Development of Speed Control and Accident Alert System For Bike

Mr.Prathmesh Jadhav[1], Prof.Prasad Mane[2], Mr. Omkar Naik[3], Mr. Satyawan Bhise[4], Mr. Balkrishn Arolkar[5]
[1, 2, 3, 4, 5]Automobile, RMCET,Ambav

Abstract- *this project has an aim to control the speed of bike automatically. Now a day in fast moving world all the peoples are not have self-control. Such peoples are driving bikes in high speed. So the police are not able to monitor all those things. This project provides a way for how to control the speed without harming others. Driver does not control anything during over speed; controls are taken automatically by the use of electronic system.*

In this project we made speed sensor using DC motor as voltage generator to trigger GSM modem for calling or SMS to the parents. Tilt sensor which trigger the GSM modem when bike tilt more than 45^0 angle. For this circuit only 12 volt supply given from bike and one SIM in GSM modem for caZlling or SMS to the parents. When bike goes above the 80(km/hr) speed then fuel cut off occurs in the carburetor

Keywords- Modem, speed sensor, Tilt sensor and GSM modem

I. INTRODUCTION

At present accidents mostly occurs due to rash driving, over speed and without safety precautions on road. People do not bother about human life. The accidents rate increased largely particularly in case of bike because of increased number of bikes on road. The government has taken too many steps to prevent these kinds of things but it is not enough. So we are trying to develop system to control this thing in simple manner. At first we have an idea to control the speed of bike as well as to give information regarding over speed to parents by SMS or calling and also alert the parents about accident.

The speed sensor and accident sensor are the two main inputs to the modem. The modem sensing the speed and accident then trigger the GSM module. Then the regarding message will convey to the parents by SMS or mobile calling. At same time the fuel cut off occurs in the carburetor by actuating the solenoid vale. The fuel cut off occurs when bike goes on extreme speed limit as well as when the accidents are happen or bike fall on the surface level. The fuel cut off and accident alert SMS or calling also convey to the parents when bike tilt more than 45° angle on curve road.

II. BASIC THEORY

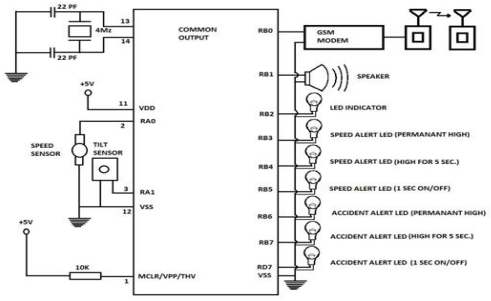

Fig.1 Circuit diagram

A.Circuit Diagram Major Components

1. LQFP Microcontroller
2. Speed Sensor
3. Tilt(Accident) Sensor
4. GSM Module / Mobile at Transmitter Side
5. LED Indicator
6. Mobile at Receiver side

B.Microcontroller

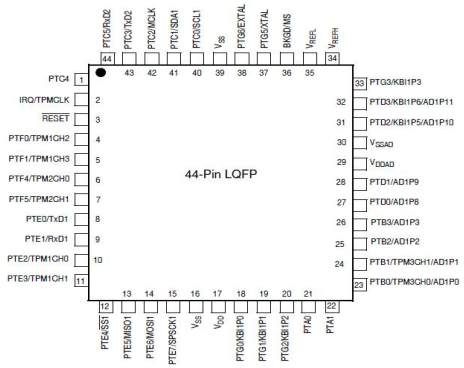

Fig.2 Pin Diagram of LQFP Microcontroller

C.Features of microcontroller

8-Bit HCS08 Central Processor Unit (CPU)

- 40-MHz HCS08 CPU (central processor unit)
- 20-MHz internal bus frequency

- HC08 instruction set with added BGND, CALL and
- RTC instructions
- Memory Management Unit to support paged memory.
- Linear Address Pointer to allow direct page data accesses of the entire memory map development Support
- Background debugging system
- Breakpoint capability to allow single breakpoint setting during in-circuit debugging (plus two more breakpoints in on-chip debug module)
- On-chip in-circuit emulator (ICE) Debug module containing three comparators and nine trigger modes. Eight deep FIFO for storing change-of-flow addresses and event-only data. Supports both tag and force breakpoints.
- Memory Options
- Up to 128K FLASH — read/program/erase over full operating voltage and temperature
- Up to 8K Random-access memory (RAM)
- Security circuitry to prevent unauthorized access to RAM and FLASH contents.

