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# Relative Wireless Rash Driving Detection System

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***Abstract*—The main aim of this project is to implement a rash-driving-detection system in cities that alerts traffic control authorities wirelessly in case of speed violation by any vehicle. Nowadays, accidents are taking place frequently in the cities due to over speeding of vehicles resulting in many casualties. In the current systems, to detect rash driving, policemen use a handheld radar gun to record vehicle speed. Our proposed system fulfills that requirement through wireless mechanism as it consists of two blocks: transmitter and receiver; both use a microcontroller of the 8051 family and a rectified-power supply. This project consists of an RF transceiver module operating at 2.4 GHz. Relative Rash driving is detected by the sensor which is interfaced to the microcontroller at the transmitting end and by using the appropriate control signals and equipments, the traffic authorities are notified.**

***Keywords*—Rash-driving-detection,Wireless,Speed,violation,microcontroller,sens**

## I. INTRODUCTION

A system designed to record and report on discrete activities within a process is called as Tracking System. In the same procedure we have developed a methodology of vehicle speed & direction system for robotics to control and achieve accurate direction speed for a class of non-linear systems in the presence of disturbances and parameter variations by using wireless communication technique. While driving on highways, motorists should not exceed the maximum speed limit permitted for their vehicle. However, accidents keep occurring due to speed violations since the drivers tend to ignore their speedometers. This speed checker will come handy for the highway traffic police as it will not only provide a digital display in accordance with a vehicle's speed but sound an alarm if the vehicle exceeds the permissible speed for the highway. The system basically comprises two IR LEDs' Transmitter & receiver sensor pairs, which are installed on the highway,with the transmitter and the receiver of each pair on the opposite sides of the road. The distance between the IR sensors is fixed. The system displays the time taken by the vehicle in crossing the fixed distance from one pair to the other.Subsequently the speed of set of vehicles is considered and the Average can be estimated. The main theme of our system is the Average calculation of the traffic. This will be set as reference value or threshold value for further vehicles to detect rash driving. Microcontroller 8051 is the heart of the system, which controls all the functions of the circuit. It measures the speed and controls the circuit through a programming flashed inside 8051. IR sensors are used as a pair of eye that keep watching the speed of each vehicle crossing the sensors. A seven segment display is used to display the total speed of the vehicle.

## II. WORKING PRINCIPLE

### *A.The Operating Cycle*

In this project we use IR sensors to detect the presence of a vehicle. According to this project, 2 IR sensors are placed apart with a fixed known distance. Whenever IR rays are interrupted by a vehicle during first sensor the count up timer is started. When the other IR sensor senses the presence of vehicle, the count up timer is stopped. As the distance and time the IR receiver receives the IR signals is noted by microcontroller and from that we need to calculate speed. Here speed is calculated from the well-known formula of speed which is distance/time. The LCD display is used to display the speed of the vehicle. The microcontroller is used to monitor the all control operations needed for the project.

### *B.Power System Employed for the Circuit*

The 8051 microcontroller works on +5V DC. Now here we have 220V AC as the input. So first of all, we need to step down the voltage using transformer. Here the transformer will step down the 220V AC to 9V AC at 50Hz. To convert AC to DC, a bridge rectifier is placed using 1N4007, a p-n diode. Two capacitor of 470µF & .01µF is used as a filter. Now, this DC output is fed to a 7805 voltage regulator which will convert the DC input into +5V DC. Maintaining the Integrity of the Specifications.

