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# Intelligent Vehicle Speed Checker on Highway with Over Speed Alert & Pollution Monitoring

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**ABSTRACT:** From the advent of increased transportation, over speeding of vehicles has become one of the major causes for accidents and killing many lives. This project presents a system, developed for over-speed detection of the vehicle or human beings and alert corresponding persons by giving buzzer automatically and also sends messages to the traffic control station. Presently, RADAR gun or LIDARS are extensively used for over speed detection but it requires a person to pull the trigger for detecting the speed. In this work it has been proved that automation provides better performance than a human handled system. Simultaneously system is capable to detect audio violation by audio level measurement circuit and co, co2 pollution by the vehicle.

## I. INTRODUCTION

We all know that over speed is the major cause for road accidents. In this busy life schedule, people always prefer to drive at very high speed rather than low speed to reach their respective places in time. Thus, it is necessary to understand the need of a technology which would be used as a speed limit enforcement system. A system which helps to limit the speed of the vehicles and the owner would be punished under the law due to over speed and this is the best method for making people to drive at normal designated speeds. In some places, traffic policemen are there to monitor to proper functioning of traffic on roads and at some places, traffic places RADAR system is used and this is a technology which is based on the Doppler Effect and with just one trigger it can determines the speed of the vehicles. Every system whether it is a RADAR or any other it manually requires a human to take for watching the vehicles passing by and to report if any vehicle breaks the law or over speeds.

Every system uses advancements technology to prioritize the automation over human handled machines. So, the traffic monitoring system should also be made as automatic which is possible in many ways. This paper is an idea of one of such system. The project is developed by keeping in view all the disadvantages mentioned above and is named as Speed Check and over speed detector. This system mainly focuses on calculating the speed of approaching vehicle that over speeds. The literature related work to the automatic speed detection systems is presented in section 2. Implementation details of the proposed system are in Section 3.

### 1.2. LITERATURE REVIEW

**Vehicle detectors could be categorized into two types:** Software based detectors - install cameras, take videos of traffic, detect vehicles, speed, count with sophisticated image processing techniques, MATLAB programming etc

A real time locating system automatically tracks and localizes people and objects. Muhammad Saqib et al, [1]

propose a model for the speed monitoring of vehicles using wireless sensor network-based on real-time localization. The model is based on symmetric double sided two way ranging algorithm which has the ability to zeros out the effect of clock drifts between transmitter and receiver.

J .Peleg et al, [2] made a new simple circuit to detect the magnetic perturbation caused by the cars with two GMR

Magnetic Field Gradient Sensors located on the pavement of a high-way or fast road without wires. When a car passes above the board, a Microcontroller processes the signal of sensors to obtain the speed and length of the car in real time. Hameed Hamada and Marathi [3] gives a new idea of speed detection devices with using the LASER

beams. The designed system has the ability to detect the speed of the vehicle in the roads and the main highways and the places where the drivers can use of more speed while driving. The designed LADAR system is more reliable and results accurate.

[4] research intends to develop the vehicle speed detection system using image processing technique Overall works are the software development of a system that requires a video scene, which consists of the following components: moving vehicle, starting reference point and ending reference point. The Suresh Babu Chungalasetty et al. / International Journal on Computer Science and Engineering (IJCSSE) ISSN system is designed to detect the position of the moving vehicle in the scene and the position of the reference points and calculate the speed of each static image frame from the detected positions. The vehicle speed detection from a video frame system consists of six major components.

A MATLAB algorithm is proposed by Ranjit et al, [5] and developed to associate the developed algorithm with real-time video sequence and images. Development of vehicle speed detection algorithm is based on the vector-valued function and motion vector technique that estimates the velocity of moving vehicle Naveen Chintalacheruvu.

Venkatesan Muthukumar [6] proposes an efficient video based vehicle detection system based on Harris-Stephen corner detector algorithm. The algorithm was used to develop a standalone vehicle detection and tracking system that determines vehicle counts and speeds at arterial road- ways and freeways.

The proposed video based vehicle detection system was developed to eliminate the need of complex calibration, robustness to contrasts variations, and better performance with low resolutions videos.

