

MICROCONTROLLER BASED AUTOMATIC ENGINE LOCKING SYSTEM FOR DRUNKEN DRIVERS

A PROJECT REPORT of J COMPONENT In
MICROCONTROLLER AND EMBEDDED
SYSTEMS - ECE3031

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ABSTRACT

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others.

In this project, we are developing an Auto Lock System. The input for the system is from Detection Sensors either from Alcohol Breath or any other mechanism.

The controller keeps looking for the output from these sensors. If there are any traces of Alcohol above the set limit, then the system will lock the Engine. As vehicle automobiles are beyond the scope of this project, we are simulating the process by activating the relay.

INTRODUCTION

EMBEDDED SYSTEMS:

An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function.

An embedded system is a microcontroller-based, software driven, reliable, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a competitive and cost conscious market.

An embedded system is not a computer system that is used primarily for processing, not a software system on PC or UNIX, not a traditional business or scientific application.

High-end embedded & lower end embedded systems. High-end embedded system - Generally 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc.

Lower end embedded systems - Generally 8,16 Bit Controllers used with an minimal operating systems and hardware layout designed for the specific purpose.

CHARACTERISTICS OF EMBEDDED SYSTEMS:

An embedded system is any computer system hidden inside a product other than a computer.

Embedded systems have a microprocessor/ microcontroller and a memory. Some have a serial port or a network connection. They usually do not have keyboards, screens or disk drives.

They will encounter a number of difficulties when writing embedded system software in addition to those we encounter when we write applications. –

Throughput: Our system may need to handle a lot of data in a short period of time.

- Response: Our system may need to react to events quickly. –
- Testability: Setting up equipment to test embedded software can be difficult.

- Debugability: Without a screen or a keyboard, finding out what the software is doing wrong (other than not working) is a troublesome problem.
- Reliability: Embedded systems must be able to handle any situation without human intervention.
- Memory space: Memory is limited on embedded systems, and you must make the software and the data fit into whatever memory exists. –
- Program installation: You will need special tools to get your software into embedded systems.
- Power consumption: Portable systems must run on battery power, and the software in these systems must conserve power.
- Processor hogs: Computing that requires large amounts of CPU time can complicate the response problem.
- Cost: Reducing the cost of the hardware is a concern in many embedded system projects; software often operates on hardware that is barely adequate for the job.

PROBLEM STATEMENT

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others.

The system uses a compact circuitry built around Flash version of AT89S52 microcontroller with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C.

The main purpose behind this project is “Drunken driving detection”.

Nowadays, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle.

Thus drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car.

This project should be fitted / installed inside the vehicle.

COMPONENTS

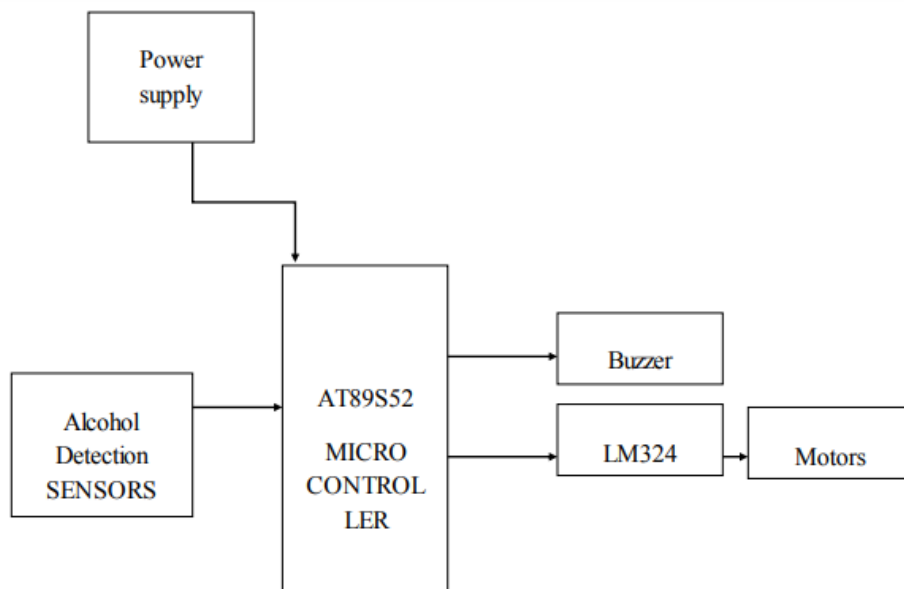
HARDWARE COMPONENTS:

1. Power supply.
2. Microcontroller AT89S52.
3. Alcohol detection sensor. (MQ-3)
4. Buzzer.
5. Buzzer Driver circuit.
6. LCD.
7. Engine/Motors.
8. LM324 op-amp.
9. Resistors.
10. Capacitors.

