

ABSTRACT

Currently, the methods used to detect the presence of a train are axle counter and track circuit, but these two methods still have shortcomings. The disadvantage of an axle counter is that if the axle counter reads more than 255 axles of a passing train, an error will occur. While the disadvantage of the track circuit is that if there is bad weather, the track circuit electrical system will experience problems. In previous research, research on magnetic fields around train tracks has been carried out. However, there are still shortcomings because it does not compare with the magnetic field of public vehicles that crosses train crossings.

Therefore, this final project aims to develop a train detection tool that utilizes changes in magnetic field strength that occurs due to friction between the train wheels and the railroad using the MAG3110, Arduino Uno, HPL sensors and buzzer on the train detection tool. The magnetic field of the train will be compared with the magnetic field of public vehicles to measure whether the magnetic field detected is actually coming from the train.

The result of this final project is that the MAG3110 sensor used has an accuracy value of 97.92% and an error value of 2.08%. Based on the tests that have been carried out, the threshold value for the magnetic field of the train set in this system is $> 20 \mu T$, while the threshold values for the magnetic field of public vehicles are $< 20 \mu T$ and $> 8 \mu T$. The system succeeded in detecting a passing train with a magnetic field value range of $20.17 \mu T$ to $49.35 \mu T$, whereas in public vehicle testing, the magnetic field value of public vehicles did not exceed the magnetic field threshold value of the train.

Keywords: *Train, Magnetic Field, Threshold*