Electric and Electronic Control System Concept

"Add-On Hybrid Electric Vehicle"

(http://MyOwnHybrid.wordpress.com)

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Development plan

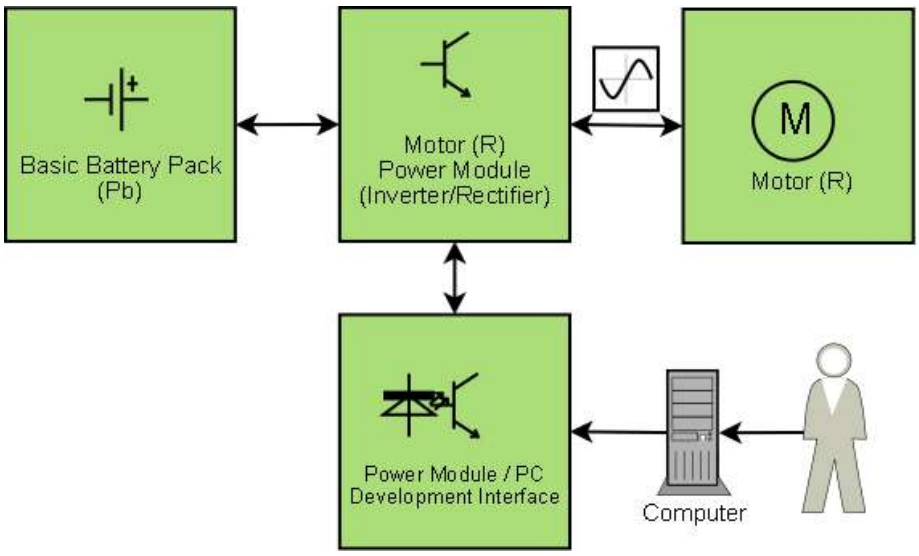
(Think big, start small)
(Murphy never sleeps)

For financial and operating reasons, the architecture will have 4 phases with increasing complexity:

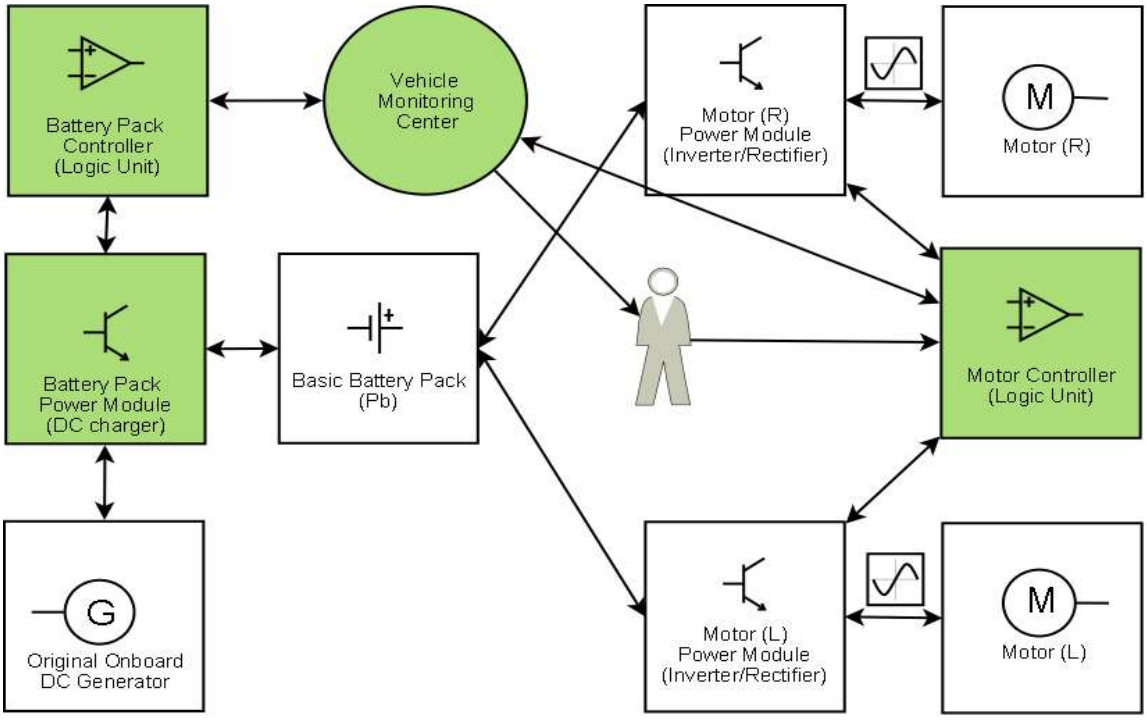
- Phase 0: (Development Set-up)
  - Inputs: Crazy ideas and a lot of wasted time and money;
  - Outputs: A lab workbench with one motor, one Basic Lead (Pb) Battery Pack, and a Development Interface for control algorithm exploration; A second motor and power module if all goes well (motor is good enough and control is efficient and effective).
- Phase 1: (Cheap Parallel HEV)
  - Inputs: Two motors, two power modules, one Basic Battery Pack, one car;
  - Outputs: One Twin-Motor Controller, one Battery Pack Power Module, one Battery Pack (Charger) Controller.
- Phase 2: (Better Parallel HEV)
  - Inputs: One simple parallel HEV;
  - Outputs: One upgraded parallel HEV with Super Capacitors and a Lithium (Li) Battery Pack.
- Phase 3: (Optimized Serial HEV)
  - Inputs: One reasonable Parallel HEV;
  - Outputs: One Serial HEV with an intelligently controlled High Power Generator/Starter, and a DC-DC converter to connect the traction electric system to the vehicle's original power network.
- All Phases: (Continuous development)
  - Inputs: all controller modules and their interfaces;
  - Outputs: One well-adapted upgradeable Vehicle Monitoring Center.

