CLOSED LOOP TRAFFIC LIGHT CONTROL SYSTEM USING IR SENSORS

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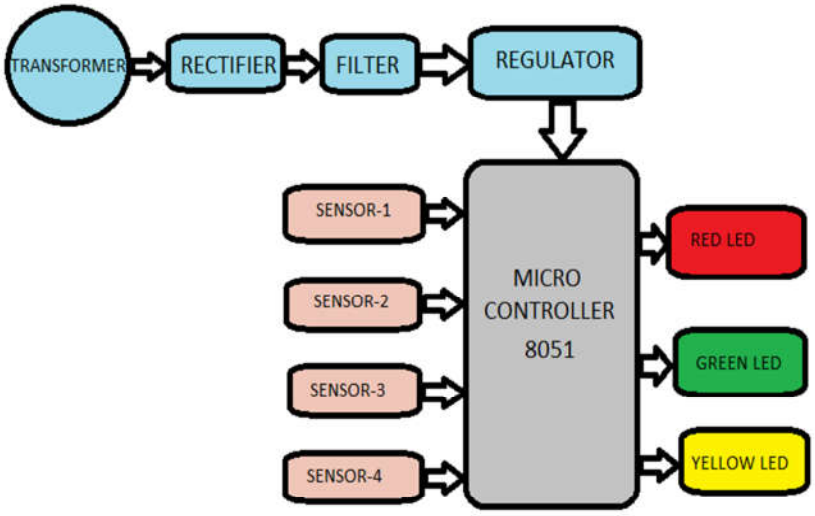
Abstract: In this paper we are proposing a closed loop control system in which the density of traffic is feed backs to the system. Now a days Controlling traffic becomes major issue because of rapid increase in automobiles and large time delays of signal lights. To rectify this problem, we are designing a density based traffic lights system. The proposed system uses IR sensor to calculate the traffic density. We can operate when emergency case as ambulance, fire engine, VIP vehicles ,etc.. When any emergency we operate by using an android app

IndexTerms:IRsensor

1. INTRODUCTION

In this system, we used IR sensors to measure the traffic density. We arranged one IR sensor for each side of the road. These sensors always sense the traffic on that road. All these sensors are interfaced to the microcontroller. Based on these sensors, controller detects the traffic and controls the traffic system. In this project we can also control traffic lights based on ambulance. Traffic control has become a major problem on the roads of many cities in India. Some emergency vehicles like Ambulances, Fire Brigades and some important Security conveys get stuck in the traffic and must wait which is not desirable. The main aim of the project is to provide a wireless control system to these emergency vehicles which controls the traffic light signals.



Functional Block Diagram.

IR-TRANSMITTER: Transmitter section is used into ambulance car which transmit IR rays and controlled to traffic light. This module emits modulated infrared light. IR-LED is connected in series for more range and wider directivity. The module can transmit IR rays up to few meters without use of any external lens. When switch key is pressed, circuit is energized. The output of IC-555 is square wave from Pin No. 3; the IR-LED is connected to pin no. 3 of IC-555 with R3. The transmit IR beams modulated at same frequency 1KHz. The oscillator frequency can be shifted by adjusting preset VR-1. The receiver uses infrared module.

The IR- signal form the receiver sensor senses the transmitter. RECEIVER SECTION Traffic light has a receiver. The receiver uses infrared module (photodiode). The output of the photodiode is connected to microcontroller. Microcontroller is wired here in time delay and switching mode. It provides negative pulses which drives traffic control section with pnp transistor

II DESIGN METHODOLOGY

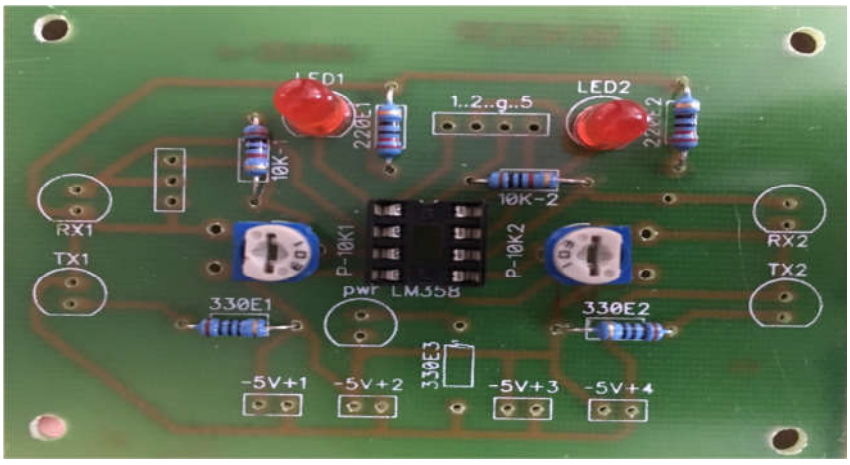
HARD WARE REQUIREMENTS

1. 8051 micro controllers
2. Leds
3. Voltage regulators
4. Resistors
5. Capacitors
6. Diodes
7. Transformer
8. Ir-led & photo diode
9. Transistors
10. Encoder and decoder ICs

