

# SMART HELMET

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**Abstract**— In today's fast paced life most of accidents happen due to drinking and driving. Most of the countries are forcing the motorists to wear a helmet, however rules are being violated by uncivilized citizens.. In present day scenario we encounter numerous cases of death due to two wheeler road accidents. The main reason being severe head injuries. Despite of the fact that helmets are available everywhere, people are not wearing them. Thus the objective of this project is to make sure people wear helmets and then ride bikes. Another objective is to make sure the rider isn't drunk.. The rider won't be able to ride the bike if he is drunk. One more objective is to reduce the fatality of the accidents by sending a message to the rider's relative about the accident. To make sure that people do not ride at illegal speeds, and to inform the traffic authorities in case of breaking the rules.

**Key Words:** Prevention of Drunk Driving, Precaution, Response, Road safety, Accident Prevention, Accident Location

## 1. Introduction-

To overcome this situation, a safety system has been embedded inside the "Smart Helmet" where a circuit will be placed inside the helmet, without wearing which the bike will not start. An alcohol level detector is also present in the circuitry. If the rider has consumed alcohol the vehicle will not turn on. Also when an accident takes place a message will be sent to the pre-stored numbers.

If accident occurs then GSM receiver inside the reader circuit will automatically transmit the co-ordinates of accident to the emergency control room, from where immediately ambulance can be dispatched to location of accident which can save life of accident victim.

Similarly many accidents occur due to rash driving. To overcome this problem the GPS unit is programmed to

calculate the speed. In case of over speeding the GSM receiver inside the circuit will automatically transmit the co-ordinates of the location of the over speeding to the traffic police control room, from where they can take the necessary action against the rider.

## 2. Working Principle-

The idea of this project is to give information about the accident to the ambulance and family members, so we have chose GSM technology to give the information by sending a SMS. We are using GSM module, which has a SIM card slot to place the SIM card and send a SMS. Sending a SMS alone can't help the driver, if we send. We cannot send a SMS simply saying that an accident has occurred. So we include GPS location in the SMS, which we are sending so that the ambulance driver will have information as to where and when the accident has occurred. For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values using, which we can find the accurate position of the accident place.

An alcohol sensor is suitable for detecting alcohol content from the breath. So it can be placed just below the face defense and above the additional face protection. The surface of the sensor is sensitive to various alcoholic concentrations. It detects the alcohol from the rider's breath; the resistance value drops leads to change in voltage (Temperature variation occurs). Generally the illegal consumption of alcohol during driving is 0.08mg/L as per the government act. Except for demonstration purpose, we have a tendency to program the drink limit as 0.04 mg/L. An IR sensor is placed in the helmet. So the wearing of helmet is confirmed by our system and similarly alcohol sensor fitted in the visor of the helmet detects the alcohol within the breath and sends the amount of alcohol to the controller. If both of the criteria's are met in an appropriate manner then

the 2 control signals are sent from the helmet unit to the vehicle control unit. The decoded RF signal is distributed to the controller within the vehicle unit to start out / stop the vehicle.

**Components-**

- RF Transmitter and Receiver
- LCD
- SIM908 GSM/GPS Module
- ATMEGA8 Microcontroller
- MQ5 Breath analyzer
- IR Sensor

**3.Block Diagram-**

The block diagram is divided into two parts: the helmet side and the bike side

The helmet module and bike module are both connected to their respective power supplies. The helmet has an IR sensor placed at its rim. IT is to make sure that the rider wears the helmet. As soon as the rider wears the helmet the sensor will detect it and display that the helmet has been worn. Once the helmet has been worn, the alcohol sensor (MQ5) being a highly sensitive and fast device gives a result immediately. It has a potentiometer that can be used to control the sensitivity.

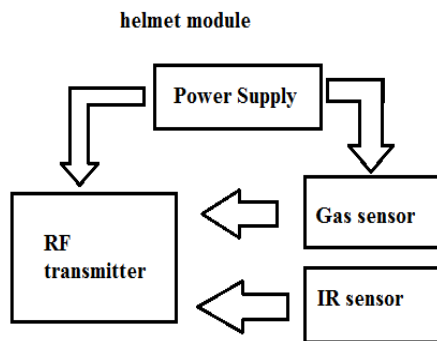


Fig .2.1

If alcohol is detected, the ignition will be cut off if not then it will allow the rider to ride the bike. All the data between the

helmet and the bike end is transmitted/received using the RF transmitter and receiver.

