ABSTRACT

Railways in Indonesia have a system for detecting the arrival of trains called axle counters, but axle counters have a shortage that is, when the axle counter counts more than 255 substations of the passing railway, there will be errors in those axle counters. In earlier studies made the detection system of the presence of train arrivals through a vibration, but there were shortcomings because the system only detected the presence of vibrations occurring without knowing those vibrations inflicted from the vibration of the railway or not.

Therefore on this final task aims to develop a railway detection tool utilizing the vibrations that occur using MPU6050, Arduino Uno, Buzzer and LED sensors at the prototype of the tool. On this final task study used a way of comparing public vehicle vibrations and train vibrations to produce effective train detection tools.

As for the result of this final task is that the MPU6050 sensor used has an accuracy value of 96.12% with an average error value of 3.88% in performing an acceleration value comparison. Of the research conducted as many as 60 times the average threshold value of the 9,394m/s2 train and the lower threshold value of the −8,772m/s2 train, and on the general vehicle vibration obtained the average threshold value of 1.746m/s2 and the lower threshold value of the train -1,3426m/s2. Of the average value the system gets using a threshold value of 9.00m/s2 as the upper threshold value and -9.00m/s2 as the lower threshold value, it is reviewed from the mean value of vibrations occurring at the time the train vibration passes. From testing of the system conducted to detect trains, the appliance successfully detected the passing train using an MPU6050 sensor, and on public vehicle vibration testing the system did not detect any train vibrations occurring at the time the public vehicle passed.

Keyword: Railway, Vibration, Threshold