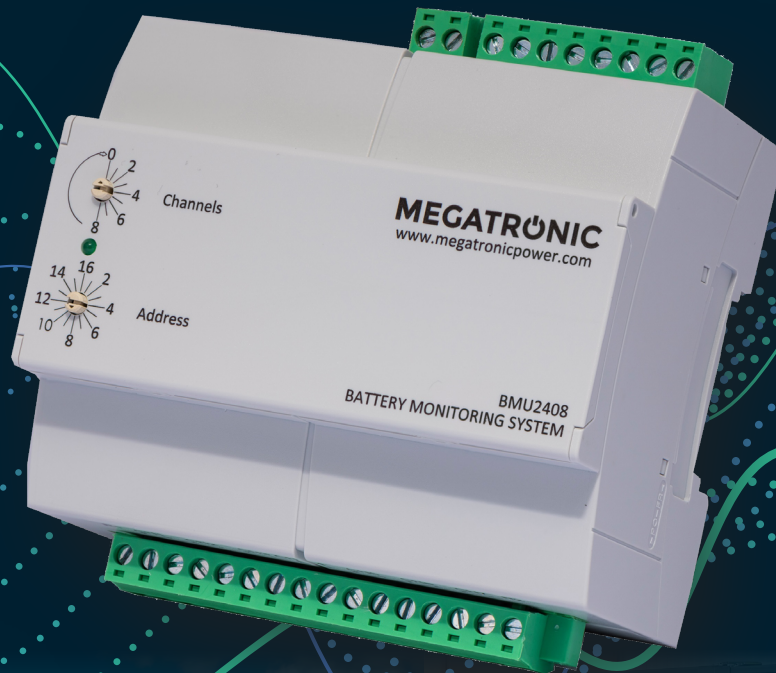




**MEGATRONIC**  
POWER SYSTEMS  
Controlling the Future.

# MEGATRONIC BATTERY MONITORING SOLUTION

Battery Protection. Automated Testing. Remote Visibility



AUSTRALIAN DESIGN  
MANUFACTURED IN AUSTRALIA

INNOVATIVE ENGINEERING BRINGING RELIABILITY & EFFICIENCY TO BATTERY POWER STORAGE SYSTEMS



# WHAT IS THE COST OF BATTERY FAILURE TO YOU?

## All batteries will fail, it's just a matter of time.

Most battery systems or UPS systems are utilised as critical backup power supplies. The reason that they are in place is to offer reliability to your operations.

Battery faults are usually detected when a battery system is called into action, but fails on demand. When you think there is a healthy 100% power storage, the reality can be that you have limited power available or none at all.

One faulty / deteriorating battery cell in a battery bank can destroy all the cells in the bank quite easily and quickly. Batteries are vulnerable when overcharged or reach the low discharge level.

- ✓ 80% of UPS failures are due to undetected / problems.
- ✓ 17% of failures are caused by Human error.

### The impact of battery failure can be catastrophic:

**Reliability of operations:** A battery system failure normally has a huge knock-on effect resulting in downtime to operations. The physical cost of the downtime can result in millions of dollars of lost production.

**Fire:** Overcharging or undercharging a single battery in a battery bank can result in catastrophic failure, explosions and battery fire.

**Cost of asset:** Replacing battery systems is expensive. Some batteries today are designed to last 20+ years. If they are not monitored and maintained properly, they will fail unnecessarily with a poor return on investment.

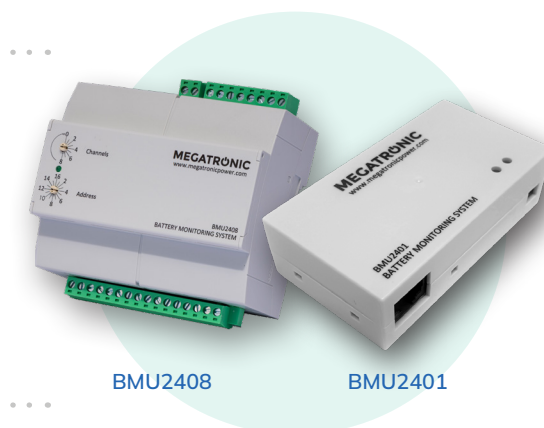
Are you confident of your battery system reliability?



# SOLUTION MEGATRONIC BATTERY MONITORING SYSTEM

Megatronic Power Systems has developed their industrial battery monitoring system (BMS) to offer protection, reliability and economic advantage to battery power storage systems.

The system is a smart and flexible product thanks to its well-engineered innovative design. It is suitable to be used for any type of rechargeable batteries and specifically engineered around the latest lithium-ion technology.



**Pro-active automated warnings and alarms** of faulty batteries via – IOT interface, SMS and email. Digital outputs available for alarms.