### C.Working IC configuration

8051 block consist of the P89V51RD2 microcontroller. It will run on the frequency of about 11.0592 MHz. 8051 is the brain of the system. All the components will drive by the instructions provided by the microcontroller through a programming code burn inside the 8051

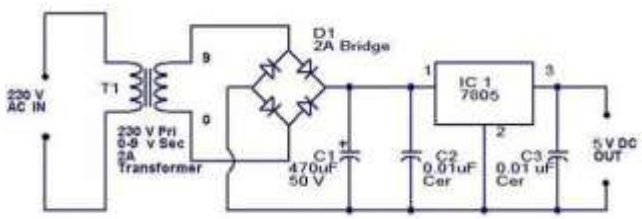


Fig.1:Power System Circuit

## III. DESIGN AND DEVELOPMENT

### *A.Module Designed*

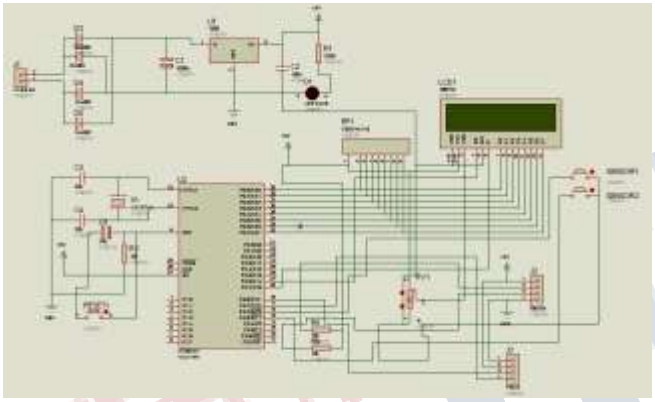

Fig 2.Circuit Configuration for the proposed model

The Integrated circuit model has individual pin configuration works and has a employed module of working The P89V51RD2 is an 8051 microcontroller with 64 kB Flash and 1024 bytes of data RAM.P0.0 to P0.7 - Port 0 is an 8-bit open drain bidirectional I/O port. Port 0 pins that have '1's written to them float, and in this state can be used as high-impedance inputs. Port 0 is also the multiplexed low-order address and data bus during accesses to external code and data memory. In this application, it uses strong internal pull-ups when transitioning to '1's. Port 0 also receives the code bytes during the external host mode programming, and outputs the code bytes during the external host mode verification. External pull-ups are required during program verification or as a general purpose I/O port.P1.0 to P1.7 - Port 1 is an 8-bit bidirectional I/O port with internal pull-ups. The Port 1 pins are pulled high by the internal pull-ups when '1's are written to them and can be used as inputs in this state. As inputs, Port 1 pins that are externally pulled LOW will source current (IIL) because of the internal pull-ups. P1.5, P1.6, P1.7 have high current drive of 16 mA. Port 1 also receives the low-order address bytes during the external host mode programming and verification. P2.0 to P2.7 -Port 2: Port 2 is an 8-bit bidirectional I/O port with internal pull-ups. Port 2 pins are pulled HIGH by the internal pull-ups when '1's are written to them and can be used as inputs in this state. As inputs, Port 2 pins that are externally pulled LOW will source current (IIL) because of the internal pull-ups. Port 2 sends the high-order address byte during fetches from external program memory and during accesses to external Data Memory that use 16-bitaddress (MOVX@DPTR). In this application, it uses strong internal pull-ups when transitioning to '1's. Port 2 also receives some control signals and a partial of high-order address bits during the external host mode programming and verification.P3.0 to P3.7 -Port 3: Port 3 is an 8-bit bidirectional I/O port with internal pull-ups. Port 3 pins are pulled HIGH by the internal pull-ups when '1's are written to them and can be used as inputs in this state. As inputs, Port 3 pins that are externally pulled LOW will source current (IIL) because of the internal pull-ups. Port 3 also receives some control signals and a partial of high-order address bits during the external host mode programming and verification. PSEN - Program Store Enable (PSEN) is the read strobe for external program memory. When the device is executing from internal program memory, PSEN is inactive (HIGH).When the device is executing code from external program memory, PSEN is activated twice each machine cycle, except that two PSEN activations are skipped during each access to external data memory. A forced HIGH-to-LOW input transition on the PSEN pin while the RST input is continually held HIGH for more than 10 machine cycles will cause the device to enter external host mode programming. While the oscillator is running, a HIGH logic state on this pin for two machine cycles will reset the device. If the PSEN pin is driven by a HIGH-to-LOW input transition while the RST input pin is held HIGH, the device will enter the external host mode; otherwise the device will enter the normal operation mode. External Access Enable: EA must be connected to VSS in order to enable the device to fetch code from the external program memory. EA must be strapped to VDD for internal program execution. The EA pin can tolerate a high voltage of 12 V.Address Latch Enable(ALE) is the output signal for latching the low byte of the address during an access to external memory.

