RAILWAY COLLISON AWARENESS SYSTEM AND AUTO SIGNALLING

R. Manju Bhargavi[1]| P. Anjali[2]| R. Nandini[3] | B. Yasheshwi Bai[4]

1Associate Professor, EEE department, Bhoj Reddy Engineering College for Women, Hyderabad, TS.

2, 3&4 UG SCHOLARS, EEE department, Bhoj Reddy Engineering College for Women, Hyderabad, TS.

ABSTRACT: The current model is intended to shield the locomotive from erroneous signals. Although current train signals function well, there are new technology issues that make train accidents more frequent. Pathway signaling systems currently use all of the latest approaches to maintain proper train signals. This concept suggests a system that has automatic fracture detection in railway tracks in addition to automated railway gates at crossings. Sensor method is used in the implementation of this model. The sensors are positioned at specific intervals from the gate; as a train approaches, they detect it and adjust the gate's operation accordingly. The coordinates are tracked and reported back to the control room for additional measures after the crack is detected. Here, by verifying both stations, we will use RF technology in our design to combat false signaling. In the context of the station signaling system, we are implementing rail-to-rail communication in our study. To operate an efficient locomotive, we are integrating wired, wireless, and electronic switching with various types of railway protective sensors. We are using both electronic and manual switching to implement our prototype model. It is equipped with relay drivers, multiplexers, demultiplexers, encoders, and decoders with motors and bulbs as outputs.

KEYWORDS: RAILWAY, RF, ENCODER, DECODER, RELAYS.

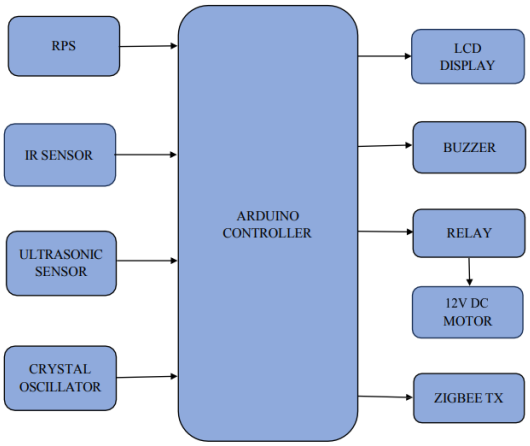
I.INTRODUCTION: The Indian Railway network is one of the biggest rail networks in the world. Indian railway Network Handling and managing such a vast network is not an easy. The rail network consists of a many-junctions and many signals set distances to manage the train flow. So far that train driver needs to linearly check for any red signals on every post and decide whether train stop or move train on station. It is very difficult to linearly keep track of every individual signal for the drive. The propose an automatic alerting system that alerts the driver of any red signal ahead. Full assembling works on the basis of RF

technology. A timer circuit is used in the transmitter circuit and this transmitter circuit is placed at a signal pole. Transmitter circuit to produced RF beam between the pulses for a particular time interval. Then switch is turned ON only when the RED signal is ON. These RF beam cycles are repeated until the RED signal is ON. The transmitter linearly transmits RF signals informing about RED signal. An RF receiver circuit is placed in the train. This is placed in such a way that it receives RF beam. Then the train whenever comes between the certain range area of the RF transmitter, RF receiver circuit receives the RF signal as input and sends it to the microcontroller.

The microcontroller then processes this receiving data for alert the driver about the signal ahead of train. 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 pulses. 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 talk about the RED signal is 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 regions. This receiving data is then interpreted by the microcontroller driver to alert the driver of the signal in front.

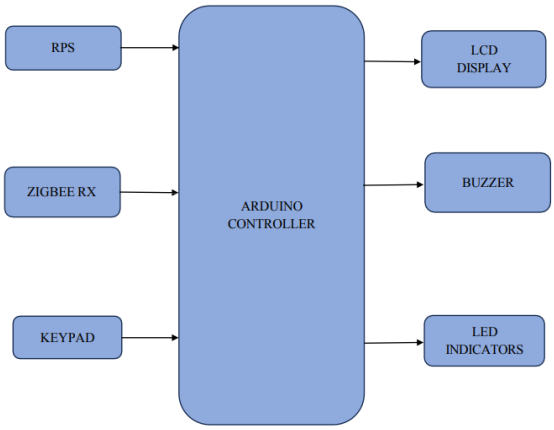
II.PRPOSED SYSTEM: First of all, whenever any train present on railway station. Transmitter circuit fitted on signal pole. Red signal turns ON through control room. Now our system gets started, Encoder are used analog signal is converted into digital signal and this signal continuously transmitted by RF transmitter. Here whenever any train comes in the range of 2 km at that time, receiver module already fitted in train. It will be receiving RF signal

and demodulate this signal. i.e., analog signal. This analog signal goes to microcontroller will be process on it, then automatically motor will be gradually slow this process will be controlled motor driver IC.



