

# Auto Platform Connectivity Using Zigbee

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**ABSTRACT:** The primary objective of automatic railway bridge system is to help the physically challenged passenger to move from one platform to another. Crossing the railway track inside the railway station is very difficult. But it is quite difficult to the handicapped and aged persons to cross the railway track without the help of others. In this paper the agents make use of a set of resources train characteristics, driving rules and information about other trains to generate their action policy. The proposed system uses the train time for opening and closing of bridges. It also confirms the presence of the train using a sensor which is placed at a certain distance away from the platform. In this project, we propose auto platform connectivity between two platform using zigbee. In this system we are automatically connect two platforms when train is not arriving using zigbee, these platform will disconnect automatically when train is arriving. These system decreases the death rate of people.

**KEYWORDS:** HardwareSensors,ZigBee.

## I. INTRODUCTION

This automatic railway platform project is used for automatically closing or opening of the mobile platforms in between the train tracks. Normally the mobile platform connects the two platforms, through which the passengers can walk on the platform to reach the next platform. Indian railway network is the one of the biggest rail network in the Asia. Railways are recognized as a one of the safest mode of mass transportation and Safety has been recognized as the key issue for the railways networks. To make it a safe and reliable system is an enormous challenge. Unmanageable platform crossings are one of the problem areas for the Indian Railways, and one of the major issues of death. In spite of various measures taken by the Indian Railways, platform crossing deaths have continued to occur, that too frequently. Crossing the railway track inside the railway station is very tedious especially for handicapped and disabled person. They find it quite difficult to walk over the over bridge for crossing the platform. To solve this problem we use a new approach called Automatic Railway Bridge System. This can be installed in major subway stations and stations where the distance between the station platforms is increased due to curve. Recently, advancements in information technology have enabled applying sensors to railway environments such as IR sensors. Also technology for wireless data transfer system. The objective of IR sensor in railway station is to sense train movements on the bridge before it opens. Therefore when emergency situation arises, immediate recognition and response to the situation is possible. The system may be semi-manually driven or semi-automatic or may be fully automatic. Normally a common man thinks that to design is to create a system or device which should be perfect or ideal in the given system. But in engineering language designing is completely different. In engineering, it is to innovate or create or to modify the existing system so that it works efficiently under the given constraints or existing conditions. Here the designing follows some specific steps which even if followed by a layman will make him able to create small and useful things.

## II. RELATED WORK

Working of Transmitter : The microcontroller used in it i. e. 8051, that has total 40 pins to which IR sensors are connected using a wireless network that is zigbee. Zigbee has a transmitter section through which data obtained will be transmitted to microcontroller via connector when it detects the train.

In this circuit there are 4 IR sensors are interfaced to controller at port P0. The timer IC555 works in astable multivibrator mode. Zigbee is connected to the microcontroller at RXD and TXD i. e. pin no. 10 and 11 of

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microcontroller. The required 5V supply is given to microcontroller through power supply design using IC 7805. It is also three terminal IC which gives the required 5V supply from AC mains via transformer action passing it through the bridge rectifier circuit. Zigbee requires 3V supply hence it is given through the LM317 which give it a 3V supply.

