Enclosure Design for FPD Repeater

Scope : Design of Enclosure

Application : Advanced Driver Assistance System (ADAS)

FPD repeaters find application in ADAS technology. They facilitate the distribution of video signals from sensors or simulation systems to multiple display devices, supporting analysis, visualization, and user interface testing.

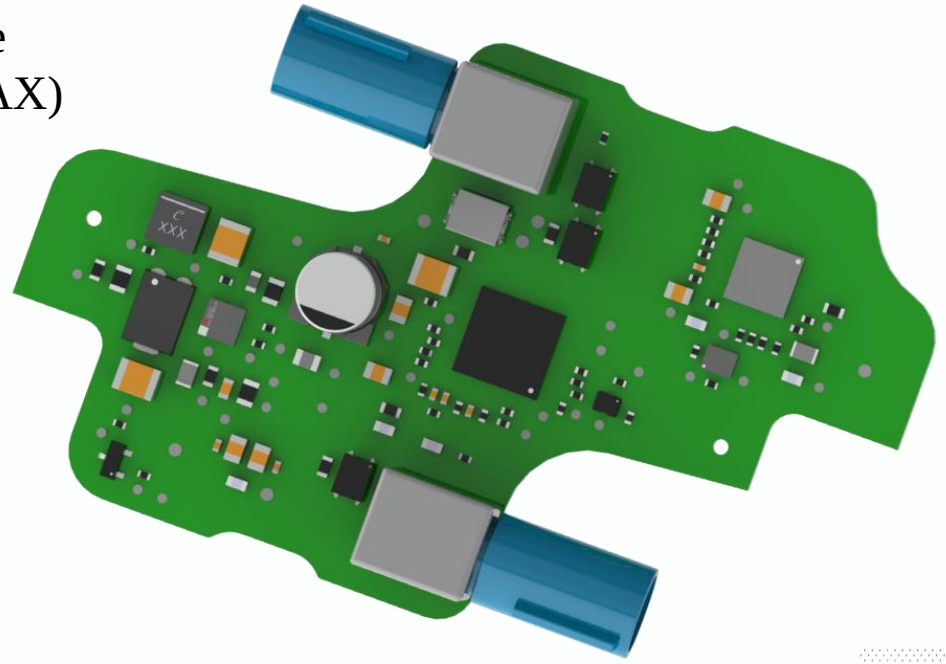
In crafting an enclosure for an FPD repeater, our approach prioritizes material selection, leveraging advanced manufacturing methods and Surface treatments to ensure durability and aesthetic appeal. Through design iterations, environmental factors and regulatory requirements are considered to guarantee optimal protection for the FPD repeater, maintaining reliability and safety standards essential for automotive applications.

MCAD - Challenges

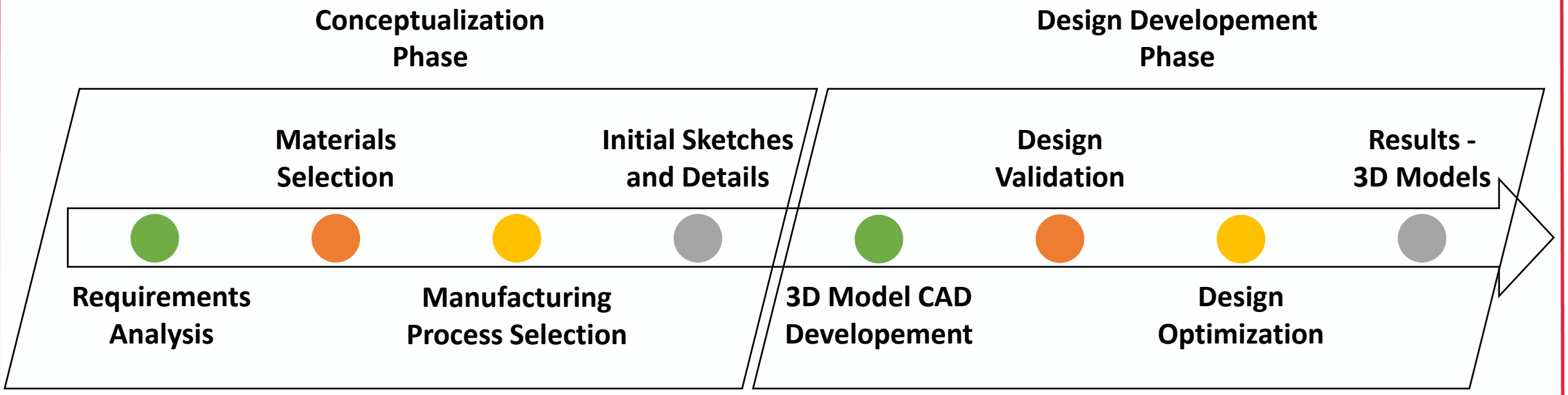
The client encountered a challenge with a request to design a robust enclosure for their FPD repeater unit, presenting us with a significant design challenge to tackle.

