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# Railway Gate Level Monitoring for Drivers

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***Abstract*:- Most of the Railways go precedence of development over highways. Railway system is very large immense scale project. We got acquainted with many railway accidents occurring because of peoples intentionally crossing the track. The drivers of are not notified unfortunately at the time.That is due to inattention in physical examination in operation or insufficiency worker. To overcome that problem, this project presents an implementation of an efficient and cost effective solution. The main objective of this is proposed detects the persons crossing the railway track. The objective is to tell the status of the Railway gate whether it is open or closed to the driver (ambulance, fire engine, for emergency issues). In this project those values are uploaded in server by using IOT so that railway management can monitor the tracks effectively. This detecting system can be used to prevent the railway accidents. It reduces the waiting time at the Railway crossing for the drivers.**

***Index terms : Monitering, accidents.***

## I. INTRODUCTION

### 1.1 Introduction to IoT

Internet of Things (IoT), which is an environment of attach manual things that are approchable through internet. IoT is considered as a human with a heart recorder i.e. things which are assigned with an IP address and it has the capacity to gather and move data a network without physical help or interference. Embedded Technology where the things assist them to interconnect with the external surroundings or internal software, therefore it affects the conclusion taken. IoT is a computing technology where machines interconnect and speak with other machines. Where things can speak with each other, through the internet, we have to take full lead of remote control.

The eventual goal of IoT operation is to robotize systems other than using physical procedures, to improve the standard of life[1].

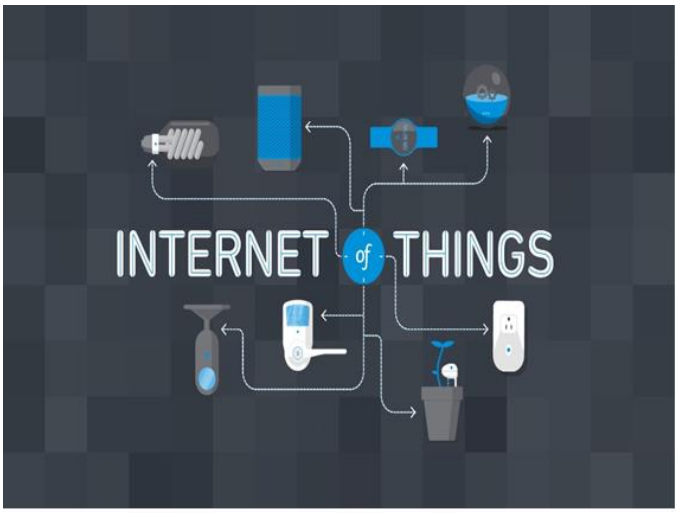


Figure 1.1: IoT

### 1.2 INTRODUCTION TO RAILWAYS SYSTEM

Street/rail level crossing points are one of a kind in the realm of transport in to such an extent as they present the main instance of two distinct frameworks put under various duties and gone by vehicles with significantly unique exhibitions which combine and meet amid their typical activity. The outcome is that these convergences comprise high-chance spots for all railroads on the planet. The potential for mishaps is made higher as the railroads just control just a large portion of the issue. The other half, in the interim, can't generally be said to be constrained by one element as, despite the fact that traffic principles and street plan guidelines as far as anyone knows exist, the developments of street clients are not sorted out and checked by one explicit element as unbendingly as rail movements[14].

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Figure 1.2: Railway Gate

The railroad frameworks of the ESCAP area don't get away from this general perception. Every year, mishaps at level intersections not just purpose the passing of or genuine wounds to a huge number of street clients and railroad travelers, yet in addition force an overwhelming monetary weight regarding interference of railroad and street administrations also, harm to railroad and street vehicles and property[3].

## II. PREPARE YOUR PAPER BEFORE STYLING

### SYSTEM MODEL

In the proposed system, we use IR Sensor to tell that the gate is opened or not and update the information in the server through GSM technology.The driver receive the status of Railway gate through web server. When a objects like a human being ,vehicles proceed by the Railway gate, it is detected by the Passive Infrared Sensor (PIR) Sensor and sends the information to the railway authorities and update the information in the server through GSM technology.

