

Zigbee based Railway Gate Controlling

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Abstract--- Paper Aims to extemporize controlling of a railway level crossing. The Micro controller is used to control DC Motors for opening and closing the Railway Gates. One of the two sides of junction two sensors are placed. If a train is impending near to gate and cuts the signal of first sensor in that direction, then the sensor gets triggered and will send an intruder to the microcontroller using zigbee. The gate get closes by interrupt service routine (ISR).To avert destruction have been provided Indicator. At certain delay, when train has passed the other sensor which is placed another end of the gate, then a gate will switch back to its initial point, moving a train to pass without any pause.

Keywords: buzzer, DC motor, IR sensor, micro controller, zigbee.

1. INTRODUCTION

Invulnerability has been one of the biggest concerns in the Indian Railways system. While the number of accidents have gone down over the last few years, the number still remains above 100. The number of rail accidents has declined from 325 in 2003-04 to 106 in 2014-15. The number of railway accidents divided by cause are shown in the figure 1 below.

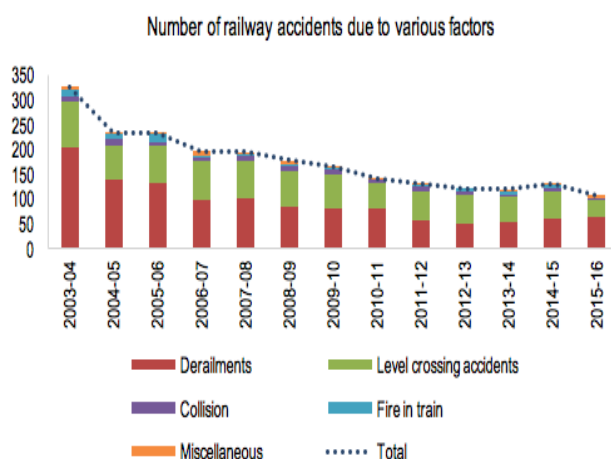


Fig.1. Number of Railway accidents due to various factors from 2003 to 2016

In 2015-16, majority of the accidents were caused due to derailments (60%), followed by accidents at level crossings (33%).

Today's, non automatic is going on for operating railway gate. For controlling a railway gate, the government has exerted workers. When the train is approaching near to the gate, the worker will manually operating (open and close).

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At prior the flag man is wave the red flag when the train is approaching the gate, so that they can layoff the traffic. Non automatic or electrical closable gates that blockade the roadway was introduced at next. In those days of the railways much road traffic was horse trading or included livestock. Thus it was required to provide a real roadblock. Thus, when closed the gates to road traffic crossed the totalistic of the road. When the gates are free let on road users to cross the line, the gates were sway over the width of the railway, avoiding any passerby or animals getting into the lane.

The Project Aim to developing an automatic railway gate controlling and signaling using zigbee. Automatic railway gate control system is implemented to prevent accidents of the traction system at the railway crossing levels.

The aberrance of motor vehicles, this blockade became less powerful and the need for a blockade to livestock monished. Most of the countries alternate the gated crossings with weaker but more highly visible blockade and confide upon to stop road users warning signals are associated.

In many countries, level crossings on less important roads and railway lines are often "open" or "uncontrolled", sometimes with warning lights or bells to warn of approaching trains. Ungated crossings represent a safety concern; many accidents have occurred due to failure to notice or obey the warning.

The main theme of the paper is to make an automatic railway gate using the microcontroller. The people get the implication when train is arrives at the sensing point the alarm is get triggered and gate closed. The gate will close either side of the track by control system. The control system automatically lifts the gate whenever the train annoyed from the end.

2. SYSTEM DESIGN & ARCHITECTURE

Here we are utilizing hardware and software tools

a. Transmitter section

The transmission section of the project Automatic Railway Gate Control consists of micro-controller AT89S52, which is further processed to have connections with power supply, IR transmitter & receiver pair, and also zigbee module which results to transmit the data wirelessly.

For this design, we applied binal energetic IR transmitters and receivers; oneup of transmitter and receiver is situated aside (from where the train comes). The level of IR sensors more than human being height in definite alignment and alike the oneup is fixed at declined side of the train direction as shown in fig.2.a. Sensor activation time is regulating by

estimating time is taken by the train with speed of standard minimum size of the Indian railway.

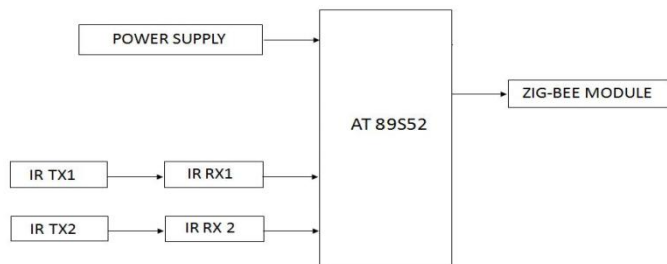


Fig.2.a. block diagram of transmitter

b. Receiver section

The receiver section of the project consists of micro controller AT89S52, which is further processes to have connections with power supply, L239D, buzzer, signal LED's, and also zigbee module which results in the receiving of the signal through zigbee wirelessly and controls the gate movements either close or open as shown in fig.2.b.

