

Wireless Based Safety Enabled Smart Helmets for Motorbikes

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Abstract

Every year in India a large number of deaths occur due to road accidents. Drivers on two wheeler contribute significantly to 134513 deaths. In a large number of two wheeler accidents, deaths occur because no preventive actions have been taken before hand by the driver or those sitting in the two-wheeler. Intention of our project is to prevent the bike riders without wearing helmet and control the maximum two persons only sit on the seat by using embedded system technology. And also we are using BREATHE ANALYSER, ACCELEROMETER and Radio Frequency system. Those are place in the particular area of field. Now we are adopting this setup using PIC16F877A microcontroller in embedded system. So we need the program to control the function of full bike system. By this way of process we must prevent from more number of accidents.

I. INTRODUCTION

There has been a sharp rise in the total number of deaths that occur due to road accidents in the past few years. Reckless driving, ignorance of traffic rules and absence of a protective shield have been some of the most important reasons for these deaths. The driver must have a line of defence in case an accident occurs. A survey performed in India confirmed that there were a total of 134513 deaths due to road accidents in India in the year 2014. The Number increased to 1, 42,485 in the year 2011. An analyses of the road accidents, injuries and deaths in India from 2002- 2009 is very high. Accidents involving two wheelers are more dangerous due to the absence of protective guards like air bags and the direct interaction of the user with the environment. It becomes utmost essential for the user have a line of defence in case they encounter an accident. Fatal injuries to the brain are an important reason behind deaths due to the road accidents

II. EXISTING SYSTEM

Piezo Electric in Vehicle

The piezoelectric material converts the pressure applied to it into electrical energy. The source of pressure can be either from the weight of the moving vehicles or from the weight of the people walking over it. The output of the piezoelectric material is not a steady one. So a bridge circuit is used to convert this variable voltage into a linear one.

The Helmet

The helmet was a normal driving helmet that had been instilled with 4 infra-red sensors that were connected to an Atmega 16 development board. This development board also had a CC-2500 wireless receiver/transmitter attached to it.

III. RFSYSTEM

Radio frequency (RF) refers to an oscillation rate of an alternating electric current or voltage or of a magnetic, electric or electromagnetic field or mechanical system in the frequency range from around twenty thousand times per second (20 kHz) to around three hundred billion times per second (300 GHz).

IV. PROPOSED SYSTEM

In this project, to prevent the drive bikes without wearing helmet and control the maximum two persons only sit on the bike seat by using embedded system technology. And also we are using ALCOHOL sensor device for automatic controls the night time driving and Accelerometer in helmet for the rotating direction of the head and if any slip in direction means it will send the intimation to information or emergency centre using the GPS system