D.Flow chart for project

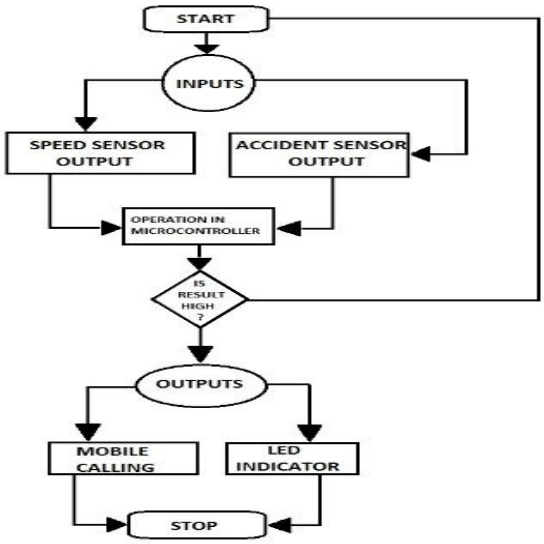

Fig.3 Flow chart

III. AIMS AND OBJECTIVE

Aim:

Aim of proposed work is to reduce the accident happen due to over speed of bike. These project helps to control the over speed by occurring fuel cut off in the carburetor with the help of electrical system. The project aim is giving the information of the over speed and accident alert to the parents by SMS and calling.

Objective:

- To reduce the accident of bike during over speed.
- To control the speed of bike above 80 km/hr by fuel cut off.
- Study new technology and help to society.
- Get information of speed and accident of bike to the parent's through mobile call or SMS.
- Increase life of vehicle.

IV. PROBLEM DEFINATION

Now a day's numbers of accidents of bikes are increases, because of over speed and lack of safety taken while driving. So we need to control the speed of bike above the speed 80 km/hr for the safety of driver as well as pedestrian.

So problem can be defined as **"controlling the speed of bike by "fuel cut off" of the engine and giving information to the parent's of over speed and accident of bike".**

V. PROPOSED WORK

A. Construction:

From fig.4 we use speed sensor and accident sensor input to the microcontroller. The speed sensor is made up of the fan. This is fitted into the plastic pipe. The air or wind fall on the fan then fan converts the air pressure into electrical energy to detect approximate speed of vehicle. The accident sensor contains a metallic / lead ball inside that will commute the two pins of the device from on to off and vice versa if the sensor reaches a certain angle. The microcontroller having total 40 pins and 33 pins are used for the input and output purpose. The microcontroller is use to receiving the command of speed sensor and accident sensor then it trigger to the GSM modem for calling or SMS. At the same time it gives command to the solenoid vale for fuel cut off the carburetor. The antenna is use for the network purpose to the GSM modem.

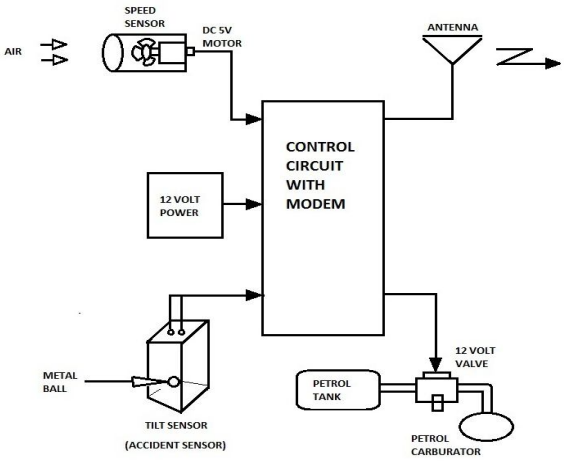

Fig.4 Construction diagram

B.Working

We first make speed sensor using DC motor as voltage generator. Which is amplified by transistor and rely activated to trigger GSM modem. For that we use air sensor as fan of DC motor. When more air force more speeding fan of DC motor hence sufficient voltage generated by DC motor to trigger transistor to activated relay. Which trigger modem to call save number of parents. At same time solenoid valve activated and fuel cut off occurs in the carburetor for short time duration.