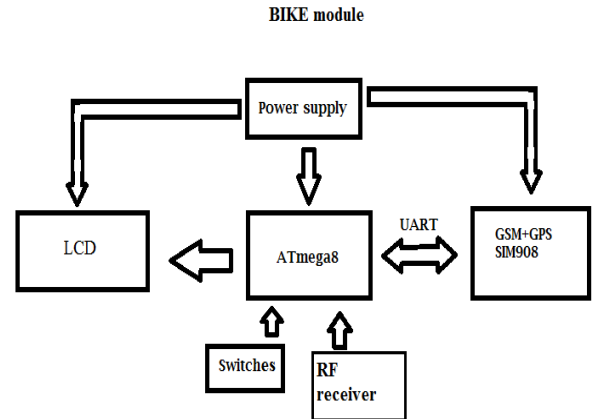
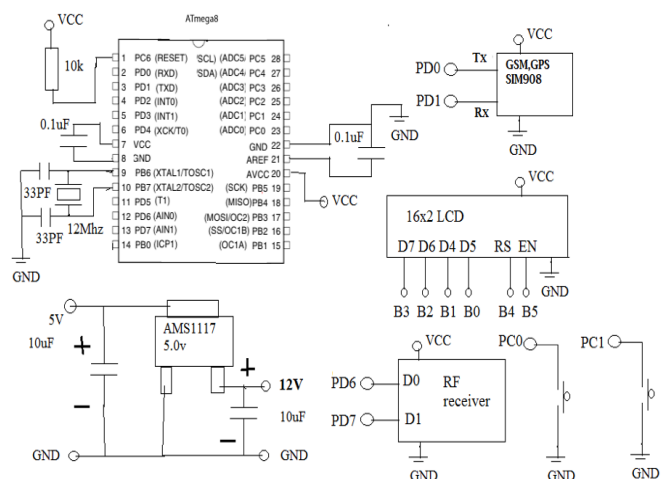


Fig 2.2

An Atmega 8 microcontroller is used to control the entire circuit.

An accident switch is placed. In case of an accident due to impact it will be pressed. The GSM +GPS unit SIM 908 will send the message (being a GSM module) and along with it also send its co ordinates (by a GPS module also).A similar scenario also takes place when a bike is overspending .Over a threshold speed a message with the co-ordinates is sent to the helpline number ,aiding in tracking of the bike.

**4.Circuit Diagram**



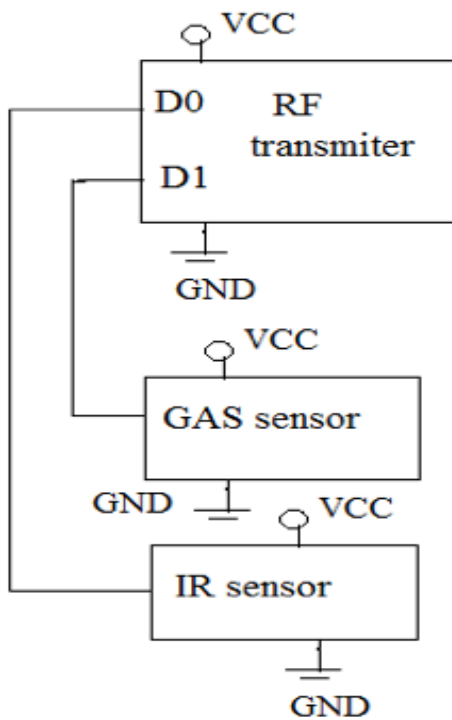


Fig 3.1 & 3.2

### 5. Result

The circuit successfully tested. All the sensors performed as required. On detection of an accident/over-speeding in over 20 tests the; GPS sends the location over a message sent by the GSM is obtained in less than 10 seconds.

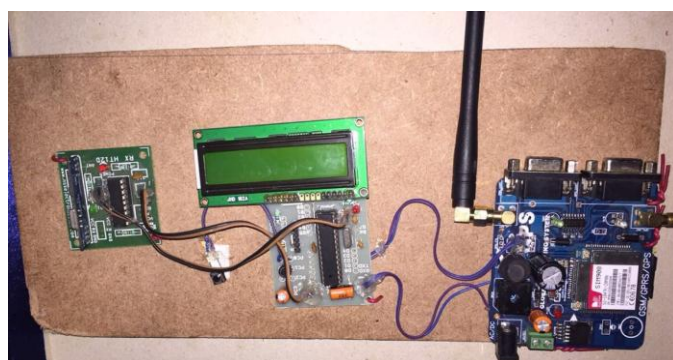


Fig 4.1



Fig 4.2

### 6. Conclusion

Nowadays, many motorcycle accidents lead to fatalities. The severities of these accidents are increased because of not wearing a helmet or by the consumption of alcohol and help not reaching in time.

In our project we pursue to develop a smart electronic helmet system that efficiently checks the wearing of the helmet and drunken driving. Also the system sends an immediate signal of the whereabouts of the injured person to his/her relative. By implementing this system a safer and much more secure two-wheeler journey is possible. The system also helps prevent over speeding. Rash riding is a menace in our present day society, which not only affects the rider but also others around him/her. With the over speeding prevention feature an eye can be kept on all riders without direct human intervention.

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