

MODULAR BATTERY SYSTEM

Lithium-ion batteries provide significant life and performance benefits for energy storage in domestic, industrial and grid-connected applications. The battery life is, however, determined by many factors such as the adequacy of their cooling and battery management system. UWC has developed a Modular Battery System which incorporates unique control algorithms and enhanced safety features, thus offering a more efficient, lighter and cost effective battery solution. The “plug & play” design is scalable to various applications.



Energy Storage
Innovation Lab

Market need / opportunity

Energy generated by photovoltaic systems is renewable and independent of the electricity grid. The energy generated, however is only available while the sun shines and needs to be stored for use at night. Current storage applications in South Africa make use of lead-acid batteries. This is not ideal as it is environmentally unfriendly, short lived and only 70% efficient. Li-ion batteries are an alternative energy storage solution and although they last longer and do not leak any gases, there are safety risks associated if not selected and managed correctly. Imported Li-ion batteries are expensive and not optimised to the typical South African applications or operating conditions.

Value proposition and benefits

A long lasting, safe, highly efficient, modular “plug and play” Li-ion modular battery system providing a cost-effective energy storage solution for a range of residential and light industry applications.



Technology description

The technology incorporates a more efficient and safer lithium-ion battery management solution with early prototypes demonstrating a 85% efficiency. Its sophisticated physical design, cell chemistry and propriety control algorithms and circuits all contribute to the safety operating envelope of the cell/battery pack. This allows a more accurate and uniform control of the state of charge, temperature and voltage during operations. The unique dual redundant safety system allows modules to be connected in series whilst maintaining safety, a key feature in the scalability of the product. A UK provisional patent application has been filed.

Key features:

- Scalable modular design for 24v to 380v
- Dual safety system
- Light compact design for easy installation
- Versatile - suitable for multiple applications
- Cost-effective
- Can be coupled to Intelligent monitoring via smart phone or internet



Applications

Applications in the range of 2.5kWh to 30kWh. This will cover residential and light industrial applications and include; PV, power backup, UPS, cell-phone towers

Contacts:

Energy Storage Innovation Lab: Prof. Ben Bladergroen
Email bbladergroen@uwc.ac.za

UWC Technology Transfer Office: Dr Janine Chantson
Email tto@uwc.ac.za
www.tto.uwc.ac.za

Acknowledgment:

The National Intellectual Property Management Office (NIPMO) for support associated with protecting the IP on this technology