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The Advance Red Signal Alerting System for Train Using Wireless Communication Network

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Abstract:

Human incompetence and human error have been the prime cause behind multiple train crashes in India. The main aim of this project is to prevent train crash and train collision using wireless communication. Our device is useful for train driver. To maintain the train traffic, large quantities of signals are needed at pre-set distances. Traditionally, a train driver needs to hold a continuous watch for any red signals that may show on the post. The train driver then determines whether to halt or to proceed on his designated route on the basis of these signals. But it's very troublesome for the drivers to have an eye out for any visual symbol. To make life for train drivers and the repair workers as well simpler, engineers have come up with an ingenious technology called as wireless red signal alerting for trains. At this time train would be progressively sluggish they still allow for a strong control device.

Keywords ***—RF Module, Microcontroller, REED Switch, Embedded System***.

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I. INTRODUCTION

One of the world's largest train networks is the Indian Railways. Managing and running such a wide network is not simple for the Indian Railway Network. The railway network comprises of a plurality of intersecting points and some signals fixed train flow intervals. To date, the train driver has to track all the red signals of the post on a linear basis and determine whether to halt or to transfer the train at the station. Any single signal for the drive is very challenging to keep track of linearly. It provides an automated warning feature to alert the driver of any red light in front of it. Full assembly is based on RF technologies. The transmitter circuit is fitted with a timer circuit and mounted on a signal pole. Circuit transmitter for a specified time interval to the RF beam generated between the pulse. Only if the RED signal is on, the key is switched on. These loops of the RF beam are replicated until the RED signal is in effect. Linear RF signals tell about the RED signal are sent by the transmitter. In the train is installed an RF receiver circuit. This is located such that the RF beam is given. Afterwards, the train receives the RF signal as input and transmits it to the microcontroller whenever it flies between the RF transmitter's some range region. This receiving data is then interpreted by the microcontroller driver to alert the driver of the signal in front.

II. PROPOSED SYSTEM

The goal of this work is to design and implement automatic red signal alerting in railway system to prevent the train accident. In this project transmitter fitted on signal pole, then RED signal is turned ON through control room. Transmitter continuous transmits RF waves informing the signal. The

receiver circuit fitted in train. Trains come in proper range of the RF transmitter. Capture this signal and demodulate this signal. Microcontroller process on it then alert the driver and automatically motor will be slow.

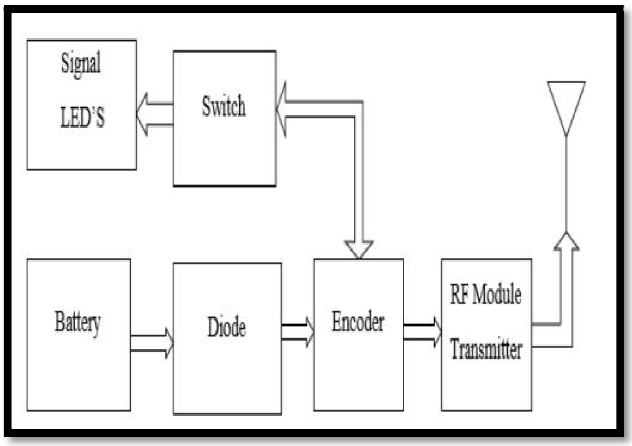

Figure 1: System transmitter and Receiver section diagram

The accidents at unmanned level crossings and collision of trains running on same track are the major accidents in railways which cause heavy human causality and damage to train. Hence it is proposed to develop a fail proof system to avoid such accidents.

