Railway Track Pedestrian Crossing without using Staircase

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Abstract— **This project is used for automatically close or opens the mobile platforms in between the track trains. Normally the mobile platform connects the two platforms through which the passenger can walk on the platform to reach on the next platform. Sensors are placed on the two sides of track. If the train reaches one sensor the mobile platform will automatically close and allows the train to go through the tracks and then when the train leaves the second sensor the mobile platform will automatically open the bridging platforms. The microcontroller will sense the presence of train by using infrared sensor. So on sensing the train on one path controller will give pulses to the stepper motor to close the mobile platform automatically.**

Keywords— **railway, pedestrian crossing, mobile platform**

I. INTRODUCTION

The present railway systems in India are not automated which are fully manmade. In railway stations normally we use bridges. It is very difficult for the elderly persons or handicapped persons to use the bridge .This paper find a good solution. Mainly 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 motor to close the mobile platform automatically.

II. BLOCK DIAGRAM AND ITS DESCRIPTION

The various blocks in the block diagram are Microcontroller, Sensor arrangement, Audio and visual indication, Driver section and Power supply,
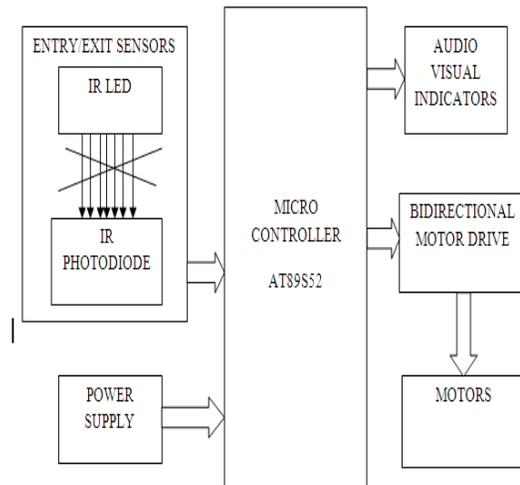
A. Micro Controller

The AT89S52 is a low-power, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry standard MCS-51™ instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcomputer, which provides a highly flexible and cost effective solution to many embedded control applications.

B. Entry/Exit Sensor

IR Photodiode is used as sensor. Photodiodes are PN junction diodes designed specifically to harness the photoelectric effect. This means the device exposes the junction region of the PN diode to incoming photons which results in conducting the transfer of electrons across the junction. This process can also be reversed to produce photons. As can be speculated, there are many useful applications of this phenomenon, such as solar cells, light detection/emission, and thus signal receiving/sending.

C. Audio Visual Alerts

Red and green LEDs can use for giving visual alert and a buzzer for giving audio alert.

I. Led

A light-emitting diode (LED) is an electronic light source. LEDs are based on the semiconductor diode. When the diode is forward biased (switched on), electrons are able to recombine with holes and energy is released in the form of light.

II. Buzzer

Buzzer is used as an audio alarm and is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave ovens, or game shows. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise).

D. Power Supply

Supply required is 5V. The regulator IC here used isL7805. It provides regulated 5V to the controller.

E. Driver Section

Two DC gear motor are used to open or close the bridge. For the controlling of DC motor an L293 IC is used. DC motor works over a fair range of voltage .The higher the input voltage more is the RPM of the motor .if the motor works in the range of 6-12V ,it will have the least RPM at 6V and maximum at 12V. DC gear motors are used to open or close the bridge.

F. Bidirectional Motor Drive

L293D is used to drive the motor. L293 Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads. The L293D is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heat sinking.

G. Power Supply

Microcontroller requires a regulated 5V supply. A regulator IC can make the requiremet.L7805 can be used for that. The L7800 series of three-terminal positive regulators is available in TO-220, TO-220FP, TO-3 and D2PAK packages and several fixed output voltages, making it useful in a wide range of applications.

III. CIRCUIT DIAGRAM
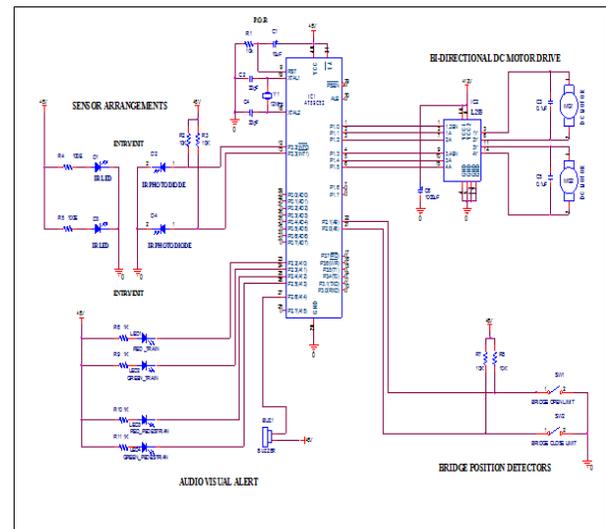
A. Circuit Diagram Description

The Microcontroller 89C52 is the central part. There is a crystal of 12MHz 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. Pin number 40&20 are +VCC and GND respectively. The Vcc is connected to the +5V line of power supply and the ND of microcontroller is connected to ground terminal of the power supply.

Interrupt pins of the microcontroller P3.2 (INT0) and P3.3 (INT1) 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 cutoff 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.

Port 1 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.L293 Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads. To simplify use as two bridges each pair of channels is equipped with an enable input.

Two switches connected to P2.0 and P2.1 are the limit switches, which are used for identifying the position of the bridge.

Audio visual indicators are connected to P2.2 toP2.6. This circuit consists of four LEDs as visual unit and a piezoelectric crystal for audio indication. This all are connected as active low. So for turning ON an LED or buzzer, microcontroller must apply a low at the corresponding pins. The resistors connected to LEDs are the current limiting resistors

IV. ADVANTAGES AND FUTURE SCOPE

It helps the elderly to reach the next platform without climbing the over bridge, helps the people to move their heavy luggage easily from one platform to the other and also saves the time that is required to reach the opposite platform.

V. FUTURE SCOPE

Sensing of train can done by signal system method and thus can work more efficiently making the easy move of passengers from one platform to the other.

VI. CONCLUSION

This project is used for automatically close/open the mobile platform .It saves the time for passengers to cross the next platform. The sensing is made continuously whenever the trains arrive and pass through. Thus 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. This efficient method will be more compact for scheduling the train timings for reaching the particular destination and also for crossing the suitable platforms.

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