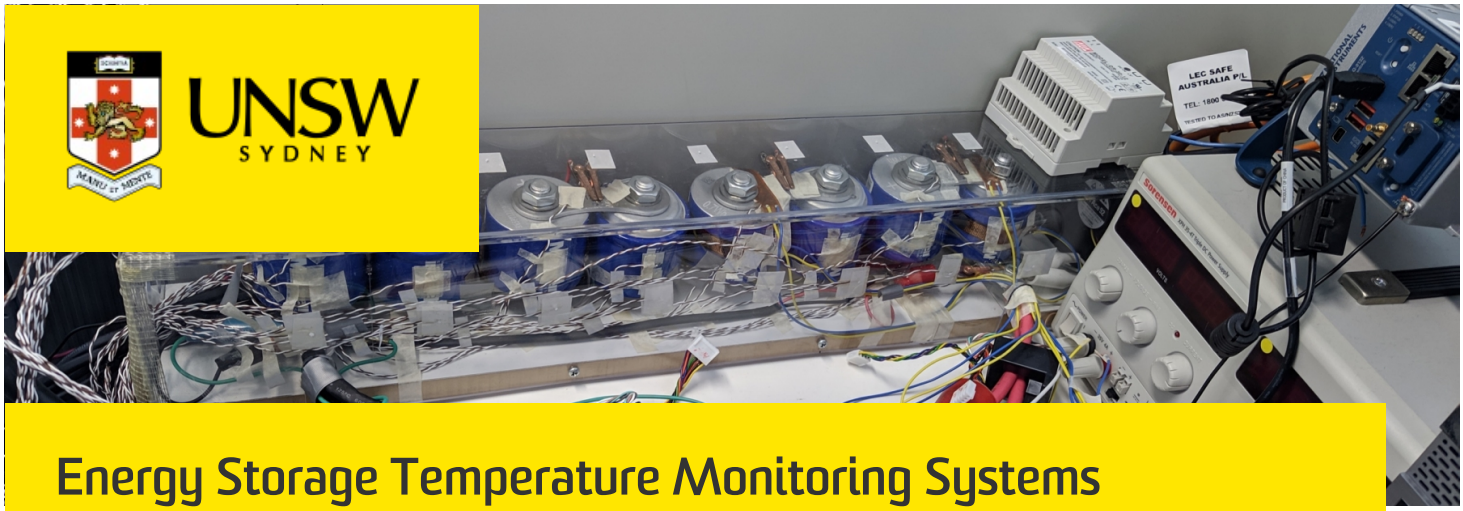

Energy Storage Temperature Monitoring Systems

In an energy storage string or module consisting of a number of cells, a significant variation in temperature distribution can exist. However, monitoring the whole module temperature is often hindered by hardware and cost limitations and, typically, only a limited number of temperature sensors are employed.

Competitive advantage

- An innovative model-based temperature monitoring and diagnostic system has been developed for a forced-cooled electrochemical energy storage string using a limited number of sensors
- A unique, multiple model estimator is used to monitor temperature of all cells as well as to detect and localise an abnormally overheating cell, with the limited number of temperature sensors. The optimal location of the temperature sensors is determined by analysis of the observability Gramian

Impact

- Reduced cost due to reduced number of temperature sensors
- Increased safety as abnormal overheating of cell within a string can be detected

Successful applications

- An experimental prototype consisting of eight supercapacitors capable of detecting overheating using three thermocouples.

Capabilities and facilities

- Power Electronics Laboratory
- Arbin Instruments batteries and supercapacitors tester

More Information

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