Sistemas de Energia Solar
Laboratory Guide: 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.

The first item to be connected to the charge controller should be the battery. You should find the reason for this.

In order to test the normal operation 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), all connected via the charge controller. The current and the voltage from 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, ("Sun shining, and no power required to the source")
- PV on, load on, ("Sun shining, and power in need")
- PV off, load on. ("Evening, and power in need")

The threshold for **over discharge** and **overcharge**, can be found by replacing the battery for the DC power supply. By **decreasing** or **increasing** the battery voltage, the students should be able to find the low voltage disconnect, and high voltage disconnect of the charge controller. The values obtained, should be contrasted with the ones referred in the device manual.

The work should be carried out with the group spread in table, with each one responsible different tasks.

The report should be written referring to the power point made available in the same Fenix subsection.

The report should be handed up to folowing week's lab session, by 2 PM. (This rule excludes the first work report. Advise with the professor). These are to be handed in via email (ivocosta@fc.ul.pt), with the reported attached in PDF AND WORD formats. File name should include: SES2021_G#_LW2 (to be read as: **S**istemas de **E**nergia **S**olar ano **2021**, **G**roup **#**, **L**ab **W**ork 2

PS. In this lab work you will be using Amperemeters to read out energy flows. Please recall, that an Amperemeter should never be connected directly to a Power source without a load in between.