

enePAQ

TinyBMS v2.1

Power In Shape

COMPACT LITHIUM BATTERY MANAGEMENT SYSTEM
FOR 12 - 60 V BATTERY PACKS

The Tiny BMS v2.1 is a compact battery management system built for lithium packs from 4S to 16S (12-60V nominal). It handles power switching, cell balancing, protection, and State-of-Charge / State-of-Health estimation, with several communication interfaces for monitoring and control.



4S - 16S
12 - 60 V



UP TO
50 A
CONTINUOUS



150 mA
BALANCING
PER CELL



UART
MODBUS
CAN
BLUETOOTH



PROGRAMMABLE
I/O

FEATURES

- Supports all lithium chemistries (Li-Ion, LiFePO4, LTO, etc.)
- Battery systems from 4S to 16S (12 – 60 V)
- Integrated high-current MOSFET switching (Low-side)
- Selectable Dual Port or Single Port operation modes
- Configurable voltage, current and temperature thresholds
- Dissipative cell balancing up to 150 mA
- Up to 2 external temperature sensors and one dual-range current sensor
- State of Charge (SOC) and State of Health (SOH) estimation
- Event log and usage statistics
- User-configurable software
- Programmable inputs and outputs
- Configurable charge detection delay
- Charge restart level logic
- Configurable over-current cutoff delay
- Ultra-compact design: 95 x 65 x 9 mm (without cooling plate)
- Free firmware updates

Mode	Current
Continuous discharge / regen	±50 A
Mounted on cooled surface	±60 A
Peak discharge / regen (< 10 s)	±150 A
With external relay / contactor and current sensor	Up to ±750 A
Continuous charge	0.8 – 30 A
With external relay / contactor and current sensor	0.8 – 750 A

*All currents are at 25 °C. Proper cooling recommended for maximum performance.

SAFETY FEATURES

- Cell over-voltage protection
- Cell under-voltage protection
- Over-current protection (Charge & Discharge)
- Charge and discharge temperature protection
- Low-temperature charge inhibition
- Fault-triggered load / charger disconnect
- Sleep mode operation for low standby consumption

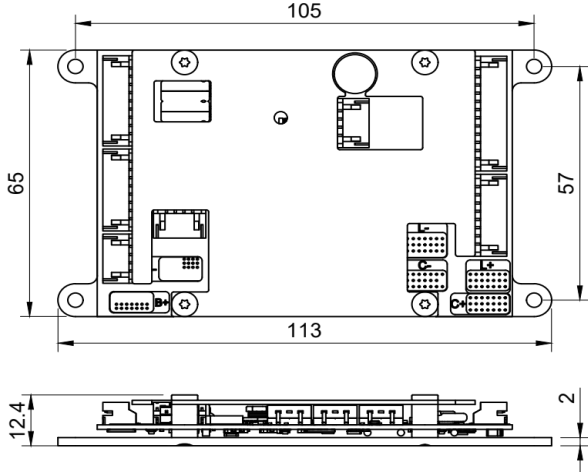




Parameter	Specification
Supported battery packs	4S – 16S
Battery voltage range	9 – 75 V
Cell voltage measurement range	0.8 – 4.5 V
Balancing current (per cell)	Up to 150 mA (Ucell = 4.2 V)
Expansion I/O current	Up to 250 mA
Expansion I/O voltage (ADC range)	0 – 75.0 V
Typical active current consumption	7 mA (Depends on battery voltage)
Typical sleep current consumption	350 µA (Depends on configuration)
Temperature sensors	Up to 2 external sensors
External current sensor support	LEM DHAB / ECS series
Communication interfaces	UART, MODBUS, CAN*, Bluetooth*, SoC bar*

* External adapter required for CAN, SoC bar, and Bluetooth connectivity.

MECHANICAL DIMENSIONS



Dimensions (without cooling plate)	95 x 65 x 9 mm
Dimensions (with cooling plate)	113 x 65 x 12.4 mm
Weight (Without cooling plate) / (With cooling plate)	~60 g ~97 g
B+ B- L+ L- C+ C- Connection	Solder pads

*Mount on a cool surface to achieve maximum performance.



The Tiny BMS v2.1 is highly configurable, allowing us to deliver custom hardware, firmware, and software solutions tailored to each customer's needs. It pairs easily with our Battery Insider application, available for free with lifetime support, used for reading live data, configuring cell safety settings, monitoring events, and updating firmware.

