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Automatic Railway Signalling System

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Abstract There are numerous railroad intersections which are unmanned because of absence of labor, expected to satisfy the requests. Consequently, numerous mischances happen at such intersections, since there is nobody to deal with the working of the railroad door when a train methodologies the intersection. The goal of this paper is to deal with the control arrangement of railroad entryway utilizing the microcontroller. The proposed model has been planned utilizing 89S52 microcontroller to maintain a strategic distance from railroad mishaps happening at unattended railroad doors, if executed recognition of train drawing nearer the entryway can be detected by method for two sensors set on either side of the door. This work uses two effective IR sensors; one of these IR sensors is settled at upside (from where the train comes) and comparably the other vicinity sensor is altered at drawback of the train course. Sensors are settled on both sides of the door. We call the sensor along the train bearing as 'foreside sensor' and alternate as 'after side sensor'.

Index Terms- AT89S52 , Sensors ,Motor, Gate

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I. INTRODUCTION

Railroad security is a urgent part of rail operation the world over breakdowns bringing about mischances generally get wide media scope notwithstanding when the rail route is not at shortcoming and provide for rail transport, among the ignorant open, an undeserved picture of wastefulness regularly fuelling calls for prompt changes. This paper is gone for helping the railroad organizations worried to reinforce their wellbeing culture and build up the checking devices required by current security administration. Railroad collaborations are extremely interesting, exceptional, possibly risky but avoidable on the planet. Here two distinct substances with completely diverse obligations, spaces, exhibitions meet up and unite for a solitary reason for giving an office to the street client. Amid the typical operations additionally, there is each plausibility of mischances happening even with next to no carelessness in methodology and the outcome is of high hazard.

The potential for mischances is made higher as the railroads control just a large portion of the issue. The other half, in the mean time, can't generally be said to be controlled by one element, as despite the fact that activity tenets and street outline benchmarks probably exist, the developments of street clients are not composed and checked by one particular substance as unbendingly as rail developments. The railroad frameworks for Asia and Pacific are no special case to this. Every year, mischances at level intersections not just purpose fatalities or genuine wounds to numerous a great many street clients and railroad travelers, additionally force a substantial monetary weight as far as interruptions of rail route and street administrations and harms to railroad and street vehicles and property.

A. Problem Statement

The aim of this paper is to be able to avoid Train Accident and Indian Railway Technology. These particular topic our choose because of Railroad related accidents and landslides are more dangerous than other transportation accident 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.

B. Objectives

1. To design a system that will enhance the existing railway gate control system.
2. To design a system which based on the 89S52 microcontroller for opening and closing the gates.
3. To reduce the time for opening and closing the gate.
4. To replace the gatekeeper by automatic control system.
5. To provide the reliability as it is not subjected to the manual error.
6. Provide the gate crossing timing of the train on seven segment display.
7. To implement a simple n cost effective system.

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C. Scope

Nowadays, the railway gate is operating by manual operation. It is operating in the area that there are railway line junction with the road. The railway gate management has to employ workers to be on duty for control the operation. Due to this, the worker will manually open and close the gate with under supervision.

II. LITERATURE SURVEY

A writing audit, writing overview is a content of an insightful paper, which incorporates the present learning including substantive discoveries, and in addition hypothetical and methodological commitments to a specific point. It is directed before the paper begins to give a thought regarding the current frameworks in that field and their upsides and downsides and includes a study and audit of pertinent writing materials in connection to a point. With the upgrade in advancements there is likewise need of computerizing all the current Railway systems which requires bunches of manual work. More mischances occurring because of Landslides in the sloping territories. The administration of railroads is diminishing immensely. At present scenario, in the level crossing line the railway gate is operated normally by a gate keeper.

