

Ex Proof BMS: Safety + Performance

Explosion Proof
Battery Management System (XBMS)



XBMS v1.0

Zone 1 IIC T6



Ex Battery Management System

Lead Acid and Nickel Cadmium batteries generate flammable hydrogen gas during the charging process. Various factors, including overcharging and excessive heat, can accelerate hydrogen production, leading to an elevated fire risk, explosion, and material deterioration.

In instances where ventilation within the battery room is inadequate, there exists likelihood of hydrogen accumulation. Adhering to the guidelines specified in the IEC60079-10-1 standard, the battery area is categorized as either Zone 1 or Zone 2 IIC T3. Consequently, all equipment installed in the battery room must be designed to meet the minimum requirements of IIC T3 as outlined in the IEC60079-14 standard

CAPESERVE ENERGY XBMS integrates seamlessly with PowerShield 8's resilient hardware devices, providing a dependable solution for monitoring and collecting battery data. Designed to meet the stringent flameproof Ex technique outlined in ATEX directives and the IECEx equipment certification scheme, our hardware devices are strategically installed in battery rooms and hazardous areas. This professional-grade solution ensures reliable data acquisition while offering intelligent software dashboards for comprehensive visualization.

XBMS Features

- Suitable for Zone 1 or Zone 2 IIC T6 hazardous area
- XBMS components Sensor, Hub and CT installed in battery room are Ex certified.
- Optional Ex Controller for hazardous area
- All sensor leads, cables, BBus interface, CAT6 cables are meeting IEC60079-14 cable requirement.
- Site installation work and time saving due to all cable glands & termination done at factory.
- ATEX and IECEx Certification - Component level
- ATEX & IECEx Certification - System Level



II 2 G D Ex db IIC T6 Gb IP66

Ex tb IIIC T120

XBMS v1.0

Zone 1 IIC T6



Ex Battery Monitoring System

Key System Features



Battery Voltage



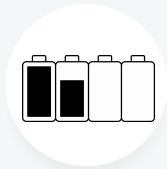
Ohmic Value



Battery Temperature



String Current



String Voltage



and more...

Reporting service

01.



Complete awareness of the overall condition of your batteries

02.



Assurance any battery issues will be identified to enable a timely response

03.