### *B.Components Employed*

LCD-Liquid Crystal Display screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi

segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a LCD.

IR LED-Here the IR transmitter is nothing but the IR LED. It just looks like a normal LED but transmits the IR signals. Since the IR rays are out of the visible range we cannot observe the rays from the transmitter. These are infrared LEDs; the light output is not visible by our eyes. They can be used as replacement LEDs for remote controls, night vision for camcorders, invisible beam sensors, etc.

LED -A light-emitting diode (LED) is a semiconductor light source. LEDs are used as indicator lamps in many devices and are increasingly used for other lighting. Appearing as practical electronic components in 1962, early LEDs emitted low-intensity red light, but modern versions are available across the visible, ultraviolet, and infrared wavelengths, with very high brightness. When a light-emitting diode is forward-biased (switched on), electrons are able to recombine with electron holes within the device, releasing energy in the form of photons. This effect is called electroluminescence and the color of the lightis determined by the energy gap of the semiconductor.

PRESET-A preset is a three legged electronic component which can be made to offer varying resistance in a circuit. The resistance is varied by adjusting the rotary control over it. The adjustment can be done by using a small screw driver or a similar tool. The resistance does not vary linearly but rather varies in exponential or logarithmic manner. Such variable resistors are commonly used for adjusting sensitivity along with a sensor. The variable resistance is obtained across the single terminal at front and one of the two other terminals. The two legs at back offer fixed resistance which is divided by the front leg. So whenever only the back terminals are used, a preset acts as a fixed resistor. Presets are specified by their fixed value resistance.

### *C.Software Organization*

This section presents the overall software structure, the variables and the Interrupt SubRoutine flowcharts. This software is based on two modules: the initialization and the runmodule. The first one is performed only once at the beginning. The second module is theBLDC control dedicated software. It is based on a waiting loop interrupted by both the PWM Unit and the ADC Unit. The waiting loop can easily be replaced by a user'sinterface (to get the reference speed and/or to monitor the control variables). Theoverview of this software is given in the flow chart below in fig 3.This gives a complete overview of what actually are the various software links employed in reality. The flow will also depict the workingness of the system as an perspective of its countable loops in the process of detection of vehicles in the case of high speed ways.

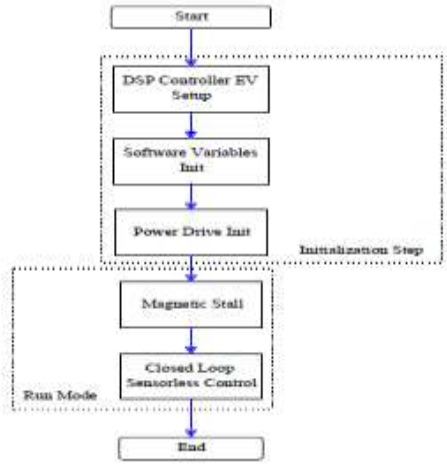


Fig.3: Software loop employed for design.

## IV. TESTING AND ISSUES

### *A. Testing Procedure*

First of all we do the continuity test to check whether there is any short circuit or not in our PCB. We don't apply the power supply to our circuit before testing, without power supply testing is called COLD Testing. We test all the components used in our project. A brief description is given below about testing procedure. In electronics, a continuity test is the checking of an electric circuit to see if current flows (that it is in fact a complete circuit). A continuity test is performed by placing a small voltage (wired in series with an LED or noise-producing component such as a piezoelectric speaker) across the chosen path. If electron flow is inhibited by broken conductors, damaged components, or excessive resistance, the circuit is "open". Devices that can be used to perform

continuity tests include multi meters which measure current and specialized continuity testers which are cheaper, more basic devices, generally with a simple light bulb that lights up when current flows. Making sure something is not connected. Sometimes a solder joint will short two connections. Or maybe your PCB has mistaken on it and some traces were shorted by accident.

