

# INTELLIGENT MANAGEMENT SYSTEM FOR DENSITY BASED CONTROL, STOLEN VEHICLE AND AUTO CLEARANCE

A Ranganath<sup>1</sup>, T Sree Valli<sup>2</sup>

<sup>1</sup> Pursuing M.Tech (ES), Working as Assistant Professor,

Visvesvaraya College of Engineering and Technology (VCET), M.P.Patelguda, Ibrahimpatnam,  
RangaReddy, Telangana, (India)

## ABSTRACT

*In this paper, we proposed an advanced intelligent traffic control system. This system was implemented based on present criteria that tackling two condition in those one is heavy traffic control and another one is making a root for emergency vehicle like ambulance and VIP vehicle. In this paper we are going to implement a sensor network work which is used to detect the traffic density, stolen vehicle and a RF based communication system for getting information from the emergency vehicle. We can identify the stolen vehicle through RFID technology. With the use of embedded controller's technology we are going to interface the two systems and it monitor things and gets signalling for traffic lights.*

**Keywords:** Microcontroller, Signalling leds, RFID, RF Transmitter, RF Receiver and IR Sensors.

## I. INTRODUCTION

Now a days in metro cities the population is increasing in huge range. As the population increasing that is mainly effecting on the traffic control system. It is a challenge to traffic police to control the traffic and also there is possibility of wasting the human power. In order to overcome this we are implemented this system in which it is directly controlling the traffic signals and it gives a way to emergency vehicle all this done without a human power that is automatically.

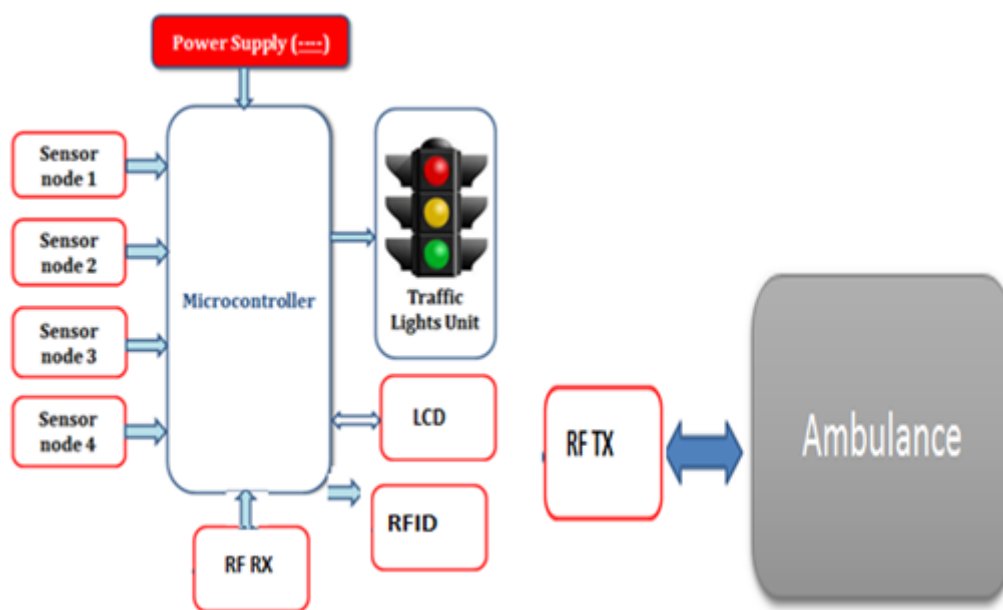
As we have seen many systems in presently situation these running systems are dependent on image processing. In order to identify the emergency vehicle it captures the number plate and extracts the number from it and then it searches in data base. It is a heavy process and cost effective, this systems produces results are very low accurate and it depends on weather conditions.

In order to overcome all this defects we are developed this system which gives accurate results and will work on in any weather condition with low cost. Her the emergency vehicle are detected by using high range RF communication. The emergency vehicle are consists of RF transmitters and at the traffic signal unit it consists of RF receiver unit. The signalling id is done based on density of vehicle in that direction, for that we are going to use sensor network which consists of pair IR sensor that is a transmitter and a receiver.

