

ABSTRAK

SISTEM *MONITORING* BESARAN LISTRIK DENGAN TEKNOLOGI IoT (*INTERNET of THINGS*)

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Monitoring besaran listrik secara *online* perlu dilakukan untuk mengetahui kondisi *real* dari sebuah system tenaga listrik. Teknologi *Internet of things* (IoT) dimungkinkan untuk memantau secara langsung kondisi tersebut. Pemantauan harus memberikan informasi kompleks dengan konsep SMART (*Specific, Measurable, Attainable, Relevant, Time-bound*) yaitu spesifik, terukur, dapat dicapai, relevan, dan dalam rentang waktu. Adapun yang dimonitor dalam penelitian ini ialah besaran listrik berupa arus, tegangan, daya, dan faktor daya.

Prototype sistem yang dibuat terdiri dari komponen – komponen elektronik seperti sensor arus, sensor tegangan, rangkaian pengkondisian sinyal, Arduino UNO, dan Ethernet Shield serta dilengkapi dengan fasilitas server dan web. Masing-masing komponen diuji sebelum dirangkai menjadi sebuah sistem.

Pengujian *prototype* dilakukan pada Lab. Teknik Pengukuran Besaran Elektrik Universitas Lampung (Unila) menggunakan Clamp meter (standard laboratorium). Dari hasil pengujian diperoleh nilai galat *prototype* $< 10\%$, dengan demikian *prototype* yang dibangun pada penelitian tugas akhir ini termasuk dalam golongan alat ukur kelas 1,5; 2,5; dan 5 yang bisa digunakan untuk pengukuran pada panel listrik.

Kata kunci: *prototype* sistem monitoring, Arduino UNO, Ethernet Shield, sensor arus, sensor tegangan, IoT

ABSTRACT

MONITORING SYSTEM OF ELECTRICAL QUANTITIES BASED ON IoT (INTERNET of THINGS) TECHNOLOGY

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Online monitoring of electrical quantities needs to be done in order to obtain the actual condition of a power system. Direct condition of monitored power system is possible to access in real-time by using Internet of Things (IoT) Technology. Monitoring should provide complex information with SMART (Specific, Measurable, Attainable, Relevant, Time-bound) concepts that are specific, measurable, achievable, relevant, and within the time frame. The electrical quantities recorded in this research were in the form of current, voltage, power, and power factor.

Designed prototype was constructed by electronic components such as current sensors, voltage sensors, signal conditioning circuit, Arduino UNO, and Ethernet Shield integrated to server and web facilities. Each components were tested before being assembled into a system.

Prototype was tested in Measurement of Electrical Quantities Laboratory, University of Lampung (Unila) using Clamp meter (laboratory standard). Results showed that < 10% of error value obtained, thus the prototype built in this research included for 1.5; 2.5; And 5 of measurment devices that can be used for measurement on electrical panels.

Keywords: monitoring system prototype, Arduino UNO, Ethernet Shield, current sensor, voltage sensor, IoT