SMART HELMET USING SOLAR POWER

Presented by :

M. Venkateswarlu(S20180010107)
P. Venkatesh(S20180010135)
V. Ajay kumar (S20180010185)
B. Vishnu vamsi(S20180020202)
J. Krishna chaitanya(S20180020214)

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Introduction

In this young era, road accidents are increasing day by day among them 90% of the road accidents are due to not wearing helmets and consumption of alcohol. The main motto of this project is to ensure safety and security of a motorcycle rider.

How to solve this problem..?

- We are introducing a smart helmet which donot let the rider to start the vehicle unless he wear helmet and donot let the bike move if the rider consumes alcohol.
- This smart helmet contains a pulse and alcohol detection

Features

- Bike startup through only wearing helmets
- Detection of alcohol consumption.
- Accessing power through solar energy

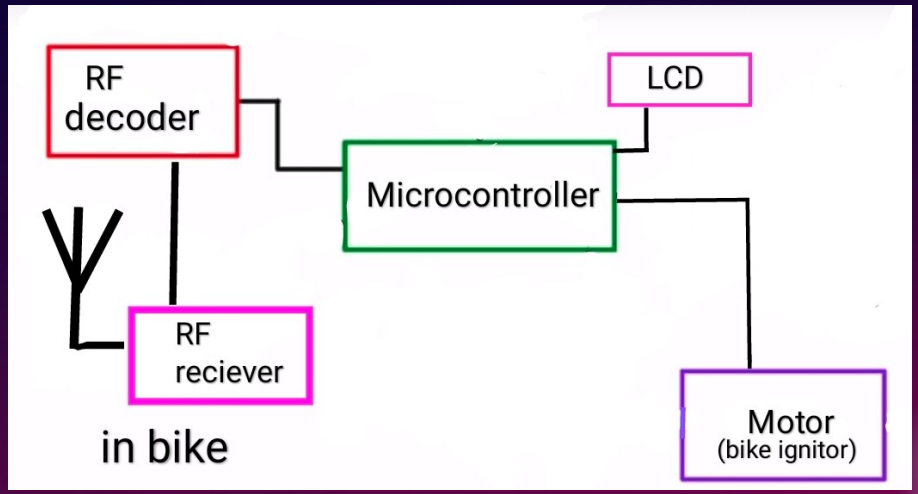
Hardware involved :

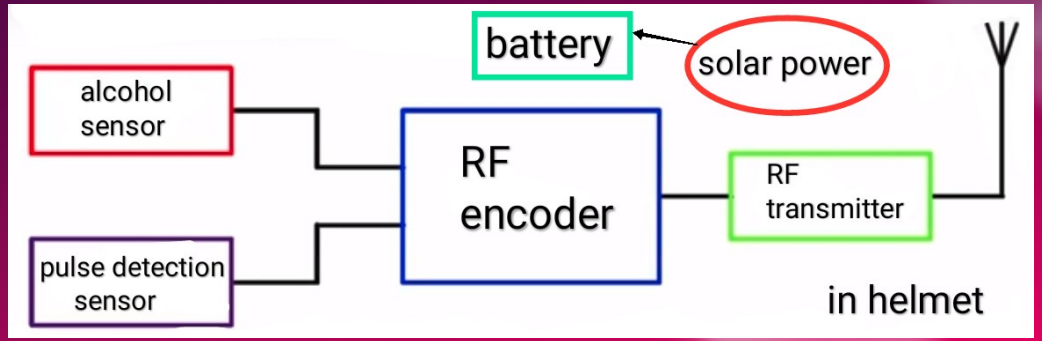
- *ATmega328 Microcontroller*
- *LCD display*
- *HT12E RF Encoder*
- *HT12D RF Decoder*
- *TLP434Mhz RF Transmitter & Receiver*
- *Solar panel*
- *3.7 LiPo Battery*
- *Motor(connected to bike ignitor)*

Sensors involved :

- *MQ3 Alcohol Sensor*
- *SEN-11574 Pulse detection sensor*

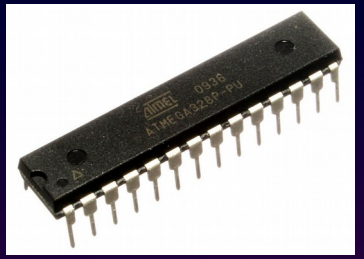
Block diagram :





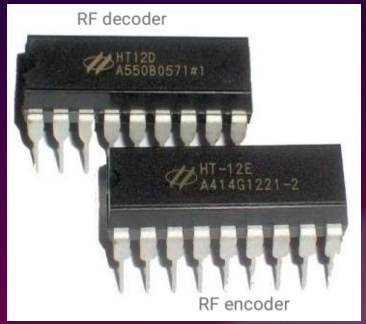
Atmega328(Microcontroller) :

- We are using microcontrollers in this project to run the program that makes decision for starting the driver or not.
- Here 328 means storing 32Kb of memory and transferring in 8 buses.



HT12E encoder (RF encoder) :

- This sensor mainly interfaces with radio frequency and ir rays.
- It transmits parallel i/p to serial format for transmission.
- Here 12 means this IC contains 2^{12} encoders.

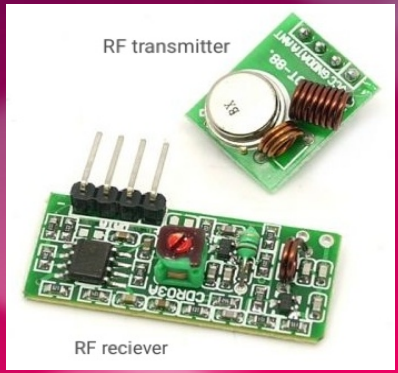


HT12D decoder (RF decoder) :

- This sensor mainly interfaces with radio frequency and ir rays.
- It transforms parallel i/p to serial format for transmission.
- Here 12 means this IC contains 2^{12} decoders.

