

SMARTER BATTERY MANAGEMENT SYSTEMS

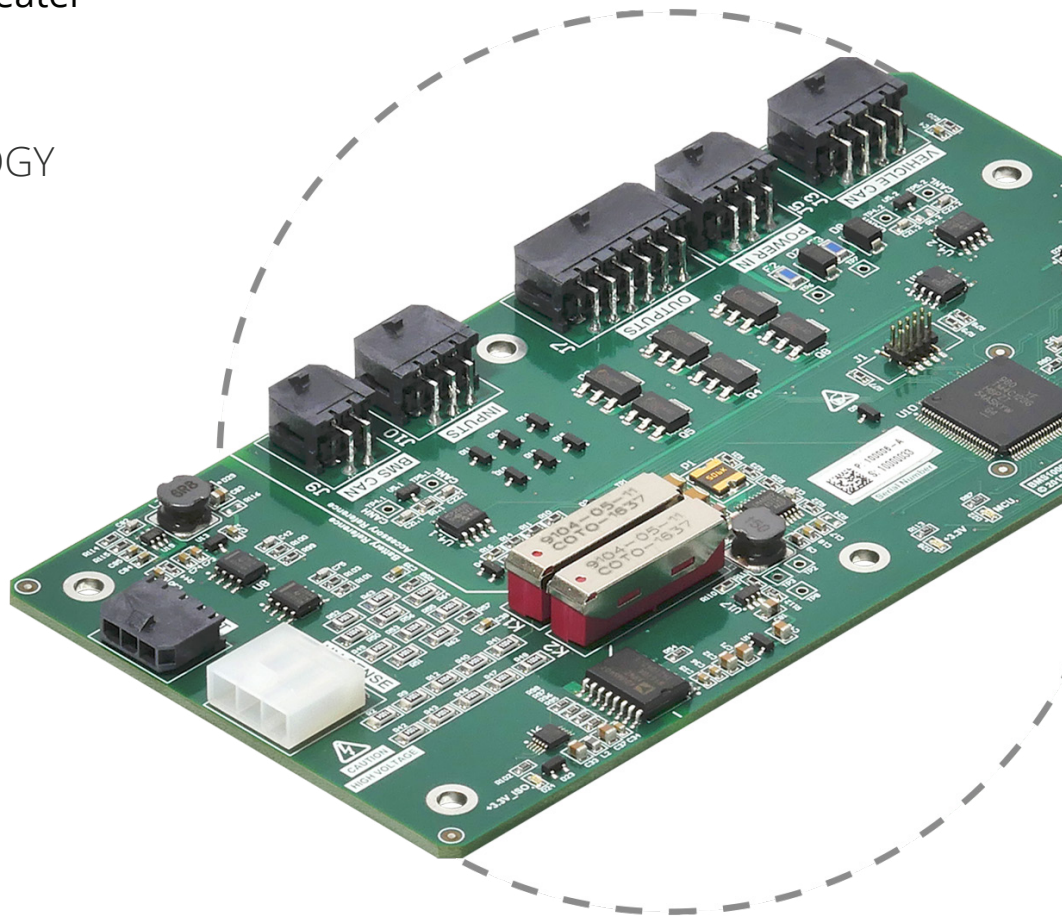
A distributed BMS for greater accuracy and flexibility.

EXCLUSIVE TECHNOLOGY

The Stafl Systems suite of off-the-shelf **BMS solutions** enhance the performance and safety of battery systems. Using exclusive Safe Operating Envelope technology that provides continuously broadcast power and current limits, the Stafl Systems BMS allows the application controller to protect and preserve the battery system.

Stafl Systems' high voltage BMS products include Vectored Fault Monitoring® to determine the location and severity of isolation faults within a battery pack, providing detailed diagnostic information for service and troubleshooting.

Each BMS Master unit communicates with up to 64 Monitor units via CAN bus in a distributed system.

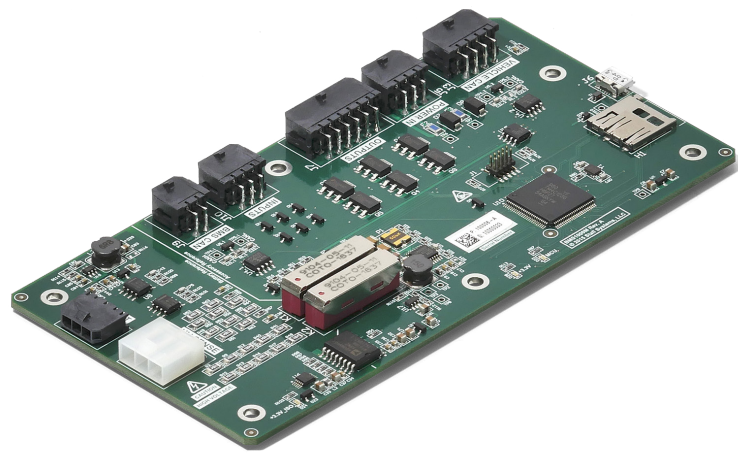


CUSTOMIZED SOLUTIONS

Stafl Systems customizes BMS solutions to meet the specific requirements for clients based on the application.

