Traffic Light Control System for Emergency Vehicle

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***Abstract*- In emergency situation, each and every second is important in saving a human's life. The idea of this project is to use the each second protectively to save person. Now a day many lives are being expired before the person reaches the hospital in ambulance or life is lost to lack of basic information about the condition of the patient and the delay caused due to this. In this project we have structure a protocol which could save every delay and save the life early. Here we use PIC 16F887 microcontroller to control the traffic signal and PIC 16F676 microcontroller to control ambulance section. CC2500 act as a wireless communication**

I. INTRODUCTION

The traffic light control plays a vital role in any intelligent traffic management system. Traffic lights are the signaling devices that are placed on the intersection points and used to control the flow of traffic on the road. In the fast-emerging world, vehicles become mandatory for all purposes. Traffic is a critical issue of transportation system in most of all the cities of countries. This is especially true for countries like India and China, where the population is huge. This condition has a definite effect over the day life and other activities of the society. The number of vehicles used by the people constantly increasing due to rapid growth in population leading to high density traffic which increases the waiting time of emergency vehicles. Traffic signals may also help in reducing various types of accidents. A survey said that 90% of heart patient can be treated if they reach in time, without any traffic congestion. It is one of the major problems of current growing world where people always prefer a comfort way of transportation. This kind of situation today has led to many deaths and losses due to increased population and increased number of vehicle.

II LITERATURE SURVEY

Smart Traffic Lights System for Emergency Response Vehicles Khalid M.Almuraykhi, Dr.Muhammad Akhlaq (published on 2019)

Emergency response vehicles, such as ambulances and fire-trucks, cannot afford to waste time while waiting on traffic lights. These vehicles need a system that would allow them to safely cross the traffic lights without any delay. We propose a smart traffic lights system (STLS) that uses an Android app, MQTT (Message Queuing Telemetry Transport) protocol, Google maps, micro-controlled traffic lights and the Internet for connecting them together. The Android app allows a user to select the destination, Google maps find the shortest path to the destination and position of all traffic signals on the path, the mobile app sends the arrival time for each traffic signal controllers. Eventually, when the vehicle will arrive at the traffic lights, it will find them opened without any conflict with the other signals. A laboratory prototype is made using an Arduino microcontroller to control the traffic lights represented by LEDs on a breadboard, while a fully functional prototype with actual traffic lights is also developed and tested with 100% correct results.

Advanced Traffic Signal Control System for Emergency Vehicles

Sangamesh S B, Sanjay D H, Meghana S, M N Thippeswamy (published on 2019)

This paper introduces the novel approach to handle the situation for emergency vehicles like ambulance and fire trucks to avoid traffic to reach the destination in time in order to save the lives. This system is based on Internet of things (IOT) using cloud at its centre. The proposed system uses real-time GPS to track the location of the vehicle and update the same to cloud, smart traffic signals which are present in route of the vehicle are notified the same. System maintains the detail on the emergency vehicles to pass through the traffic with no or minimum waiting time, thus reducing the number of deaths during the travel to hospital and conditions to reduce the loss of property in case of fire emergency.

III. PROPOSED METHOD

TRAFFIC SECTION

This module contains hardware components of the system. PIC 16887 microcontroller to which the crystal oscillator is inbuilt and CC2500 receiver receives the signal from the ambulance to which CC2500 transmitter is connected

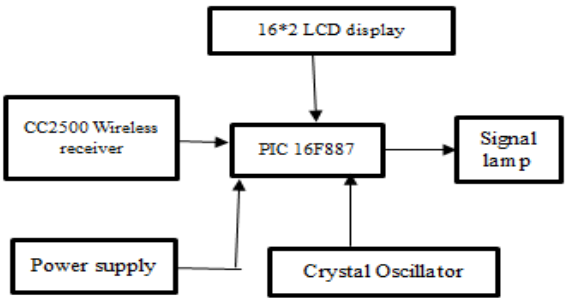


FIGURE 1.1

AMBULANCE SECTION

This section contains mainly PIC 16F676 microcontroller and CC2500 transmitter. The CC2500 transmitter is placed in the ambulance which transmits the signal by data with the range of 200 meters.