Sr. No.	Research Paper	Authors	Description
1	Alarm System of Railway Gate Crossing	Burra. Raju, B. Sreenivas	Reason for choosing this paper because the objective of this paper is to overcome the problem by assuring
2	Smart Rail Track Director based on PIC Microcontroller at npeducations.com	P. Santhini, B. SahayaJeli, D. Srimathi, M.Malarvizhi, S.Ashvini	The destination of each train is changed or diverted to link the different

TABLE 1. Literature survey

III. SYSTEM ARCHITECTURE

Presently a days, India is the nation which having world's biggest railroad system. Over many railroads running on track each day. As we realize that it is without a doubt difficult to stop, the running train at moment is some basic circumstance or

crisis emerges. Train mischances having genuine repercussion as far as loss of human life, harm, harm to Railway property. These weighty train mishaps - incorporate Collision, Derailments, Fire in Trains, and Collisions of trains at Level Crossings. subsidiaries of p-phenylene vinylene and polystyrene.
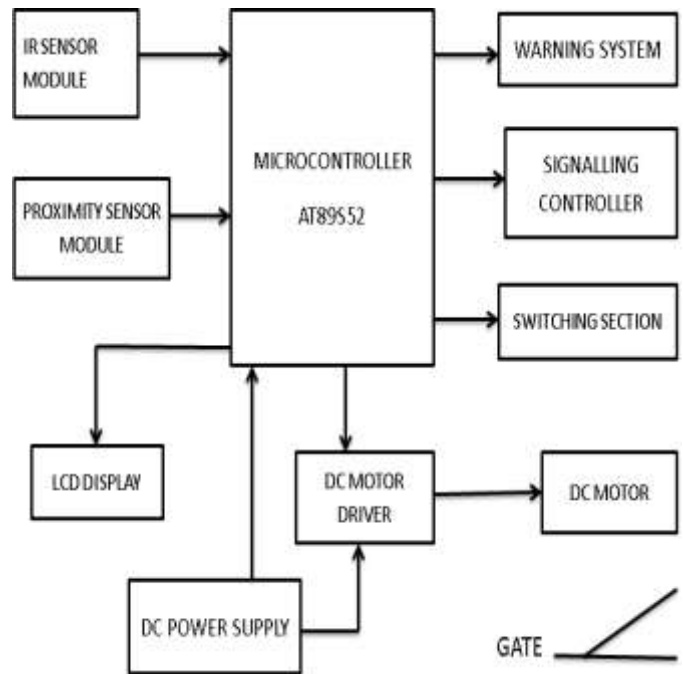

Fig 1.Block Diagram

As shown in block diagram Fig 1, all sensors are connected to the main controller unit. At output section warning system, signal system, switching section as well as DC motor connected to gate panel. With the help of IR and proximity sensors detection of train is carried out. The sensors are fixed at the certain distance on both sides of the gate, that is before the train arrive and after the train departure.

A. Hardware

1.Microcontroller AT89S52: 8051 is the member in a big family of microcontrollers. The device which we used in our paper was the 'AT89S52' which is a typical 8051 microcontroller manufactured by Atmel. The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8Kbytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pin out.The 89S52 has 4 different ports, each one having 8 Input/output lines providing a total of 32 I/O lines. Those ports can be used to output DATA and orders do other devices, or to read the state of a sensor, or a switch. They can be used for two different functions.

2.IR Sensor: The infrared transmitter & receiver are designed to sense the presence or absence of partitions such that lighting functions change to accommodate the appropriate size space. An infrared sensor is an electronic device that emits and/or detects infrared radiation in order to sense some aspect of its surroundings. Infrared sensors can measure the heat of an

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object, as well as detect motion. Many of these types of sensors only measure infrared radiation, rather than emitting it, and thus are known as passive infrared (PIR) sensors.

3. DC Motor: A DC motor is a rotary actuator that allows for precise control of angular position, velocity and acceleration. It consists of a suitable motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with DC motors.

B. Software

1. Embedded C: Embedded C is a set of language extensions for the C Programming language by the C Standards committee to address commonality issues that exist between C extensions for different embedded. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory, and basic I/O operations.

