# TRAFFIC SIGNALS CONTORL FOR AMBULANCE PASSAGE

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## Abstract

*Traffic jams in the world today is one of the biggest concerns. Traffics jams might even lead to death of people in case of serious situations. Not only ambulance but the other emergency vehicles like Fire Brigade trucks and Police cars tend to get stuck in jams. These different emergency vehicles which get delayed due to traffic jams might result in loss of many lives [1]. With the help of our system all the red traffic light signals will be turned to green in order to provide a clear way for the emergency vehicles. Apart from providing clearance to the emergency vehicles our system will also help in identifying any stolen vehicle when is crosses the different traffic light signals.*

## Introduction

Ambulances are the primary source of transport which are used for saving life of human beings. Great deal of problem arises when such emergency vehicles get stuck in jams specially when someone is critically injured and needs urgent treatment. All ambulances are not equipped with advanced life saving equipment inside them which increases the risk of a patient to lose his or her life. Not only ambulances but the other emergency vehicles like the fire brigade and police cars may stuck in these traffic jams and therefore might not be able to perform their emergency operation on time. It takes a very long time in clearing such traffic jams and since it is a priority to save someone's life new and efficient traffic control system is a must. In our proposed system emergency vehicles will be provided clearance by turning the red traffic lights to green, hence providing a complete green wave to the desired vehicle. Emergency vehicles should be given the highest priority and therefore this system will be very efficient in giving priority to these emergency vehicles. A comparison of the responses of ambulance drivers and family members of patients in wards‖ showed that 60% of drivers agreed i.e 15 respondents and 40% disagreed while 100% of the family members i.e 25

respondents agreed that traffic jams led to deaths due to architectural short comings like congested and wrecked roads, unorganized traffic and no visible role of traffic management. This serious turmoil ultimately left negative impacts on the health of common man. In addition to providing clearance to the different emergency vehicles, this system will also help in location a stolen vehicle when it crosses a traffic signal.

**Introduction to Embedded System**

An embedded system is one kind of a computer system mainly designed to perform several tasks like to access, process, and store and also control the data in various electronics-based systems. Embedded systems are a combination of hardware and software where software is usually known as firmware that is embedded into the hardware. One of its most important characteristics of these systems is, it gives the o/p within the time limits. Embedded systems support to make the work more perfect and convenient. So, we frequently use embedded systems in simple and complex devices too. The applications of embedded systems mainly involve in our real life for several devices like microwave, calculators, TV remote control, home security and neighborhood traffic control systems, etc. Please follow the below link for Embedded system basics; block diagram, types, and applications.

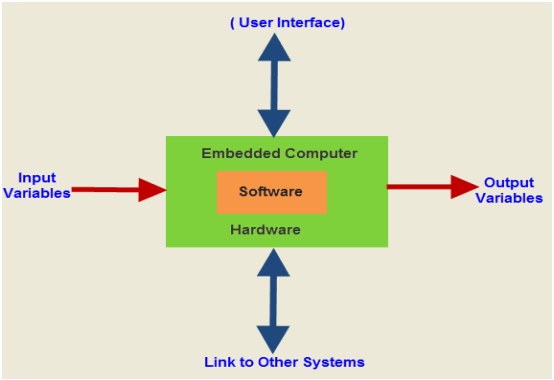


**Fig 1 : Embedded systems**

**Embedded System Applications**

The applications of an embedded system basics include smart cards, computer networking, satellites, telecommunications, digital consumer electronics, missiles, etc.

- Embedded systems in automobiles include motor control, cruise control, body safety, engine safety, robotics in an assembly line, car multimedia, car entertainment, E-com access, mobiles etc.
- Embedded systems in computer networking & peripherals include image processing, networking systems, printers, network cards, monitors and displays.
- Embedded Systems in digital consumer electronics include set-top boxes, DVDs, highdefinition TVs and digital cameras.

Thus, this is all about the basics of embedded system basics and applications. We all know that embedded systems are extremely fabulous systems that play avital role in many applications like equipment, industrial instrumentation, etc.

