

# **TRAFFIC INTIMATION AND CONTROL FOR EMERGENCY VEHICLE**

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## **ABSTRACT**

*This paper presents traffic intimation and control for emergency vehicles. The Infrared Sensors to detect density of vehicles is mounted on road. The presence or absence of a vehicle is sensed by a sensor assembly mounted on each road. This acts as an input to the Intelligent Traffic Light Controller unit. This input signal indicates the length of vehicles on each road. The ITLC unit generates output signals for Red and Green Signals and monitors their timings taking into consideration the length of vehicles on each road. The same information is transmitted to the mobile user which will request for congestion status. If a vehicle driver at junction sends SMS on GSM mobile phone to ITLC unit, the driver of will get message indicting congestion status of road. If emergency vehicle will come on that road then to release the traffic Green light of the signal will get ON for longer time to reduce traffic congestion. The basic operation of ITLC can be realized by using embedded system which has advantages of simplicity, user friendly, easily programmable and a facility for GSM mobile interface. In our proposed model the basic operations are implemented using Microcontroller.*

**Keywords: GSM, Traffic Junction, ITLC, Emergency Vehicle.**

## **I. INTRODUCTION**

In metropolitans there are many problems that are occurring every day due to these reasons like Heavy Traffic Jams No traffic, but still need to wait, Emergency car stuck in traffic jam, Lack of Traffic Information to users. When more than one emergency car came then most of the system fails. They give green signal to both which lead to traffic conjunction problem and also leads to accidents. In ITSC system, this problem solve by giving red signal to all traffic and only emergency cars will pass the signal for particular time period.

## **II. PROPOSED SYSTEM**

To develop an intelligent traffic system that monitors the density of the traffic at the junction and gives the green signal accordingly and also to know the position of the traffic by using GSM technology. In order to overcome congestion problems user have developed a project called intelligent traffic controller. Aim is to develop the system at signals. This system will have multifunctional operations. Initially the system will measure the traffic density at different signals and accordingly change the time delays for traffic lights viz. the side at which the traffic is high the signal will remain green for more time and make a route for emergency vehicle.

