

ABSTRACT

The development of electricity consumption is increasing in direct proportion to the growth of the population and economic growth in a region. Monitoring of electric energy use is necessary in order to control the use of electricity effectively and efficiently, as are efforts to save energy. The electrical flow monitoring system with the NodeMCU ESP8266 microcontroller and the real-time data flow with the websocket communication protocol, developed in this study using the scrum method, aimed at displaying electrical volume data at all times as well as obtaining accurate data related to the quality and quantity of the electric volume so that it is easier for the user to control the use of electricity. The monitoring system is also based on the Internet of Things (IoT), so that the use of electric energy can be seen from a distance and there is no need to see it with this monitoring tool. Based on the design, implementation, and testing results obtained, the calculation of the use of kWh shown on the application can be said to be quite accurate with an error percentage average of 0.505%; the data readings of the electric flow have an accuracy with an average error percentage of 0.675%; packetloss 17,27%, jitter 10 millisecond and data delay of 70,3 milliseconds, which means the application of the electrical monitoring system already included real-time at the time of data processing.

Kata Kunci : *NodeMCU, Websocket, Monitoring, Real-Time, IoT.*

ABSTRAK

Perkembangan penggunaan energi listrik semakin meningkat berbanding lurus dengan pertumbuhan jumlah penduduk dan pertumbuhan ekonomi di suatu wilayah. *Monitoring* penggunaan energi listrik diperlukan dalam rangka pengendalian penggunaan listrik yang efektif dan efisien serta upaya untuk penghematan pemakaian energi listrik. Sistem *monitoring* aliran listrik dengan mikrokontroler NodeMCU ESP8266 dan aliran data secara *real-time* dengan protokol komunikasi websocket, yang dikembangkan pada penelitian ini menggunakan metode scrum yang bertujuan agar dapat menampilkan data besaran listrik yang bersifat setiap saat serta untuk mendapatkan data yang akurat berkaitan dengan kualitas dan kuantitas besaran listrik sehingga memudahkan pengguna dalam mengontrol pemakaian listrik. Sistem *monitoring* ini juga berbasis *Internet of Things* (IoT) sehingga pemakaian energi listrik dapat di lihat dari kejauhan dan tidak perlu melihat dari alat *monitoring* ini. Berdasarkan hasil perancangan, implementasi, dan pengujian yang telah dilakukan diperoleh hasil perhitungan penggunaan kWh yang ditampilkan pada aplikasi dapat dikatakan cukup akurat dengan *error%* rata-rata 0,505%, hasil pembacaan data aliran listrik memiliki akurasi dengan *error%* rata-rata 0,675%, *packetloss* sebesar 17,27%, *jitter* sebesar 10 *millisecond* dan *delay data* sebesar 70,3 *millisecond* yang berarti aplikasi sistem *monitoring* listrik sudah termasuk *real-time* pada saat pemrosesan data.

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HALAMAN MOTTO

“One way to resolve a real-world problem is to make a possible solution called a hypothesis”

“Believe in yourself and all that you are. Know that there is something inside you that is greater than any obstacle.” – Christian D. Larson