

Configure Victron BMV Battery Monitor and MPPT for Lion Safari UT Batteries

Initial Installation

1. Connect the Batteries, BMV battery monitor and Smart Solar MPPT charge controller as described by the manufacturers
2. Install the VictronConnect app on your smartphone

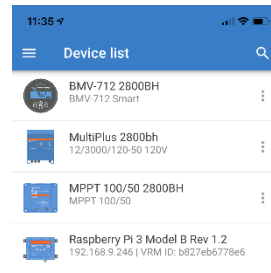
Configure the BMV Battery Monitor

1. Move within Bluetooth range of the battery monitor and MPPT controller and launch the Victron Connect app

If the app doesn't Autodiscover the BMV and MPPT, tap the orange "refresh" circle on the bottom right of the screen

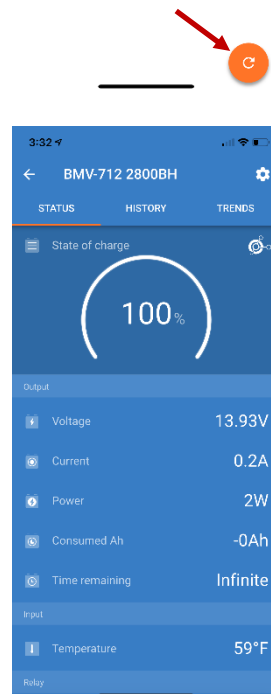
The devices should be discovered and should be displayed in the app.

You should see something similar to this:

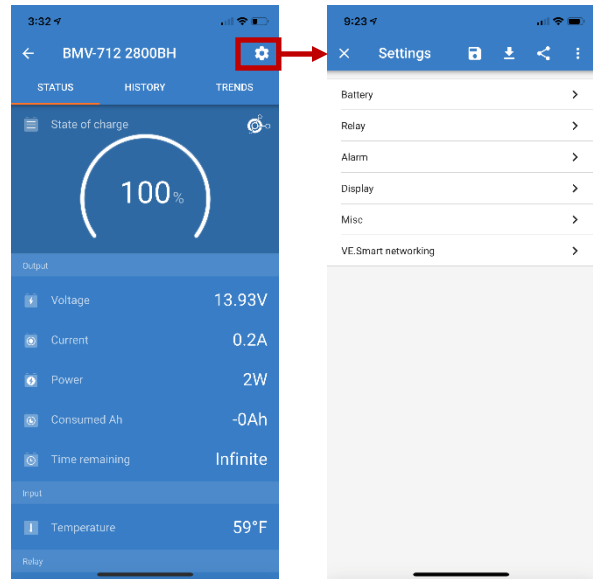


2. Tap on the **BMV battery monitor** to select it

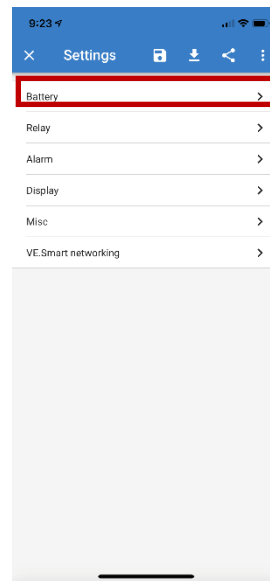
You should see something similar to this:



3. Tap the **gear icon** in the top right corner to display the settings screen



4. On the **Settings** screen, tap **battery** to display the battery settings



- On the **battery settings** screen you will need to modify some settings to best work with the Lion Safari UT batteries.

To change a value, tap the value to the right of the property you wish to modify.

Battery capacity: (number of batteries X Amp hours)

Set this to the sum of the amp hours of that batteries that you have in your system. In this example the system has 4 Lion Safari UT 1200 batteries which are rated at 90Ah each (4x90Ah=360Ah). If you have the Lion Safari UT 1300 batteries you would use 105Ah per battery (or 420Ah for this example).

