

# SOLAR BASED RAILWAY TRACK PEDESTRAIN CROSSING WITHOUT USING STAIRCASE AND AUTOMATIC LIGHTING

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**Abstract:**It is very difficult for senior citizens and physically challenged people to cross the bridge. In railway stations to move from one platform to other platform people take risk without having the knowledge of train approaching, also the pedestrian's carrying heavy luggage's face difficulties to cross the platform using cross over. "Solar based railway track pedestrian crossing without using staircase" can be the solution for above difficulties. By using "Sensor base and manual operators" technology automatically bridge is moved in backward direction. When the train will pass from platform then command will be sent through microcontroller through motor to open it. And by using automatic lightning, the consumption of electrical power can be minimized and for that sensors and microcontrollers are used such that lights get ON/OFF based on motion in a room. The various sensors used for sensing the motion in an area are PIR and IR motion sensor.

**IndexTerms - Railway, Pedestrian crossing, mobile platform.**

## I. INTRODUCTION

In present railway stations normally we use bridges to cross from one platform to another platform; it is very difficult to cross the bridge for physically challenged and elderly persons. Also pedestrians carrying heavy luggage's face difficulty to cross the bridge. In modern times escalator or lift system is also being implemented but these options are either a costly affair or time consuming affair. To overcome these all difficulty found more efficient technique "Solar Based Railway track pedestrian crossing without using staircase and Automatic lightning". The tracking of a train is sensed by sensor; this is used for automatically close/open the mobile platform. Sensors are placed on two sides of track to sense the motion of train. The microcontroller will sense the presence of trains by using infrared sensors. So on sensing the train on one path, the controller will give pulses to the stepper motor to close the mobile platform automatically. As electric power is one of the major concerns, so the concept of the automatic lightning saves the electric energy. For reducing the man power and energy saving, we are using manual system where the light will turn on in evening time and turn off during day time, so that this system saves the energy. The proposed system can be referred as enhancement of current railway system converting the manned and unmanned railway light into automated railway platform. Light control system by using IR sensors. As we have seen the most of power get wasted on railway platform rather than other public sector.

II. PROPOSED METHODOLOGY

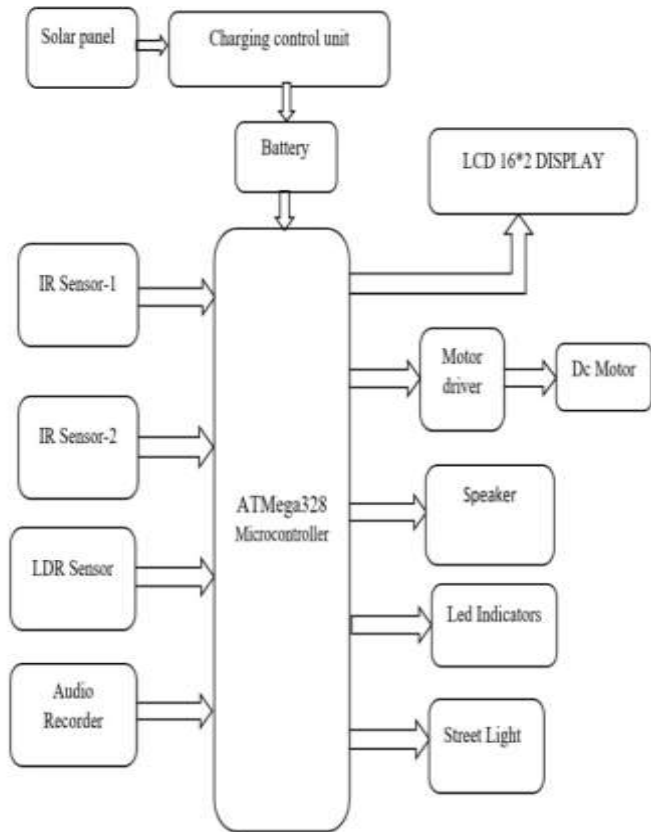


Fig 2.1: Block diagram of solar based railway track pedestrian crossing without using staircase and automatic lighting