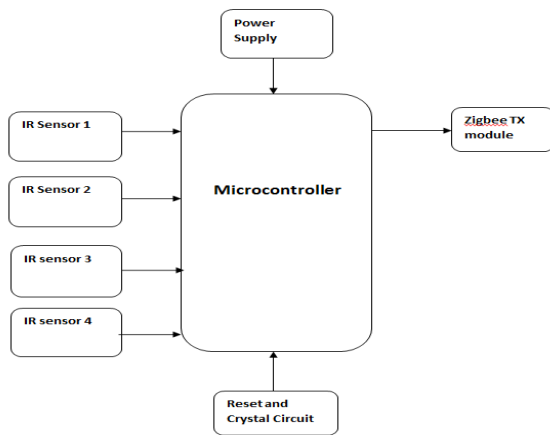


Fig. 1 Transmitter Section

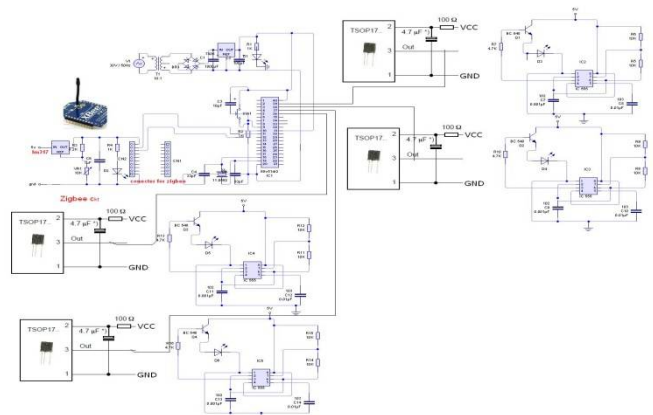


Fig. 2 Circuit Diagram of Transmitter Section

Working of Receiver: It consists of zigbee receiver which operates same as 3V powers supply that of zigbee transmitter using LM317. The zigbee receiver is connected to RXD and TXD pins of microcontroller. DC motor driver IC L293D is interface to receiver microcontroller to drive the motor in clockwise and anticlockwise direction to move the slider connecting to platform backward and forward direction. The required 5V supply is given to microcontroller through power supply design using IC 7805. It is also three terminal IC which gives the required 5V supply from AC mains via transformer action passing it through the bridge rectifier circuit.

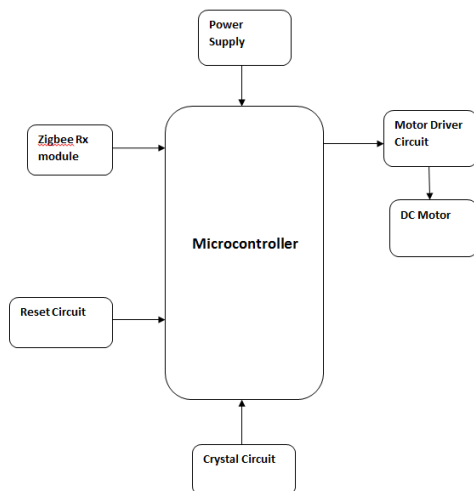


Fig.3 Receiver Section

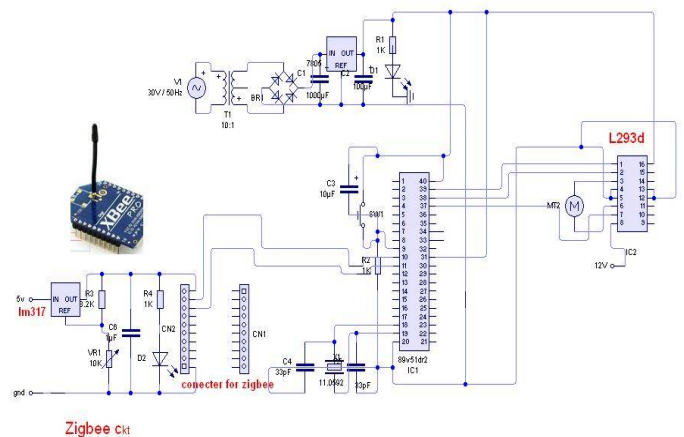


Fig.4 Circuit Diagram of Receiver Section

### III. SENSOR

#### 1. IR SENSOR

Infrared radiation exists in the electromagnetic spectrum at a wavelength that is longer than visible light. Objects that generate heat also generate infrared radiation such as animals and the human body.

