LAFAYETTE
ELECTRICAL & COMPUTER ENGINEERING

Formula Electric Vehicle ECE 492 – Spring 2018

Tractive System Interface (TSI)

TSI Overview

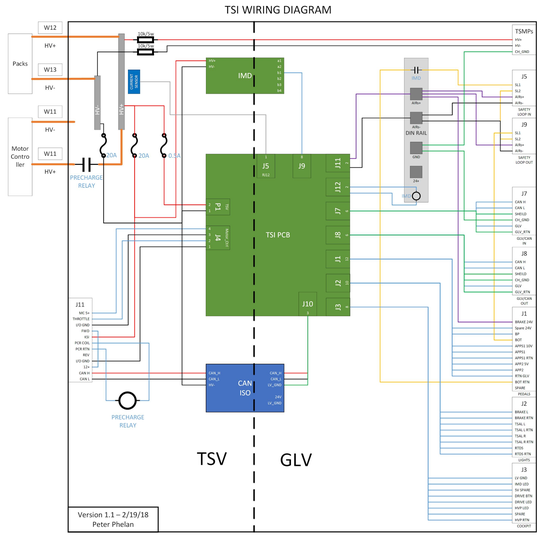
Hardware:

- **Provide interface and isolation between motor controller and TSV**
- **Determine throttle plausibility**
- **Determine brake overtravel**
- **Power up TSAL**

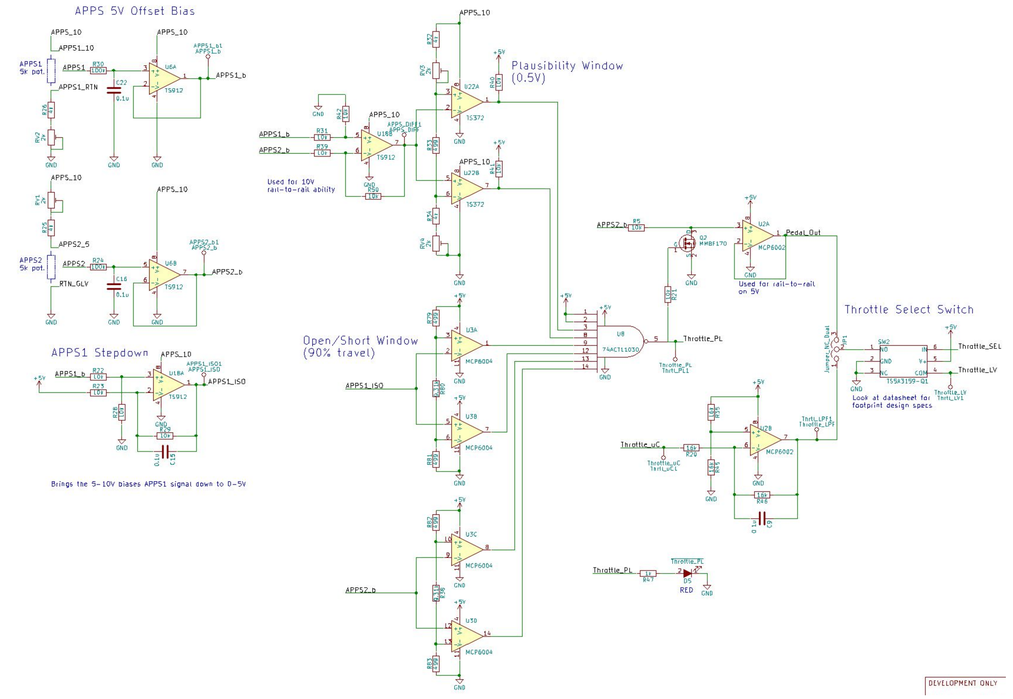
Firmware:

- **Manage drive states and startup/shutdown conditions**
- **Measurement of voltage, temperature and other system characteristics**
- **Send data via CAN to be displayed by VSCADA**
- **Display status system lights**

TSI Block Diagram:

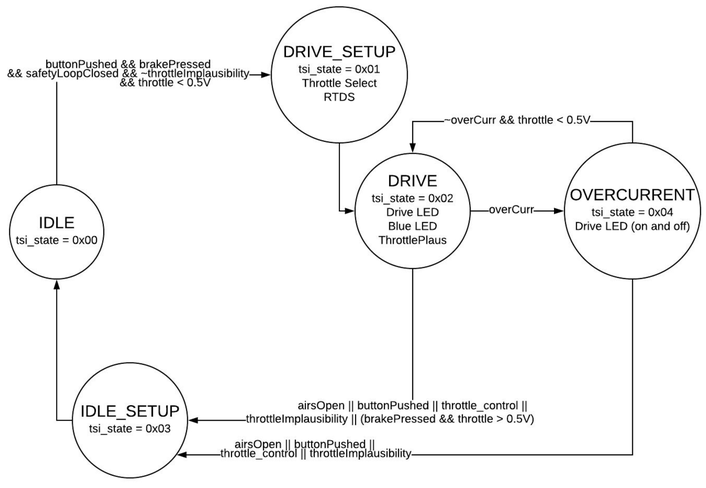


Throttle Plausibility:



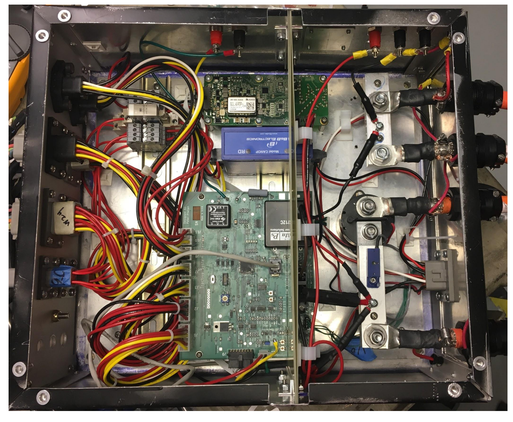
Drive State Diagram:

- Go into drive if all occur:
  - Safety loop is closed
  - Throttle is Plausible
  - Throttle is below 0.5V
  - Brake is pressed
  - Drive button is pushed
- Drop out of drive if one of the following occur:
  - AIRS open
  - Drive button is pushed
  - Throttle Implausibility occurs
  - Throttle_control from SCADA tells us to drop out of drive
  - Throttle and brake are pressed at the same time



TSI Enclosure:

- TSI PCB, CAN isolator, and IMD are mounted on grounded a backplate
- GLV and TSV are isolated by a Garolite board
- Current measurements made with electromagnetic current sensor on HV+
- All wires connected to TSV are protected by resistors (TSMPs) or fuses



Contact Information

Project Website: www.sites.Lafayette.edu/ece492-sp18
Peter Phelan ‘18 (Hardware), Austin Mam ‘18 (Firmware), Thomas Clagett ‘18 (Firmware)

Acknowledgements:

We would like to thank the Lafayette College Electrical and Computer Engineering Department, Mechanical Engineering Department, Prof Nadovich, and Prof Nestor for their continued support of this project.