III. BLOCK DIAGRAM

3.1 Junction 1

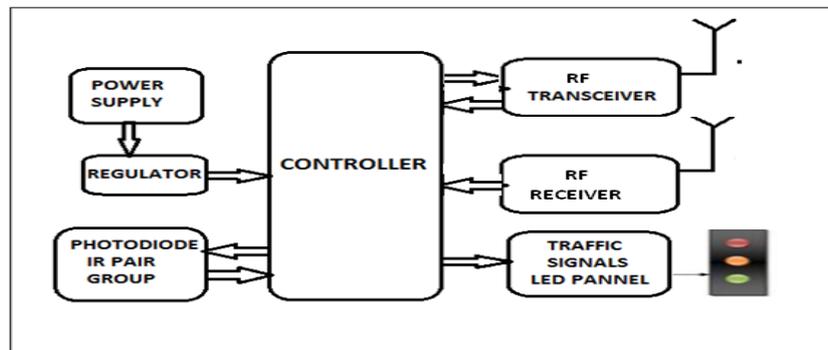


Fig.1 Junction 1

3.2 Base Station

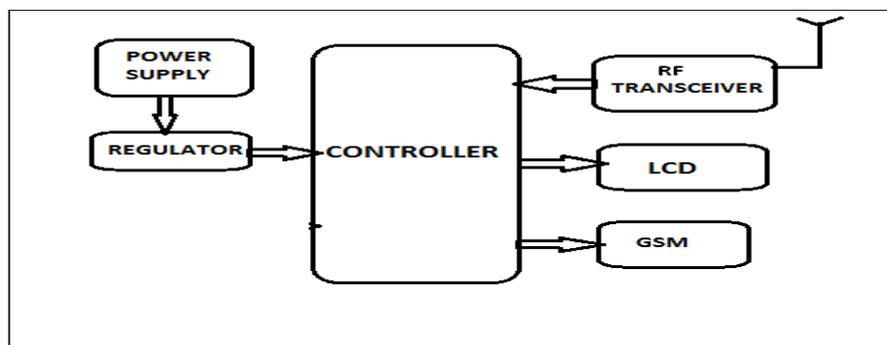


Fig.2 Base Station

3.3 Emergency Vehicle :

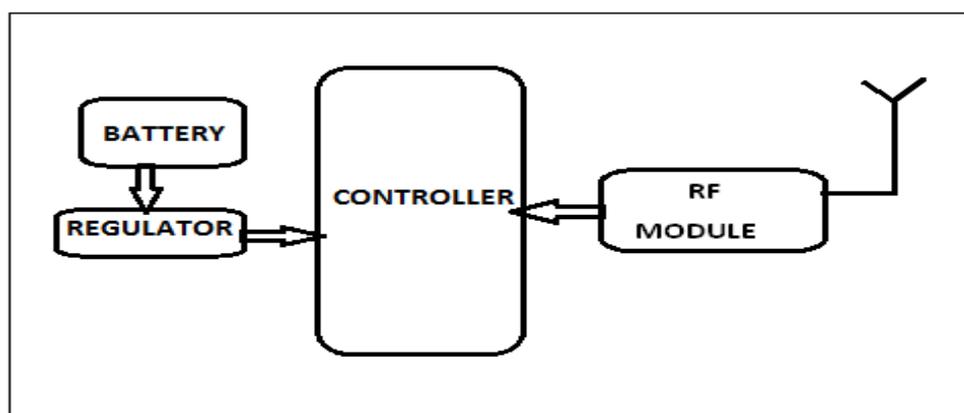


Fig.3 Emergency vehicle

3.4 Description:

The Infrared Sensors to detect density of vehicles is mounted on road. The presence or absence of a vehicle is sensed by a sensor assembly mounted on each road. This acts as an input to the Intelligent Traffic Light Controller unit. This input signal indicates the length of vehicles on each road. The ITLC unit generates output signals for Red and Green Signals and monitors their timings taking into consideration the length of vehicles on each road. The same information is transmitted to the mobile user which will request for congestion status. If a

vehicle driver at junction sends sms on GSM mobile phone to ITLC unit, the driver will get message indicating congestion status of road. The basic operation of ITLC can be realized by using embedded system which has advantages of simplicity, user friendly, easily programmable and a facility for GSM mobile interface. In this model the basic operations are implemented using Microcontroller. The signals from sensor assembly will be applied to input switching circuit. These input signals from sensors will be in the form of digital signals which corresponds to presence or absence of a vehicle. These digital signals from each lane will be given to the input port of microcontroller, where the microcontroller will determine the length of vehicle at each lane. This information is the input to microcontroller to determine various timing signals. The on and off time of the four junctions will be calculated by microcontroller, in order to keep waiting time minimum.