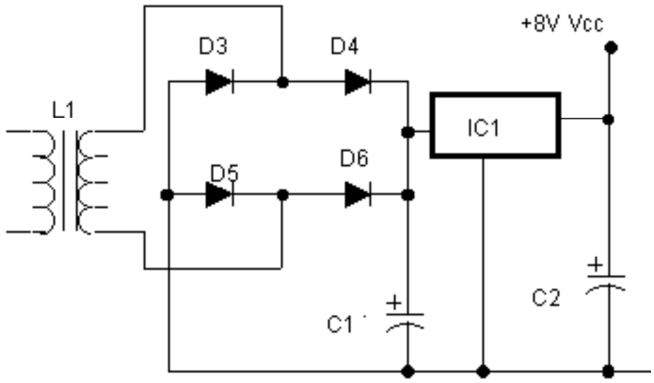
SOFT WARE REQUIREMENTS

1. Keil compiler
2. Language: embedded “c”

Sensor circuit

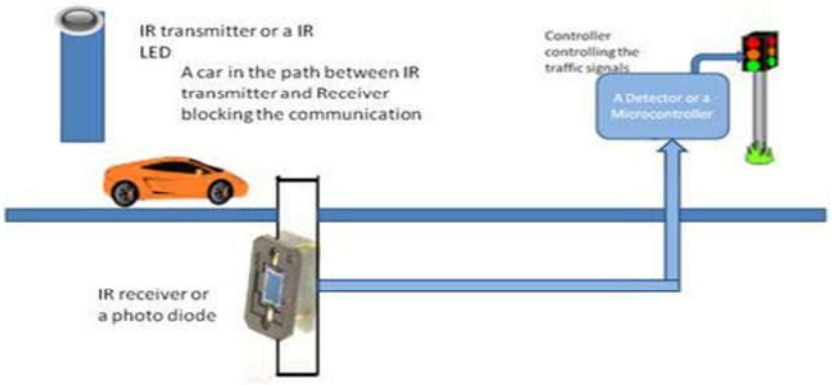


Power supply circuit



III. IMPLEMENTATION STEPS

This project is implemented by placing IR transmitters, receivers, microcontroller and led's at 4 way junction .If the traffic at one of the lanes goes high the voltage output of the IR sensor goes low. The microcontroller reads the voltage output of the IR sensor and sets the delay time.While the IR light falls on the photodiode the resistance of the photodiode falls increasing the bias voltage. Based on the IR interruption the green ON time increases, thus more the vehicle longer will be the green signal time. Thus dynamic time control is achieved based on the traffic density.



SOFTWARE

µVision3

µVision3 is an IDE (Integrated Development Environment) that helps you write, compile, and debug embedded programs. It encapsulates the following components

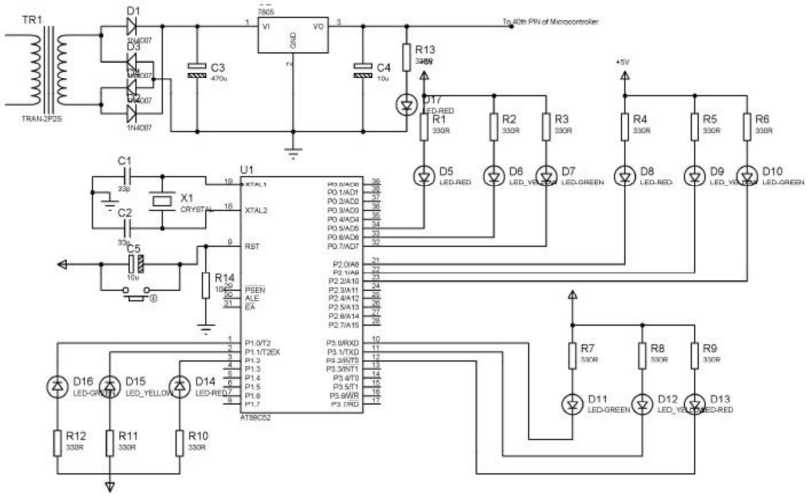
i)A project manager ii) A make facility iii)Tool configuration iv) Editor

