**Victron Energy Battery Monitor – BMV 600-602**

**Recommended settings for Solar Systems to avoid inaccurate State of Charge readings.**

Example System:

500A/H Battery Bank @ 12V

150/70 Blue Solar MPPT Charger

2000W Solar Array

BMV-600 Battery Monitor

Normal settings in set up menu of Battery Monitor

1. CB – Battery Capacity
2. DF – Discharge Floor

The rest of the default settings are usually correct for most applications where Battery Chargers are used to charge a battery bank with a Bulk-absorption-float charge characteristic. When the battery has absorbed the charge current the charge voltage drops to float charge and charge current slowly drops to almost nothing.

In Solar Application where charging is done via a Solar Charge Controller it is important to adjust the following settings. With Solar Charging the charge current varies all the time which affect the battery voltage also, the BMV monitors the Charge current and battery voltage as indicators of the state of the battery.

In the Set up menu the following setting must be looked at, here is the description of each.

**Vc: Charged voltage.** The battery voltage must be above this voltage level to consider the battery as fully charged. Make sure the voltage-charged-parameter is always slightly below the voltage at

which the charger finishes charging the battery (usually 0.1 V or 0.2 V below the ‘float’ stage voltage of the charger).

**It: Tail current.** When the charge current value is below this percentage of the battery capacity (Cb), the battery can be considered as fully charged. Make sure this is always greater

than the minimum current at which the charger maintains the battery, or stops charging.

**Tcd: Charged detection time.** This is the time the charged parameters (It and Vc) must be met, in order for the battery to be considered fully charged.

To summarize these settings, the BMV looks at both the **VC** and **It** settings and when these conditions are met for the time set in **Tcd** the BMV will assume the SOC is 100%.

**The default settings for each are as follows:**

**Name Range Default Unit**

**Vc 0-90 13.2 V**

**It 0.5 – 10 4 %**

**Tcd 1-50 3 Min.**

Taking our example system above we can see the following issues that can arise when the default settings have not been changed.

If after a night time cycle the battery SOC is 65% and the next morning the sun comes up and starts to charge the battery bank, we are assuming there is no other discharge taking place for the first 2 hours.

The charge current will not go to maximum because of sunlight and in turn the battery voltage will not rise to absorption level very quickly.

The situation now occurs that the battery voltage and charge current can settle within the default settings of the above settings for SOC synchronization to 100%!

How do we prevent this from happening, usually the Vc settings must be adapted to the battery bank voltage whether 12/24/48V, keeping it just below float level is advised. The It level is most often changed, here the level can be lowered to a 1 or 2%, this depends on the battery capacity and the possible (installed solar charger size) charging that can take place.

The Tcd is also increased to a longer time interval.

**It is important to remember when during the charging process the battery monitor reads a negative current or discharge the whole process is reset.**

When these settings are made, careful attention must be paid to how power is used on the site, if there is a constant discharge then the battery voltage will increase very slowly as the sun rises. If the main power usage is at night then more charging will take place into the battery and the voltage will react differently.

It is not always the case that the first settings made work perfectly.