Charged voltage: 13.9

This is where things differ a bit from other Lithium Ion battery manufacturer’s batteries. Due to the nature of the (very good) battery management system (BMS) in the Lion Safari UT batteries, the state of charge (SOC) measured by the Victron BMV battery monitor can get out of sync with the actual SOC of the battery causing the displayed battery percentage to drop slowly over time. To avoid this the Charged voltage is set to 13.9 volts. (This change will also be made later in the MPPT charge controller as well).

Tail current: 4.00%

No change needed here. The default is sufficient.

Charge detection time: 3m

No change needed here. The default is sufficient

Peukert exponent: 1.05

This setting is related to the efficiency of the battery when charging particularly in relation to battery temperature. Compared to lead acid based batteries, LiFePo4 batteries are extremely efficient to charge across their entire operating temperature range so this number should be very close to 1.00 (without being set to 1.00 as this would disable the Puckert compensation).

Charge efficiency factor: 99%

As lithium Ion based batteries accept a charge very easily this should be as close to 100% as possible (without being 100% because as efficient as they are there is still a very small amount of Ah loss with LiFePo4 batteries).

Current threshold: 0.10A

No change needed here. The default is sufficient.

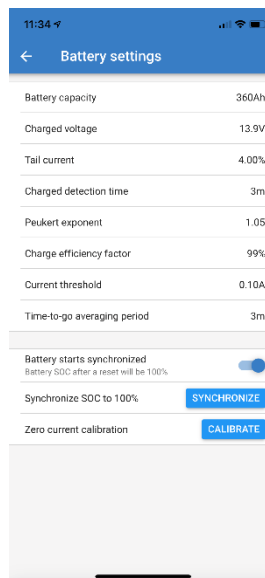
Time-to-go average period: 3m

No change needed here. The default is sufficient.

Note: The changes will be saved when a green checkmark appears next to the modified property.

- Tap the back arrow in the top left corner to return to the Settings screen

Tap the X in the top left corner to return to the main battery monitor screen



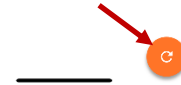
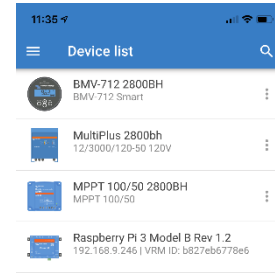
Configure the SmartSolar MPPT Charge Controller

1. Move within Bluetooth range of the battery monitor and MPPT and launch the Victron Connect app

If the app doesn't Autodiscover the BMV and MPPT, tap the orange "refresh" circle on the bottom right of the screen

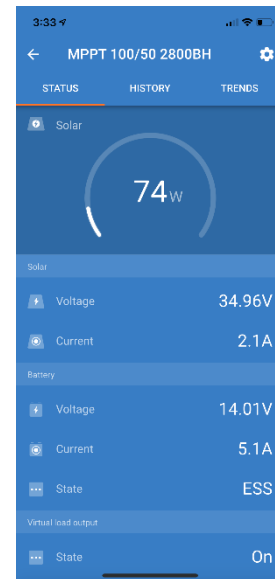
The devices should be discovered and should be displayed in the app.

You should see something similar to this:

