

IMPLEMENTATION OF WATER COOLING SYSTEM USING ESP32 NODEMCU AND DS18B20 SENSOR ON 50 WP POLYCRYSTALLINE SOLAR PANEL WITH INTERNET OF THINGS BASED MONITORING

Nesfara Irmatian

*Electrical Engineering Study Program, Faculty of Science & Technology
University of Technology Yogyakarta
Jl. Ringroad Utara Jombor Sleman Yogyakarta
E-mail : irmatiannesvara@gmail.com*

ABSTRACT

The need for electrical energy is increasing from year to year, especially since fossil fuels for producing electrical energy are running low. So, an energy transition to renewable energy such as PLTS is needed. Most of the heat energy in PLTS is not converted into electrical energy but is converted into heat energy which can increase the operating temperature of the solar panels. Techniques are needed to analyze temperature changes on the power produced by solar panels. An automatic water cooling system with monitoring is one solution that can be used to improve the performance of solar panels and detect temperature changes in output power. The DS18B20 temperature sensor, NodeMCU ESP32, 5V Relay, and INA219 sensor are the main components needed to create an automatic water cooling system. Internet of Things monitoring using Blynk aims to facilitate and optimize measurements of temperature, current, voltage and power of solar panels. Solar panels without a water cooling system have relatively high temperatures compared to solar panels with a water cooling system. Solar panels without a water cooling system have the highest solar panel temperature, namely 58.44 °C, and solar panels with a water cooling system have the highest temperature, namely 41.06 °C. PLTS without a water cooling system and with a water cooling system produce the greatest power, namely 10.98 W and 15.97 W respectively. The water cooling system can increase the power value of solar panels by 37.25% on day 1 and day 1 -2 of 32.75%.

Keywords: PLTS, Solar Panel Temperature, Water Cooling System, Internet of Things.