

## Introduction

The Wattius wBMS-R24 is a compact Battery Management System developed to work with up to 24-cell lithium batteries while safely providing extended isolated interface possibilities. The system has been designed to meet all relevant industry requirements such as the Automotive ISO26262 and provides reinforced isolation according to EN50178.

This system can monitor and balance up to 24 cells in series with total maximum voltage measurement error of  $\pm 1,5$  mV for the entire range. It features state-of-the-art low power mode as well as integrated hardware and software diagnostics.

Multiple wBMS-R24 systems can work together on complex series - parallel architectures, providing EN50178 compliant interface isolation for systems up to 800 Vdc.

The wBMS-R24 protects the battery by driving up to 6 power contactors with low-power mode possibilities, calculates advanced parameters such as SoC and SoH and features multiple interface possibilities such as CAN bus, Bluetooth, and USB.

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.

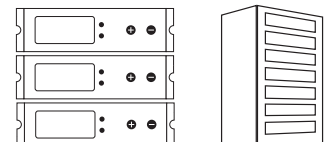
## Applications



Electric mobility



Industrial



Domestic &amp; high-scale storage

## Connectivity

Bluetooth, USB & CANbus

Real-Time logging of events, alarms and operation data to microSD card

Monitoring, configuration & analysis with free W-BMS-Toolkit PC software

## Performance

Up to 24 cell measurement with  $\pm 1,5$  mV max. error

Ultra low power mode (< 5 mW)

High-precision SoC algorithm

Up to 300mA autonomous balancing

Stackable up to 800 Vdc

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

## Main Specifications

<b>Power Supply</b>	9 - 36 Vdc < 5 mW in deep sleep mode Independent input for output supply
<b>Maximum system voltage</b>	800 Vdc (EN50178, reinforced isolation)
<b>Cell measurements (voltage &amp; temperature)</b>	Multiple cell chemistry and supercapacitors. Extended internal redundancy and hardware integrity diagnostics. Open wire detection. Up to 5 ms data acquisition refresh rate.
<b>Cell voltage</b>	6 - 24 cells. 0 - 5 Vdc. ± 1,5 mV cell voltage max total error.
<b>Cell temperature</b>	Up to 6 channels. Configurable NTC 10 kΩ. ± 1°C cell temperature max total error.
<b>Balancing</b>	Autonomous. Configurable. Up to 300 mA per channel.
<b>Current sensing</b>	External 0 - 5 Vdc hall current sensor. < ± 0,1 mV.
<b>CAN Interface</b>	CAN bus 2.0 A/B (Up to 1Mb/s). Referenced to external power supply. Configurable termination resistor with switch. CANopen compatibility.
<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>	6x output External supply voltage. Up to 1,8 A per channel. Adjustable PWM @ 50 kHz max. Open circuit, short-to-battery and short-to-ground detection. Configurable to contactors, precharge, LEDs, etc.
<b>Memory</b>	Integrated redundant EEPROM to store system configuration and maximeter. microSD support (up to 16 GB).
<b>Data logging</b>	Continuous logging of cell data. Event / error / alarm log.
<b>Stackable</b>	Up to 32 devices in series and/or parallel configuration.
<b>Dimensions</b>	70 x 150 mm

## Typical Application

