

INTIMATION OF TRAFFIC SIGNALS TO VEHICLES AT ROAD JUNCTION THROUGH WIRELESS WITH OBSTACLES IDENTIFICATION

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Abstract— The major problem in transportation is viewing traffic signal during winter season. This project is used to displaying the traffic signal to driver during heavy fog and rain fall. This project also helps railway signal transmission in heavy fog. During winter season driver may not possible to see the traffic signal. This project will help to transmit the signal to the vehicle and displays the signal inside the vehicle. This project has some security features to the accidents like driver status monitoring, seat belt monitoring and obstacles detection.

Index Terms—About four key words or phrases in alphabetical order, separated by commas.

I. INTRODUCTION

Traffic congestion occurs due to the avoid traffic signal, heavy fog condition and rain fall i.e. traffic signal is based on LIGHT EMITTING DIODE lights to show the signals. In the signals are not clearly displays in the heavy fog and rain fall. The RF transmitter ranges up to 50 meters and the detection of the vehicles could possibly done before entering the road junction. This is possible by the use of RF transmitters and receivers. Traffic congestion problem is the phenomena which contributed a huge obstacle to the transportation system. Intelligent traffic light system is interfaced with wireless communication to indicate within the vehicles. This will be used during fog conditions and during heavy rain conditions. This method will help for the railway signalling during heavy fog conditions also. During winter conditions many places will get affected due to fog and the drivers will find difficult in driving the vehicles and also to view the signals. This project will help the driver to see the signals inside the vehicle. This will avoid the accident. In the vehicle itself, the traffic signals has to be viewed for this the LIGHT EMITTING DIODE and the controller has to be placed inside the vehicle nearby the driver itself. The traffic signals in the post will be identified by the controller and that particular

colour code is send to the vehicle through RF transmitter. The RF receiver in the vehicle has to receive that signal and the LIGHT EMITTING DIODE has to be displayed in the vehicle. The LIGHT EMITTING DIODE in the vehicle has to be placed near the driver itself. The ultrasonic sensor is used to identify the obstacle and that distance is displayed in the LCD.

A. BLOCK DIGRAM DESCRIPTION

In micro controller used to transmit signal from the traffic post which is displaying at the time.

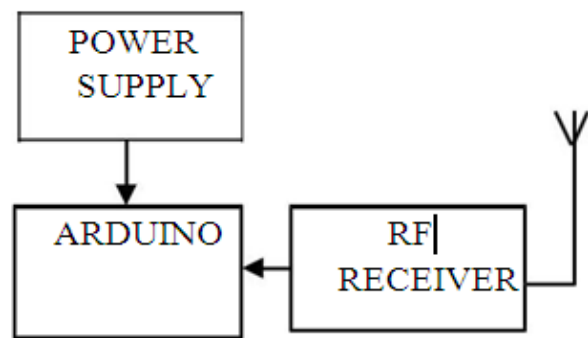


Fig 1: In traffic post

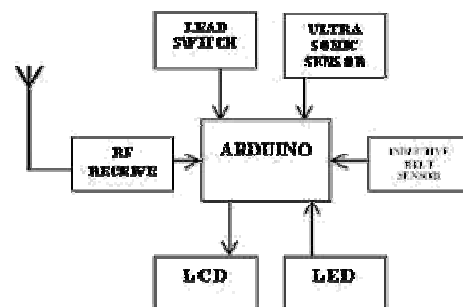


Fig 2: In Vehicle

In vehicle micro controller used to receive the signal transmitted from traffic post and check the obstacles present or not in front and rear side of the vehicle with the help of ultrasonic sensor and monitoring the driver status whether driver sleep or not using inductive belt sensor and checks driver wear the seat belt or not using lead switch.

II. HARDWARE DESCRIPTION:

ARDUINO BOARD: Arduino is a free and open-source electronics platform based on flexible-to-use hardware and software. Arduino Micro controller boards are able to understand inputs - light on a sensor, a finger on a button, or a Twitter message - and revolve it into an output - activating a motor, power on an LIGHT EMITTING DIODE, distributing something through internet. You can let know your micro controller board what to do by transfer a set of commands to the ATmega microcontroller on the Arduino board. To do so you use the Arduino programming Language (Based on script), and Arduino software IDE based on dispensation.

