

Mandatory Usage of Helmets in Two-Wheelers

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Abstract - This paper is mainly focused on the safety of the two wheeler riders. To protect the rider's head during impact, thus preventing or reducing head injury and saving the rider's life. Today most of the people don't wear the helmets. So, this paper offer an idea of wearing helmets made compulsory for the bike riders. The engine will ignite after only the rider's put their helmet properly and also free from any kind of alcohol. Hence the helmets become the unavoidable and safety equipment for the rider's.

Key Words: MQ2 Sensor, RF Wave, Ignition, Relay Circuit, Antenna, Microcontroller.

1. INTRODUCTION

The main purpose behind this paper is “**Drunk driving detection with helmet**”. Now a day, many road accidents happened because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus drunk driving is a major reason for road accidents in almost all countries all over the world. Alcohol Detector in Cars is designed for the safety of the people seating inside the car. Integrated drunk and drive prevention system is an idea to intimate the alarm signal when there is any alcohols drinking drive. Driving while either intoxicated or drunk is dangerous and drivers with high blood alcohol content (BAC) are at increased risk of car accidents, highway injuries and vehicular deaths. Prevention measures evaluated include license suspension or revocation, impounding or confiscating vehicle plates, enforcing open container bans, increasing penalties such as fines or jail for drunk driving, mandating education for young people, and lowering legal BACs. Also discussed are safety seat belts, air bags, designated drivers, and effective practical ways to stay sober. Furthermore, the plan will urge the implementation of safety and health education by employers with regard to fire safety in multiple-tenant buildings with small businesses. At the same time, it will seek all-embracing strategies to prevent explosion and fire accidents, including measures to prevent dust explosions caused by magnesium alloys. In This paper tells how to sense the gas leakage and indicates the alarm with indication. In addition to this how to lock/unlock the devices by using helmets of the passenger. It's highly safe control of the devices from other person. Due to the rapid development in the field of science and technology, many more advancements have been made in automation and controlling the hardware can adopt this technique. The main

aim of this paper is to lock/unlock the devices by using **helmets** of the passenger. It's highly safe control of the devices from other person. Due to the rapid development in the field of science and technology, many more advancements have been made in automation and controlling the hardware can adopt this technique. This technique is not only applicable to vehicle but also to control the various appliances in home. This marvelous technique is highly confidential as we are the only persons who can access the whole system and control various activities through helmets in **Radio Frequency** modulation techniques.

2. WORKING

Initially the reference voltage is set with the help of the variable resistance. The alcohol contents is sensed by the sensor and this control signal is given to the microcontroller unit. The **F.M transmitter** is fixed to the inside of the helmet. The F.M receiver circuit is fitted to the vehicle. F.M Receiver will activate the engine ignition at the time of helmet hold in to the head. The **alcohol sensor** senses the alcohol contents of the vehicle or air. This sensing signal is given to the microcontroller unit. When there are no alcohol contents in the air, there is no signal given to the microcontroller unit. In This 9 volt power supply is used. The power supply output is given to the control unit. Control unit having one relay, they are connected to the alarm unit or with the **ignition** part of the vehicle.

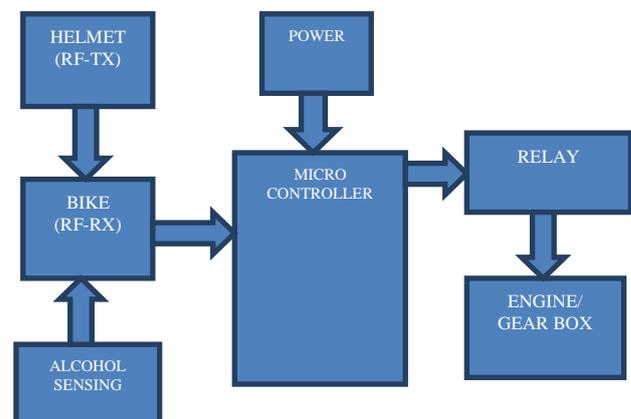


Fig. 1. Block Diagram

3. COMPONENTS

MQ-2 Sensor: It is a sensing element to detect all type of alcohols.

