

**SAFETY HELMET FOR BIKE AUTHENTICATION AND ALCOHOL SENSING FOR RIDERS****D. LAKSHMI RAMYA<sup>1</sup>, K. RAVICHANDRA<sup>2</sup>**

<sup>1</sup>D. Lakshmi Ramya, M.Tech Student, Dept of ECE, Abdul Kalam Institute Of Technological Sciences, Vepalagadda, Kothagudem Mandalam, Bhadradi Kothagudem Dist., Telangana, India.

<sup>2</sup> Guide details: K. Ravi Chandra, M.Tech, Assistant Professor, Dept of ECE, Abdul Kalam Institute Of Technological Sciences, Vepalagadda, Kothagudem Mandalam, Bhadradi Kothagudem Dist., Telangana, India.

**Abstract:** An accident is a specific, unexpected, unusual and unintended external action which occurs in a particular time and place, with no apparent and deliberate cause but with marked effects. Carelessness of the driver is the major factor of such accidents [1]. The traffic authorities give a lot of instructions to the vehicle operators. But many of them do not obey the rules. Nowadays most of the countries are forcing the motor riders to wear the helmet and not to use the vehicles when the person is in drunken condition. But still the rules are being violated by the users. In order to overcome this we introduces an intelligent system, Smart Helmet, which automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. Here we have a transmitter at the helmet and the receiver at the bike. There is a switch used to sure the wearing of helmet on the head. The ON condition of the switch ensures the placing of the helmet in proper manner. An alcohol sensor is placed near to the mouth of the driver in the helmet to detect the presence of alcohol. The data to be transferred is coded with RF encoder and transmitted through radio frequency transmitter. The receiver at the bike receives the data and decodes it through RF decoder. The engine should not ON if any of the two conditions is violated. MCU controls the function of relay and thus the ignition, it control

the engine through a relay and a relay interfacing circuit.

**Keywords:** *RF Encoder and Decoder, Safety helmet, GSM.*

**I. INTRODUCTION**

A traffic accident is defined as any vehicle accident occurring on a public highway (i.e. originating on, terminating on, or involving a vehicle partially on the highway). These accidents therefore include collisions between vehicles and animals, vehicles and pedestrians, or vehicles and fixed obstacles. In higher-income countries, road traffic [1] accidents are already among the top ten leading causes of disease burden in 1998 as measured in disability-adjusted life years. In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities [2]. The problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people and organizations at all levels, local to national, because drunken driving control [6] requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions

on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take steady steps towards long-term improvement. And they will establish mechanisms for identifying and solving problems rather than attempting to apply one-size fits- all methods. Application of electronics in the automobile field is very much popular now. Because of the low prices and various varieties available in the market people prefer motorbikes to buy over 4 wheelers. Hence Road Safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet and to avoid drunken driving. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor [8] and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data. Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data corresponding to the output of

sensors to the encoder only if the two conditions are satisfied. Most of the accidents occur outside the cities are due to drunken driving and no testing methodology is adopted to avoid these fatalities in highways. Motorists parking their vehicles in No parking areas increase the rate of traffic in the metropolitan cities. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities.

## II. HARDWARE SYSTEM

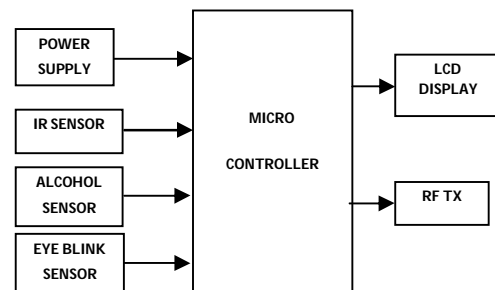


Fig 1: Helmet section

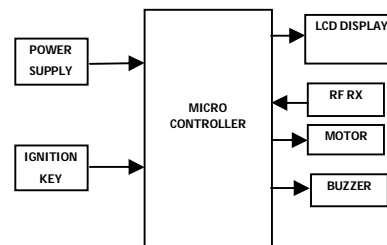


Fig 2: Bike section

In the helmet section, the IR sensors detect the presence of helmet on the user head; the alcohol sensor detects the alcohol levels in the biker body and the eye blink sensor detects the user drowsiness. The microcontroller continuously monitors the sensors values. If the biker doesn't wear the helmet the IR sensors will inform the microcontroller. In case if the

biker doesn't have the helmet, the ignition key doesn't allow the bike to start. The bike movement is controlled corresponding to the traffic signals. The helmet section sends the sensor info to the bike section through RF. The bike section controls the bike movement based on the sensor values. If the biker doesn't wear a helmet and is in drunken state, the ignition key will not allow the bike to start. Whenever the helmet is not present and the alcohol levels are above the threshold level, the bike motors will not start and buzzer is generated by the controller.

