

ABSTRACT

The Mangudu Building or Manufacturing building is one of the buildings under the auspices of the Faculty of Industrial Engineering, Telkom University. Inside the Manufacturing building in August 2022, there is a total change of using 89,915 Watts of electrical power if all existing electronic equipment is turned on simultaneously. With so much electronic equipment accompanied by a large amount of power that can be used, the Manufacturing building has the opportunity to waste the use of power and electrical energy because electronic equipment is still left on but is not being used due to not being monitored. Therefore, in this final project, the design of a monitoring system for the use of electrical power used in machinery, lighting, cooling, and room sockets in the Manufacturing building is carried out with Telegram notifications by utilizing the Internet of Things using the ESP-Now communication protocol. To be able to design a power and electrical energy monitoring system in a Manufacturing building, three types of sensors are needed, the PZEM-004T sensor is used to measure the amount of power and electrical energy used, and the HC-SR501 PIR sensor is used to detect the presence or absence of human movement using electrical energy at the socket or air conditioner, and the LDR sensor is used as a room lighting detector to determine whether or not the use of electrical power in room lighting is needed. All data on the use of electrical power, electrical energy, the presence or absence of human movement, and the dark conditions the lighting conditions at the sixteen monitoring points will be processed using the Node MCU ESP8266 microcontroller with the help of the ESP-Now communication protocol. Furthermore, the data obtained will be stored in the Firebase database which will then be displayed on the monitoring website to facilitate the monitoring process so that it can be done anywhere. In addition, if there is a discrepancy in the monitoring process such as the use of power in the air conditioner or socket when there is no human movement in the room, there is power use in machinery outside the working hours of the PROSMAN laboratory or there is power use in room lighting when the room is in a state of emergency. In bright conditions, the ESP8266 MCU Node which acts as an ESP-Receiver will give notification commands via the Telegram chatbot application as

feedback in the monitoring process. In testing the system made, it was found that the system can monitor the use of electric power, electrical energy, the presence or absence of human movement, as well as the darkness of the actual lighting conditions of the room and online so as to facilitate the monitoring process.process.

Keyword - Electrical Power Monitoring, IoT, ESP-Now