ABSTRACT

In this research, measurement and monitoring of solar energy obtained from a 10Wp solar cell has been carried out and the value of the intensity of sunlight for use in measuring the water level and also monitoring the energy consumption required for measuring the water level. The tool is designed using Arduino Uno microcontroller, current sensor, voltage sensor, light intensity sensor, and ultrasonic sensor. There are 2 places for storing measurement data, namely using a Micro SD Card and the IoT platform. For sending measurement data to the IoT platform using the GSM SIM800L module. In measuring solar energy from 10Wp solar cells for 5 days, an average total daily energy of 36.06 Wh is obtained, the energy produced is relatively small because the solar cells used are 10Wp in size, where the peak power produced by solar cells is only 10 watts and also the influence of changing weather conditions during the 5 days of measurement. In light intensity measurements measured with the TSL2561 sensor, the largest average measurement value is 141308.7 lux and the smallest measurement average value is 17394.33 lux. There are 2 power optimization methods for the water level system, namely run mode where the total daily energy consumption required is 143.03 Wh, and idle mode where the water level measurement is carried out only when receiving work order interruptions from the microcontroller. When the system receives a work order, the required power measurement is 7-8 watts, while when the system does not measure the required power, it is 2-4 watts.

Keywords: *optimization of power, monitoring,* **IoT.**