

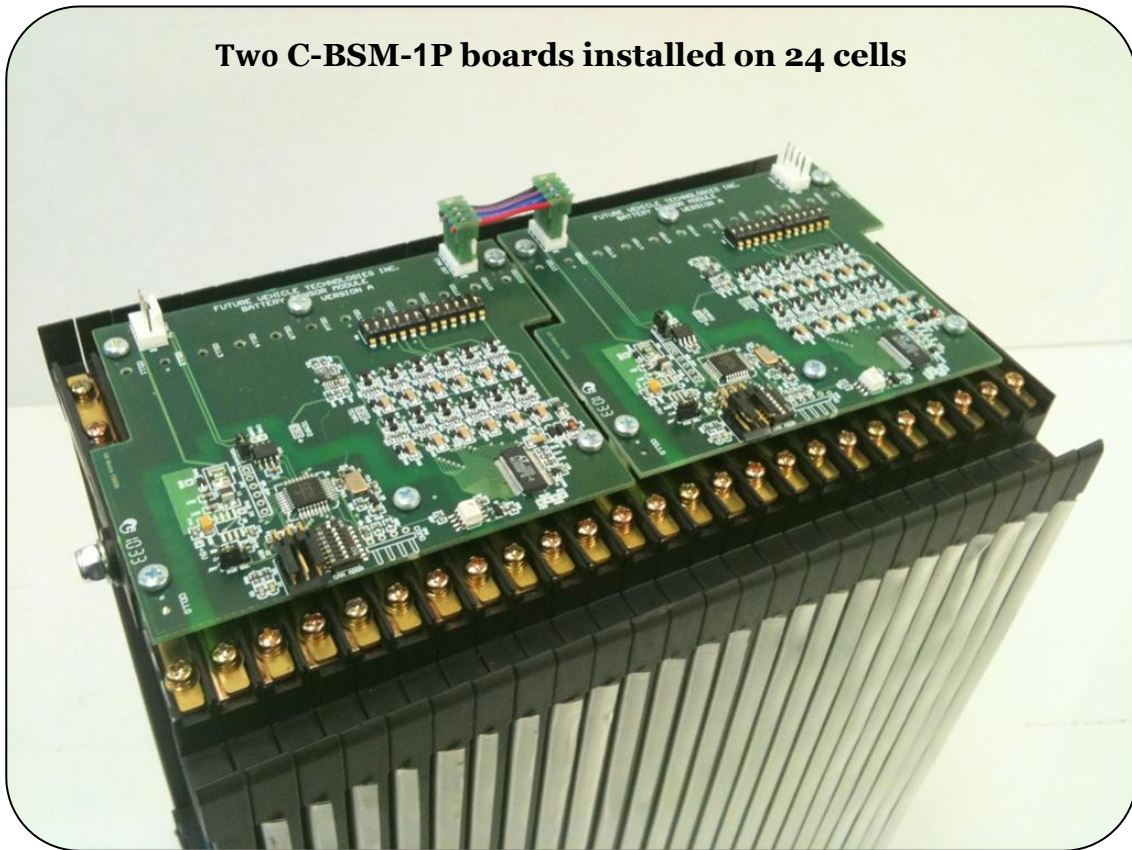


## **Battery Management System**

### **BMS Overview**

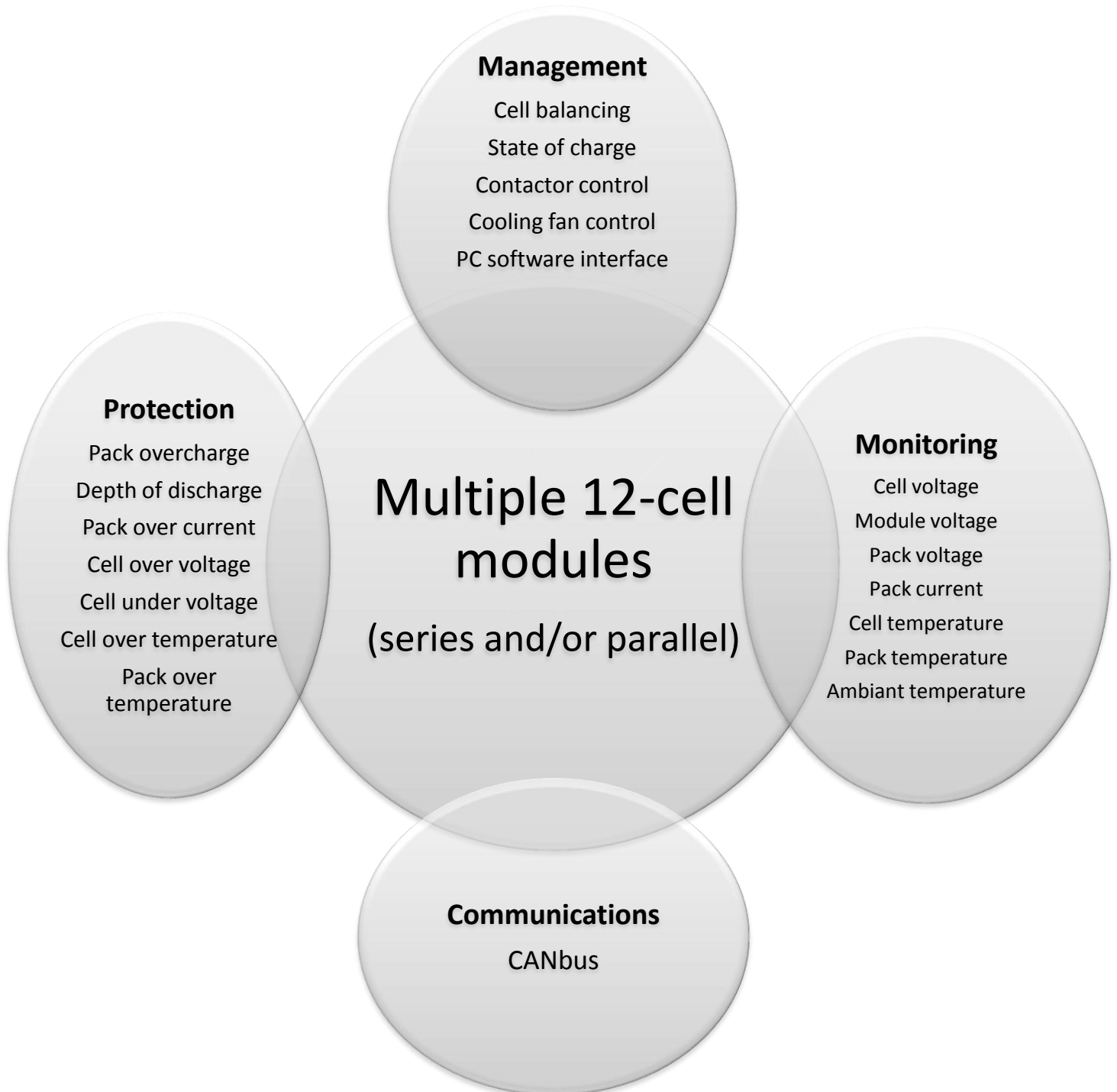
FVT's innovative BMS is designed for applications requiring ease of installation, high power, complete protection and high precision. Boards mount directly to bus bars eliminating all wires, dramatically reducing installation time and improving reliability. Each board protects and monitors up to 12 cells and boards can be daisy chained up to 1200 volts per array. Balancing is passive and communication is through CANbus protocol. FVT's BMS sets a new standard for speed, expandability, maximum voltage and balancing precision.

**Two C-BSM-1P boards installed on 24 cells**





## Features overview





## **Additional features**

### **Power requirements**

FVT's BMS requires just a few micro amps when in sleep mode. Power from the BMS analog circuits are derived directly from the cells and the digital circuits are from an isolated outside power source in the master controller.

### **User interface**

FVT's software lets users view individual cell voltages, cell balancing, etc. and identifies problem cells.

### **Expandability**

BMS boards can be daisy chained up to 1200 volts per array. With the addition of FVT's Master Battery Controller, multiple packs can be linked in parallel and balanced within specifications.

### **Speed and accuracy**

Maximum polling time is 20 milliseconds for all cells in the pack. CANbus protocol is adjustable from 250-500-1000 kbps. Cells can be balanced within 5 mV.

### **State of charge**

SOC is calculated using coulomb counting and can be adjusted for temperature and time.

