KEEN PROTECTIVE HELMET AND SMART MOTORCYCLE

CH. Mahesh Babu 1, SD. Amanulla 2, D. Narashimhaswamy 3, Prof. Y. Kumari 4, Prof. M. Ranga Rao 5

Department of ECE

Potti Sriramulu Chalavadi Mallikarjuna Rao college of Engineering and Technology

Kothapeta, Vijayawada, India

mahi.maheshbabu007@gmail.com

ABSTRACT

This project manages an exceptional thought which makes bike driving more secure than some time recently. Present days such a variety of tragedies are going on in our general public. So for that we are executing another thought of sharp defensive head protector and shrewd cruiser. This framework is isolated into 2 units as protective cap helmet unit and bicycle unit. For protective helmet unit we are utilizing sensors like Vibration sensor, FSR sensor, and MQ-3 sensor. Arduino Uno Board controller and remote correspondence utilize Bluetooth Device. For bicycle unit we utilize Arduino Uno Board and Bluetooth Device, GPS Module, GSM Module, and Accelerometer Sensor. In protective cap unit it checks either driver wears a cap or not and next checks either driver is drunken or not. In bicycle unit, its controls relied on the activity of protective helmet unit. By utilizing this kind of observant head protector framework we can control difficulties by utilizing GPS and GSM Modules as it offers messages to relatives and to doctor's facilities so we can help mischance individual by utilizing the framework.

Key Words: Bike Driver safety, Accident detection and alert system, Protective helmet, and Alcohol detection.

1. INTRODUCTION:

Presently a now day's such a variety of mishaps are going on in our general public. So for that we are another idea that savvy protective cap utilizing GSM and GPS Technology. It is a unique thought which is actualized by GSM and GPS Technology [1][4][5]. Working of this savvy protective helmet is very straightforward, vibration sensors [2] are put in better places of head protector where the likelihood of hitting is more which are associated with Micro-Controller Board [1][2] are ARM [4][5]. So when the rider crashes and the protective cap hit the ground, these sensors sense and provides for the Micro-controller Board [3], then controller extricate GPS information utilizing the GPS module [1][2][3] that is interfaced to it. At the point when the information surpasses least anxiety restrict then GSM module [2][4] consequently sends message to emergency vehicle or relatives.

In this framework Arduino Uno is utilized. At the point when the framework is exchanged on, LED will be ON demonstrating that power is provided to the circuit. Bluetooth [1] is utilized for begin the bike firstly it checks whether the driver is kept or not, if little voltage of start of the bike is grounded. In typical condition when the protective cap is being used the FSR sensor, detects weight and the Bluetooth [1] emanates the FM balanced flag. The Bluetooth [1] is associated with the bike which is gets the transmitted signal and enact the relay. The transfer is expelling the start wire from the beginning associated with the starter switch now the bike will begin. Driver met with mischance vibration sensor sends message to Arduino. The GPS [1][4][5] gets the area of the vehicle that met with a mischance and gives the data back. This data will be sent to a portable number through a message. This message will be gotten utilizing GSM module [1][4][5] exhibit in the circuit. The message will give the data of longitude and latitude values. Utilizing these qualities the position of the vehicle can be assessed.

Subsequently, the closing some portion of this venture, without appropriate activity at legitimate time, threat anticipates us with a greater face. We should follow up on time when a man is harmed. We should deal with individual the way it is implied. Something else, a profitable life may be lost. We have to see how valuable existences of individuals are and what significance emergency treatment conveys in sparing these valuable lives

and going to the cost, it is less cost and GSM and GPS are advancements ate utilizing little sensor so it is exceptionally minimized size. So it will be extremely helpful for our lives.

