

ABSTRAK

Monitoring solar panel sistem digunakan untuk memonitor besaran arus, tegangan, dan temperatur. Seiring berjalannya waktu, solar panel sering mengalami beberapa permasalahan, seperti pertumbuhan jamur yang dapat menyebabkan penurunan efisiensi daya yang dihasilkan oleh solar panel. Selain itu, proses pengukuran juga dapat menjadi kurang efektif karena memerlukan pengukuran manual yang dilakukan secara berkelanjutan, maka diperlukan sebuah inovasi untuk monitoring solar panel secara otomatis sehingga membantu pengguna dalam memantau kinerja solar panel.

Pada penelitian ini agar dapat memonitor arus, tegangan, dan temperatur, maka digunakanlah sensor arus ACS758, rangkaian pembagi tegangan, sensor suhu DHT22. Monitoring solar panel sistem berbasis *IoT*, menggunakan Mikrokontroler XIAO ESP32C3 sebagai pemroses data sensor. Sistem yang dibuat untuk monitoring solar panel secara *real-time* melalui tampilan display *OLED (Organic Light Emitting Diode)* maupun perangkat *smart phone Android* yang telah di install aplikasi *Blynk*. Sistem juga terdapat kamera berupa modul ESP32-CAM untuk memonitor tampilan visual dari solar panel sistem atau tampilan visual kondisi lingkungan sekitar tempat solar panel terpasang secara *live*.

Dengan penggunaan monitoring solar panel sistem, dapat memantau kinerja solar panel secara jarak jauh melalui perangkat *smart phone* dengan persentase kesalahan pembacaan terkecil untuk tegangan sebesar 0,43%, arus sebesar 1,47%, temperatur tertinggi 38,2°C dan juga dapat melihat *live streaming* video kondisi lingkungan solar panel sistem terpasang.

Kata Kunci: *internet of things*, monitoring, solar panel, ACS758, DHT22, XIAO ESP32C3, ESP32-CAM.

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ABSTRACT

Solar panel monitoring systems are used to monitor current, voltage, and temperature. As time goes by, solar panels often experience several problems, such as mold growth which can cause a decrease in the efficiency of the power produced by the solar panels. Apart from that, the measurement process can also be less effective because it requires manual measurements that are carried out continuously, so innovation is needed to automatically monitor solar panels so that it helps users monitor the performance of solar panels.

In this research, to monitor current, voltage, and temperature, an ACS758 current sensor, voltage divider circuit, and DHT22 temperature sensor were used. IoT-based solar panel monitoring system, using the XIAO ESP32C3 microcontroller as a sensor data processor. A system created for monitoring solar panels in real-time via OLED (Organic Light Emitting Diode) displays or Android smartphone devices that have the Blynk application installed. The system also has a camera in the form of an ESP32-CAM module to monitor the visual display of the solar panel or a visual display of the environmental conditions around where the solar panel is installed.

By using solar panel monitoring, the system can monitor solar panel performance remotely via a smartphone device with the smallest reading error percentage for voltage of 0.43%, current of 1.47%, highest temperature of 38.2°C and can also view live streaming video environmental conditions of the solar panel system installed.

Keywords: internet of things, monitoring, solar panels, ACS758, DHT22, XIAO ESP32C3, ESP32-CAM.

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