

System and Method for Charging Multiple Electric Vehicle Batteries Using Pulse Charging in a Swappable Charging Station

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ABSTRACT

A system and method for delivering smooth power while charging multiple electric vehicle batteries in a swappable charging station using pulse charging methods. The system includes a dynamic charging algorithm that optimizes charging efficiency and battery health by selecting appropriate charging methods based on the number of batteries and their state of charge (SOC). The system ensures smooth power delivery from the grid (101) to the charging station by preventing fluctuations in grid current and DC link voltage, optimizing the charging process for two-wheeler and three-wheeler EVs.

KEY APPLICATION AREAS

1. EV Battery Swapping Stations.
2. Electric Two-Wheeler & Three-Wheeler Charging Infrastructure.
3. Battery Management Systems (BMS).
4. Energy Storage Systems (ESS).
5. Multi-Battery Charging Facilities.
6. Renewable Energy Storage Applications.

POTENTIAL USE

1. Charging multiple EV batteries simultaneously in swappable stations.
2. Fast and efficient charging using pulse charging techniques (PC1, PC2, PBC).
3. Extending battery life by reducing lithium plating and dendrite formation.
4. Managing charging loads to ensure smooth power delivery and grid stability.
5. Battery charging for electric scooters, e-rickshaws, and commercial EV fleets.
6. Optimizing charging of large battery banks in renewable energy storage systems.