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Intelligent Train Engine to Avoid Accident and Controlling Railway Gate Automatically

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ABSTRACT

A system which will help the railway department by overcoming accidents. This project is introduced to add automation in railway transportation. Here obstacle sensor is used to monitor the track and sense any obstacle, if sensed in short distance signal is transmitted to the receiver section which will give horn i.e. buzzer and train stops. If any person or vehicle is trying to cross the railway gate then also train stops and the gate is kept open by the DC motor for the person or vehicle to pass. Fire sensor is used to detect fire which will buzzer to alert passengers as well run motor to spread water on the fire detected surface. RF transmitter and receiver are used to continuously transmit and receive signals to control the movement of train. DC motor is fixed at the railway gate to open and close the gate, as well as spread water based on signal received. Here ATMEL microcontroller is employed for the functioning of the system.

Keyword: Automation, dc motors, ir sensor, alert system

1. INTRODUCTION

A level crossing occurs where a railway line is intersected by a road or path on one level, without recourse to a bridge or tunnel. It is a type of at grade intersection. The term also applies when a light rail line with separate right-of-way in reserved track crosses a road in the same fashion. Other names include railway crossing, railroad crossing, road through railroad, train crossing or grade crossing. Early level crossings had a lagman in a nearby booth who would, on the approach of a train, wave a red flag or lantern to stop alralic and clear the tracks. Manual or electrical closable gates that barricaded the roadway were later introduced. The gates were intended to be a complete barrier against instruction of any road traffic onto the railway. In the early days of the railways much road traffic was horse drawn or included livestock. It was thus necessary to provide a real barrier. Thus, crossing gates, when closed to road traffic, crossed the entire width of the road. When opened to allow road users to cross the line, the gates were swung across the width of the railway, preventing any pedestrians or animals getting onto the line. With the appearance of motor vehicles, this barrier became lesseffective and the need for a barrier to livestock diminished dramatically. Many countries therefore substituted the gated crossings with weaker but more highly visible barriers and relied upon road users following theassociated warning signals to stop.

Present work is designed using 8051 microcontroller to avoid railway accidents happening at unattended railway gates, if implemented in spirit. This paper utilizes two powerful IR transmitters and tworeceivers; one pair of transmitter and receiver is fixed at upside (from where the train comes) at a level higher than a human being in exact alignment and similarly the other pair is fixed at down side of the train direction.

Sensor activation time is so adjusted by calculating the time taken at a certain speed to cross at least one compartment of standard minimum size of the Indian railway.

We have Automatic Railway Gate Control System considered 5 seconds for this paper. Sensors are fixed at 1km on both sides of the gate. We call the sensor along the train direction as ‘foreside sensor’ and theother as ‘after side sensor’. When foreside receiver gets activated, the gate motor is turned on in one direction and the gate is closed and stays closed until the train crosses the gate and reaches aft side sensors. When aft side receiver gets activated motor turns in opposite direction and gate opens and motor stops. Buzzer will immediately sound at the fore side receiver activation and gate will close after 5 seconds, so giving time todrivers to clear gate area in order to avoid trapping between the gates and stop sound after the train has crossed.

2. RELATED WORK

2.1 Automatic Railway Gate Control System Using 8051microController

Author: C. R. Balamurugan, P. Vijayshankarganth

The objective of this paper is to provide an automatic railway gate at a level crossing replacing the gates operated by the gatekeeper. It deals with two things. Firstly, it deals with the reduction of time for which the gate is being kept closed, and secondly, to provide safety to the road users by reducing the accidents. By the presently existing system once the train leaves the station, the stationmaster informs the gatekeeper about the arrival of the train through the telephone. Once the gatekeeper receives the information, the closes the gate depending on the timing at which the train arrives. Hence, if the train is late due to certain reasons, then gate remain closed for a long time causing traffic near the gates. By employing the automatic railway gate control at the level crossing the arrival of the train is detected by the sensor placed near to the gate.

