

FUTURISTIC SMART RIDING HELMET

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Abstract: The intention of this paper is to explain about the concept of a smart helmet which will perform various functions in order to ensure the safety of the rider. The helmet has three sensors such as MQ-3 alcohol sensor which senses the alcohol of the rider and sends SMS. Other sensors like accelerometer sense sudden movement of the helmet in the forward direction detecting a jerk which indicates the accident and sends the SMS to the family member. The third sensor is the clip. The DC motor will only start once the clip is inserted. The simulation was carried out using Proteus software. In order to reduce the wiring, RF transmitter and receiver is used.

IndexTerms - Alcohol sensor (MQ-3) sensor, encoder, decoder, comparator, accelerometer, tachometer.

1. INTRODUCTION:

There are a lot of accidents that take place due to drunk driving and every year, thousands of lives are lost due to this. Another cause of death is that in remote locations, if an accident occurs there is no help which can be provided to the rider. Human lives are lost due to negligence and this leads to loss of productivity and pain to family members. This concept if implemented properly can be extremely helpful and prevent many such future accidents [1-2].

2. BLOCK DIAGRAM:

The system mainly consists of two major units.

1. Helmet Unit
2. Vehicle Unit.

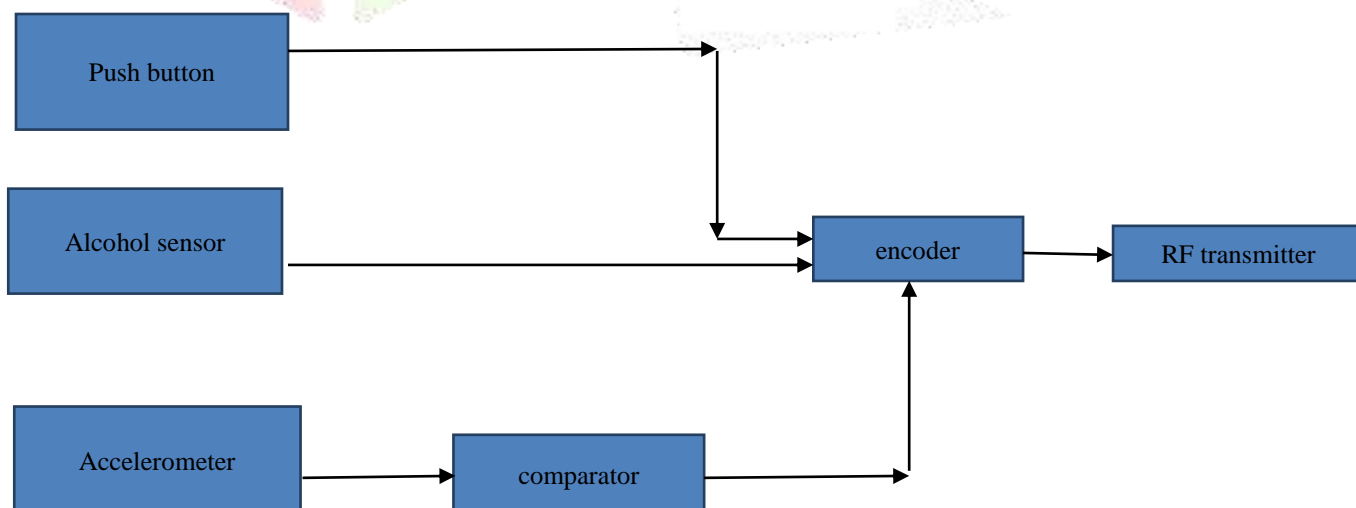


Figure 1: Block Diagram of Helmet Unit

As shown in the figure, the push button senses the wearing of helmet .The alcohol sensor senses the alcohol in the breath. Accelerometer senses the sudden tilting of helmet. Comparator converts the analog values of accelerometer into digital values. All the outputs are sent to inputs of encoder. Encoded values are sent to RF transmitter.

