

PowerShield.

Protecting your power supply

## SENTINEL BATTERY MONITORING



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Integration

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## PowerShield

If you're operating mission critical systems and relying on the protection of a UPS and battery bank, then it has to make sense to have battery monitoring. It's about peace of mind – knowing that the batteries are healthy and being constantly monitored. Knowing that everything has been done, that can be done, to protect your enterprise from the consequences of a power failure.

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

It only takes the failure of one battery to compromise the entire battery string. It is often assumed that batteries are meticulously maintained, but this is rarely so. Many batteries are not inspected or maintained beyond an annual UPS service visit. Unknown and undetected battery failures become apparent right at the time when you need the batteries the most – during a mains failure.

UPS systems provide only rudimentary battery monitoring. The UPS cannot identify faults within individual batteries, nor detect an imbalance in the performance of multiple strings. To ensure the integrity of the battery system, it is necessary to detect failing blocks before they affect the performance of the entire system. The effectiveness of a battery monitoring system is proportional to the number of points that are monitored and the frequency that this occurs. With regular monitoring comes the accumulation of data, the ability to report and spot trends, and the ability to take timely remedial action.

PowerShield provides the most advanced and most cost-effective tool for monitoring and managing stand-by battery banks. PowerShield's continuous data sampling, reporting and battery management capability delivers reduced costs, gives peace of mind, and most importantly - ensures that you have batteries that perform when needed.

### PowerShield – when and where it matters the most

PowerShield is trusted throughout the world to help protect the power supply of data centres, banks, hospitals, telecommunications operators, and a wide range of major commercial and industrial enterprises.

The PowerShield System takes a modular approach to battery monitoring. This means that by selecting from a range of options, the system can be tailored to meet your specific requirements. VRLA or wet cells, lead acid or Ni-Cd - PowerShield has a solution for your battery.

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*80% of UPS failures are due to  
undetected battery problems*

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## Understanding your batteries

### Individual Battery Voltage

Correct float voltage is critical for battery life. Incorrect charge voltages may result in loss of capacity, accelerated grid corrosion, excessive gassing and premature end of life. Voltage also identifies catastrophic failures, such as short circuit cells, and gives true visibility of performance under discharge.

### Ambient Temperature

A battery's life-span is normally specified at 20 or 25 degrees centigrade. Temperatures outside of the specified range can significantly affect the battery's corrosion rate, and therefore the life of the battery. An 8-10deg temperature increase can decrease battery life by 50%.

### String Current

String current monitoring measures the energy delivered or accepted by each battery string. A UPS will only measure total current and cannot detect imbalances between strings. An imbalance highlights potential problems within a battery string.

String current measurement also allows detection of incorrect battery charging and any significant earth leakage faults.

### String Voltage

Tracking the string voltage confirms the charger is on and performing correctly.

### Individual Battery Impedance (Ohmic Value)

The impedance of a battery will increase with age. High impedance results in a battery that cannot supply the required current – its key task. By trending impedance you can accurately determine end-of-life. High impedance readings also highlight poor connections and open circuit batteries before failure.

Batteries can fail in a very short period of time (less than a week) so measuring impedance daily allows you to detect faulty batteries - without the need to discharge them.

### Individual Battery Temperature

Measuring the temperature of each battery allows the early detection of thermal runaway. It pinpoints localised environmental problems through poor HVAC, and can also highlight poor connections and excessive charger ripple. A common failure mode for Ni-Cds is separator failure which can be detected with temperature.

PowerShield System				
	Option 1	Option 2	Option 3	Option 4
Individual Voltage	✓	✓	✓	✓
Ambient Temperature	✓	✓	✓	✓
String Current	✓	✓	✓	✓
String Voltage	✓	✓	✓	✓
Impedance		✓		✓
Battery Temperature			✓	✓

Get the information you need to confirm your batteries are operating within IEEE/IEC guidelines.





## The financial benefits

By definition, wherever there is a bank of batteries, there is a mission-critical environment being protected. It follows that if the batteries are unable to perform when they are needed, the consequences and costs are going to be serious. Power failures happen all too often, and at a time like that, the investment in the UPS, battery bank, and battery monitoring system needs no further financial justification.