2. Keil U-Vision: The program is developed by using this software named as a KEIL u-Vision. It acts as a compiler, in which the program is written in ".C" format.

IV.   ALGORITHM

Step 1. Make intial settings of the signals for the   train and platform users.

Step 2. Check for the arrival of the train in either direction by the sensors. If the train is sensed
go to step 3 otherwise step 2.

Step 3. Make the warning signal for the platform users and set the signal for the train.

Step 4. Check for the presence of any obstacle using sensors. If no obstacle go to step 5,   otherwise repeat step 4.

Step 5. Stop warning and close the gate.

Step 6. Change the signal for the train.

Step 7. Check for the train departure by the sensors. If the train is sensed go to next step, otherwise repeat step 7.

Step 8. Change the signal and open the gate.

Fig 2.Algorithm

For the operation of pressure switch:

Step 1. Set input at logic 0.

Step 2. If there is a load on the track go to Step 3, otherwise go to step 2.
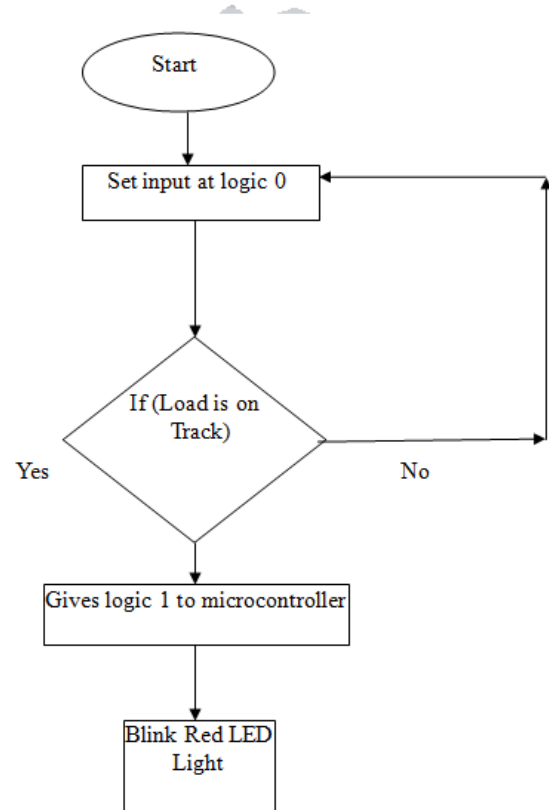
Step 3. Blink the Red LED light.

Step 4. Train is stop.

Fig 3.Algorithm for the operation of pressure switches

V.   ADVANTAGES

1. Prevention of accident inside the gate.
2. Reliable machine which operates the railway gate even without gatekeeper which makes it useful for operation at unmanned crossing.
3. Easy learning system.
4. Easy to implement.
5. Compatible with existing system.
6. All the operation is automatic.
7. Cost effective system.

VI.   DISADVANTAGES

1. This paper is not able to avoid collision of two or more trains.
2. If there is any kind of power, connection it may result in fatal accidents which will be extremely costly in terms of time, money and lives.

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VII.   CONCLUSION

As every product which is developed or engineered earlier needs to be modified with some minor or major changes to make those product consistent. These modifications are the need of the moment which must be brought to the market at the specific instance of time.The modifications which are to be or can be brought to a specific product and those modifications and enhancements are been recognized while development phase of the product but are not fulfilled; which is said to be conclusion of the paper.

VIII.   FUTURE SCOPE

This paper has satisfactorily fulfilled the basic things such as prevention of accidents inside the gate and the unnecessity of a gatekeeper. But still the power supply for the motor operation and the signal lights. It can be avoided and a battery charged by means of a solar cell. It can be used directly during daytime and by charging the battery during night. In future, the feature anti-collision may get added in the system, which is used to avoid train to train accidents from same track. Systems likely to be available in future for the protection of level crossings are of following types:
1.Advanced Radio-based Train Control System
2.GPS-Based Advanced Train Control System

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