2.1 TRANSMITTER SIDE BLOCK DIAGRAM

The implementation of wireless red signal warnings for trains. This revolutionary technique is intended to prevent train accidents. In Indian railways, train accidents have occurred due to poor timetable management; therefore, we propose an automatic train stop. Therefore, this design is very applicable to railway applications**.**

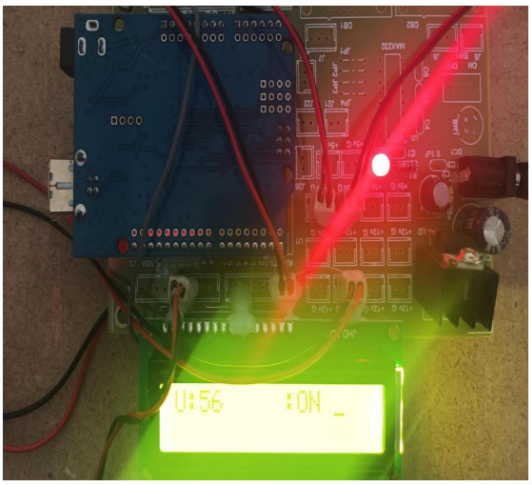


2.2 RECIEVER SIDE BLOCK DIAGRAM

This technology enhances and greatly increases the safety of rail transit. We believe that the railway industry and the regulator must work together to achieve this common objective. Level Crossing protection systems are designed using microcontrollers to provide extra safety shields at both manned and unmanned level crossings by an audible and visible signal to road users. Thus, the automatic railway gate controller can be utilized to limit the occurrence of accidents at unmanned level crossings. Since the design is fully automated, it can be implemented in rural villages where there is no station master or lineman. Additionally, it saves a great time because it's automated, where manual systems require the lineman to inform the station master to close and open the gate, which consumes a great deal of time. As it is

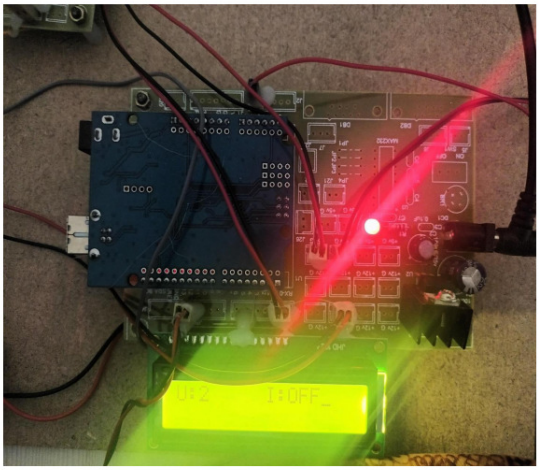
automated, there may be some chances of errors.

III.RESULTS: Whenever there is no any obstacle at ultrasonic sensor and IR sensor then the buzzer shuts off and the DC Motor rotates.



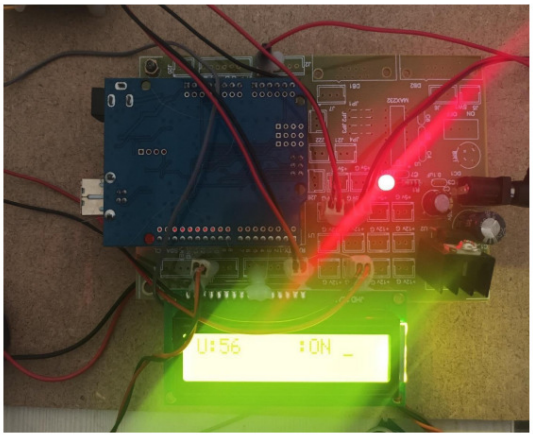
3.1 No Obstacle at IR and UR sensor

Whenever there is any obstacle at ultrasonic sensor then the buzzer will turn ON and LCD displays IR: OFF and UR displays the distance of the obstacle from ultrasonic sensor. So, the DC motor will not rotate due to obstacle detection.



