

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.

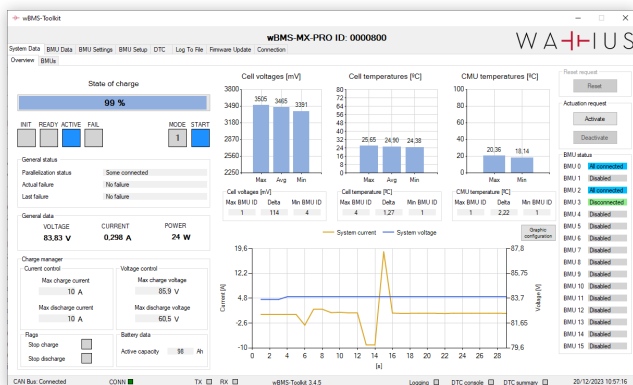
The wBMS-HX products feature direct compliance with **IEC62619** and is pre-certified for **Functional Safety**, with a Compliance Report for **ISO13849:1** Performance Level D issued by a certified third-party testing entity.

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

Each BMU supports **up to 48 CMUs**. Multiple BMUs can be connected in **parallel** without additional hardware. The system automatically handles smart string connection / disconnection and provides a single control interface with 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.

wBMS-Toolkit



Connectivity

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

Performance

- Up to 48 CMUs per BMU.
- Multiple battery string in each 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.

Safety

- ISO13849:1 Performance Level D
- Reinforced isolation up to 1.500V (IEC60664)
- Internal diagnostics and safety-critical redundant systems.
- Cell and relay open-wire detection.

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 through USB, CAN bus and Ethernet.

Technical Specifications

Power supply	15 – 36 Vdc. Independent input for contactor supply.
Consumption	< 3,5 W (@ 24 Vdc).
Isolation	1.500 V reinforced isolation (IEC60664).
Supported CMUs	Two CMU links. Up to 48 CMUs. Compatible with all wBMS-MX and wBMS-HX CMU models.
Current sensing	Up to 4 external 0 – 5 Vdc hall current sensor. Accuracy $\pm 0,1$ mV. Support for dual-range, differential or redundant single-ended 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. Configuration of per-device customer certificates. 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 low-side switch. 1,5 A nominal, 2,5 A peak. Extended diagnostics and redundant high-side disconnection. 2x high-side outputs. Open load detection and overload protection.
Other interfaces	Isolated USB 2.0. Bluetooth Low-Energy (BLE).
High-voltage measurement	Included 1.500 Vdc voltage measurement. Direct support with wBMS-VIC.
Isolation measurement	Direct support with wBMS-VIC. Support for third-party external CAN bus.
Memory	Integrated redundant non-volatile memory: system configuration, maximeter and flags. MicroSD support (up to 32 GB).
Parallelization	Up to 16 BMUs in parallel. Smart parallelization management without additional hardware. Multiple battery string management in each BMU.
Dimensions	L180 x W125 x H18 mm. 5x M4 mounting holes.
Operating temperature range	-40 to +85 °C.
Connectors	Molex MicroFit.
Compliance	Functional Safety ISO13849:1 PLd (Compliance Report from certified third-party available). Fully compatible with IEC62619, including 2023/1542/EU. EMC: 2024/30/EU RoHS: 2011/65/EU

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