



Introduction

The Wattius wBMS-HX is a high-performance BMS solution for high-voltage large-scale battery energy storage. The system has been designed for applications up to **1.500 V** and provides **reinforced isolation** for all external interfaces according to IEC60664.

This BMS solution features an **Ethernet** interface with support for **Modbus TCP** for local device control (i.e. PLC, EMS, inverter). It also supports **cloud connectivity**, with integration with MQTT brokers and complete compatibility of the wBMS-Toolkit over internet.

Each BMU includes two CMU (Cell Monitoring Unit) links, supporting up to 48 CMUs. Up to **16 BMUs** can be connected in **parallel** via CAN bus without additional hardware. Proprietary string management algorithms automatically control up to 16 battery strings, and provide a single control interface for EMS / Inverter.

The wBMS-HX BMU V4 features multiple isolated and non-isolated interfaces, including two CAN bus, USB, Ethernet and analog and digital I/O, and even Bluetooth. Finally, this BMU integrates a battery high-voltage sensor for up to 1.500V.

wBMS-Toolkit



Connectivity

- Ethernet, 2x CAN bus, USB and Bluetooth.
- Modbus TCP.
- Cloud connectivity. MQTT broker compatibility and remote wBMS-Toolkit.

Performance

- Up to 48 CMUs per BMU.
- Up to 16 BMU automatic parallelization.
- High-precision SoC algorithm.
- Multiple isolated and non-isolated I/O.
- Included 1.500V voltage sensor.
- Support for dual-range hall and CAN bus current sensors.
- EMC CE Class A & B compatible.

Safety

- Reinforced isolation up to 1.500V (IEC60664)
- Internal diagnostics and safety-critical redundant systems.
- Cell open-wire detection and contactor feedbacks.

The wBMS-HX is compatible with the **wBMS-Toolkit**, our Windows software provided free of charge:

- Monitor all **BMS data** in real time.
- Configure **hundreds of configuration parameters**.
- Data logging, diagnostics and flags.
- Firmware update.

Technical Specifications

Power Supply	15 – 36 Vdc, Typ. 24 Vdc. Up to 8A for external output supply.
Maximum system voltage	IEC60664, reinforced isolation: DC side: 1.500 Vdc. AC side: 800 Vac, CATIII.
Supported CMUs	Two CMU links. Up to 48 CMUs. Support for Wattius 12, 16 and 18-cell CMUs.
Current sensing	1x External 0 - 5 Vdc hall current sensor. $< \pm 0,1$ mV. Support for dual-range hall current sensors. Support for external CAN bus current sensors.
CAN Interface	2x Isolated CAN bus 2.0 A/B (Up to 1Mbps). Configurable termination resistor with switch.
Ethernet	Up to 100Mbps. Compatible with Modbus TCP for local device control (i.e. PLC, EMS, Inverter).
Cloud connectivity	Cloud connectivity, with direct integration to encrypted MQTT broker. Remote management and monitoring. Complete compatibility of wBMS-Toolkit over Internet.
Isolated I/O	3x dry-contact inputs. 1x 24V input. 1x external NTC temperature sensor. 3x 24V output (~ 1W each).
Non-Isolated I/O	3x external NTC temperature sensor. 3x analog inputs. 0 - 36 Vdc. 5x dry-contact inputs. 8x outputs (up to 1,5A each). Low-side. Open-wire and malfunction diagnostics. 2x outputs. High-side.
Other interfaces	Isolated USB 2.0. Bluetooth Low-Energy (BLE).
High-voltage measurement	Included 1.500 Vdc voltage measurement.
Isolation measurement	Support for external CAN bus and digital isolation measurement devices.
Memory	Integrated redundant EEPROM to store system configuration and maximeter. MicroSD support (up to 32 GB). MicroSDHC Class 10 is recommended.
Data logging	Continuous logging of cell data. Event / error / alarm log. Real-Time Clock with CR2032 battery.
Parallelization	Up to 16 devices in parallel without external hardware. Autonomous string management algorithm.