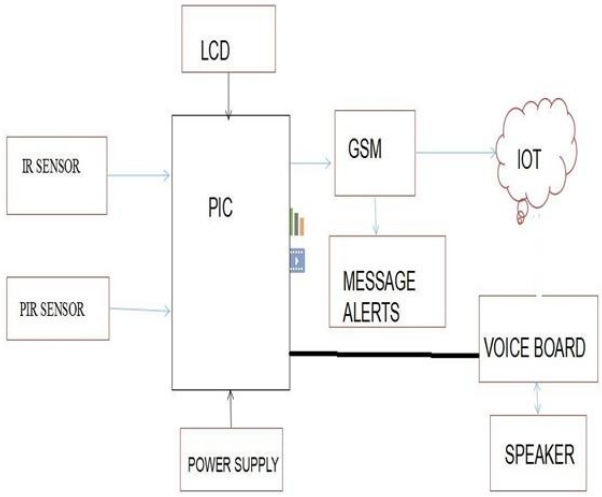


Figure 3.1: System Model Diagram

### INTERFACING SENSOR

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### 3.1 PASSIVE INFRARED SENSOR

A device which estimates IR light emmits from things in its extent of noticeable in the world is called A Passive Infrared sensor. PIR-build moving detectors are often constructed by PIR sensor. Commonly moving of an things are sensed through an IR Source with some temperature, such as a human body move before an IR source with some another temperature, such as a objects with less than obsolute temperature does not emit energy but more than obsolute temperature emits energy ,also known as black body radiation. Often it is IR Radiation which is undetectable to the eye of a human but it detected by devices constructed for that type of a observation. Passive means that the PIR device can passively receive incoming infrared radiation and it does not radiate an infrared beam .. Explanation is under our capacity to notice it to see, and that colour considered the small energy level that human eyes can detect in front of it gets to be undetectable. In this way infrared means under the energy level of the red colour, and applies to more number of reference of undetectable energy.

Figure PIR sensor

*3.11Passive IR-build motion detector*

PIR sensor has cylindrical one side of lens (facets) before it . Each Fresnel lens is a rectangular facet. the term PID stands for Passive Infrared Detector is also known as PIR build motion detector, the PIR sensor which is usually produce on a PCB with the required electronics to explain the indicated signals from pyroelectric sensor bit. The full constructed is equiped within in a place where the sensor can see the place to be observed. With the help of window infrared energy reaches the pyroelectric sensor because the infrared radiation is transparent to the plastic (but only semitransparent to normal light). This plastic sheet also prevents the tresspass of dust or small insects are prevented by that plastic sheet from hide the sensor's extent of the observable view. Generally insects, produce the wrong signals. A very few procedure to concentration the faraway infrared energy into the sensor top. The many Fresnel lenses are shape into the window.

*3.12 IR Sensor*

Infrared radiation is radiated by IR LED's. Before LED that radiation light up the top side. The amount of light reflected varied rely on the property of reflecting light of the

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topside. On reverse biased IR sensor that reflected light is falls on reverse bias Infrared sensor. The quantity of e-h pairs produce rely on on strength of incident Infrared radition. That strength of incident ray differs, voltage over resistor will differ consequently. An infrared sensor is device with electronic property, which radiate in sequence to de-tect some particular part of the atmosphere. An Infrared detector can amount of the heat of things additionally sense the moving of a thing. Generally, Infrared Spectrum where whole things emits some different form of heat radiations. These category of radiations are undetected to normal human eye, which can be sensed by an infrared detector. The Infrared LED (Light Emitting Diode) is merely an emitter and IR photodiode is merely the detector which is responding to Infrared light of the equal wavelength and the IR LED emits it.
Whenever the Infrared light drops into the photodiode, The resistances ,output volt-ages are change in quantity with respect to the immensity of the Infrared light collected.