Here in our proposed system have developed a system which is used to provide clearance to any emergency vehicle. We have developed a density based control system in order to achieve our desired results. Due to wind, rain, fog, etc., the image received by the camera is distorted by noise and it becomes difficult for the system to identify the desired vehicle.

Thus, we have built our system using density based control system. The advantage of this system is to provide accurate signal without any interrupt to any persons. The system also provides security for ambulance clearance. Hence it is easy way to overcome the defects across traffic signal and performs the certain desired task. The proposed system consists of four pairs of IR transmitter and IR receiver for the purpose of density detection and RF transmitter and receiver unit are used in order to get the information from the emergency vehicle. Whenever they passed the information of the direction then that direction should be signalling to green. We can also recognize stolen vehicle occurred across different area and simultaneously, getting alertness to person when he theft the vehicle.

### 2.1 Block Diagram



**Fig: Block Diagram at Traffic Section**

**Fig: Block Diagram at Ambulance Section**

The system consists of two sections .one is traffic and another one is ambulance. The traffic section consists of microcontroller, LCD, power supply, IR sensors, RF receiver and traffic light control whereas ambulance section has RF transmitter and ambulance vehicle.

The ARM 7 LPC2148 is plays an important role in this project. It performs all operation and control the desired task. It consumers less power compare to other controller. Here we are employing a high speed micro controller named as LPC2148 with ARM7 architecture to do the prototype module of the project.

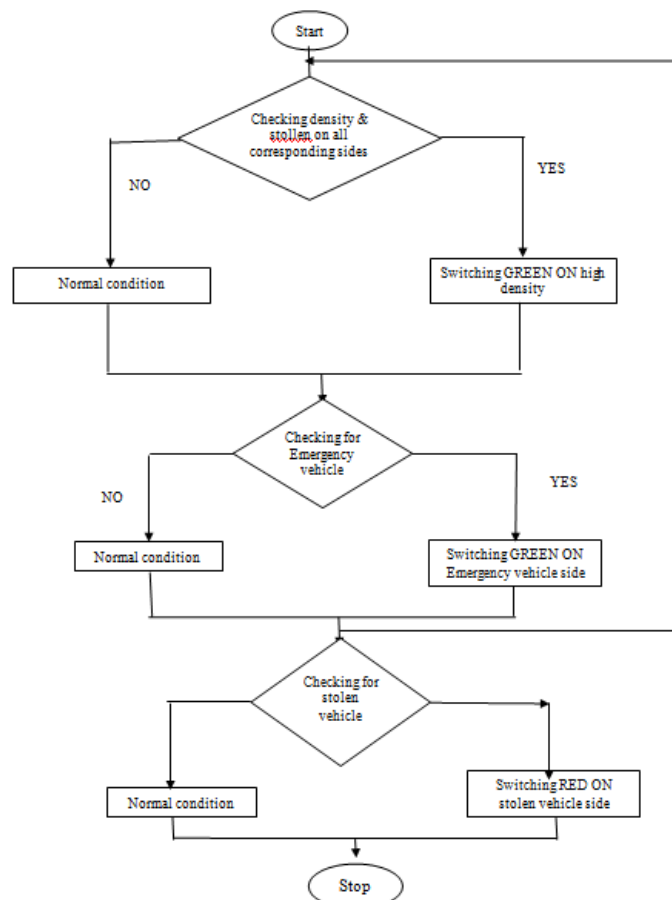
The LCD is used to view the corresponding signal and easy to recognize the traffic signal lights. The power supply is applied to controller which performs the desired results. Here we are using the LCD for displaying the signal position. The traffic model there are three LED's red, orange and green. We make a design a traffic light control through LED's similarly like traffic signal manner as shown in below representation figure. Here we are

using one green led for the indication of the ambulance vehicle if it is found in that particular traffic signal and remaining LED's performs the corresponding task.

Whenever an ambulance vehicle exists then the corresponding light will convert into green. To establish communicate between ambulance and traffic control system we use RF module. It is easy to communicate between two sections. The system can control based on pair of IR sensor. In this paper the traffic control system can be controlled based on density. We place different IR sensor at respective traffic signals. If IR sensor detects at certain signal then corresponding led will glow ON and vice-versa. Based on IR sensor we calculate the density. The code is written in embedded C on the Kiel cross compiler and burned into the microcontroller with the help of USB to Serial convertor by using Flash magic software.