Reduce the internal effort required for monitoring battery performance data

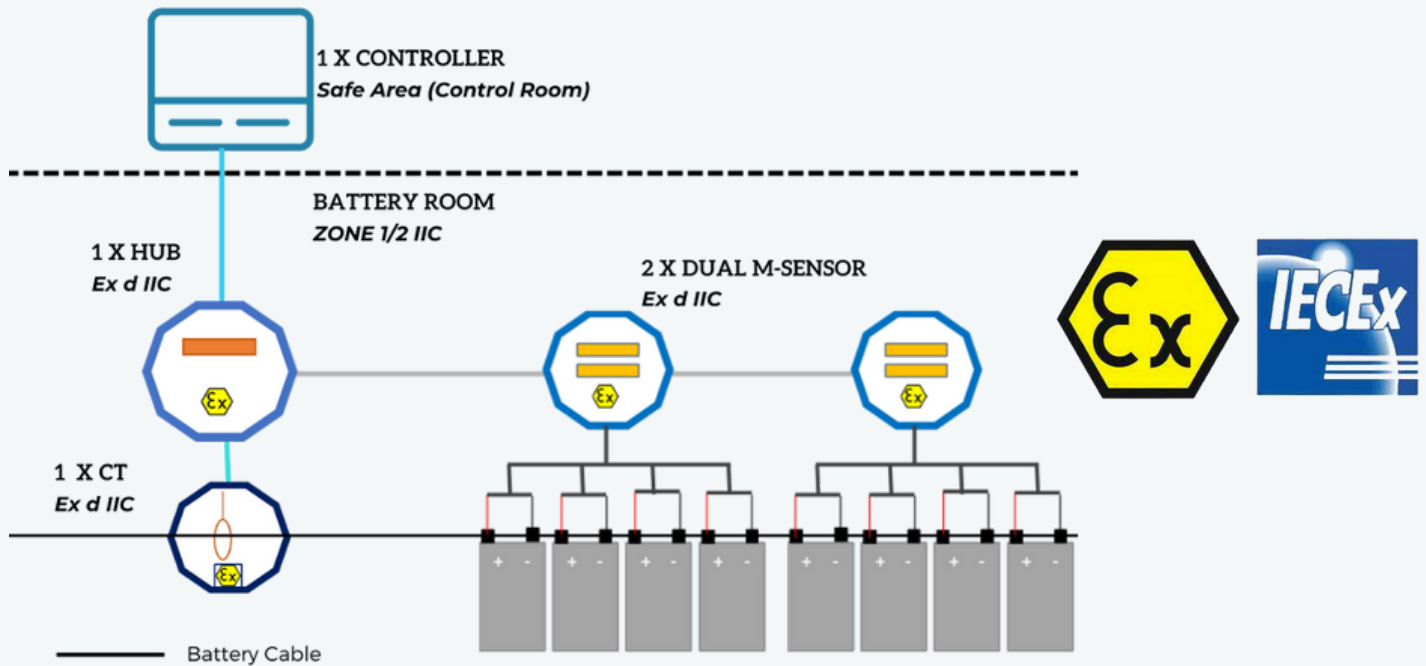
XBMS v1.0

Zone 1 IIC T6



Powering Performance, Eliminating Hazard

Ex Battery Monitoring System Layout



XBMS v1.0 Zone 1 IIC T6



PowerShield 8

Powering Performance

PowerShield is a global supplier of battery management systems, supporting UPS Industries to achieve maximum availability by helping ensure power back-up is always available.

Capeserve Energy XBMS v1.0 combines with PowerShield 8 hardwares for reliable monitoring and collection of battery data with smart software dashboards. These provide a real-time view of battery health and predictive analytics about future performance. All backed by world-class technical expertise in battery management.

Controller

The Brain

PowerShield 8 Controller is an intelligent hardware device that at four second intervals captures, processes and stores all relevant data collected from batteries and the operating environment. The Controller captures, processes and stores data from the Hubs and mSensors. This includes battery voltage (DC and ripple), impedance and temperature, string voltage and current (DC and ripple), humidity, plus ambient temperature.



Key Features

- Simple installation, minimal cabling and the capability to monitor UPS batteries that are up to 8 strings per system.
- A user-friendly web interface with smartphone/tablet friendly status screens.
- Dry contact inputs can be utilised for monitoring battery breaker status, door status, electrolyte level sensors or other 3rd party devices.
- Battery behaviour captured accurately through non-latching alarms, providing high resolution record of battery readings that cross two level alarm limits. Also captures the extreme values recorded during alarms.
- Integration with infrastructure management systems enabled with built-in protocols like SNMP, ModbusTCP, HTTP, DNP3 (Optional).
- Access options for non-networked sites, including LCD version of the Controller LX with keypad access, and simplified data collection option with USB port.

XBMS v1.0 Hardware



Explosion Proof Sensor

Ex M-Sensor BMS-624S

Ex-M Sensors enable you to quickly and accurately record data from every battery. Located at the battery, mSensors gather individual voltage (DC and ripple), impedance (Ohmic value) and temperature for VRLA, VLA and Ni-Cd batteries. Advanced circuits in the mSensor drive fast data sampling and powerful measurement algorithms. 750Vdc optical isolation inside the mSensor keeps the dangerous voltages at the battery and away from the operator, while still ensuring battery data is passed to the monitoring system at speed. Designed for use with batteries in racks or cabinets, mSensors come with pre-terminated harnesses, making them a simple 'plug and play' solution for ease of installation

Key Features

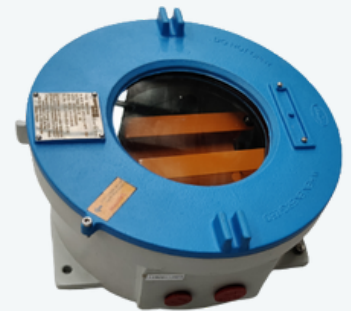
- Ni-Cd, 2V, 4V, 6V, 8V, 12V, 16V solutions.
- Simultaneous voltage sampling across all batteries.
- Temperature measured at negative terminal as per IEEE guidelines.
- 750Vdc optical isolation.
- Factory terminated harness.
- Cabinet or rack compatible.
- On-board high precision reference for impedance self-calibration.



