VEHICLE SPEED LIMIT CONTROL(VERSION 2.0)

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Abstract—This paper aims to control the speed of vehicles at speed restricted areas such as schools, hospital zones etc. Nowadays the drivers driving the vehicles at high speed even in speed limited areas without considering the safety of the public. The traffic police are not able to control them. Also it is not practical to monitor. This project paves way to control the speed of the vehicles within certain limit in restricted zones without interruption of the drivers. An RFID reader is fixed in all the vehicles and tags will be placed in each zones for indicating the speed limits. These tags are programmed to send a signal that the reader comes in proximity. Whenever the vehicles enter into these zones their receivers will receive this code and the speed of the vehicles is controlled automatically with the help of the controller unit present inside the vehicle. The tags will be placed at the beginning and the end of the regions for which the speed should be reduced. The proposed work includes the alcohol sensor and to transfer the message to nearest police station, also the information is sent when the driver or owner tries to remove the RFID reader from the vehicle.

Keywords—RF Transmitter and Receiver; Controller Unit; Alcohol Sensor; GSM Module
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1. INTRODUCTION

Nowadays accident occurs due to rash driving and over speed in restricted area. Rash drivers do not bother about human lives. The accidents rates are increasing day by day, because of more vehicles on to ground. The government has taken many steps to prevent this kind of accident but it not enough. Most of the vehicle has advanced of laser based control system but its cost is too high. It is again so difficulty when human crosses the road it cannot detect so we tried to develop a system to control these kinds of accidents by a simple manner. At first we have an idea to use sensors but it was costly so we go for IR module again there is a draw back in using this it works under line of sight so finally decided to use RF.

RF transmitter placed on the different zone areas and receiver is placed in the vehicle. The current speed will be monitored by the server module or by the use of ultrasonic sensor that sends information to controller. The controller compares both speed and the driver does not decreases the speed control transferred automatically but the driver again operate it manually and exceeds the limited speed means the information send to the nearest control station. The information contains the vehicle speed and registration number. Additionally alcohol sensor has been included. The controller transmits both the information by using GSM module. Then the penalty amount is paid by the owner, and too in alcohol is detected then the fuel will not be injected.

2. RF MODULE

RF transmitter and receiver needs power source or battery for operating and it should be usable for a long period more than decades. It has an inbuilt short range antenna, also we can use handheld antenna. The antenna used in the RF module is a scanning antenna. The scanning antenna will release the signal in short range. Whenever an RF receiver comes across the transmitter device the information send to transmitter will started to pass to the receiver module which is placed in the vehicle will get the signal.

A. Transmitter Modules

An RF transmitter is a small module it can able to transmit the radio waves. It is working along with the microcontroller. This is used to send data to module which can be transmitted. Transmitter power output can be decreased by the physical environmental changes such as harmonics, noise and through other parameters. We can take necessary steps to overcome this to make transmitter to increase or maintain the quality.

B. Receiver Modules

An RF Receiver module receives the transmitted RF signal, and demodulates it. There are two different types of RF receiver modules: super heterodyne receiver and super-regenerative receiver. Super-regenerative receivers are usually low cost and low power designs with using a series of amplifiers to avoid modulated data from a carrier wave. Super-regenerative receivers are generally imprecise as their frequency of operation varies differentially with temperature and power supply voltage. Super heterodyne modules have a performance advantage over super-regenerative they offer increased ability and stability over a large voltage and temperature range. This stability comes from a fixed crystal design which in turn leads to a comparatively expensive product.

3. CONTROLLER UNIT

A. Transmitter

The diagram shown below (Fig. 3.1). Is the transmitter which is placed in edges of the speed limiting areas. This unit simply contains the information of how much the vehicle speed in that region that can be predefined based on the needs.

The controller is used to transmit the information through RF transmitter to multiple receivers.
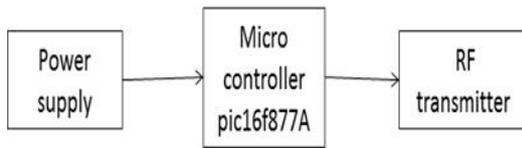

Fig.3. 1. Transmitter block diagram.

B. Receiver

The receiver block diagram is shown below (see Fig. 3.2).The receiver is used to predict the information from the transmitter based on the sender location it received it controls the speed of the vehicle. The receiver modules consist of RF reader, LCD display, GSM modem, motor. LCD is used to shows the predefined information to the driver who drives the vehicle.
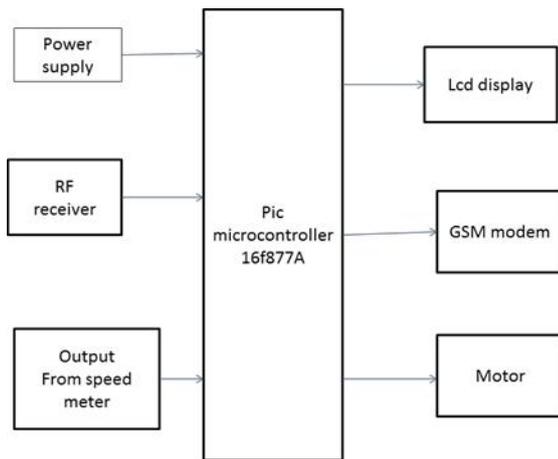

Fig.3. 2. Receiver block diagram.