LCD DISPLAY: Liquid Crystal Display monitor is an electronic demonstrates module and discover a broad range of applications. A 16x2 LCD (Liquid Crystal Display) is very fundamental module and is very normally used in different devices and circuits. These modules are favoured over seven segments and other multi segment Light emitting Diodes. The reasons being: Liquid Crystal Displays are economical; easily program in microcontroller; contain no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 Liquid Crystal Display means it can display 16 characters per line and there are 2 such lines. In this Liquid Crystal Display each character is displayed in 5x7 pixels in matrix format. This Liquid Crystal Display has 2 registers, namely, Instructions and Information. The command register saves the command instructions given to the Liquid Crystal Display. A command is an instruction given to Liquid Crystal Display to do an already defined operation like initializing it, glade its screen, setting the cursor position in the display, domineering display etc. The data register stores the information to be shown on the Liquid Crystal Display. The data is the American Standard Code for Information Interchange value of the character to be displayed on the Liquid Crystal Display.

ULTRASONIC SENSOR: An Ultrasonic sensor is an electronic device that can calculate the space to an object with the help of sound waves. It calculates distance by sending out a sound wave at a specific frequency from trig part of the ultrasonic sensor and listening for that transmitted sound wave to return from the object. By soundtrack the beyond time flanked by the sound wave being generated and the sound wave returning back, it is probable to measure the distance between the ultrasonic sensor and the object.

IR SENSOR: An Infra-Red Sensors work by using a specific light signal sensor to sense a select light wavelength

in the IR (Infra-Red) continuum. By using a Light Emitting Diode which transmitting light at the similar wavelength as what the sensor is looking for, you can appear at the strength of the received light in Infra-Red detector. When an object is near to the Infra-Red sensor, the light from the Light Emitting Diode bounces off the object and into the Infra-Red light sensor. This results in a maximum jump in the strength, which we previously know can be detected using a threshold.

DC MOTOR:Electrical motors is all over the place around us. Approximately all the electro-mechanical actions we see in the region of us are caused either by an AC or a DC motor. Here we will be using DC motors. This is a device that converts DC electrical energy to a mechanical energy.

III. SOFTWARE DESCRIPTION:

ARDUINO: The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing the code for a specific operation, a message locale, a text relieve, a toolbar with buttons for ordinary operations and a sequence of menus. It interconnects to the Arduino and Genuine hardware to upload programs and communicate with the hardware. Programs written using Arduino Software (IDE) are callLight Emitting Diode sketches. This software is written in the text editor of the Arduino IDE and is stored with the file conservatory ino. The editor has characteristics for cutting/pasting and for penetrating/replacing text. The message area gives criticism while saving and exporting and also shows errors as problems in code. The console shows text output by the Arduino Software (IDE), together with complete error messages and other information about the code presents in the Arduino editor window. The bottom right-hand corner of the window shows the configured board and serial port. The toolbar buttons permit you to authenticate and upload programs, create, open, and save sketches, and open the serial monitor.

EMBEDDED C: Looking in the region, we find ourselves to be enclosed by various types of embedded systems technologies. Be it a digital camera or a mobile phone or a washing machine, all of them has some kind of micro processor operating inside it. Connected with each micro processor is the embedded software like Arduino IDE. If hardware forms the body of an embedded system, embedded micro processor acts as the

Central part like brain and embedded software forms its spirit. It is the embedded software which first and foremost governs the implementation of embedded systems.

IV. CONCEPTS USED

A. RADIO FREQUENCY:

RF transmitter is placed in all emergency vehicles. It will be turned on with siren sound. RF receiver is placed at road ends. When RF receiver receives signal it intimates system to make a way for emergency vehicle. The RM-433 is a radio frequency receiving device that operates at 433 MHz it is

designed to receive signals that are transmitted by RTI universal system controllers. The RM-433 contains a microprocessor that monitors all received signals so that RF noise and data from non-RTI transmitters is filtered out. When valid RTI data is detected, the RM-433 passes the signal through its output driver which allows the data to travel long distances over wire. The output driver is compatible with industry standard infrared repeating systems, and can be wired together with those systems or with additional RM-433 units. This allows RTI control systems to be control Light Emitting Diode from almost any location with either IR or RF transmitters.



