ABSTRACT

Electrical energy has a big role in supporting human activities, one of which is in the household sector where the demand for electricity is high. Another problem that occurs in households is the occurrence of MCB kWh meter trips due to overload. In solving the problem, an electrical monitoring and automation system is needed in household utilities to monitor the use of electrical energy and prevent MCB trip problems. The monitoring system utilizes the PZEM004T power module and is integrated with IoT so that monitoring is carried out remotely and in real time in recording energy consumption. Electricity costs are also calculated. The automation system in the form of load trips is carried out with current control based on load priority to prevent overload. The load with the lowest priority will trip to prevent tripping the MCB kWh meter and also limit current consumption. The monitoring and automation system designed will control the use of current where the current does not exceed 5 A. The success of the system is seen from the suitability of the measurement of electrical quantities by the system displayed on the IoT platform against conventional measurements where PZEM004T as a measuring instrument has a voltage and current measurement error of 0.25% and 4.4%. In addition, data transmission traffic is also considered so that the data displayed to the IoT platform corresponds to the actual situation with delay, jitter, packet loss and throughput obtained 103.4 ms, 103.4 ms, 0% and 61.06 kbps, respectively. The system succeeded in disconnecting the load relay with the lowest priority to a higher priority load until a current of less than 5 A was achieved and there was a saving in energy consumption due to the limitation of current use by the system where energy consumption after using the system became 1.80 kWh.

Keywords : Monitoring, Automation, Electricity, Trip, Current