

Connecting a battery charger to the SOLAR- terminal

Please read the following notes if considering connection of a battery charger to the SOLAR-terminal of a solar regulator:

1. Are you gaining anything by connecting the battery charger through the SOLAR- terminal ? Many battery chargers are designed to be used as 'bulk' charge sources and are constant voltage output. This means you don't really gain anything by connecting it through the regulator, as opposed to direct connection to the battery. It won't follow the PL regulator charging cycle anyway.

For example:

If the battery charger output is say 14V (constant voltage)...

Since 14V is not a typical boost maximum voltage, the PL20 will never reach boost max with just the battery charger, and will therefore never cycle.

Also, the battery charger will taper off the current as the battery voltage gets near to 14V. It could take a long time to reach this 14V target (since the charge current tapers off).

2. Older style battery chargers are little more than a transformer and a rectifier. While these can theoretically be connected to the SOLAR- input, there are a couple of issues that should be considered first...

(a)

There must not be a capacitor across the output of the battery charger or an inductor in series with the output.

The reason is that the inrush current from the capacitor when the regulator FET switch 'closes' can be very high and potentially damaging to the regulator FET charging switch.

Likewise the voltage spike generated by any series inductors when the regulator FET switch 'opens' can be potentially damaging to the regulator FET charging switch.

(b)

It should be noted that the charge current rating of the battery charger is often given as an average charge current.

The actual RMS charging current can be considerably higher than this figure and could potentially damage the regulator FET charging switch (usually by overheating it).

3. Any newer style switchmode battery charger may not handle having it's connection to the battery being switched on-and-off at high speed (PWM) via the SOLAR- input. The switchmode battery charger is likely to become unstable and behave in a strange manner. Also: There will be an inductor in the output stage that can cause problems as indicated in (2a) above.
4. If overcharging the battery is of concern, a possible solution is to simply use the PL regulator to switch a relay on/off as per normal generator control functionality via the 'G' Terminal. This relay can, in turn, be used to switch the battery charger on/off as required, thus automating the process.
5. Any battery charger connected directly to the battery can have it's charge current monitored by the PL regulator with the addition of a shunt/PLS2 to the system.