Compact multifunctional source-meter system for characterisation of laboratory-scale solar cell devices - DTU Orbit (24/07/2019)

Compact multifunctional source-meter system for characterisation of laboratory-scale solar cell devices

This article presents an innovative and low-cost solution for optimizing the acquisition of performance data of small-laboratory-scale photovoltaic devices. A novel measuring setup is proposed, designed based on an Arduino microcontroller and low-cost components, coupled with open source hardware and software. The manuscript describes in detail the instrument design, components and assembly enabling the reproduction and customization of the instrument for any reader. The setup is combined with an optional web-platform, which enables fast analysis and comparison of the collected data. For the demonstration of the instrument in operation, comparison of measurements of solar cell with the developed setup and commercial products has been conducted. It is shown that the presented prototype provides values of accuracy and precision during I-V curve recording, comparable with the values measured using a commercial source-meter (Keithley 2400). The study also discusses the unique advantages of easy transport and data collection by the setup and the drawbacks in the hardware, which have been observed during a round robin study.

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