

Experimental Analysis of Control in Electric Vehicle Charging Station Based Grid Tied Photovoltaic-Battery System

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Abstract : This work presents an improved strategy of control for charging a lithium-ion battery in an electric vehicle charging station using two charger topologies i.e. single ended primary inductor converter (SEPIC) and forward converter. In terms of rapidity and accuracy, the power system consists of a topology/control diagram that would overcome the performance constraints, for instance the power instability, the battery overloading and how the energy conversion blocks would react efficiently to any kind of perturbations. Simulation results show the effectiveness of the proposed topologies operated with a power management algorithm based on voltage/peak current mode controls. In order to provide credible findings, a low power prototype is developed to test the control strategy via experimental evaluations of the converter topology and its controls.

Keywords : battery storage buffer, charging station, electric vehicle, experimental analysis, management algorithm, switches control

Conference Title : ICEVT 2019 : International Conference on Electric Vehicle Technologies

Conference Location : London, United Kingdom

Conference Dates : June 27-28, 2019