Here the GSM module plays an important role. When the driver does not reduce the speed then the control goes automatically and the information will send to the nearest police station.

C. RFID

RFID is a tracking technology used to identify and authenticate tags that are applied to any product, individual or animal. Radio frequency Identification and Detection is a general term used for technologies that make use of radio waves in order to identify objects and people.

Purpose of Radio frequency Identification and Detection system is to facilitate data transmission through the portable device known as tag that is read with the help of RFID reader; and process it as per the needs of an application. Information transmitted with the help of tag offers location or identification along with other specifics of product tagged – purchase date, color, and price. Typical RFID tag includes microchip with radio antenna, mounted on substrate.

The RFID tags are configured to respond and receive signals from an RFID transceiver. This allows tags to be read from a distance, unlike other forms of authentication technology.

D. RFID Reader

An RFID reader's function is to interrogate RFID tags. The means of interrogation is wireless and because the distance is relatively short; line of sight between the reader and tags is not necessary.

A reader contains an RF module, which acts as both a transmitter and receiver of radio frequency signals.

The transmitter consists of an oscillator to create the carrier frequency; a modulator to impinge data commands upon this carrier signal and an amplifier to boost the signal enough to awaken the tag.

The receiver has a demodulator to extract the returned data and also contains an amplifier to strengthen the signal for processing. A microprocessor forms the control unit, which employs an operating system and memory to filter and store the data. The data is now ready to be sent to the network.

RFID systems can be classified by the type of tag and reader. A Passive Reader Active Tag (PRAT) system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from 1–2,000 feet (0–600 m) allowing flexibility in applications such as asset protection and supervision.

A variation of this system could also use a Battery-Assisted Passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal.

Fixed readers are set up to create a specific interrogation zone which can be tightly controlled. This allows a highly defined reading area for when tags go in and out of the interrogation zone. Mobile readers may be hand-held or mounted on carts or vehicles.

4. WORKING

When the vehicle enter in to the normal area it speed does not decrease and it goes normally no action is performed. When the vehicle enter into the restricted area that means it enters into the speed limiting. Whenever it enters the transmitter just send information that contains speed limit that a vehicle can go inside the speed limited region. Then the information is received by the receiver and the signal acquired from the speed meter is also given to the controller. The signal is basically analog in nature that will be converted into digital so only the microcontroller can able to process the signal.

The information from the transmitter and the speed meter is compared by the controller. In this there are two cases: first, the current speed is less than the transmitted speed the vehicle goes normal speed no actions were required. Second, the signal from the speed meter is greater than the transmitted speed by the transmitter module then the controller automatically takes the control and reduces the speed according to it. At the same time the information is transmitted to the nearest police station. The information contains the vehicle number, time and the location. The time indicates that at which time the vehicle cross that area. Then the fine amount is collected by the nearest check post. At the end of the speed limit area there is another transmitter that contains release information means the control releases by the controller to drive.

5. EXISTING WORK

Now a day's accidents are increasing at a large pace, and various technologies are being introduced to reduce the accidents. In this project we are presenting a means to prevent speed controlling in school and college zone.
When speed of the vehicle nears the speed limit it displays the warning and if exceeds the limit, the microcontroller records the violated speed and time. The LCD displays the lane speed limit.

To Ensure decline in accidents and to improve road safety, speed control techniques such as speed control in school and college zones by using RF transceiver, automatic braking systems, Camera based detection, RFID technology based detection are implemented. The existing techniques still doesn't able to reduce the number of accidents. Hence in our system we are using GSM, which is low cost.

6. PROPOSED WORK

The main aim of our project is to control the over speed of vehicle for school and college zone using the robot. Here we use the RF technology for that controlling. By this project we can control the vehicle speed through the radio frequency. The transmitter will receive the signal in the predetermined area only. When transmitter receives the signal, automatically it will display as school zone, voice module is enable and announce as school zone using AVR voice module and speaker. Ultrasonic sensor will find distance of the front and back cars. Control the speed limit of vehicle. The software for the microcontroller is written using embedded C. Also we have included the alcohol detector to sense; if the signal is detected car will not start.

7. CONCLUSION

The paper has an RFID tag which indicates the vehicle when it enters a speed limit zone. Hence by using the proximity sensor to monitor the speed of the vehicle and accelerator unit to control the speed, the speed of the vehicle can be maintained in the limited speed without the intervention of the driver. If this can be implemented effectively rash driving and over speeding in the speed limit zones can be reduced to a large extend, thus decreasing the total number of road accidents in our country.

8. FUTURE WORK

In this paper we do not use ultrasonic sensor i.e., ultrasonic sensor to find distance of the front and back cars. Control the speed limit of vehicle by using RF module. The software for the microcontroller is written using embedded C.

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