2. TECHNICAL STUDIES:

2.1 Force Sensing Resistor (FSR):

Fig -1: Force Sensing Resistor

Force Sensing Resistor is set at inside the protective cap where the real human touch is detected. It decides by protective helmet unit that whether head protector is kept or not. In the event that this condition will realize or not realized then it sends the message to bicycle unit. Force Sensing Resistors (FSR), are solid polymer thick film, gadgets that resistance is conversely corresponding to drive connected to the substance of the sensor. This sensor is utilized as human touch control in different applications. For example, therapeutic frameworks car hardware and in mechanical autonomy and modern applications. The drive versus resistance trademark appeared in Fig 2 gives a general thought of force detecting resistor common place reaction conduct. For comfort, the press Vs resistance information is plotted on a semi-log design. Constrain detecting resister is two-wire sensor with a resistance that progressions on connected press. The resistor RM is chosen to expand the required constrain affectability go and to point of confinement current. Here we utilize Infinite / open circuit (no pressure), 100K Ohms (light pressure) to 200 Ohms (max. pressure) of measuring resistor. The yield voltage is portrayed by scientific condition.

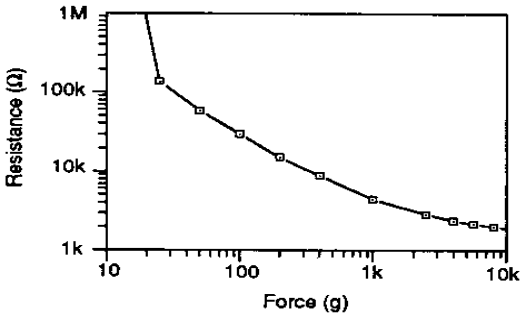


Fig -2: Resistance Vs Force

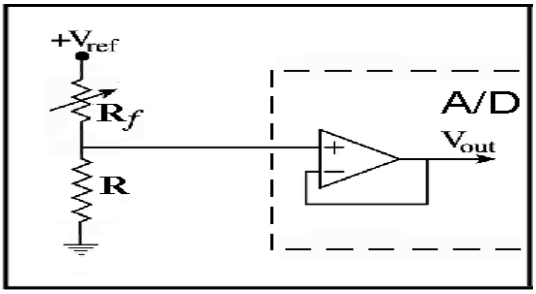


Fig -3: Circuit Diagram of FSR

2.2 Alcohol Sensor (MQ-3):

The MQ-3 alcohol sensor is appropriate for distinguishing the liquor content from breath. It can be situated quite recently front of the helmet. The sensor is reacts to different gasses. It decides by helmet unit that climate the rider is kept or not. MQ-3 sensor has potentiometer to changing diverse centralization of gasses. We align the locator for 0.4mg/L of Alcohol absorption in air and utilize estimation of resistance is 200 Kw. MQ-3 has underpins for both simple and computerized. MQ-3 has a 4 stick to be specific GND, VCC, Analog Out, and Digital Out. Here we utilize computerized yield of this sensor which is gives yield in terms of high or low. It chose by our protective helmet unit climate rider is very drunk.

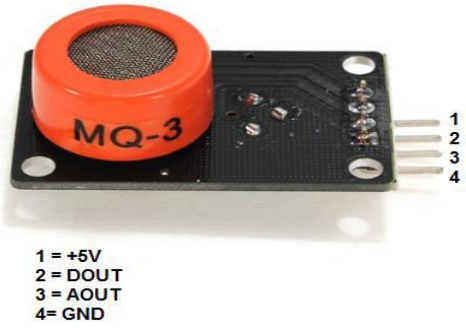


Fig -4: Alcohol Sensor (MQ-3)

