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IJIEMR Transactions, online available on 30th Jul 2022. Link :http://www.ijiemr.org/downloads.php?vol=Volume-11&issue= Spl Issue 06

DOI: 10.48047/IJIEMR/V11/SPL ISSUE 06/15

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Volume 11, SPL ISSUE 06, Pages: 68-72

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INTELLIGENT SAFETY CONTROL FOR AUTOMOTIVE SYSTEMS

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Abstract: According to a survey done by W.H.O almost every 90 seconds, a person is injured in a drunken driving crash. One in three people will be involved in an alcohol- related crash in their lifetime. The main Aim of this project is to develop a system that can detect the alcohol content in the air exhaled by the driver and automatically turn off the car, if Alcohol percentage exceeds the limit. In this project I am using 8052 family micro controllers. In this we are going to embed the program to receive data from alcohol sensor, convert it into digital form and then control the ignition system.

Keywords: 8051 Microcontroller, MQ-3 sensor, Ignition key, Buzzer, Motor.

I.INTRODUCTION

In Present days, Road accidents kill 382 in India every single day. India's daily death index due to road accidents especially two wheelers is more than four times the annual death toll from terrorism.Predictably, most of those who die on the roads perish because of preventable causes: speeding, drink driving and driving without a helmet [8]. In America on average, nearly 12,000 people die every year in DUI-related accidents. 90,000 are arrested each year for DUI/DWI and a full 1/3 of those are repeat offenders. Because of drunk and drive the people are highly injured o sometimes dead. This is killing not only the driver but also the co-passengers travelling on the road at the same time[9].

Here in this project, we are going to turn off the ignition system, by doing so we can stop the car and prevent accidents that can occur due to drunk and drive. Here we can use trials relays to control ignition system. The project was implemented with a focus on people safety. The system will take the advantage of a pre-existing Alcohol sensor. In fact, the project is intended for granting a base start for further explorations in the future. Roads safety has always been in the center of attention [10].

II.HARDWARE

A. Micro Controller

This segment shapes the control unit of the entire undertaking. This area fundamentally comprises of a Microcontroller with its related hardware like Crystal with capacitors, Reset hardware, Pull up resistors (if necessary) et cetera. The Microcontroller shapes the heart of the task since it controls the gadgets being interfaced and speaks with the gadgets as per the system being composed [11].

B. AT89S52

The AT89S52 is a low-control, elite CMOS 8-bit microcontroller with 8K bytes of in-framework programmable Flash memory. The on-chip Flash permits the project memory to be reinvented in- framework or by a customary nonvolatile memory software engineer. By joining an adaptable 8-bit CPU with in-framework programmable Flash on a solid chip, the Atmel AT89S52 is a capable[12] microcontroller which gives a very adaptable and financially savvy answer for some implanted control applications. The prime use of a microcontroller is to control the operation of a machine using a fixed program that is stored in ROM and that does not change over the lifetime of the system. The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory.

The AT89S52 gives the accompanying standard components: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, two information pointers, three 16-bit clock/counters, a six-vector two-level interfere with design, a full duplex serial port, on-chip oscillator and clock hardware [13].

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C. Alcohol Sensor

Sensitive material of MQ-3 gas sensor is SnO2, which with lower conductivity in clean air. When the target alcohol gas exist, the sensor's conductivity is more higher along with the gas concentration rising. So we used a simple electro circuit, which converts the change of conductivity to correspond output signal of gas concentration. MQ-3 gas sensor has high sensitivity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. The sensor could be used to detect alcohol with different concentrations, and it is of low cost and can be used for the different applications [14].

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple, all it needs is one resistor. A simple interface could be a 0-3.3V ADC.

This sensor provides an analog resistive output based on alcohol concentration. When the alcohol gas exists, the sensor's conductivity gets higher along with the gas concentration rising [15].

There is a resistance across an A and B inside the sensor which varies on detection of alcohol. More the alcohol, the lower the resistance. The alcohol is measured by measuring this resistance [16]. The sensor and load resistor form a voltage divider, and the lower the sensor resistance, the higher the voltage reading will be.

D. DC Motor

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor.

DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances [17].

E. Buzzer

Sensitive A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows.

It most commonly consists of a number of switches or sensors connected to a control unit that 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. 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 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.