However, even in day-to-day operation, PowerShield battery monitoring provides a strong return. The following cost savings are worth considering:

- Fewer batteries to purchase - through extending the useful life of those that you have.
- Reduced manpower – through automation & reduced number of discharge tests.
- Reduced call-out charges – through effective preventive maintenance.
- Planned battery purchasing – through avoiding emergency replacements.
- Reduced travel and time – through remotely accessing status data.
- Successful warranty claims – through having documentary evidence.
- Reduced Insurance premiums

Permanent monitoring not only offers increased measurement frequency and consistency, it allows this to be done with greater safety and security. Keep personnel out of hazardous battery rooms and away from sensitive plant & operations. Simplify your health & safety planning and focus on your core operations.

***"The more critical your environment - the more necessary PowerShield becomes."***

*"PowerShield gives us the confidence to get on with running the business with the peace of mind that should there be a power outage, our battery back up is in A1 condition"*

*...Television New Zealand*

*"PowerShield's increased safety through optical isolation became very important to our system. The reduction in maintenance cost was an added advantage."*

*...Telecom*

*"It is easy to install, neat in appearance, straight forward to commission and the software is user friendly. We use the system wherever possible to obtain complete and accurate battery data"*

*...Advanced Battery Care Ltd*



## PowerShield battery monitoring features

- 24/7 alarm notification.
- Automatic capture and recording of data during float, charge, discharge & idle.
- Compatible with float & intermittent charging
- Rapid voltage sampling - all batteries simultaneously every 4 seconds.
- Built in intelligence - battery state recognition & self calibration for reliable impedance
- User defined alarm limits
- On-board memory
- Sealed, vented, Ni-Cd batteries
- Flexible to suit battery model & application
- Designed to allow IEEE/IEC best practice

## Data presentation is the key for efficient management

A single PowerShield system can monitor up to 1,280 batteries. Connecting multiple systems via PowerShield Link battery management software gives visibility to an unlimited number of batteries from a single desk.

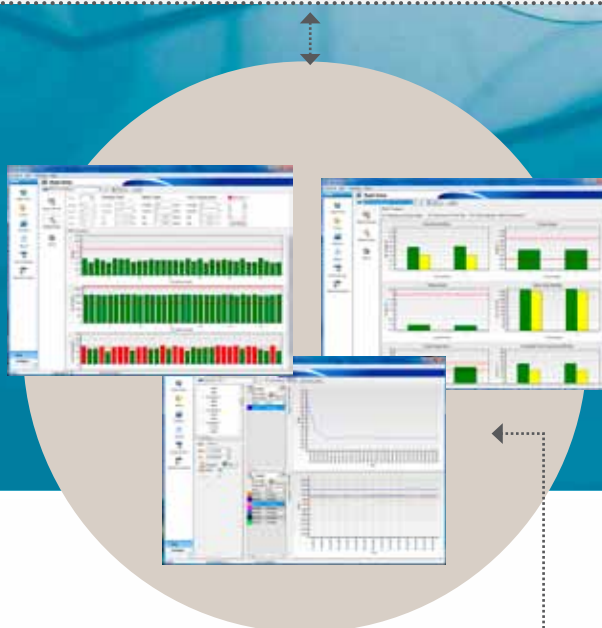
### PowerShield offers:

- WAN/LAN integration for remote monitoring via Link software
- RS 232 connection for local battery service & diagnosis
- SNMP or Modbus interface to Building Management Systems
- Dry contacts for alarm output

Ensure that you can see and understand what is happening in your battery room.

## Link battery management software

- Proactive management tool
- Permanent connection to multiple sites
- Real time battery status
- Alarm & activity log with on-screen pop-ups and email alerts
- Live discharge display
- Automated data management with RDBMS storage
- Battery history database for life trending
- Point & click report generation



## PowerShield helps to protect:

Air Liquide • ANZ Bank • Australian Parliament House  
• Barclays Bank • Chevron • Deutsche Bank • Equinix  
• Ford • Hong Kong Stock Exchange • IBM • Indesit  
• Layer 42 • Los Angeles Metro • Macquarie Bank •  
OCBC Bank • Pfizer • Qwest • Rabo Bank • Rio-Tinto •  
Singapore Telecom • SNCF • Taiwan Stock Exchange •  
Telstra • Unisys • Vector Electricity • ViaWest

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