

ABSTRACT

The use of electricity for large loads such as buildings and industry is a 3-phase electrical system. Manually recording or monitoring electricity usage data is considered impractical, so the use of IoT devices can be a solution. However, sending IoT device data using wired communication and Wi-Fi is considered unsuitable considering that the device will be placed in a panel room that is rarely covered by the network. So that the use of other IoT communications such as LoRa can be an option.

Therefore, the design and manufacture of LoRa-based IoT devices that can read 3-phase kWh meter data is carried out using RS485 serial communication via the modbus protocol. This is done to expand the scope of IoT devices in reading 3-phase kWh meter. The device transmits data via LoRa communication with test parameters namely RSSI, SNR and throughput.

The device made is an interface between a 3-phase kWh meter with LoRa communication in which there is a MAX485 IC, ATmega 2560, and LoRa communication module RFM95W. From the test results, the device can read 3-phase kWh meter data with an energy reading accuracy of 94.533% and is transmitted on average every 3.611 seconds with a throughput of 957.231 bps. LoRa communication performance used in LOS conditions can reach 300 meters along the female dormitory highway, Telkom University with RSSI -107.625 dBm, SNR -13.063 dB. Meanwhile, in non-LOS conditions, the best value was obtained on the 1st floor point A in Deli Building, Telkom University with an RSSI of -73.364 dBm and an SNR of 8.080 dB.

Keywords: *3-phase kWh meter, microcontroller, LoRa*