Explosion Proof Hub

Ex Hub BMS 270H

Ex Hub on each battery string connects the various data points required to provide an accurate picture of your battery bank's current and future state. The Ex Hub reduces the need for excessive cabling. It allows for more batteries to be added to every cable as well as being able to hold two roles (e.g. ambient temperature and current transducer). This reduces the clutter of a system and streamlines the configuration.



Explosion Proof CT

Ex CT BMS-624T

Ex CT gathers string current from the series of batteries. This parameters are communicated to Ex Hub and further transferred to controller.



XBMS v1.0 Software



Battery Management Software

PowerShield Link

Link battery management software is a window into the health and performance of your battery systems. It enables you to make informed decisions quickly and proactively. Bundled with your PowerShield 8 system, the Link software application manages the Controller and records all battery readings in its database for viewing, trending and reporting.

Data is turned into actionable information in the form of alerts and dashboards. Link also sends key information to control room and facility management systems. Available across sites and to multiple users, Link comes with no additional licensing or costs.

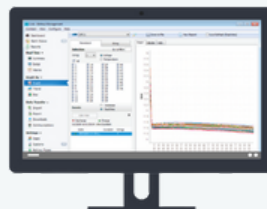


KEY FEATURES

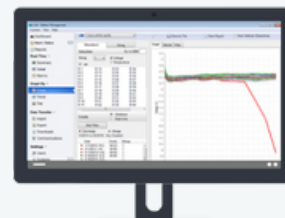
- Reduce the cost of manual monitoring and intervention (and the associated health and safety risk).
- Live discharge data.
- Permanent connection to multiple sites: for unlimited number of batteries.
- Real time battery status.
- Remote access via LAN.
- Alarm and activity log.
- Graphing and analysis tools.
- Discharge – individual events in detailed activity summary.
- Trending – impedance change, end-of-life, charge voltage, temperature.



**24/7 REAL
MONITORING**



**SERVICE
ACCESS**



**REMOTE
ANALYSIS &
REPORTING**

XBMS v1.0 Software



Thermal Runaway Protection



TRP Detection & Protection

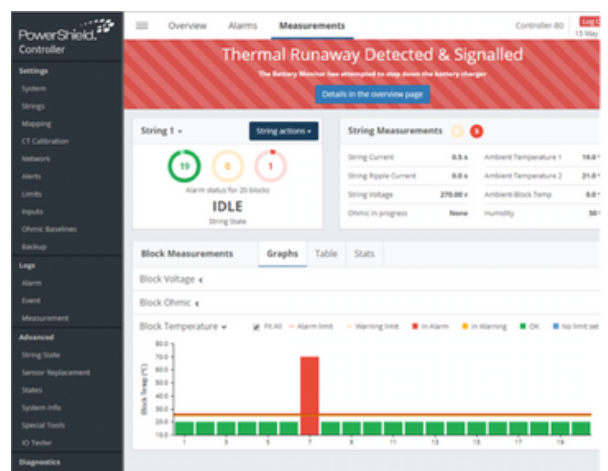
The XBMS system detects thermal runaway by monitoring the temperature difference between the individual batteries and the ambient. When a notable difference is detected, XBMS raises an alarm¹ and starts a countdown timer. If no action is taken by the operator before the end of the countdown period, the XBMS system sends a control signal. Depending on the installed equipment, a battery string breaker may be tripped or the charger directed to step down its voltage. These actions remove the energy source and breaks the thermal runaway cycle.

Enabling the output signal is by operator selection. In other words, you're in control of how your facility – and your batteries – are managed.

Effective battery monitoring means keeping a close watch on the status of your batteries at all times. With the XBMS TRP feature, thermal runaway is automatically detected, giving you the time you need to take corrective action.

TRP Features

The Explosionproof battery monitoring system (XBMS) comes with a Thermal Runaway Protection (TRP) option. It is designed to detect when one or more blocks in a string go into thermal runaway, and provide a method to mitigate it.



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