

# Software Release Note

## superBMS™ 4.1

<b>Release Date</b>	28/10/2024 – 11/12/2024
<b>Version</b>	superBMS™ 4.1
<b>Candidates</b>	Gen2 and later sites

### Overview

The superBMS™ 4.1 release consolidates previously field-deployed modifications into a consistent version, eliminating the need for multiple BMS versions and enhancing operational efficiency across all Gen2 installations and beyond. This release is developed and closely aligned with superEMST™ 4.1, providing a streamlined, cohesive management environment. superBMS™ 4.1 is designed to optimise battery and energy management, improving diagnostic accuracy, operational stability, and safety across our entire Gen2 and newer hardware base.

### Key Features and Enhancements

#### 1) Unified BMS Platform for Gen2 and Later Generation Hardware

- a. Consolidates diverse software modifications into a singular platform, ensuring that all Gen2 and later Energy Renaissance systems benefit from consistent, optimised management.
- b. Seamless compatibility with superEMST™ 4.1 enables coordinated operations across Gen2 and newer installations, supporting robust energy management and diagnostic capabilities.
- c. Comprehensive support for parallel operation
- d. Improved compatibility with varying inverter capacitance ranges with configurable time and voltage settings for pre-charge resistor

#### 2. Enhanced State of Charge (SoC) Algorithm

- a. Uses current integration for mid-range SoC measurements, with top and bottom scale resets based on cell voltage, significantly enhancing SoC accuracy.
- b. Integrates a sigmoid curve for SoC scaling by cell voltages, reducing noise interference and ensuring minor measurement deviations do not trigger unnecessary faults.



superBMS™ 4.1 Release Note		Version No: 1.1
Effective Date: 28/10/2024	Authorised by: Brian Craighead	Page 1 of 3

### 3. Improved State of Health (SoH) Algorithm

- a. Incorporates SoH calculations based on changes in SoC, enhancing the accuracy of battery health metrics and extending battery longevity across all Gen2 and later systems.

### 4. Advanced Filtering and Stability Enhancements

- a. Applies 4th-order Bessel filtering to cell voltage, index, and current measurements, reducing noise and stabilising measurements.
- b. Fault latching for electric current prevents contactor bouncing, bolstering system stability and safety.

### 5. Scalable Thresholds and Dynamic Sigmoid Curve Implementation

- a. Dynamic scaling of recommended current using a sigmoid curve ensures a smooth operational response across all thresholds.
- b. Simplified configuration through default threshold settings with a single command reduces setup time and ensures consistency across all Gen2 and later installations.

### 6. Configurable Connection and Communication Settings

- a. Adjustable baud rates for backward compatibility with legacy systems, supporting 56700 and 9600 speeds.
- b. Customisable connection parameters, including target safe voltage and time thresholds, for flexible deployment across varied environments.

### 7. Maintenance and Diagnostics

- a. Maintenance mode enables cell charging from low levels while temporarily bypassing safety locks for controlled servicing.
- b. Automatic reporting of BMS version and microcontroller type facilitates more straightforward diagnostics and management across all systems.

### 8. Enhanced Safety and Fault Management

- a. Redesigned voltage mismatch fault logic and refined contactor fault definitions to enhance fault management for Gen2 and later systems.
- b. Automated fan controls based on cell temperature thresholds prevent overheating and support battery health.



superBMSTM 4.1 Release Note		Version No: 1.1
Effective Date: 28/10/2024	Authorised by: Brian Craighead	Page 2 of 3

## Deployment Strategy and Testing

superBMST™ 4.1 is currently in the progressive rollout, evaluating performance across varied operational scenarios further, ensuring superBMST™ 4.1 meets Energy Renaissance's high standards for reliability and compatibility with superEMST™ 4.1.

## Expected Impact on Installed Base

The standardisation offered by superBMST™ 4.1 will streamline operations across all Gen2 and later installations, allowing for simplified support, efficient updates, and improved performance. Enhanced battery health management, refined thermal regulation, and precise diagnostics contribute to greater longevity and operational clarity across our client base.

## Support and Additional Information

For comprehensive technical information on installation, configuration, and troubleshooting, please refer to <https://energyrenaissance.com/resource-centre/>.

For any additional queries or specific deployment assistance, contact our support team at [service@energyrenaissance.com](mailto:service@energyrenaissance.com).



superBMST™ 4.1 Release Note		Version No: 1.1
Effective Date: 28/10/2024	Authorised by: Brian Craighead	Page 3 of 3