

## **ABSTRACT**

**Syahrul Romadhon, *IoT-Based kWh Meter Top-Up. Thesis, Electrical Engineering Study Program, Faculty of Engineering, Siliwangi University, 2024.***  
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*The purpose of making a device entitled “Top Up kWh Meter Based on IoT” is to develop and implement an IoT system on a digital kWh meter that allows charging tokens and measuring electrical parameters to monitor the energy used remotely. The device used uses an ESP32 microcontroller, PZEM-004T sensor, I2C LCD, Optocoupler Relay, and LM2596 IC. The application uses the blynk application as a communication medium for charging tokens and monitoring electricity parameters. The topup method is implemented with an encryption system using web Base64 to process transactions safely and efficiently.*

*The test results of the topup process were successfully carried out by conducting several different experiments. Parameter measurement testing is divided into two types based on resistive and inductive loads, with a 15watt light bulb, iron, rice cooker, electric pot, laptop charger, cell phone charger, and fan. The disconnection of electrical energy will occur if the kWh token value runs out. the error value for the results of the parameter measurement value is 0.053% and the error value for the disconnection test compared to the manual calculation is 0.894%. With a fairly small error value, the designed tool is successful and can be said to have a high accuracy value. The development of the IoT top up system and IoT energy monitoring is proven to be more effective and efficient in the*

*development of increasing contributions to science and technology to bring innovation and ease of use of the latest digital kWh meters.*

***Keywords: Digital kWh Meter, IoT, ESP32 Microcontroller, Blynk.***