2.2. Automatic Railway Gate Control System Using Microcontroller

Author: Hnin Ngwe Yee Pwint, Zaw Myo Tun, Hla Myo Tun

In everywhere at level crossing between railroad and highway there are so many railway accidents happening due to the carelessness in manual operations or lack of workers. So, this paper describes the automatic railway gate control system using PIC microcontroller for saving precious human lives and preventing major disasters in railway track. The gate is closed, when the train crosses the first IR sensor and the gate is opened, when the train crosses the second IR sensor. This system deals about one of the efficient methods to avoid train accidents. The second part is based on software programming to operate the hardware structure.

2.3 Automatic Railway Gate and Crossing Control based Sensors &Microcontroller

Author: Ahmed Salih Mahdi. Al-Zuhairi

Railroad related accidents are more dangerous than other transportation accidents in terms of severity and death rate etc. Therefore more efforts are necessary for improving safety. There are many railways

crossing which are unmanned due to lock of manpower needed to fulfill the demands.Hence many accidents occur at such crossing since there is no one to take care of the functioning of the railway gate when a train approaches the crossing. The main objective of this paper is to manage the control system of railway gate using microcontroller.

2.4 Pressure Sensed Fast Response Anti-Collision System for Automated Railway Gate Control

Author: Subrata Biswas, Rafiul Hoque Bhuiyan, Samiul Hoque

An innovative project design of a pressure sensor based swift response anti-collision system for an automatic railway gate control. By replacing the manual system of railway gate control at the level crossing it has been develop an automatic system in which the arrival and departure of the train will be sensed automatically to control the gate. The novelty of this project based paper is the use of pressure switch which has been integrated in this anti-collision system for the railway.

2.5 Automatic Railway Gate Control System

Author: Shubham Shrirao, Dinesh Rojatkar

The Railroad related accidents are more dangerous than other transportation accidents in terms of injurity and death rate etc. Therefore more efforts are necessary for improving safety and security. There are many railways crossing which are unmanned due to lack of manpower needed to fulfill the demand signal is sent to the control room and the gate is closed and stays closed until the train crosses the gate and crossing side sensors. When Hence many accidents occur at such crossing since there is careless of the functioning of the railway gate when a train arrive the crossing .

3. AUTOMATION RAILWAY SYSTEM

This system makes use of a micro controller which is programmed by the user using keil software and also two IR sensors which are placed on either side of the lever gate to detect the arrival and departure of the train. The dc motors rotate in clockwise and anti-clock wise directions to open and close the gate. As the sensors are placed at a particular distance away from the gates when the train arrives the gates automatically closes so that we can avoid accidents and also can reduce the waiting time of vehicle users. As it does not involve any involvement of human we can completely avoid human errors. The proposed work has many significant focal points it will lessen the mishaps happening at the railroad level crossing, it will expand the accuracy and decrease mistakes happening because of manual activities. It will diminish the impact of train and will likewise deal with the course of a specific train to maintain a strategic distance from any postponement in arriving at its goal. Train will consistently be on time at the station no postpone will be caused which happens in manual activity.