F. Ignition key

Transmitter An ignition switch, starter switch or start switch is a switch in the control system of a motor vehicle that activates the main electrical systems for the vehicle, including "accessories" (radio, power windows, etc.). In vehicles powered by internal combustion engines, the switch provides power to the starter solenoid and the ignition system components (including the engine control unit and ignition coil), and is frequently combined with the starter switch which activates the starter motor.
The ignition locking system may be sometimes bypassed by disconnecting the wiring to the switch and manipulating it directly; this is known as hotwiring. A car key or an automobile key is a key used to open and/or start an automobile. Modern key designs are usually symmetrical, and some use grooves on both sides, rather than a cut edge, to actuate the lock [18].

III.POWER SUPPLY

Power supply is a reference to a source of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called power supply unit or PSU. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others. A Regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes.

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This power supply section is required to convert AC signal to DC signal and also to reduce the amplitude of the signal. The available voltage signal from the mains is 230V/50Hz which is an AC voltage, but the required is DC voltage (no frequency) with the amplitude of+5V and +12V for various applications.
In this section we have Transformer, Bridge rectifier, are connected serially and voltage regulators for +5V and +12V (7805 and 7812) via a capacitor (1000µF) in parallel are connected parallel as shown in the circuit diagram below

Block diagram

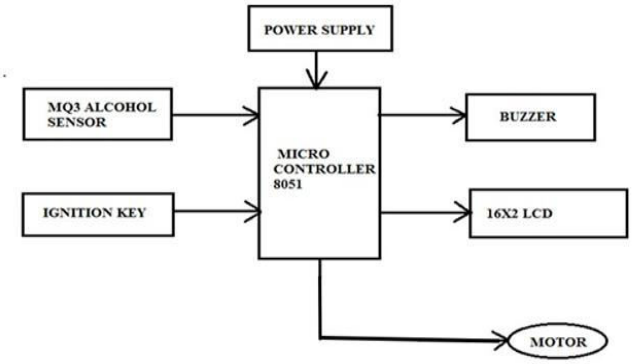

Fig1: Block diagram

Working Principle

Using microcontroller, we propose to design a system consisting of an alcohol sensor MQ3, to detect the presence of alcohol by analyzing a person's breath and shutting down the vehicle's engine when a specific amount of alcohol is detected to prevent any kind of accident that may occur due to the driver taking control over the vehicle.

The system consists of an microcontroller, which acts as a controller for every component which is used. The microcontroller is connected to a LCD, an alcohol sensor, a buzzer, a DC motor, a LED and is powered by a DC power supply of 5 volts. As soon as the system is ON, the LCD displays "No Alcohol detected" and the vehicle engine gets started. As soon as the alcohol sensor detects alcohol, the LED starts to blink, the buzzer starts, the engine is switched OFF and the LCD displays "Alcohol Detected".
The alcohol device that is connected to port1, has wood spirit share. Whenever alcohol share of the motive force exceeds the limit of alcohol device, then the ignition that is connected port1.0 stops mechanically by showing a message "Alcohol Detected" on the Digital display.

At constant time buzzer that is connected to port1, pin5 is ON acting as a warning to the motive force. If the alcohol share of the motive force doesn't exceed the device alcohol content, then a message "no alcohol" is displayed on the digital display screen

IV. SOFTWARE DESCRIPTION

Keil Introduction:

Keil small Vision is a free software package that solves several of the pain points for associative degree embedded program developer[17]. This software package is associate degree integrated development surroundings, that integrated a text editor to put in writing programs, a compiler and it will convert your ASCII text file to hex files too[18]. Here is straight forward guide to begin operating with Keil uVision which might be used for

- Writing programs in C/C++ or programming language
- Compiling and aggregation programs
- Debugging program
- Creating hex file
- Testing your program while not offered real

These area unit the straight forward steps to urge off the mark your inning.
Step1: once gap keil uV4,head to project tab and build new uVision project.
Step2: once making project currently choose your device model.
Step3: your project is made and message window can seem to feature startup file of your device click on affirmative therefore it will be side to your project folder
Step4: currently head to file and build new file and put it a side with .C extension.
Step5: currently write your program and put it a side once more.
Step6: subsequently on left you see project window currently come back on project window. Click output tab here & check produce Hex file if you wish to get hex file currently ok therefore it will save changes.
Step7: currently expand target and you will see supply cluster Right click on cluster and click you on add files to supply cluster.
Step8: click on build target. You will be able to realize it below project tab or in toolbar. It can also be done by pressing F7 key.
Step9: you will be able to see standing of your program in Build output window [if it's not there head to read and click on Build output wind].

