

BMV-700 series: Precision Battery Monitoring

www.victronenergy.com



BMV-700

Battery 'fuel gauge', time-to-go indicator, and much more

The remaining battery capacity depends on the ampere-hours consumed, discharge current, temperature and the age of the battery. Complex software algorithms are needed to take all these variables into account.

Next to the basic display options, such as voltage, current and ampere-hours consumed, the BMV-700 series also displays state of charge, time to go, and power consumption in Watts.

The BMV-702 features an additional input which can be programmed to measure the voltage (of a second battery), battery temperature or midpoint voltage (see below).

Bluetooth Smart

Use the Bluetooth Smart dongle to monitor your batteries on Apple or Android smartphones, tablets, macbooks and other devices.

Easy to install

All electrical connections are to the quick connect PCB on the current shunt. The shunt connects to the monitor with a standard RJ12 telephone cable. Included: RJ 12 cable (10 m) and battery cable with fuse (2 m); no other components needed.

Also included are a separate front bezel for a square or round display appearance, a securing ring for the rear mounting and screws for the front mounting.

Easy to program (with your smartphone!)

A quick install menu and a detailed setup menu with scrolling texts assist the user when going through the various settings.

Alternatively, choose the fast and easy solution: download the smartphone app (Bluetooth Smart dongle needed)

Midpoint voltage monitoring (BMV-702 only)

This feature, which is often used in industry to monitor large and expensive battery banks, is now for the first time made available at a low cost, to monitor any battery bank.

A battery bank consists of a string of series connected cells. The midpoint voltage is the voltage halfway along the string. Ideally, the midpoint voltage would be exactly half of the total voltage. In practice, however, deviations will be seen, that depend on many factors such as a different state of charge for new batteries or cells, different temperatures, internal leakage currents, capacities and much more.

Large or increasing deviation of the midpoint voltage, points to improper battery care or a failed battery or cell. Corrective action following a midpoint voltage alarm can prevent severe damage to an expensive battery. Please consult the BMV manual for more information.

Standard features

- Battery voltage, current, power, ampere-hours consumed and state of charge
- Remaining time at the current rate of discharge
- Programmable visual and audible alarm
- Programmable relay, to turn off non critical loads or to run a generator when needed
- 500 Amp quick connect shunt and connection kit
- Shunt selection capability up to 10.000 Amps
- VE.Direct communication port
- Stores a wide range of historical events, which can be used to evaluate usage patterns and battery health
- Wide input voltage range: 9,5 – 95V
- High current measurement resolution: 10 mA (0,01A)
- Low current consumption: 2,9Ah per month (4mA) @12V and 2,2Ah per month (3mA) @ 24V

BMV-702 additional features

Additional input to measure voltage (of a second battery), temperature or midpoint voltage, and corresponding alarm and relay settings.

BMV-700HS: 60 to 385 VDC voltage range

No additional parts needed. Note: suitable for systems with grounded minus only (battery monitor is not isolated from shunt).

Other battery monitoring options

- VE.Net Battery Controller
- High voltage VE.Net Battery Controller: 70 to 350 VDC
- Lynx Shunt VE.Net
- Lynx Shunt VE.Can

More about midpoint voltage

One bad cell or one bad battery can destroy a large, expensive battery bank. When batteries are connected in series, a timely warning can be generated by measuring the midpoint voltage. Please see the BMV manual, section 5.2, for more information.

We recommend our **Battery Balancer** (BMS012201000) to maximize service life of series-connected batteries.



BMV bezel square



BMV shunt 500A/50mV
With quick connect pcb



BMV-702 Black



BMV-700H

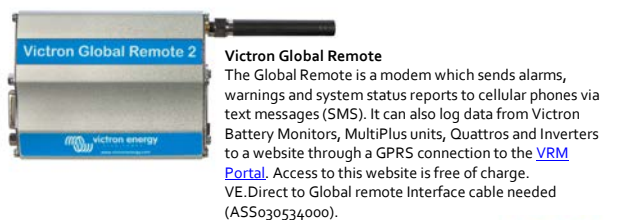
| Battery Monitor | BMV-700 | BMV-702 BMV-702 BLACK | BMV-700HS |
|---|---|--------------------------|--------------|
| Supply voltage range | 6,5 - 95 VDC | 6,5 - 95 VDC | 60 - 385 VDC |
| Current draw, back light off | < 4mA | < 4mA | < 4mA |
| Input voltage range, auxiliary battery | n. a. | 6,5 - 95 VDC | n. a. |
| Battery capacity (Ah) | 20 - 9999 Ah | | |
| Operating temperature range | -40 +50°C (-40 - 120°F) | | |
| Measures voltage of second battery, or temperature, or midpoint | No | Yes | No |
| Temperature measurement range | -20 +50°C | | n. a. |
| VE.Direct communication port | Yes | Yes | Yes |
| Relay | 60V / 1A normally open (function can be inverted) | | |

| RESOLUTION & ACCURACY (with a 500 A shunt) | | | |
|--|----------|----------|-------|
| Current | ± 0,01A | | |
| Voltage | ± 0,01V | | |
| Amp hours | ± 0,1 Ah | | |
| State of charge (0 - 100%) | ± 0,1% | | |
| Time to go | ± 1 min | | |
| Temperature (0 - 50°C or 30 - 120°F) | n. a. | ± 1°C/°F | n. a. |
| Accuracy of current measurement | ± 0,4% | | |
| Accuracy of voltage measurement | ± 0,3% | | |