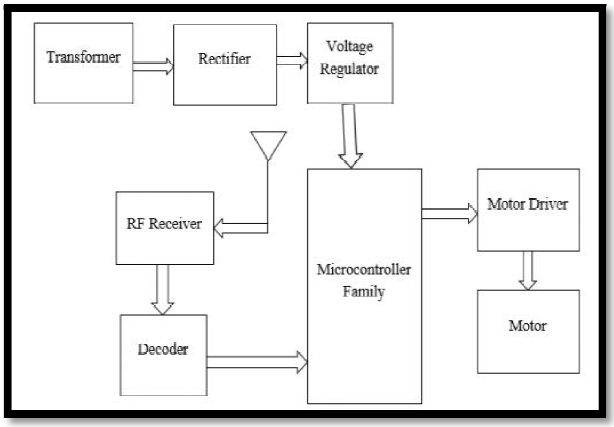

Figure 2: System block diagram

The unmanned level crossing is fitted with obstacle sensor and automatic gate closing mechanisms and Zigbee. The PC in the master control room will receive information via Zigbee from the train and continuously estimate the distance between the train and the unmanned gate. When the train is nearing an unmanned gate, server will monitor the status of obstacle in the gate. If an obstacle is sensed then command will be issued to stop the train at a safe distance. If no obstacle is sensed then the server will issue command to close the gate with an alarm/siren. In addition to automatic unmanned gate closing, the prevention of collision between two trains running on same track will also be implemented.

III. SYSTEM WORKING

First of all, whenever any train present on railway station. Transmitter circuit fitted on signal pole. red signal turns ON through control room. Now our system gets started, Encoder are used analogy signal is converted into digital signal and this signal continuously transmitted by Transmitter. Here whenever any train comes in the range of 2 km at that time, receiver module already fitted in train.

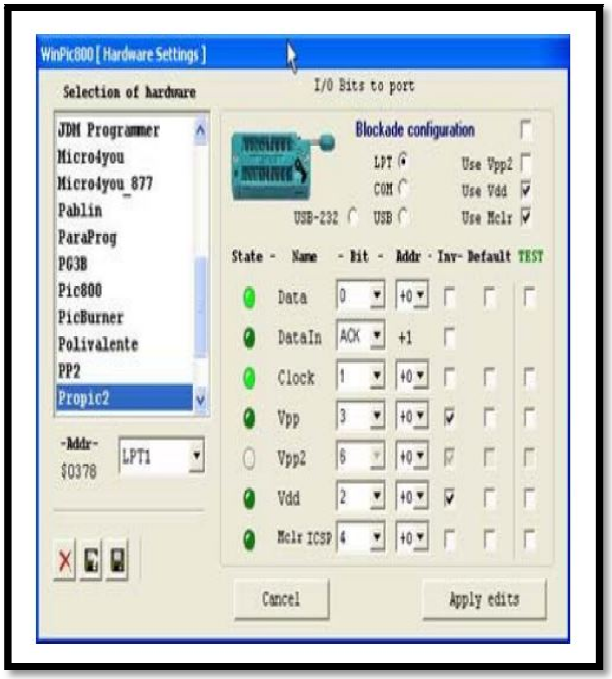

Figure 3: Diagram of Hardware Setup

It will be receiving RF signal and demodulate this signalize. analogy signal. This analogy signal goes

to microcontroller will be process on it, then automatically motor will be gradually slow this process will be controlled motor driver IC.

