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TRAFFIC CONTROLLER BASED ON RF

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Abstract: The project aims to provide a rational reaction for the traffic signal system to routinely refuse the usual sign timings during emergencies. When there is an emergency situation, such as a fire department or crisis car trapped in rush hour traffic, people tend to think that need should come first. In addition, the necessity becomes apparent when a certain route acquires excessive thickness. Hence, the system makes use of an android application device remote control that effectively offers a green piece of information for vehicles travelling in that direction and a red sign for all other traffic. The project makes use of an 8051 family microcontroller that is connected to IR sensors and photodiodes that are evenly distributed across the shop to see the thickness. The thickness is measured using three distinct methods: low, medium, and high, as indicated by the durations that are suitable for sign. RF advancement is used for the management of the replacement.

I. INTRODUCTION

Traffic congestion has become a significant problem in our daily activities in the fast-paced world we live in today. It undermines each person's performance as well as that of the general populace since a great deal of time is lost in the sign. The usual causes of these atypical obstructions are the large number of cars, the deficient system, and the astounding dispersion of the hailing structure. As long as engines are running, a significant amount of brand-name resources like oil and diesel are used pointlessly, which also contributes to the increase in sulphate level. In a similar vein, constantly updated plans should be carried out by acquiring sensor-based computerization strategies in this sector of traffic hailing structure in order to discard these troubles or perhaps rot them to significant degree.

II. LITERATURESURVEY

A review of the literature on traffic controllers Based on RF, it is clear that a lot of research has been done in this field with a goal of enhancing reaction times and guaranteeing the security of patients and healthcare professionals. According to a World Health Organization (WHO) research, traffic congestion may have a substantial influence on the time it takes for an ambulance to arrive, and putting in place traffic priority measures can help shorten these delays. According to the research, in order to guarantee the shortest response times, priority should always be given to ambulances, even outside of peak periods.

According to a different research by the European Commission (EC), implementing traffic priority measures for ambulances, such as using flashing lights and sirens, may improve patient outcomes. The research also stressed how crucial it is to make sure that traffic priority systems are uniform and similar across nations in order to reduce confusion and boost productivity.

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The use of Intelligent Traffic Light Systems (ITLS) to give emergency vehicles precedence in traffic has also been examined in a number of studies. In order to make traffic signals clear for ambulances, ITLS uses sensors to identify their presence. It has been shown that these technologies greatly speed up reaction times and increase both patient and healthcare practitioner safety.

The literature review concludes by emphasising the significance of giving ambulances traffic priority in order to enhance response times and patient outcomes. This objective may be accomplished by a number of methods, including the integration of intelligent traffic signal systems and the use of flashing lights and sirens. But it's also crucial to make sure that these mechanisms are uniform and consistent across nations.

III. WORKING PRINCIPLE

The answer to the problem of the traffic signal system, which will automatically bypass the typical signal timings in the event of an emergency. This occurs when there is an emergency issue, such as an ambulance or fire brigade being stalled in traffic; these services demand priority to proceed first. When there is a high density in a certain direction, there is also a need for it to be addressed. As a result, the system makes use of an android application device remote control to circumvent the signal timings. This causes the system to instantly provide a green signal in the direction that the car is travelling while sending a red signal to all other directions.

For the purpose of determining the load's density, the project makes use of a microcontroller from the family of 8051, which is interfaced with infrared sensors and photodiodes that are arranged in a line of sight arrangement across the load. The density may be assessed in three different ways: low, medium, and high. The timings that are allocated for signals are determined by whatever measurement method is used. Using RF technology, the time is successfully altered.

IV. BLOCKDIAGRAM

TRANSMITER SECTION

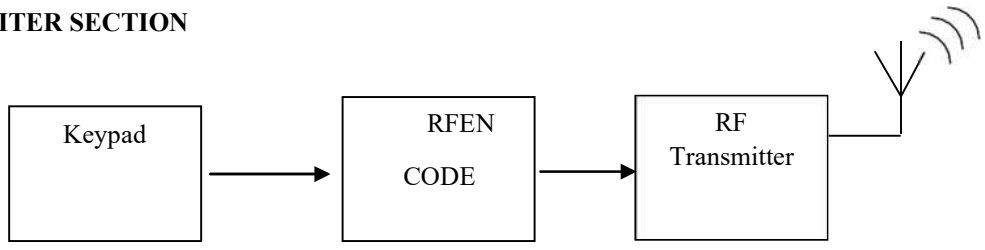

Figure 2.1 Blockdiagram of Traffic priority for ambulance (Transmitter)

