

# Smart EV Battery Management System with IoT-Based Monitoring, Fire and Theft Protection

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**Abstract:** *This project presents the design and implementation of a Smart Electric Vehicle (EV) Battery Management System (BMS) integrated with IoT-based monitoring, fire, and theft protection. The system aims to enhance the safety, efficiency, and real-time supervision of EV battery operations. Key features include accurate State of Charge (SOC) estimation, voltage and current monitoring, and live data visualization through the Blynk IoT platform. The system also incorporates overcharge protection by automatically disconnecting the charger once the battery reaches full capacity. Fire safety is addressed using temperature sensor that trigger alerts and activate protective mechanisms when hazardous conditions are detected. Additionally, the project includes an anti-theft module that uses motion sensors to detect unauthorized movement and notify the user instantly. This comprehensive BMS solution ensures improved battery performance, extended battery life, and enhanced vehicle security, making it a reliable advancement in the field of electric mobility*

**Keywords:** Electric Vehicle (EV), Battery Management System (BMS), Internet of Things (IoT), State of Charge (SOC), Overcharge Protection, Fire Safety, Anti-Theft System, Real-Time Monitoring, Blynk Platform, Voltage and Current Sensing, Temperature Sensor, Motion Detection, Battery Safety, EV Security, Smart Charging.

