Battery Packs

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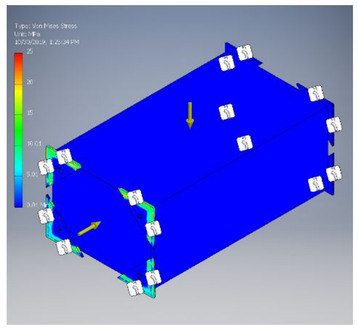
A joint project of the Lafayette College ECE and ME Departments

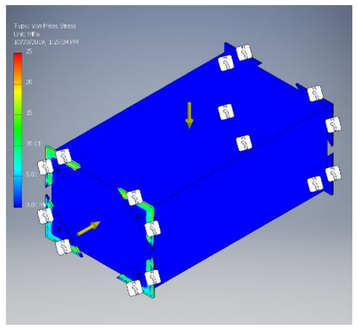
Goals

- Firmwares with a new pack display
- A functional safety loop
- Two fully integrated prototypes

Mechanical Design

- Protective outer aluminum shell
- Structurally robust 80/20 aluminum frame
- Compressive garolite segment insulation



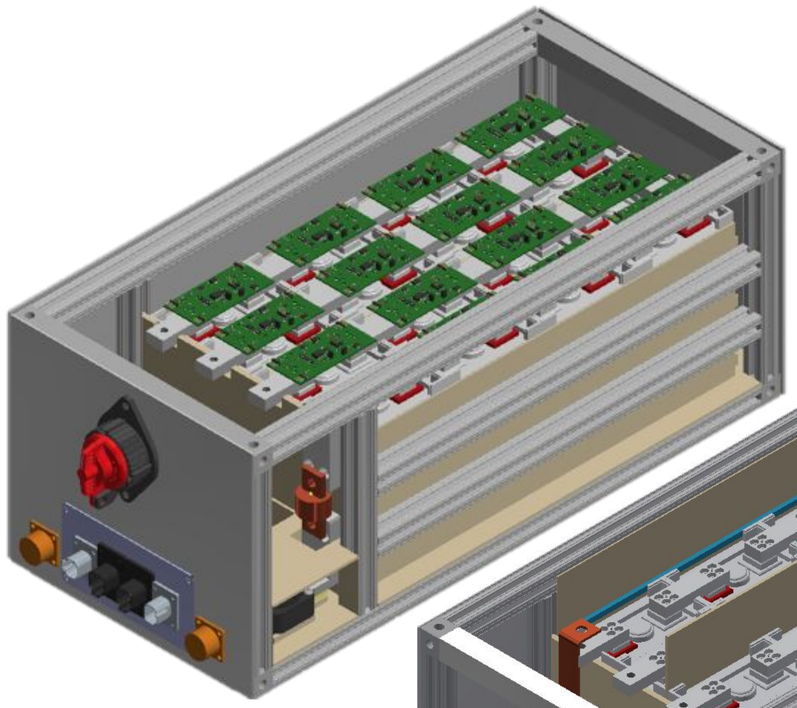


Rules

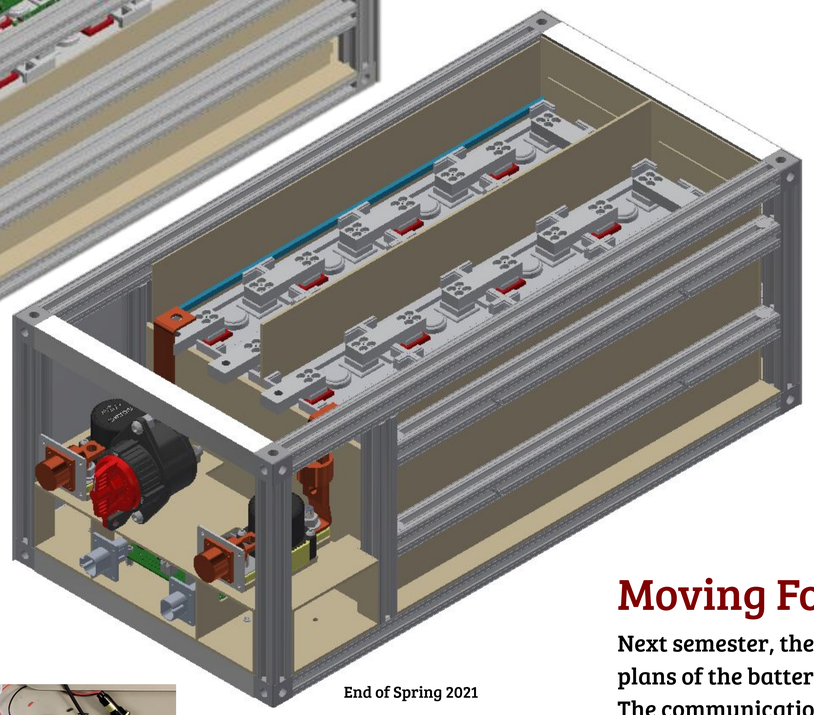
- 100% high voltage current isolation
- Low resistance to ground
- 10-second High Voltage disconnect
- Mounted batteries withstand 20 g vertically and 40 g horizontally

Specifications

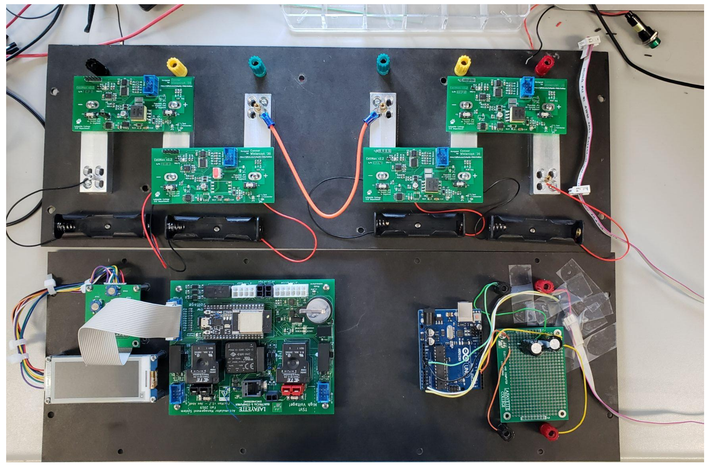
- 16 Cells per Pack
- Two Packs wired in Series
- Voltage per Pack: ~ 51 Volts
- Current: 0 - 200 Amps
- Fused for 300 Amps
- Power: 3072 Watt-hours



Start of Fall 2020



End of Spring 2021



Cellman test bench

Accomplished

<u>Mechanical:</u>

- Manufactured Mechanical Prototype
- Identified all areas of rules noncompliance
- Complete BOM and parts on hand for successive packs

<u>Electrical</u>:

- Firmwares:
  - Added Arduino codes for AMS measurement tests.
  - Adjusted CellMan sorting algorithm.
  - Adjusted safety loop codes to comply with rules.
- Demo & Hardwares
  - Electrical function demo of AMS using 18650 batteries.
  - Replaced pack display and solved I2C failure by resoldering.
  - Changed CellMan circuit resistor and adjusted firmware to support it.

Moving Forward

Next semester, the team will focus on realizing the charging plans of the battery pack.
The communication between SCADA and PackMan also needs additional work.
The Battery Packs team hopes the remaining tasks will be successfully completed and two fully functional packs will be made safely and efficiently.

Website QR

Scan this code to view the car on our website!

A special thank you to our faculty advisor, Prof. Chris Nadovich and also to ECE Prof. John Nestor for their incredible support of this project

LAFAYETTE