OBTAINING VOLT-AMPERE CHARACTERISTICS OF PHOTOELECTRIC BATTERIES IN A COMPUTER-CONTROLLED PHOTOELECTRIC SOLAR POWER DEVICE

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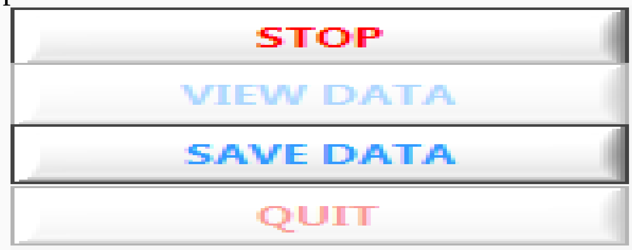
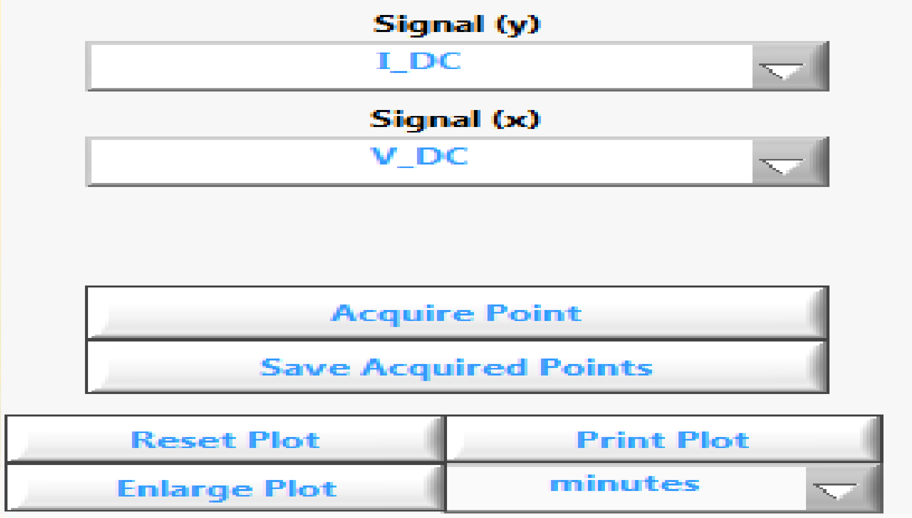
Key words: Sun energy, atmosphere, current, save date.

The sun brings great energy to the earth. The sun emits an average of 88 * 10^{24} calories of heat or 368 * 10^{12} TW of energy per second. Only 2 * 10^{-6} % of this energy, 180 * 10^{6} TW of energy reaches the earth. The rest is absorbed and dispersed in the atmosphere, and the remaining energy reaches the earth. The energy coming into the atmosphere from space is 1.395kW / m^2, this energy is called the solar constant. To convert this type of energy into electricity, we need a solar device. This allows us to determine the various parameters of the solar panel using the energy of incident light. For example, we can determine more than 30 parameters such as current dependence on voltage, current dependence on temperature, current dependence on time, voltage dependence on time, power dependence on voltage, and so on.
What we are going to look at now is the voltage dependence of the amperage .
In this case, the control unit is separate, which allows you to see how different sizes change at the same time. It is possible to save the obtained values and use them to study the status of the graph at other times. To do this, we do it by pressing a separate SAVE DATA button.



We can determine the sizes of solar panels using each axis. The voltage was studied along the x-axis and the current along the y-axis. The graph also allows us to study the relationship of current to time, so the time axis is placed on the "x" and the current is placed on the "y" axis[4].



We use two large solar panels, each consisting of 36 small solar panels of 156 * 156mm, with a total surface area of 0.51 m^2 and a lux meter that measures light intensity. It consists of 8 lamps with a voltage of 400 W, which illuminate the panels. We control the computer to supply these lamps and keep the temperature constant.
Experience №1:
Intensity 40%.
Outside temperature t_1 = 22.9 ° C.
Panel 1 temperature t_2 = 38.9 ° C.
Panel 2 temperature t_3 = 25 ° C.
We need a rheostat to get the volt-ampere characteristics of the solar panel. The function of the rheostat is to change the resistance of the solar panel. In this experiment, we used a blade to analyze the effect of temperature on the operation of the blade device. The panels are connected in series[3]. Figure 1.

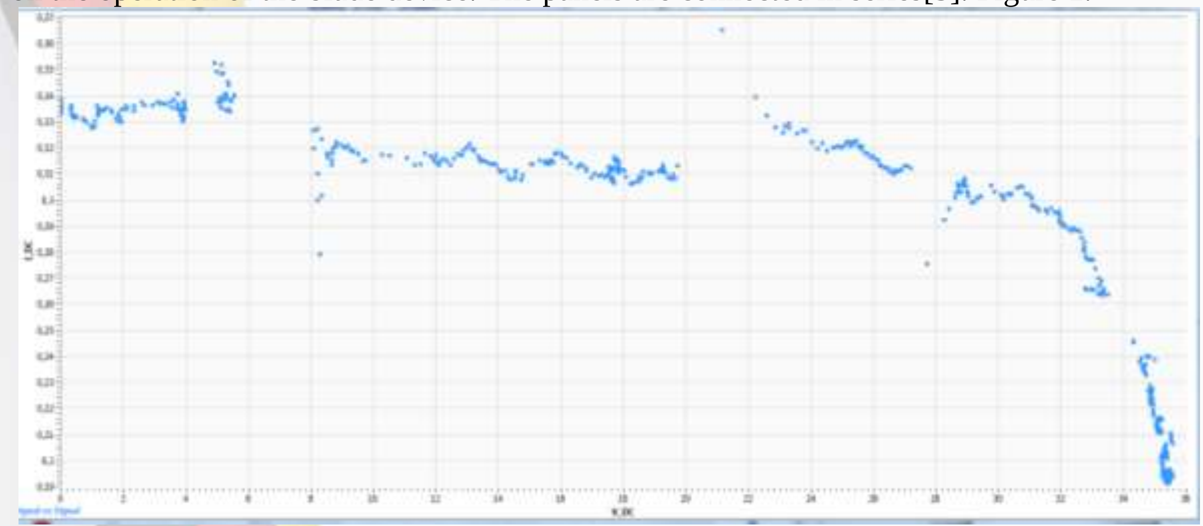


Figure 1. Volt-ampere characteristics of a solar panel.
As can be seen from this graph, the relationship between current and voltage is not linear. We saw that the current remained constant for a while and then changed again. As the voltage increases, the current decreases, and as the voltage increases and reaches a certain voltage, the current decreases sharply. As the voltage increased, Umax = 35.5 V and I = 0 A. Imax = 0.7 A. During our experiment, we will test the solar panels in case they change the connection methods [5].

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