



- ① The Motor Drive produces up to 10kW instantaneously at 300-350V, with settable current and voltage limits. The electrical power is delivered in short pulses every 10 seconds or so with a peak average power of 1kW.
- ② The Motor Drive communicates via CAN Bus, over which the voltage and current limits can be set, and/or the Drive can respond to regular messages about state-of-charge from the battery controller or BMS.
- ③ The Motor Drive contains a large amount of capacitance so a slow-start charge circuit is needed when it is connected to the batteries. This connection is activated by a manual switch and is never under programmatic control.
- ④ Battery and Battery Management System to maintain cell voltage balance and report state-of-charge and similar information. The device could report directly on the CAN bus, or to the battery controller, or could be combined with the battery controller but is always powered. 6-10 kW-Hr, 325V. Parallelization of these strings is desirable, with or without additional housings. Desirable but not required is the ability to accommodate different bus voltages down to 48V for different applications.
- ⑤ Battery System reports telemetry data on the CAN Bus, and can implement the low-voltage disconnect or other features. This is always powered and could be combined with the BMS.
- ⑥ Below a certain state-of-charge, the loads on the system are disconnected. The connection to the Motor Drive remains and the BMS/Battery Controller continues to operate. In typical usage there is enough wave-action to re-charge the batteries and the Loads are turned back on when an acceptable state-of-charge is reached.
- ⑦ Isolation monitoring is required, this is currently reported by the battery controller. Ground Fault interruption is not currently implemented, but could be on the 300V load circuit.
- ⑧ The 300V load circuit needs to include a current limiter on turn on due to the unknown nature of the loads. This could be implemented as part of the Low-Voltage Disconnect also. Galvanic isolation here is desirable.
- ⑨ An external Linux computer monitors and logs all CAN bus traffic, has some control over various sub-systems, and has a cell-modem to shore connection. Nothing in the electrical system should depend upon this controller.