Solar Energy 2026/2027

Laboratory Guide LW2: Determination of the working conditions and main characteristics of a charge controller

The aim of this laboratory task is to study the performance of the charge controller under normal operation condition as well as the thresholds for over-discharge and overcharge.

To test the normal operating conditions of a charge controller, a DC power supply should be used as a PV module, as well as a battery and a load (variable resistor, light strip), all connected via the charge controller. The current and the voltage from the PV module, batteries and load should be measured, and the power should be calculated. This procedure should be done for the following conditions:

- PV on, load off,
- PV on, load on,
- PV off, load on.

The threshold for over-discharge can be found during the PV off, load on condition with the maximum load possible.

The threshold for overcharge can be found by connecting the DC power supply to the battery terminals of the charge controller. By increasing the voltage, the students should be able to find the high-voltage disconnect of the charge controller.

The file to be delivered should be named as G#_LW2 and be submitted through Moodle.