
# Battery Management Systems

**Expertise in battery management systems including the ability to monitor temperature, state-of-charge, and maintain the system within safe operating limits to improve battery life.**

## Competitive advantage

- Cooperative state of charge balancing
- Advanced state-of-charge, state-of-health estimation algorithms
- Monotonic charging/discharging of battery packs
- Temperature monitoring using limited number of temperature sensors
- Reduction of battery current variation

## Impact

- Extended lifetime of batteries
- More efficient and reliable battery products

## Successful applications

- Direct AC linked hybrid (battery/ultracapacitor) energy storage system with second order harmonic current reduction
- Distributed cooperative balancing system for reconfigurable battery systems
- Modular multilevel battery storage system with second order harmonic current reduction
- Temperature monitoring system for ultracapacitor strings using limited number of temperature sensors

## More Information

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## Capabilities and facilities

- Power Electronics Laboratory
- Arbin Instruments battery tester
- Prototypes of hybrid (battery/ultracapacitor) energy storage system, reconfigurable (hybrid) energy storage system and temperature monitoring system for supercapacitors strings

## Our partners

- ABB