Formula Electric Vehicle  
ECE 492-Spring 2016  

Introduction

This year’s Lafayette Formula Electric Vehicle team set out to use battery pack designs from 2014-2015 as well as other subsystems such as VSCADA and GLV to create a full integrated system with the motor and controller purchased from last year.

Though full integration was not entirely completed, our team was able to build a new data acquisition and more streamlined GLV design as well as our biggest accomplishment a fully functional battery pack.

Specs:

- RPM Range: 0-4500 RPM
- Maximum Torque: 90 Nm
- Power Usage (Max): 19 kW
- Power Output (Max): 16 kW @ 225V

System Efficiency: 84% Efficiency

VSCADA
Vehicle System Control and Data Acquisition

The VSCADA acts as the brain of the car, collecting, recording, and display data from the various other vehicle subsystems.

The dashboard for the vehicle displays the current being drawn from the battery packs, the battery state of charge, motor temperature and vehicle speed.

TSV
Tractive System Voltage

Overview:

The Tractive System Voltage provides high voltage power to the from 4 identical battery packs connected in series, capable of providing 95V and over 200 amps continuously.

The pack manager computer, PacMan, underwent 2 major revisions. To minimize wiring in the pack, components were consolidated onto to the current version (including a current sensor, charging relay, and safety loop relay).

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Motor Modeling & Characterization

Goals:

- The motor characterization and modeling team set out to characterize the motor performance trying to answer questions such as
  - What is the normal operating range of the car?
  - What is the max speed of the car?
  - What is the most efficient speed for the car?
  - How long will it take to discharge the batteries?
  - What is the best gear ratio for the car?

- The battery display reads the packs state of charge status of the safety loop and time it has been running.

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