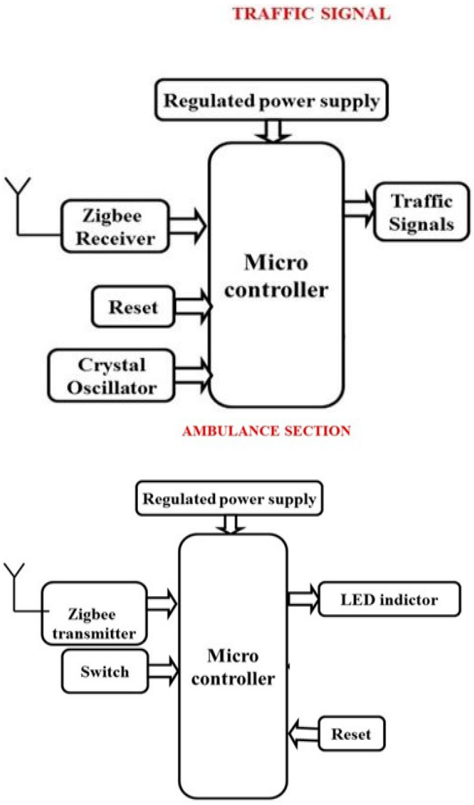


**Figure 2: Block Diagram**

**INTRODUCTION TO MICROCONTROLLERS**:

A microcontroller is a tiny, affordable and self-contained computer-on-a-chip which will be used as an embedded system. It's a pc on- a- chip optimized to manage electrical gadgets. It is meant significantly for specific tasks like an exact system. A microcontroller is often abbreviated as µc,or MCU. Also, a micro-controller could be a fraction of a set in systemthat is essentially a whole card. A fixed-in system could be a computing system supposed to hold out one or a lot of functions over and all over again with real- time estimate limits. It is embedded as a part of a full machine typically enumeration hardware and motorized parts inaddition.

Hardware tools:

Arduino Uno

- Zigbee Module
- Led lights
- Regulated Power Supply
- Switch (4)

**Software tools:**

- Arduino Software
- Proteus

**ARDUINO MICROCONTROLLER:**

- High Performance, Low Power AVR® 8-Bit Microcontroller
- Advanced RISC Architecture
- 131 Powerful Instructions – Most Single Clock Cycle Execution
- 32 x 8 General Purpose Working Registers
- 4/8/16/32K Bytes of In-System Self-Programmable Flash program memory
- 256/512/512/1K Bytes EEPROM
- 512/1K/1K/2K Bytes Internal SRAM
- Write/Erase Cycles: 10,000 Flash/100,000 EEPROM

**ATMEGA 328 PIN DIAGRAM:**

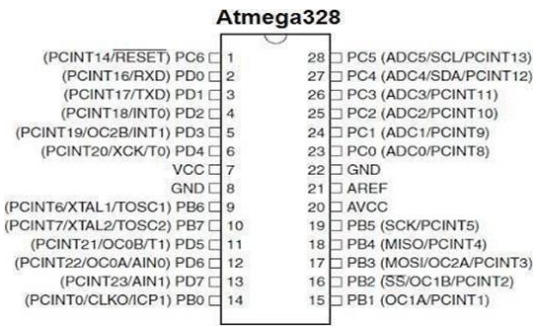


**Fig 3 - ATMEGA 328 Pin description**

**Comparison between Processors:**

The ATmega48A/48PA/88A/88PA/168A/168PA/328/328P differ only in memory sizes, boot loader support, and interrupts vector sizes. Table 2-1 summarizes the different memory and interrupt vector sizes for the

devices.

**Table : Different types of microprocessors**

| Device | Flash | EEPROM | RAM | Interrupt Vector Size |
|---|---|---|---|---|
| ATmega48A | 4K Bytes | 256 Bytes | 512 Bytes | 1 instruction word/vector |
| ATmega48PA | 4K Bytes | 256 Bytes | 512 Bytes | 1 instruction word/vector |
| ATmega88A | 8K Bytes | 512 Bytes | 1K Bytes | 1 instruction word/vector |
| ATmega88PA | 8K Bytes | 512 Bytes | 1K Bytes | 1 instruction word/vector |

**Table: Memory Size Summary**

| Device | Flash | EEP ROM | RAM | Interrupt Vector Size |
|---|---|---|---|---|
| ATmega168PA | 16K Bytes | 512 Bytes | 1K Bytes | 2 instruction words/vector |
| ATmega328 | 32K Bytes | 1K Bytes | 2K Bytes | 2 instruction words/vector |
| ATmega328P | 32K Bytes | 1K Bytes | 2K Bytes | 2 instruction words/vector |

ATmega48A/48PA/88A/88PA/168A/168PA/328/328P support a real Read-While-Write Self-Programming mechanism. There is a separate Boot Loader Section, and the SPM instruction can only execute from there. In AT mega 48A/48PA there is no Read-While- Write support and no separate Boot Loader Section. The SPM instruction can execute from the entire Flash.

