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## INTELLIGENCE TRAFFIC SIGNAL SYSTEM FOR AMBULANCE

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**Abstract:** - The project is designed to develop a density based dynamic traffic signal system for ambulance. The signal timing changes automatically on sensing the traffic density at the junction when the ambulance is in emergency. Traffic congestion is severe problem in many major cities across the world and it has become a nightmare for the commuters in these cities. Conventional traffic light system is based on fixed time concept allotted to each side of the junction which cannot be varied as per varying traffic density. After calculating the number of vehicles, we will come to know in which side the density is high based on which signals will be allotted for a particular side. Arduino Mega is used as a microcontroller which provides the signal timing based on the traffic density while the ambulance is on the way.

**Keyword:** Microcontroller, Arduino Uno, RF Module.

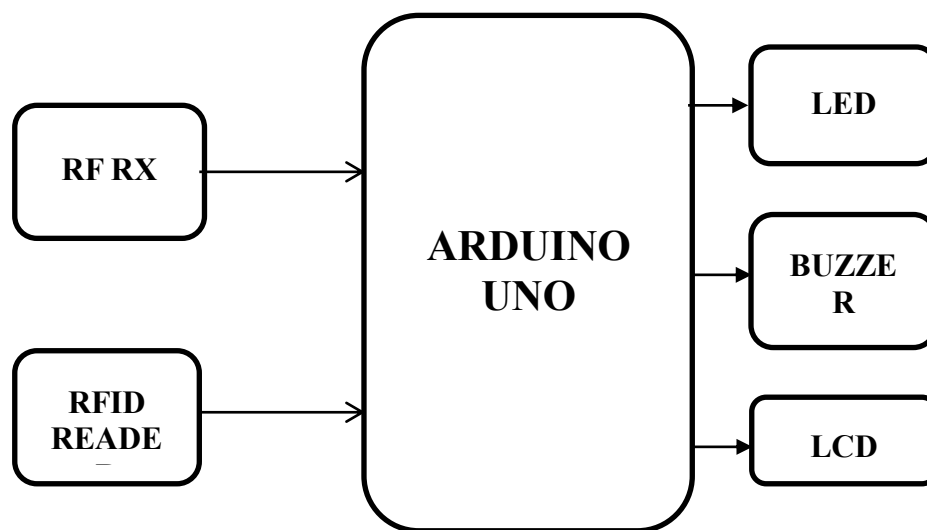
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### INTRODUCTION

The **INTELLIGENCE TRAFFIC SIGNAL SYSTEM FOR AMBULANCE** is an automated Way of controlling signals in accordance to the density of traffic in the roads. The signal changes automatically on sensing the traffic density at the junction. The prototype model was developed using Arduino mega Based, micro controller detects the traffic and controls the traffic system. The controls of traffic light depend on number of vehicles available in the road. In this system use sensors to measure the traffic density. To arrange one sensor for each road. These sensors always sense the traffic on that particular road.

Traffic congestion is a severe problem in many cities across the world and it has become a nightmare for the commuters in these cities. Traffic can be controlled in several main junctions by incorporating either automatic traffic light control or traffic police. But conventional traffic light system is based on fixed time concept allotted to each side of the junction which cannot be varied as per varying traffic density. At some times, priority of traffic light needs to be changed on more number vehicles waiting in the same road, VIPs vehicles and Ambulance vehicles etc.. Propose to design and develop a density based traffic signal system.