3.12Features of IR Sensors
1)Managing voltage(5Vdc),

2) Output voltage( 0Vdc - 5Vdc)
3)Easy to get together and utilize,
4) Onboard noticing signal,
5) valid distance scope of 2cm,

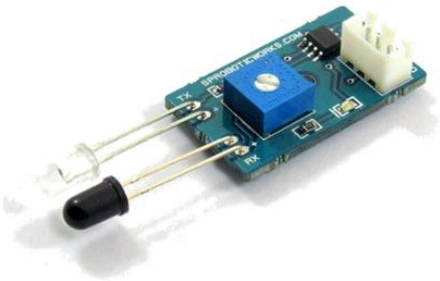

Figure IR Sensor

PROGRAMABLE MICROCONTROLLER

- *4.1 Programming Microcontroller*

A Peripheral Interface Computer is a processor with RAM and in-built memory . We can utilize it to make change in your projects . It rescue you from constructing a circuit with unconnected outside ROM, RAM and perimetric bits. it has many useful in built modules they are:

- 1)EPROM.
- 2)Timers.
- 3)Analog comparators.
- 4)UART.

Other than these four modules we can have many projects to make they are:
A)Frequency counter - It uses LCD display to display the frequency and PIC time.PIC timmer1 measures input signal.Timmer0 measures time period.
B)Capacitance meter - analog comparator oscillator.
C)Event timer - utilize interior timers.
Event data logger -Record analog facts proving an internal ADC and using the internal EEPROM to record facts.
E)Servo controller - Utilize a software generate PWM.

4.1.1 programm

One of the most useful features of a Peripheral Interface Computer microcontroller it uses the flash memory to re-program them .We program a PIC Microcontroller by using the high level languages like c language or Assembler.

*4.1.2 Input / Output*

A Peripheral Interface Computer Microcontroller can manage outputs and respond to given inputs. One could study input knob. Accompained by the very huge gadgets it is viable to operate LCD's or seven part displays with extremely fewer U-control as all the job is to do inner side the Peripheral Interface Computer Microcontroller. dissmilarities of a frequency token to separate web plan to discover 2 or 3 bits for micro controllers plan and 10 or more for a separate plan. So utilizing that rescue blueprint plan endeavour that you can use to construct in peripherals to be cautious of a great deal of the network working. Multiple integral Analog to Digital Converter (ADC) can study analog signal quantity that we need not to attach an outside gadget.

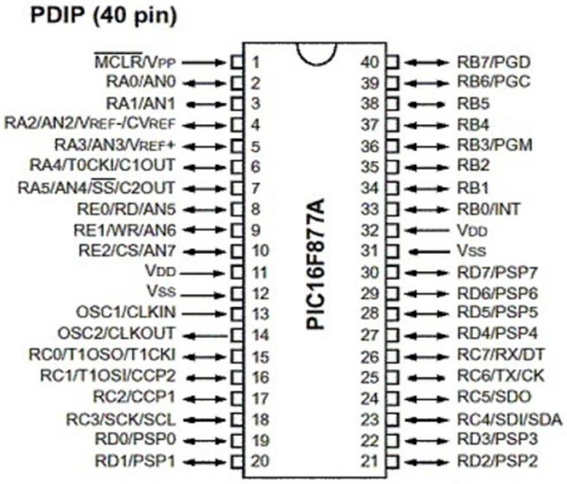


Figure 5.1: PIC Microcontroller

- *4.1.3 peripherals*

The Peripheral Interface Computer(PIC microcontroller) have many in built peripherals and that make utilize it fully unsettling at begining that is why we made the synopsys page having each crucial peripheral chunk in the record under.

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| FEATURE | FEATURE INTERPRETATION |
|---|---|
| Flash memory | Re-programmable production storehouse. |
| RAM | recall storehouse for variables. |
| EEPROM | Long term steady storehouse. |
| I/O ports | very high current I/o ports |
| Timers/Counters | Usually 3. |
| USART | set up RS232 procedure |
| CCP | Capture,Compare,PWM component. |
| SSP | I2C and SPI Intersection. |
| Comparator | An analog comparators. |
| ADC | Adc converter. |
| PSP | Parallel Slave Port |
| LCD | LCD computing. |
| Special features | PWRT,POR,BOR,WDT,ICSP |
| ICSP | Serial Programming in circuit. |

Table of peripherals of pic micro controller

*4.1.4 In Circuit Serial Programming*

It is the following most critical advantage. Rather than exchanging your chip from the software engineer to the improvement load up you simply abandon it is in that board. By orchestrating the programming associations with circuit accurately you will not have to expel the chip.

