

Traffic Control System Based on Traffic Density

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Abstract- This is aimed at designing a density based dynamic traffic signal system where the timing of signal will change automatically on sensing the traffic density at any junction. Traffic congestion is a severe problem in most cities across the world and therefore it is time to shift more manual mode or fixed timer mode to an automated system with decision making capabilities. Present day traffic signalling system is fixed time based which may render inefficient if one lane is operational than the others. To optimize this problem, we have made a framework for an intelligent traffic control system. Sometimes higher traffic density at one side of the junction demands longer green time as compared to standard allotted time. We, therefore propose here a mechanism in which the time period of green light and red light is assigned on the basis of the density of the traffic present at that time. This is achieved by using PIR (proximity Infrared sensors). Once the density is calculated, the glowing time of green light is assigned by the help of the microcontroller (Arduino). The sensors which are present on sides of the road will detect the presence of the vehicles and sends the Information to the microcontroller where it will decide how long a flank will be open or when to change over the signal lights. In subsequent sections, we have elaborated the procedure of this framework.

the inadequate infrastructure and the irrational distribution of the signalling system are main reasons for this chaotic congestion. Therefore, in order to get rid of these problems or at least reduce them to significant level, newer schemes need to be implemented by bringing in sensor based automation technique in this field of traffic signalling system.

II. DENSITY BASED TRAFFIC CONTROL SYSTEM

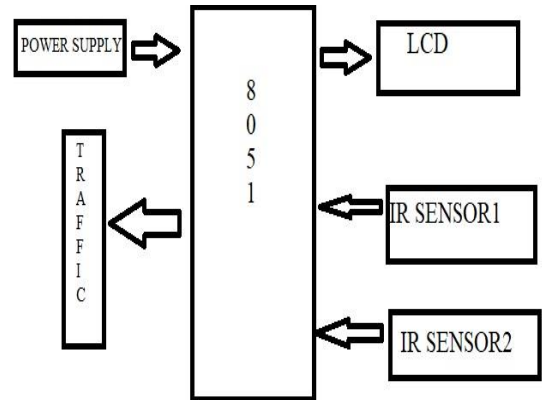


Fig.2: block diafram of traffic control system

A microcontroller is a general purpose device, but that is meant to read data, perform limited calculations on that data and control its environment based on those calculations. The prime use of a microcontroller is to control the operation of a machine using a fixed program that is stored in ROM and that does not change over the lifetime of the system.

The AT89C51 is a low-power, high-performance CMOS 8-bit microcontroller with 4k bytes of Flash Programmable and erasable read only memory (EROM). The device is manufactured using Atmel's high-density non-volatile memory technology and is functionally compatible with the industry-standard 80C51 microcontroller instruction set and pin out. By combining versatile 8-bit CPU with Flash on a monolithic chip, the Atmel's AT89C51 is a powerful microcomputer, which provides a high flexible and cost-effective solution to many embedded control applications.

Intel Corporation is first company who presented 8051 microcontrollers in market. It is 8-bit microcontroller. It has on chip 128 bytes of RAM, 4K bytes ROM, two timers, one serial port and four general purpose input/output ports. Each port has 8-bit register. It also knows as single on chip. It has 8-bit processing unit. Its mean it can process 8 bit of data at a

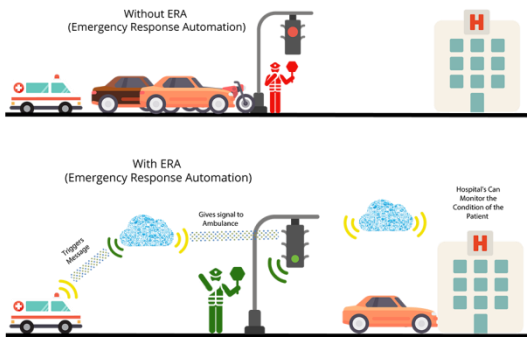


Fig.1: Traffic signal

I. INTRODUCTION

In today's high speed life, traffic congestion becomes a serious issue in our day to day activities. It brings down the productivity of Individual and thereby the society as lots of work hour is wasted in the signals. High volume of vehicles,

time. Large data must be divided into 8-bit information for processing. It can have maximum of 64k bytes ROM. It has gain many popularities after Intel allows other manufacturers to make it. After that its many versions with different speed, on chip RAM and ROM sizes were introduced in market by many manufacturers. But all these versions have same instruction set and program written for one will run on any other version without any change. 8052, 8031 are another version of its family.

III. POWER SUPPLY

We have power supplies with +5V & -5V option normally +5V is enough for total circuit. Another (-5V) supply is used in case of OP amp circuit. Transformer primary side has 230/50HZ AC voltage whereas at the secondary winding the voltage is step downed to 12/50hz and this voltage is rectified using two full wave rectifiers. The rectified output is given to a filter circuit to filter the unwanted ac in the signal. After that the output is again applied to a regulator LM7805 (to provide +5v) regulator. Whereas LM7905 is for providing -5V regulation. (+12V circuit is used for stepper motors, Fan and Relay by using LM7812 regulator same process like above supplies.).

IV. ADVANTAGES

- Avoids wastage of time due to the traffic.
- Low cost to design the circuit, maintenance the circuit is good.
- Low power consumption.
- By using this controller IC we can create many more control to the appliances.
- Light efficient light can be achieved with high intensity high power LED.
- It mainly to make the traffic management system a smart and intelligent one.
- It save the precious time of the commuters on road.

V. APPLICATIONS

- Control traffic in metro Politian cities.
- Controlling signals like emergency.
- Edge detection
- First order edge detection.
- Robot operator.

VI. CONCLUSION

Thus from above theory, we can conclude the using the method of density based control of traffic lights we can save a considerable amount of time and also we can prevent excessive traffic jams thus leading to smooth traffic flow.

In practise presently in India wearer following time based control of traffic signals and we are experiencing a heavy traffic a jam all over which in turn consumes lot of time and fuel. We hope these methods will be adopted as soon as possible so that the limitations we are experiencing with present method of can be overcome.[6]

VII. REFERENCES

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