

ABSTRACT

Indonesia has abundant renewable energy potential, one of which comes from solar energy. Indonesia has a solar energy potential of 200 thousand Megawatts (MW), but it has only been utilized by 150 MW or around 0.8% of the total potential. The potential for developing Solar Power Plants (PLTS) is astronomically supported when Indonesia passes by the equator; this impacts sunlight for more than 6 hours a day. Before the construction of PLTS, data on the solar irradiation value of the selected location is required. Data collection of solar irradiation values can be done using a Solar Power Meter (SPM). Data collection using SPM is considered less effective because data collection is carried out directly for a long time. In addition, SPM sold in the market has a relatively expensive price.

This research discusses the Intelligence Solar Power Meter (ISPM), which can detect solar irradiation values that can be monitored remotely. This research discussion focuses on the ability to detect the value of solar irradiation, have a high accuracy value, record the data obtained, be monitored remotely, and have a lower price than those on the market.

The design results show that ISPM can detect the value of solar irradiation in the 0 - 937 W/m² range. The test results also show that ISPM can record solar irradiation value data every minute with a tolerance of 1 second. Irradiation data can also be monitored remotely through the website by utilizing the Internet of Things (IoT) system. The data transmission can take place optimally if the ISPM and gateway are located at a maximum distance of 400 meters in non-LoS (Line of Sight) conditions and 1000 meters in LoS conditions. The designed prototype produces a selling price of Rp 2,409,000.

Keywords: Solar Irradiation, Solar Power Meter, IoT