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RECEVIER

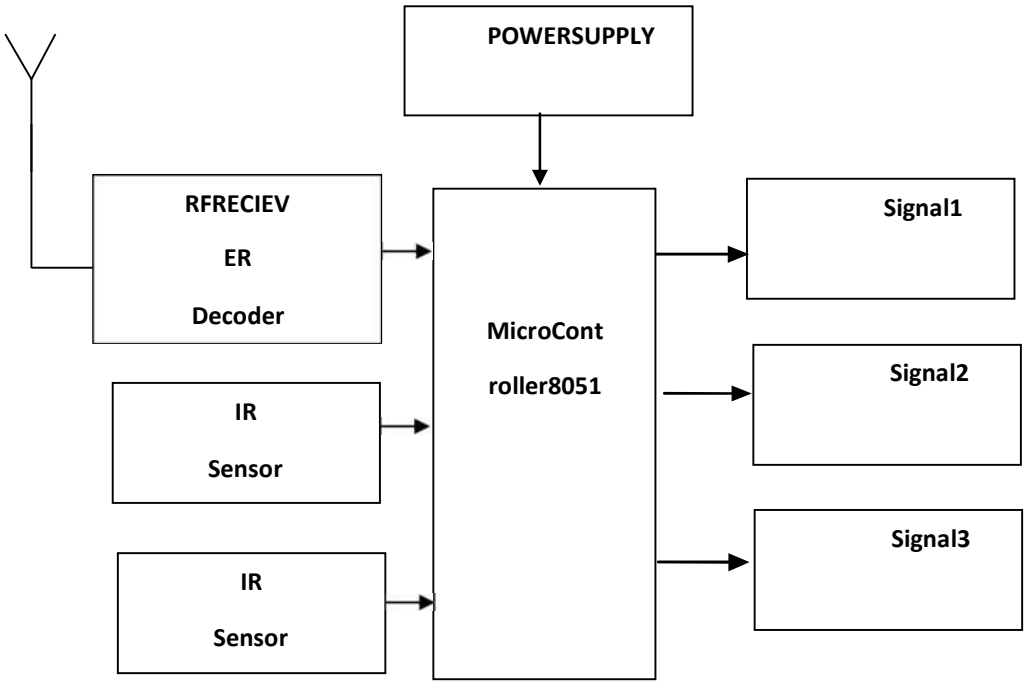
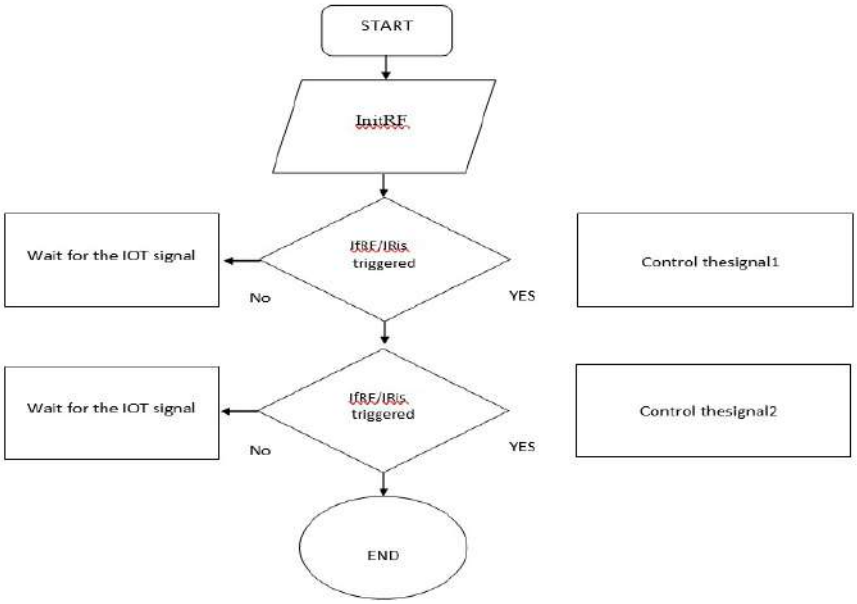


Figure2.1 Blockdiagram of Traffic priority for ambulance (Receiver)

I. FLOWCHART



V.