FM Transmitter and Receiver: It is a basic format to detect the helmet with a small transmitter and a receiver. (When pressure is applied)

RF sensor: It is used to indicate the RF signals.

PIC Controller: It is mainly used for ignition control and other process.

4. IMPLEMENTATION

4.1. MICRO CONTROLLER

Initial step is helmet design. Helmet contains FM transmitter and an alcohol sensing circuit. FM transmitter is placed inside the helmet with two buttons (433 MHz). Alcohol circuit is placed in the front position of the helmet. The second step is microcontroller and ignition control. PIC16F877A microcontroller is used to receive both the FM transmitter and alcohol circuit's signal. After only the motor cycle's ignition will ON. Then, this circuit also indicates the RF signals while riding the bike.

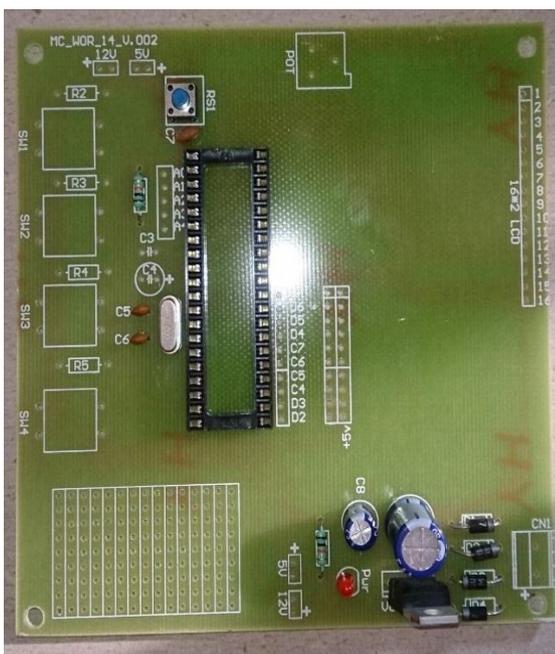


Fig. 2. Microcontroller board

4.2. TRANSMITTER

Whenever the high output pulse is given to base of the transistor BF 494, the transistor is conducting so tank circuit is oscillated. The tank circuit is consists of L2 and C4 generating 433 MHz carrier signal. Then the modulated signal is given LC filter section. After the filtration the RF modulated signal is transmitted through antenna.

4.3. RECEIVER

The RF receiver is used to receive the data which is transmitted by the RF transmitter. Then the received data is given to transistor which acts as amplifier. Then the amplified signal is given to carrier demodulator section in which transistor Q1 is turn on and turn off conducting depends on the signal. Due to this the capacitor C14 is charged and discharged so carrier signal is removed and saw tooth signal is appears across the capacitor. Then this saw tooth signal is given to comparator. The comparator circuit is constructed by LM568. The comparator is used to convert the saw tooth signal to exact square pulse. Then the square pulse is further amplified by LM741. After the amplification the amplified signal is given to FSK demodulator section.

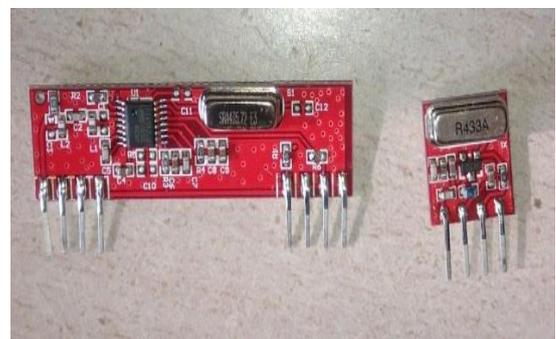


Fig. 3. Transmitter and receiver

Transmitter circuit is placed inside the helmet for the detection of helmet with two smooth buttons. Receiver circuit is placed in the two-wheeler as controller. Frequency modulation concept is used in the transmitter part for detecting the helmet. Receiver circuit is simply trigger the controller.

4.4. ALCOHOL SENSOR

The gas sensor MQ-2 is used to detect the alcohol content of the rider. After the detection of helmet using FM transmitter, the alcohol sensor circuit is initialised.

