

ABSTRACT

In recent months, a frequent case has been the fall of Commuter Line service users in the gap of the railway crossing platform. The participation of railways in the development of national transportation is still limited, due to the lack of adequate infrastructure and facilities, and the level of service is still far from expectations. Therefore, a prototype model of the bridge is needed that is able to automatically open and close the gaps on the platform. The sensor used to detect the train is the Ultrasonic sensor sensor, and the drive is the Servo Motor. 16x2 LCD and buzzer as a notification when the user is allowed to pass through the gap of the platform. From the results of testing and discussion that has been carried out by the author, it was found that the HCSR04 ultrasonic sensor obtained an average error of 6% and some measurements made showed an error of less than 1% which indicates that the sensor is able to provide accurate measurement results in detecting miniature trains. Based on the test results on servo motors, with the PID controller obtained PID parameters with $KP = 1.01$, $KI = 0.0034$, and $KD = 0.0005$ as a very good combination. This parameter indicates a fast, stable, and close response to setpoints without significant overshoot or undershoot. This combination creates an optimal balance between fast response and system stability in servo motors, making it an excellent parameter choice for such applications.

Keywords: *Electric rail train, platform gap, sensor, servo motor, PID*