For accident sensor we use tilt sensor. When bike tilt more than 45° angle then tilt sensor short its terminal hence GSM modem get trigger to call or SMS to parents which is save number. At same time solenoid valve activated and fuel cut off occurs in the carburetor for short time duration.

For above working we fix speed sensor in front of bike in plastic pipe to face air in front of fan of DC motor and accident sensor fix 90° to ground so that when bike on stand no call or SMS goes to save number. When the bike falls on the ground then also fuel cut off occurs in the carburetor by actuating the solenoid valve

VI. METHODOLOGY

A.Project to be developed

Now a day in fast moving world all the peoples are not have self-control. Such peoples are driving bikes in high speed. At present accidents mostly occurs due to rash driving, over speed and without safety precautions on road. People do not bother about human life. So the police are not able to monitor all those things. The accidents rate increased largely particularly in case of bike because of increased number of bikes on road. The government has taken too many steps to prevent these kinds of things but it is not enough. This project provides a way for how to control the speed without harming others. Driver does not control anything during over speed; controls are taken automatically by the use of electronic system.

In this project we made speed sensor using DC motor as voltage generator to trigger GSM modem for calling or SMS to the parents. Tilt sensor which trigger the GSM modem when bike tilt more than 45^0 angle. For this circuit only 12 volt supply given from bike and one SIM in GSM modem for calling or SMS to the parents. When bike goes above the 80(km/hr) speed then fuel cut off occurs in the carburetor.

B.Minimize negative visual aesthetic

Another design is to ensure that the project will not have a negative effect on current vehicle aesthetics. All components should be located as possible and should be located as inconspicuously as possible and should only we seen we servicing the unit. However in case of electronic control unit, it should be provided with sufficient coating to protect from inconvenient weather change. Therefore, the ideal functional objectives have been modified to account for this design requirement

C.Ability to provide speed control and accident alert system:

The objective to provide speed control and accident alert system is to provide all the said benefits to the through an speed and accident alert system, minimizing the user intervention. Especially it is desired that the system will work independent on the road condition. However since this objective is closely linked with ideal objectives in the controlling the bike speed, thus unattainable to time constraints, this objective will not be pursued.

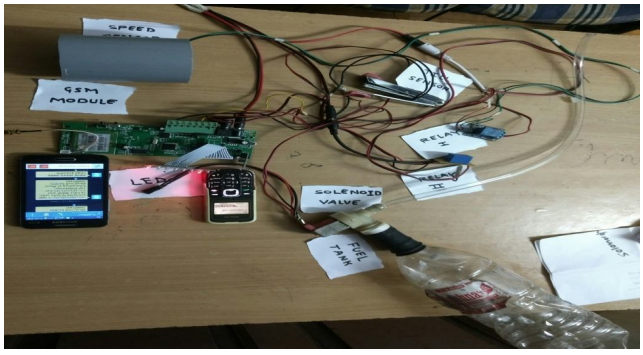

Fig.5 Circuit connection.

D.Component selection

The proper selection of the component for the different kind of operation is the main objective of this design. For a design engineer it is must that he may be familiar with properties of components and their various handling techniques the choice of every component for engineering purpose depend upon following factors

- Availability of components.
- Suitability of components for the working condition in service.
- Cost of the component.
- Physical properties of the components.
- Mechanical properties of components.
- Ease of handling and serviceability of the components.

Speed (Fan) Sensor

Speed sensor made of simple small Fan which is calibrated and made in such size that when air which falls on it has flow of greater than 90km/hr, it produces the high signal. Speed sensor mounted on vehicle in proper position to fall wind/air properly.

Fig.6 Speed sensor

Accident (Tilt) Sensor:

Tilt is fixed at proper position on Bike, so it will detect the good tilt angle of bike when accident happened the tilt sensor is a component that can detect the tilting of an object. However it is only the equivalent to a pushbutton activated through a different physical mechanism. This type of sensor is the environmental-friendly version of a mercury-switch. It contains a metallic/Lead ball inside that will commute the two pins of the device from on to off and vice versa if the sensor reaches a certain angle.

