

ABSTRACT

The need of electrical power in Indonesia is estimated to increase 433 TWh in 2027, which is imbalance to the availability of electrical source in Indonesia. This condition is caused by the usage of electrical power passing the maximum power capacity. The impact is over power, or the sudden disconnecting of electrical flow. Continuous over power may affect electronic devices.

The problem mentioned above mostly occurs in boarding home building. Thus this can be solved by power management system with the application of power allocation concept and load priority. On the other hand, a system to calculate total power usage and its fare are needed so that customers can monitor their own power usage.

Management system and electrical power monitoring are consisted of sensors block, microcontrollers block, and LCD block. There are several current sensors working with the technology of current transformers in sensors block, and also voltage sensors combining with voltage transformers. Both of them are being functioned to detect current and voltage of load used by customers. The sensor used 6 current sensors that connect to the 6 loads and a voltage sensor that connect to phase (L) and neutral (N). The output is then as the input for ADC microcontroller. Microcontroller block processes all of the variables to calculate the usage of electrical power and its rate. To ease the monitoring process, the result is being displayed in LCD block.

This power calculation system could be used to calculate current, voltage and electrical power for any type of load with 0.59 error percentage of voltage calculation, 9.72 average error percentage of current calculation, and 8.58 average error percentage of power calculation.

Keywords: Electrical power, monitoring, current and voltage sensors