

# Victron & BYD B-Box

The combination of Victron products with BYD B-Box lithium batteries (2.5, 5.0, 7.5, 10.0 and 12.8 models) has been tested and certified by the Victron and BYD R&D departments. The combination is actively supported by both companies.

## 1. Product & system compatibility

### 1.1 Offgrid, Backup and Energy Storage Systems are possible

Victron + BYD B-Box can be used for the following system types:

- Off-grid
- Backup
- Energy Storage Systems

For Off-grid and Backup systems, see below details about allow-to-charge and allow-to-discharge.

For Energy Storage Systems, use [ESS](#).

### 1.2 Color Control GX is required

When used with B-Box batteries, the minimum required firmware version for the [Color Control GX](#) is v1.73.

### 1.3 All 48V Multis, MultiPlusses, MultiGrids and Quattros are compatible

When the B-Box battery is installed in a [Victron ESS installation](#), which is the best solution for Energy Storage Systems, there is no need for additional control wiring.

For other systems, such as off-grid systems, the Allow-to-discharge and Allow-to-charge contacts need to be wired to the inverter/charger, and it needs to be configured with the [Lynx Ion BMS Support Assistant](#). See [this document](#) for details, as well as chapter 4.3 below.

## 1.4 All 48V BluSolar and SmartSolar MPPT Chargers are compatible

For proper operation, the B-Box battery needs to be able to disable the MPPTs.

### MPPTs with a VE.Direct port

They are controlled via the Color Control GX. Make sure the CCGX runs v2.02 or later, and also update the MPPTs to the latest available version.

Starting with CCGX version 2.03, the maximum charge current from the battery is no longer copied directly to the MPPT, because it would prevent feed-in to the grid, and PV power would not be used to feed loads on AC-out. Instead, if there is connection with a battery, a high (1000A) maximum charge current will be set in the MPPT. This will ensure that the MPPT will stop charging when connection between MPPT and CCGX, or battery and CCGX is lost.

To test operation, try disconnecting the CCGX from the MPPT. After a time-out, the MPPT will stop charging and flash an error code on its LEDs. The error code is [error #67: no BMS](#).

### MPPTs with a VE.Can port

Wire the B-Box Allow-to-charge contact to the MPPT. Our MPPTs with a VE.Can port have a dedicated Remote On/Off input for this. It needs to be connected to battery positive to enable the charger. Leaving the Remote On/Off input floating or pulling it to ground will disable the charger.

## 1.5 Battery compatibility

The following batteries are supported:

<b>B-BOX LV series type</b>
B-BOX Pro 2.5-10.0
B-BOX Pro 12.8
B-BOX Res 2.5-10.0
B-BOX Compact

Minimum firmware versions:

<b>B-BOX BMU</b>	BMU_V2_V4-13_15-Mar-2017
<b>B-Plus 2.5 modules</b>	TBD

Products delivered starting from March 17th, 2017 are compatible.

Batteries with older firmware versions can be updated. Please contact BYD for more information.

## 2. Wiring of the Allow-to-charge and allow-to-discharge contacts

B-Box relays:

- Relay T1-T2: closed if allowed to discharge
- Relay T4-T5: closed if allowed to charge

## 3. Wiring of canbus cable between B-Box and CCGX

A special RJ-45 cable is necessary to connect the battery to the CCGX. Pinout:

Function	VE.Can RJ-45	B-Box RJ-45
GND	Pin 3	Pin 6
CAN-L	Pin 8	Pin 5
CAN-H	Pin 7	Pin 4

Plug the CCGX side of that cable into one of the VE.Can sockets on the back of the CCGX. Plug the other end into the battery.

Then, plug a [VE.Can terminator](#) in the other VE.Can socket on the CCGX. Two VE.Can terminators are included with the package of the CCGX as an accessory, only one is used. Keep the other one as a spare.

Without properly connecting this cable, the battery will stop charging/discharging after several minutes. Also, the battery will not show up on the display of the CCGX.

## 4. VEConfigure settings

## 4.1 General tab

- Check the “Enable battery monitor” function
- Set the battery capacity to the total capacity of the battery: 50Ah times the number of battery modules.
- The other parameters (“State of charge when bulk finished” and “Charge efficiency”) can be left to their default setting: They are ignored for a BYD installation.

