

Introducing the BM-01 Battery Monitor...

Have you ever been stuck with a flat battery in your car or truck?

Have you wondered how much charge is left in the deep-cycle batteries in your motorhome/RV or boat?

Have you wanted to know just how much longer your off-grid supply will last?



Features

- Voltage / Current / Temperature monitoring
- Sums over time to calculate charge (Amp-hour counting)
- Adjustments for rate (Peukert), and self-discharge
- Calculates remaining charge & time to empty (or full)
- Fully configurable for all types of battery
- Independent* monitoring of TWO separate batteries
- Automatic self-calibration for current readings
- Simply installation with no need to fit a current shunt
- Wide supply & monitoring voltage ranges
- Two inputs & two programmable outputs
- Remote control & monitoring using PC terminal software
- High-contrast LCD with separate day/night brightness settings
- Clock with day/date/month/year & programmable alarms
- Stopwatch with lap time/speed
- Countdown timer
- Four user variables which can be set as additional timers
- Proprietary multi-tasking operating system
- Graphical user interface with menus and windows
- Voltage, current & charge graphs with variable timebase
- User-upgradable firmware (free updates for life)

*Must share same negative earth for current monitoring

The BM-01 can be installed into almost any system using lead-acid batteries (wet/AGM/gel etc.) with a nominal system voltage of 12V, 24V, 36V or 48V, and will precisely measure the current flowing into or out of your batteries.

It will sum this value over time to determine exactly how much charge has been used, and how much remains. This information is then used to calculate a simple "state of charge" percentage estimate, and "time-to-empty" based on the discharge rate.

Actual voltage and current readings are also visible. Voltage alone is not sufficient to estimate the state of charge since it will vary significantly with load and whether the battery is being charged or discharged at the time. The BM-01 uses a proprietary algorithm taking current, capacity and temperature into account.

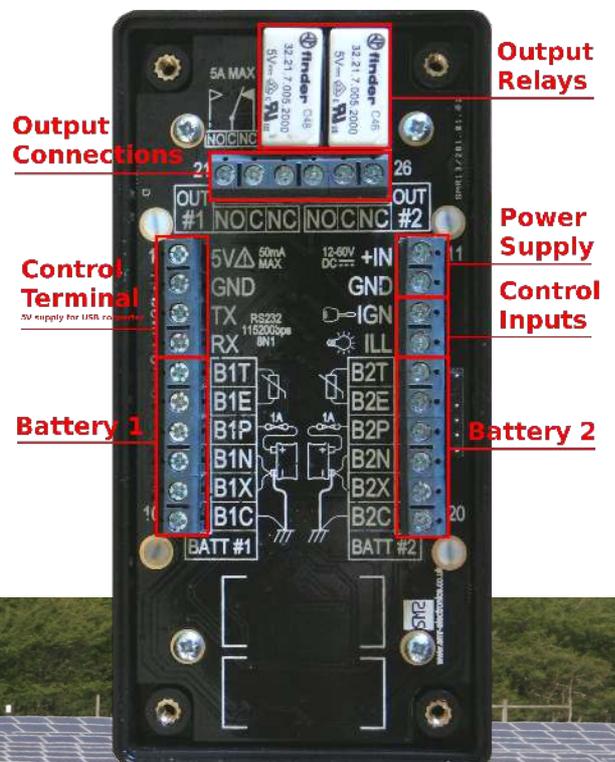
The BM-01 will give an early indication of charging problems, or if insufficient charge is being put back into a battery after use – a common issue during winter driving.

Installation is straightforward and can typically be completed by the user. Power is supplied from an existing fuse-box and a six-core cable is run directly to the battery. There is no need to disconnect any of the battery connections as the sense wires simply attach to the terminals and to the negative chassis connection. Current is calculated by measuring the tiny voltage drop in the negative cable which connects the battery to the chassis (or bus-bar etc.).

Calibration is automatic, and in typical installations, accurate to +/- 0.01A or better.

Specifications

Supply voltage	12 ~ 60V DC (75V max.)
Power consumption	<0.015A (BL & relays off)
Standby power consumption	<0.0005A
Monitored voltage (B1/B2)	0 ~ 99.99V
Monitored current (B1/B2)	-999.9A ~ +999.9A
Outputs	2 (changeover relay contacts)
Output switching voltage	up to battery voltage
Output switching current	5A max.
Inputs	2 (IGN & ILL)
Sampling resolution	24-bit ADC
Control terminal	RS-232 (USB with adaptor)
Display	2.5" backlit LCD 128x64
Dimensions	130x65x25mm
Weight	180g



Event-driven programmability

Incorporated into the BM-01 is a powerful event-based configurability. Far more than simply a means to set up switching of the output relays, the flexibility of this system opens up numerous possible applications.