IV. CIRCUIT DIAGRAM

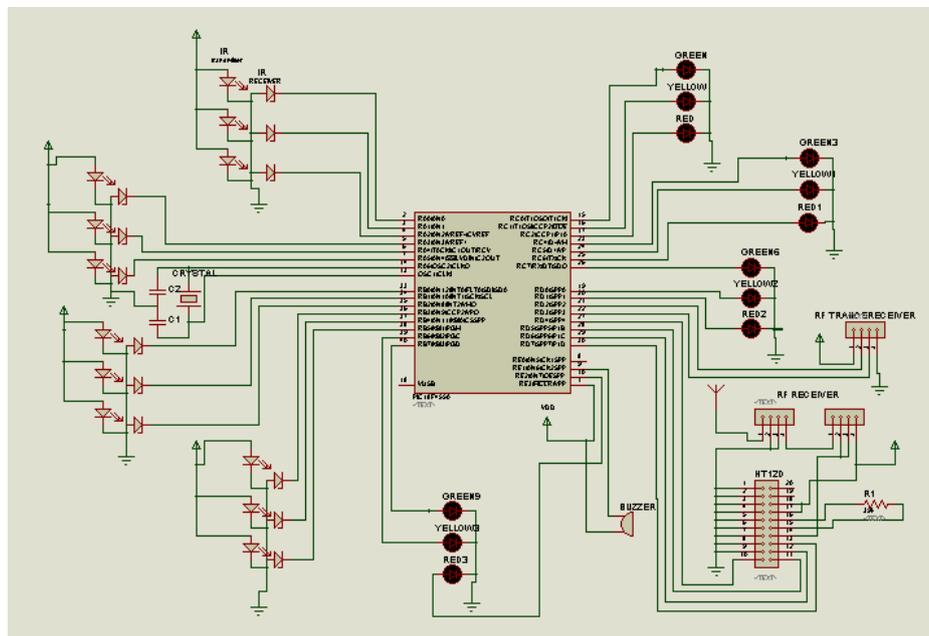


Fig no. 4

V. PCB LAYOUT

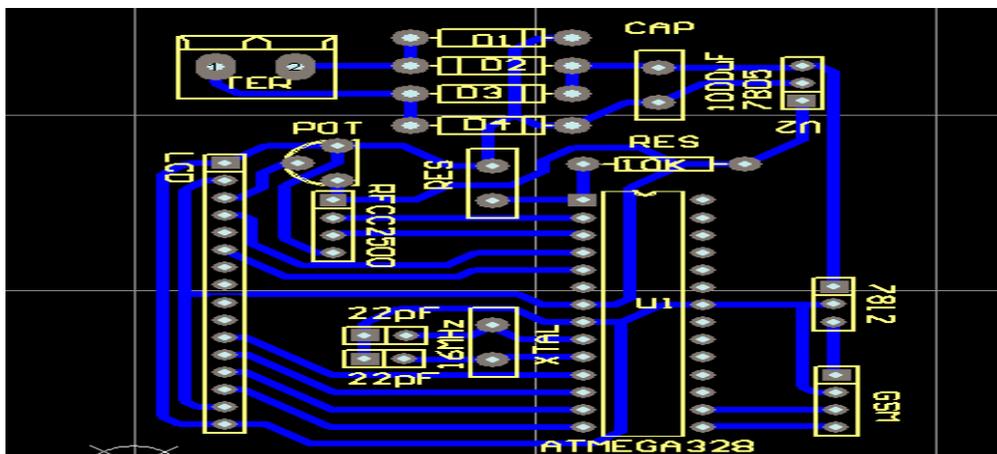


Fig no.5 Main Unit

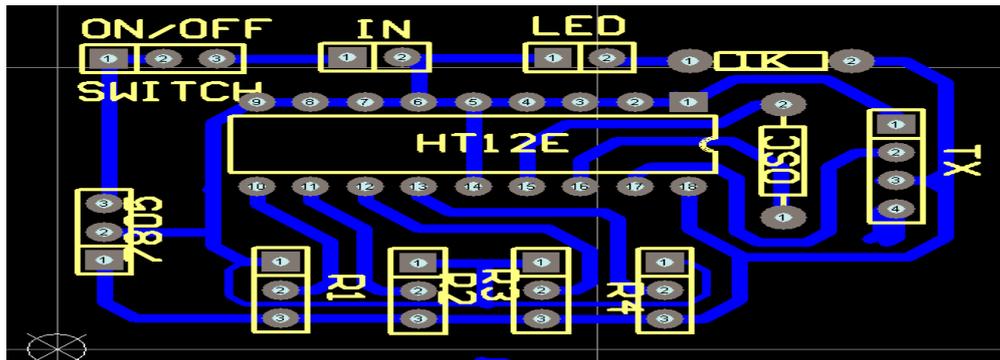


Fig no. 6 Emergency Unit

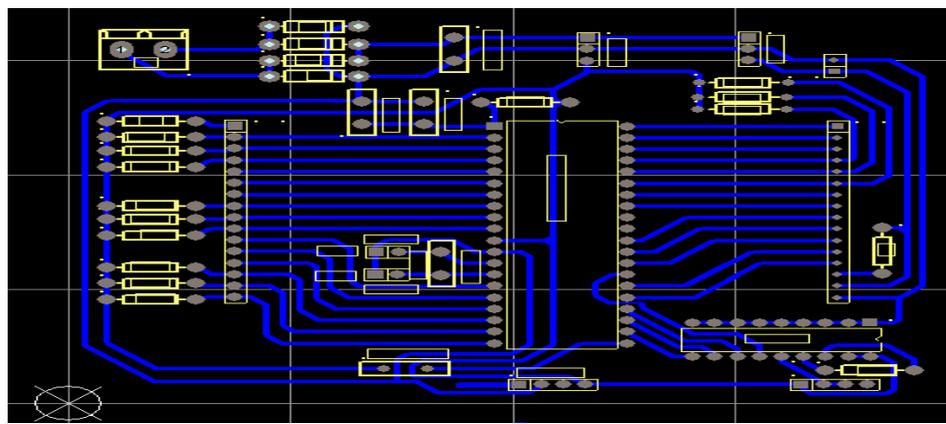


Fig no. 7 Junction Unit

## VI. IR SENSOR

### 6.1 IR transmitter:

IR LED's are solid state light sources which emit light in the near-IR part of the spectrum. Because they emit at wavelengths which provide a close match to the peak spectral response of silicon photo-detectors, both GaAs and GaAlAs IREs are often used with phototransistors. The IR led is connected to Vcc via 480 ohms current limiting resistance.

Key characteristics and features of these light sources include:

- Long operating lifetimes.
- Low power consumption, compatible with solid state electronics.
- Narrow band of emitted wavelengths.
- Minimal generation of heat.
- Available in a wide range of packages.

### 6.2 IR Receiver:

- Phototransistors are solid state light detectors that possess internal gain. This makes them much more sensitive than photodiodes of comparably sized area. These devices can be used to provide either an analog or digital output signal. The phototransistor conducts only if infrared light falls on it. This family of detectors offers the following general characteristics and features:

- Low cost visible and near-IR photo-detection.

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- Available with gains from 100 to over 150.
- Moderately fast response .
- Usable with almost any visible or near infrared light source such as IRED's, neon, Fluorescent, incandescent bulbs, lasers, flame, sources, sunlight, etc.