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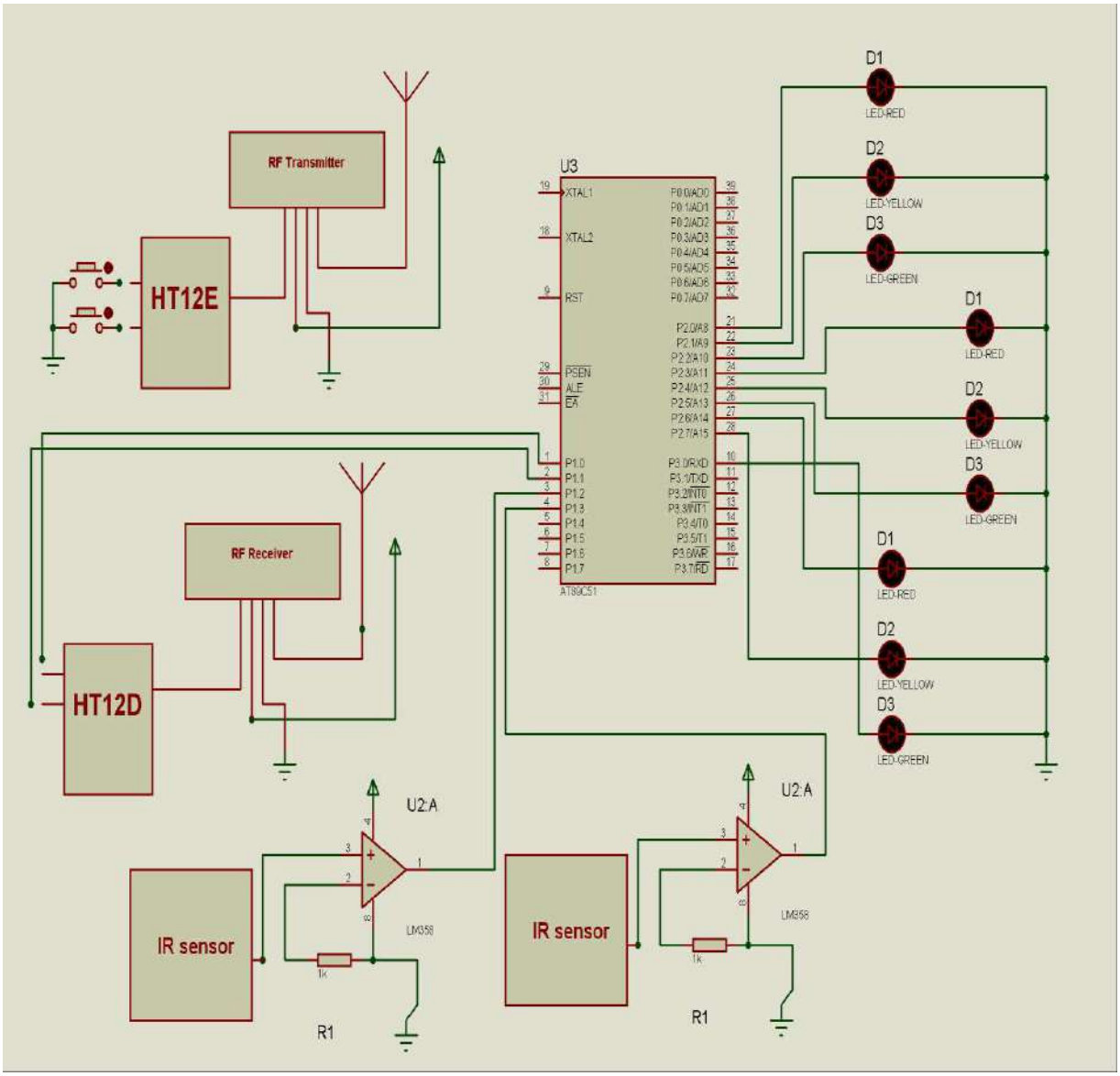
VI. SCHEMATICDIAGRAM:



VII. HARDWARE DESCRIPTION

A. POWERSUPPLY

The +5V required to operate the components is supplied by the power source. The +5V DC power supply is provided by an ICLM7805.

A transformer is wired in series with the ac voltage, usually 220V, and produces dc at the output voltage setting. After a dcvoltage is generated, it is filtered by a simple capacitor filter before being fed into a diode rectifier to create a full-wave rectified voltage. There is often some rippleor ac voltage change in the resultant dc voltage.

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Whether the input dc voltage or the load linked to the output dc voltage fluctuates, the regulator circuit eliminates the ripples and maintains the same dc value. One of the most common types of voltage regulator IC devices is responsible for achieving this desired result.

