



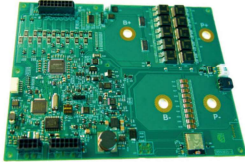
EBERSPÄEHER VECTURE

# PRODUCT OVERVIEW

Integrated and Distributed Battery  
Management Systems

# V04290 – LOW VOLTAGE INTEGRATED BMS

A scalable, high performance, stand-alone integrated BMS protecting 4 to 16 cells with 80A continuous load, secondary protection and parameter configurable with GUI.



## MARKET SEGMENTS:

- Automated Guided Vehicle
- Industrial Applications
- Material Handling
- Medical Devices
- Off-road Mobility

## TECHNICAL DATA:

Power Supply (B+ to B- or P+ to P-)	(-0.3V)- 65V
Operating Temperature	(-30)°C- 50°C
Continuous Load	80A
Min and Max Detectable Cell Voltage	2.3V-5V
Supported CAN comm type	CAN open
Supported CAN speed	500 Kbps
Active consumption (@ VCELL = 3.2V)	10mA Max
Cell balance topology	Passive
Cell balance current	160mA Max
Cell voltage typical sampling time	200ms
# of temp sensors (NTCs)	External sensors, up to 4
Accuracy of temperature measurement-CAN	±2°C
Dimensions	175mm (L) x 130mm (W) x 20mm (H)

## PRODUCT FEATURES:

State-of-charge (SoC) measurement	±1% Current Scale Factor
State-of-health (SoH) measurement	Yes
Supported LED interface for SOC display	External 5 LEDs segment module, display by push button

Fuel gauging via TI Impedance Track technology, thereby eliminating in-service calibration.

The BMS is capable of controlling the FET's and one off-board contactor at the same time.

Capable of supporting multiple battery chemistries.

## OTHER FEATURES:

Secondary protection
Parallel operation
Vertical and horizontal connectors
Parameter configurable with GUI
24/7 real-time monitoring
I2C communication available as well
3 external I/O lines
Heater 4A output (at pack voltage) can be activated via CAN to drive an external heater

# V04265 – LOW VOLTAGE INTEGRATED BMS

A scalable, high performance, stand-alone integrated BMS with 100A continuous operation free air, protecting 4 to 16 cells in any battery chemistry.



## MARKET SEGMENTS:

- Automated Guided Vehicle
- Industrial Applications
- Material Handling
- Medical Devices
- Off-road Mobility

## TECHNICAL DATA:

Power Supply (B+ to B- or P+ to P-)	(-0.3V)- 65V
Operating Temperature	(-30)°C- 85°C
Continuous Load	100A
Min and Max Detectable Cell Voltage	2.3V-5V
Supported CAN comm type	CAN open
Supported CAN speed	125 Kbps or 500 Kbps
Active consumption (@ VCELL = 3.2V)	10mA Max
Cell balance topology	Passive
Cell balance current	80mA Max
Cell voltage typical sampling time	200ms
# of temp sensors (NTCs)	External sensors, up to 4
Accuracy of temperature measurement-CAN	±2°C
Dimensions	150mm (L) x 130mm (W) x 18.1mm (H)

## PRODUCT FEATURES:

State-of-charge (SoC) measurement	±1% Current Scale Factor
State-of-health (SoH) measurement	Yes
Supported LED interface for SOC display	External 5 LEDs segment module, display by push button
Fuel gauging via TI Impedance Track technology, thereby eliminating in-service calibration.	
The BMS is capable of controlling the FET's and one off-board contactor at the same time.	
Capable of supporting multiple battery chemistries.	

## OTHER FEATURES:

I2C communication available as well
3 external I/O lines
Heater 4A output (at pack voltage) can be activated via CAN to drive an external heater

# V04278 – LOW VOLTAGE INTEGRATED BMS

A flexible industrial, medical and consumer electronics integrated BMS protecting 1 to 4 cells and targeting voltages from 3.2V to 15V nominal. Designed to operate with any battery chemistries with SMBus communication. It is easily integrated into systems where reliable and predictable behavior is required.