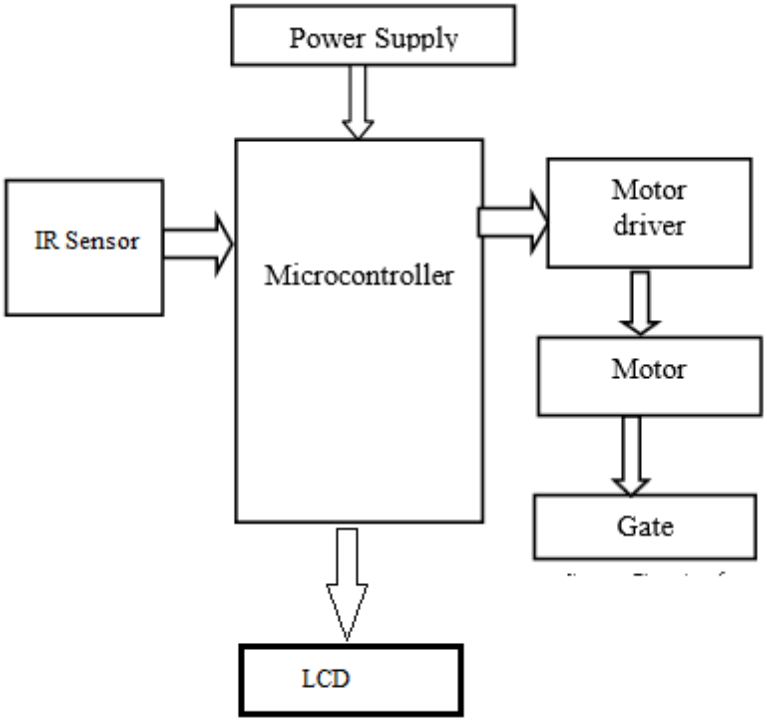
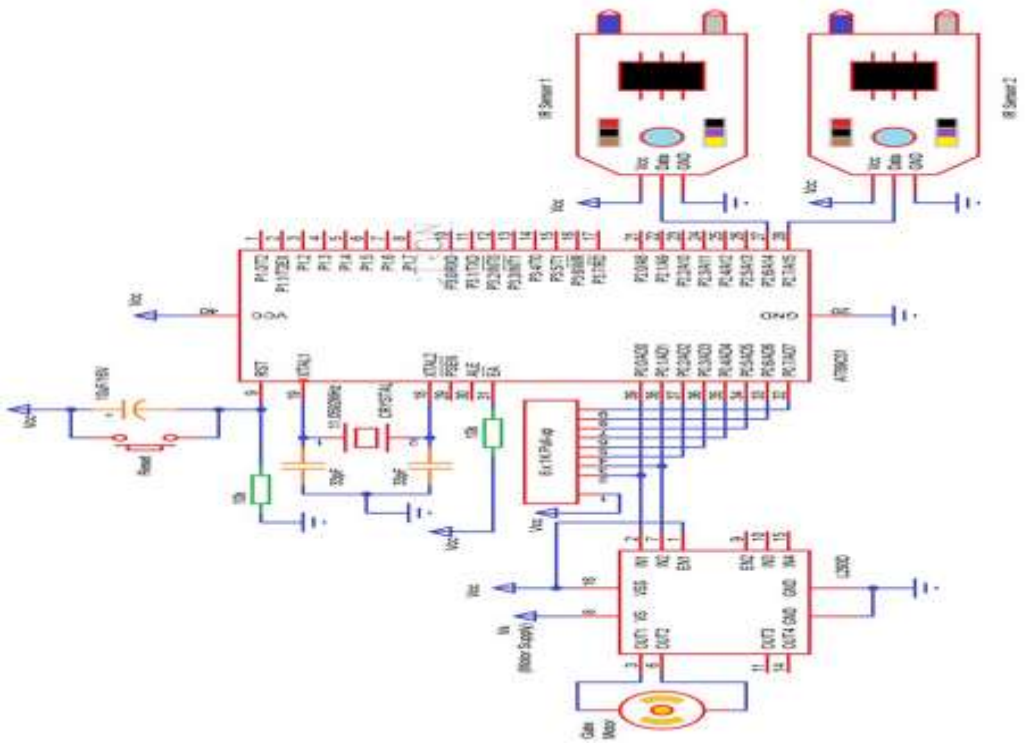


Figure: 1.1block diagram

4 . CIRCUIT DIAGRAM



4.1 WORKING OF PRINCIPLE

This circuit is a small 5V power supply, which is useful when experimenting with digital electronics,and easy to build. Small inexpensive wall transformers with variable output voltage are available them any electronics and supermarket. Those transformers are easily available, but usually their voltage regulation is very poor, which makes then not very usable for digital circuit experimenter unless a better regulation can be achieved in some way.

