



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.

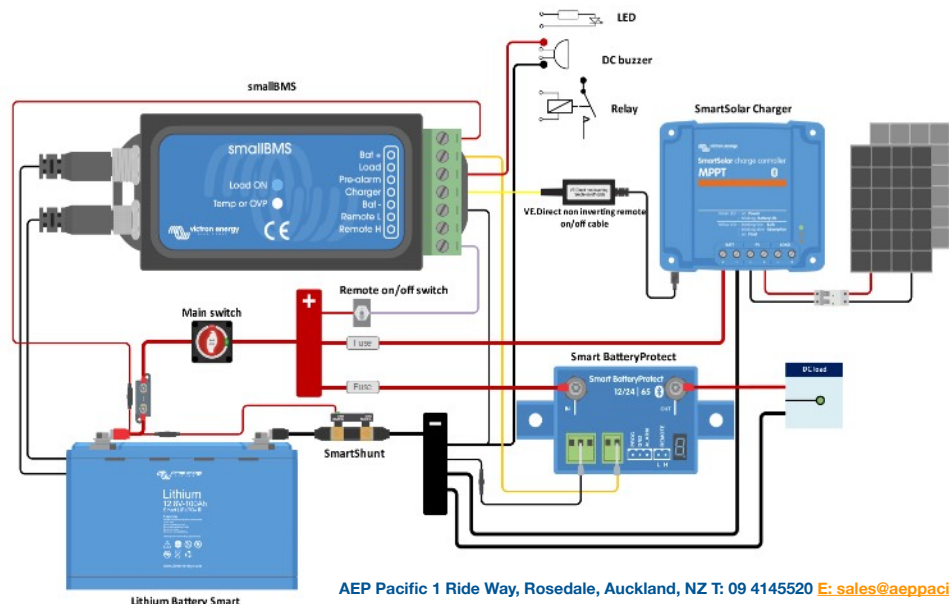
The smallBMS with pre-alarm is an all-in-one Battery Management System (BMS) for [Victron Energy Lithium Battery Smart](#) batteries. These batteries are Lithium Iron Phosphate (LiFePO4) batteries and are available in 12.8 V or 25.6 V in various capacities. They can be connected in series, parallel and 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 V¹⁾ and 48 V¹⁾ 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 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.

¹⁾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](#).



| 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 _H < 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 |

