INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Automatic Railway Gate Management System with 8051 Micro-Controller

Vaibhav Baranwal[1], Prabhakar Awasthi[2], Swapnil Singh[3], Utkarsh Srivastava[4], Surendra Kumar Pal[5]

[1, 2, 3, 4]Student, [5]Assistant Professor , Department of Electrical Engineering, Galgotias College of Engineering and Technology, Knowledge Park 2, Greater Noida, Uttar Pradesh - 201306 (India)

Abstract: The purpose of this article is to replace human-operated gates with an automatic one-level railroad gate. There are two things: on the one hand it is about reducing the closing time of the door and on the other hand ensuring safety by reducing accidents. Under the current system, as soon as the train departs from the station, the porter is informed by the station master by telephone about the arriving train. As soon as the porter has received the details about the train, he closes the door which depends on when the train arrives. So if the train arrives late for some reason, causing the door to remain closed over a long time, thereby causing huge amounts of traffic. By automating the system, the arrival of the train is detected using the sensors.

I. INTRODUCTION

A level crossing takes place when the railway line gets interrupted at a level by road or railway, without need for a bridge or tunnel. It's kind of a crossroads. The term also applies when a light train priority crosses a road on reserved tracks in a similar way. There was a lagman in the intersections first level, in a nearby gallery who, when sees a approaching train, would fly red flag or use flashlight to avoid alerts and thereby clearing the lanes. Later, electric or manual barriers were introduced that obstructed the road. Gates were to be a complete deterrent to the direction of train traffic. At the beginning of the railways, much of 'Road traffic is carried by horses or cattle. So countries have replaced it with weaker and visible obstacles also relied on road passengers to block the corresponding danger signs. this barrier has become less likely to be effective and there is a need for a livestock barrier was considerably reduced. The work is designed with a 8051 microcontroller to avert rail accidents from occurring at unprotected railway crossings. The idea is to use two IR receivers and two transmitters; a pair of receivers and transmitters are upside down (where the train is coming from) to a higher level compared to a human in a exact alignment, and the other pair is located at the bottom of a direction of train.

II. FUNCTIONAL DIAGRAM

There is a small circuit of 5 V supply, convenient to experiment with electronics and ease of constructing. Inexpensive transformers which are small in size with output voltage variable is available both electronically in supermarkets. These are easily available transformers, but we get generally a very poor voltage regulation, making them unusable for the digital circuit researches unless we get some better regulation. This next circuit is a solution to this problem. The circuit provides a + 5 V output at a current of approximately 150 mA, but can increase the AI when a good cooling is added to the 7805 controller. The circuit has an final protection and overload protection.
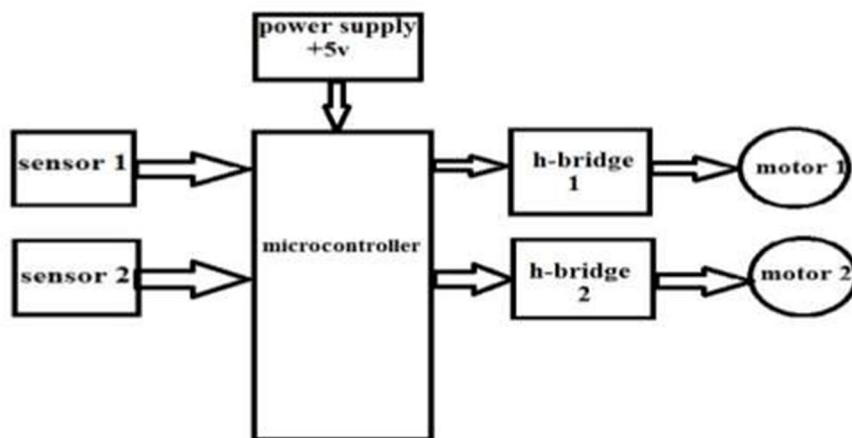

Figure 1: Bock diagram

The railway as the cheapest means of transport is preferable to all other modes of transport when navigating the daily news, we find many train accidents that occur with unmanned level gates. It is mainly because of the negligence in the manual operation or labour shortage. Wefound a solution to this in this article. We try to automate rail door control using simple electronic components. When a train approaches the intersection on all sides, sensors are placed at fixed distance to the gate detects approaching train and thereby control the gate operation. There is also a indicator for warning motorists to approach the train. The IR sensors are made mounted on to the both sides of the door of rail. The distance depends on the length of the train between the two sensors. For generalization, we needto consider the length of the longest train possible on this route.
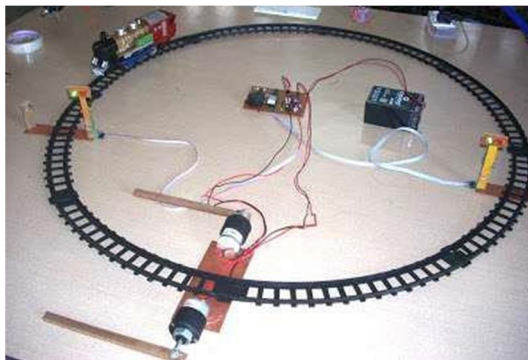

Figure 2: Hardware model

III. CONCLUSION

The proposed works have many major advantages: they will reduce accidents at level crossings, increase accuracy, and reduce manual operation errors. It reduces train collisions and also manages a private train route to avoid delays in arriving at the destination. The train reaches the station without any delay, which happens in a manual mode. Safety is implemented using a tracker on the train to supervise the location of train in case of problem. Solar panels may be used for generating energy for the system thereby improving the system efficiencies. Because the system gets totally automated, manual errors are avoided and offers users maximum security. Therefore, the automatic control of the railway doors by means of the 8051 microcontroller works efficiently and reduces labor and time. The operation of the railway door is easy to check and lowers the risk of defects.

IV. FUTURE SUGGESTIONS

A. When a vehicle running past the gate, a GSM module is used to send the message reporting a malfunction

B. So train driver Stop the train first

C. The full number contains several IR modules

D. If the track is locked, the module reports it to the track operator.

REFERENCE

[1] Ajay.V. Deshmukh, Microcontrollers (Theory and Application), Tata McGraw-Hill Publication, 2005.

[2] Ahmed Salih Mahdi, Al-Zuhairi, automatic gate detectors and crossing control & Microcontroller, International Journal of Computer Trends and Technology (IJCTT), 2013, 4; (7). 2013.

[3] Deepa S, Kaliraj V, Thamilarasi N, Balasubramanian P, Banuchandar J Automated Unmanned Railway Level Crossing System, International Journal of Modern Engineering Research (IJMER), 2012, 2 (1); 458–463.

[4] Fred Coleman, Young J. Moon, Trapped Vehicle Detection System for Four Quadrant Doors in High Speed Rail Corridors, Transportation Investigation File, 2011.

[5] Fred Coleman, Young J. Moon, Gate Delay Design, and Gate Period Time for a Four-Quadrant with Four-System in the Railroad-Highway Grade Crossings Transportation Research Record, 2010.

[6] Krishna, Shashi Yadav and Nidhi, automatic railway management of gates using a microcontroller ”, Oriental Journal of Computer Science & Technology, 2013, p. 6; 4.

[7] VK Mehta, Principles of Electronics, 11th edition, S Chand and Company, SRM University, 2009

INTERNATIONAL JOURNAL
FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 ⓒ (24*7 Support on Whatsapp)