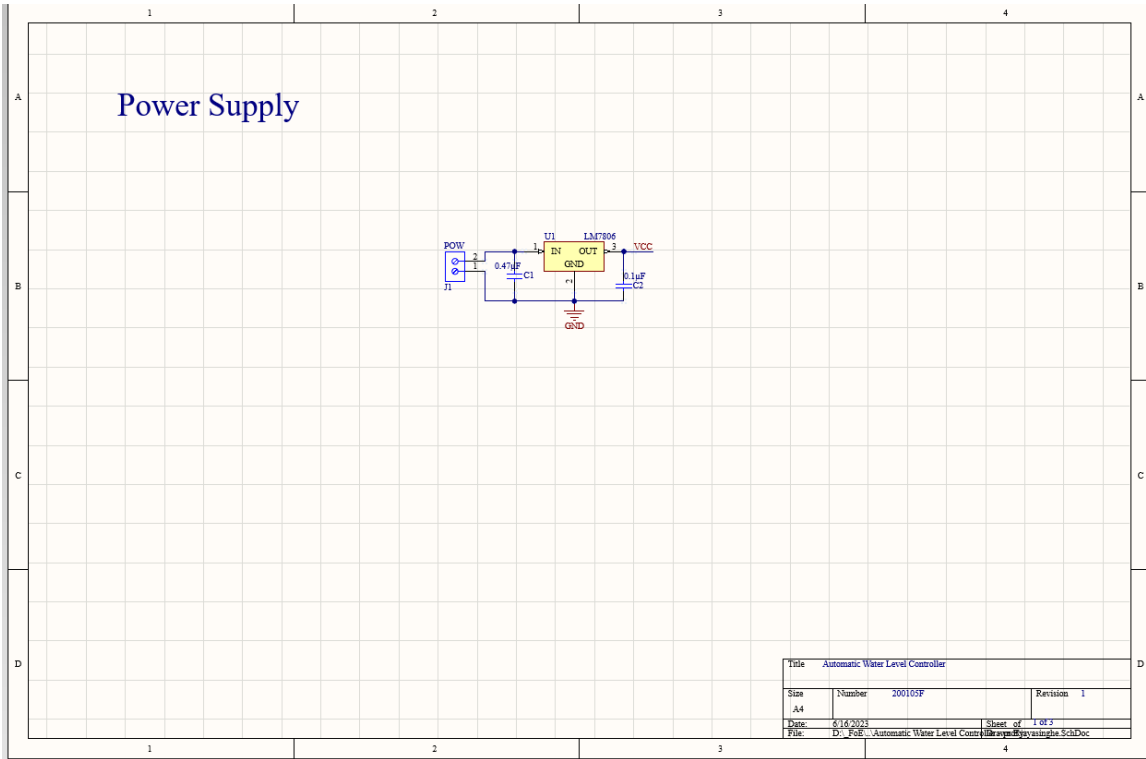
Water level indication: They suggested me to add a water level indication part as it would be a value addition to the product.