Challenges

- Material selection for durability and environmental resistance
- Accommodation for signal input and output connectors (COAX)
- Mounting and installation optimization
- Visually appealing aesthetic design
- Accessibility for maintenance
- Efficient heat dissipation
- Regulatory compliances
- Cost-effective solutions



MCAD - SoW



Conceptualization Phase

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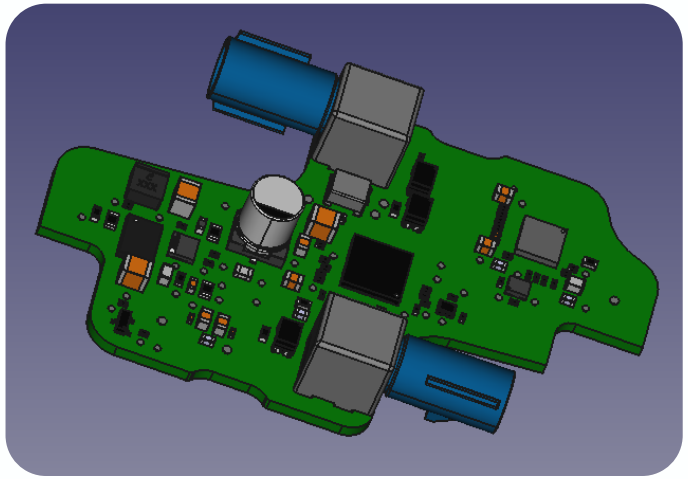
Requirements

- Details related to the enclosure of the PCB
- “STEP” file for the PCB for accurate fit and
- Additional document contain other relevant details.

We studied and analyzed the details before initiate the task and brainstormed with client for clarifications.



Materials Selection

Material for the enclosure selected based on

- Environmental conditions (Durability) and
- Ease for maintenance.

Plastics: Provides excellent durability, cost effective, and light weight, this will be perfect suit for this application.

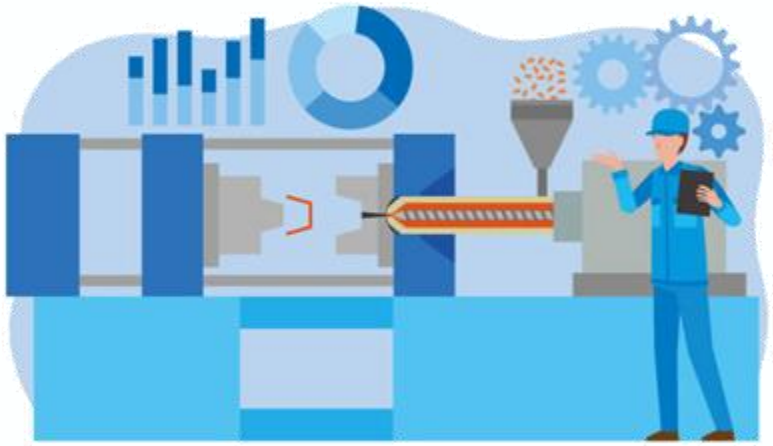
Conceptualization Phase (Cont.)

Manufacturing Process

The inputs considered during this are

- Tight tolerance manufacturing
- excellent repeatability
- Fast cycle time
- Cost effectiveness

Based on this, Injection Molding is preferred for manufacturing.