These systems leverage an extensive design library for faster design cycles. Every custom solution is designed for a specific battery pack to optimize performance and safety according to the customer's needs.

BMS1000M BMS Master Controller



Description

The BMS1000M Master Battery Controller serves as the main BMS unit for a battery pack. It directly measures the pack voltage, pre-charge voltage and pack current, and communicates with each BMS Monitor for cell voltage and temperature data. The BMS1000M performs SOC, SOH and SOE calculations, and broadcasts the battery state and measurement data via a standard CAN bus interface. It also performs cell balancing calculations and commands the BMS Monitors accordingly.

The BMS1000M features six integrated relay drivers that can be used to control pre-charge relays or contactors for ease of system integration. It also features six general-purpose digital inputs that can be monitored via the CAN bus.

The BMS1000M includes a proprietary Vectored Fault Monitoring® circuit that can detect and locate isolation faults within a battery pack. If an isolation fault is present between the motive and accessory voltage domains, the system will provide a measurement of the estimated isolation resistance, location in the voltage stack and a measurement of capacitance between the voltage domains. This can be used to ensure compliance with ISO6469-4 limits for limiting the shock energy available in Y-capacitors.

The BMS is configured by the Staf Systems team and shipped to you based on your pack specifications. This allows for proper performance, warning and fault limits appropriate for each application.

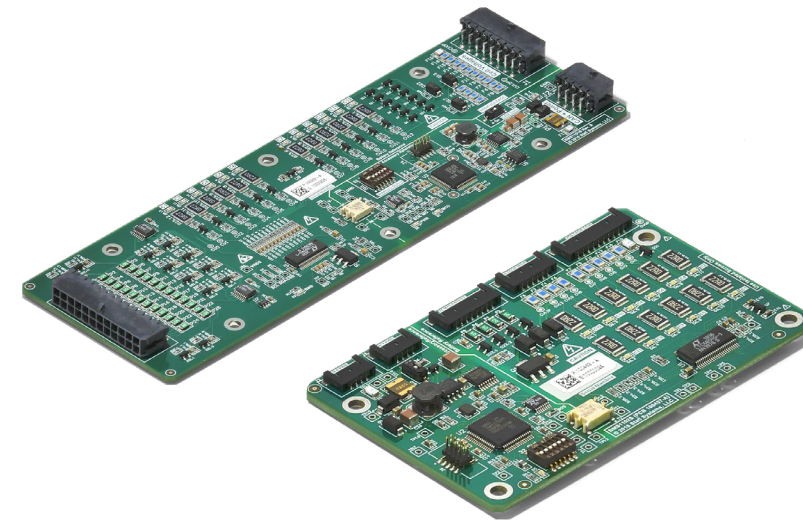
Features

- Supports up to 850 V Battery Systems
- 2 Isolated High Voltage Measurement Inputs
- 50 mV Isolated Shunt Current Monitor with Dual Gain
- Manages up to 64 BMS Monitors
- Externally Powered for Low Quiescent Battery Current
- 6 Contactor/Relay Drivers
- 6 General Purpose Digital Inputs
- High Voltage Interlock (HVIL) Support
- Vectored Fault Monitoring® for High Voltage Safety Diagnostics
- Safe Operating Envelope (SOE) Technology
- 12/24 V Nominal Compatible Power Input
- CAN 2.0B Communication Port to External System
- Data Logging Support on MicroSD Card
- 1000 V Isolation Barrier between Accessory and Motive Circuits

Applications

- Electric and Hybrid-Electric Vehicles
- Stationary Energy Storage Systems
- Backup Battery Systems
- Electric Aviation

BMS1101S / BMS1102S Battery Monitors



Description

Staf Systems Battery Monitor products are designed to be used with other Monitors and the BMS1000M Master Controller to form a high-accuracy, distributed Battery Management System. Data and commands are transmitted and received via a CAN 2.0B interface which connects these units.

