ABSTRACT

Electricity is one of the important needs for humans in carrying out daily life. Electricity consumption in Indonesia continues to increase every year. Furthermore, exaggeration of the use of electrical energy is one of the problems which is faced by consumers since they do not control the use of electricity; besides, they do not know how much power which is used for each electrical load that is commonly used. On the basis of this thought, a research system was conducted in order to estimate electricity consumption by using the Kalman Filter Algorithm.

Kalman Filter has the ability to predict a condition in the future with limited data. Moreover, the latest measurement data is very important in the Kalman Filter algorithm since the data will correct the data from the predictions. Therefore, the results of those predictions will be close to the actual conditions. This system is designed by using the PZEM-004T sensor for data collection of electrical quantities from loads; such as, voltage, current, active power, and energy.

The data taken from this study were electronic loads on the electricity consumption of the boarding room. The electrical load was taken every 15 minutes for 60 days. The data was divided in the ratio 8:2 where 80% is training data while 20% was test data. From each of these tests, the accuracy values are obtained by using RMSE, MSE, and MAPE. Furthermore, one of the tests is on the fan load by using RMSE in order to get an error percentage of 0.077% on the training data and 0.076% on the test data. Moreover, error percentage which is obtained by using the MSE equation reaches 0.006% on the training data and 0.005% on the test data. Meanwhile, error percentage which is obtained by using MAPE reaches 0.789% on the training data and 0.202% on the test data. From these results, it can be concluded that the test results using the Kalman Filter prediction method are very good at predicting the use of electrical loads.

Keywords: *Electrical Energy, Prediction, Kalman Filter, PZEM-004T*