In the following section, the architecture of the system in each implementation phase is graphically clarified, with the newly-created blocks marked in green.

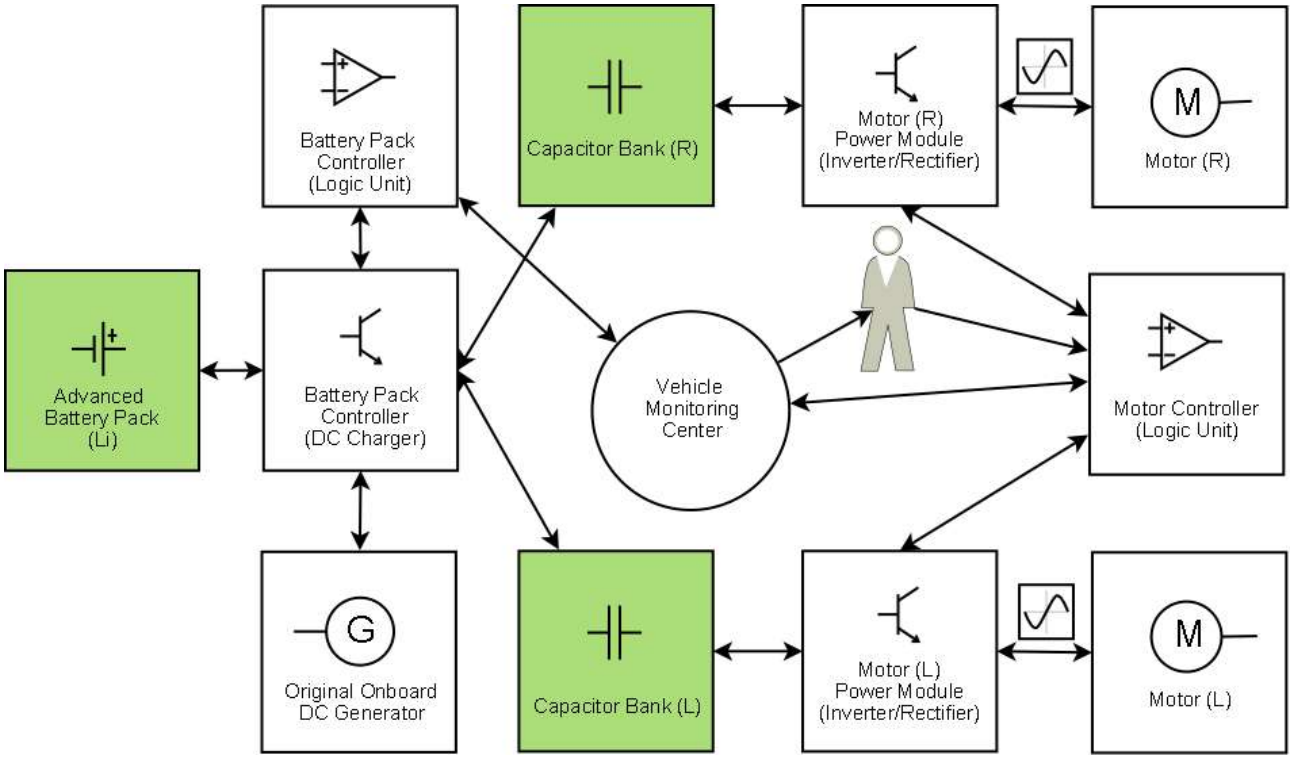
Architectural diagrams



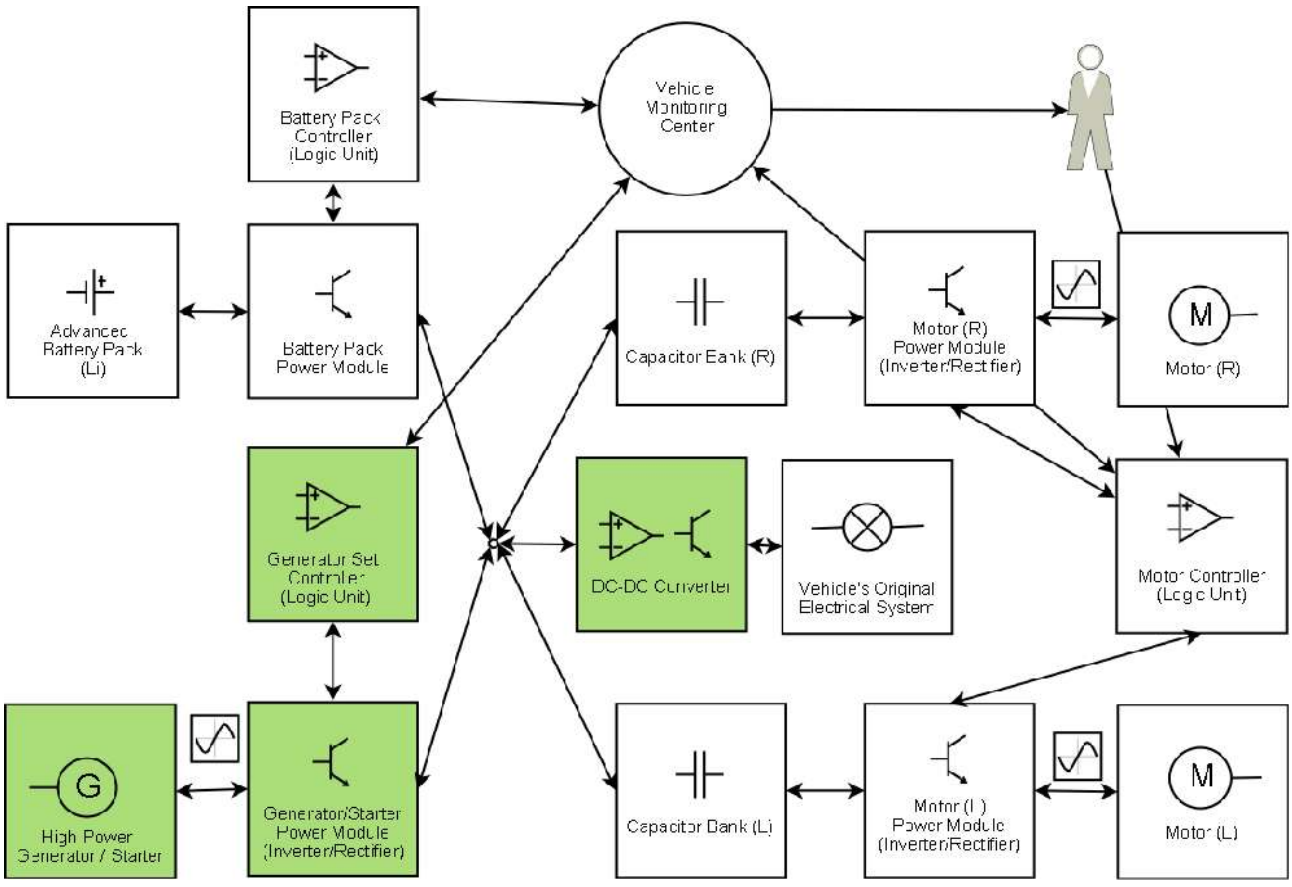
Phase 0 (Development Set-up)



Phase 1 (Cheap Parallel HEV)



Phase 2 (Better Parallel HEV)



Phase 3 (Serial HEV)

Sub-project breakdown

Implementation phase *	Module name	Qty. *	Main technical skills required	Assigned to
0	Motorized Electric Wheel (MEW)	2	Mechanics; Magnetics; Electrotechnics.	
	Motor Power Module (MoPoMo)	2	Power Electronics, Analog Electronics.	
	Power module / PC Interface (PoMPI)	1	Digital Electronics.	
	Basic Battery Pack (BaBaP) - Pb	1	Electrotechnics.	
	Workbench Control Algorithm (WoCoA)	1	Software	
1	Twin Motor Controller (TwMoC)	1	Digital Electronics, Firmware	
	Battery Pack Controller (BaPaCo)	1	Digital Electronics, Firmware.	
	Battery Pack Power Module (BaPPMo)	1	Power Electronics, Analog Electronics	
	Parallel Vehicle Integration (Work!)	1	Mechanics, Electrotechnics	
2	Advanced Battery Pack (ABP) - Li	1	Electrotechnics, Analog Electronics	
	Capacitor Banks (CaBa)	2	Electrotechnics	
	Vehicle Integration Upgrade (More Work!)	1	Electrotechnics	
3	High Power Generator/Starter (HiPoGeS)	1	Mechanics; Magnetics; Electrotechnics.	
	Generator Power Module (GePoMo)	1	Power Electronics, Analog Electronics	
	Generator Set Controller (GeSeCo)	1	Digital Electronics, Firmware	
	Serial Vehicle Integration (BigWork!)	1	Mechanics, Electrotechnics.	
0,1,2,3	Vehicle Monitoring Center (VeMoCe)	1	Digital Electronics, Analog Electronics, Firmware, Software	

Qty.* - May not be necessary to produce full quantity right away; one specimen for initial testing is appropriate, followed by remaining ones or full replacements (if necessary) at end of phase.

Impl. order * - Between each two phases (1,2,3,4...) there must be a complete system testing period.