Both Battery Monitors measure the voltages of 6 – 12 series connected battery cells, and can apply a shunt resistor across each battery cell to bleed off excess charge (passive balancing). Each monitor board measures the resistance of thermistors to determine cell temperatures. The BMS1101S is designed with a narrow form factor and 12 thermistors. The BMS1102S is compact and has inputs for four thermistors.

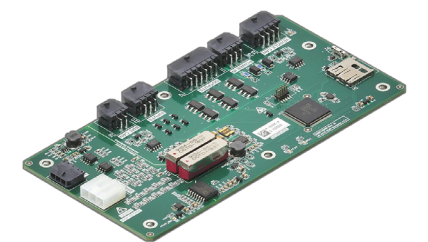
Specifications

Parameter	Conditions	Min	Typical	Max	Units
Input Power					
System 12 V/24 V Input Voltage		7	12 / 24	32	V
System 12 V/24 V Input Current	Active Mode	10	15	25	mA
Battery Monitoring					
Cell Voltage		0		4.75	V
12 Cell Stack Voltage		14		57	V
Quiescent Battery Current	Input Power Off		3.6	10	µA
Cell Voltage Measurement Error				1.4	mV
General System					
Accessory – Battery Domain Isolation Voltage				1000	V
Operating Temperature		-35		80	°C

Features

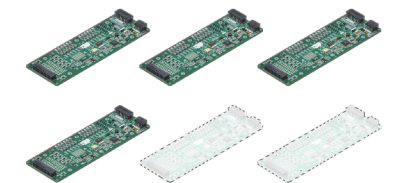
- 12 Cell Battery Monitor with Passive Balancing
- Switchable Shunt Resistor for Each Cell
- 12 Thermistor Input Channels (**BMS1101S**)
- 4 Thermistor Input Channels (**BMS1102S**)
- 12/24 V Nominal Compatible Power Input
- CAN 2.0B Communication Port
- DIP Switch for Setting Module Address
- DIP Switch to Enable CAN Termination Resistor
- 1000 V Isolation Between Accessory and Cell Voltage Domains

System Architecture



1X
BMS Master Controller

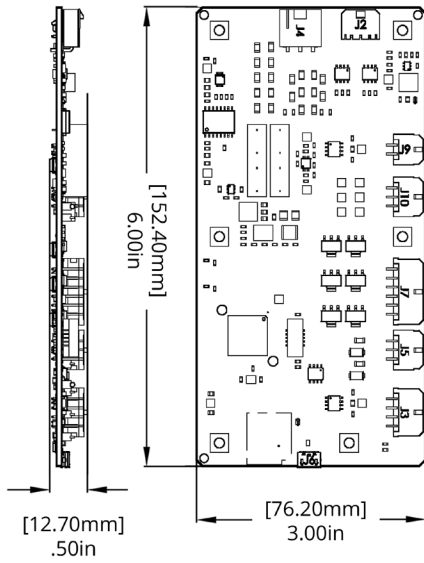
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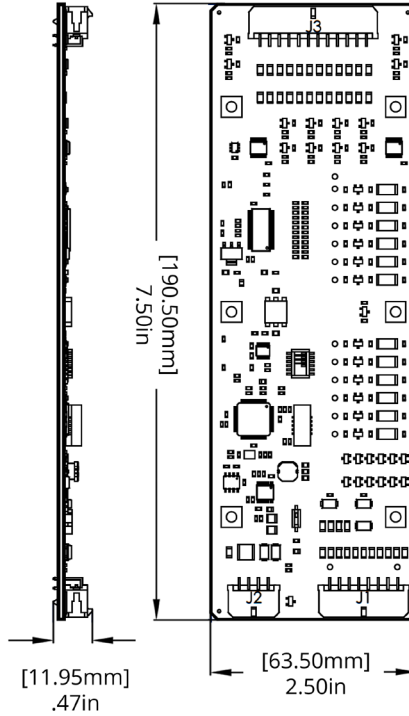
1-64X
BMS Monitors

Mechanical Drawings

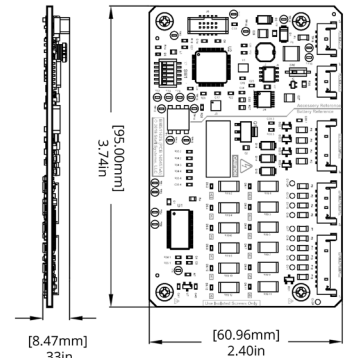
BMS100M Master



BMS1101S Monitor



BMS1102S Monitor



Typical System Diagram

