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Automatic Override of speed and brake control and ABS System

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Abstract: **In nearby period, in school areas speed breakers are provided to reduce the speed of vehicles, but the drivers do this manually. This process can be automated by means of RF communication. That is to say that each vehicle should be equipped with a RF receiver circuit that reduces the speed automatically on entering the RF communicated area. A RF transmitter, kept where the speed breakers are to be installed, transmits a digital code. This code is decoded by the receiver circuit in the vehicle, which controls the activities of a carburetor to bring down the speed of the vehicle.**
The circuit devised has hardware for microcontroller to microcontroller data communication using 433.92 MHZ TX/RX modules. The receiver section microcontroller receives the data and brings down the speed of the motor of the vehicle model by pulse width modulation program in it.

Keywords: **Microcontroller, Encoder, Decoder, Relay driver IC.**

I. INTRODUCTION

Road transport is important mode of transport in India as well as over the land. India has large network of road throughout the country. As far as commuting accidents is concerned, India faces the highest number of accidents and accidental fatalities in the world. Ministry of Road Transport & Highways report reveals that India witnessed one road accident every minute in the year 2011 which claimed one life in 3 minutes. A total of 497,000 road accidents were reported in the year 2011 in India which was less than the number of accidents reported in 2010. However, the number of deaths at 1,42,485 recorded an increase of nearly 7, 000 deaths in 2011 from 2010. Contrary to the popular belief, only 1.5% of the accidents are caused by defective roads. In majority of the cases (77%), driver is at fault. This become more dangerous in populated regions like schools or hospitals.

In school areas speed breakers are provided to reduce the speed of vehicles, but the drivers do this manually. Many times due to driver's fault speed is not controlled. This process can be automated by means of RF communication i.e. speed is controlled automatically.

The objectives of the project are given below:

1. Controlling of the speed of vehicles.
2. Prevention of accident
3. The unnecessary speed brake made in the road is avoided.
4. Regulation of the traffic in the road.
5. Horn prohibited in silence zone

BLOCK DIAGRAMS:

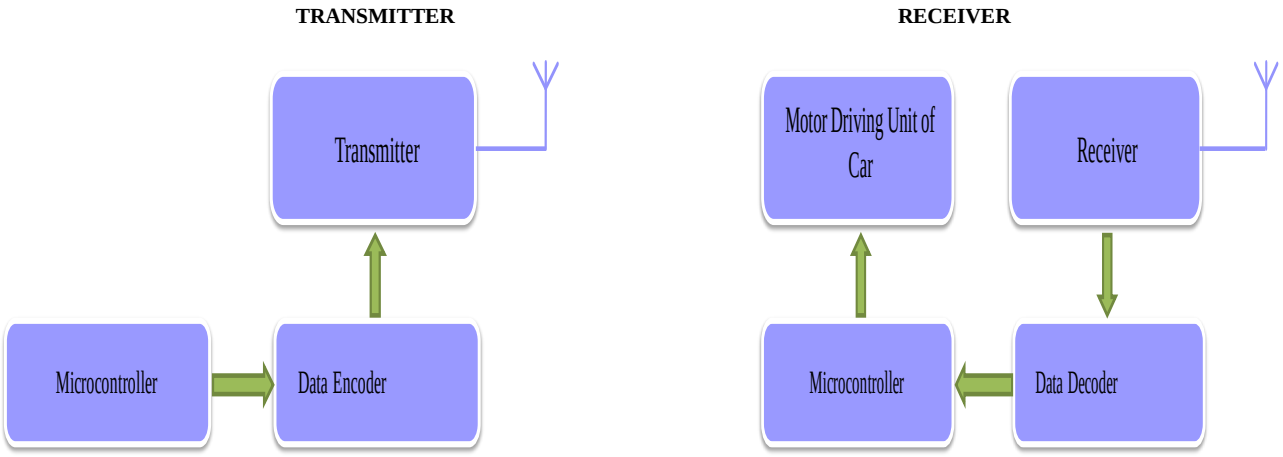


Fig. 1 Block diagram explaining working of the project

II. DESIGN

Hardware:

Transmitter circuit consist of following components: Encoder, Transmitter, Voltage supply, Switches For transmitter section, the different commands signals are transmitted via RF transmitter module of 433 MHz. it has 4 pins of antenna, Vcc, Gnd, & serial data input.