2.3 Accelerometer ADLX345:

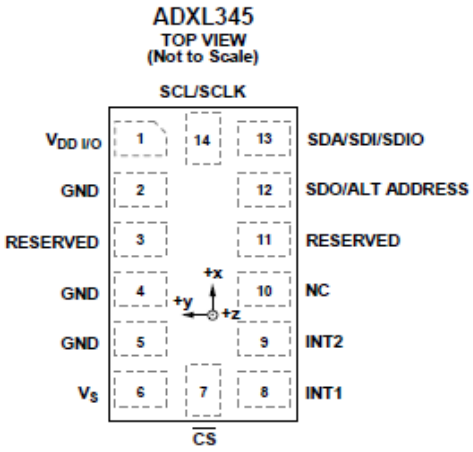


Fig -5: interfacing diagram of Accelerometer

The ADXL345 is tinny, tri pivotal accelerometer with determination of 13bit. The yield of accelerometer is computerized what's more, utilize 16bit 2's complement information. It is access to interface by means of Serial Peripheral Interface (SPI 3-4 wire) or I2C interface. Accelerometer is utilized for both estimation of static and dynamic quickening. In this venture we utilize accelerometer measures the static speeding up of gravity. Free-fall detecting sees if the bicycle id falling. Furthermore, Bike unit take choice that mischance is happens or not. In this venture we interfaced ADXL345 by utilizing I2C computerized interface system. The CS associated with high to VDD I/O, the accelerometer is requiring 2- wire association. The negligible operational voltage of this gadget can't more prominent than VDD I/O that is 0.3 V. For the legitimate working condition, we utilize two outer draw up resister. The estimation of draw up resister is 3.3 kilo ohm.

2.4 Vibration Sensor:

Fig -6: Vibration Sensor

The piezo-electric property is a reversible marvel. At whatever point an electric excitation(voltage) is connected over the inverse countenances of quartz precious stone, it begins to vibrate and subsequently creates mechanical motions. At whatever point mechanical vibrations are connected to the precious stone, it produces electric potential over inverse countenances of the precious stone. Consequently a precious stone can be utilized for the development of vibration sensor. The recurrence of motions relies on upon the physical size and the state of the precious stone. By and large, littler measurements of gems deliver higher frequencies and greater precious stones create bring down frequencies.

The mechanical vibrations are connected to a thin stomach. The stomach vibrates as per the connected mechanical vibrations and applies weight to the gem. The precious stone creates a voltage in understanding with the vibrations. These voltages are of low adequacy. Thus these signs are bolstered to an operation amp enhancer. The enhanced signs are bolstered to a monostable multivibrator for delivering beats of settled length. The microcontroller routinely checks the yields of the monostable multivibrator.

For vibration sensor:
Output: High (V) -whenever the vibration sensor hitter. Low (0V) –when there is no interruption on vibration sensor.

2.5 Bluetooth Sensor:

Bluetooth module is a simple it utilize Bluetooth SPP (Serial Port Protocol) module, intended for straightforward remote serial association setup. Serial port Bluetooth module is completely qualified Bluetooth V2.0+EDR (Enhanced Information Rate) 3Mbps Modulation with finishes 2.4GHz radio handset and baseband. It utilized CSR Blue core 04-External single chip Bluetooth framework with CMOS innovation and with AFH (Adaptive Frequency Hopping Feature). It has the impression as little as 12.7mmx27mm. Trust it will disentangle your by and large outline/advancement cycle.

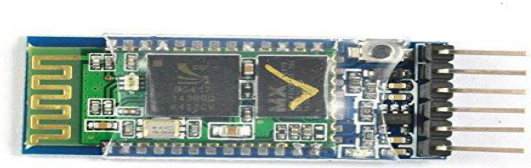


Fig -6: Bluetooth Sensor

3. CONSTRUCTION:

We as of now specified that we isolate a venture in two units to be specific protective helmet and bicycle. In helmet unit, the force detecting resister is put on inside upper piece of the protective cap where really head was touched with sensor surface. What's more, liquor sensor is set on before rider's mouth. It can sense effectively. Sun based boards are mounted on upper side of protective cap which is in direct daylight. Furthermore, the battery and normal circuits was settled inside the head protector. Auxiliary controller and Bluetooth was additionally put on inside the helmet, radio wire are situated outside the head protector.