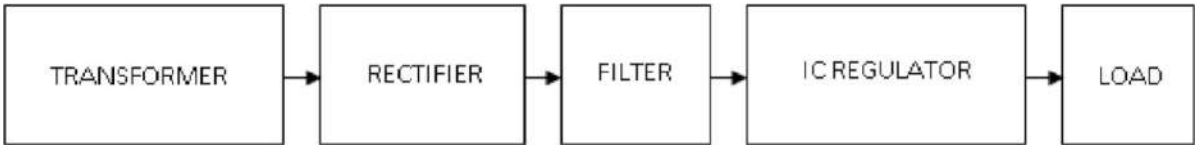

Figure: BlockDiagram of Power Supply

B. MICROCONTROLLER

A microcontroller, or MCU, is a little computer that may be programmed to manage various electrical functions. Unlike a general-purpose microprocessor, which is designed to do a wide variety of tasks, this kind of microprocessor is focused on efficiency and independence (the kind used in a PC). Unlike a general-purpose microprocessor, which needs extra chips to provide capabilities like memory and interfaces, a basic microcontroller has everything required for a simple application.

The following are the defining characteristics of a microcontroller, an integrated circuit that performs many tasks:

- RAM for data storage Input/output connections like serial ports CPU ranging from modest and basic 8-bit CPUs to complex 32- or 64- bit processors
- ROM, EEPROM or Flash memory for software storage
- The quartz timing crystal, resonator, or RC circuit of a clock's generator. Several electronic devices also have microcontrollers.

They make up the lion's share of the market for computer processing units. More over half are "basic" controllers, whereas the remaining 20% are more complex DSPs. Just one or two general-purpose microprocessors may be found in a house in a developed nation, but anywhere from a dozen to a hundred microcontrollers. Fifty or more microcontrollers are common in vehicles in the middle price range. And they're in everything from phones to microwaves to computers to washing machines.

C. RFMODULE(RadioFrequency)

Radio frequency is any frequency in the electromagnetic spectrum that has to do with the spread of radio waves. When an RF current is sent through an antenna, it creates an electromagnetic field that can move through space. RF fields are used in a lot of wireless technologies.

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ReceiverModule

Transmitter

ModuleFigure3.9RF Modules

Radio waves. The spectrum of frequencies from 10 kilohertz to 300 gigahertz that may be utilised for wireless transmission. This is a radio frequency. Also used to describe the energy that may be picked up by a wireless receiver, such as the radio signal broadcast by the system's transmitter.

- Wireless mouse, keyboard
- Wireless data communication
- Alarm and security systems
- Home Automation, Remote control
- Automotive Telemetry
- Intelligent sports equipment
- Handheld terminals, Dataloggers
- Industrial telemetry and tele–communications In-building environmental monitoring and control.

d. IRSENSOR

If you want to build a robot that can avoid obstacles or follow a line, an infrared (IR) sensor is a must-have. We'll be building a basic infrared (IR) sensor capable of sensing objects between 7 and 10 centimetres away. An infrared (IR) sensor is only a diode with high sensitivity to IR. As a pair, the infrared transceiver and transmitter are abbreviated as IRTX-RX..