The receiver circuit installed to vehicles permanently through manufactures, which is, consists of the following section Receiver module, Decoder module, Microcontroller section, Relay driver IC, Driver section, Voice module, Vehicle controlling section, LCD Display.

Software:

The main processing of the data is done by themicrocontroller AT89S51 processor IC.The AT89S51 is a low-power, high-performance CMOS 8-bit microcontroller with 4K bytes of In System Programmable Flash memory.BASCOM-8051© is the Windows BASIC COMPILER for the 8051 family. It is designed to run on W95/W98/NT/W2000 and XP. All programming needed for microcontroller is done with BASCOM-8051.

III. PRINCIPLE OF OPERATION

Description This radio frequency (RF) transmission system employs Amplitude Shift Keying (ASK) with transmitter/receiver (Tx/Rx) pair operating at 434 MHz. The transmitter module takes serial input and transmits these signals through RF. The transmitted signals are received by the receiver module placed away from the source of transmission. The system allows one way communication between two nodes, namely, transmission and reception. The RF module has been used in conjunction with a set of four channel encoder/decoder ICs. Here HT12E & HT12D have been used as encoder and decoder respectively. The encoder converts the parallel inputs (from the remote switches) into serial set of signals. These signals are serially transferred through RF to the reception point. The decoder is used after the RF receiver to decode the serial format and retrieve the original signals as outputs. These outputs can be observed on corresponding LEDs.

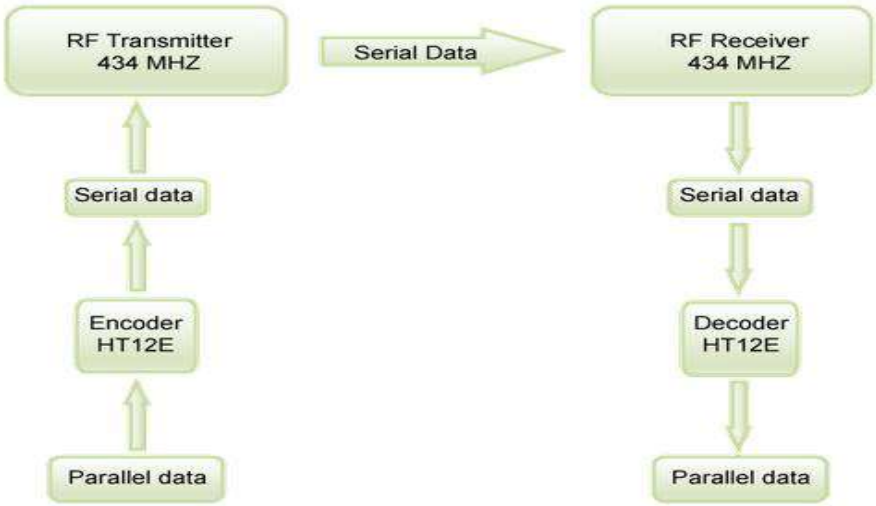
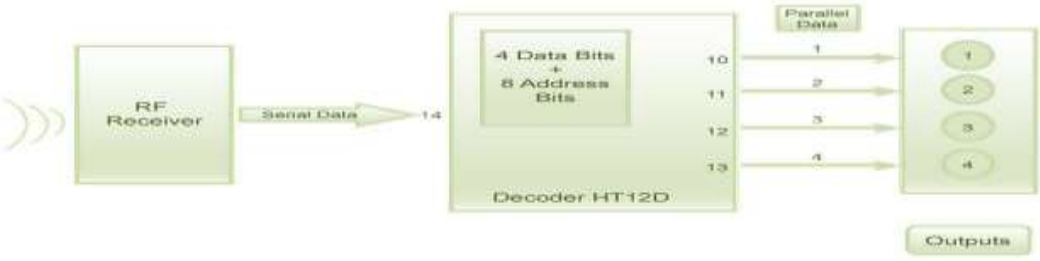


Fig 2: Principle of operation

Encoder IC (HT12E) receives parallel data in the form of address bits and control bits. The control signals from remote switches along with 8 address bits constitute a set of 12 parallel signals. The encoder HT12E encodes these parallel signals into serial bits. Transmission is enabled by providing ground to pin14 which is active low. The control signals are given at pins 10-13 of HT12E. The serial data is fed to the RF transmitter through pin 17 of HT12E.