CC2500 RF Module is a transceiver module which provides easy to use RF communication at 2.4 GHz. It can be used to transmit and receive data at 9600 baud rates from any standard CMOS/TTL source. This module is a direct line in replacement for your serial communication it requires no extra hardware and no extra coding to It works in Half Duplex mode i.e. it provides communication in both directions, but only one direction at one time .No complex wireless connection software or intimate know Light Emitting Diode of RF is required to connect our serial devices.

B. Technical specifications:

1) RF transmitter:

- Working voltage: 3V~12V
- Working current: max≤40mA (12V), min≤9mA(3V)
- Resonance mode: sound wave resonance (SAW)
- Modulation mode: ASK /OOK
- Working frequency: 315MHz-433.92MHz, customized frequency is available.
- Transmission power: 25mW (315MHz at 12V)
- Frequency error: +150kHz (max)
- Velocity: ≤10Kbps

2) RF Receiver:

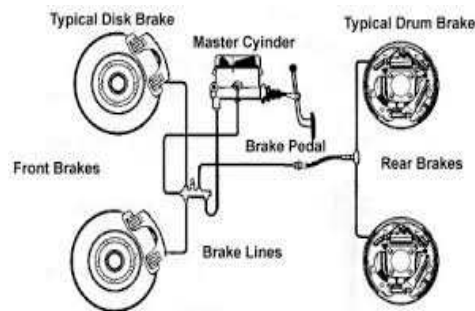
- Working voltage: 5.0VDC +0.5V
- Working current:≤5.5mA (5.0VDC)
- Working principle: single chip super regeneration receiving
- Working method: OOK/ASK
- Working frequency: 315MHz-433.92MHz, customized frequency is available.
- Bandwidth: 2MHz (315MHz, having result from testing at lowing the sensitivity 3dBm)

- Sensitivity: excel –100dBm (50Ω)
- Transmitting velocity: <9.6Kbps (at 315MHz and -95dBm)

V. SYSTEM OPERATION

Based on the Traffic signals, the value will be transmitted to the vehicle through RF transmitter. The RF receiver will receive the value in the vehicle. These values will be received in the vehicle when it comes near the traffic signal. Based on the received value, the LIGHT EMITTING DIODE inside the vehicle will be ON. The obstacle is identified by the ultrasonic sensor and the distance of the obstacle is identified and it is displayed in the LCD. The ultrasonic sensor is placed in front of the vehicle. In rear side IR sensor placed. It is used to detect the obstacles. Lead switch is placed inside the vehicle. Lead switch is used to identify whether the driver wear the seat belt or not. If driver not wear the seat belt means the signal send to the micro controller and micro controller send the signal to the relay it act as a switch to disconnect the power to the vehicle so, the vehicle will stop at a time. If the ultrasonic sensor detects obstacles it will send a signal to the micro controller and micro controller sends the distance to the LCD display. It shows the distance and buzzer will intimate the driver. Inductive belt sensor used to monitor the driver breathing levels to identify the driver sleep or not. If the driver sleeps buzzer will intimate to driver.

VI. ABS SYSTEM



The Anti-lock braking system is concerned as an automobile safety system that allows the wheels on a motor vehicle to maintain reactive contact with the road surface according to driver inputs. It prevents the wheels of the vehicles from ceasing rotation and avoids uncontrolled Light Emitting Diode skidding. This prevention occurs at a much faster rate and with better control than a driver could manage. Generally it offers improved vehicle control and it decreases stopping on dry or slippery surfaces.

VII. CONCLUSION

This paper presents wireless communication for traffic signal to vehicle. The Arduino ATmega micro controller done all operations like transmission of data in traffic post and

receiving the data, monitor the driver status, checks obstacles front and rear side of the vehicle.

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