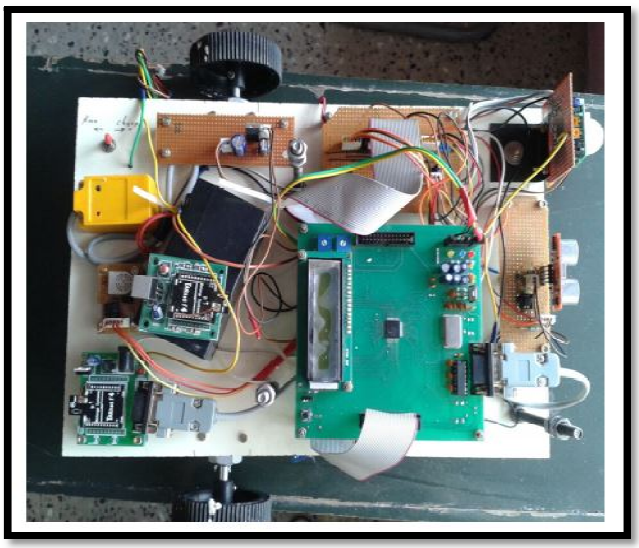

Figure 4: Project diagram setup

The present current mechanism is completely manual and human-controlled; after the train exits the station, the station master alerts the gatekeeper that the train has arrived through the mobile. The gatekeeper collects the details and locks the gate based on the arrival time of the train. If the train is late owing to such circumstances, so the gates will stay locked for a long time triggering significant traffic jams near the gates.

At present, signals are regulated by means of interlocking and alert signs. Through using automated railway gates regulation, these gates can stay locked for a limited period at the crossings than the manually managed ones. This can be employed in locations where the probability of dangers is greater, and reliability is a must. As the procedure is automatic; errors attributable to the activity are avoided. Therefore, this will eliminate the overload in train injuries.The Keil C51 C Compiler is the most popular 8051 C compiler in the world. Its supply's more features than any other C compiler.

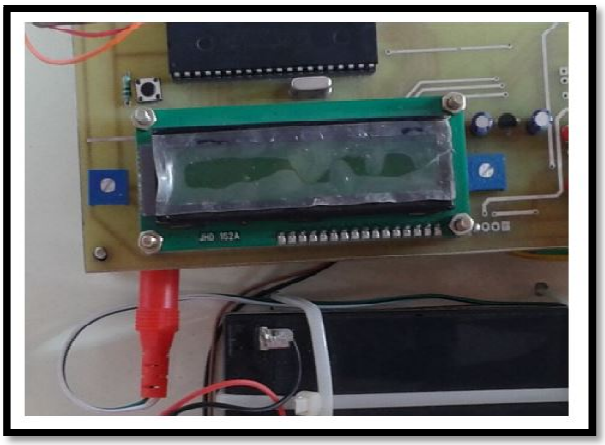

Figure 5: Result final display diagram

It gives you allows to write 8051 microcontroller applications in C that have the efficiency and speed of assembly language. Also, it gives you full access to all resources of the 8051. The C51 Compiler translates C source files into re-locatable object modules which contain full symbolic information for debugging with the µVision Debugger or an in-circuit emulator. In add any other object file, the compiler generates a listing file which include symbol table and cross reference information

IV. RESULT AND DISCUSSION

The present existing system is manually and human controlled system, once the train leaves the station, the station master informs the gatekeeper about the arrival of the train through the telephone. Once the gatekeeper receives the information, he closes the 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. No centralized system is available, presently signals are control by mean of interlocking and warning signs and signal device, which is totally semiautomatic system. By employing the automatic railway gate control at the level crossing, the time for which it is closed is less compared to the manually operated gates and also reduces the human labour. This type of gates can be employed in an unmanned level crossing where the chances of accidents are higher and reliable operation is required. Since, the operation is

automatic; error due to manual operation is prevented. And implementing the work railway system can be centralized which can control the accidents

V. CONCLUSIONS

Designing wireless and red warning signal for cars. The device is revolutionary to eliminate train collisions. We recommend that the train avoid automatically in Indian railways by not controlling the train schedule so far. This invention strengthens travel and allows things much better across the train line. We assume that this shared purpose can be fulfilled both by the Railways sector and the regulator.

Crossroad safety systems for manned and unmanned level crossings have been built with a microcontroller to provide additional protection for road users via audio-visual indication. The automated railway gate controller may also be used to reduce the incidence of injuries at unmanned crossing stages. Since the architecture is entirely automatic, it can be used in distant villages where there is no station master or line guy. It often saves time by automating, while manual systems require time for a line man to notify the station master about shutting and opening the doors, which takes a large period of time. Often, there are minimized risks of a mistake when it is entirely automated. This design is also very beneficial for rail use.

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