ABSTRAK

Nama   : Muhammad Arfan Lesmana

Program Studi   : Teknik Elektro

Judul   : Monitoring *Charging-Discharging* Baterai Li-Ion CD 18650 3,7V Menggunakan NodeMCU Berbasis *Internet Of Things* (IOT)

Baterai merupakan salah satu teknologi penyimpanan energi listrik. Jenis baterai yang banyak digunakan adalah *lithium-ion*. Penggunaan baterai Li-Ion CD 18650 3,7V lebih sering digunakan karena harganya yang murah. Penggunaan baterai yang tidak terpantau, dapat menimbulkan peluang proses *charging-discharging* berlangsung secara cepat. Hal tersebut memiliki dampak negatif bagi baterai seperti dapat memperpendek usia baterai akibat *overcharge* dan *overdischarge*. Untuk mengatasi masalah tersebut, diperlukan fasilitas monitoring agar pengguna baterai dapat mengetahui kondisi baterai sehingga mampu meminimalisir kerusakan baterai. Penelitian ini mengembangkan alat dengan sistem monitoring baterai Li-Ion CD 18650 3,7V yang dapat memantau proses *charging* maupun proses *discharging* berlangsung. Tujuan penelitian ini adalah untuk membuat alat dengan sistem monitoring yang mampu mengukur arus dan tegangan selama proses *charging* (pengisian baterai menggunakan modul *charger*), proses *discharging* (penggunaan kapasitas baterai oleh beban berupa lampu 3,8V), maupun saat baterai dalam keadaan tidak tersambung suplai ataupun beban. Hasil penelitian menunjukkan bahwa sensor arus ACS712 dapat mengukur arus saat proses *charging-discharging* berlangsung, sensor tegangan DC dapat mengukur tegangan murni baterai saat proses *charging* maupun ketika baterai dalam keadaan tidak tersambung suplai ataupun beban, sensor-sensor dapat mengirimkan data ke mikrokontroler, *multiplexer* dapat menjadi penambah *slot* pin pada NodeMCU, NodeMCU dapat menerima data dari sensor, dan LCD 20×4 dapat menampilkan data berupa arus *charging* (±0,97A), arus *discharging*(0,54A − 0,15A), dan tegangan baterai (dengan nilai tegangan maksimum baterai 3,83V dan tegangan minimum baterai 1,05V) secara *real time*. *Platform ThinkSpeak* dapat menjadi fasilitas monitoring sistem *internet of things* (IoT) mampu menampilkan hasil data pembacaan sensor tegangan DC dengan kapasitas 25V dan sensor arus ACS712 dengan kapasitas 5A pada proses *charging-discharging*.

Kata Kunci : Baterai Li-Ion CD 18650 3,7V, Sensor Arus ACS712, Sensor Tegangan DC, *Multiplexer*, NodeMCU, Sistem *Charging*, Sistem *Discharging*, Sistem Monitoring, ThinkSpeak

ABSTRACT

Name : *Muhammad Arfan Lesmana*
Study Program : *Electrical Engineering*
Title : *Monitoring Charging-Discharging Battery Using Node-MCU Based On Internet Of Things*

Batteries are one of the electrical energy storage technologies. The type of battery that is widely used is lithium-ion. The use of Li-Ion CD 18650 3.7V batteries is more often used because the price is cheap. The use of batteries that are not monitored can lead to opportunities for the charging-discharging process to take place quickly. This has a negative impact on the battery, such as shortening the life of the battery due to overcharge and overdischarge. To overcome this problem, monitoring facilities are needed so that battery users can find out the condition of the battery so as to minimize battery damage. This research develops a tool with a Li-Ion CD 18650 3.7V battery monitoring system that can monitor the charging process and the discharging process in progress. The purpose of this research is to make a tool with a monitoring system that is able to measure current and voltage during the charging process (charging the battery using the charger module), the discharging process (using battery capacity by a load in the form of a 3.8V lamp), or when the battery is not connected to a supply. or burden. The results show that the ACS712 current sensor can measure the current during the charging-discharging process, the DC voltage sensor can measure the pure battery voltage during the charging process or when the battery is not connected to supply or load, the sensors can send data to the microcontroller, the multiplexer can as an addition to the pin slot on the NodeMCU, the NodeMCU can receive data from the sensor, and the 20×4 LCD can display data in the form of charging current (±0.97A), discharging current (0.54A – 0.15A), and battery voltage (with a value of the maximum battery voltage is 3.83V and the minimum battery voltage is 1.05V) in real time. And the ThinkSpeak platform can be a monitoring facility for the internet of things (IoT) system capable of displaying the results of reading data from a DC voltage sensor with a capacity of 25V and an ACS712 current sensor with a capacity of 5A in the charging-discharging process. The data received by ThinkSpeak can be saved and displayed as a graph.

Keywords : ACS712 Current Sensor, Charging System, DC Voltage Sensor, Discharging System, Li-Ion CD 18650 3.7V Battery, Monitoring System, Multiplexer, NodeMCU, ThinkSpeak