b) Build an Application in µVision2

c) Create Own Application in µVision2

d) Debug an Application in µVision2

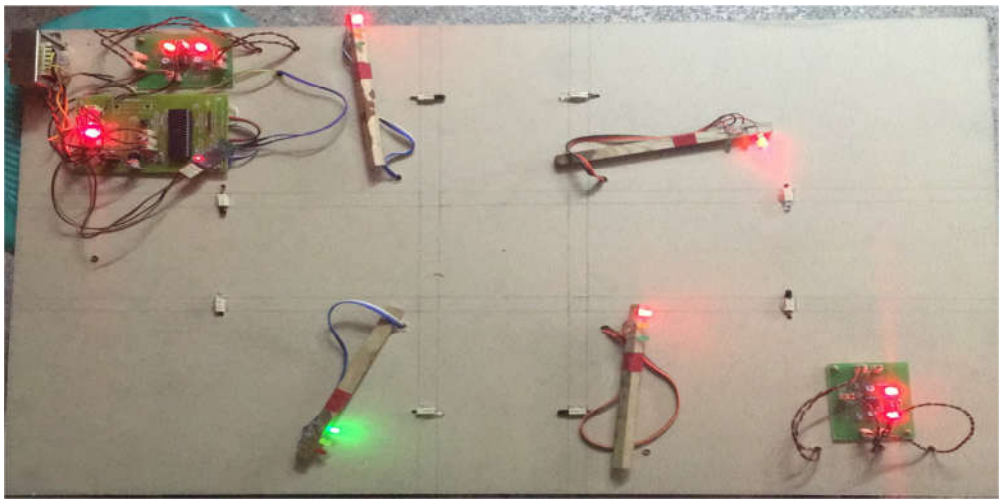
Circuit Diagram



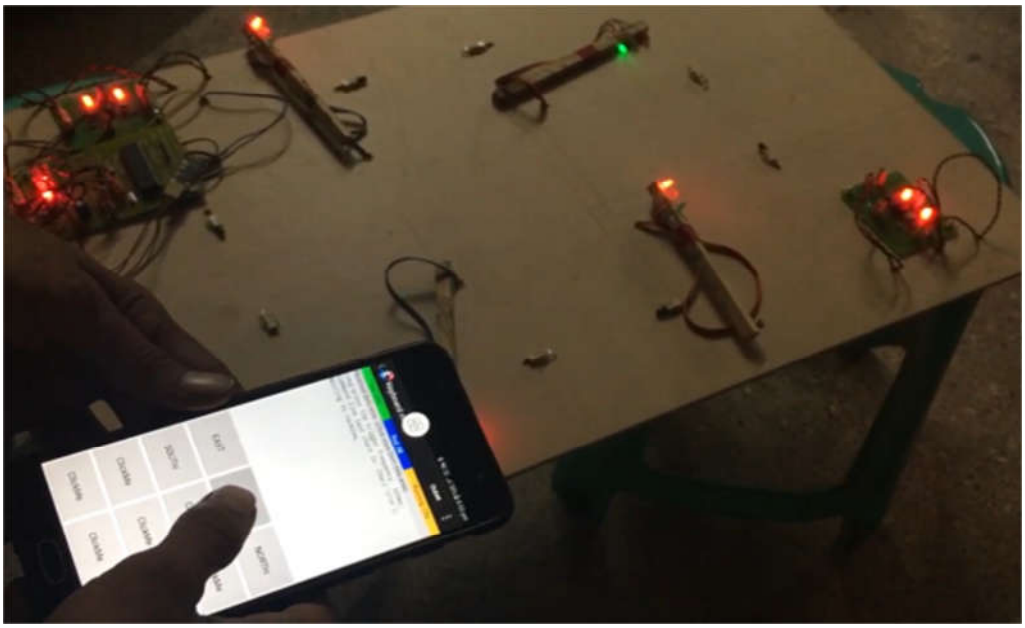
IV. RESULTS AND DISCUSSIONS

The IR system gets activated whenever any vehicle passes on road between IR sensors. The system contains 4 pairs of IR sensors for traffic density indication. When sensor is ON it means density is more on that side, then time delay of signal light increases

Working on normal traffic condition



Working on emergencecy case



CONCLUSION: In this paper we worked on problem for such special area where we have huge traffic density the system works on traffic related problems such as traffic jam, un reasonable delay time. By using this system configuration, we try to reduce the possibilities of traffic jams caused by signal lights.

V.REFERENCES

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