

## Regenerative Braking System for Electric / Hybrid Vehicles

The objective of this project is to develop an Ultra capacitors based Regenerative Braking System for Electric/ Hybrid Vehicles in order to allow higher accelerations and decelerations of the vehicle with minimal loss of energy and minimal degradation of the main battery pack. The system uses a Buck-Boost converter, which is connected to the ultra capacitor bank at the Boost side, and to the main battery at the Buck side. The energy transfer between different sources is achieved by a DSP based control algorithm which measures and stores the system parameters like primary source voltage, vehicle speed to adjust the energy stored in the ultra capacitor, instantaneous currents in both terminals (primary source and ultra capacitor), and actual voltage of the ultra capacitor.

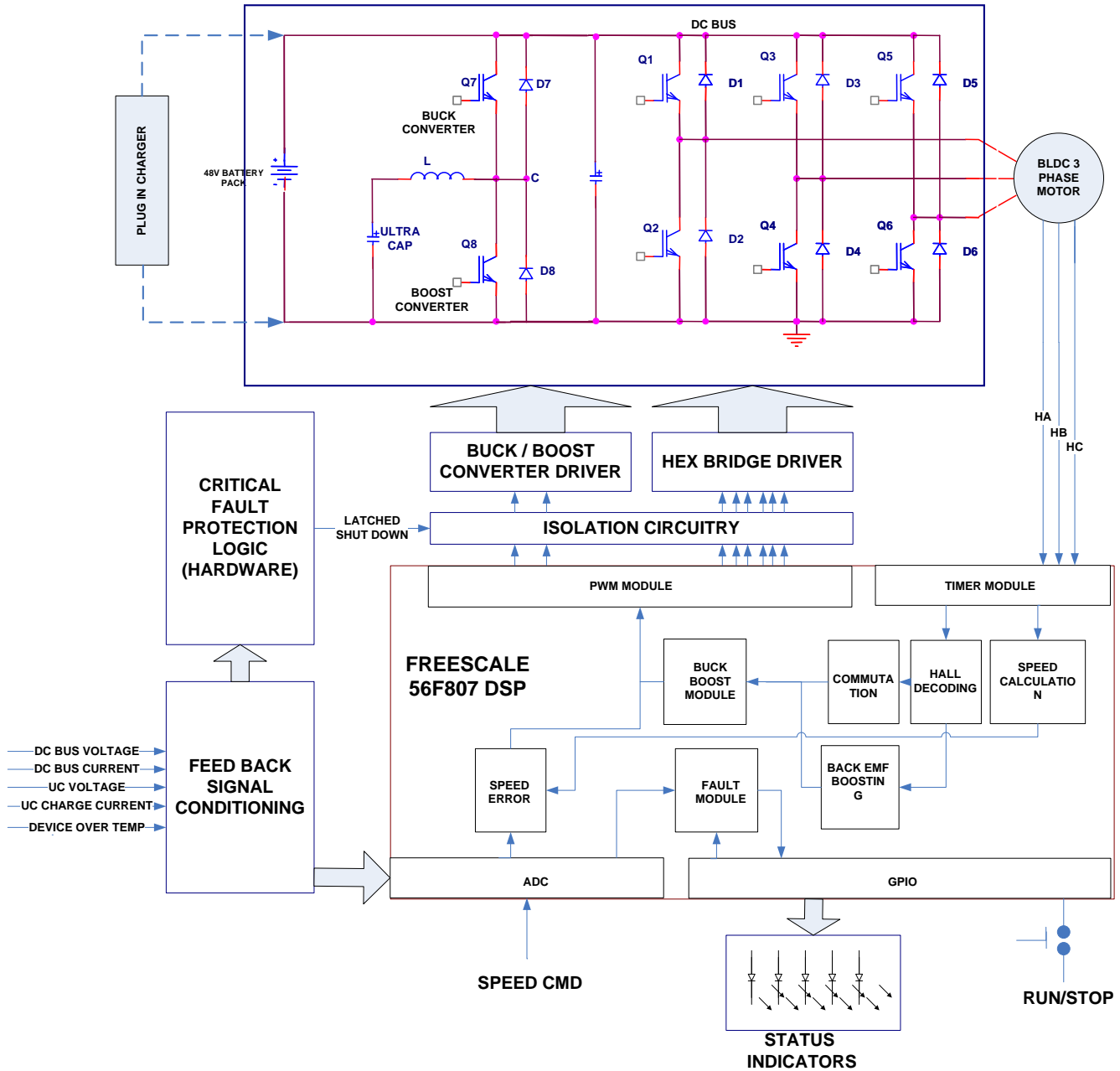
### Outline Specifications

- Motor Type : Brushless DC with Hall Sensors
  - Working Voltage : 48V DC
  - Primary Storage Device : Lead Acid Battery / Lithium - Ion Battery
  - Temporary Storage Device : Ultra capacitor
  - Hardware Platform : DSC 56F8302
  - Programming : Developed in 'C' language
  - Control Algorithm : Indigenous Braking Control Algorithm
  - Communication : RS232/485 interface
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- Real time Fault diagnostic System
  - LCD Display Interface

### Challenges

- Complete system simulation in MATLAB
- DSC based control algorithm design for efficient energy management
- System implementation and testing in an Electric vehicle

**Block Diagram**



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