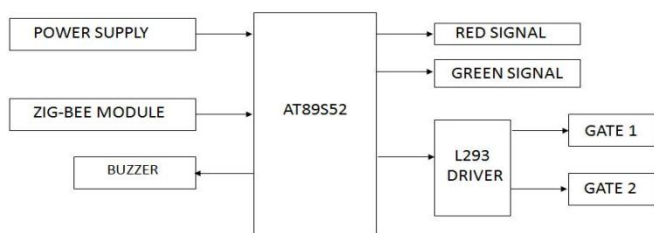


Fig.2.b. Block diagram of Receiver

c. Software Description

Keil's μ Vision IDE, software toolsets produce a capable and develop the embedded applications like, easy to use and learn.

Steps for Keli's μ Vision IDE are

1. Choose a project target device from the Device Data base and tool settings.
2. Generate source files in C programming, C++ or Assembly language.
3. Using a project manager create a application.
4. Fix and correct the faults in source files
5. Flash ROM or SRAM are used test.

3. IMPLEMENTATION

When the power supply is turned on all the components in the circuit will be turned on, the microcontroller AT89S52 will turn on the Zigbee module of the kit in the transmitter side, here as we can see in above block diagram we are having two IR transmitter & receiver pairs, these two IR sensor transmitter and receiver pairs are used to notice the incoming (or) outgoing of the train, these are placed on either sides of the tracks and will always be in high state. When the train crosses IR sensor pair they will record a low state and this signal will be sent to the transmitter Zigbee module using microcontroller AT89S52. This transmitter Zigbee module will send this low state signal to the receiver Zigbee module wirelessly.

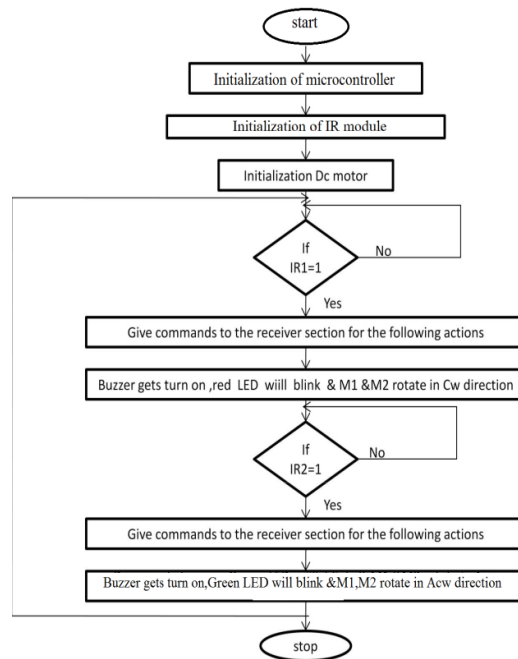


Fig.3.Flow chart for proposed system

At the start we initialized microcontroller IR module and DC motor. If IR1=1 we will give commands to receiving section for the following actions i.e. buzzer get activated, red LED will blink and M1 & M2 motors will rotate in clock wise direction. If IR1 is zero then it direct rechecks of IR1. If IR2 =1 we will give commands to the receiving section for the following actions i.e. buzzer gets activated, green LED will brink and M1 & M2 motors will rotate in anti-clock wise direction. If IR2 is zero then it direct rechecks of IR2. This process keep on continues.

4. RESULTS

The proposed method for Railway Gate controlling has been well execute and certified. assimilate lineaments of all the hardware peripherals used for devolving. Each element has been resolve and fixed carefully thus enrich to the finest functioning of the section. Then after that using greatly leading integrated circuits and the architecture has been strongly resolved with the help of developing technology. The Microcontroller 89S52 performs the entire activity i.e., sensing the train, close the gate and winding up.

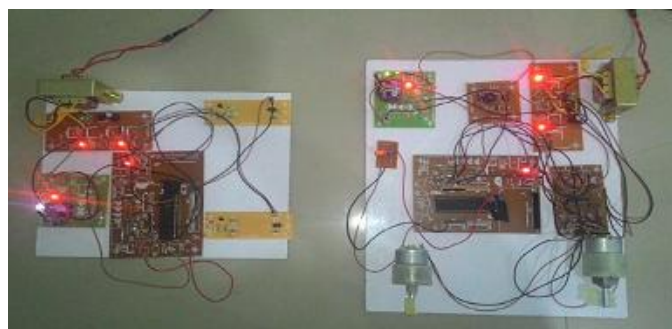


Fig.3. Project setup

Following great usage of the suggested system. It might have been tried for its fitting attempting. Following mix for every last one of difficult ware parts and product establishment we bring began my framework Furthermore we bring convey through commands the individuals need aid beneath indicated.

5. CONCLUSION

The proposed system introducing an economically less budget and less power utilization embedded system for railway hazard controlling system. The design of Automatic Railway Gate controlling and signaling using AT89S52 Microcontroller (Atmel) as hardware rostrum and Zig-Bee using as communications platform. Zig-Bee can transmit, receive and display the track, train information. The result of this new inventive technology going to increase the security of the railway transport system and in real time application railways can escape accidents proximately 70 percent. If the system is fully automated then it avoids the human failures and gives extreme safety to roadsters.

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