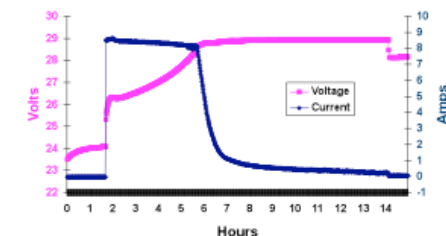
| INSTALLATION & DIMENSIONS | |
|---------------------------|----------------------------|
| Installation | Flush mount |
| Front | 63mm diameter |
| Front bezel | 69 x 69mm (2.7 x 2.7 inch) |
| Body diameter | 52mm (2.0 inch) |
| Body depth | 31mm (1.2 inch) |

| STANDARDS | |
|---------------------|-------------------------|
| Safety | EN 60335-1 |
| Emission / Immunity | EN 55014-1 / EN 55014-2 |
| Automotive | ECE R10-4 / EN 50498 |

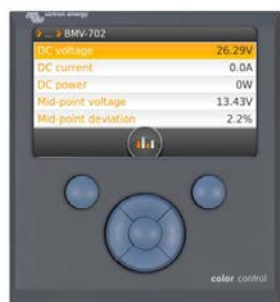
| ACCESSORIES | |
|--------------------|--|
| Shunt (included) | 500A / 50mV |
| Cables (included) | 10 meter 6 core UTP with RJ12 connectors, and cable with fuse for '+' connection |
| Temperature sensor | Optional (ASS00100000) |



Interface cables
- VE.Direct cables to connect a BMV 70x to the Color Control (ASS030530xxx)
- VE.Direct to USB interface (ASS030530000) to connect several BMV 70x to the Color Control or to a computer.
- VE.Direct to Global remote interface to connect a BMV 70x to a Global Remote. (ASS030534000)



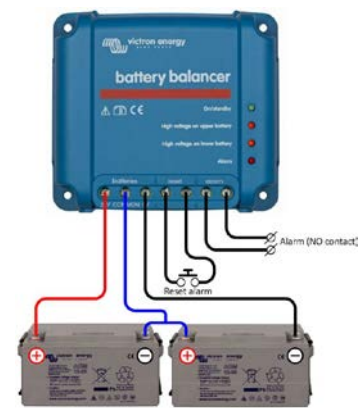
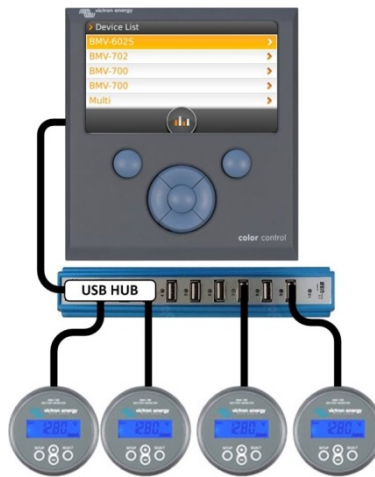
The PC application software **BMV-Reader** will show all current readings on a computer, including history data. It can also log the data to a CSV formatted file. It is available for free, and can be downloaded from our website at the [Support and downloads section](#). Connect the BMV to the computer with the VE.Direct to USB interface, ASS030530000.



Color Control
The powerful Linux computer, hidden behind the colour display and buttons, collects data from all Victron equipment and shows it on the display. Besides communicating with Victron equipment, the Color Control communicates through CAN bus (NMEA2000), Ethernet and USB. Data can be stored and analysed on the VRM Portal.



A maximum of four BMVs can be connected directly to the Color Control. Even more BMVs can be connected to a USB Hub for central monitoring.



Battery Balancer (BMS012201000)
The Battery Balancer equalizes the state of charge of two series connected 12V batteries, or of several parallel strings of series connected batteries. When the charge voltage of a 24V battery system increases to more than 27V, the Battery Balancer will turn on and compare the voltage over the two series connected batteries. The Battery Balancer will draw a current of up to 1A from the battery (or parallel connected batteries) with the highest voltage. The resulting charge current differential will ensure that all batteries will converge to the same state of charge.

If needed, several balancers can be paralleled.

A 48V battery bank can be balanced with three Battery Balancers.



With the VE.Direct to Bluetooth Smart dongle real time data and alarms can be displayed on Apple and Android smartphones, tablets, macbooks and other devices.

Also use your smartphone to adjust settings!

(the VE.Direct to Bluetooth Smart dongle must be ordered separately)



See the VictronConnect BMV app Discovery Sheet for more screenshots