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Wireless Red light Alerting System forTrain by Voice

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Abstract

India is known to be worlds third largest railway network with 11.5K KM of track , 13.1K KM of bridges , and 7K stations . As per a survey between the year 2014 and 2015 Indian Railways has carried over 8 billion passengers in India . Thus managing the schedule of the train is not simple .

Still in today's world train driver has to track all the red signals at the stations so as to determine whether the train driver should stop the train or keep moving forward. Due to human negligence that results in train cashes in India . To maintain such huge amount traffic , a very large quantity of signals are required . Here comes forth our project which is to prevent the train crashes and collisions using wireless communication system . To maintain such huge amount traffic , a very large quantity of signals are required .

Keywords: Arduino UNO , SD Card Module , IC7805 Regulator, Speaker, LCD Display 16x2, Amplifier board,I2C Protocol, RF Transmitter and Receiver.

Introduction

Railways are mostly used in railways as a comfortable medium of transport. But also in India many train accidents has occured due to slight human errors. Therefore it is very difficult to get rid of such accidents as trains are at high speed and it utilizes quite some time to slow the train down .

There are around 24K railways accident fatalities in that yearand around 70-75% of these accidents were caused due to collision of trains .Hence the proposed solution would be to use Radio Frequency Identification (RFID) .

Hence Our goal is to find the possible train collisions that is going to happen in future and then send the report to main control room or driver . At present there is no current solution but we came with an idea to minimize it to avoid these collisions . At first the track number is shared with the nearby station using radio frequency system . We propose a unique way of displaying the train networks . If two trains are travelling on the same track so say the train network is busy due to some reasons, then system will send the voice message through speaker connected at the drivers nearby location so that the driver can take appropriate action.

We hope that the project made by us can make a significant improvement in the safety of the people travelling through train .

Literature Review

1] In One of the Study from IARJSET the put forward a study called " Wireless red signal earning for trains ". It is a new mechanism to keep the trains away from crashing caused many train accidents has happened due to the poor management from the railways . Its also very promising technology , if our Indian railways implement it , we will have much less

casualties than in our present condition .

2] One of the leading companies environ technologies published one of the paper given by volume 6 ,in 2017 . In that paper they proposed about unmanned level crossing where no one is present to manage the crossing which can lead to serious injuries. The microphones alert system will alert the driver in advance to minimize the error .

3] On February 10, 2014 journal of International Research in science , Engineering and Technology published that they will use micro controller for gate crossing protection system.via an audio or visual indication to road users. As a result this technology can be used to minimize the number of accidents that takes place in unmanned railways gate crossing .

4] Back in 2013 IEEE India Conference proposed a system. In there study Radio frequency Identification (RFID) is used . It detects any upcoming collisions and deliver those reports to main control station before it occurs.

Thus ACD also known as Anti-Collision Device is installed on each train to keep the passengers safe.

Proposed Model

Working description :

The goal or objective of the project is to implement eh red signal alerting in railways with voice so that whenever any train is present at the station the station master relays if track is free or not . if the track is not empty then from the station signal is transmitted continuous in the form of RF waves to the receiver circuit fit in the train .

As both outcome, whenever the train goes through into the RF transmitter's range. The signal is intercepted by the receiver, which therefore demodulates it. When the system is ready to use encoders, digital signals are converted into digital signals, and these signals are constantly transmitted by RF transmitter.

When a train with a receiver comes within 100 m of the train, the receiver module that is already installed in the train is triggered. It will receive an RF signal from a nearby station, that it will then demodulate into such an analog form. Depending on the signal received, this one will enable the motor to slow down slowly.

Above mentioned process will be controlled by a motor driver IC, which then Arduino processes and alerts the driver with voice message , which will make the motor go slow .

At present these signals are regulated by interlocking and alert signs . this can be employed in locations where probability of harming the receiver is low . As the procedure is automatic with the help of receiver fitted in the train , as any train comes within the proper ranger the RF captures those signals .

