

ABSTRACT

One alternative power plant that has great potential in Indonesia is solar panels. Indonesia has the advantage of being a tropical country because it gets optimal sunlight throughout the year. Solar panels can be used as an alternative energy that is environmentally friendly and can be applied anywhere, even in remote areas as long as it has good sunlight. The performance of solar panels can be determined by measuring the parameters of current, voltage, power and intensity of solar radiation. Therefore, this study aims to design a solar panel monitoring system that can measure the current and voltage of the photovoltaic module. The sensors used in this system are the ACS712 current sensor and the f031-06 voltage sensor, both of these sensors must be able to read parameters accurately which will be compared with the readings on the multimeter. The Quality of Service of the system is also sought to determine the quality of the network used. The concept of the Internet of Things in this study is to use a microcontroller that can be connected via the internet and can be monitored using thingspeak. The measurement data will be displayed on a website as information that can be used for reference and also analysis of solar panel installations. Based on the results of the analysis of this study, it was found that the system was running well after carrying out the error test, the Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) tests produced a high degree of accuracy in the multimeter measurement results. The accuracy of readings from the sensor is very good because the average test error on voltage readings is 0.3%, the RMSE test is 0.0367, and the MAE test is 0.036. Then the average error test on current readings is 3.03%, RMSE test with a value of 0.166, and MAE test with a value of 0.093. The quality of service on the network used in this IoT-based solar panel system is very good because it has a delay of 144.65 ms and a packet loss value of 0.3%.

Keywords: *Internet of Things, Solar Panel, Thingspeak, Quality of Service*