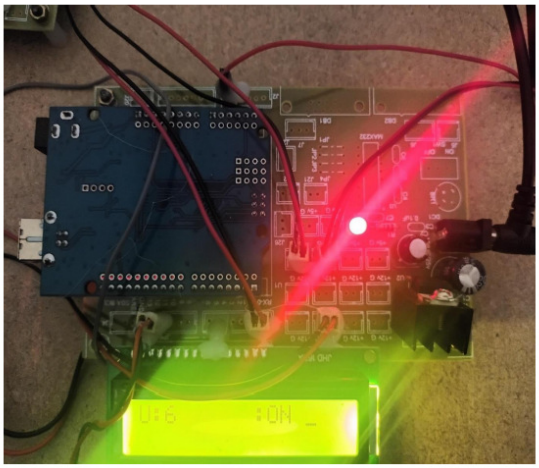
3.2 Obstacle at only UR sensor

Whenever there is any obstacle at IR sensor, the buzzer will turn on and LED displays as IR: ON and UR displays long distance. So, the DC motor will not rotate due to obstacle detection.



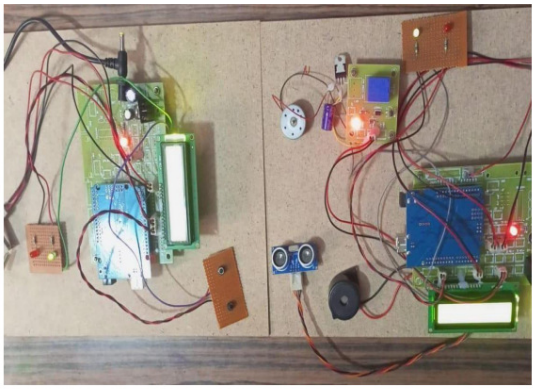
3.3 Obstacle at only IR Sensor

Whenever there is any obstacle at both Ultrasonic and IR sensors then the buzzer will turn on and LED displays as IR: ON and shows the distance of the obstacle at UR sensor. So, the DC motor will not rotate due to obstacle detection at IR and UR sensors.



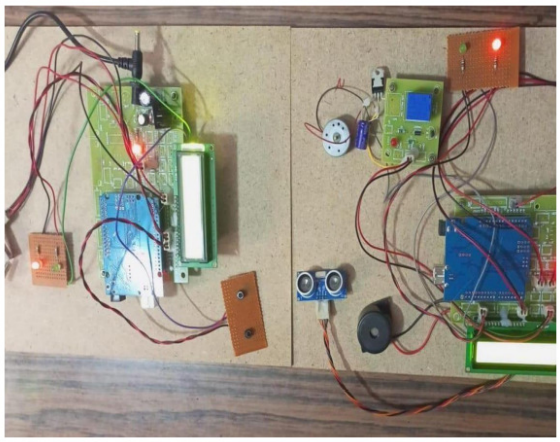
3.4 Obstacle at only IR and UR Sensor

Whenever green signal is given from the control room from the transmitting side then the same signal will reflect on the receiving side at the other station. As the green signal indicates the absence of obstacle, buzzer shuts off and DC motor will rotate.



3.5 Green Signaling

Whenever red signal is given from the control room from the transmitting side then the same signal will reflect on the receiving side at the other station. As the red signal indicates the presence of obstacle, buzzer shuts ON and DC motor will stop to rotate.



3.6 RED SIGNALLING

IV.CONCLUSION: In order to prevent train accidents caused by obstacle detection and fault signaling, automatic railway signaling and traction systems are being studied and put into use. For obstacle detection in this project, we are utilizing ultrasonic sensors, and for obstacle detection at the traction side, we are using infrared sensors. This system will use an LED to show the status of the infrared and ultrasonic sensors, and a buzzer to alert users to obstacles. The DC motor only runs while the infrared and ultrasonic sensors are deactivated, meaning that no obstruction should be present at any of the sensors. Train accidents on Indian railways are mostly caused by a poor timetable management system. So far, we recommend that the train come to an automatic halt. The railway system's transportation is enhanced and made considerably safer by this technology. We think that cooperation between the railroad sector and the regulatory body is essential for success in order to accomplish that shared objective.

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