## 2. Block Diagram:

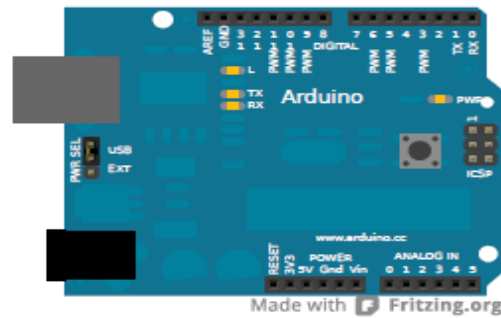


## 3. Components Used:

- Arduino Mega
- RF Module
- LED
- LCD
- RF id
- Buzzer

### 3.1 Arduino Mega

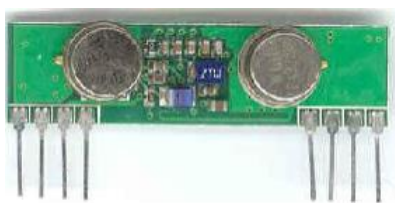
A micro-controller is a small computer on a single integrated circuit containing a processor core, memory, and programmable input/ output peripherals. The important part for us is that a micro-controller contains the processor (which all computers have) and memory, and some input/output pins that you can control. (often called GPIO - General Purpose Input Output Pins).



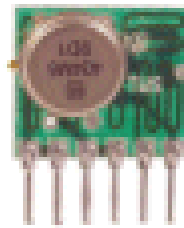
*Fig 1: Arduino*

### 3.2 RF Module (Radio Frequency)

Radio Frequency, any frequency within the electromagnetic spectrum associated with radio wave propagation. When an RF current is supplied to an antenna, an electromagnetic field is created that then is able to propagate through space. Many wireless technologies are based on RF field propagation.



*Fig 2: Receiver Module*



*Fig 3: Transmitter Module*

### 3.3 LED

In the simplest terms, a light-emitting diode (LED) is a semiconductor device that emits light when an electric current is passed through it. Light is produced when the particles that carry the current (known as electrons and holes) combine together within the semiconductor material. Since light is generated within the solid semiconductor material, LEDs are described as solid-state devices.



*Fig 4: LED (Light Emitting Diode)*

### 3.4 LCD:

Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.



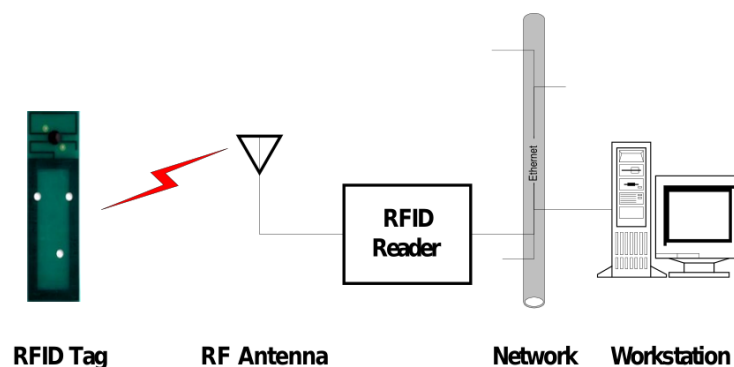
*Fig 5: LCD Display*

### 3.5 RFID:

RFID is a Radio Frequency Identification.

An ADC (Automated Data Collection) technology that:

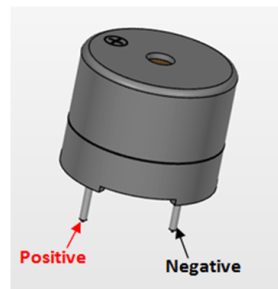
- uses radio-frequency waves to transfer data between a reader and a movable item to identify, categorize, track..
- Is fast and does not require physical sight or contact between reader/scanner and the tagged item.
- Performs the operation using low cost components.
- Attempts to provide unique identification and backend integration that allows for wide range of applications.



*Fig 6: Radio Frequency Identification*

### 3.6 Buzzer:

There are two types are buzzers that are commonly available. The one shown here is a simple buzzer which when powered will make a Continuous Beep sound, the other type is called a readymade buzzer which will look bulkier than this and will produce a Beep. Beep. Beep. Sound due to the internal oscillating circuit present inside it. But, the one shown here is most widely used because it can be customized with help of other circuits to fit easily in our application. This buzzer can be used by simply powering it using a DC power supply ranging from 4V to 9V.

