

Anytime lead-acid batteries are connected in series to make higher voltage battery packs, as is the case with electric vehicle applications, the usable capacity of the entire pack will only be as much as the capacity of the lowest battery. Even if a battery pack is well-matched when new, imbalances between the batteries will occur over time. The primary function of a Battery Management System (BMS) is to facilitate equalization at the individual battery level so that the entire battery pack has as much useable capacity as possible.

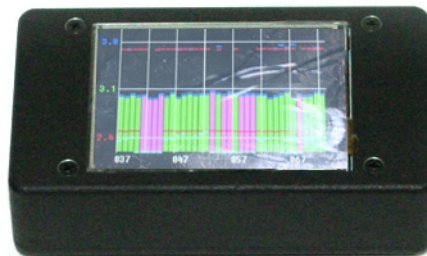
The other benefits of the Manzanita Micro Mk3s digital BMS is rapid monitoring of battery voltages and temperatures. There are a variety of free software options available for download from www.manzanitamicro.com which allow for a clear visual display of the battery or cell data. With high accuracy and easily programmable high and low voltage set points the Mk3s is an exceptional solution for many electric vehicle battery packs, stationary power supply packs and also for battery testing.

Connecting to the BMS with any Windows based computer is easy with the USB Dongle Terminator. The optional Rudmanbus Display (RBD) allows for an independent in-dash color touch screen solution. The Mk3s units will manage one 12V battery or two 6V batteries.

The Mk3 BMS units use an intuitive command structure and are very simple to set up. Real-time status LEDs on the boards themselves indicate high and low conditions as well as which batteries are full (when dissipating energy during equalization). The red undervoltage latch LED is useful for spotting the weakest modules after a discharge situation (such as a long drive for an EV). Specific historical data of maximum voltage high and low points are stored in the BMS unit's internal memory and can be easily viewed on the RBD or using the graphical Reg Scanner program on a PC or even using simple text commands in any terminal program. The Manzanita Micro Mk3s BMS is a feature rich system and unlike many other BMS options, the Mk3 series units do not require any expensive central control module. Instead, each individual BMS unit can function on its own or with many others connected. This makes it very easily scalable and allows for adding or subtracting batteries if future needs change. A simple two-pin plug allows the BMS to be used with an optional temperature sensor which can be placed on or near the battery being monitored.

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RBD

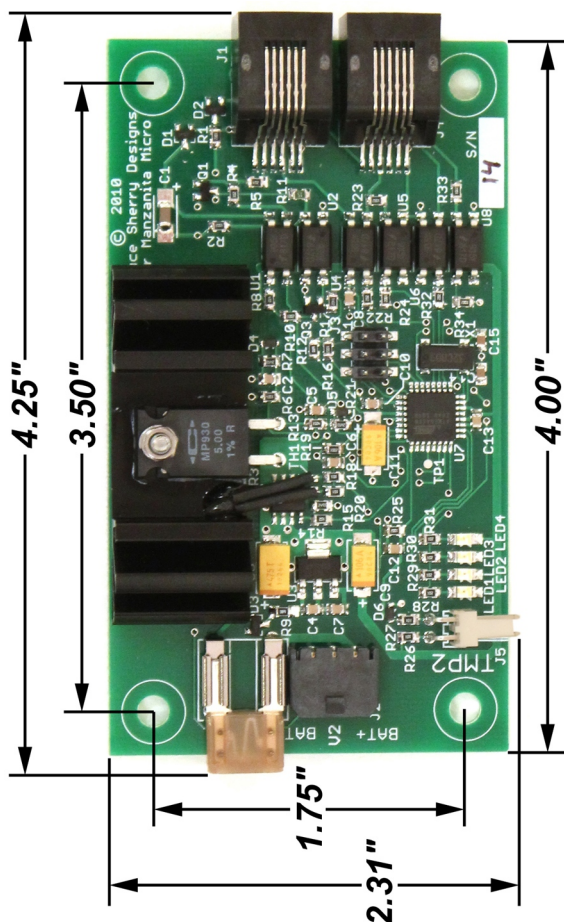


Mk3s



USB Dongle

	Mk3s
Voltage monitoring of:	One 12V or Two 6V Batts.
Dissipation channels	1
Recommended voltage measuring range	9 to 16 VDC* total
Recommended supply voltage range for entire unit.	9 to 18 VDC
Absolute min and max supply voltage for the unit	7 to 25 VDC
Dissipation ratings	~12 watts**
Dissipation temperatures	Up to 180°F (82.2°C)
External temp sensor inputs	1
Internal temp sensor	Yes, 1 is built-in
Cell voltage sampling rate	62.5mS for both V & Temp
RS232 rate	9600 Baud
Max number of units in a system	30 boards (30 to 60 batteries)
Dimensions L x W x H	4.25in x 2.3in x 0.75in (108mm x 59mm x 19mm)
Total weight of unit	2.1 ounces (60 grams)
Isolation rating	1,000 V
Current draw while idle	8.5 milliamps
Supported voltage sense wire size range	22 to 20 awg
External fan control	None
Communication ports	2 Regbus RJ ports
Analog comm. lines	High/Low cell or Hot Reg
Unit Protection	5 Amp Mini ATM Fuse
Pre-made voltage wiring harness	Housing & pins kit incl. (Full harness available)



* The Mk3s BMS unit can measure low voltages but since it receives its power from the battery or batteries that it is monitoring, it will stop measuring if the total supply voltage ever drops to 7 volts DC or less.

** The wattage ratings will vary depending on the voltage of the cells that are connected to the BMS and also depending on if they have active fan cooling. The units can shunt approximately 2.5 amps so higher input voltage levels will yield higher dissipation wattage ratings.

Pricing and accessories available at: www.manzanitamicro.com

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