V. BLOCKDIAGRAM

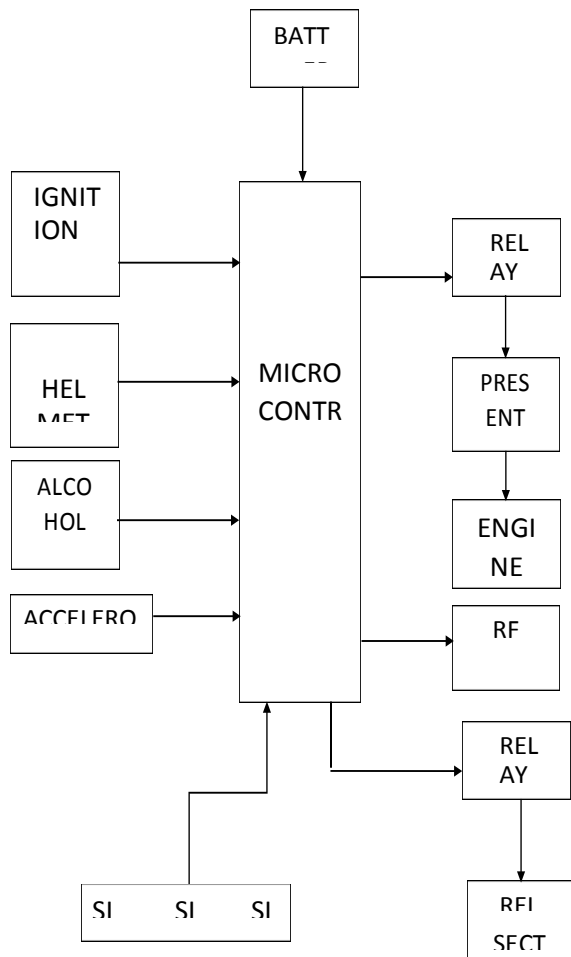


Fig Block diagram of I bike

Transmitting signals and RF System is used to get the alarm from the distance of 5 mts or 20 mts for the alarm of important zones near from the bike. Now we are adopting this setup using PIC16 F877A microcontroller in embedded system.

So we need the program to control the function of full bike system. This project must be in such a way that when bike's IGNITION KEY IN OFF condition that time bike in OFF mode and no operation executed. Otherwise when bike's IGNITION KEY IN ON condition that time bike in ON mode and monitored in LCD display as KEY ON. At that time if a rider (person1) wear HELMET and sits on the bikes seat. In these conditions only satisfy the process for start the bike engine. Here we will discuss some condition is after wearing helmet and sit on seat by rider(person1) continuously another one person only sits on the same

seat in bike. Suppose three persons same time sits on seat, automatically bike Engine will be go to OFF mode. And the main operation of automatic control is executed by sensors device. In this way of process we must prevent from more number of accidents.

VI. WORKING PRINCIPAL

In our projects contains the operation for fully controlled and safety. These operations deeply given below. When two wheeler system on stage, that time only possible for our main project operations. Firstly started the ignition key switched ON condition our project is activated by the microcontroller unit. If the Key is ON condition all other steps are possible, otherwise two wheeler system an OFF condition. In Key ON condition followed by the step is Helmet wearing concept. Here main condition is driving person (1st person) must wear Helmet device. Because bike rider must wear helmet by according to the traffic rules. So after ignition Key On condition, helmet must wear by the rider (1st person). And the main think in our project is avoiding over load of persons sit on bike seat. Here maximum two persons only possible for sitting on bike seat system. If more than two persons sits on seat system, automatically bike Engine system goes to OFF mode condition. Otherwise bike Engine system in ON condition. In this project followed by the steps of Key ON condition, wear Helmet device by the rider and seat sitting concept.

Any one step will be stopped in between the conditions by rider or other persons Engine automatically goes to OFF mode of operation. Another main concept of our project is automatic accelerometer can rotate in the XYZ direction while its get the different direction or its get dropped by the accident it gives the intimation to the Emergency area using the GPS system.