## 4.2 Charge parameters

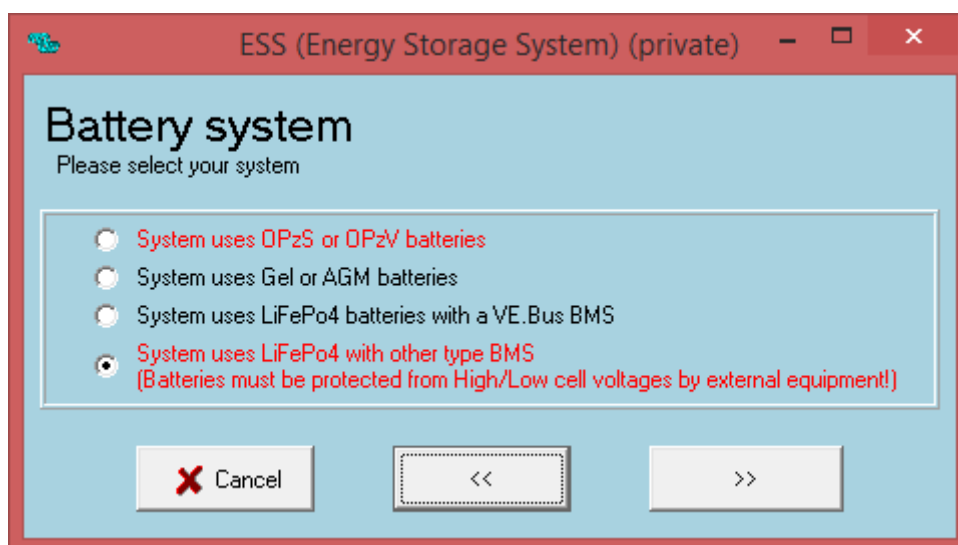
Parameter	Setting
Battery type	Lithium
Charge curve	Fixed
Absorption voltage	55.2 V
Float voltage	55 V
Absorption time	1 Hr

Note: make sure to double check the float voltage after completing Assistants, and if necessary set it back to 55 V.

## Option A: ESS Assistant

Use this option for ESS systems.

Select the fourth battery type:



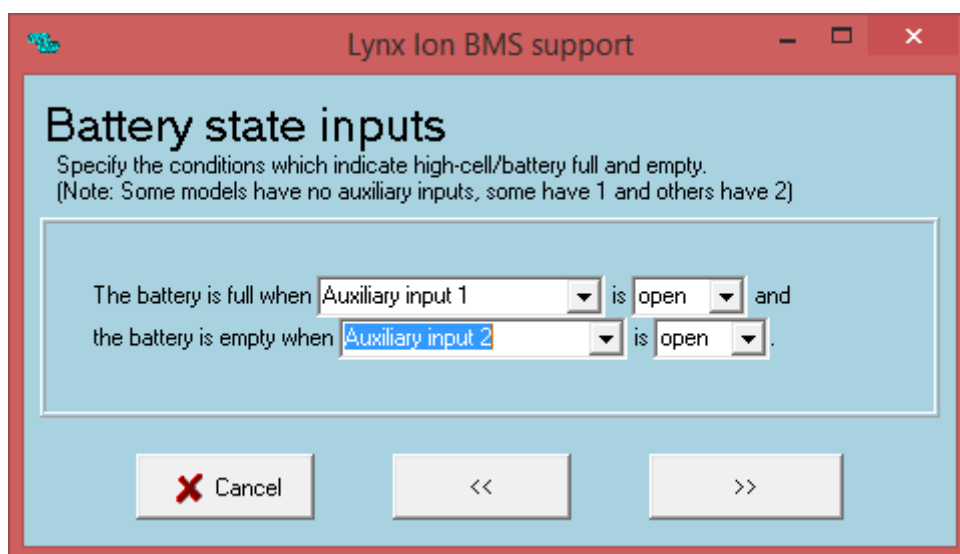
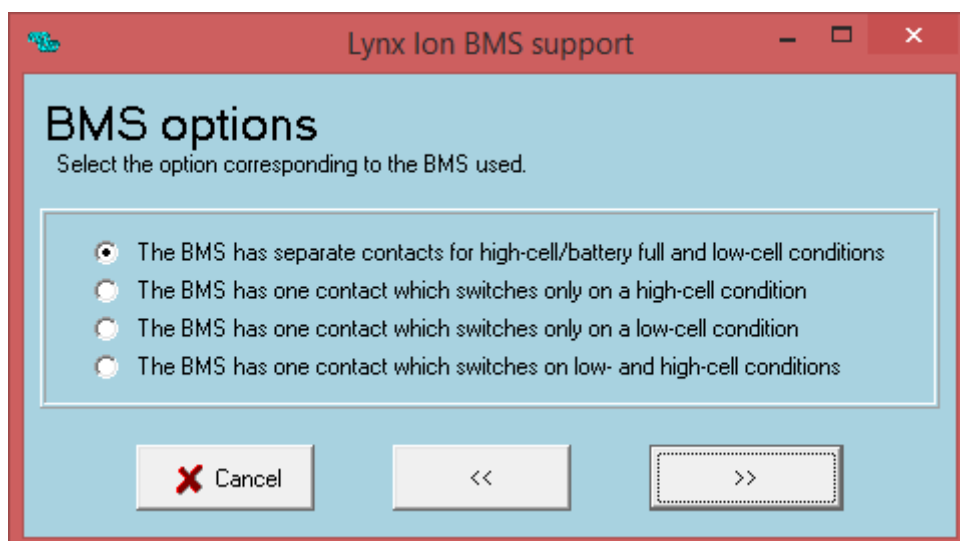
Then:

