

# smallBMS with pre-alarm

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smallBMS



**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.

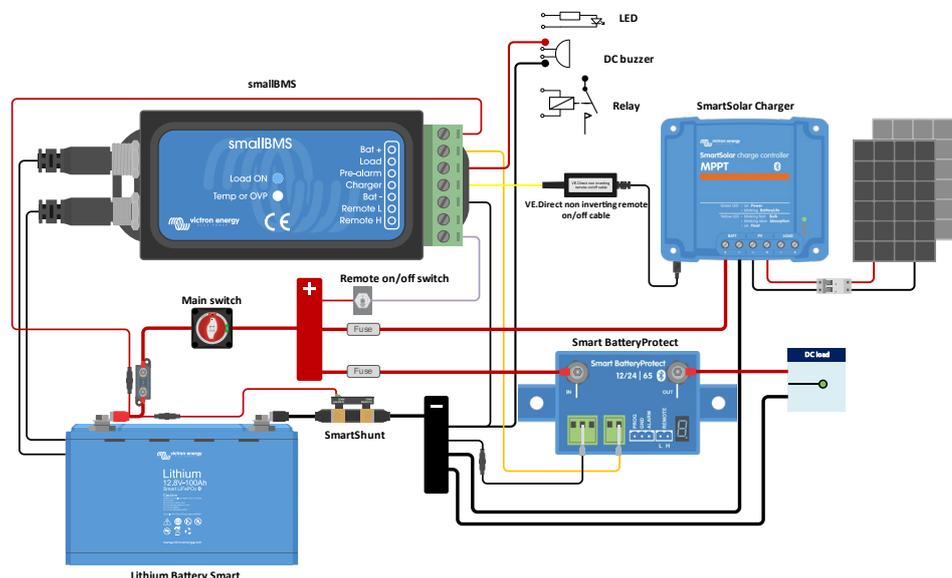
The smallBMS with pre-alarm is an all-in-one Battery Management System (BMS) for [Victron Energy Lithium Battery Smart](#) batteries. These batteries are Lithium Iron Phosphate (LiFePO4) batteries and are available in 12.8 V or 25.6 V in various capacities. They can be connected in series, parallel and series/parallel so that a battery bank can be built for system voltages of 12 V, 24 V or 48 V. The maximum number of batteries in one system is 20, which results in a maximum energy storage of 84 kWh in a 12 V system and up to 102 kWh in a 24 V<sup>1)</sup> and 48 V<sup>1)</sup> system.

The smallBMS is a simple and inexpensive alternative to the VE.Bus BMS, but does not have a VE.Bus interface and is therefore not suitable for use with VE.Bus MultiPlus and Quattro inverter/chargers.

**Features**

- **Load disconnect output:** Can be used to control the remote on/off input of a [BatteryProtect](#), [Inverters](#), [DC-DC converter](#) or other loads that have remote on/off port functionality. Due to its maximum output current of 1A, it can even control a high-current relay or a contactor. Note that a non inverting or inverting on/off cable may be required, please consult the manual.
- **Pre-alarm output:** The pre-alarm output can be used to issue a visible or audible warning when the battery voltage is low and will trip with a minimum delay of 30 seconds before the Load disconnect output is disabled due to cell undervoltage.
- **Charge disconnect output:** Can be used to control the remote on/off port of a charger, such as the [Smart Charger IP43](#), a [Cyrix-Li-Charge](#) relay, a [Cyrix-Li-ct Battery Combiner](#) or a [BatteryProtect](#). The output is normally high and becomes free floating in case of imminent low cell voltage or high/low temperature. Note that the Charge disconnect output is not suitable to power an inductive load such as a relay coil.
- **Remote on/off terminal:** Both the Load and Charge disconnect output can be controlled remotely via the remote on/off terminal. When off, both outputs will be free floating so that loads and chargers are turned off.
- **LED indicators:** The smallBMS has two LED indicators, a blue LED indicating that the Load disconnect output is still high and the cell voltage is above the threshold set in the battery, and a red LED indicating that the Charge disconnect output is low due to high/low cell temperature or high cell voltage.

<sup>1)</sup> To reduce required balancing time, we recommend to use a little different batteries in series as possible for the application. 24 V systems are best built using 24 V batteries. And 48 V systems are best built using two 24 V batteries in series. While the alternative, four 12 V batteries in series, will work, it will require more periodic balancing time. For more information on these batteries, visit the [Lithium Smart Battery product page](#).



Lithium Battery Smart

smallBMS with pre-alarm	BMS400100000
Operating voltage (Vbat)	8 – 70 VDC
Power supply cable and fuse (not supplied)	Recommended fuse size 0.3 A - 2.5 A, dependent on devices connected to Load disconnect and pre-alarm output
Current consumption, remote on	2.2 mA (excluding Load and Charge disconnect output current)
Current consumption, low cell voltage	1.2 mA
Current consumption, remote off	1,2 mA
Load disconnect output	Normally high (Vbat – 0.1 V) Source current limit: 1A (not short circuit protected) Sink current: 0A (output free floating)
Charge disconnect output	Normally high (Vbat – 0.6 V) Source current limit: 10mA (short circuit protected) Sink current: 0A (output free floating)
Pre-alarm output	Normally free floating In case of alarm: output voltage Vbat - 0.1 V Maximum output current: 1A (not short circuit protected)
Remote on/off: Remote L and Remote H	Use modes: 1. ON when the L and H terminal are interconnected 2. ON when the L terminal is pulled to battery minus (V < 3.5 V) 3. ON when the H terminal is high (2.9 V < V <sub>H</sub> < Vbat) 4. OFF in all other conditions
GENERAL	
Operating temperature range	-20 to +50 °C (0 – 120 °F)
Humidity	Max. 95 % (non-condensing)
Protection grade	IP20
ENCLOSURE	
Material and colour	ABS, matt black
Weight	0.1 kg
Dimensions (h x w x d)	106 x 42 x 23 mm
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