**Remote visibility** across multiple platforms. IOT web interface, mobile app etc.



**Automated battery testing.**



**Automated protection** features / capabilities.



**Automated reports.** Historical trending and alarming.



**Charge control** – Utilise the BMS features to accurately control the charge of your batteries.



**Battery agnostic** – Suitable for Lithium, Lead Acid and many others.



**Quick and tidy installation.** Modular and easy to retro-fit to new and existing batteries.



**Cyber secure** – Highest level of cyber security.



**Network capabilities**



**Future proof** – Your systems will be ready for upgrade to new battery technology if and when required.

*The Megatronic BMS makes the 'Invisible – Visible'.*



# SYSTEM OVERVIEW

## HOW IT WORKS.

The solution has been developed to detect the state of charge (SOC) and health state of each individual battery cell on a bank of batteries.

It detects individual battery faults prior to failure and raises warning before the whole bank of batteries suffers.

The BMS also automatically tests each battery at regular intervals and logs the data ensuring that maintenance tasks are completed accurately and as efficiently as possible.

The BMS can also be utilised to control the charge of a battery power system.

The cyber secure, IOT web-based user interface ensures that the right information is extracted from the batteries and displayed in a clear, easy to understand format with simple instruction on how to rectify any highlighted issues.

Control systems can also read and display the data through standard industrial communication protocols.

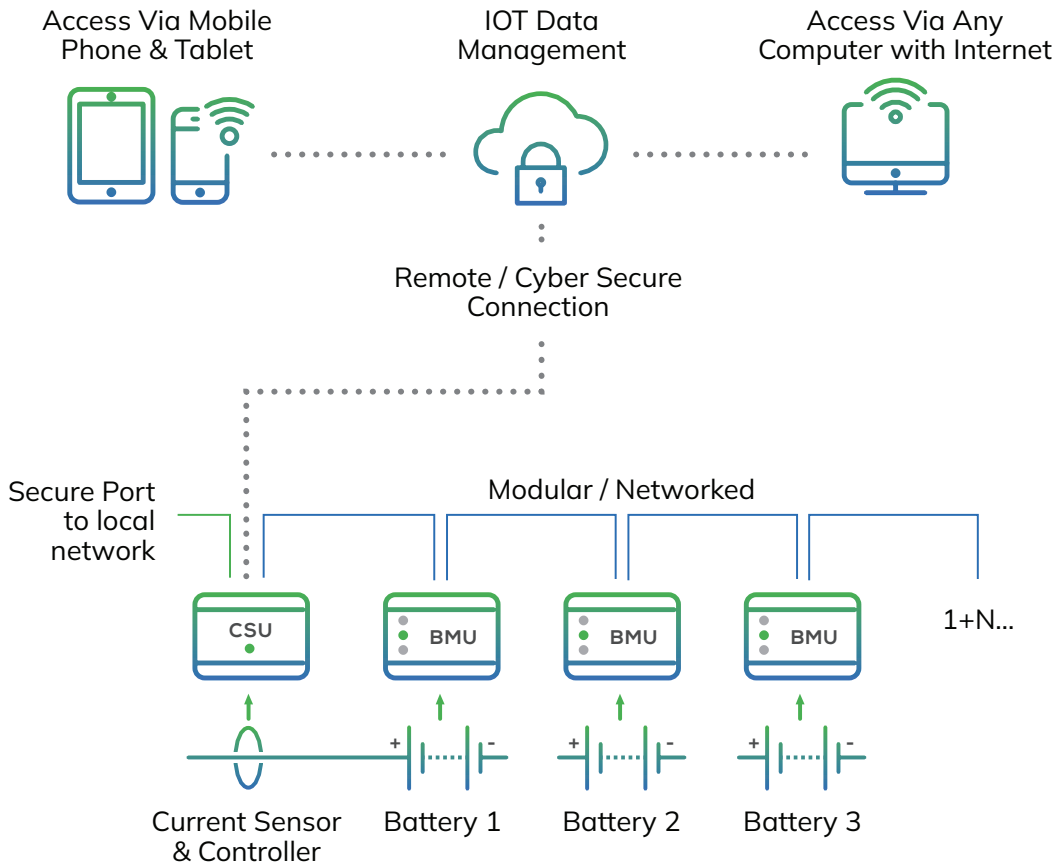
There are also volt free contacts which are pre-programmed to receive hardwired alarms from the BMS.

SMS and Email alarms can be sent to maintainers, along with monthly reports.

The battery monitoring units are modular and can be linked together to monitor an infinite number of battery cells. The system is completely scalable.



The BMS can be easily and efficiently retro fitted to any existing battery power storage system.



\* Note: BMU2401 = 1 Battery, BMU2408 = 7 Batteries

# CRITICAL BATTERY INFORMATION

### Individual Battery Monitoring:

Individual battery monitoring offers 100% certainty on the health of a battery bank. A string of batteries is only as strong as the weakest battery in the string. If one battery suffers problems or has reduced capacity, then the entire string is limited to the performance of that compromised battery.