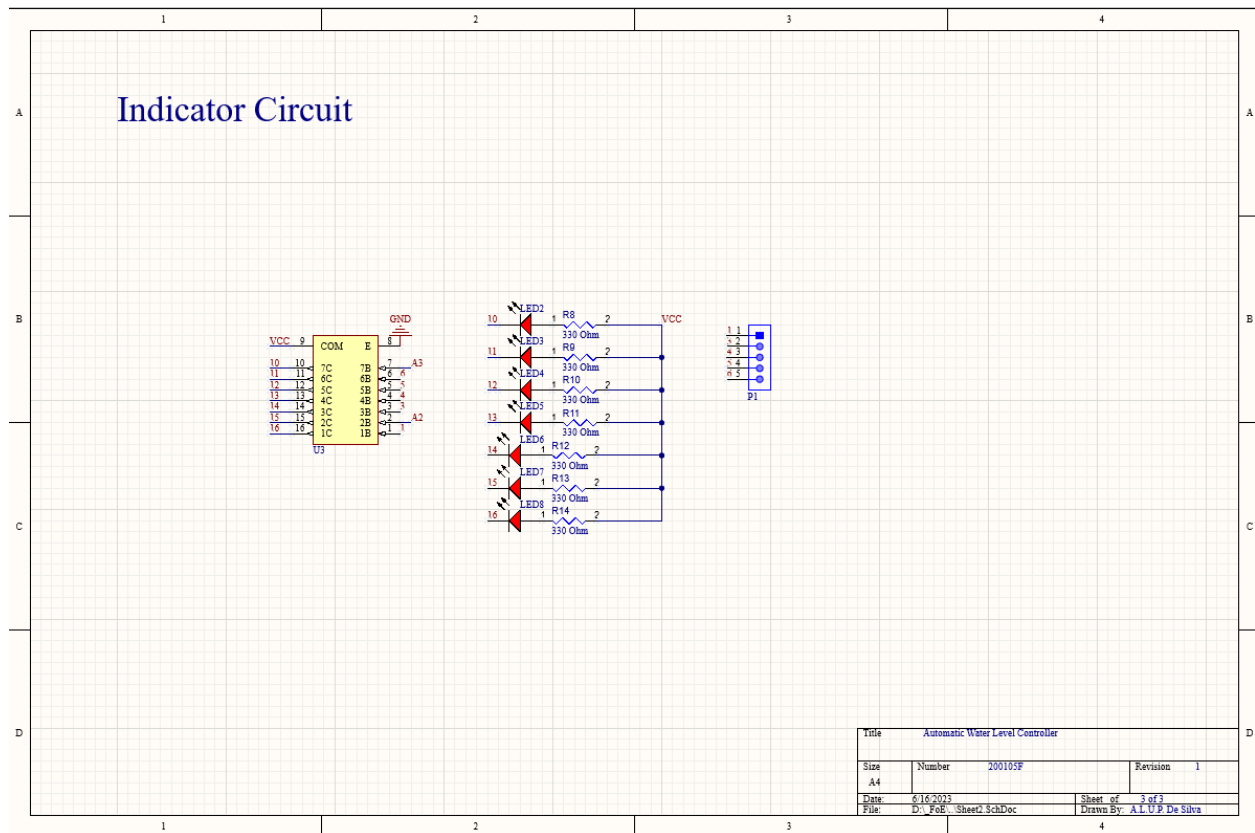
Sensor Placement: Ensure that the water level sensors are positioned correctly in the water tank. The sensors should be installed at appropriate heights to accurately measure the water level.

Data Logging and Analysis: Incorporate data logging capabilities into the controller to record water level data over time. Analyzing this data can provide insights into water usage patterns, trends, and potential issues.

By implementing these additional suggestions, the automatic water level controller can further be enhanced to provide more user-friendly features, customization options, and integration with modern techniques.