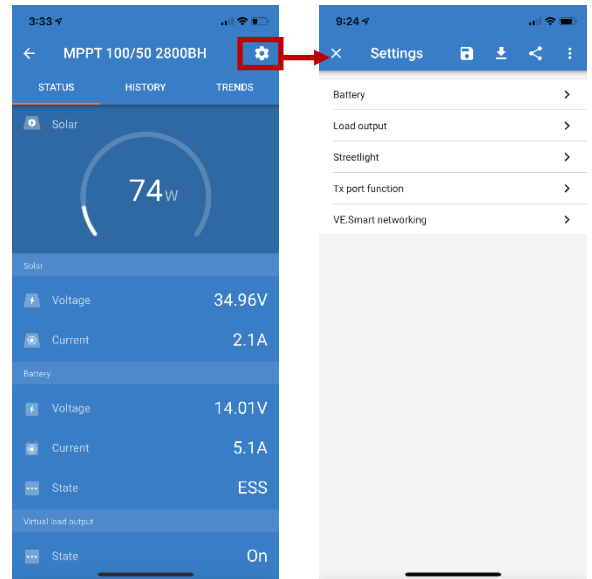


2. Tap on the **MPPT Charge Controller** to select it

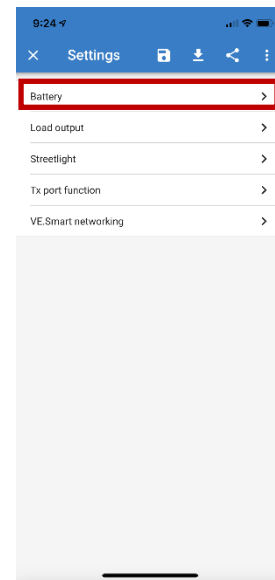
You should see something similar to this:



3. Tap the **gear icon** in the top right corner to display the settings screen



4. On the **Settings** screen, tap **battery** to display the battery settings



5. On the **battery settings** screen you will need to modify some settings to best work with the Lion Safari UT batteries.

To change a value, tap the value to the right of the property you wish to modify.

Battery voltage: 12V

This HowTo is assuming you have a 12V system. For a 24V or 48V system you should adjust the parameters accordingly.

Max charge current: 50A

Set this to the maximum supported by the charge controller (in this example 50A). Do not exceed 100A x number of batteries (i.e. 4 batteries X 100A = 400A maximum)

Charger enabled: (selected)

No change needed here. The default is sufficient.

Battery preset: User defined

Expert mode: (not selected)

Absorption voltage: 13.90V

Like with the battery monitor, this is where things differ a bit from other Lithium Ion battery manufacturer's batteries. Due to the nature of the (very good) battery management system (BMS) in the Lion Safari UT batteries, the state of charge (SOC) measured by the Victron BMV battery monitor can get out of sync with the actual SOC of the battery causing the displayed battery percentage to drop slowly over time. To avoid this the Charged voltage is set to 13.9 volts. This value could be as high as 14.60 volts. Setting it to a lower voltage will both allow the charge controller to better know when to start charging the batteries and extend the lifespan of the batteries.

Float voltage: 13.90V

Setting the Float voltage to the same as the Absorption voltage also helps keep the SOC of the batteries in sync with the battery monitor. This essentially keeps the charge controller charging the batteries at the same voltage when ever it is in charging mode.

Equalization voltage: 0.00V

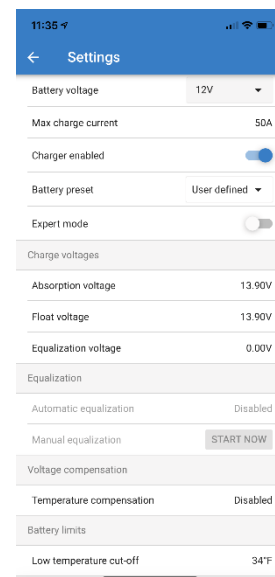
LiFePo4 batteries do not require and equalization cycle so this can be set to 0.00V.

Temperature compensation: Disabled

Because LiFePo4 batteries do not require significantly more voltage to charge when they are cold, unlike lead acid based batteries, this can be disabled.

Low temperature cut-off: 34F

Lion Safari UT batteries have a low temperature cutoff built into their BMS which cuts off charging to the batteries internally when it is too cold. Setting this here just keeps the charge controller from needlessly attempting to charge the batteries when the BMS would already be cutting of charging.



Note: The changes will be saved when a green checkmark appears next to the modified property.

6. Tap the back arrow in the top left corner to return to the Settings screen

Tap the X in the top left corner to return to the main battery monitor screen