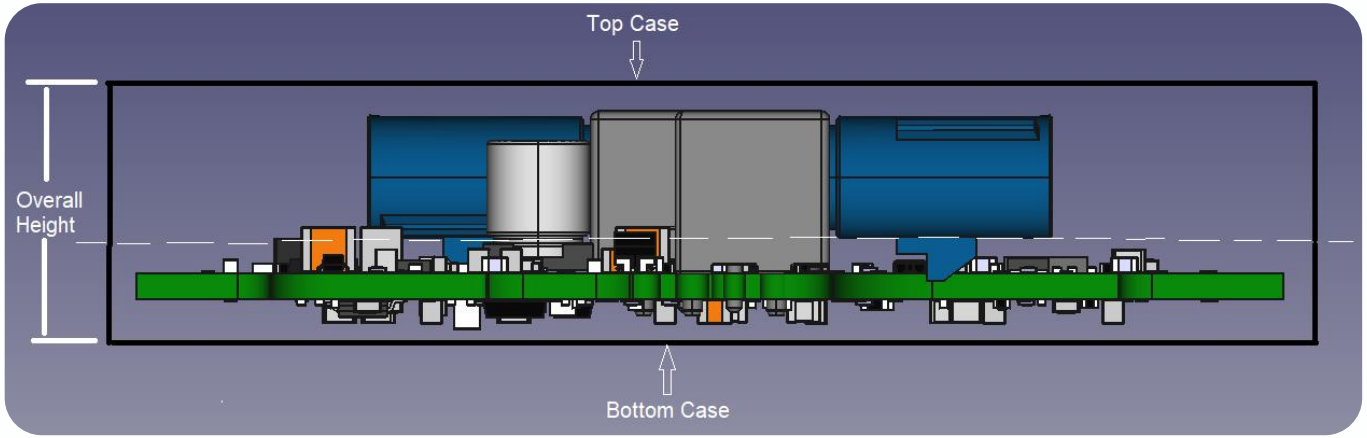


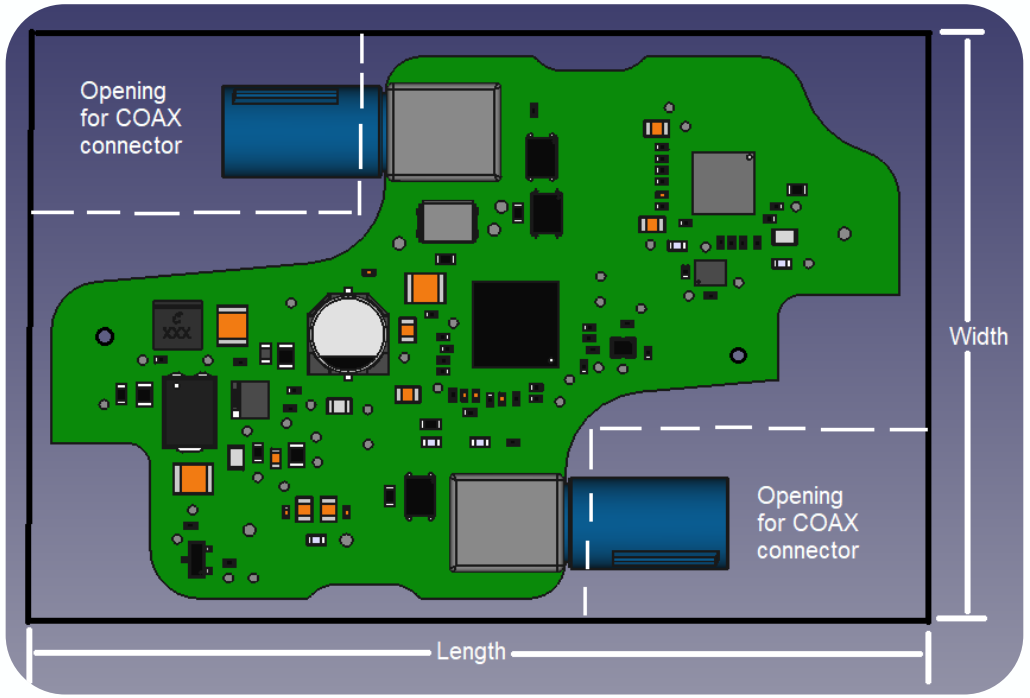
Conceptualization Phase (Cont.)

Initial Sketches – Enclosure Shape & Size Plan

Rough initial sketches are drawn with the details related to cutout for input output connectors.