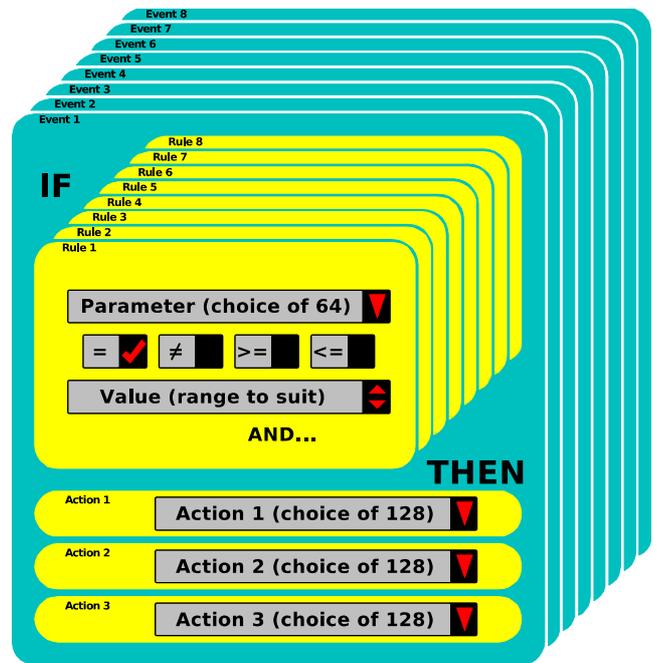
In vehicle installations for example, it may be necessary to switch on connected equipment when the ignition is turned on, or perhaps when the engine is actually started, and maybe only at certain times of the day – or even certain days of the week. Sometimes it may be desirable for the equipment to stay on for a period after the engine has been stopped, but it should always turn off if the battery charge drops below a certain level. Perhaps too, there should be a means to manually switch on. This can all be easily configured with the BM-01.



For fleet customers, we can supply the BM-01 with your own custom graphics, and even a modified or pre-configured version of the software. Please contact us for more details.



SMR Electronics Limited reserves the right to make changes and improvements to the design shown in this document. Specifications may be subject to change. Photographs depict prototype device and may not be identical to production units. ©2018 SMR Electronics Limited. www-smr-electronics.co.uk



With eight events, each containing up to eight rules - all of which must be "true" for up to three actions to be carried out, there's plenty of possibilities.

Each event can be individually assigned a name to identify it. Then the rules and actions are configured, and finally the event is "enabled". All events are evaluated once per second (so A = A + 1 in the following example is counting seconds).

A typical example would be to switch on both outputs when the engine is started. Output 1 is turned off five minutes after the ignition is turned off, and output 2 after half an hour. This can be implemented using four events:

1. IF Battery 1 voltage >=13.00V AND Ignition = On THEN
Output 1 On
Output 2 On
A = 0
2. IF Ignition = Off THEN
A = A + 1
3. If A >= 300 THEN
Output 1 Off
4. If A >= 1800 THEN
Output 2 Off

Parameters	Actions
Battery voltage (1,2,1+2,1-2)	Output on (1,2)
Battery current (1,2,1+2)	Output off (1,2)
Battery power watts (1,2,1+2)	Output toggle (1,2)
Battery capacity left % (1,2,1+2)	Output pulse on (1,2)
Battery discharge Ah (1,2,1+2)	Output pulse off (1,2)
Battery discharge Wh (1,2,1+2)	Stopwatch (start,stop,lap,reset)
Battery temperature (1,2)	Timer (start,stop,reset)
Ignition state	Alarm
Illumination state	Calibrate battery (1,2)
Ignition on/off time	Suspend event (1-8)
Illumination on/off time	Resume event (1-8)
Stopwatch time	Zero/reset discharge (1,2)
Countdown timer time	External command out
Time (hour,minute,second)	Zero user variable (A,B,C,D)
Date (day,date,month,year)	Increment user variable (A,B,C,D)
User button pressed	Decrement user variable (A,B,C,D)
External command in	Set info screen to user variable
Info screen displayed	Power off
User variable (A,B,C,D)	Store waypoint n*
Speed*	Write log†
Altitude*	
Latitude*	
Longitude*	
Range to waypoint n*	

* With optional GPS † With optional datalogger