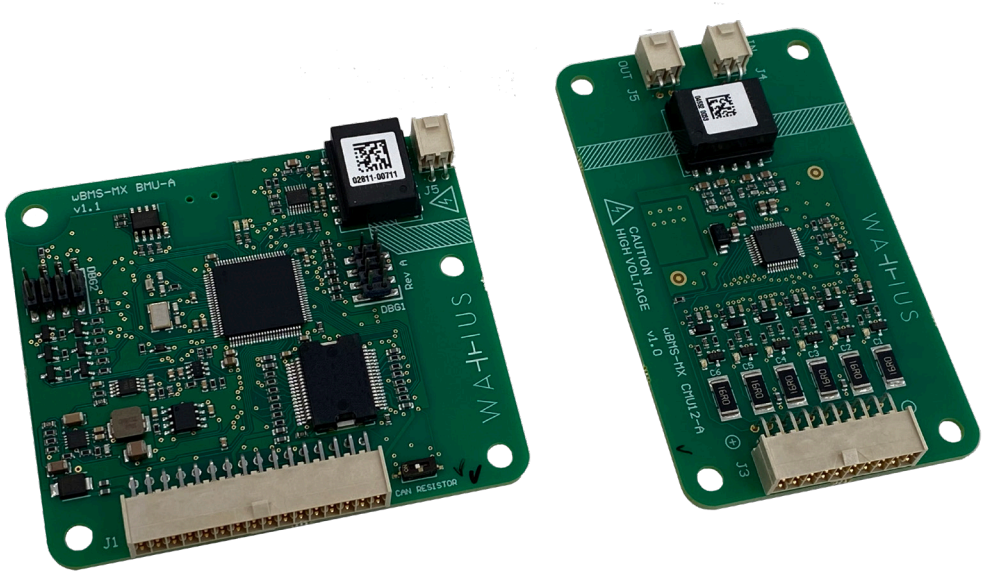
wBMS-MX

Distributed high-voltage Battery Management System



Introduction

The Wattius wBMS-MX is a distributed Battery Management System developed to work with high-voltage batteries up to 800V. The system has been designed to meet all relevant industry requirements such as ISO26262 / IEC61508 and provides reinforced isolation according to EN50178.

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 multiple string connection and provides a single control interface with the inverter / charger.

Each CMU12 can monitor up to 12 cells with total maximum voltage measurement error of ± 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.

Connectivity

- CANbus, Bluetooth & USB.
- Real-Time logging of events, alarms and operation data to microSD card.
- Monitoring, configuration & analysis with free wBMS-Toolkit PC software.

Performance

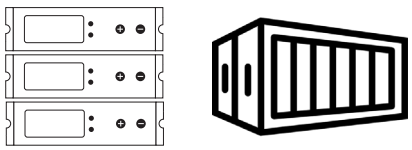
- 12-cell Cell Monitoring Unit.
- Up to 24 CMU12s per BMU.
- High-precision SoC algorithm.
- Up to 300mA autonomous balancing
- Parallelization of up to 16 BMUs.
- EMC CE Class A & B compatible.

Safety

- ISO26262 & EN50178 compatible design and components.
- Internal diagnostics and safety-critical redundant systems.
- Cell and relay open-wire detection.

Applications

Electric mobility & industrial traction



Large-scale ESS

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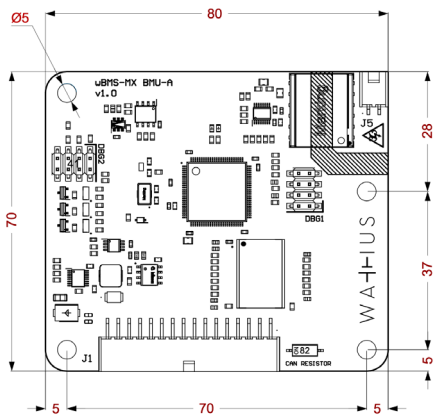
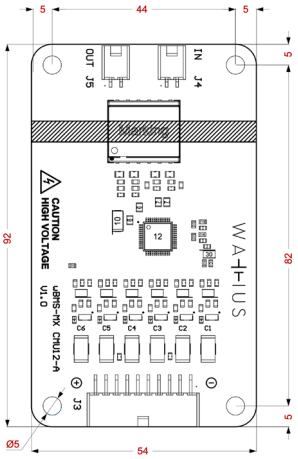
BMU Specifications

Power Supply	10 - 36 Vdc. < 15 mW in deep sleep mode. Independent input for output supply.
Maximum system voltage	800 Vdc (EN50178, reinforced isolation). Compatible with transformerless stationary ESS use cases.
Supported CMU12s	24 CMU12s per each BMU (288 cells max.).
Current sensing	External 0 - 5 Vdc hall current sensor. < ± 0,1 mV.
CAN Interface	CAN bus 2.0 A/B (Up to 1Mb/s). Referenced to external power supply. Configurable termination resistor with switch. CANopen compatibility.
Other interfaces	Mini USB 2.0. Bluetooth 5.0 Low Energy.
General Input	2x analog / digital (configurable) signal up to 36 Vdc. 4x dry contact digital input. Configurable to multiple functions (ignition key, HVIL, relay feedback etc.).
General Output	6x independent channels. External supply voltage. Maximum total output 4 A. External fuse recommended. Channel 1-4: 2 A nominal, 4 A peak per channel. Channel 5-6: 1 A nominal, 2 A peak per channel. Adjustable PWM @ 10 kHz max. Open circuit, short-to-battery and short-to-ground detection.
Memory	Integrated redundant EEPROM to store system configuration and maximeter. MicroSD support (up to 16 GB). MicroSDHC Class 10 is recommended.
Data logging	Continuous logging of cell data. Event / error / alarm log.
Parallelization	Up to 16 devices in parallel without external hardware.

CMU12 Specifications

Cell measurements (voltage & temperature)	Multiple cell chemistry and supercapacitors. Extended internal redundancy and hardware integrity diagnostics. Open wire detection.
Cell voltage	5 - 12 cells. 0 - 5 Vdc. ± 1,5 mV cell voltage max total error.
Cell temperature	Up to 3 channels. Configurable NTC 10 kΩ. ± 1 ºC cell temperature max total error.
Balancing	Autonomous. Configurable. Up to 300 mA per channel.





Dimensions in mm

WATTIUS
battery solutions

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