TLP434Mhz RF (Transmitter & Receiver) :

- Transmitter and reciever operates with radio frequency of around 434MHz.
- Receieves serial data and transmits to the receiver in serial mode.
- Transmission happens at a ratee of 1 -10 kbps



Pulse detection sensor :

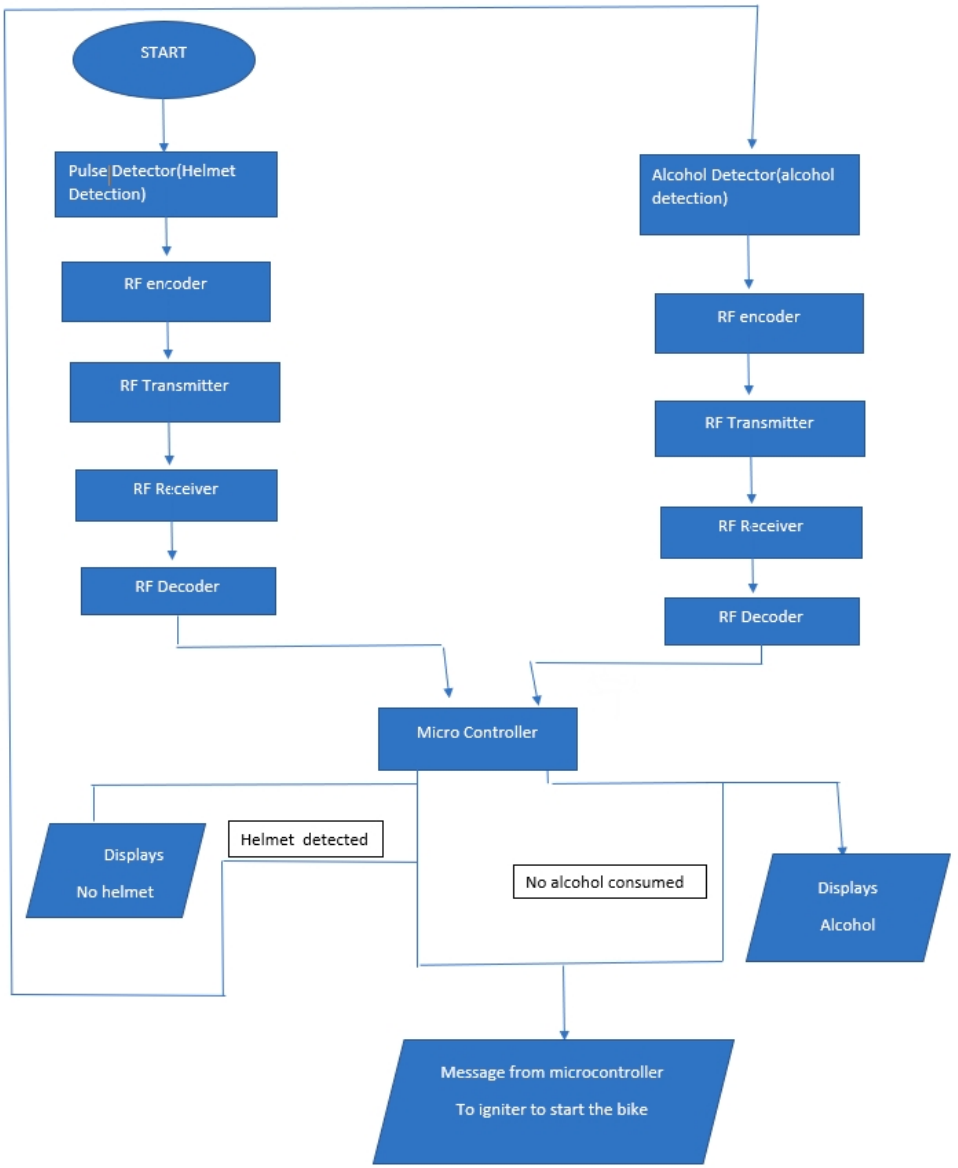
- *We are using this sensor to check the pulse at the neck so that it confirms whether he is wearing any helmet or not and sends the information to controller whether to start the bike or not.*
- *It measures the change in volume of blood in tissue.*
- *The detector o/p is in the form of electrical signal which is directly proportional to pulse rate.*

MQ -3 Alchol sensor :

- *The MQ-3 alcohol sensor detects 25 to 500 ppm of alcohol (ethane) which can be easily interfaced with microcontrollers.*

WORKING:

The process of helmet detection starts immediately after the key is inserted in the bike which supplies power to the circuit. Pulse detection sensors detects whether the biker is wearing the helmet or not and transmits the information through the RF transmitter to the microcontroller on the bike .The microcontroller verifies the message if everything goes fine microcontroller sends message to the alcohol detection sensor to detect whether he he consumed alcohol or not, else the microcontroller gives the error message “NO HELMET”. After the alcohol detection alcohol sensor send message to the microcontroller through the RF module . Microcontroller verifies the message if alcohol is detected it gives an error message “ALCOHOL CONSUMED“ through the LED display else the microcontroller gives message to the ignitor to start the bike.



Challenges :

- At rare cases we can face signal problem with RF frequency transmitter and receiver.
- Bike wont start unless we wear the same helmet that designed with the microcontroller and rf transmitter.

Feasibility :

- All the required components are available mostly.
- The cost of making this helmet will be around Rs.1500 which is bearable by a common citizen.
- Steps should take by the govt to make it as a initiative while preparing bikes.

References :

- Images from google
- Sensors source from wikipedia

THANK YOU