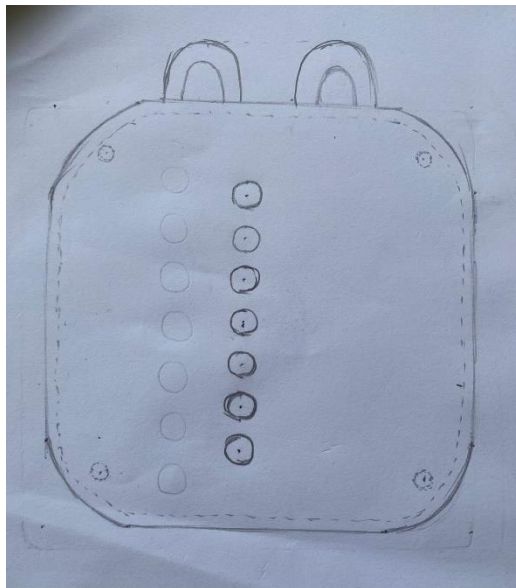
Schematic design of the improved design



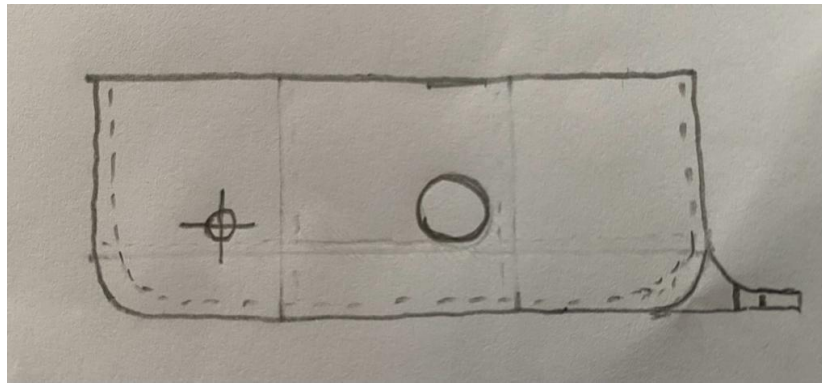
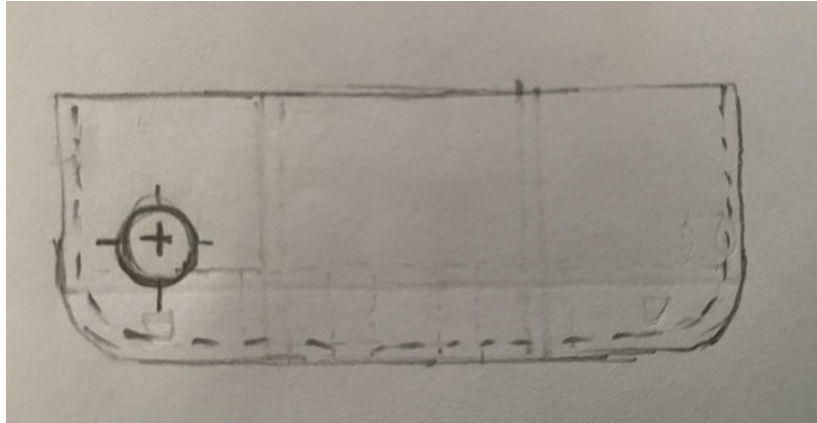


Hand sketches of the improved design

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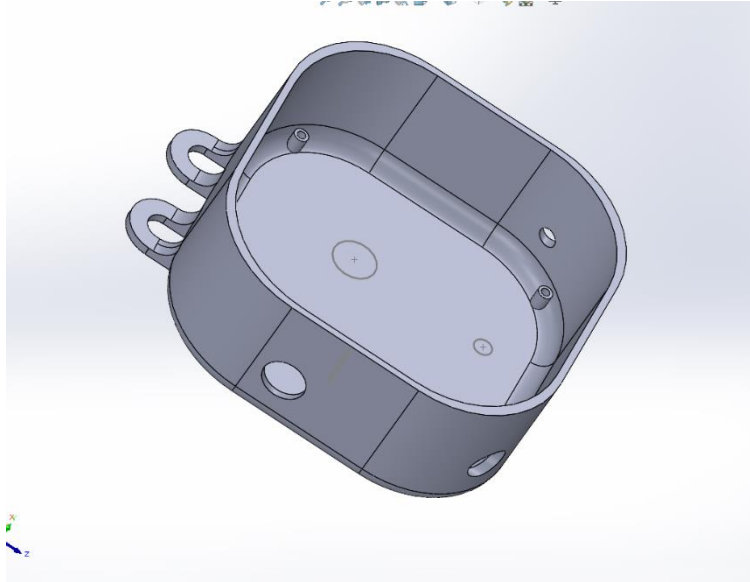