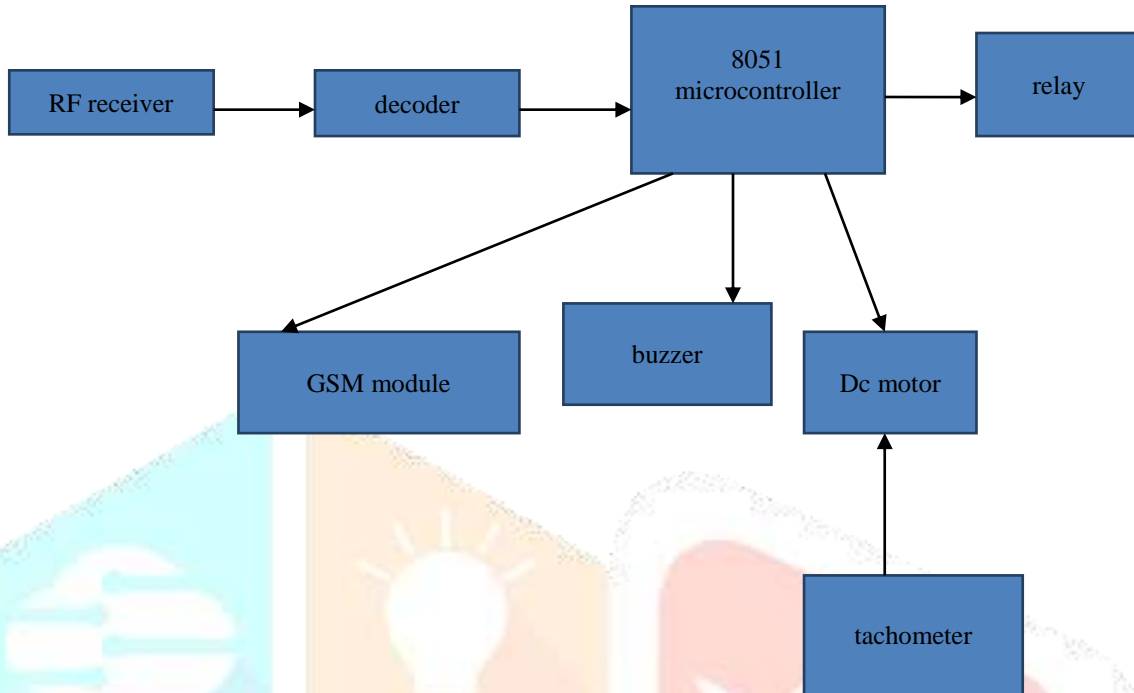


Figure 2: Block Diagram of Vehicle Unit

Output of RF transmitter is fed into H12D decoder. The decoded values are fed into the microcontroller. If the driver is drunk, then microcontroller put on the buzzer and sends the SMS to the registered contact number by GSM module. If driver wears the helmet then the relay actuates the DC motor. Tachometer checks the RPM of wheel [3-4].

3. PROPOSED CIRCUIT DIAGRAM:

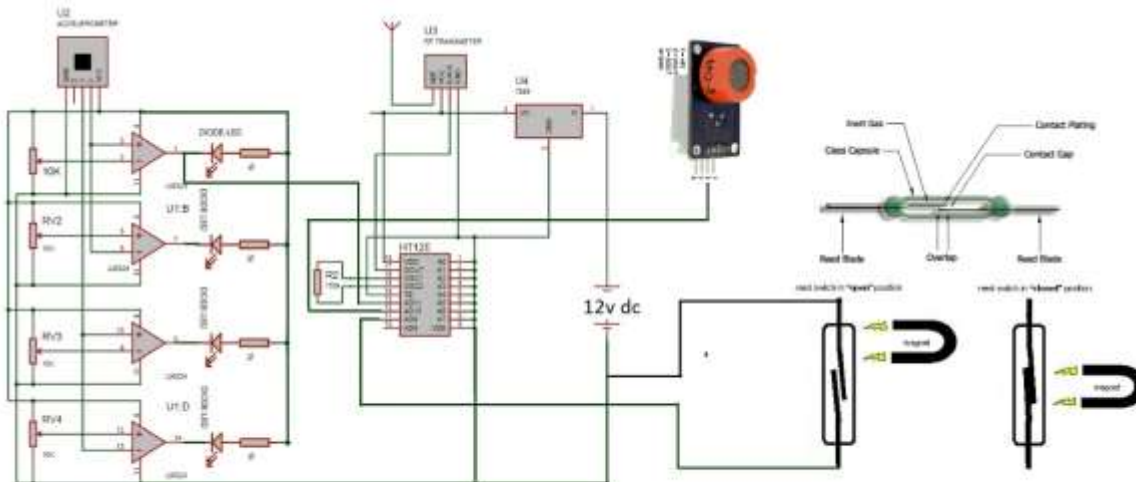


Figure 3: Schematic of Helmet Unit

4. RESULTS:



Figure 5(a): LCD DISPLAY SHOWING GEAR AND RPM

5(b): SMS SCREENSHOT SHOWING DRIVER DRUNK AND SYSTEM IS READY

After testing, certain results were obtained. Once the RPM crossed 60, the motor stopped and Gear 2 was displayed on the LED. Also, when the alcohol sensor detected the alcohol, the buzzer went off and the SMS was received on the registered GSM number. If the clip was not inserted, the DC motor did not start, hence the wheel did not rotate. Also, when we tilted the helmet sharply in the forward direction so as to show an accident, an SMS was sent to the registered mobile number by the GSM module.

The SMS was received showing that the driver is drunk once we test it with the smoke from the matchstick. Also when the helmet clip is inserted, the message is displayed that the system is ready.

5.CONCLUSION:

This helmet can reduce number of road accidents that takes place every day. The helmet will provide safety to the rider which will eventually reduce the death rate. This helmet, if made mandatory by the authorities will be a great boon to the society.

6. REFERENCES:

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