

ABSTRACT

Electricity is one of the main energy sources for human life. Almost every day people always use electricity in various activities. Conventionally, to change the condition of switching of electronic devices using a manual switch. The use of manual switches in monitoring and controlling electricity use is considered to be less effective because it creates a waste on the efficiency of electric power and human time. So it takes a system to replace the manually monitoring and controlling electricity usage, that is a DC Smart Relay.

DC-Smart Relay system utilize the help of microcontrollers with several sensors to monitor and control electricity usage. This system uses NodeMCU as a control, DC Relay as the switch, ACS712 as the current sensor, and ZMPT101b as the voltage sensor. System can switch over remotely and monitor the electrical voltage and electrical current flowing on electronic devices to a real-time database through real-time wireless communication using the internet.

With the implementation of this system, it is proven that the system can provide convenience in controlling and monitoring of electrical devices with an average delay of relay control is 1.76 seconds and 2.85 seconds on 4G network. In the measurement of the voltage value obtained an error of 2.25% with data transmission delays is 6.48 seconds and 10.0265 seconds on 4G network. And the measurement of current values is 1.67% with data transmission delays is 4.02 seconds and 4.69 seconds on 4G network.

Keywords: Relay, Electric Current, Electric Voltage, NodeMCU, Real-time Database.