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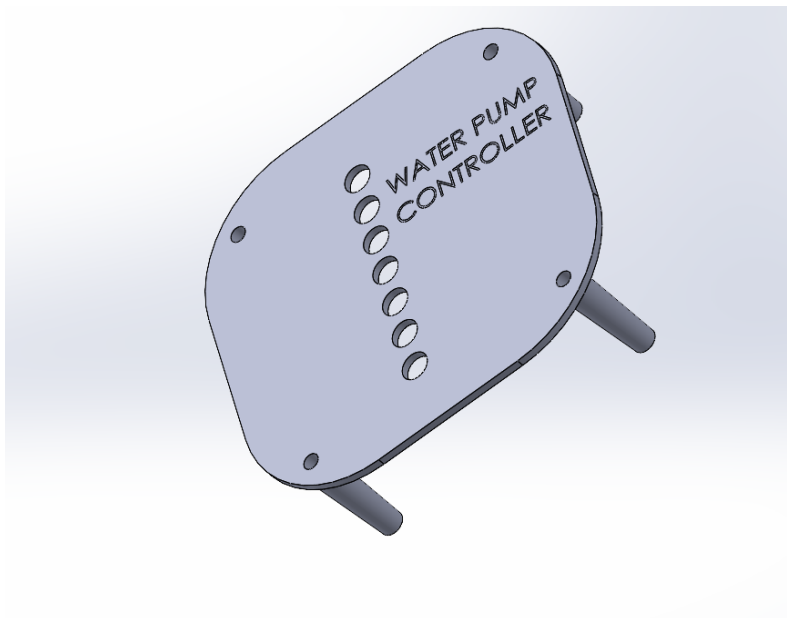


Solid works design of the improved design

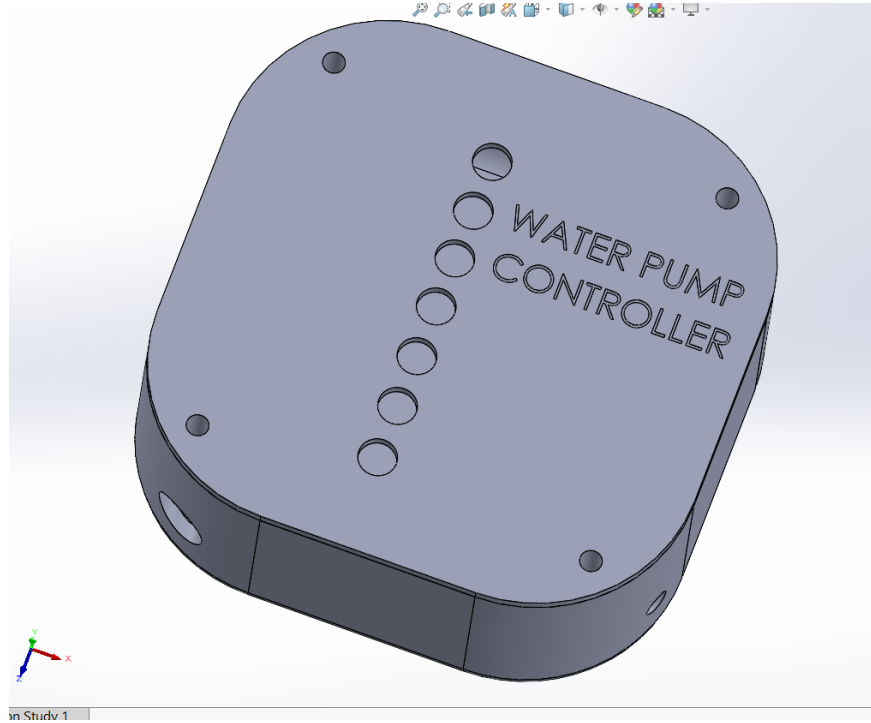
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Assembly



Model tree of the improved design

