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Prolonging the Service Life of Lithium Ion Batteries in Electric Vehicles (EV) Using Double Layer Capacitors (EDLC)

Current electric vehicles (EV's) rely exclusively on lithium ion batteries to power the car. Consequently, they must supply short burst of high power (current) during acceleration, hill climbing and towing, for which they are not designed to do such. As a result their service life is depleted.

Through the implementation of a DC to DC pseudo bidirectional converter, the hope was to produce a simple control mechanism that would allow easy integration of Electrochemical Double Layer Capacitors (EDLC's) into any R/C car and eventually electric vehicles. In contrast to lithium ion batteries low power density, EDLC's have a high power density making them an ideal energy source during times of high power consumption. The EDLC's will supplement the battery during times of high power to prevent the battery from providing quick bursts of current.

The DC to DC converter allowed for the voltage regulation of both the battery and the EDLC's. The converter boosted the EDLC's characteristically low and non-linear voltage to a constant higher voltage. Additionally, the system bucked the battery voltage down to EDLC's rated charge voltage.

The final system successfully bucked the battery voltage from 7.4V to 2.0V and boosted the EDLC's up to a constant 7.4V. Further, EDLC's were successfully initiated during times of high power consumption, alleviating some of the stress on the battery. By reinforcing the current benefits of EV's with this new EDLC technology EV's can finally make an inroad in the robust gasoline vehicle market.