## WORKING PROCEDURE

In order to improve the existing system we have developed a new green wave system. In which the traffic signal management for emergency vehicle is included. To make the proposed system work two methods are implemented. First is that as soon as emergency vehicle driver switches on the zigbee module transmitter and as soon as it starts communicating with the zigbee module that will be installed in the other end at the traffic pole, the traffic light will turn green and as soon as the vehicle passes the junction, traffic signal will automatically convert to previous state as well as the timing in the traffic signal will be bring back to previous state in order to take care of people‘s convenience

## RESULTS AND DISCUSSION

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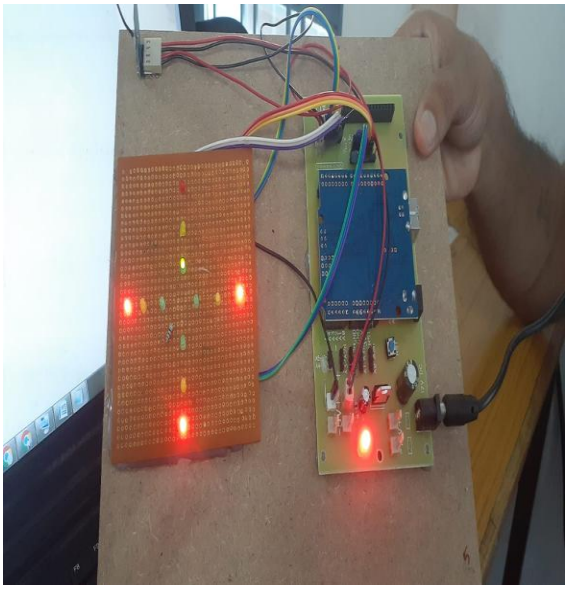
Advantages: In our proposed system emergency vehicles will be provided clearance by turning the red traffic lights to green, hence providing a complete green wave to the desired vehicle.

**ON:**



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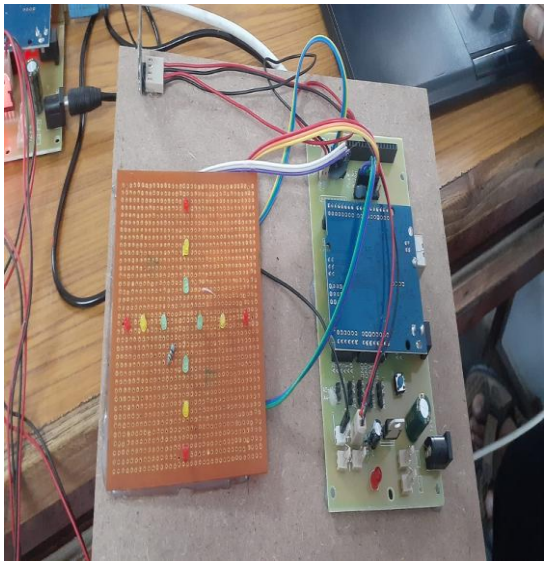

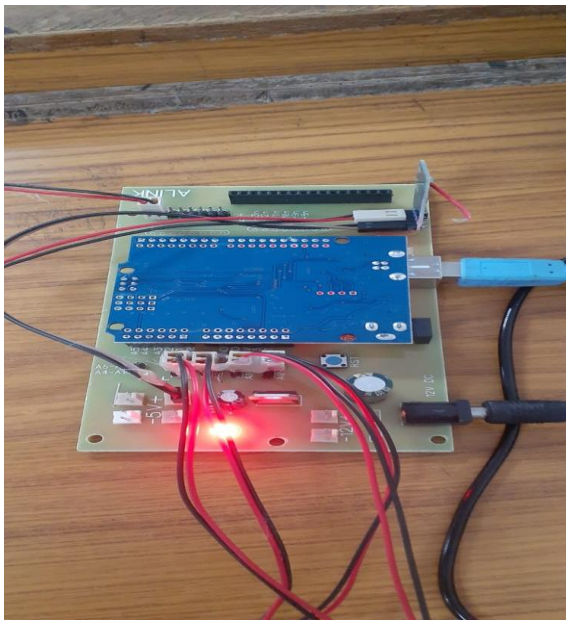

**Conclusion:**

Emergency vehicles should be given the highest priority and therefore this system will be very efficient in giving priority to these emergency vehicles. A comparison of the responses of ambulance drivers‖ and family members of patients in wards‖ showed that 60% of drivers agreed i.e., 15 respondents and 40% disagreed while 100% of the family members i.e., 25 respondents agreed that traffic jams led to

deaths due to architectural short comings like congested and wrecked roads, unorganized traffic and no visible role of traffic management. This serious turmoil ultimately left negative impacts on the health of common man. In addition to providing clearance to the different emergency vehicles, this system will also help in location a stolen vehicle when it crosses a traffic signal.

**Future scope:**

This technology is very vital and it has major impact on real time scenario like number of deaths due to delay of treatment can be reduced with very high margin [10]. Few more features can be added to this technology to make it more effective and error prone free. As soon as emergency vehicle sends signal to the nearby traffic signal it will also send few more data like destination address according to that we can make smart traffic system in which traffic signals will communicate with each other for the best possible path such that according to vehicle location traffic signal changes its state and help emergency vehicles to reach the destination as early as possible. One more feature which can be added is that when a stolen vehicle get identified it will send alert to traffic police, along with that possible path of the vehicle can also be provided to the police which make easier to catch stolen vehicle.

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