

Rancang Bangun Sistem Pengukuran Parameter *Photovoltaic* Berbasis Mikrokontroler

ABSTRAK

Pemanfaatan energi surya sebagai sumber energi alternatif semakin berkembang seiring dengan kebutuhan energi terbarukan yang ramah lingkungan. Untuk memastikan kinerja optimal dari *photovoltaic*, diperlukan sistem pengukuran parameter yang mampu memonitor tegangan, arus, daya, kelembapan dan suhu yang dihasilkan oleh *photovoltaic* secara real-time. Pengukuran kinerja sebuah sistem *photovoltaic* dapat dilakukan dalam berbagai kondisi dengan cara mengevaluasi parameter-parameter yang terdapat pada sistem tersebut, seperti sensor tegangan, sensor arus, serta sensor kelembapan dan suhu. Hasil tegangan tertinggi diperoleh pada hari ketiga sebesar 10,70volt sedangkan tegangan terendah berada pada hari pertama sebesar 10.50 volt. Hasil arus tertinggi diperoleh pada ketiga sebesar 2.24 Ampere sedangkan arus terendah berada pada hari kedua sebesar 1,8 Ampere. Hasil daya tertinggi diperoleh pada hari ketiga sebesar 23,99 watt sedangkan daya terendah berada pada hari kedua sebesar 14,69 watt. Hasil kelembapann tertinggi diperoleh pada hari 80,33% sedangkan kelembapan terendah berapa pada hari pertama sebesar 44%. Hasil temperature tertinggi diperoleh pada hari pertama sebesar 39,94°c sedangkan temperature terendah berada pada hari kedua sebesar 31,71°c.

Kata Kunci: Energi surya, *photovoltaic*, mikrokontroler, pengukuran parameter, Sensor ACS 712, sensor tegangan, sensor DHT 11.

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ABSTRACT

The utilization of solar energy as an alternative energy source continues to grow alongside the increasing demand for renewable and environmentally friendly energy. To ensure the optimal performance of photovoltaic systems, a measurement system is required to monitor parameters such as voltage, current, power, humidity, and temperature generated by the photovoltaic system in real time. The performance of a photovoltaic system can be evaluated under various conditions by assessing the parameters present in the system, such as voltage sensors, current sensors, as well as humidity and temperature sensors. The highest voltage result was obtained on the third day at 10.70 volts, while the lowest voltage was recorded on the first day at 10.50 volts. The highest current result was obtained on the third day at 2.24 Amperes, while the lowest current was recorded on the second day at 1.8 Amperes. The highest power result was obtained on the third day at 23.99 watts, while the lowest power was recorded on the second day at 14.69 watts. The highest humidity result was obtained on the third day at 80.33%, while the lowest humidity was recorded on the first day at 44%. The highest temperature result was obtained on the first day at 39.94°C, while the lowest temperature was recorded on the second day at 31.71°C.

***Keywords:* Solar energy, photovoltaic, microcontroller, parameter measurement, Voltage sensor, ACS 712 sensor, DHT11 sensor.**