✓ **Individual Voltage Measurement:**  
Overcharging or undercharging batteries can quickly destroy them or lead to the batteries exploding and causing a fire. It is also very important to keep the voltage of each battery in a sting / bank balanced and as close to equal as possible. This will ensure the capacity and efficiency of the string / battery bank.

✓ **Individual Resistance Measurement:**  
The resistance of each battery is a good indicator of the age and health of the battery. Degradation can be tracked and the life expectancy of the bank can be projected more accurately.

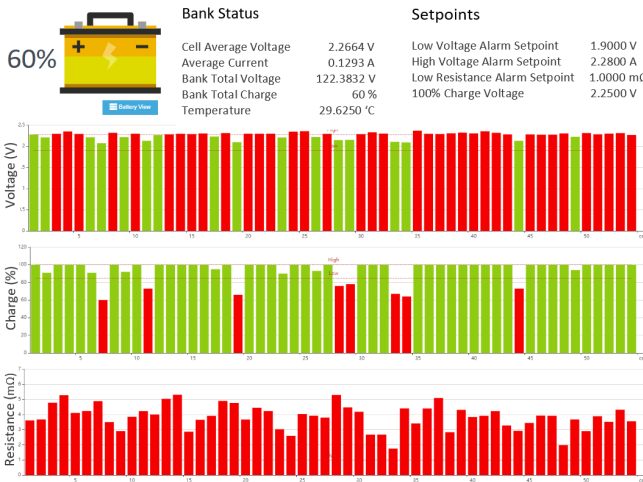
✓ **Individual Battery Charge % Calculation:**  
Monitoring individual voltage and resistance, combined with string current allows for an accurate calculation of 'Individual Battery Charge %'. This allows the operator to easily identify the 'weakest link'.

✓ **Individual Battery Temperature (BMU2401)**  
Monitoring individual temperature of each cell can be useful information when diagnosing battery problems and detecting battery thermal runaway.

**String Current:**  
Monitoring the current of the string / battery bank means the energy delivered or used can be accurately determined. This can also help identify issues with the battery charger.

**String Voltage:**  
This can indicate that the charger is powered on and performing.

**Ambient Temperature:**  
It is very important to know and control the environment batteries are operating in to maximise equipment life.



### Artificial Intelligence:

A trend graph can show clear signs of stress on certain batteries within a string or battery bank. Megatronic BMS algorithms can quickly filter through historical information and pin-point issues with the batteries.



Above: BMU2401 Single Channel installation





## RELIABILITY INCREASED

Proactive warnings and alarms mean battery problems can be dealt with prior to outages or catastrophic failure. Regular, automated, accurate testing means maintainers can be assured of battery health and that the batteries won't fail on demand.



## COST SAVER

Reduced maintenance and savings on man hours through automated testing and remote monitoring.

Maximising battery life means savings on replacement batteries and labour associated with breakdowns.

Reduced Insurance premiums associated with utilising the battery monitoring solution (Fire risk reduction).



## SAFETY INCREASED

No requirement to remove battery covers to test battery health ('Arc flash' risk for Electricians).

Remote visibility means less travel is required to check on the health of the batteries.



## EFFICIENCY INCREASED

Automated battery testing saves on man hours.

Remote visibility means less travel which increases business efficiency.

The BMS ensures that the batteries last for their full design life and beyond – maximising equipment life.



## RISK REDUCED

The BMS ensures maintainers and managers have critical information to act on. The risk of unplanned outages is dramatically reduced.

The solution means heavily reduced battery fire risk.

There is also a reduced corporate risk and reduced risk of reputational damage.



Above: BMU2408 x7 Channel installation



# APPLICATIONS

- ✓ Switch-room Control Power Backup System's (Power Generation and Distribution).
- ✓ Rail Signalling Battery Power Systems.
- ✓ Mobile and Fixed Communications.
- ✓ Large Scale Solar / Renewable Battery Storage.
- ✓ Residential Battery Storage.
- ✓ UPS Systems for Hospitals and Datacentres.
- ✓ All Solar / Battery Storage Systems.
- ✓ Diesel Generator Batteries – Protect Start-up.
- ✓ Power Generation Backup Power Systems.
- ✓ Battery Charger Control Unit.
- ✓ Solar Power Monitoring (Power Generation and Usage Tracking)



Above : BMU2401 Single Channel installation

# The Megatronic Battery Monitoring Solution

- ✓ No upfront costs.
- ✓ Easily scale the solution across your operations without the capital constraint.  
(Cost benefits gained immediately)
- ✓ Free unlimited remote support / consultation on your battery & power system.
- ✓ Unlimited warranty on hardware.
- ✓ Free updates to firmware to stay ahead of battery technology changes.

**Call today for more information and advice on how our Battery Monitoring Solution can help your operations and be a real cost saver for your business.**

**Case studies and specifications available on request.**



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