

# smallBMS with pre-alarm

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smallBMS

### A simple and low cost alternative to the VE.Bus BMS

The smallBMS can replace the VE.Bus BMS in several applications. It is however not suitable for use with VE.Bus MultiPlus and Quattro inverter/chargers: it has no VE.Bus interface. The smallBMS is intended for use with Victron Smart LiFePo4 batteries with M8 circular connectors. The smallBMS has three outputs, similar to the VE.Bus BMS.

### Load Disconnect output

The Load output is normally high and becomes free floating in case of cell under voltage (default 2,8V/cell, adjustable on the battery between 2,6V and 2,8V per cell). Maximum current: 1A. The Load output is not short-circuit protected.

The Load output can be used to control:

- A high current relay or contactor.
- The remote on/off input of a Battery Protect, inverter or DC-DC converter or other loads. (a non-inverting or inverting on/off cable may be required, please consult the detailed manual on our website)

### Pre-alarm output

The pre-alarm output is normally free floating and becomes high in case of imminent cell under voltage (default 3,1V/cell, adjustable on the battery between 2,85V and 3,15V per cell). Maximum current: 1A (not short circuit protected).

The minimum delay between pre-alarm and load disconnect is 30 seconds.

### Charge disconnect output

The Charger output is normally high and becomes free floating in case of imminent cell over voltage or over temperature. Maximum current: 10mA.

The Charger output is not suitable to power an inductive load such as a relay coil.

The Charger output can be used to control:

- The remote on/off of a charger
- A Cyrix-Li-Charge relay
- A Cyrix-Li-ct Battery Combiner

### System on/off input

The system on/off input controls both outputs. When off, both outputs will be free floating so that loads and chargers are turned off.

The System on/off consists of two terminals: Remote L and Remote H.

A remote on/off switch or relay contact can be connected between L and H.

Alternatively, terminal H can be switched to battery plus, or terminal L can be switched to battery minus.

### Protects 12V, 24V and 48V systems

Operating voltage range: 8 to 70V DC.

### LED indicators

- **Load ON (blue):** Load output high (cell voltage >2.8V, adjustable on the battery).
- **Temp or OVP (red):** Charger output free floating (due to cell over temperature (>50°C), cell under temperature (<5 °C) or cell over voltage).

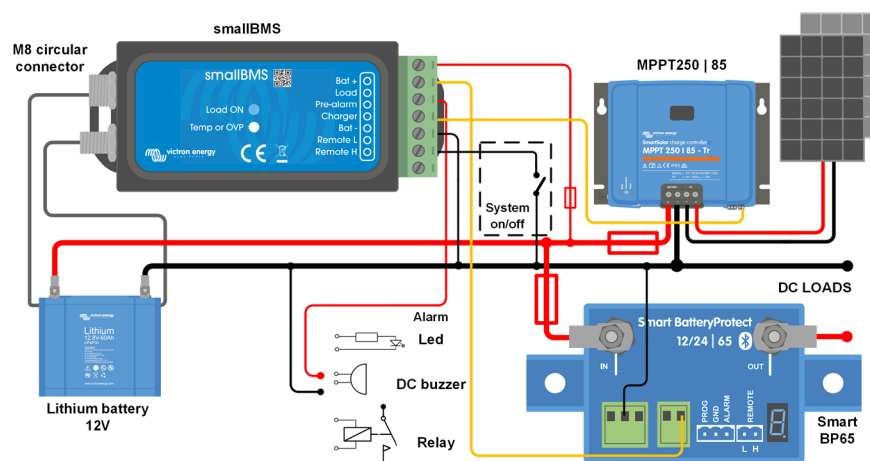


Figure 1: Application example for a DC off-grid system, with system on/off switch between L and battery negative

smallBMS	
Normal operating Input voltage range (Vbat)	8 – 70V DC
Current draw, normal operation	2.2 mA (excluding Load output and Charger output current)
Current draw, low cell voltage	1.2mA
Current draw, remote off	1,2 mA
Load output	Normally high (Vbat – 0.1V) Source current limit: 1A (not short circuit protected) Sink current: 0A (output free floating)
Charger output	Normally high (Vbat –0.6V) Source current limit: 10mA (short circuit protected) Sink current: 0A (output free floating)
Pre-alarm	Normally free floating In case of alarm: output voltage Vbat -0.1V Maximum output current: 1A (not short circuit protected)
System on/off: Remote L and Remote H	Use modes of the system on-off: a. ON when the L and H terminal are interconnected (switch or relay contact) b. ON when the L terminal is pulled to battery minus (V < 3.5V) c. ON when the H terminal is high (2.9V < V <sub>H</sub> < Vbat) d. OFF in all other conditions
GENERAL	
Operating temperature	-20 to +50°C 0 - 120°F
Humidity	Max. 95% (non-condensing)
Protection grade	IP20
ENCLOSURE	
Material and colour	ABS, matt black
Weight	0.1kg
Dimensions (h x w x d)	106 x 42 x 23mm
STANDARDS	
Standards: Safety Emission Immunity Automotive	EN 60950 EN 61000-6-3, EN 55014-1 EN 61000-6-2, EN 61000-6-1, EN 55014-2 Regulation UN/ECE-R10 Rev.4

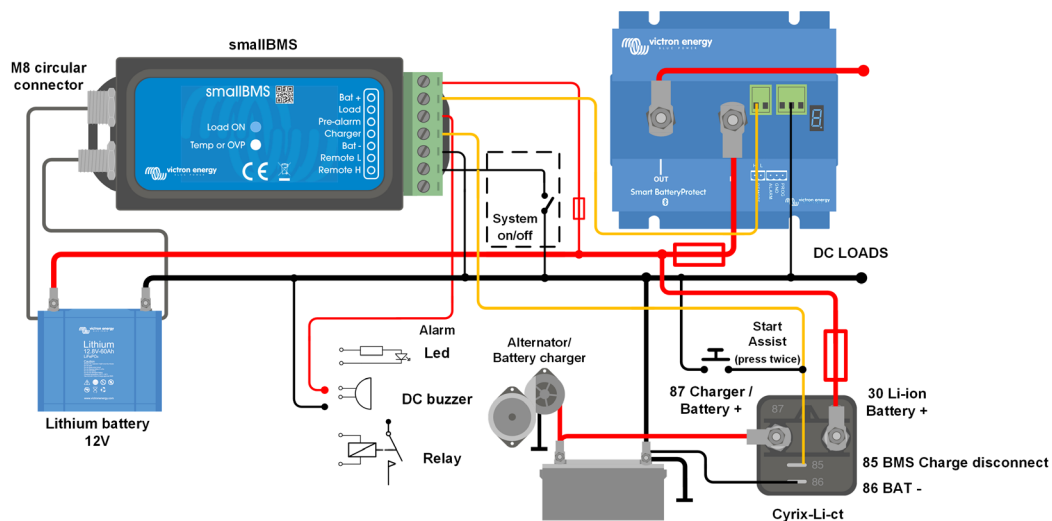


Figure 2: Application example for a vehicle or boat, with system on/off switch between L and battery negative



### Cyrix Combiners designed for use with the smallBMS and the VE.Bus BMS:

#### Cyrix-Li-ct (120A or 230A)

Is a battery combiner with a Li-ion adapted engage/disengage profile and a control terminal to connect to the Charge Disconnect of the BMS.

#### Cyrix-Li-Charge (120A or 230A)

Is a unidirectional combiner to insert in between a battery charger and the LFP battery. It will engage only when charge voltage from a battery charger is present on its charge-side terminal. A control terminal connects to the Charge Disconnect of the BMS.