© 2017 IJSRST | Volume 3 | Issue 4 | Print ISSN: 2395-6011 | Online ISSN: 2395-602X
Themed Section: Science and Technology

Automatic Over Speed Control Systems for the School and College Zone

Dr. R. Prema

Department of Electronics and Communication Systems, Karpagam University, Karpagam Academy of Higher Education, Coimbatore, Tamil Nadu, India

ABSTRACT

Increasing of Traffic in our country is keep on increasing day by day. It becomes a serious problem to control the speed of the vehicles and clear traffic. Many people are not giving a good response for the traffic rules in many places. Especially, in the school and the college zone, people are hesitating for decreasing the speed to its limit. This paper proposes a circuit to indicate the over speed and to control the vehicle in the over speed condition. By using RFID the speed of the vehicle is monitored. The transmitter unit is fixed in the schools and the colleges. This will continuously transmit the signal and the vehicle will have the receiver. The receiver will receive the signal and decodes the signal and bring it to the original form. This is given to the microcontroller, which is a programmable IC. The microcontroller will indicate the over speed and the speed of the vehicle is automatically controlled by the microcontroller. Thus by controlling the speed of the vehicle automatically, the accidents occur in the school and the college zone will be greatly reduced.

Keywords : Microcontroller, Transmitter, Receiver, RFID, Liquid Crystal Display.

I. INTRODUCTION

The rate of accidents is increasing day by day in this fast moving world. Speed of vehicles should be controlled as much as possible. Lack of speed control and violating the road rules makes the route for most of the accidents. For this reason, different speed limits are put to decrease accidents. Unfortunately, drivers usually do not take these speed limits seriously and ignore them.

Proverb said that “Prevention Is Better Than Cure” in the aspect we have automatic over speed control system for the school and the college zone. Because where ever accident occurs it is based on two aspects. One is speed of the vehicles and the other is the driver mistakes. In this paper RFID sensor is used for controlling the vehicle in the school and the college zones.

II. METHODOLOGY

The voltage from the wall outlet (mains) to lower voltage is converted by using AC linear power supply. A rectifier is used to produce a DC voltage. The pulsating current is smoothened with the help of a capacitor. Some small periodic deviations from smooth direct current will remain, which is known as ripple. These pulsations occur at a frequency related to the AC power frequency. The output voltage can be set over a wide range with the help of adjustable linear power supplies. For example, a bench power supply used by circuit designers may be adjustable up to 30 volts and up to 5 amperes output. For applications requiring a pulsed output, it can be driven by an external signal.

When the AC is negative, a single diode can be used as a rectifier which produce half-wave varying DC which has gaps. The smoothing capacitor does not significantly discharge during the gaps, and it is hard to smooth this sufficiently well to supply electronic circuits unless they require a very small current.

A. Battery

The most basic individual component of a battery is the battery cells. The electrolyte and the lead plates can interact in a container. Each lead-acid cell fluctuates in voltage from about 2.12 Volts when full to about 1.75 volts when empty. Note the small voltage difference between a full and an empty cell can be considered for designing a circuit.

B. Characteristics

The lead acid batteries are generally too big and heavy for higher power applications with intermittent loads. These batteries have shorter cycle life and typical usable power down to only 50% Depth of Discharge. Despite these shortcomings Lead acid batteries are still being specified for PowerNet applications (36 Volts 2 kWh capacity) because of the cost, but this is probably the limit of their applicability and NiMH and Li-Ion batteries are making inroads into this market. For higher voltages and cyclic loads other technologies are being explored.

C. PIC Microcontroller

PIC microcontrollers have a set of registers that function as general purpose RAM. Special purpose control registers for on-chip hardware resources are also mapped into the data space. Depending on device series, the addressability of memory varies. All PIC devices have some banking mechanism to extend addressing to additional memory. Later series of devices feature move instructions which can cover the whole addressable space, independent of the selected bank. In earlier devices, accumulator act as a medium to transfer any data through any register. To transfer a data, indirect addressing, a "file select register" and "indirect register" are used. A register number is written to the FSR, after which reads from or writes to INDF will actually be to or from the register pointed to by FSR. The extension of this concept with post- and pre- increment/decrement for greater efficiency in accessing sequentially stored data is used in later devices. This also allows FSR to be treated almost like a stack pointer (SP). External data memory is not directly addressable except in some high pin count PIC18 devices.

D. Relay

A relay is an electrically operated switch and is used for switching purpose. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts.