### III. METHODOLOGY

**Micro controller:** This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

**ARM7TDMI:** ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs.

**Liquid-crystal display (LCD)** is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock.

**Alcohol sensor:**

Sensitive material of MQ-3 gas sensor is SnO<sub>2</sub>, which with lower conductivity in clean air. When the target alcohol gas exist, the sensor's conductivity is higher along with the gas concentration rising. Please use simple electro circuit, Convert change of conductivity to correspond output signal of gas concentration. MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol with different concentration; it is with low cost and suitable for different application.



Fig 3: Alcohol sensor

#### IR Tx and Rx:

Transmitter and receiver are incorporated in a single housing. The modulated infrared light of the transmitter strikes the object to be detected and is reflected in a diffuse way. Part of the reflected light strikes the receiver and starts the switching operation. The two states – i.e. reflection received or no reflection – are used to determine the presence or absence of an object in the sensing range.

This system safely detects all objects that have sufficient reflection. For objects with a very bad degree of reflection (matt black rough surfaces) the use of diffuse reflection sensors for short ranges or with background suppression is recommended.

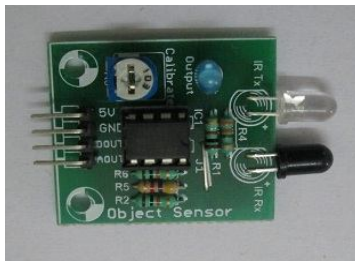


Fig 4: IR sensor



Fig 6: DC Motor

### Eye Blink sensor:

#### FEATURES

- EYE BLINK indication by LED
- Instant output digital signal for directly Connecting to microcontroller
- Compact Size
- Working Voltage +5V DC
- TTL output 5V or 0V

#### APPLICATIONS

- Digital Eye Blink monitor
- Vehicle Accident prevention.
- Suite for real time driving applications.



Fig 5: Eye blink sensor

### DC Motor:

A DC motor relies on the fact that like magnet poles repels and unlike magnetic poles attracts each other. A coil of wire with a current running through it generates an electromagnetic field aligned with the center of the coil. By switching the current on or off in a coil its magnetic field can be switched on or off or by switching the direction of the current in the coil the direction of the generated magnetic field can be switched 180°.

### Buzzer:

A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave ovens, & game shows. The word "buzzer" comes from the rasping noise that buzzers made when they were electromechanical devices, operated from stepped-down AC line voltage at 50 or 60 cycles. Other sounds commonly used to indicate that a button has been pressed are a ring or a beep.

The "Piezoelectric sound components" introduced herein operate on an innovative principle utilizing natural oscillation of piezoelectric ceramics. These buzzers are offered in lightweight compact sizes from the smallest diameter of 12mm to large Piezo electric sounders. Today, piezoelectric sound components are used in many ways such as home appliances, OA equipment, audio equipment telephones, etc. And they are applied widely, for example, in alarms, speakers, telephone ringers, receivers, transmitters, beep sounds, etc.



Fig 7: Types of Buzzers

## IV. CONCLUSION

Nowadays, most cases of accidents are unit by motor bikes. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic smart helmet system that efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet and additionally reduce the accident rate due to drunken driving. We have a tendency to introduce advanced sensors techniques and radio frequency wireless communications are included in this project to make it a good one. Our system efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate because of drunken driving.

#### V. REFERENCES

- [1] Road accidents in India [online] 2007 June 25. Available from: URL: <http://www.easydriveforum.com/f44-share-yourroad-experience/road-accidents-in-india-834.html>
- [2] Articles base directory [online] 2011 Feb. 16 Available from: URL: <http://www.dwworld.de/dw/article/0,,5519345,00.html>
- [3] Article from The Hindu [online] 2011 Feb. 10 Available from: URL: <http://www.hindu.com/2011/02/10/stories/2011021063740500.htm>
- [4] Yue -Cheng Wu, Yun-qing Xia &, Zhegiang, —Multichannel reflective PPG earpiece sensor with passive motion cancellation|| Biomedical Circuits & System, IEEE, 2007, PP 235-241.

[5] Drunk Drivers Beware Of Saab Device,[<http://www.buzzle.com/articles/drunkdirvers-beware-saab-device.html>]

[6] Nissan to drink drive-proof its vehicles, September 2006,[[http://www.nissanglobal.com/EN/NEWS/2007/\\_STORY/070723-01](http://www.nissanglobal.com/EN/NEWS/2007/_STORY/070723-01)]

[7] Drunken driving protection system International Journal of Scientific & Engineering Research Volume 2, Issue 12, December-2011 1 ISSN 2229-5518

[8] Alcohol sensor and Automatic control system for bike, Volume 2, Issue ICRAET12, May 2012, ISSN Online: 2277-2677.

#### VI. BIOGRAPHIES

INTERNAL GUIDE, HOD



Name: Kilaru. Ravichandra

Qualification: Mtech (Ece Dept)

Designation: Assistant Professor

Mail id: kilaru.ravichandra@gmail.com