Cutouts requirements
Enclosure Size
Height of the Enclosure



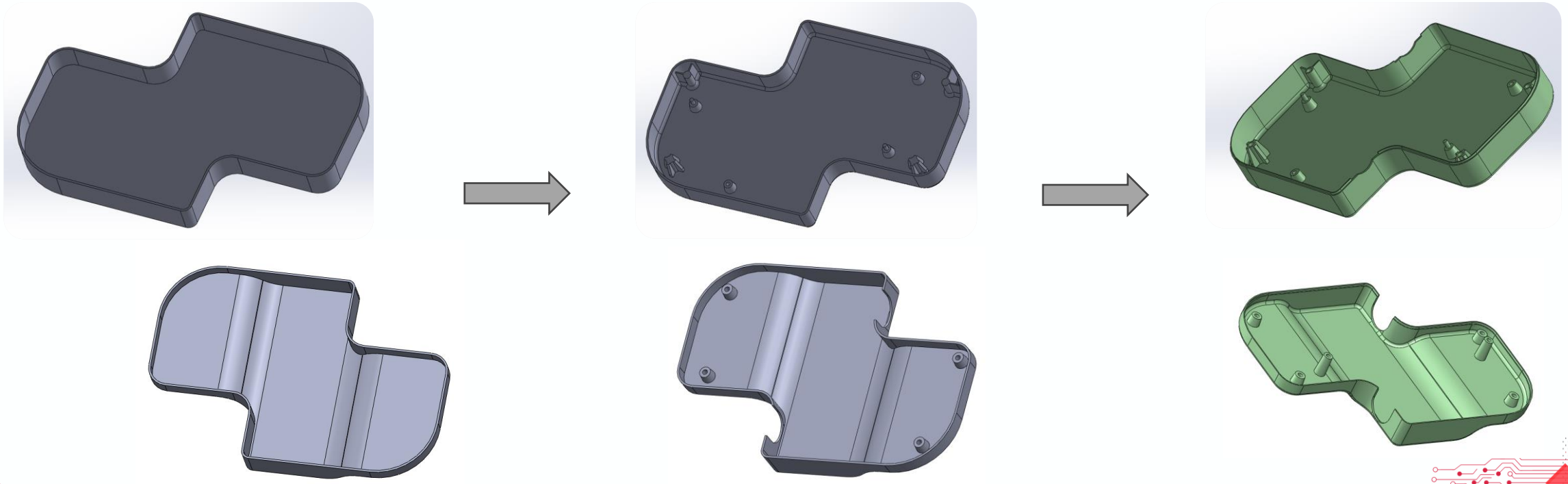


Design Phase

From the sketch details, 3D modeling in the CAD tool is initiated and design optimizations are completed based on the frequent discussion with the client to meet the requirements.

CAD Model Development stages:

Outline Design **Design Optimization** **Aesthetic Improvements**

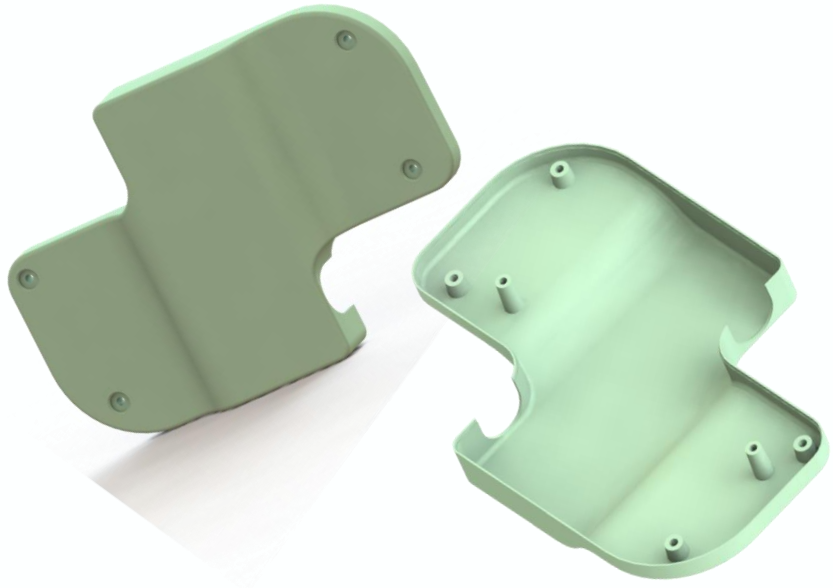


Design Phase (Cont.)