The coil current can be on or off so relays have two switch positions and most have double throw (change over) switch contacts. A relatively large current is passed by the coil of a relay. It typically uses 30mA for a 12V relay, but it can be as much as 100mA for relays designed to operate from lower voltages. Most ICs cannot provide this current, the small IC current to the larger value required for the relay coil is amplified by using a transistor. The maximum output current for the popular 555 timer IC is 200mA. So these devices can supply relay coils directly without amplification. Relays are usually available as SPDT or DPDT but they can have many more sets of switch contacts, for example relays with 4 sets of changeover contacts are readily available.

The coil will be obvious and it may be connected either way round. Relay coils produce brief high voltage 'spikes' when they are switched off and this can destroy transistors and ICs in the circuit. To prevent damage you must connect a protection diode across the relay coil.

E. Liquid Crystal Display

A liquid crystal display (LCD) is an electronically-modulated optical device shaped into a thin, flat panel made up of any number of color or monochrome pixels filled with liquid crystals and arrayed in front of a light source (backlight) or reflector. The LCD uses very small amounts of electric power and is often utilized in battery-powered electronic devices. The materials used in LCD has the properties of both liquids and crystals. Instead of having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered from similar to a crystal.
The liquid crystal molecules would be aligned in a specific direction when sufficient voltage is applied to the electrodes. The polarizer in the LCD rotates the light rays passing through it. This would result in activating/highlighting the desired characters. The power supply should be of +5v, with maximum allowable transients of 10mv. The voltage (VL) at pin 3 should be adjusted properly to achieve a better/suitable contrast for the display. A module should not be removed from a live circuit.

F. Buzzer

This consists of a number of switches or sensors connected to a control unit The buzzer determines if and

which button was pushed or a preset time has lapsed and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong. The metal gong makes the ringing noise. Often these units were anchored to a wall or ceiling and used the ceiling or wall as a sounding board. Another implementation with some AC connected devices was to implement a circuit to make the AC current into a noise loud enough to drive a loudspeaker and hook this circuit up to a cheap 8-ohm speaker. A ceramic-based piezoelectric sounder like a Son alert is used nowadays and becomes most popular. The pitch of the sound or pulsed the sound on and off can be varied by hook up to the driver circuits.

III. III. CIRCUIT CONSTRUCTION

The circuit consists of a PIC16F877A, vehicle or robot, dc motor, to run the vehicle, RF transmitter, RF receiver, LCD to display the status of the vehicle speed. This circuit is mainly used to control the speed of moving vehicle according signal received by the receiver from transmitter. It uses RF technology to transmit and receive.

The arrival of the vehicle is continuously monitored. When a vehicle enters the school and college zone the RF signal will be detected by the receiver. The transmitter transmits the signal from the RF Transmitter, which was already placed in the zone. The signal received from the RF will be decoded by the microcontroller and it alert the driver. The alert signal will be displayed through a LCD screen. According to the signal received, the microcontroller controls the vehicle or DC motor speed after a few seconds from the time it receives the signal.