SCREENSHOTS

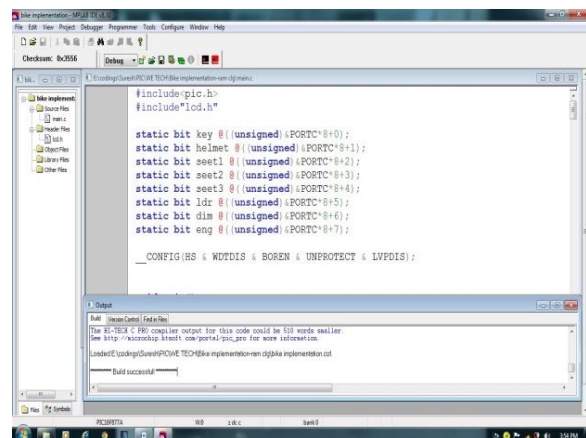


Fig Screenshot of Main coding

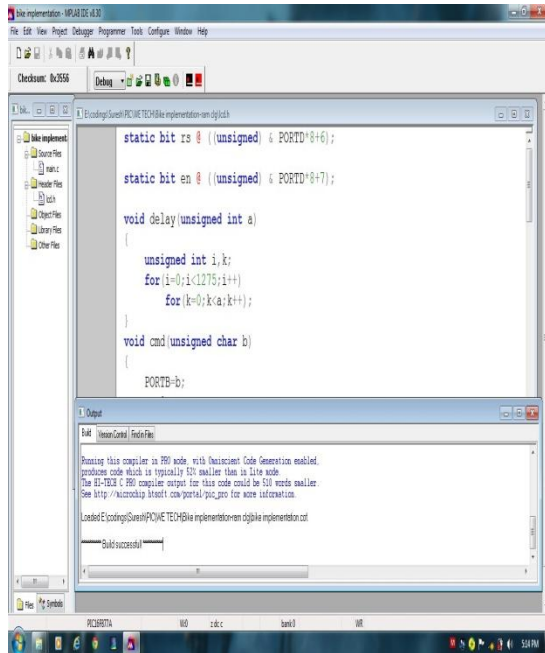


Fig Screenshot of Main coding

OUTPUT

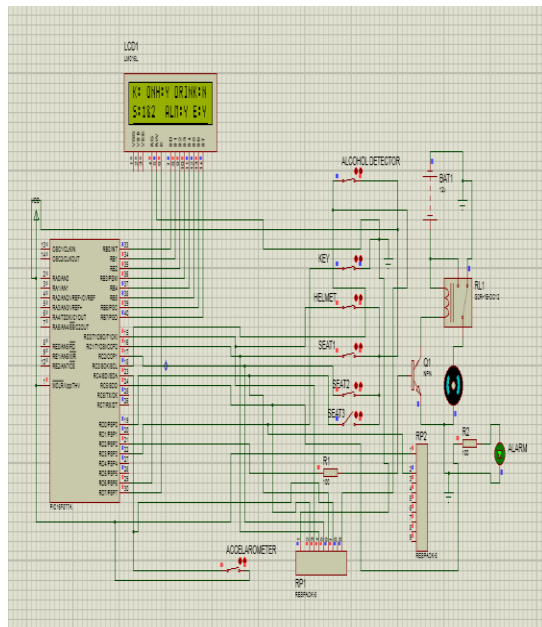


Fig Screenshot of output

CONCLUSION

A seating arrangements may not be a full proof but is definitely the line of defence for the rider in case of an accident. Because it ensures that, the three persons sits at the time on seat automatically bike engine will be go to OFF mode and the main operation of automatic light control is executed by ALCOHOL sensor, RF system and accelerometer device. It produce some light signals from their dooms in the night time. Our proposed approach makes it mandatory for the rider to use this protective guard in order to drive a two- wheeler vehicle. This system ensures the safety of the human brain and therefore reduces the risks of brain injuries and deaths. Therefore it is extremely vital for the people on a two wheeler. In this way of process we must prevent from more number ofaccidents.

FUTUREENHANCEMENT

Our project is only interfaced with two wheeler system. So we will need to introduce many innovative ideas for future development of two wheeler system like RF communication for Helmet unit, finger print based security system, auto removal side stand and notification of drunk and drive to police station.Firstly we will able to interface the RF wireless system with Helmet unit and two wheeler system. Here RF transmitter fixed on the helmet setup and RF receiver unit placed on the two wheeler system. When RF receiver (on bike) received a RF signal from the RF transmitter (on Helmet), that time only vehicles Engine goes to ON mode operation otherwise OFFmode.

Finger print technology is most important one in biomedical security system. Here we will add these technology for security purpose. If presented finger is yours, automatically Engine will ON mode otherwise OFF mode and unauthorized message will send to your own mobile number using GSM technology. Auto side stand system is one of the most important for two wheeler safety system. Here automatic side stand operated by the dc motor device controlled by the microcontroller. When ignition KEY is ON condition that time side stand automatically removed otherwise (OFF condition) side stand putted around the groundsurface.

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