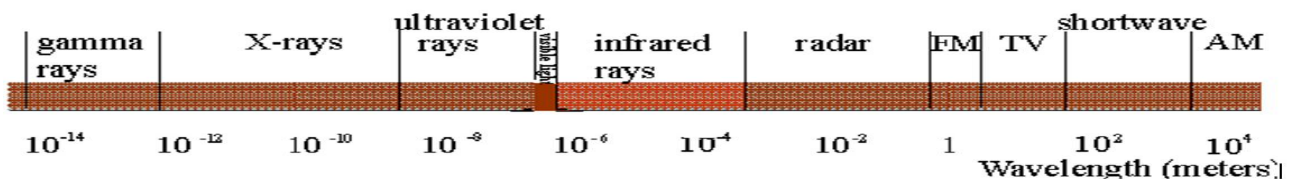


Fig 5. Electromagnetic Spectrum

In the Electromagnetic spectrum the infrared radiation covers the range from 300 GHz (1 mm) to 400 THz (750 nm). It can be divided into far-Infrared, mid-infrared, near infrared. In this section we mainly concentrate on mid-infrared because this range finds many applications in human life like TV remote control, object counter, etc. The mid-range IR ranges from 30 to 120 THz (10 to 2.5  $\mu\text{m}$ ). Hot objects (like black body radiators) can radiate strongly in this range. It is absorbed by molecular vibrations, where the different atoms in a molecule vibrate around their equilibrium positions.

### IV. ZIGBEE

ZigBee was presented as the chip alternative of Bluetooth and Wifi in the beginning of last decade .there was demand for an ad-hoc network, with limited resources and low cost with the ability to hold more clients (Bluetooth has only 7).The main concept was ZeeBee could adopt in different aspects of everyday life and integrate human interaction with environment (e.g. lighting, health care,etc.) without noticing by user .It is focused on monitoring and control and sensor applications by means of low and green energy consumption, while delivering reliability and security.The first zigBee specification was publically available in 2005while the 2<sup>nd</sup> and current one was released on 2007.

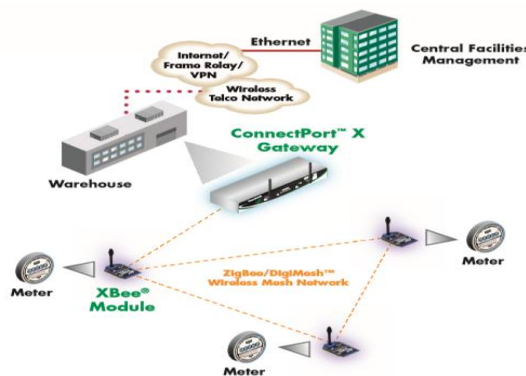


Fig 6. ZigBee Module

In parallel, there is another specification, ZigBee RF4CE which is targeted to applications which do not need the full functionality that ZigBee specification provides such as ZigBee remote control. After the first ZigBee specification has been ratified, the Alliance continued with validation of specification through expanded interoperability and scalability tests which result in newer specifications and increasing number of available. Fig. shows actual ZigBee module. For applications where robust mesh networking topologies are preferred, ZigBee RF modules provide developers with both ZigBee mesh and the soon-to-be-released proprietary Digi Mesh topologies.

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## Features of ZigBee

- ZigBee/mesh and proprietary peer-to-peer mesh topologies
- 2.4 GHz for worldwide employment
- Fully interoperable with other Digi Drop-in Networking products including gateways ,device adapters and extenders
- Common Zigbee footprints for a variety of RF modules
- Low-power sleep modes

## V. ADVANTAGES

1. Due to this concept of connecting the two platforms the tedious job of climbing the staircase has reduced.
2. Again this ideas is very useful for then physically challenged peoples.
3. This system is going to help to carry the heavy loads or parcels coming via railway transportation.
4. In this way the death rate of the people has reduced while changing the platforms.

## VI. DISADVANTAGES

1. This concept of our project is not used for the local railways as the time interval between the two trains is very less.
- 2 Practically to install this bridge is challenging task as the bridge is mobile it will unable to carry heavy load.
3. The management of the people will have to be done by the railway committee to clear the rush on the mobile platform.

## VII. CONCLUSION

The whole work took place in this paper heading towards trying to avoid accidents and reduce the number of fatalities in the field of railway transportation system. Thus basically paper concept through a stone to avoid a two barriers, those of firstly, replacing manned type by adopting unmanned type i.e. fully automatic microcontroller based system, this helps in preventing the death caused near level crossing. To help people those who are physically ill and aged because they are not having enough stamina to climb and cross the track with the aid of flyover, to keep in mind that use of automated plat form bridge is predominant and did the same in this work. This is the step towards help them and also effective method for those who do not use flyover and cross the track along track itself. As the system is completely automatic, it avoids manual errors and thus provides ultimate safety to pedestrians. The mechanism works on the simple principle and there is not much of complex needed in the circuit.

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