## VII.GSM:

GSM stands for **g**lobal system for **m**obile communication. It is a digital cellular technology used for transmitting mobile voice and data services. The concept of GSM emerged from a cell-based mobile radio system at bell laboratories in the early 1970s. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard. GSM is the most widely accepted standard in telecommunications and it is implemented globally. GSM is a circuit-switched system that divides each 200 KHz channel into eight 25 KHz time-slots. GSM operates on the mobile communication bands 900 MHz and 1800 MHz in most parts of the world. In the us, GSM operates in the bands 850 MHz and 1900 mhz. GSM owns a market share of more than 70 percent of the world's digital cellular subscribers.

## VIII. FEATURES

- Increases transportation system efficiency.
- System provides more accuracy.
- By measuring the traffic density we can automatically set the timings for different signals.
- System gives previous information of traffic.
- Vehicle path guidance.

## IX. ADVANTAGES

- System save the time of user.
- System provides more accuracy.
- Surveying the traffic.
- Security & safety due to use of embedded system.
- Traffic density control.
- System avoiding traffic jam.

## X. APPLICATIONS

- In heavy Traffic Areas.
- Near to the public places areas.
- Near to the Emergency places (Hospitals, National Highways)

## XI. CONCLUSION

With automatic traffic signal control based on the traffic density in the route, the manual effort on the part of the traffic policeman is saved. As the entire system is automated, it requires very less human intervention. With

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emergency vehicle detection SMS will be sent so that emergency vehicles like ambulance, fire trucks, need to reach their destinations at the earliest. Hence this project going to develop an intelligent traffic control system which determines the traffic density and gives the signal accordingly.

## REFERENCES

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3. Traffic Monitoring Guide, 2013, U.S. Department of Transportation Photo credits: Retail Sensing, Louis van Senden [CC BY-SA 4.0]