

**DESIGN, FABRICATION AND TESTING
OF A PORTABLE MONITORING SYSTEM
FOR A SMALL PV-BATTERY
STANDALONE SYSTEM**

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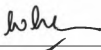
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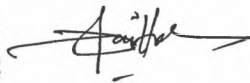
This final year project report entitled “**Design, Fabrication and Testing of a Portable Monitoring System for a Small PV-Battery Standalone System**” was submitted by Noor Azwani Binti Rusli, in partial fulfillment of the requirement for the Degree of Bachelor of Science (Hons) Physics, in the Faculty of Applied Sciences, and was approved by



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ABSTRACT

DESIGN, FABRICATION AND TESTING OF A PORTABLE MONITORING SYSTEM FOR A SMALL PV-BATTERY STANDALONE SYSTEM.

This project involves the use of renewable energy technology, known as solar photovoltaic technology for providing electricity. This project involves design, fabrication and testing of a portable monitoring system for a small PV-battery standalone system in Malaysian conditions, especially in Universiti Teknologi MARA, Shah Alam. The study involved design and fabricate the sensors that were used for the monitoring system. In this project, datalogger, Hall Effect transducers, thermocouple and pyranometer are important equipment in order to achieve its goal. Therefore, the first thing was done was designing the monitoring system using theoretical formulation. It is important in order to avoid any short circuit and to get the best performance of the system. Then, fabricate and test the monitoring system by calibrating the sensors that is Hall Effect transducers and pyranometer to ensure that these sensors are in good condition. The information were used in the datalogger programming which the data provided by the datalogger are true. After that the monitoring system as well as PV system was installed at the field that situated at UiTM, Shah Alam. The system was monitored for seven days starting from 7th till 13th October 2007. Hall Effect transducers, pyranometer and thermocouple were sense current, voltage, irradiance and temperature from the PV system. This electrical signal produce by the PV system were interpreted by the datalogger and all the data were logged into the datalogger. Then all the data were transfer using portable computer having datalogger software and after that the performance of the system was determined. Technical performance analysis was used to determine the performance of the PV system. From the result, the highest solar irradiation received on 7th October 2007 that is 4.93kWhm⁻². The array efficiencies for this project in the range of 9.8% to 15% which it is true that the efficiencies for mono-Si module in the range of 11% to 16%. Last but not least was the performance of the system. The highest PR was on 11th October 2007 that was 15.29% followed on 10th

October that was 12.35% and the lowest PR obtained was on 7th October that was 9.40%.