### **Safety**

Minimum, maximum cell voltages are protected. Boards can remotely activate solenoids to shut down packs. Over temperature conditions are monitored and can trigger either warnings or a shut down. System can be interfaced with ground fault, crash and roll over shut off protection, extinguishing systems, etc.

### **Models**

**C-BSM-1P**- single cells in series, 12 cells total

**C-BSM-2P** – two cells in parallel , 24 cells total

**C-BSM-3P**- three cells in parallel, 36 cells total

**C- BSM- U**- universal board when direct connection is not possible. Designed for wires to each cell.

### **Custom Designs**

Custom layouts are available and affordable. Contact us with your requirements.



# BMS Specifications

<b>Max number of cell voltages monitored per board</b>	<b>12</b>
<b>Min number of cell voltages monitored per board</b>	<b>8</b>
<b>Individual cell voltages</b>	<b>Yes</b>
<b>Thermal cell monitoring</b>	<b>2 per board</b>
<b>Ambient heat sensors</b>	<b>1 per board</b>
<b>Number of wires per board</b>	<b>2 CAN, 2 POWER</b>
<b>Query time</b>	<b>once per second</b>
<b>Max polling period</b>	<b>20 milliseconds</b>
<b>Communications protocol (adjustable)</b>	<b>CAN 250- 500-1000 kbps</b>
<b>Cell measurement accuracy</b>	<b>.002 V</b>
<b>Max voltage per pack</b>	<b>1200 V</b>
<b>Max current per pack</b>	<b>1000 A</b>
<b>Max cell balancing precision</b>	<b>.005 V</b>
<b>Max current per board (without balancing)</b>	<b>.012 A</b>
<b>Min current per board (sleep mode)</b>	<b>.00001 A</b>
<b>Multiple Platforms</b>	<b>Yes</b>
<b>SOC Calculation</b>	<b>Yes</b>
<b>Max. heat dissipation per board (balancing)</b>	<b>5.5 W</b>