## MARKET SEGMENTS:

- Industrial Applications
- Medical Devices
- Portable Electronics
- Robotics and Drones

## TECHNICAL DATA:

Power Supply (B+ to B- or P+ to P-)	(-0.3V) - 24V
Operating Temperature	(-30)°C - 85°C
Continuous Load	12A
Min and Max Detectable Cell Voltage	2.7V - 4.25V
Supported SMBUS comm type	SMBUS rev 1.1
Standby current (sleep mode, no communication, FET off)	70uA - 90uA
Active consumption	336uA - 420uA
Cell balance topology	Passive
Cell balance activation (during charging)	Cell voltage $\geq$ 3.90V, cell voltage difference $\geq$ 50mV
Cell voltage typical sampling time	Updates the individual series cell voltages at 0.25s intervals
# of temp sensors (NTCs)	On board long-lead sensors, up to 4
Accuracy of temperature measurement	$\pm$ 1°C
Dimensions	64.00mm (L) x 17.50mm (W) x 4.10mm (H)

## PRODUCT FEATURES:

Accuracy of SOC measurement	2% - 3%
State-of-health (SoH) measurement	Yes
Supported LED interface for SOC display	ZIF connector or soldered pads to external 5 LEDs segment module, display by push button

Available as a 1s, 2s, 3s and 4s combined Protector & SMBUS rev 1.1 Fuel Gauge.

MOSFET charge and discharge switches are controlled by the BQ4050 with automatic reset.

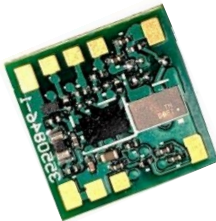
Capable of supporting multiple battery chemistries.

## OTHER FEATURES:

LED interface for SOC display can also be wired via solder pads or thru hole
Logging of lifetime event data

# V04298 – LOW VOLTAGE INTEGRATED BMS

A flexible industrial, medical and consumer electronics integrated BMS protecting 1 cell and targeting voltages from 1.5V to 5.5V nominal. Designed to operate with any battery chemistries with I2C communication. It is easily integrated into systems where reliable and predictable behavior is required.



## MARKET SEGMENTS:

- Industrial Applications
- Medical Devices
- Portable Electronics
- Robotics and Drones

## TECHNICAL DATA:

Power Supply (B+ to B- or P+ to P-)	(-0.3V)- 8V
Operating Temperature	(-30)°C-85°C
Continuous Load	1A
Min and Max Detectable Cell Voltage	1.5V – 5.5V
Supported comm type	400kHz I2C
Standby current (sleep mode, no communication, FET off )	20uA
Active consumption	57uA
# of temp sensors (NTCs)	1x Built-in + 1x External
Accuracy of temperature measurement	±1°C
Dimensions	10.0mm (L) x 10.0mm (W) x 1.50mm (H)

## PRODUCT FEATURES:

Accuracy of SOC measurement	2%
State-of-health (SoH) measurement	Yes
MOSFET charge and discharge switches are controlled by the BQ27Z746 with automatic reset.	
Capable of supporting multiple battery chemistries.	

## OTHER FEATURES:

Optional external enable
Logging of lifetime event data

# V04282 – HIGH VOLTAGE DISTRIBUTED BMS

The Battery String/System Manager (BSM) for a distributed system is designed to work together with the Battery Cell Manager (V04288) and the Voltage Transducer (V07036) to complete the entire system. It monitors up to 20, V04288 boards while monitoring string voltage through the V07036.