Block Diagram :

Figure 1 : Block diagram Of Transmitter

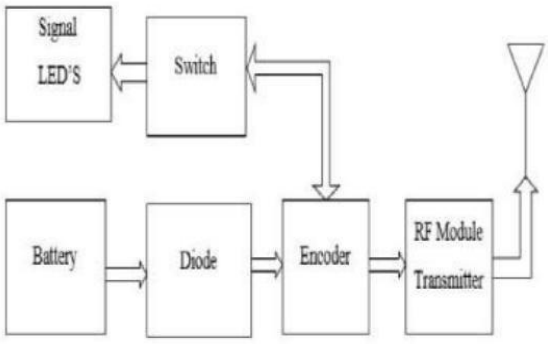


Figure 2 : Block Diagram Of Receiver

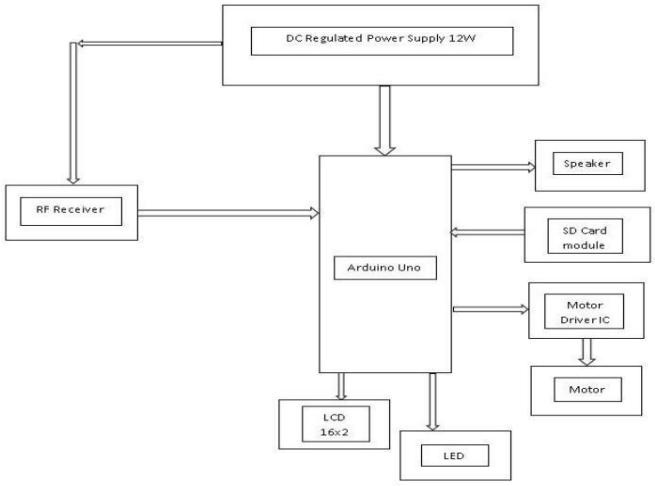
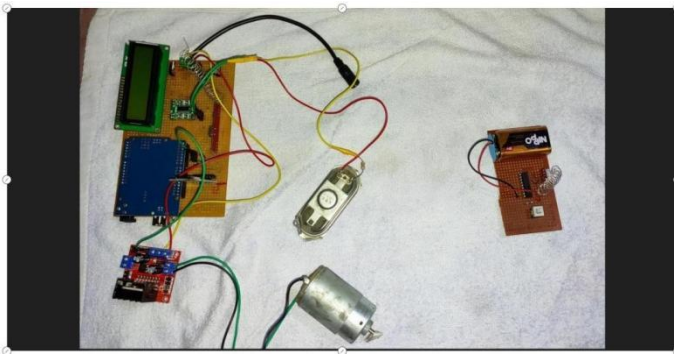


Figure 3 : PCB view of complete Circuit



Objectives

The main goal of the module in our proposed methodology is to implement red signal alerting in railways to prevent any such accidents.

The Project is to make the Alerting Red Signal System in Railways to avoid the Accidents that may or may not be caused by the Drivers Driving the trains.. To check the Red Signal if the Line of Railway is Busy. To avoid mismanagement during Signaling.Regularization of Train Traffic Conclusions

Our proposed system is a product technology that is put in place to prevent train accidents. Train accidents in Indian railways are induced by fail to comply the timetable established by the railways. As just a result, we suggest that the train be stop automatically. Our proposed system will offer railway transportation and make it far safer.

Because wireless sensor networks may operate in remote areas and are simple to set up, they will undoubtedly meet the demand for new signalling systems, which stands for railways. As a result, we can conclude that implementing our proposed railway system will help to improve the safety of passengers travelling by train.

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.

Future work

To cope up with the customer's needs for railway services, various modifications of existing signaling system is needed. The system we proposed for Railway Signaling System gives us all the facilities which was lacking in Existing signaling system.

Various benefits of our proposed signaling system are given below :-

1. To manage timetable of railways.and give them more flexibility in scheduling.
2. Our given system will be useful to avoid train accidents caused during extremely bad weather conditions.
3. Our system can be used and will be helpful in development of modern signal alerting system.
4. Also, via using our proposed technology we can directly stop trains automatically from the main control room .
5. Also We have added a voice alert, purpose of adding voice alert will enable the driver to listen to the alert and the chances of being ignored are very less as the volume will gradually increase till the alert is manually stopped.

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