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ADVANTAGES

- This circuit detects the alcohol directly.
- This circuit is simple in construction.
- Readily available ICs are used.
- Responsibility of the circuit is high.

APPLICATIONS

- All types of vehicles
- This project can be used in various organizations to detect alcohol consumption of employees
- Travels operators

V. RESULT

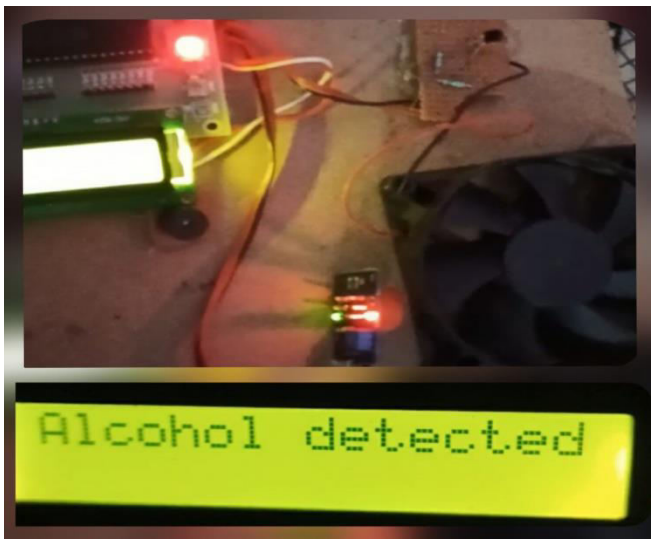

Fig2: Module When Alcohol Detected

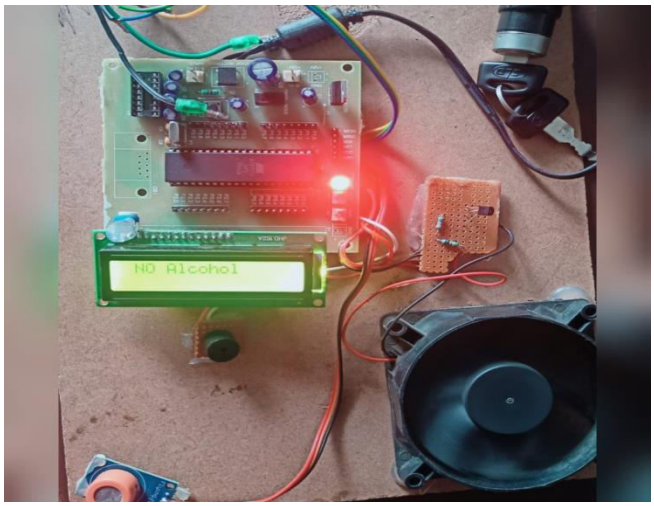

Fig3: Module When There Is No Alcohol

VI. CONCLUSION

In this project we have developed a real time model that can automatically lock the engine when a drunken driver tries to drive a car. Now- a-days car accidents are mostly seen. By fitting this alcohol sensor into the car, we can save guard the life of the driver and also the remaining passengers. It is very simple application. The life time of the project is high. It has low or zero maintenance cost and of course low power consumption.

This is a developed design to efficiently check drunken driving. By implementing this design, a safe car journey is possible decreasing the accident rate due to drinking. By implementing this design, drunken drivers can be controlled so the accidents due to drunken driving. Government must enforce laws to install such circuit in every car and must regulate all car companies to preinstall such mechanism while manufacturing the car itself. If this is achieved the deaths due to drunken drivers can be brought to minimum level. In this type of system, future scope can be safely landing of car aside without disturbing other vehicles.

VII. REFERENCES

[1] Altaf SV, Abhinay S, Ansari E, Kaunain Md, Anwer R. Alcohol Detection and Motor Locking System. International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering. 2017; 6(2): 989-993.

[2] Kousikan M, Sundaraj M. Automatic Drunken Drive Prevention System. International Journal of Students Research in Technology and Management. 2014; 2(2): 75-77.

[3] Bhuta P, Desai K, Keni A. Alcohol Detection and Vehicle Controlling. International Journal of Engineering Trends and Applications. 2015; 2(2): 92-97.

[4] Shafi S., Tanmay NTS, Tarunya D, Vinay G, Reena K. Automatic Vehicle Engine Locking Control System to Prevent Drunken Driving using Virtual Instrumentation. International Journal of Engineering and Technical Research. 2016; 5(1):76-79.

