

Smart Traffic Light Controller

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Abstract:

Today's scenario is number of people on the earth are rapidly increasing and according to that the number of vehicles on the road is also increased. Therefore the problem of traffic management is arises specially for EMERGENCY Vehicles. The idea behind this paper is to implement a system which can easily control the traffic and helps for the emergency vehicles to reach at their destination. This scheme relies completely on automatic intelligent control. Here the goal is to reduce the latency of emergency vehicles with minimum or less disruption to regular traffic flow is possible. However there is still problem for an emergency vehicle to bypass near the traffic junction. The emergency vehicles could not be going as fast as it can. So to overcome that problem we have to find the new methods.

Keywords — Micro controller, LEDs, Transmitter, Reciever, Encoder, Decoder.

I. INTRODUCTION

The traffic lights are used mainly for pedestrians to be protected when they cross the roads. The normal function of traffic system is to control the coordination to ensure that traffic moves as smoothly and safely as possible. It was reducing collisions, both vehicular and pedestrians. It was encourage travel within the speed limit to meet the green lights. The emergency will occur any way, any time and on any location. in that case the speedily response is required. the number of vehicles using the limited road networks infrastructure which was slowly increased. We feel that the major consequence of this increase is the traffic management problem. one of the most critical consequences of traffic problem is the delay of emergency vehicles such as, ambulance during accidents to reach hospitals on time, fire brigade vehicles, police van to catch the thief, and VIP (Minister or president) vehicles.

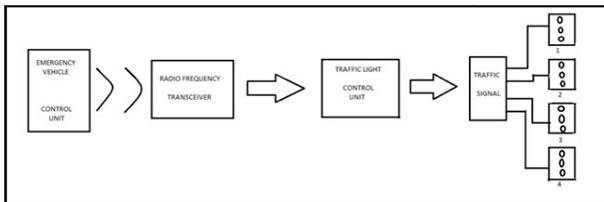
There are traffic jams occur on main way in special seasons and rush hours. That was lead to a long waiting time of peoples and high cost of fuel consumption on the road. And in that delay the Emergency vehicles are stuck in traffic jams. Sometimes even if there is no traffic then also people have to wait because there is a certain time limit of traffic signal. So road users have to wait till the traffic signal turned to green light. Therefore we have to find new methods which solve this problem.

Particularly in India, Most of people cannot give a way for an ambulance because of traffic.^[10]The Indian ambulance experiment was done around 400 cars on the road. There was 0% response to an Indian ambulance. Suppose someone has suffered a heart attack and needs ambulance immediately. But by this way the patient will die before the ambulance could reach to the hospital.

The Indian people could not do even an effort to pass the ambulance first. The person can die before the ambulance reach to the hospital. Then who is responsible for him or her death? On the other hand in foreign countries, every people are giving a first priority to an ambulance or any emergency vehicle. So why could not done with Indian peoples? The Indian peoples can also do the same thing while their family members are lying in this ambulance. So why could we have to wait for this much time? Why we could not implement this from today itself? Just think this by giving the first priority to an ambulance, we can save someone's life and on him/her depends the life of them family. India has the highest number of deaths due to delay of ambulance. And remember we can overcome this by giving 'Right of Way' to the ambulance. Along with implementing traffic signals, at least 9 out of 10 lives can be saved.

II. HARDWARE

BLOCK DIAGRAM

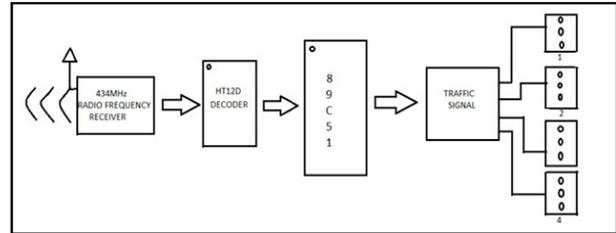


Complete System Block Diagram

RF MODULE-

RF modules are 433 MHz RF transmitter and receiver modules. The transmitter draws no power when transmitting logic zero while fully suppressing the carrier frequency thus consume significantly low power in battery operation. When logic one is sent carrier is fully on to about

4.5mA with a 3 volts power supply. The data is sent serially from the transmitter which is received by the tuned receiver. Transmitter and the receiver are duly interfaced to two microcontrollers for data transfer.



