ABSTRACT

Electrical energy has an important role in the daily life of every individual. The use of electronic devices will not be separated from electrical energy, therefore every electronic device certainly requires a high supply of electrical energy, causing an increase in the basic cost of electricity in households and industries. So that awareness and high efforts are needed for each individual in saving electrical energy. Waste of electrical energy can be reduced by the existence of a system that can detect and notify about the use of electrical energy in electronic devices that are being used.

In this study, a household electrical load detection system was designed using the Density-based spatial clustering of applications with noise (DBSCAN) algorithm based on the Internet of things (IoT). This system uses the PZEM-004T module which is integrated with the Raspberry Pi 3B+ to process data and send the detection results to the Antares server. This system is designed with an effort to overcome the problem of efficiency in the use of electrical energy in households by grouping data based on the density of the data obtained.

In this study, we succeeded in communicating the PZEM-004T module with the Raspberry Pi 3B+ using CP2102. Testing of this system was carried out using 8 types of devices with the average accuracy obtained is 91% using the DBSCAN model that was formed, with an average detection time and sending results to the server which was 0.418159 seconds at internet access speed 6.28 Mbps.

Keywords: Electrical Energy, DBSCAN, Clustering, Detection, Electrical Load, Current, Active Power.