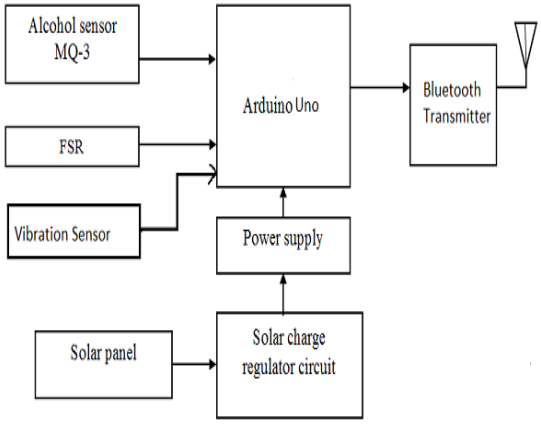


Fig -7: Helmet Unit

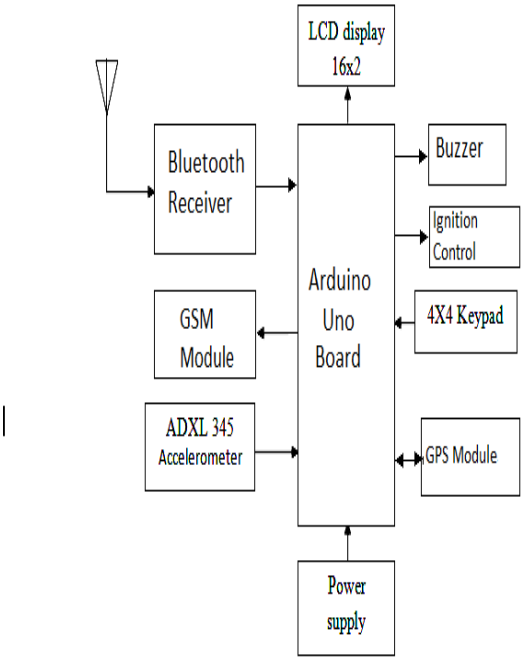


Fig -8: Bike Unit

The bicycle unit is mounted on real bicycle. Accelerometer was settled on bicycle for the identification. Our principle controller is situating into capacity instance of bicycle. Also, decoder circuit is put on in handle of bicycle. We likewise stick a console on the petrol tank. So we can without much of a stretch sort the secret key.

4. LCD Display (16x2):

LCD (Liquid Crystal Display) screen is an electronic show module and locate an extensive variety of uses. A 16x2 LCD show is extremely fundamental module and is normally utilized as a part of different gadgets and circuits. These modules are favoured more than seven sections and other multi portion LEDs. The reasons being: LCDs are practical; effectively programmable; have no constraint of showing unique and even custom characters (dissimilar to in seven sections), activities et cetera. A 16x2 LCD implies it can show 16 characters for every line and there are 2 such lines. In this LCD each character is shown in 5x7 pixel grid. This LCD has two registers, to be specific, Command and Data.

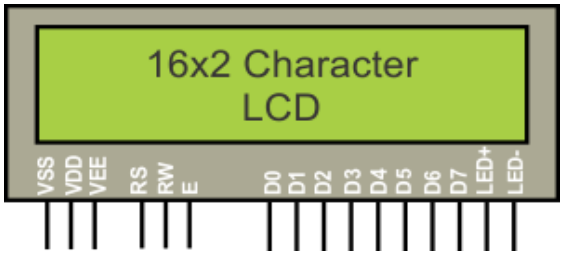


Fig -9: LCD Display (16x2)

The orders enlist stores the order directions given to the LCD. A +is a direction given to LCD to do a predefined errand like instating it, clearing its screen, setting the cursor position\, controlling showcase and so on. The information enlist stores the information to be shown on the LCD. The information is the ASCII estimation of the character to be shown on the LCD. A common LCD is appeared in figure 9.

