MANZANITA MICRO Mk3 Lithium BMS

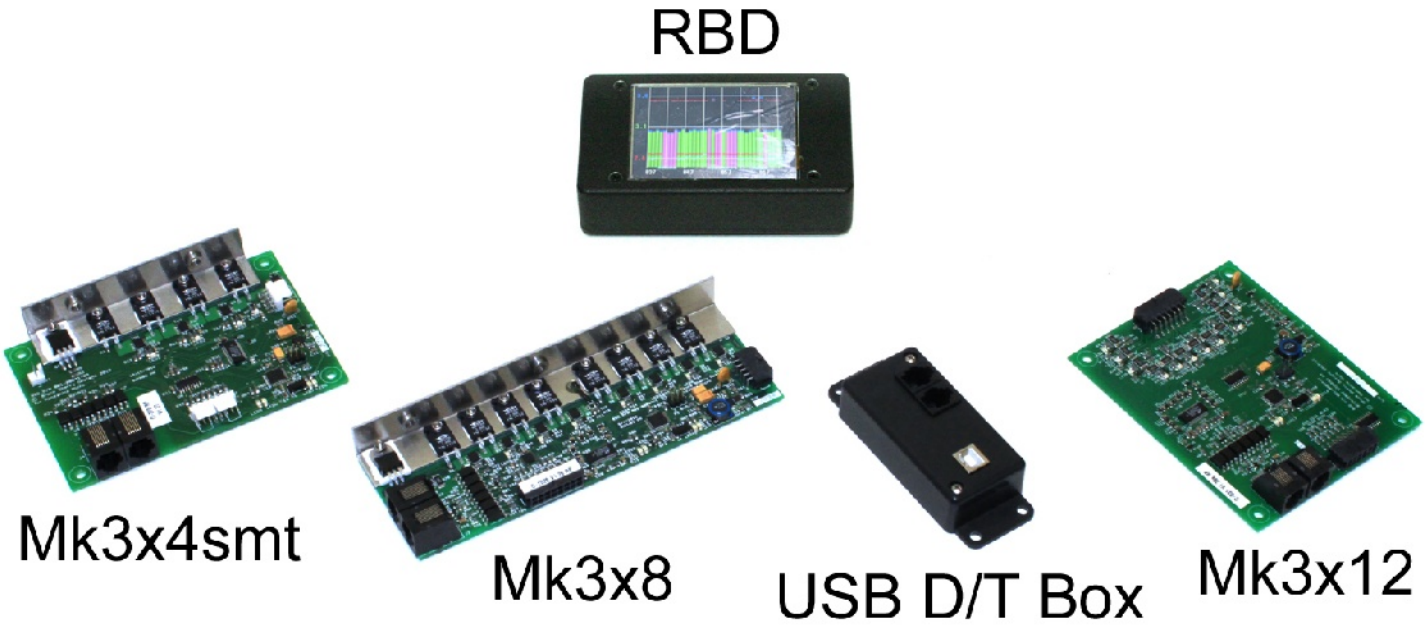
DIGITAL LITHIUM CELL MANAGEMENT

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

The other benefits of the Manzanita Micro Mk3 digital BMS line of products is rapid monitoring of individual cell 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 and cell data. With high accuracy and easily programmable high and low voltage set points the Mk3 BMS is an exceptional solution for many electric vehicle lithium 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 Rudman Bus Display (RBD) allows for an independent in-dash touch screen solution. The Mk3x4smt will manage 4 lithium cells, the Mk3x8 will manage as few as 5 or as many as 8 lithium cells and the Mk3x12 will handle between 7 and 12 lithium cells.

All of the 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 cells 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 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. Long sense wires are a thing of the past with a Manzanita BMS. The Mk3x4 and Mk3x8 units can be made to plug directly into the Manzanita Micro Reg Deck eliminating cell wires!



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	Mk3x4smt	Mk3x8	Mk3x12
Voltage monitoring of:	4 cells	5 to 8 cells	7 to 12 cells*
Dissipation channels	4	8	12
Recommended voltage measuring range	1.75 to 5.5 VDC** per cell	1.75 to 5.5 VDC** per cell	1.75 to 5.0 VDC** per cell
Recommended supply voltage range for entire unit.	10 to 24 VDC	10 to 48 VDC	10.5 to 60 VDC
Absolute min and max supply voltage for the unit	7 to 35 VDC	9 to 50 VDC	9 to 60 VDC
Dissipation ratings	~33 watts***	~75 watts***	~2.4 watts***
Dissipation temperatures	Up to 180°F (82.2°C)	Up to 180°F (82.2°C)	Up to 180°F (82.2°C)
External temp sensor inputs	4	8	6
Internal temp sensor	Yes, 1 is built-in	Yes, 1 is built-in	Yes, 1 is built-in
Cell voltage sampling rate	62.5mS per cell	62.5mS per cell	62.5mS per cell
RS232 rate	9600 Baud	9600 Baud	9600 Baud
Max number of units in a system	30 boards (120 cells)	30 boards (240 cells)	30 boards & up to 254 cells
Dimensions L x W x H	5 in x 3.5 in x 0.875 in (127mm x 89mm x 22mm)	7 in x 2.37 in x 0.938 in (175mm x 60mm x 23mm)	4.75 in x 3.938 in x 0.625 in (121mm x 100mm x 16mm)
Total weight of unit	2.7 ounces (76.5 grams)	3.6 ounces (102 grams)	1.9 ounces (54 grams)
Isolation rating	1,000 V	1,000 V	1,000 V
Current draw while idle	10 milliamps	3 milliamps	2 milliamps
Supported voltage sense wire size range	22 to 20 awg	22 to 20 awg	22 to 20 awg
External fan control	12VDC variable speed	12VDC variable speed	None
Communication ports	2 Regbus RJ ports	2 Regbus RJ ports	2 Regbus RJ ports
Analog comm. lines	High/Low cell or Hot Reg	High/Low cell or Hot Reg	High/Low cell or Hot Reg
Unit Protection	Integrated Polyfuse	Integrated Polyfuse	Integrated Polyfuse
Pre-made voltage wiring harness	Housing & pins kit incl. (Full harness available)	Includes full 3ft multicolor 10-wire harness assembly	Includes full 3ft multicolor 14-wire harness assembly

* The Mk3x12 BMS unit can measure as few as 7 cells when user-calibrated as described in the Mk3x12 owner's manual.

** The Mk3x4, Mk3x8 and Mk3x12 units can measure individual cell voltages down to zero volts as long as the rest of the cells connected to the unit are supplying enough voltage for the unit to function.

*** 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 or are mounted to a larger heat sink. Mk3x12 units have no heat sink or fan control. Mk3x4 and Mk3x8 units can shunt approximately 2.5 amps so higher input voltage levels will yield higher wattage ratings.

Pricing and accessories available at: www.manzanitamicro.com

Manzanita Micro reserves the right to alter product offerings and specifications at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

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