[5] Shah S, Nawgaje DD. ARM Based Drunk Driver Identification with Tracking System. International Journal of Modern Trends in Engineering and Research. 2016; 3(4): 302-307.

[6] Ogazi C, Edison E. The drink driving situation in Nigeria. Traffic Injury Prevention. 2012; 13(2):1

[7] Karthik Kumar Vaigandla, Dr.N.Venu, " Survey on Massive MIMO: Technology, Challenges, Opportunities and Benefits," YMER, VOLUME 20 : ISSUE 11 (Nov) - 2021, Page No:271-282.

[8] Dr.Nookala Venu, Dr.A.ArunKumar and Karthik Kumar Vaigandla. Review of Internet of Things (IoT) for Future Generation Wireless Communications. International Journal for Modern Trends in Science and Technology 2022, 8(03), pp. 01-08.

[9] AVLN. Sujith, R. Swathi, R. Venkatasubramanian, Nookala Venu, S. Hemalatha, Tony George, A. Hemlathadhevi, P. Madhu, Alagar Karthick, M. Muhibbullah, Sameh M. Osman, "Integrating Nanomaterial and High-Performance Fuzzy-Based Machine Learning Approach for Green Energy Conversion" Journal of Nanomaterials, ISSN: 1687-4129,Volume 2022,PP:1-11.

[10] Nookala Venu, D. Yuvaraj, J. Barnabas Paul Glady, Omkar Pattnaik, Gurpreet Singh, Mahesh Singh, and Amsalu Gosu Adigo, "Execution of Multitarget Node Selection Scheme for Target Position Alteration Monitoring in MANET", Wireless Communications and Mobile Computing, ISSN:1530- 8669,

Volume 2022, PP: 1-9.

[11] Karne, RadhaKrishna, and T. K. Sreeja. "ROUTING PROTOCOLS IN VEHICULAR ADHOC NETWORKS (VANETs)." *International Journal of Early Childhood* 14.03: 2022.

[12] Karne, RadhaKrishna, et al. "Optimization of WSN using Honey Bee Algorithm."

[13] RadhaKrishna Karne, Dr TK. "COINV-Chances and Obstacles Interpretation to Carry new approaches in the VANET Communications." *Design Engineering* (2021): 10346-10361.

[14] Karne, RadhaKrishna, et al. "Simulation of ACO for Shortest Path Finding Using NS2." (2021): 12866-12873.

[15] RadhaKrishna Karne, Dr TK. "Review On Vanet Architecture And Applications." *Turkish Journal of Computer and Mathematics Education (TURCOMAT)* 12.4 (2021): 1745-1749.

[16] Karne, Radha Krishna, et al. "GENETIC ALGORITHM FOR WIRELESS SENSOR NETWORKS."

[17] Nookala Venu, R.Swathi, Sanjaya Kumar Sarangi, V. Subashini, D. Arulkumar, Shimpy Ralhan, Baru Debtera, "Optimization of Hello Message Broadcasting Prediction Model for Stability Analysis", Wireless Communications and Mobile Computing, ISSN:1530- 8669, Volume 2022, PP: 1-9.

[18] Nookala Venu, Karthik Kumar Vaigandla, Dr.A.ArunKumar, "Investigations of Internet of Things (IoT): Technologies, Challenges and Applications in healthcare", International Journal of Research (IJR), ISSN: 2236-6124, Volume XI, Issue II, Feb 2022, PP: 143-153

[19] Dr.Nookala Venu, "Analysis of Xtrinsic Sense MEMS Sensors" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (IJAREEIE), ISSN:2278-8875 Vol 4, Issue:8, August 2015, PP: 7228-7234.

[20] Nookala Venu, Asiya Sulthana, "Local Mesh Patterns for Medical Image Segmentation" Asian Pacific Journal of Health Sciences (APJHS), e-ISSN: 2349-0659 p-ISSN: 2350-0964, Vol. 5, Issue 1, March 2018, PP: 123-127.

[21] Dr Nookala Venu, Mrs Asiya Sulthana "Local Maximum Edge Binary Patterns for Medical Image Segmentation, International Journal of Engineering and Techniques (IJET), ISSN: 2395-1303, Volume 4 Issue 1, Jan- Feb 2018, PP: 504-509.

[22] Dr.N.Venu, Dr.A.Arun Kumar, "Comparison of Traditional Method with watershed threshold segmentation Technique", International Journal of Analytical and Experimental Analysis (IJAEMA),ISSN: 0886-9367, Volume XIII, Issue 1, January- 2021, PP:181-187.