

ABSTRACT

Technological developments play an important role in encouraging the development of Temporary Voltage Supply (TVS) as an alternative device used in PLN substations to maintain voltage stability during disturbances. PLN plays an important role as the main electricity provider, so improving TVS monitoring is important in the operational reliability of Distribution Substations. This research was conducted because there are several obstacles that must be resolved, namely the unavailability of realtime battery percentage monitoring, the absence of warnings when battery power is weak, and the difficulty in knowing the location of weak batteries. The method used starts with a literature study to understand the standards used in the research, followed by design (system architecture, hardware, software), system testing, and system analysis of the workflow. If the system is not suitable, then improvements are made starting from the design stage again until finally a conclusion is obtained. Testing was carried out for one week at the PTDB Distribution Substation in Cirebon city. The test results show that the ESP32 Wi-Fi connection produces an RSSI value of -49 dBm and SNR 46 dB which is classified as good. The I2C LCD functions as designed. The DC voltage sensor has an average error of 3.67% with an accuracy of 96.33%, while the Neo-8M GPS test shows a fairly high accuracy. The monitoring system with Arduino IoT Cloud and email notification was successfully run. Signal quality testing using Wireshark and NetSpot showed good results. Overall, the system displays data in real time. The battery lasts one week in standby condition and decreases to 50% in 24 hours when the battery is active and email notifications are received. The system successfully displays the battery percentage in real time, provides alerts when the battery is low, and accurately detects the location of the device.

Keywords: *Battery Monitoring, Temporary Voltage Supply (TVS), Real time, 12 volt battery, Internet of Things (IoT), ESP32, DC voltage sensor, Neo-8M GPS module, email notification.*