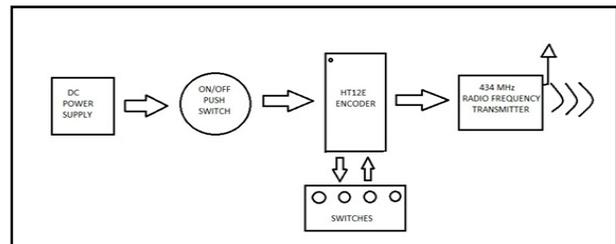
Traffic Signal Controller Block Diagram

HT12D DECODER IC-

In simple terms, HT12D converts the serial input into parallel outputs. It decodes the serial addresses and data received by, say, an RF receiver, into parallel data and sends them to output data pins. The serial input data is compared with the local addresses three times continuously. The input data code is decoded when no error or unmatched codes are found. A valid transmission is indicated by a high signal at VT pin.

AT89C51 MICROCONTROLLER-

AT89C51 is an 8-bit microcontroller and belongs to Atmel's 8051 family. **ATMEL 89C51** has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times.



Emergency Vehicle Block Diagram

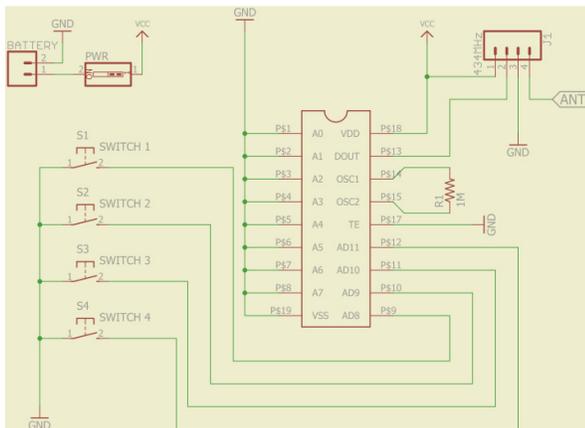
HT12E ENCODER IC-

HT12E is an encoder integrated circuit of 2^{12} series of encoders. They are paired with 2^{12} series of decoders for use in remote control system applications. It is mainly used in interfacing RF and infrared circuits. The chosen pair of encoder/decoder should have same number of addresses and data format.

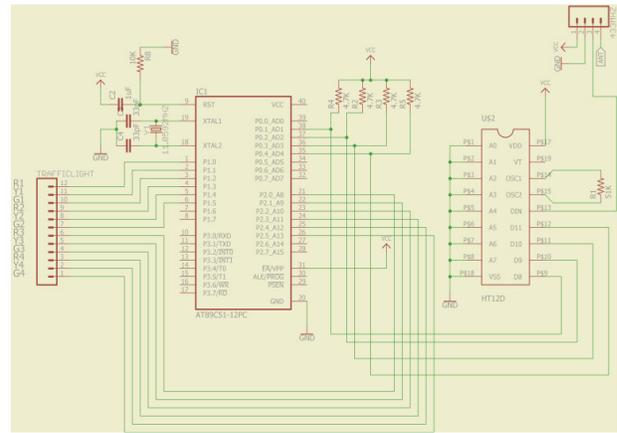
III. CIRCUIT DIAGRAM AND IMPLEMENTATION

The architecture of this system is divided in two systems. One of them is fitted in ambulance, so it is called an ambulance system. And another one is