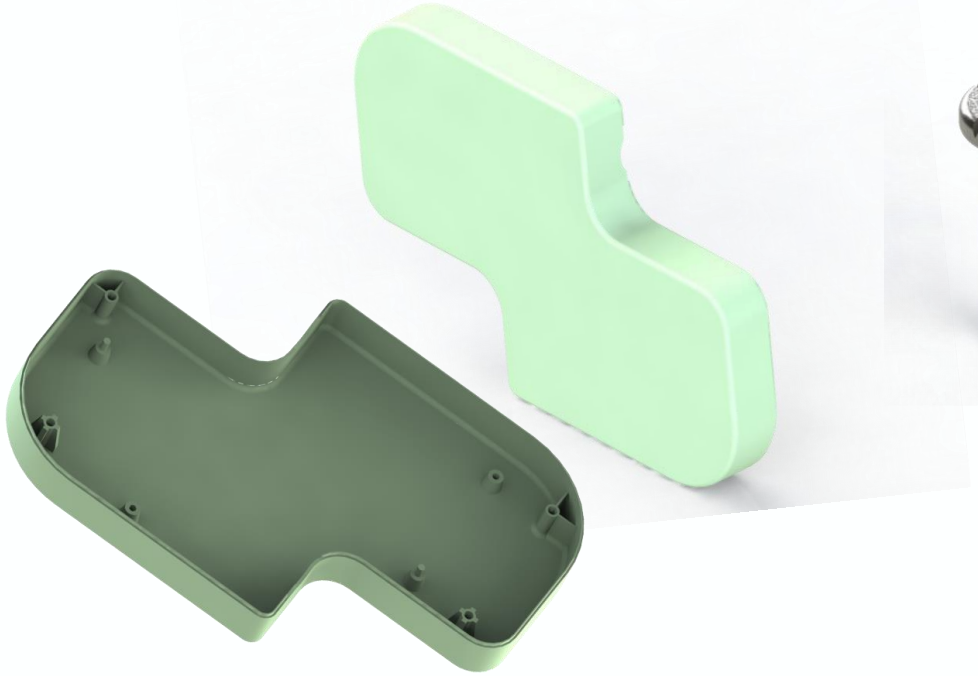
All the individual parts required for the enclosure are designed using the CAD tool and design optimization completed for the material savings, accommodation for connectors and perfect fit of enclosure.