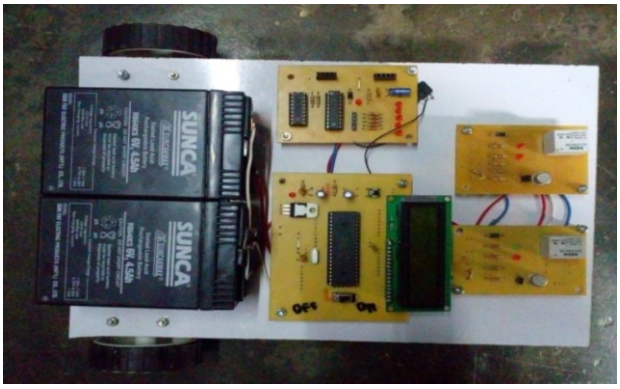

Figure 1: RF Receiver in vehicle

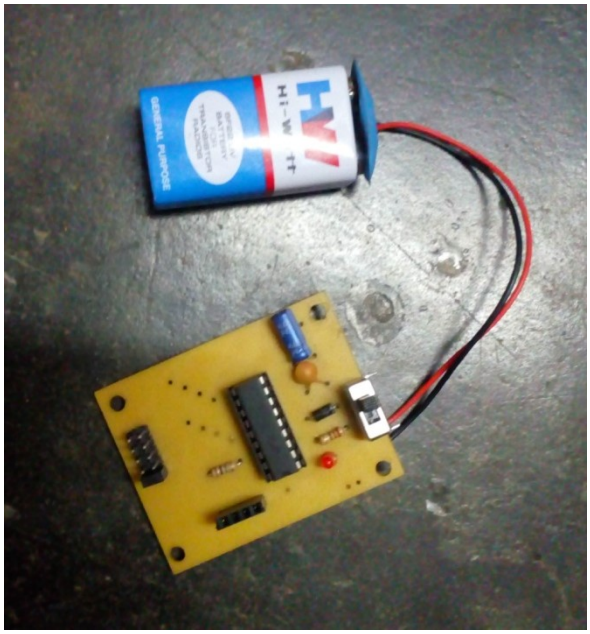

Figure 2: RF Transmitter in school zone

A. WORKING

RFID tag is a small device which stores and sends data to RFID reader. They are categorized into two types – active tag and passive tag. An internal battery is set in active tags and do not require power from the reader. Typically active tags have a longer distance range than passive tags. Passive tags are smaller and lighter in size than the active tags. An internal battery is not set in the passive tags. The passive tags depend on RFID reader for operating power and certainly have a low range limited up to few meters. The power and RF signals from the RFID reader are received by the antenna. The signal that is received is send to the chip. The chip receives those signals, computes them and sends back the data to the RFID reader.

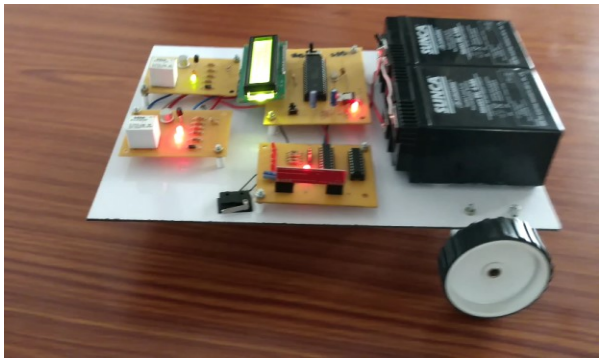

Figure 3: Vehicle Movement

These systems are used for tracking parts and working in process for reduction of defects, managing production of various versions and increasing output. The technology has also been useful in the closed looped supply chains for years. For tracking shipments among the supply chain allies more and more companies are turning to this technology. RFID also plays an important role in the access and security control and is used in many applications.

IV. ADVANTAGES AND APPLICATIONS

- It has excellent transmission process
- Cost is cheap and very easy to implement
- Covers maximum area
- More stuff can be added and implemented with other wireless technologies
- Used in automated systems for wireless control
- It can be used at heavy traffic areas
- Used in school zones and college zones
- It can be used in driving guidance systems and automatic navigation system

V. CONCLUSION

This paper explains the automatic vehicle over speed control based on the RFID technology. The RFID system alerts the driver about the speed limit zone. If the driver is inattentive the speed of the vehicle can be maintained in the limited speed without the intervention of the driver. This system is more useful for the society to prevent road accidents near school and college zones. It also reduces the traffic rule violations. This keeps the traffic clear and regularity. The main motive for designing this system is to avoid accidents and alert the drivers about speed limit for safe travelling. It is used to govern and regulate the speed of the vehicle in school and college zones. Accidents can be prevented which are caused by the careless activity of the driving or speed up of the driver. This work helps to save many valuable lives.

VI. FUTURE SCOPE

- Other additional new sensory system and sensory fusion is to be explored to plug additional information to the control system.
- This work can be expended to include different maneuvers to make the driving system capable of dealing with all driving environments.
- Future issues may also include an algorithm for autonomous formation of the corporative driving.

VII. REFERENCES

[1]. Amarnarayanan and Chella Saikumar, Automatic Over Speed Controlling of Vehicle, International Journal of Combined Research & Development (IJCRD) ISSN:2321-225X;pISSN:2321-2241 Volume: 5; Issue: 5; May -2016

[2]. Leena Thomas and Swetha Annu James, Automatic Speed Control of Vehicles Using RFID, International Journal of Engineering and Innovative Technology (IJEIT) Volume 3, Issue 11, May 2014

[3]. Vinod Kumar, Saketh Kumar and Anil Kumar, Smart Zone Based Vehicle Speed Control Using RF and Obstacle Detection and Accident Prevention, International Journal of Emerging Technology and Advanced Engineering , Volume 4, Issue 3, March 2014

[4]. K.Govindaraju and Boopathy, Embedded Based Vehicle Speed Control System Using Wireless Technology, International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering Vol. 2, Issue 8, August 2014

[5]. Dr. R. Prema, K. Subramanian, Mr. B. Senthilvel, ”Automatic Aircraft Parking Systems”, International Journal of Scientific Research in Science and Technology, vol.3(3), pp.358-361, Apr. 2017.