### III. WORKING

The system is mainly divided into two processes, those are monitoring of signalling with according to density and detection of emergency vehicle, providing way for that vehicle. The density of vehicles information is getting with the help of IR sensors placed towards the junction on four roads, when it detects that the vehicle stopped. The process of continuous signalling is stopped and then immediately it is transforming to the particular destination in which the density of vehicle is high. In other side it is continuously monitors the RF receiver information. If the levels at RF receiver changes then it automatically executes the information which we have written in the programming. The system flow action is given below.



**Fig: Flowchart of System Design Model**

#### **IV. SOFTWARE IMPLEMENTATION**

In order to communicate with the hardware we require a predefined software. An embedded system we require both hardware and software, it is mandatory to perform a specific application. The hardware components will run according to the instruction given to the program. The software tools should be selected based on micro-controller using in this application. The following some of software tools are used in this project.

- 1) MDK Keil  $\mu$ Vision
- 2) Flash Magic

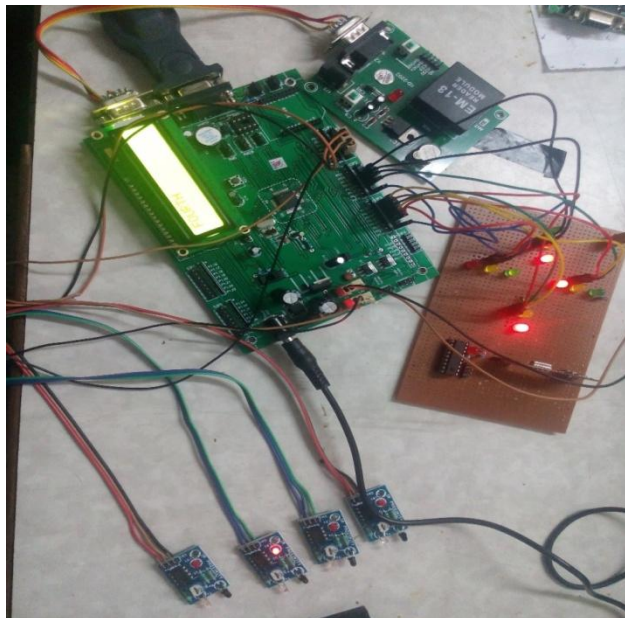
##### **4.1 Keil $\mu$ Vision**

The Keil  $\mu$ Vision is an IDE which will consist of complete programming environment for various micro-controllers. Keil is having a C editor, ANSI C cross compiler, debugger, and a hex file generator in it. It supports programming for various 8-bit, 16-bit and 32-bit micro-controllers.

##### **4.2 Flash Magic**

It is simply a programming dumping software. Micro-controllers can only understand machine language. Whatever we are writing in the program, that we need to convert into machine level language. That machine level language format of the program, we call it as Hex file. After completion of writing all the code, the programmer needs to write the hex file into the micro-controller.

#### **V. RESULTS**



**Fig 1: Overview of System Design Based on RF Communication**

#### **VI. CONCLUSION**


The system we developed here is producing high efficient results. By using this we can save the human resources traffic department. It is easy to implement and also it is a cost effective product. It requires low

maintenance. We can extend this project to the long range by using best suited RF modules. With this project we are detecting emergency vehicle and we are providing a way to the vehicle, not only this we can extend this for detection of stolen vehicle also.

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## AUTHOR DETAILS

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|  | <p><b>A. RANGANATH</b>, Pursuing Mtech (ES) from Visvesvaraya College of Engineering and Technology (VCET), M.P.Patelguda, Ibrahimpatnam, RangaReddy, Telangana, INDIA.His area of interest includes embedded systems interrelated with different types of microcontrollers.</p> |
|   | <p><b>T. SREE VALLI</b>, working as Assistant Professor from Visvesvaraya College of Engineering and Technology (VCET), M.P.Patelguda,Ibrahimpatnam, RangaReddy. .She has morethan two years of Experience in Teaching Field.</p>  |