

ABSTRACT

Forest fires that often occur are something that can make the balance of life not well established. Forest fires are an event that often gets delayed in handling. This happened because the large forest area and the lack of monitoring of the state of the forest made forest fires occur at several locations. However, forest fires cannot be separated from several people who intentionally burn forests or weather factors that are the initial trigger for the fire.

Based on this background, a Forest Fire Detection System was designed using LoRa (Long Range) Communication. By utilizing LoRa communication, this system is expected to be able to help overcome forest fires by means of early monitoring of the source points of forest fires so that they can prevent wider forest fires that can cause negative impacts on the community. The system uses devices and sensors such as Arduino, Fire Sensor, Mq2 Sensor, Ds18b20 Sensor, Neo 6 GPS Module and LoRaSX1278 (Long Range).

The result of this final project is that the device can be used to monitor forest conditions and detect when a fire occurs in the forest. Tests are carried out on each sensor. The results of the test between LoRa are the average RSSI values ranging from ± 100 dBm in LOS and non-LOS conditions and the large bytes of the data sent and the farther the distance, the greater the RSSI value. The NEO 6 GPS module is compared with the coordinates obtained from the GPS module with mobile maps so that the results are obtained that the comparison between the GPS module and maps on the mobile phone ranges from $\pm 3-5$ meters. The temperature sensor is carried out by comparing the results of temperature measurements between the Ds18b20 sensor and the food temperature and the difference between the two is $\pm 0.2-0.20$ degrees Celsius. The smoke sensor has test results that the smoke in a closed room has a thicker smoke density and more concentrated smoke levels up to 439 ppm. Fire sensors, the results obtained are different and for the value of fire that is detected is greater at night than during the day because the value of fire is affected by the available light.

Keywords: *Arduino, Ds18b20, LoRaSX1278, , NEO6M GPS Module, Mq2 and Fire Sensor.*