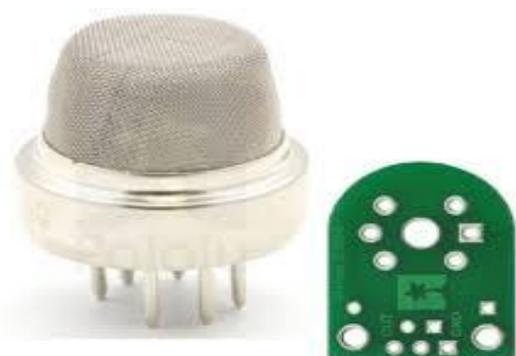


Fig. 4. Alcohol Sensor unit

4.5. RELAY

Controller is basically used to receive the signals from FM transmitter and Alcohol sensor circuit. The signals are received in port A of the controller to trigger the relay circuit. Relay circuit is used to control the ignition part of the two-wheeler.

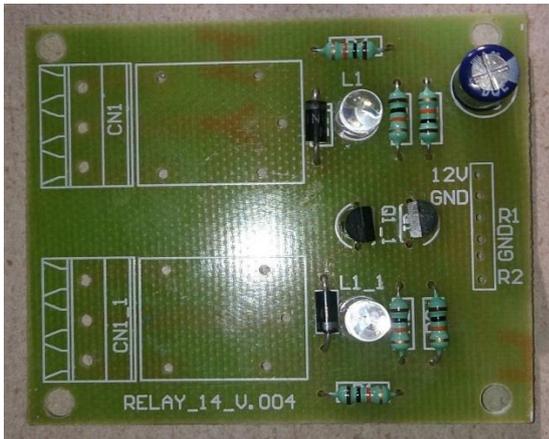


Fig. 5. Relay board

4.6. RF WAVE DETECTION

It is the additional process, used for the safety purpose of the riders. While riding the Two-wheeler, if any RF waves received, a separate indication will be made.

5. IMPORTANT TERMS

FM Transmitter's operating at the frequency of **433 MHz**. **Drive circuit** is used to combine the signals from transmitter circuit and alcohol circuit. **Relay circuit** is used control the process in ignition of two-wheeler. MPLAB-PDE and **Proteus** software are used for developing and simulating the coding. **PICKIT2** Burner is used to feeding the programs into the kit. The compiler uses the **High-tech C** algorithm.

6. FEATURES

- All Two wheeler applications
- Automobile manufacturing industrial applications.
- The sensor circuit is senses the particular amount of alcohol content.
- All car owners and Drivers

7. FUTURE DEVELOPEMENT

This paper can be implemented in GSM technology to inform the relatives or owners of the vehicle about the alcohol consumption. This paper can be implemented in GPS technology to find out the location of the vehicle and so on.

8. CONCLUSION

Safe guard this life with helmets. This paper aims to make all the riders to put their helmets properly.

REFERENCES

- [1] Technical Data of MQ2 Gas Sensors, www.hwsensors.com
- [2] About PIC Microcontroller: in the site of en.wikipedia.org/wiki/PIC microcontroller.
- [3] "Automatic Speed Control System by the ColThis Sensor for Automobiles - An Innovative Model Based Approach" by Sunil R. Kewate in ISSN 2250-3234 Volume 4, Number 2 (2014).
- [4] "Integration" by Oliver Carsten and Fergus Tate in the University of Leeds and the motor the industry research association.
- [5] "Automatic Speed Control System by the ColThis Sensor for Automobiles - An Innovative Model Based Approach" by Sunil R. Kewate in ISSN 2250-3234 Volume 4, Number 2 (2014).
- [6] W.H. Hucho, Aerodynamics of Road Vehicles, ISBN 0-7680-0029-7, Warrendale PA, Society of Automotive Engineers, 1998, 142-145 .
- [7] T.D. Gillespie, Fundamentals of Vehicle Dynamics, ISBN 1-556091-199-9, Warrendale PA, Society of Automotive Engineers, 1992.

BIOGRAPHIES



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