

## Introduction

The Wattius **wBMS-MX** is a compact **distributed** Battery Management System developed for high-voltage batteries.

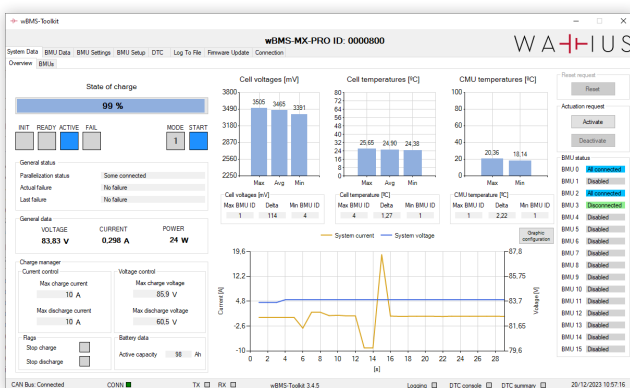
This system is composed by the **BMU** (Battery Monitoring Unit) and **CMU12s** (Cell Monitoring Units, each for up to 12 cells). Each BMU supports up to 24 CMU12s for a total of 288 cells in series.

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.

Each **CMU12** can monitor up to 12 cells with total maximum voltage measurement error of  $\pm 1,5$  mV, and 3 external temperatures. The **BMU** provides multiple configurable I/O options, as well as CANbus, Bluetooth and USB interfaces.

With the wBMS-Toolkit PC software multiple configuration parameters can be tuned to work with different types of cells, architectures and use cases, as well as providing an excellent tool to monitor the system and access diagnostic and debug information.

## wBMS-Toolkit



## Connectivity

- CANbus, Bluetooth & USB.
- Non-volatile log of maximeters and flags.
- Monitoring, configuration & analysis with free wBMS-Toolkit PC software.

## Performance

- 12-cell Cell Monitoring Unit.
- Up to 24 CMU12s per BMU.
- Up to 16 BMU automatic parallelization.
- Support for external isolation monitors and HV sensors.
- EMC CE Class A & B compatible.

## Safety

- Internal diagnostics and safety-critical redundant systems.
- Cell and relay open-wire detection.

The wBMS-MX 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.

## BMU Specifications

<b>Power supply</b>	9 - 36 Vdc.
<b>Consumption</b>	Active: < 1 W Deep sleep: < 35 mW.
<b>Supported CMUs</b>	Up to 24 CMUs per each BMU. Compatible with all wBMS-MX and wBMS-HX CMU models.
<b>Current sensing</b>	External 0 - 5 Vdc single-ended hall current sensor. Accuracy < ± 0,1 mV. Support for external CAN bus current sensors.
<b>CAN interface</b>	CAN bus 2.0 A/B (Up to 1Mb/s). Referenced to external power supply. Configurable termination resistor with switch.
<b>Other interfaces</b>	Mini USB 2.0. Bluetooth 5.0 Low Energy.
<b>General input</b>	2x analog / digital (configurable) signal up to 36 Vdc. 4x dry contact digital input. Configurable to multiple functions (ignition key, HVIL, relay feedback etc.).
<b>General output</b>	Maximum total output 4 A. 6x low-side switch. Up to 2 A nominal, 3 A peak. Extended diagnostics. Configurable to multiple functions (contactor, precharge, alarm, coolong, etc.).
<b>High-voltage measurement</b>	Direct support with wBMS-VIC. Support for third-party external CAN bus.
<b>Isolation measurement</b>	Direct support with wBMS-VIC. Support for third-party external CAN bus.
<b>Memory</b>	Integrated redundant non-volatile memory: system configuration, maximeter and flags. MicroSD support (up to 32 GB).
<b>Parallelization</b>	Up to 16 BMUs in parallel. Smart parallelization management without additional hardware. Multiple battery string management in each BMU.
<b>Dimensions</b>	L80 x W70 x H16 mm. 4x M4 mounting holes.
<b>Operating temperature range</b>	-40 to +85 °C.
<b>Connectors</b>	Molex MicroFit.

## CMU12 Specifications

<b>Cell measurements (voltage &amp; temperature)</b>	Multiple cell chemistry. Extended internal redundancy and hardware integrity diagnostics. Open wire detection.
<b>Cell voltage</b>	5 - 12 cells. 0,1 - 4,5 Vdc. ± 1,5 mV cell voltage max total error.
<b>Cell temperature</b>	Up to 3 channels. Configurable NTC. ± 1 °C cell temperature max total error.
<b>Balancing</b>	Configurable autonomous passive balancing strategy. 16 Ω per channel.
<b>Isolation</b>	Isolation rated for 800V.
<b>Consumption</b>	Active: < 10 mA Sleep: < 10 µA
<b>Operating temperature range</b>	-40 to +85 °C
<b>Dimensions</b>	L92 x W54 x H12 mm. 4x M4 mounting holes.
<b>Connectors</b>	Molex MicroFit.

20250410 RevF



### Wattius Battery Solutions

Camí de Can Bassa 6  
08401 Granollers  
Barcelona

+34 93 018 06 08  
www.wattius.com  
info@wattius.com