



Control for Grid Connected Electric Vehicles in Single- And Three-Phase Networks with On- Board Battery Charging

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Abstract: Due to the increased rate of depleting fossil fuels, air pollution and global warming, the conventional vehicles using internal combustion engines (ICE) are replaced by electric vehicles (EV). It recaptures the regenerative braking energy, thus eliminating engine idling time. The bidirectional flow capability of vehicle is controlled by using a unified control methodology. It also reduces cost, weight and size of on board chargers in electric vehicles, thus enhancing dual usage of converters for charging and propulsion. The control is eminent in that it can be executed for four quadrant operation when connected in single-phase or three-phase network. The operation and grid management are spontaneously adjusted depending on specified terminal voltage and current measurements without the need for additional status signals. The proposed system is validated via detailed simulation.

Keywords: Electric vehicle, internal combustion engine, charging, global warming, voltage source inverter.

