



**POWER & ENERGY IS NOT ONLY THE  
GREATEST ENABLER FOR DEFENCE FORCES,  
IT IS ALSO THE MOST SIGNIFICANT  
LIMITATION**



# **VBMS**

## **Battery Management System**

VBMS is the definitive vehicle battery power solution allowing adjustable charging, power sharing and incorporates an integrated DataCell battery monitoring that provides data including:

- Battery Voltage
- State Of Charge (SoC) (% Remaining)
- State Of Health (SoH) (% Remaining)
- Time To Run (Hours / Mins)
- Net Charge / Discharge (Amps)
- Temperature

A single VBMS installation can support up to four separate battery banks simultaneously and multiple power sources.



## THE CHALLENGES

The last decade has witnessed a step change in the number and complexity of electrical equipment that combat and tactical vehicles need to power and operate. A good example is the drive towards network-centric warfare which has required greater interaction and interoperability with other battlefield systems and so increased the number of communication links required. Couple this with systems for the likes of situational awareness, defence, soldier support and vehicle HVAC and the demands, along with the criticality, of on-board electrical power has become ever greater. For a significant proportion of operations the majority of this power comes from the vehicle's vital storage medium – batteries. Therefore management of batteries is essential to avoid premature damage or weakening which in turn can avoid:

- Total vehicle failures and vehicle availability issues due to flat or damaged batteries
- The increased procurement and logistical costs associated with in-theatre battery replacement
- Vehicle system 'brown outs' or failures during use in theatre

## THE APPLICATION

Vehicle commanders need comprehensive yet clear information regarding electrical power consumption and availability at any given point in time. This enables sound planning of on-board system usage for any given mission and provides control and confidence. VBMS can deliver this functionality and reliable information to permit effective management of how the charging sources both on and off the vehicle (alternators, APU's, import power) serve on-board electrical and electronic consumers, ensuring that power is going to the right places at the right time, in the correct proportion for storage and use. VBMS consists of a microprocessor controlled 'hub' linked via cable to a number of 'gateways' (housing high current contactors) around the vehicle. It ensures that the available electrical current from charge sources such as alternators, is efficiently and intelligently delivered to multiple batteries on-board in direct proportion to the power demand placed on them. The hub is also programmed to prevent batteries from being flattened at individually specified levels, ensuring that vehicles do

not enter theatre with batteries that have been unknowingly weakened during the last mission or by loads left running while the vehicle is parked up.

In addition, VBMS can control and prioritize charge output from other sources such as additional alternators and enable or disable APU's to provide additional power depending on battery state of charge. Custom VBMS control panels allow the vehicle commander to manually isolate and parallel batteries from a central location as well as monitor battery state of charge and over-ride flat battery protection if the vehicle is performing a critical task. VBMS utilises the outputs from the separately available Datacell II system that monitors the state of charge and health of the batteries to appropriately manage charging. The live data output from VBMS can be fed into third party C4I systems on-board to display battery state of charge and alarm messages via existing computer displays.



## PRODUCT HIGHLIGHTS

- Ensures vehicle commanders know exactly how much power they have in reserve during missions such as silent watch
- Avoids unforeseen power shortages and failures (improving crew safety and mission effectiveness)



VBMS Display

- VBMS can provide a CANBUS output for display via vehicle Vetronics (or C4I).
- One set of SKU's (stock keeping unit) can be configured for use with multiple vehicle types and easily diagnosed when fitted
- State of Charge (% of energy remaining)



VBMS CPU

- Hardwire alarm outputs for LED lamp illumination or control of external relays (generator start, consumer load control, buzzers etc)
- Simultaneously measures up to four battery banks. Can be split voltage 12 or 24 V DC
- Choice of display options available

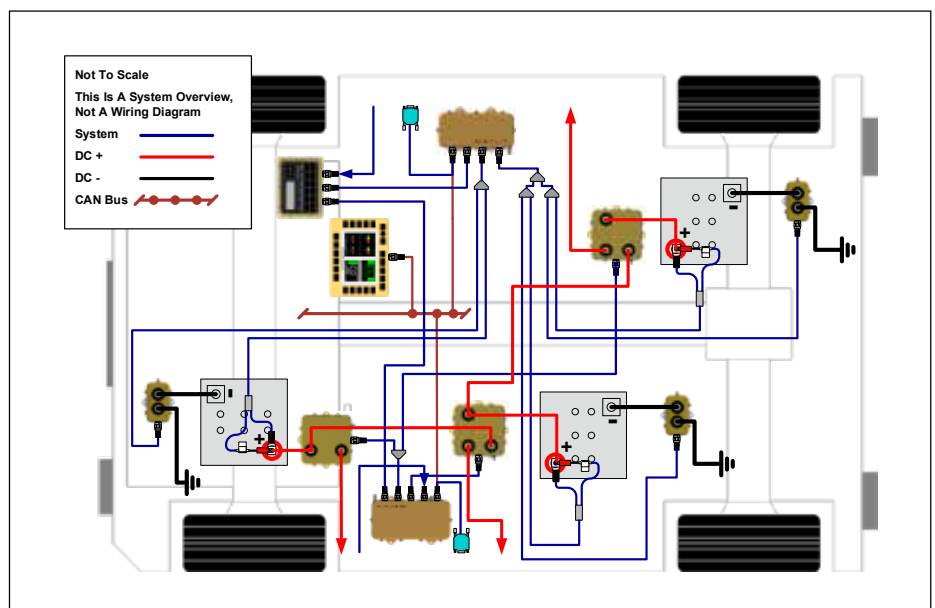


VBMS Gateway

- Vastly reduces battery failures as a result of misuse, saving money and keeping vehicles on the move
- A single control and monitoring interface for the battery system that is easy to use
- VBMS can be configured to optimise power sharing between multiple battery groups, significantly extending silent watch capability and optimising the use of on-board power
- The ability to connect any selected battery groups in an emergency (using a remote switch) to allow one to supplement another
- Automatic deep discharge protection through assigning different discharge levels for each battery group, dependent on their role on the vehicle, to protect them from damage and increase battery life
- VBMS contains a programmable I/O for interfacing with the wider vehicle architecture for the automation of other essential tasks (e.g. auto APU start).

- State of Health (% of original capacity remaining)
- Time remaining (until programmed discharge level reached)
- Net charge / discharge (amps)
- Programmable alarms (SoC, SoH, Voltage)

- Full installation and operation support available along with comprehensive training programmes for operators and maintenance teams.
- Part of a comprehensive range of power management systems
- Datacell II is optimised for operation with the theatre proven Armasafe Plus VRLA batteries



VBMS 3 Battery Bank Example

## SPECIFICATIONS

Supply Voltage Range	8 - 40V DC
Maximum Supply Current (CPU)	<20mA (Plus activated panels / relays)
Operating Temperature Range	-40 TO +80 °C
Accuracy	
State Of Charge (Charge)	Normal Conditions + / - 2%
State Of Charge (Discharge)	Normal Conditions + / - 2%
State of Health	< + / - 2%
Voltage	+ / - 0.5%
Temperature	+ / - 2 °C
Current	+ / - 5% tolerance, + / - 2% offset, +/- 1% LSD
Dimensions (CPU)	See below
Weight (CPU)	0.5 kg
Complies to	CE, ISO 7637-2
Designed to	DEF - STAN 59-411 MIL - STD 461F DEF - STAN 00-35 MIL - STD 810G DEF - STAN 61-5 MIL - STD 1275D