## MARKET SEGMENTS:

- Energy Storage
- Off-road Mobility
- Industrial Applications
- UPS
- Renewable Power

## TECHNICAL DATA:

Supply Voltage from Battery	12V ± 5 %
Operating Temperature	(-40)°C - 85°C
Ground fault controlled Battery System Voltage	100V-1000V
Idle or Sleep consumption	10mA Max, no Host (CAN) connected, no contactors driver
Active consumption	150mA-250mA, Host (CAN) connected, no contactor driver, no analog & digital outputs/inputs
High Range Discharge Current-OCD	≤625A and determined by external current transducer and contactors
Supported CAN comm type	CANOpen protocol
Supported CAN speed 1	For communication with Cell Manager Modules: 500 kbps
Temperature sensing Inputs	3 optional ; 10K NTC thermistors ; -45 to + 85C
HV Voltage sensing input	3: 1000Vdc - Max with external transducer
Dimensions	203.2mm (L) x 25.04mm (W) x 25.9mm (H)

## PRODUCT FEATURES:

SOC Display	Optional LED indicators
Watchdog	Stand alone on board window-based Watchdog IC
Usability	On board data logging

Three independent isolated CAN interfaces all 3 CANs are 1000Vdc isolated. Each CAN has two parallel connectors.

## OTHER FEATURES:

Can be powered by an external power supply
The controller has a Ground Fault Interruption (GFI) built in
There is an interface to gather current sensing information via LEM, shunt, or CAN based on the specific system implementation



# V04288 – HIGH VOLTAGE DISTRIBUTED BMS

The Battery Cell Manager (BCM) manages and monitors cell performance for a distributed system and works together with the Battery String/System Manager (V04282) and the Voltage Transducer (V07036) to complete the system.



## MARKET SEGMENTS:

- Energy Storage
- Off-road Mobility
- Industrial Applications
- UPS
- Renewable Power

## TECHNICAL DATA:

Power Supply (B+ to B- or P+ to P-)	12.5V- 67V
Operating Temperature	(-40)°C- 50°C
Accuracy of voltage measurement	±0.1%, ±3mV Max
Active consumption (@ VCELL = 3.65V from B+)	10mA
Active consumption (from External Power Supply @ 12 Vdc)	30mA Max
Shut down consumption (from B+)	500uA Max
Cell balance topology	Passive
Cell balance activation (during charging)	≥3.45V
# of temp sensors (NTCs)	External sensors up to 8 & on board PCB TEMP sensor
Accuracy of temperature measurement – Stability	±1°C
Supported CAN comm type	Open
Safety interlock	100V, 3.5A; 40mV voltage drop at 0.5A
Dimensions	105.0mm (L) x 80.0mm (W) x 15.0mm (H)

## PRODUCT FEATURES:

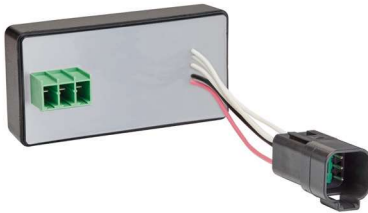
Usability	16 MBytes of on-board SPI Serial Flash memory for event logging
State-of-charge (SoC) measurement	Yes, this function is done on V04282 controller board
State-of-health (SoH) measurement	Yes, this function is done on V04282 controller board
Standalone Window-Watchdog Timer as well as optional hydrogen sensor	

## OTHER FEATURES:

Number of cells	4-16S
Optional hydrogen sensor available	
BCM provides communicates to the Battery System Manager via isolated CAN interface	

# V07036 – HIGH VOLTAGE DISTRIBUTED BMS

The Voltage Transducer works together with the Battery String/System Manager (V04282) and the Battery Cell Manager (V04288) to complete a distributed system. V07036 provides string voltage data to V04282.