Features: [5]

- 5 x 8 dots with cursor
- Built-in controller (Ks 0066 or Equivalent)
- +5V power supply (Also available for +3V)
- 1/16 duty cycle
- B/L to be drive by pin1, pin2 or pin15, pin16 or A.K (LED)
- N.V. optional for +3V power supply

5. ADVANTAGES, APPLICATION AND FUTURE SCOPE:

5.1 Advantages:

- The project offers insurance from lacking streets and awful driving conditions that is regular in nations like India.
- Discovery of mishap in remote range can be effectively distinguished and restorative administration gave in brief time.
- Just avoiding drunken drive by using liquor locator. It will decrease the likelihood of mishap.
- Works on sunlight based and in addition battery supply.
- In the event that cap was stolen then we can begin the bicycle by the secret key.

5.2 Application:

- Less power expending wellbeing framework.
- It can be utilized as a part of constant wellbeing framework.
- This security framework innovation can further be upgraded in auto and furthermore by supplanting the cap with safety belt.
- We can execute the entire circuit into little module later.

5.3 Future Scope:

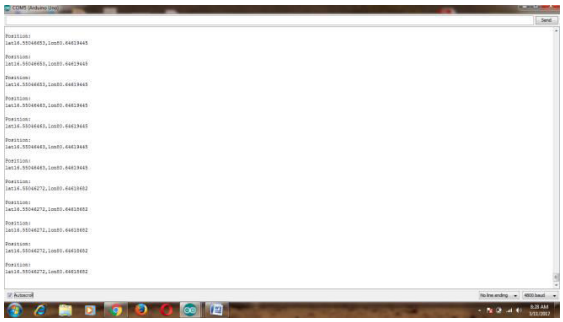
- We have utilized sun powered board for protective cap control supply by utilizing same power supply we can charge our portable.
- We can fix the little camera for the recording the drivers action.
- It can be utilizing for passing message from the one vehicle to another vehicle by utilizing remote transmitter.

6. RESULT:

6.1 In the event that liquor fixation introduce in human breath then it show the message on LCD and it sends the SMS to no. with their present area.

Fig -10: LCD Display on “Not Driver Drunk”

Fig -11: LCD Display on “Driver Drunk”



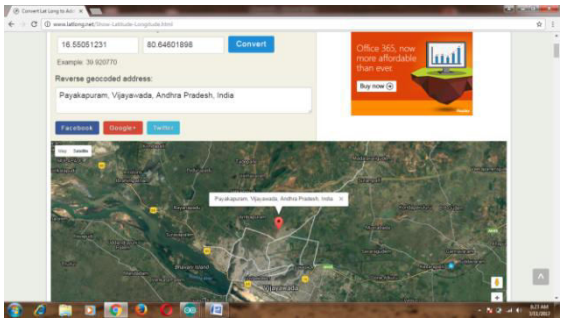


Fig -12: GPS Longitude and Latitude Locations

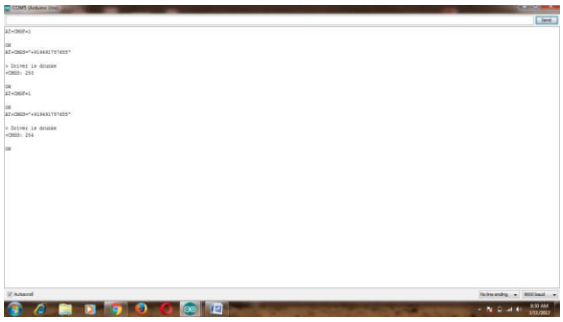


Fig -13: GSM send the Register numbers

8. CONCLUSION:

The results of the project have demonstrated that the bicycle start will begin if the head protector is worn. Along these lines, it will consequently diminish the impact from mischance and it can maintain a strategic distance from bicycle from being stolen. Arduino Uno is great in controlling the entire framework and the sensors. Executing the remote framework which Bluetooth Module to send motion from helmet unit to the bicycle unit.

Because of this remote association is superior to anything wired link.

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