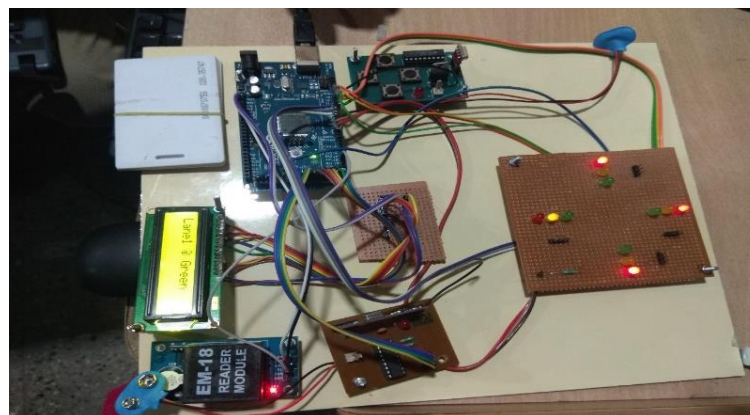


*Fig 7: Buzzer*

## 4. System Input and Output Implementation:

### 4.1 Input design:

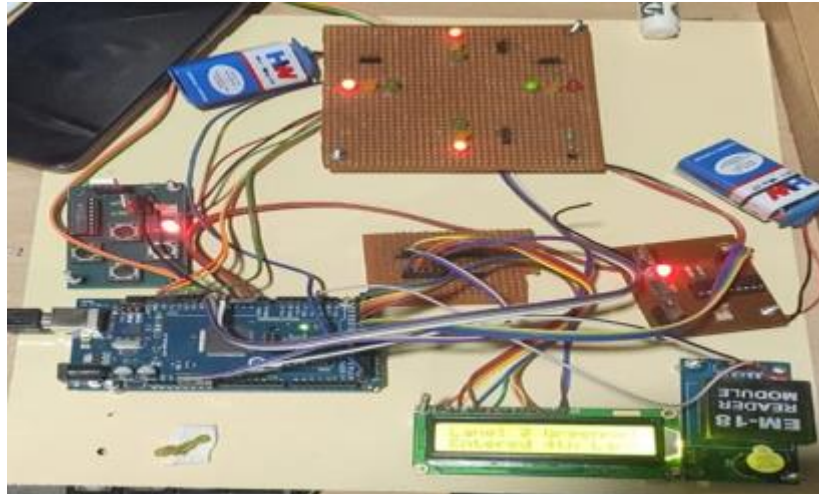
Arduino (Atmega) pins default to inputs, so they don't need to be explicitly declared as inputs with pin Mode() when you're using them as inputs. Pins configured this way are said to be in a **high-impedance state**. Input pins make extremely small demands on the circuit that they are sampling, equivalent to a series resistor of 100 megohm in front of the pin. This means that it takes very little current to move the input pin from one state to another, and can make the pins useful for such tasks as implementing a capacitive touch sensor, reading an LED as a photodiode, or reading an analog sensor with a scheme such as [RCTime](#). This also means however, that pins configured as pin Mode(pin, INPUT) with nothing connected to them, or with wires connected to them that are not connected to other circuits, will report seemingly random changes in pin state, picking up electrical noise from the environment, or capacitively coupling the state of a nearby pin.



*Fig 8: Power Supply to the Board*

## 4.2 Output Design

Pins configured as OUTPUT with pin Mode () are said to be in a low-impedance state. This means that they can provide a substantial amount of current to other circuits. At mega pins can source (provide positive current) or sink (provide negative current) up to 40 mA (milliamps) of current to other devices/circuits. This is enough current to brightly light up an LED (don't forget the series resistor), or run many sensors, for example, but not enough current to run most relays, solenoids, or motors.



*Fig 9: LCD Signal Output*

## 5 Conclusion:

This project will be very useful in the optimization of Traffic Signal System For Ambulance in a city using Arduino and RF id. A traffic light system has been designed and developed with proper integration of both the hardware and software. This interface is synchronized with the whole process of the traffic system for ambulance. Automatically this project could be programmed in any way to control the traffic signal system for ambulance and will be useful for planning proper road system.

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