As seen from the images below, mercury, being a liquid metal can flow down and establish contact between the leads of the switch. The blob of mercury is able to provide resistance to vibrations as mercury is a dense liquid metal.

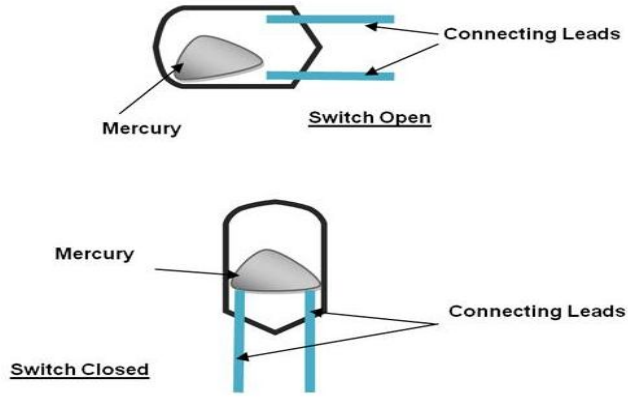

Fig. 7 Tilt sensor

GSM Module/ Mobile at Transmitter side

The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.

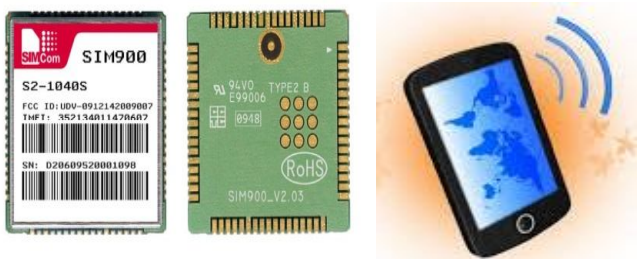

Fig.8 GSM Module

LED Indicator

A **light-emitting diode** (**LED**) is a two-lead semiconductor light source. It is a PN-junction diode, which emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons.

Relays

A relay is an electrically operated switch. Mainly relay use to electric magnetic to operate a switching mechanism electrically, but other operating principle is also used. Relay are use where it is necessary to control a circuit by low power signal (with complete electrical isolation between

controller and controlled circuit), or where several circuit must be controller by one signal.

Relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a leaver and change the switch contact. The coil current can be on/off so relays have two switch potions and must have throw (change over) switch contact.

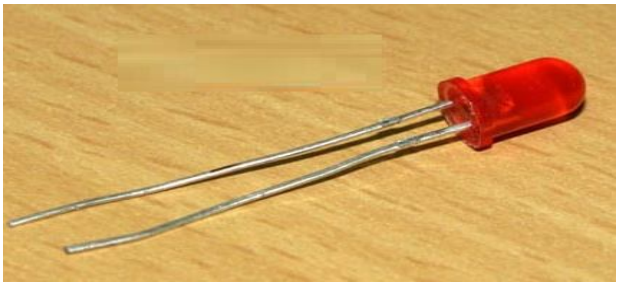

Fig.9 Led indicator

VII. CONCLUSION

It control the over speed of bike above 80 km/hr by fuel cut off occurs in the carburetor. At the same time it send information about the over speed to the parents by SMS or calling. When the accident happen at that time also fuel cut off occurs and sending information about the accident to the parents.

Future scope:

Development of speed control and accident alert system is mostly useful in Automobile industry. With the help of speed sensor and tilt sensor the project aim to reduce causes of accident during over speed. This project work as safety for the driver as well as pedestrian. Giving information of speed and accident to the parents.

Advantages

- Easy to setup.
- Safety feature.
- Less traffic problem.
- Robust design.
- No line of sight requirements.
- Require less maintenance.
- Fast and accurate.
- Low cost.

REFERENCES

[1] B.Devikiruba,-Vehicle speed control system using GPS and GPRS. Vol-2**,** International Research journal of engineering and Tech. 2013**.**

[2] A.Vengadesh, K.-Sekar automatic speed control of vehicle in restricted areas using RF and GSM. vol-2, International Research journal of engineering and Tech. 2015.

[3] K.Govindaraju, S.Boopathi,-Embedded based the vehicle speed control system using wireless technology.