Transmitter, upon receiving serial data from encoder IC (HT12E), transmits it wirelessly to the RF receiver. The receiver, upon receiving these signals, sends them to the decoder IC (HT12D) through pin2. The serial data is received at the data pin (DIN, pin14) of HT12D. The decoder then retrieves the original parallel format from the received serial data.

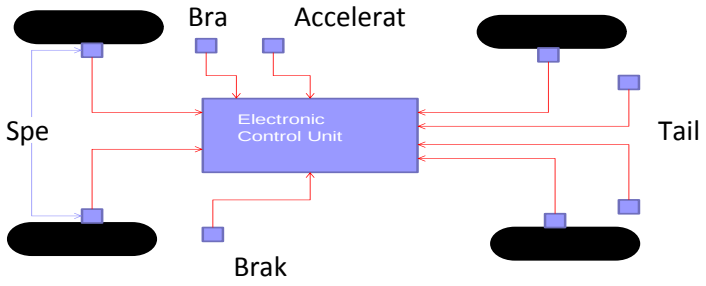


When no signal is received at data pin of HT12D, it remains in standby mode and consumes very less current (less than 1μA) for a voltage of 5V. When signal is received by receiver, it is given to DIN pin (pin14) of HT12D. On reception of signal, oscillator of HT12D gets activated. IC HT12D then decodes the serial data and checks the address bits three times. If these bits match with the local address pins (pins 1-8) of HT12D, then it puts the data bits on its data pins (pins 10-13) and makes the VT pin high. An LED is connected to VT pin (pin17) of the decoder. This LED works as an indicator to indicate a valid transmission. The corresponding output is thus generated at the data pins of decoder IC. A signal is sent by lowering any or all the pins 10-13 of HT12E and corresponding signal is received at receiver's end (at HT12D). Address bits are configured by using the by using the first 8 pins of both encoder and decoder ICs. To send a particular

signal, address bits must be same at encoder and decoder ICs. By configuring the address bits properly, a single RF transmitter can also be used to control different RF receivers of same frequency.

To summarize, on each transmission, 12 bits of data is transmitted consisting of 8 address bits and 4 data bits. The signal is received at receiver's end which is then fed into decoder IC. If address bits get matched, decoder converts it into parallel data and the corresponding data bits get lowered which could be then used to drive the LEDs. The outputs from this system can either be used in negative logic or NOT gates (like 74LS04) can be incorporated at data pins.

How ECU Unit works in ABS?



Most engine systems have idle speed control built into the ECU. The engine RPM is monitored by the crankshaft position sensor which plays a primary role in the engine timing functions for fuel injection, spark events, and valve timing. Idle speed is controlled by a programmable throttle stop or an idle air bypass control stepper motor. Early carburetor based systems used a programmable throttle stop using a bidirectional DC motor. Early TBI systems used an idle air control stepper motor. Effective idle speed control must anticipate the engine load at idle. Changes in this idle load may come from HVAC systems, power steering systems, power brake systems, and electrical charging and supply systems. Engine temperature and transmission status, and lift and duration of camshaft also may change the engine load and/or the idle speed value desired.

A full authority throttle control system may be used to control idle speed, provide cruise control functions and top speed limitation.

IV. ALGORITHM

Step 1: Speed of vehicle is monitored and sensed by sensors

Step2: It is checked whether vehicle is in speed limit zone or not.

Step 3: It is checked whether vehicle speed is less than safe speed.

Step 4: ABS system is activated and vehicle speed is reduced

Step 5: Then, It is checked whether vehicle is still in prohibited zone and speed lock is removed.

V. CONCLUSION

The automatic speed breaker control system at vehicles which uses a advance features of micro controllers together with radio frequency generator, IVRS, encoder as well as decoder proves to be effective in achieving objective.

Saving human life, protection against accident and communicable mechanical system are the silent feature and these added the advantage of this project .It is cost effective.

It is applicable at every speed-prohibited area like schools, hospitals etc and uninterruptible service to the vehicles.

ACKNOWLEDGEMENT

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