*4.15Input/Output Port*

I/O ports make you speak with outside earth so that we can maintain LED's, LCDs or pretty much everything within the correct interface. That can likewise arrange them as contributions to assemble data.

*4.1.6 Current*

The Periperal Interface Computer Input/Output ports is high current port prepared to do straight forwardly driving LED's (up to 25mA yield current) the absolute current permitted as a rule 200mA that is regularly to the entire chip

*4.1.7 USART*

The USART is a helpful module and spares coding up a product form so it spares important program storehouse. We can discover more data on RS232 to built it work.

*4.1.8 Pulse Width Modulation*

Pulse Width Modulation gives you one PWM yield with 10 bit objectives and with no item overhead once started it works without any other person's contribution aside from in the event that you have to deliver the commitment cycle.That utilizes Timer 2 to describe what it is undertaking utilizing Timer 2 period register to portray the repeat of the Pulse Width Modulation.

*4.1.9 Analog to Digital Conveter*

A single 10 bits ADC have up to 8 contributions to a gadget multiplexed from infor-mation pins. The Analog to Digital Converter which utilizes amid rest however you need to utilize the RC clock mode. One advantage of this is there will be no advanced exchanging commotion so you will show signs of improvement change exactness. For the 16F877A you can't simply utilize a simple info on the off chance that you feel the need as there are just a particular and predetermined number of ways that the simple information pins can be empowered. It is ideal to begin with AN0 and include more as essential - observe the datasheets for that simple information sources that will be empowered for example on the off chance that you began a plan utilizing just AN5 you would find that you may need to empower a couple of increasingly simple contributions too.

## 5. GSM MODEM CONFIGURATION

*5.1 GSM Modem Configuration*

The mobiles on the planet with Global System for Mobiles (GSM) are popular. Its supporter, the GSM organization, appoximate that

81 percent of worldwide versatile commercial center use this model. In excess of 200 nations individuals uses these GSM standard. GSM makes overall wandering amazingly standard interfacing PDA admin-istrators,enables perusers to use his/her mobile phones in various division of the globe. Globle System Mobile is completely unique from its antecedent in along these lines incorporate flagging and voice channels are advanced flag, and this is contemplate as a Second Generation (2G) portable system. Information correspondence was not difficulty to make the system. GSM EDGE is a third era sort of the method.

*5.1.1 History of GSM*

Forerunners to GSM, including Advanced Mobile Phone System in the United States and Total Access Communication System in the United Kingdom, were worked with straightforward development. Regardless, these media interchanges structures were un-fit to scale with the choice of more customers. The deficiencies of these structures demonstrated a necessity for an undeniably compelling cell development that could moreover be used all around.

To achieve that objective, the European Conference of Postal and Telecommuni-cations Administrationsthe European Conference of Postal and Telecommunications Administrations (CEPT) set up a leading body of trustees to develop an European stan-dard for electronic media correspondences in 1983. CEPT settled on a couple of criteria that the new structure must meet: overall wandering help, high talk quality, support for
handheld devices, low organization cost, support for new organizations and Integrated Services Digital Network (ISDN) capacity.

In 1989, the commitment of the GSM adventure was traded from CEPT to European Telecommunications Standards Institute (ETSI).

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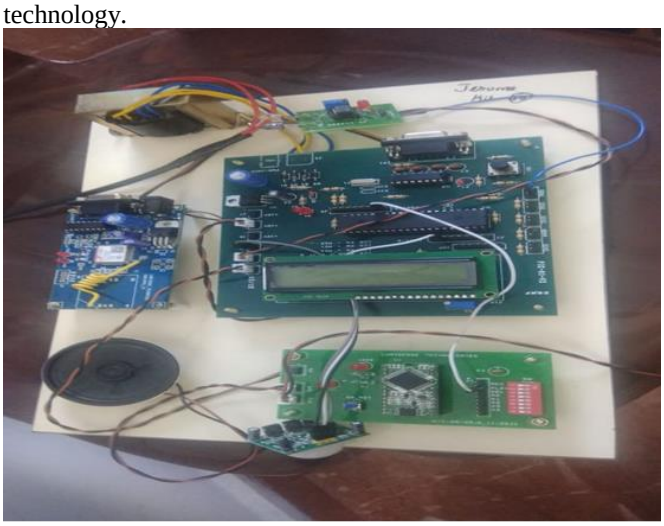
*5.12 Product Description*

