

ABSTRACT

In the last years there has been an enormous interest in the research and development of photovoltaic systems, which are based on organic semiconductors.

The main goal is the development of an automated system for the calculation of an organic photovoltaics efficiency. This has the intention to cover the needs of a research laboratory so a large number of samples can be measured simultaneously. In this dissertation there is an introduction to what is an organic photovoltaic. This dissertation includes the electrical analysis, the modelling, the efficiency and explanation of the parameters which are necessary for the calculation of the efficiency for each photovoltaic cell.

Additionally, with the use of SolidWorks a platform base was designed which is capable of installing the exact amount of substrates. This platform was designed for nine substrates and also takes account the electrical wiring needed for the development of the system.

The development was done with the use of the MyRIO device and the wiring design from the company to calculate the voltage of a photovoltaic device. The wiring and the whole methodology can work for more photovoltaic systems using a device with more analog channel inputs. Also the software LabVIEW was used for programming the system and for the communication between the MyRIO device and the computer. An effort was made while writing the program to extract the efficiency and other useful parameters which are considered important for the researcher and the development of organic photovoltaic systems.

Key-Words: organic photovoltaics, efficiency, automated control system, LabView, MyRIO, SolidWorks.