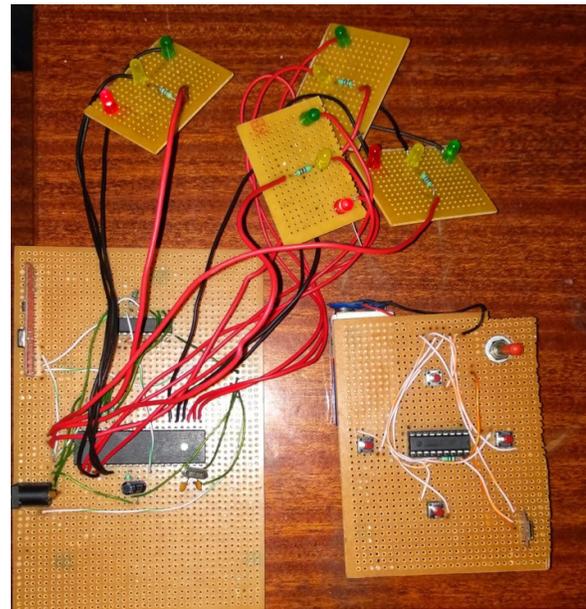
fitted at traffic junction. So that it is called a traffic junction unit.



Ambulance Circuit



Traffic Light Circuit



Recent Publications and Guidelines

Traffic condition of India is increasing day by day. So the major concept came into existence is to control the traffic junction in such a way that peoples does not affected and all problems can be overcome. No doubts, ambulance will not have to wait on the traffic junction even when the traffic signal is red. The Bangalore city is planning to implement a traffic control system for emergency vehicles. In some of the area this system is already implemented few months ago. The working of traffic control in that city is, whenever an

emergency vehicle is passes through traffic junction than the traffic junction will detect this emergency vehicle and controlling the traffic signal in a sense that to turn on the green colour of that traffic junction. So by this way the emergency vehicle passes through that junction and does not have to wait till the route clear.

IV CHALLENGES

There are traffic jams on the roads. In that people have to wait for a long time on the traffic junction. And because of that it is very hard for emergency vehicles to pass through that junction. So it would be helpful to change the traffic signal in accordance to emergency vehicles. Turning to manual control of traffic jam and pass the ambulance over traffic junction is sometimes solve the problem of emergency vehicles. In today's system, it is operated manually. Why we cannot think to make it automatically? By doing so, it will reduce the time of traffic officer to stay over there. It would guarantee a clear path for an emergency vehicle. But obviously some interruptions are possible over there with road users. They have to compromise with this to protect some one's life. System can display a message on traffic junction through LCD or play an alarm to indicate the upcoming EMERGENCY Vehicles.^[7]

V. CONCLUSION AND FUTURE ENHANCEMENT

Conclusion:

Human life is very precious and must follow safety measures very conscious in all aspects. Due to delay of ambulance, the loss of life came into an existence. Thus many people have proposed a new design for automatically controlling the traffic signal. By doing this the ambulance would

be able to cross all the traffic junction and can be reached to the hospital without delay. It would guarantee a clear path and smooth flow for an emergency vehicle. But obviously some interruptions are possible over there with road users. They have to compromise with this to protect someone's life. In this application, an Automatic Traffic Signal Control is implemented to avoid congestion of traffic to reach the particular place, hospitals and to save the life of human. As the entire system is automated, it requires very less human intervention. With this system, the ambulance can be maneuverer from the accident spot to the hospital without time lag. The signals turn to RED, only after the Emergency vehicle passes through. This system is proved to be effectual to control not only ambulance but also authoritative vehicles. The system is more accurate with no loss of time.

Future Scope:

With automatic traffic signal controller , the manual effort on the part of the traffic policeman is saved. As the entire system is automated, it requires very less human interactions by using IOT devices. With the help of Internet of Things [IOT] we can easily monitor the traffic signals density and emergency vehicles enter and exit on a website. Another application of IOT devices is we can easily control the traffic signals also. Depends on our requirements when VIP persons visit, with in a fraction of time intervals also we can reset the signals as previous.

VI. REFERENCES

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