1)DB9 RS232 interface with voice task,
2)Based on Waveform module Q2303A,
3)3V SIM card slot,
4)SIM Application Toolkit,
5)Double tone multi-frequency function(DTMF),
6)Send and receive data and Short Message service,
7)Antenna with high responsiveness,
8)Comply with ETSI GSM Phase2+,
9)Dual-band,
10)Class 42W at 900MHz,
11)Class 11W at 1800MHz,
12)Input voltage(6Vdc to 36Vdc),
13)Input current(1A-2A),
14)Standby current( 56mA),
15)Working current(100mA to 140mA),
16)Working temperature(-20 to +55),
17)Storage temperature(-25 to +70),
18)Accessories: AC/DC adaptor, DB9 RS232 cable, antenna, 2 mounting plates, CD

## 6. PRACTICAL SYSTEM MODEL

- We connect the 220V power supply to the step down transformer to decrease the voltage otherwise the components are burnt. After decreasing the power supply we give it to PICmicrocontroller. From PIC Microcontroller power supply other components in the project.After getting the power the sensors sense the data and update it in the server and sends the message to the driver through GSM technology.



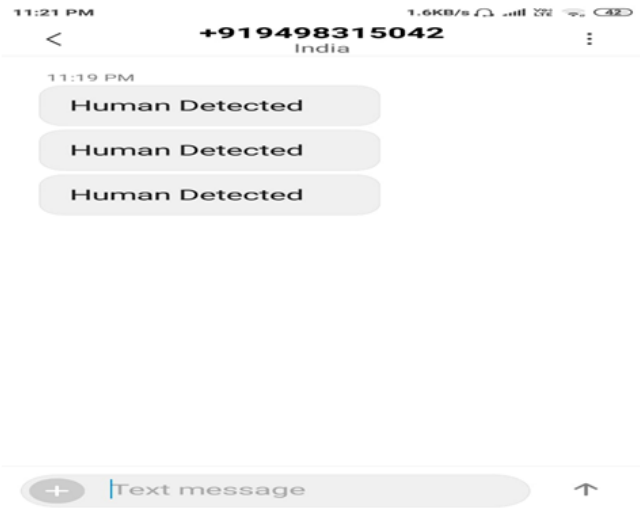
Practical setup

whenever Railway gate is closed the output of the IR sensor is received other-wise it is not received.IR sensor has 3 pins one is for output,of second one is for power supply and the third one is for ground.In IR Sensor one IR Transmitter and one IR Receiver.Transmitter transmitts the IR Signal when any object is comes under the trans-mitted light it reflects back. The reflected back light is received by the IR Receiver. After that we create a web link in it the sever. i.e " http://www.iotclouddata.com/iotlog/sti3/page1view.php "

In this link we know LogID,Status,Logdate,Logtime. as shown in the below.


Fig of cloud data

when we use PIR Sensor basically it is a motion detector sensor.IT actually detects when the object is moving. In PIR Sensor it has multiple IR Sensor is placed at differnt position when the reading of IR sensor differs from the near one it detected as the object is moving.When people crossing the Railway track they might get an accident at the crossing so we trying to give the object detection to the Railway drivers through a message alerts as shown below.




## CONCLUSION

In this Project, We intend to implement the safety of the persons who cross the railway track intentionally. So we made a prototype which has PIR Sensor that detects the objects in between the railway tracks and sends the messages to the Railway authorities such as railway drivers. We try to help the ambulance drivers to help the wheather the gate is closed or not By the help of IR Sensor. The IR Sensor receives the out put the gate is closed. The IR sensor doesn't receive the output if gate is opened. We create a server in that we can able to update the information of the

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status by the GSM Module. It reduces the waiting time at the Railway crossing for the drivers. It gives us traffic free environment at the Railway gate. So we monitor the railway gate with the help of these prototype as suggested by the titile "RAILWAY GATE LEVEL MONITORINR FOR DRIVER"

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