

ABSTRACT

Seismic activities must be watched out by the community, seismic activities must be carried out by the community and oil and gas exploration. The activity of seismic waves that radiate in the earth's stomach that is reflected to the surface will receive seismic sensors to determine the complexity of earthquakes or seismic wave waves on the ground, buildings, and humans. At this time the seismic sensor with coil suspended by a spring used requires workers and is quite expensive. To overcome this problem a multi-sensor seismic system was built to protect seismic activity using MEMS accelerometers using MMI value scales and duration to analyze seismic activity, normal seismic waves or overcome earthquakes. In this research system, a device that reads seismic wave data has been created by the accelerometer sensor MEMS NodeMCU module to measure the acceleration of position using the x, y, z axis. After the data is obtained by the MPU6050 sensor, the data can be obtained by NodeMCU so that the data can be read by a computer. Then the data is sent through a Wi-Fi network that uses the MQTT (Message Queuing Transport Telemetry protocol) in order to create a locally designed broker through mosquitoes as a communication channel to send and receive data carried out by microcontrollers and computers in real-time. A low pass filter is used to eliminate the noise caused by the sensor in order to refine the frequency of recording data obtained for the earthquake calculation process, so that the data obtained is not data from a fake earthquake. The output of this study is the data obtained later in the form of real-time graphs and fuzzy logic decisions to determine differences in normal seismic waves or overcome earthquakes.

Keywords: accelerometer MEMS, NodeMCU, MQTT, low pass filter, fuzzy, seismic