Abstract

Home automation is a concept that is a combination of hardware and application software to work together and control the electronic devices that operate in a place, for example in the modern home, with or without direct human view[1]. Previous technologies such as *X11*, *Bluetooth*, and *Wi-Fi* has its limitations as a base for home automation, which had a cable on *X11*, the limited number of devices in *Bluetooth*, and the need for power / energy needed for sending data over *Wi-Fi*. Controlling devices in *home automation* also *need* one tool to *one device*. To overcome this, ZigBee technology was created, wich controllable *through Android.*ZigBee is an IEEE 802.15.4-based technology that can save more power, has a range up to 80 m, and can form a lot of nodes in the network.

In this study, examined the use of ZigBee protocol and how to implement it for home automation device, with case study house lights are controlled by Android devices. The parameters used to demonstrate the performance of this research is RSSI, throughput, round trip time, and energy efficiency. ZigBee devices that use XBee S2 is a collaboration between the microcontroller Arduino XBee S2 module so that it can be easier to operate.

From the results of the experiment showed that the XBee device is able to work with the round trip time value from 60 − 160 ms and throughput is about 7 operations per second. Even so, the XBee only able to work in range about 10-20 meters if the module is placed in a different space, and able to work up to 80 meters if the module is placed in a room without barrier. As for the power consumption is obtained that a battery with a voltage of 3.7 volts with a capacity of 790 mAh will last only about less than 28 hours, if the frequency XBee sleep time was 7.5 seconds. It is influenced by the use of the Arduino microcontroller along the shield consuming considerable stream, which is about 25.8 mA

Keywords: XBee, ZigBee / IEEE 802.15.4, Android, Performance, Power.