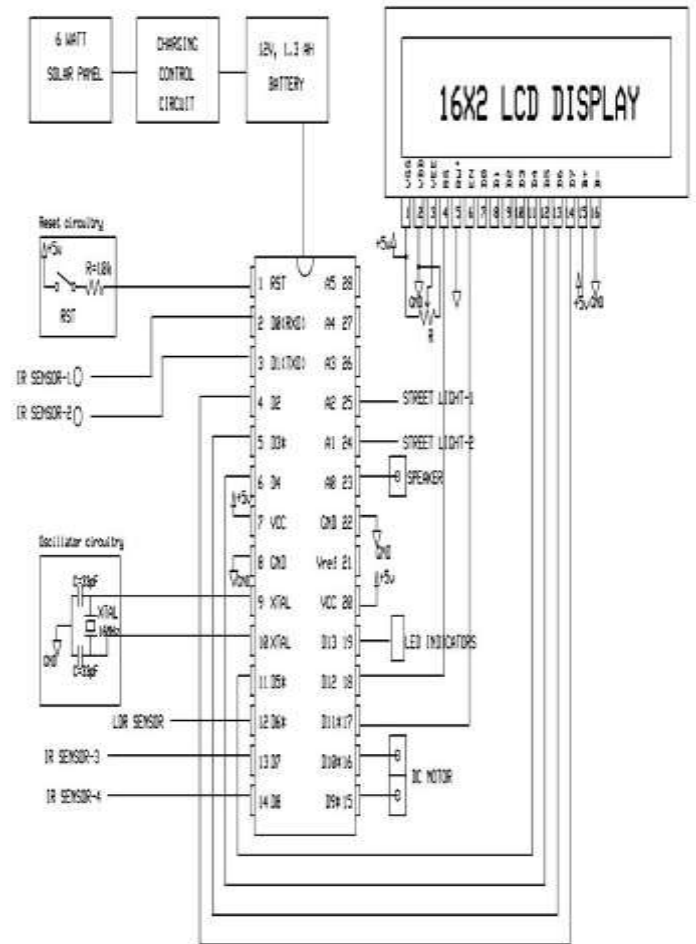


Fig 2.2: Circuit diagram of solar based railway track pedestrian crossing without using staircase and automatic lighting

III. WORKING

The Arduino Microcontroller is the central part. There is a crystal of 16MHz is connected across clock pins (pin 18 &19) to provide system clock. A 33pF capacitor is connected across these pins to cancel harmonic noises. An RC circuit constituted by C1 and R2 are connected to reset pin (pin 9) to reset Microcontroller on each power on time. The Vcc is connected to the +5V line of power supply and the GND of microcontroller is connected to ground terminal of the power supply. Interrupt pins of the microcontroller 2 and 3 are used for connecting entry and exit sensor. Entry and exit sensor consists of IR photo diode and IR LED connected in face to face each other. When IR light falls on the photodiode it conducts. If there is an object in between these sensor arrangements, Photo diode will be in cut-off mode. Then the microcontroller closes the mobile bridge. If the train had left, the IR light falls on the photodiode and it conducts. Then the controller opens the mobile bridge for pedestrians. Pin 4 is used for connecting bidirectional motor drive. This circuit is the essential part for controlling the bridge. A DC motor is used to open or close the mobile bridge upon entry of train. For the controlling of DC motor an L293 IC is used.

Equation

Filter design equations

$$V_{rms} = \text{RMS voltage}$$

Vdc =Direct Current voltage

Vm= peak voltage

F= frequency of ac signal

$\gamma$  = Ripple factor

Idc= Direct Current

$$\gamma = \frac{1}{4\sqrt{3}X_{FC}X_{RL}}$$

→ (“Equation1”)

$$V_m = V_{rms} \times \sqrt{2}$$

→ (“Equation 2”)

$$R_L = \frac{V_{dc}}{I_{dc}}$$

→ (“Equation 3”)

$$V_{dc} = V_m + \frac{I_{dc}}{4FC} \text{ (Equation 4”)}$$

→

#### IV. RESULT

**Table**

SI.No.	Components	Condition	Result
1	IR sensor 1	Train is arrived	Platform is open
2	IR sensor 2	Train is Departured	Platform is Close

#### V. CONCLUSION

It has been observed that the tracking of train is sensed continuously, which automatically close/open the mobile platform is partially automated which is beneficial for passengers to cross the rail grade crossing. The system is into a fully automated instead of climbing the staircase. This efficient method will be more compact for scheduling the train timings for reaching the particular destination and also for crossing the suitable platforms. The project will save the energy comparatively to elevator, because of this project crossing of platform will be so easy. This project prevents the level of accidents. Peoples who have fractures, leg cramps, chronic foot pains and etc. they also can cross the platform easily as well as it is also helpful for the senior citizens who have problem for crossing the platform by using the bridge. As the system is completely automated it avoids manual errors and thus provides utmost safety to pedestrians.

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