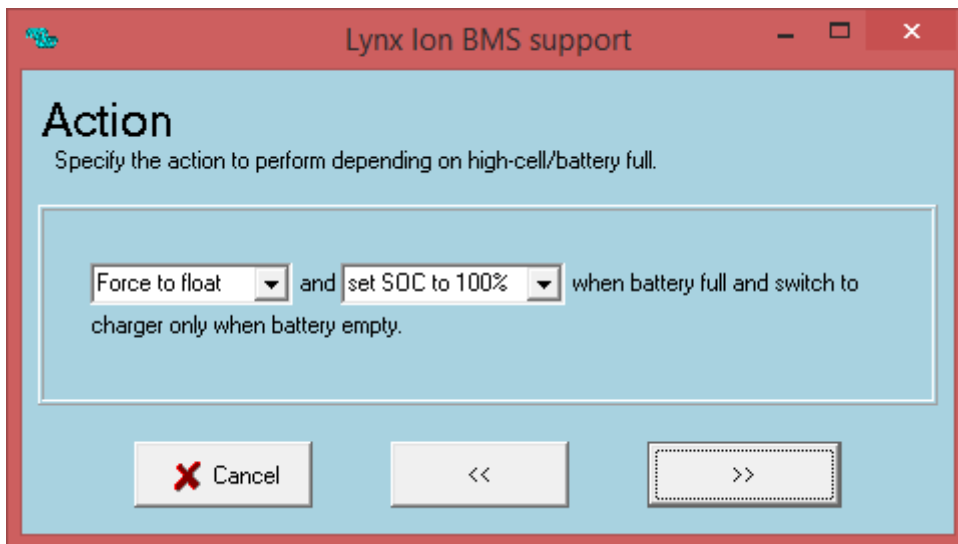
1. Sustain voltage: 50V
2. Dynamic cut-off values: set all values to 47V.
3. Restart offset: change to 4V

## Option B: Off-grid system using the Allow-to-discharge and Allow-to-charge contacts

- Wire BBox Relay T1-T2 to Aux input 2.
- Wire BBox Relay T4-T5 to Aux input 1.

Install the “Lynx Ion BMS support Assistant”:





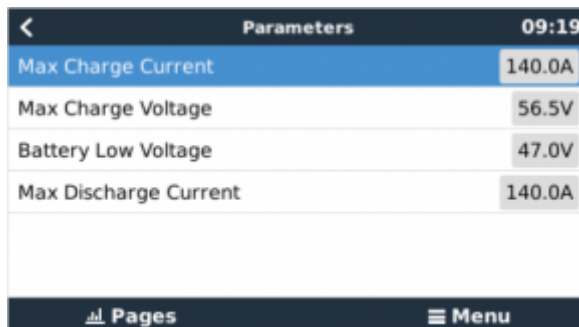
## 5. Color Control GX Configuration

- Select the *CAN-bus BMS (500 kbits/s)* CAN-profile in the CCGX. Menu path: *Settings* → *Services* → *CAN-profile*. Note that this changes the function of a VE.Can port: it is not possible to connect both VE.Can products and an B-Box battery together.
- After properly wiring and setting up, the B-Box will be visible as a battery in the device list:



(if you have multiple batteries a single entry will show up, which represents all batteries).

- The parameters option within the battery page shows the actual battery charge and discharge limits



## 6. Configure MPPT (VictronConnect)

- Disable *Autodetect voltage*
- Set *Battery voltage* to 48V.

## 7. DISQUS

[View the discussion thread.](#)

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