ABSTRACT

An early warning system is a system as an early warning that a natural disaster will occur. As we cannot know when natural disasters occur, we need an early warning system, in order to minimize the number of casualties due to natural disasters. Therefore, a fire early warning system based on LPWAN LoRa was created, where LPWAN LoRa (Long Range) is a means of sending data from one place to another. LPWAN LoRa is a quite unique and amazing modulation format created by Semtech. The resulting modulation uses FM modulation. The essence of LoRa processing itself is that it can produce a fairly stable frequency value. The frequency value used in LoRa can vary depending on the area it is used in. While the buzzer itself is an output device that will produce sound, the sound it produces serves as a warning that there is a fire or natural disaster. And DHT11 is used as a monitoring tool for temperature and humidity conditions, the data generated by DHT11 serves to determine the state of the area where the transmitter is placed. The design of this early warning system can operate properly, so it can be used in areas with minimal internet because this system will not use the internet as a data transmission tool, which will use a peer-to-peer LoRa system. The test results of the DHT11 sensor have an accuracy of temperature and humidity above 93%. For testing the equipment at the furthest LOS (line of sight) conditions of 330 meters, the largest received packet was 32%, and for NLOS (non-line of sight) conditions the furthest distance of 270 meters, the largest received packages were 27%. Distance affects signal strength during the LoRa communication process.

Keywords: *Early warning system*, LPWAN LoRa, Buzzer, DHT11.