FIGURE 1.2

WORKING:

The power supply is given to the traffic section. In traffic section there is a receiver named CC2500 is fixed and in the ambulance section a transmitter CC2500 is fixed and the data from transmitter sends signal to the receiver with the help of PIC Microcontroller. The buzzer and fourth light are added along with the traffic light. Here the buzzer is connected to PIC16f887 in the port. Crystal oscillator is used here. It is used to generate clock pulse the forth LED is connected to the port 17. These are placed to give alert to the people before the arrival of ambulance.

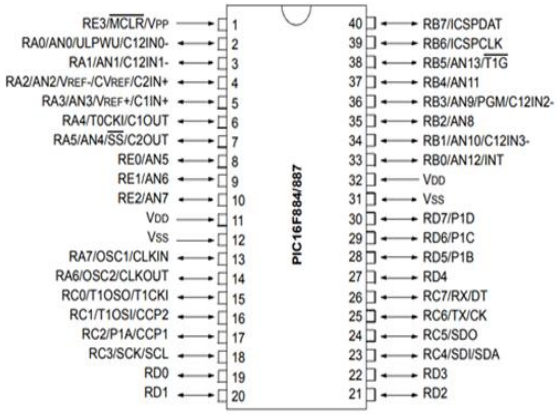
COMPONENTS AND REQUIREMENTS:

The components used for traffic section are

- PIC16F887 Microcontroller
- Power supply
- CC2500 Receiver
- Buzzer
- LED

PIC16F887

The PIC16F887 is an 8-bit microcontroller from microchip. The IC also has 2 comparators, 2 timers and supports SPI, 12C and UAN communication protocols. It can operate at a speed up to 20MHz with external oscillator and also has precision internal oscillator tunable between 8MHz to 32KHz



CC2500 TRANSCEIVER

The CC2500 is a low-cost transceiver designed for very low power wireless application

The features of CC2500 are

- High sensitivity
- Low current consumption
- Excellent receiver selectivity and blocking performance
- Frequency range (2400-2483.5MHz)

POWER SUPPLY

It is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from source to the correct voltage, current and frequency to power the load. All power supplies have a power input connection, which receives energy in the form of electric current from the source, and one or more power output connections that deliver current to the load

LED (LIGHT EMITTING DIODE)

It is a semiconductor light source that emits visible light when, electric current passes through it. Unlike ordinary incandescent bulbs there is no filament. LED traffic signals use high brightness LEDs connected together to build a cluster consisting of hundreds of LEDs. The simple truth is traffic lights run on 120volts and all used medium based light bulbs

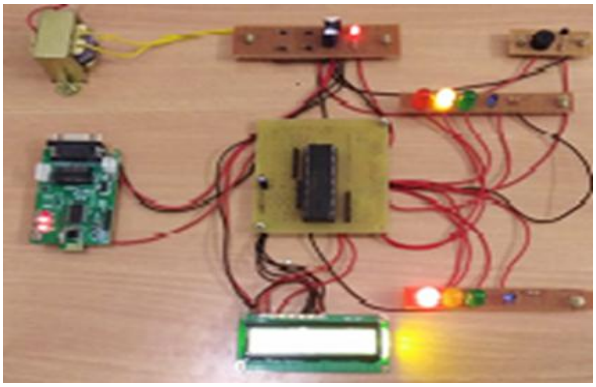
BUZZER

A buzzer or beeper is an audio signaling device which may be mechanical, electro mechanical or piezo electric. The buzzer consists of an outside case with two pins to attach in ton power and ground. Inside is a piezo element, which consists of a central surrounded by a vibration disc. When current is applied to the buzzer. It causes ceramic disc to contract expand. The sensor buzzer is a passive buzzer like a magnetic speaker, it needs voltage with different frequency so that it can make sound accordingly. The pitch becomes louder when the frequency gets higher.

The components used for ambulance section is
PIC16F676
CC2500 TRANSMITTER

PIC16F676

PIC16F676 may be smaller in size but it has internal 10-bit Analog to digital converter within a 14-pin package



IV CONCLUSION AND FUTURE WORK

Thus, the project is built for two lanes by incorporating two channels in CC2500 for receiving and transmitting data. Once the emergency vehicle is approaching a lane the data is received by the CC2500 receiver in the traffic section and the signal in the particular lane is changed. To differentiate the two lanes two different data are transmitted by different channels. An alarm sound is activated so that the other vehicles through the lane is also alerted of the approaching emergency vehicle.

REFERENCE

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