

ABSTRACT

The development of information and communication technology has received demands for sending information over long distances and being more energy efficient. The reliability of information delivery and low prices make several technology developers compete to find new technologies that can accommodate this. One of them is LoRa technology, which has long-distance communication capabilities such as cellular but low power like Bluetooth, so that it is considered a better choice for sending information. In this study, two LoRa modules were used where communication was carried out point-to-point by sending GPS sensor data. One module functions as a sender and the other as a receiver. The study was conducted using three types of LoRa operating frequencies for comparison, namely the frequencies of 433 MHz, 868 MHz, and 915 MHz. The test is carried out by measuring the parameters of RSSI (Receive Signal Strength Indicator), SNR (Signal to Noise Ratio), and packet loss at 3 test distances, namely 300 m, 500 m, and 1000 m. The test results at a distance of 300 meters concluded that the 868 MHz frequency has the best RSSI value of -107.6 dBm, the 915 MHz frequency has the best SNR value of 18.6 dB, and the 433 MHz frequency has the smallest packet loss amount of 17.5%. The test results at a distance of 500 meters concluded that the frequency of 433 MHz has the best RSSI and SNR values of -125.9 dBm and 11.4 dB, and has the smallest packet loss of 21.87%. The test results at a distance of 1000 meters concluded that the frequency of 868 MHz has the best RSSI value of -126.5 dBm, the frequency of 433 MHz has the best SNR value of 11 dB, and the frequency of 915 MHz has the smallest amount of packet loss of 62.5%.

Keywords: *Internet of Things, Long Range, Point to point, Receive Strenght Signal Indicator, Signal to Noise Ratio.*