

# Design and Implementation of Smart Helmet

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**Abstract:** In this project we are going to implement the vehicle safety and human Life safety. ROAD traffic crashes take the lives of nearly 1.3million every year and injure 20-50 million more in the world. Refusal to use proper motorcycle helmets is among the main factor contributing to deaths from road crashes ,WHO said this in its report on 'Decade of Action for Road Safety 2010-2011'. More disturbingly, a large number of deaths from road accidents are borne by "vulnerable road users" such as pedestrians, cyclists and motorcyclists. Around 13% of the victims from road-related death sure pedestrians in India as compared to 15% of accidents from passenger cars and taxis and 27% from riders of motorized two-or-three wheelers. So if it can be made mandatory to make the people wear the helmet when they ride the bike then the rates of these accidents can be expected to fall. Worldwide most governments have already made stringent laws regarding wearing the helmet. But despite the laws such cases are still on a rise because of the lack of proper implementation. Until now only the laws have been formed but no technological work has been done in this regard. The helmet described here once installed with any bike forces the rider to wear it while riding so law or no law the biker will have to wear the helmet ensuring his/her own safety.

**Keywords:** Microcontroller, FM Module.

## 1. Introduction

In less developed countries, road traffic accidents were the most significant and they will establish mechanisms for identifying and solving traffic accidents are already among the top ten leading causes of disease burden in 1998 as measured in disability-adjusted 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 city. 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 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 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 thereof the bike. Our system includes an alcohol sensor 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 analogy 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 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.

## 2. Literature survey

A smart helmet is type of protective head gear used by rider which makes bike driving safer than before. The main purpose of this project to provide safer for rider. The implement by using advance feature like alcohol detection this makes not only smart helmet but also smart bike its compulsory to wear helmet, without helmet ignition switch cannot on a FM module as a wireless link which able to communicate between transmitter and receiver if a rider getting a drunk it get automatically ignition switch is locked this are main issue which motivate us for developing this project.

Smart helmet has special idea which makes motorcycle driving safety than before, this is implemented using GSM and GPs technology. Other advantages of this project is to measure the alcohol level of the drunken people who is riding the bike. Whenever the alcohol level crosses the predefined value, the alarm starts and get notification about the drunken driver. The author have also discussed about the accident detector and the sensor will active the GPS and find the location and further SMS will send to ambulance or family members.

AS they have used microcontroller for controlling their overall operation due to that the project will might be fail to upgrade newer versions. The idea of a smart helmet is not new. This project base on various technique. One thing that is consistent among all of them is that they fail to relate to the general public. The closest realization of a public-oriented vision is blurred, a Kick starter funded system that fits technology into a helmet in a neat package. This, however, comes with a huge cost. A traditional helmet on the other hand does not involve cost and omits any form of information availability with it. It contrast to any smart accessory in its category in terms of cost and features.

### 3. Block diagram

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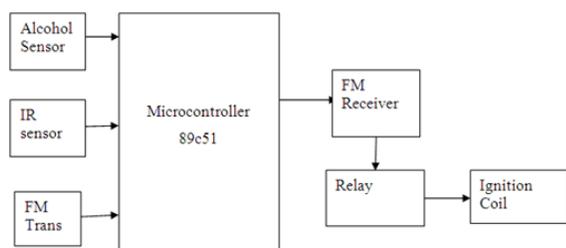


Fig. 1. Block Diagram

At helmet we put alcohol detector it is used for raider is drink or not Transmitter is connected to Helmet and receiver is connected to the Relay and Relay is connected to ignition coil it is operated in 88 to 108 MHz frequency range. Power supply for transmitter is given through a 12V battery. The block diagram consists of two parts RF transmitter part and RF receiver part. One part is to be implemented in the helmet and consists of transmitter and the other in the bike which consists of a receiver. The transmitter part interprets the required condition and the microcontroller generates the code sequence continuously which is ported to the transmitting block. This transmitting block can be a IR module. This signal is transmitted to the receiver. The receiver decodes this signal based on which it takes necessary action like turning on/off the ignition system. The first step is to detect whether the driver is wearing the helmet or not. For this purpose, we can use an IR sensor. The second condition is to check whether the rider is drunk or not.

To check this, we are using an alcoholic detector interfaced

to the control circuit, which is placed near his mouth in helmet The wireless network can be implemented by the RF (radio frequency) transmission/reception. With the help of RF we can intimate the rider is drunken or not worn helmet to the police station or concern person. The proposed system also checks whether the person is using mobile phone while riding if it is so then the bike speed will automatically reduces. If the person met with an accident then this smart helmet will send a message to the nearer hospital through the RF signal. The engine should not ON if any of the above conditions is violated. The software used in the proposed system is keil compiler–uVision3 which uses embedded c for coding.

An IR sensor is an electronic device, that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes, that can be detected by an infrared sensor.

The emitter is simply an IR LED and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode, the resistances and these output voltages, change in proportion to the magnitude of the IR light received. Sensitive material of MQ-3 gas sensor is SnO which with lower conductivity in clean air. When the target alcohol gas exist, The sensor’s conductivity is more 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 vapour. The sensor could be used to detect alcohol with different concentration, it is with low cost and suitable for different application.

A radio receiver is an electronic device that receives radio waves and converts the information carried by them to a usable form. An antenna is used to catch the desired frequency waves. The receiver uses electronic filters to separate the desired radio frequency signal from all the other signals picked up by the antenna, an electronic amplifier to increase the power of the signal for further processing, and finally recovers the desired information through demodulation of the radio waves, FM is the most popular one. Frequency modulation is widely used for FM radio broadcasting. It is also used in telemetry, radar, seismic prospecting, and monitoring newborns for seizures via EEG, two-way radio systems, music synthesis, magnetic tape-recording systems and some video-transmission systems. An advantage of frequency modulation is that it has a larger signal-to-noise ratio and therefore rejects radio frequency interference better than an equal power amplitude modulation (AM) signal. Frequency modulation is used in radio broadcast in the 88-108MHz VHF band. This bandwidth range is marked as FM on the band scales of radio receivers, and the devices that are able

to receive such signals are called FM receivers.

The FM radio transmitter has a 200kHz wide channel. The maximum audio frequency transmitted in FM is 15 kHz as compared to 4.5 kHz in AM. This allows much larger range of frequencies to be transferred in FM and thus the quality of FM transmission is significantly higher than of AM transmission. Presented below is electronics circuit for FM receiver along with its full explanation.

#### 4. Conclusion

This helmet incorporates a very simple and cost effective technology, which if implemented has the potential of drastically reducing fatalities in road accidents due to negligence in not wearing a helmet. Also as a future scope it can be combined with many existing technologies to provide guidance and on road tracking facilities. This helmet incorporates a very simple and cost effective technology, which if implemented has the potential of drastically reducing fatalities in road accidents due to negligence in not wearing a helmet. Also as a future scope it can be combined with many

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