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VIII. RESULT & DISCUSSION

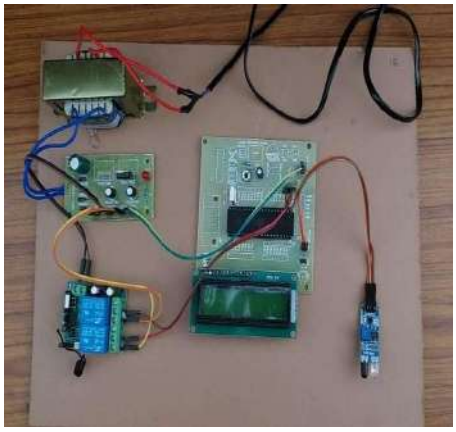

Figure: Receiver Side

Figure: Transmitting Side

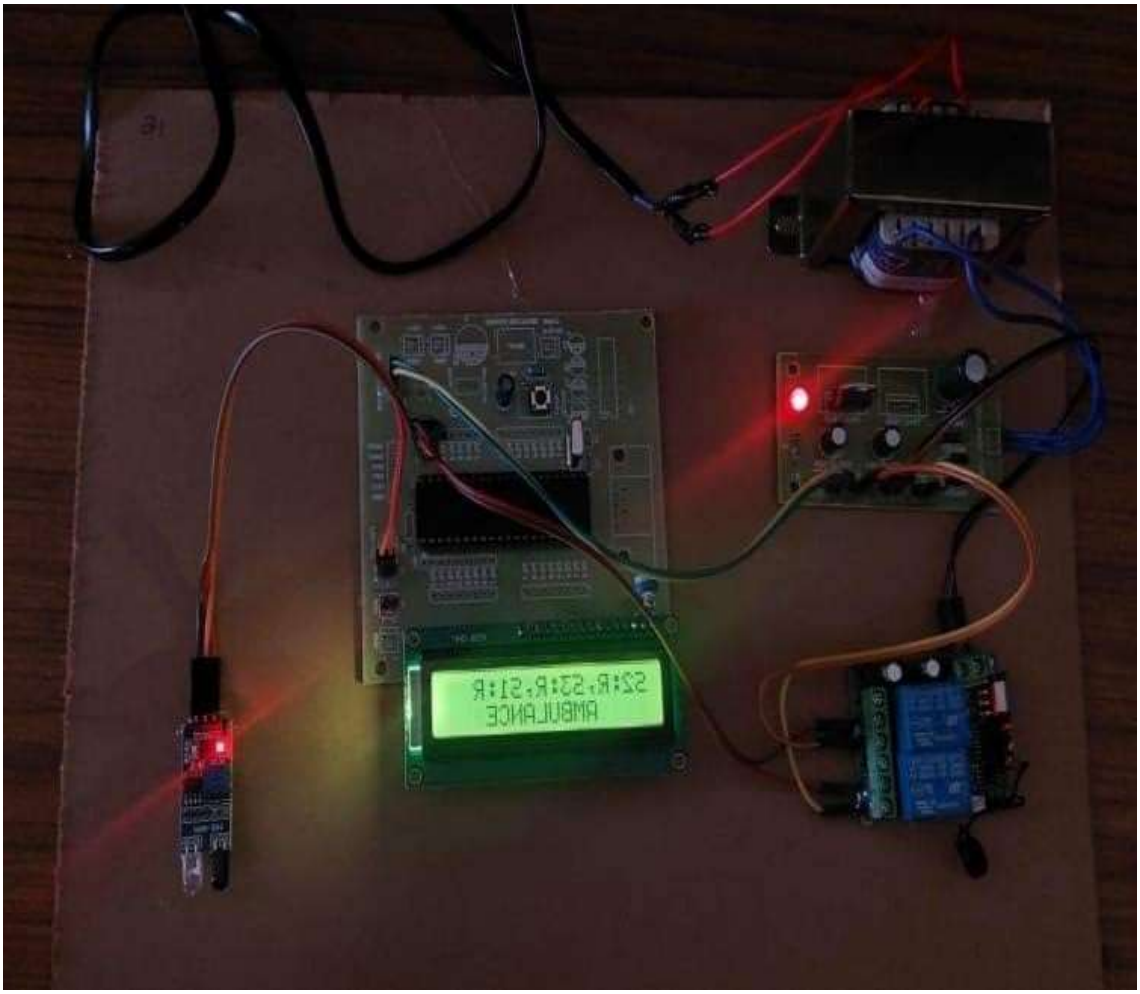

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FIGURE: WORKING

IX. CONCLUSION

The project "TrafficController Based on RF" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit. Secondly using highly advanced IC's and with the help of growing technology the project has been successfully implemented.

X. REFRENCES

[1] Singh SR. Engineering IOT in Education (IoTE): An Overview. J. Innov. Res. Comput. Commun. [Internet]2017;11324–8.Available from: www.ijircce.com

[2] Tellawar MP. Smart Solar Photovoltaic cell RemoteMonitoringSystembasedonIOT.2019;8:235–40.

[3] Suresh, Ankit K,Gawre. Solar photo voltaic cell remote monitoring system based on IOT. Conf. Recent Innov. Signal Process. Embed. Syst. 2018;2018– Janua:619–23.

[4] Shanthi T, Anushree S V, Prabha SU, Rajalakshmi D.DAC to monitor solar powered home appliances and usage control using Bluetooth enabled mobile application and IoT.Proc.2017Int.Conf.Innov.Information, Embed.Commun.Syst.ICIIECS20172018;2018–Janua:1–4.

[5] Ms.ApurvaLMMN. IoT based SolarMonitoring System.IEEE 5thWorld Forum Internet Things,WFIoT2019-Conf. Proc. 2016;3:1–18.

DOI: https://doi-ds.org/doilink/03.2023-29968157