This meter is very simple. When the probes are not touching, the display shows "1". When you touch the tips together, the display changes to a three digit mode (it's displaying resistance, which we will cover later) It also emits a beep. Set your meter to the continuity/diode "bleep" test. Connect the red meter lead to the base of the transistor. Connect the black meter lead to the emitter. A good NPN transistor will read a junction drop voltage of between 0.45v and 0.9v. A good PNP transistor will read "OL". Leave the red meter lead on the base and move the black lead to the collector. The reading should be the same as the previous test. Reverse the meter leads in your hands and repeat the test. Now connect the black meter lead to the base of the transistor. Connect the red meter lead to the emitter. A good PNP transistor will read a junction drop voltage of between 0.45v and 0.9v. A good NPN transistor will read "OL". Leave the black meter lead on the base and move the red lead to the collector. The reading should be the same as the previous test. Finally place one meter lead on the collector, the other on the emitter. The meter should read "OL". Reverse your meter leads. The meter should read "OL". This is the same for both NPN and PNP transistors. With the transistors on a PCB in circuit, you may not get an accurate reading, as other things in the circuit may affect it, so if you think a transistor is suspect from the readings you have got, remove it from the PCB and test it out of circuit, repeating the above procedure.

***B. Issues***

Testing of electronic components or circuit is a very interesting work. In our project we have not faced any serious problem. By testing we got a shorted path in our circuit on PCB and there are 3-4 tracks which were broken during the etching process. We joined these tracks by tuning. The initial problem was soldering, it was not easy to solder the components on the PCB.

## V. RESULTS & CONCLUSION

The model of "Relative wireless rash driving detection system" has been successfully designed and tested. It has been developed by integrating features of all the hardware components used. Presence of every module has been reasoned out and placed carefully thus contributing to the best working of the unit at the minimum time loss. Secondly, using highly advanced IC's and with the help of growing technology the project has been successfully implemented. Finally we conclude that "Relative wireless rash driving detection system" is an emerging field and there is a huge scope for research and development. It can be further advanced by using a CCTV camera in the circuit. Whenever any vehicle crosses speed limit, camera captures the image of number plate and through transport database finds the address of the owner and is fined.

## REFERENCES

[1]Zutao Zhang, Jiashu Zhang, ―A Novel Vehicle Safety Model: Vehicle speed Controller under Driver Fatigue‖, IJCSNS International Journal of Computer Science and Network Security‖, VOL.9 No.1, January 2009

[2] M. Bertozzi, A. Broggi, M. Cellario, A. Fascioli, P. Lombardi, and M.Porta, ―Artifical vision in road vehicles,‖ Proceedings of the IEEE, vol.90,no. 7, pp. 1258–1271, 2002.

[3] S. Tsugawa and Sadayuki, ―Vision-based vehicle on japan: Machine vision systems and driving control systems,‖ IEEE Trans.on Ind. El.???, vol.41, no. 4, pp. 398–405, 1994.

[4] Vehicle-highway automation activities in the United States. U.S.Dept of Transportation, 1997.

[5] C. Thorpe, J.D. Carlson, D. Duggins, J. Gowdy, R. MacLachlan, C. Mertz,A. Suppe, and C. Wan, ―Safe robot driving in cluttered environments,‖ 11th International Symposium of Robotics Research,2003.

[6] Qian Martin Eriksson, Nikolaos P. Papanikolopoulos, Eye-Tracking for Detection of Driver fatigue. Proceedings of the international Conference on intelligent Transportation System,Boston, MA, November 1997, pp.314-319.

[7] Qiang Ji, Zhiwei Zhu, and Peilin Lan, Real-Time Nonintrusive Monitoring and Prediction of Driver Fatigue. IEEE Transactions on Vehicular Technology, VOL. 53, NO.4, July2004,pp.1052-1068.