## II. PROPOSED SYSTEM

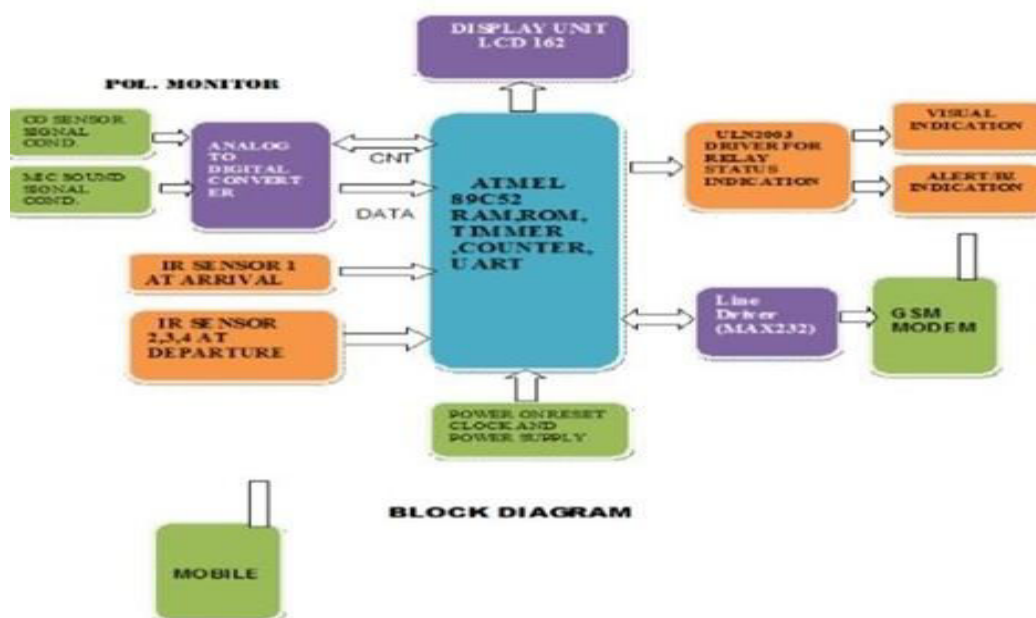


Fig -1: Block Diagram

This is one of the main parts of our project. The main intention of this block is to sense the vehicle entry and exit from sensor on highway. For sensing the vehicle we are using the IR light LED and IR detector sensor. By using this sensor and its related circuit diagram we can count the speed of vehicle.

Power supply:

As we are using 89S51 microcontroller its need 5v regulated power supply. Buffer, op amp Ic also needs dual power supply but the relay is of 12V hence unregulated power supply is given to relay circuit.

Relay driver circuit:

To operate the lamp load such as on/off relay is used of 12V/SPDT type. Relay coil is energized from transistor to provide sufficient current to turn on relay. Freewheeling diode and proper indicator is also connected in parallel with coil.

Microcontroller :

Heart of the project is microcontroller 89S52 which is interfaced as shown in circuit diagram. Software is developed using kiel4 compiler. Hex code of program is dumped in flash rom using topwin6 programmer.

### 1. Microcontroller 89S52:

It is a low-power, high performance CMOS 8-bit microcontroller with 8KB of Flash Programmable and Erasable Read Only Memory (PEROM). THE device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the MCS-51T instruction set and pin out. The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89c51 is a powerful.



Fig -2: Microcontroller 89S52

### 2. Features:

- 80C51 central Processing Unit
- On-Chip flash Program Memory with in System Programming (ISP) and Application Programming (IAP) capability
- Boot ROM contains low level Flash programming routines for down loading via the UART
- Can be programmed by the end- user application (IAP)
- Parallel programming with 87S51 compatible hardware interface to programmer
- Supports 6 clock/12 clock mode via parallel programmer ( default clock mode alter Chip Erase in 12 clock )
- 6clock / 12 clock mode Flash bit erasable and programmable via ISP



- 6 clock /12clock mode programmable “on the fly” by SFR bit
- peripherals (PCA, TIMERS , UART) may use either 6clock or 12 clock mode while the CPU is in 6 clock mode

### 3. Visual & Audio alert relay control section

We will operate relay on safety side of requirement for high speed detection. One relay is used to turn for siren and another for visual indication.

A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.



Fig -4 Relay

A relay is an electrically operated switch. 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 (changeover) switch contacts as shown in the diagram.

#### 2.4 ADC 0809:

ADC is used to measure the temp of coal mine. All the analog parameters are applied to 8 bit multi channel ADC. The data lines of ADC are connected to port2 of the micro controller. ADC is working in a free mode as output is always in enable condition to monitor the different parameter from the signal conditioner block of the system. The appropriate address and control signals to the ADC are as shown in fig. The channel address selection is given using P3.6 and P3.7 lines.

The ADC0808 data acquisition component is a monolithic CMOS device with an 8 bit analog to digital converter. 8-Bit A/D converter uses successive approximation as the conversion technique. The converter features a high impedance chopper stabilized comparator. A 256R voltage divider with analog switch free and a successive approximation register. The 8- channel multiplexer can directly and microprocessor compatible control logic. The 8-channel multiplexer can directly access any of single ended analog signals.

The device eliminates the need for external zero and full scale adjustments. Easy interfacing to microprocessors is provided by the latched and decoded multiplexer address inputs and latched TTL TRI STATE outputs. measurement. Among the various gas sensors available in the market semiconductor sensors are considered to have fast response, high stability, low cost, long life, low dependency on humidity, low power consumption, and compact size etc. The semiconductor sensor consists of one or more metal oxides such as tin oxide, aluminum oxide etc. When heated to a high temperature an N-type semiconducting material decreases its resistance while P-type increases its resistance in the presence of *Sensors*

The design of the ADC 0808 has been optimized by incorporating the most desirable aspects of several A/D conversion techniques. The ADC0808 offers high speed, high accuracy, and minimal temperature dependence. Excellent long term accuracy and repeatability, and consumes minimal power. These features make this device ideally suited to applications from process and machine control to consumer and automotive applications. For 16-channel multiplexer with common output (sample / hold port).

## 6. GSM:



**Fig -6:** Measurement of CO :(MQ-3)

Features:-

1. Easy interface to all microprocessors.
2. Operates ratio metrically or with 5VDC or analog span adjusted voltage reference.
3. No zero or full scale adjust required
4. 8-channel multiplexer with address logic.
5. 0V t 0 5v input range with signal 5v power supply
6. Outputs meet TTL voltage level specification.
7. Standard hermetic or molded 28 – pin DIP package.
8. Pin molded chip carrier package.



Fig -7: GSM

## 2.7 BUZZER:

A buzzer or beeper is an audio signal device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. If embedded system is misplaced from dashboard, the IR sensor becomes active. The signal is sent to microcontroller to ring the buzzer. It is connected to the pin no.28 of microcontroller.



Fig -8: Buzzer

## III. CONCLUSIONS

In this project we will achieve automatic system for parameter measurement, sun tracking & dust cleaning to reduce human efforts. In case of any failure in the system we will come to know within short time due to remotely acquire parameters. The efficiency of the system will increase due to automatic



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12. microcontroller msp430 family, designed by CDAC for IIT Bombay in 2003.





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