Individual CAD Models

Top Case



Bottom Case

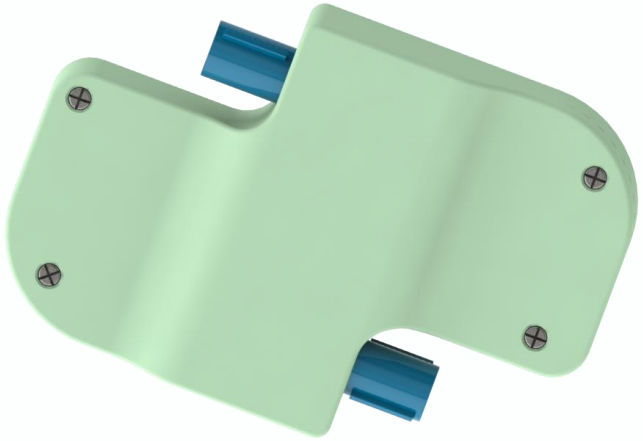


Screw

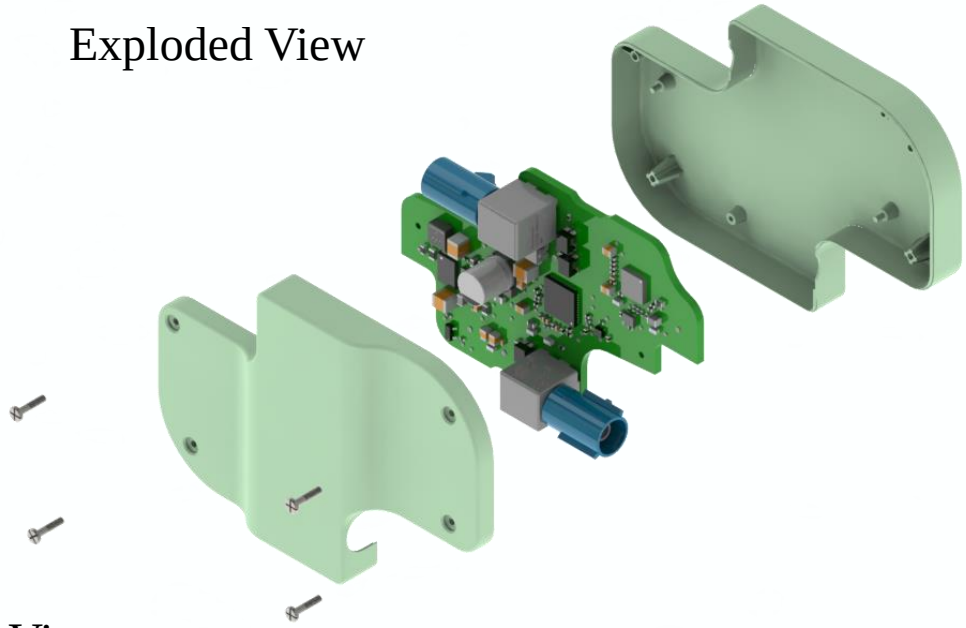
Results

Final Enclosure CAD Model Optimal reference for the final CAD model in orthographic and exploded perspective views.

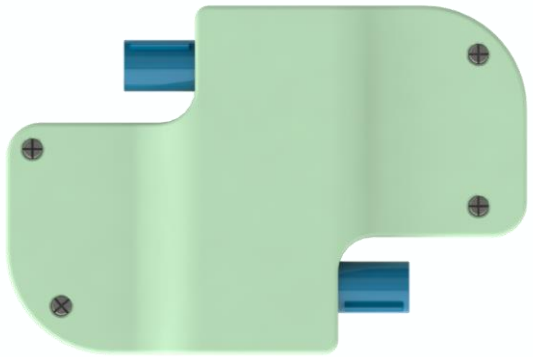
Isometric View



Exploded View



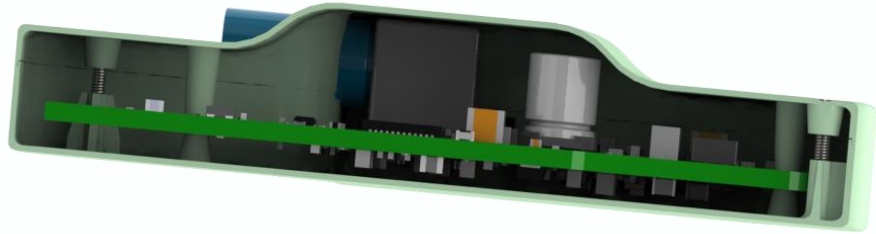
Top View



Front View

Side View

Sectional View



Customer Testimonial

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We are pleased to share a testimonial from a highly satisfied client,

"We extend our utmost gratitude for their exceptional 3D enclosure design services. The design they delivered was visually appealing and perfectly aligned with our requirements, showcasing their expertise and attention to detail. Moreover, they completed the project well within the specified timeline, demonstrating efficiency and reliability. Despite delivering high-quality results, they managed to optimize costs without compromising quality, highlighting their professionalism and dedication to customer satisfaction. We confidently endorse them to any organization seeking top-tier design solutions. Their exceptional performance has undoubtedly elevated the success of our project, and look forward to collaborating with such a talented and reliable team again."

Conclusion

In summary, our team adeptly navigated challenges to deliver a meticulously designed Enclosure, leveraging extensive brainstorming sessions and our expertise in MCAD Engineering Services.

We provided the client with an expertly crafted enclosure design, meticulously tailored to exceed expectations. Through careful analysis and precise execution, we optimized every aspect of the enclosure for superior performance.

Our collaborative approach extended beyond technical considerations, focusing on fine-tuning the design to meet the client's specific requirements while ensuring cost-effectiveness and timely delivery.

We're dedicated to providing unparalleled MCAD services, showcasing our skills and reliability in achieving exceptional results.