## MARKET SEGMENTS:

- Energy Storage
- Off-road Mobility
- Industrial Applications
- UPS
- Renewable Power

## TECHNICAL DATA:

Power Supply	8V-24V
Range of high voltage input measurement	0V-1000V
Operation temperature	(-40)°C-85°C
Power Supply	8V-24V
Quiescent Current	≤0.7mA
Dimensions	100mm (L) x 50mm (W) x 37mm (H)

## PRODUCT FEATURES:

Power Supply Current (@12V Supply)	5mA-30mA (5V Power supply configuration is available upon request)
Output Ratio Error	0.01 with a Voltage measurement accuracy of ±1%

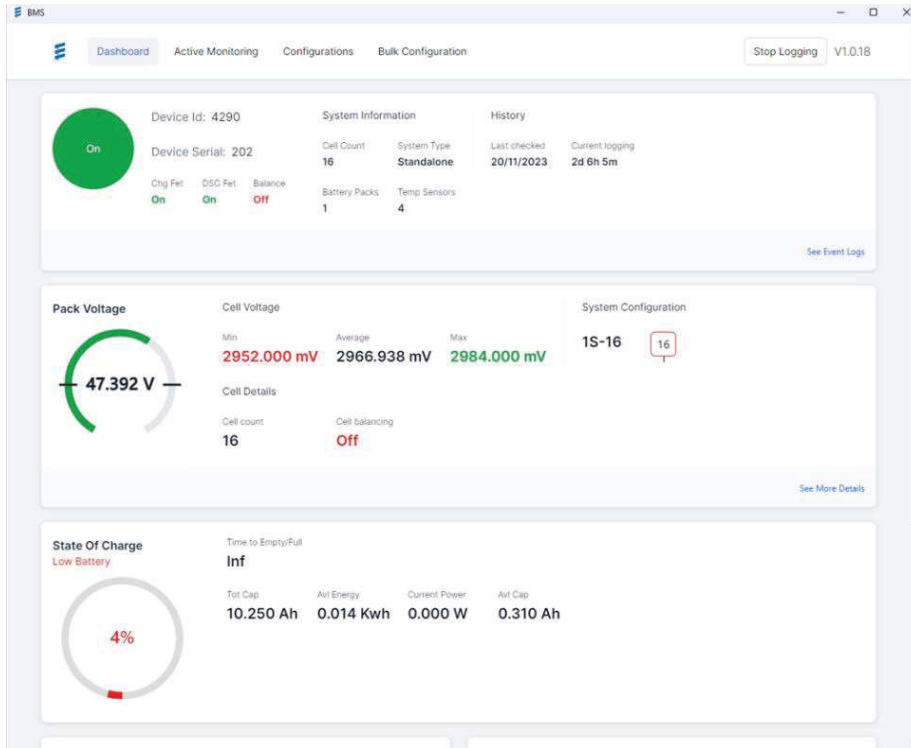
## OTHER FEATURES:

Variants: V0703600	Voltage input 0-500V; V <sub>out</sub> : 2.9V; Supply Voltage: 8-24V (Other Transfer ratios are available upon request)
Variants: V0703601	Voltage Input: 0-1000V, V <sub>out</sub> : 2.9V; Supply Voltage: 8-24V (Other Transfer ratios are available upon request)



# PRODUCT OVERVIEW – GUI

The Eberspaecher Vecture GUI platform facilitates 24/7 monitoring and field configurability of the Company's BMSs. It provides users with valuable options and insight into the status and health of the battery systems, helping to ensure efficient operation and maximum battery life.



## FEATURES:

- Home screen dashboard
- Active Monitoring
- Event logging
- Parameter configurations

## SUPPORT PLATFORMS:

V04282 Distributed BMS
V04290 Integrated BMS
V04265 Integrated BMS (planned)

## AVAILABLE DATA:

Device configuration
State-of-charge
State-of-health
Cell voltages
Cell temperatures

## SYSTEM REQUIREMENTS:

Operating system (Mobile & PC)	Android, iOS, Windows
Hardware requirement	Bluetooth w/ BLE (wireless), PEAK CAN (USB)

EBERSPAECHER VECTURE INC.  
8900 KEELE ST. UNIT 3  
CONCORD, ON L4K 2N2 / CANADA

PHONE: 905-761-0331  
FAX: 905-761-0334  
INFO-VECTURE@EBERSPAECHER.COM  
WWW.EBERSPAECHER-VECTURE.COM