The following circuit is the answer to the problem. This circuit can give +5V output at about 150 mA current, but it can be increased to I A when good cooling is added to 7805 regulator chip. The circuit has over overload and terminal protection.The receivers, on the other hand, takes input from transmission pin of RS232 serial port and give serial output to microcontroller's receiver pin. MAX232 needs four external capacitors whose value ranges from 1µF to 22µF.This part explains how the actual proces s is being done.The working of the project is explained below as follows:At the First Stage we should fill the seeds inside the container. Then select the button for distance between the seeds. When the power supply is given to the robo its start to move in the field. The time taken to reach the distance is feed into the microcontroller when it reaches the distance it will stop the robo by OFF the geared motor with the use of relay.Then the stepper motor is activated to control the flow of seeds which is kept inside the container after the flow of seed it will stopped by using relay. Finally the DC motor is activated to sow the seeds inside the field at the depth of 1 to 1.5 inches.

5. CONCLUSION

The pressure sensed anti-collision system for an automatic railway gate control is developed to reduce the loss of death and injuries for the human at the level crossing of the rail-line. An automatic system is more reliable than a manual system. That's why this project is very much effective and efficient considering the safety of the human life. In this project, all the apparatus were handled safely to avoid unexpected short circuit. The novelty of this project is the safety of the human life at the level crossing of the railway.There are many scopes to improve this project in future. If we overlook the whole project we can get the idea of using RF module instead of using wire for the transmission of signal. Another improvement of this project could be the sector of pressure switch. Instead of using this, a high-tech load sensor could be used so that it could give the actual rating of the vehicle that gets stuck at the level crossing. So, it is expected that more works will be done on relevant project in near future

REFERCENCES

[1] Atul Kumar Dewangan, Meenu Gupta, Pratibha Patel, "Automation of Railway Gate Control Using Microcontroller", International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 1 Issue 3, May – 2012

[2] Santosh B. Patil, Rupal M. Walli, "Design and Development of Fully Automatic AT89C52 Based Low Cost Embedded System for Rail Tracking", International Journal of Electronics, Communication & Soft Computing Science and Engineering (IJECSCSE), Volume 1, Issue 1, February 2012.

[3] Ahmed Salih Mahdi, Al-Zuhairi, "Automatic Railway Gate and Crossing Control based Sensors & Microcontroller", International Journal of Computer Trends and Technology (IJCTT), Volume 4, Issue 7, July 2013

[4] Daniel D. Frey, Assistant Professor, Kevin N. Otto, Associate Professor, Stan Taketani, "Manufacturing Block Diagrams and Optimal Adjustment Procedures", Journal of Manufacturing Science and Engineering, Volume 123, Issue 1, October 1999.

[5] Sanchez, G.A.; Carlos, G.O., "A low-cost control system for hydraulic applications," ANDESCON, 2010 IEEE , vol., no., pp.1,5, 15-17 Sept. 2010. doi: 10.1109/ANDESCON.2010.5631888

[6] Ćika, D.; Grundler, D., "Proteus Virtual System Modelling used for microcontroller education," MIPRO, 2010 Proceedings of the 33rd International Convention , vol., no., pp.1034,1038, 24-28 May 2010.

[7] Bo Su, Li Wang, "Application of Proteus virtual system modelling (VSM) in teaching of microcontroller", IEEE 2010 International Conference on E-Health Networking, Digital Ecosystems and Technologies (EDT), (Volume:2), ISBN- 978-1-4244-5514-0, 375 – 378.

[8] Ahmed M. A. Haidar, Chellali Benachaiba, Mohamad Zahir, "Software Interfacing of Servo Motor with Microcontroller", Journal of Electrical Systems, Volume 9, Issue 1, September 2013, 84 – 99.