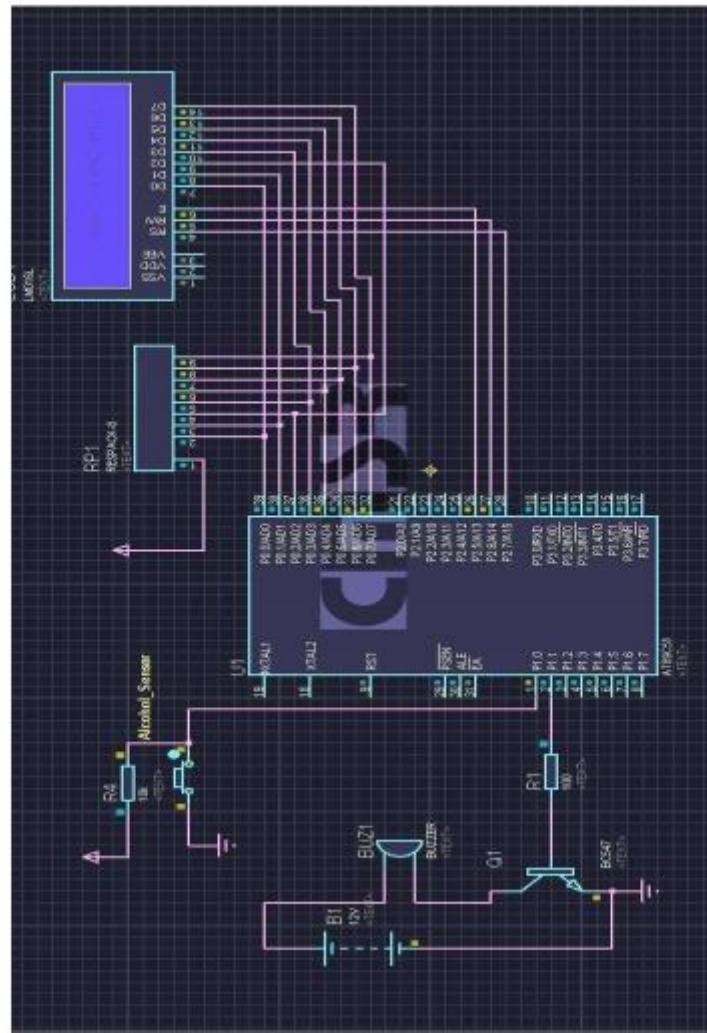
SOFTWARE COMPONENTS:

1. Keil software.
2. Keil software programming.

BLOCK & CIRCUIT DIAGRAM



BLOCK DIAGRAM



SCHEMATIC CIRCUIT DIAGRAM

WORKING

We are developing an Auto Lock System. The input for the system is from Detection Sensors either from Alcohol Breath or any other mechanism.

The machine utilises the vapours in your breath to calculate an estimation of the level of alcohol in a person's system. This simple approach is due to the fact that alcohol is not digested by the body and is merely absorbed through different parts. These include the mouth, stomach and intestines. As a result, traces of the material can still be identified minutes after drinking, making it possible for the Breath Analyser to calculate an accurate number.

The controller keeps looking for the output from these sensors. If there are any traces of Alcohol above the set limit, then the system will lock the Engine. As vehicle automobiles are beyond the scope of this project, we are simulating the process by activating the relay. The system designed is for the sensing of alcohol using alcohol sensor which in turn activates the rectifier that initiates the relay through which a signal is transmitted in form of a delay. This delay will activates/deactivates the DC motor. (In general a motor is the basic component in the engine vehicle system)

The system uses a compact circuitry built around Flash version of AT89S52 microcontroller with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C.

The main purpose behind this project is "Drunken driving detection". Other than the critical connectivity issues the programming part as well as the logical issues were to be resolved in the effective use of the microcontroller we are using for the design of the detection system.

ADVANTAGES

- Low cost.
- Automated operation.
- Low Power consumption.
- It provides an automatic safety system for cars and other vehicles as well.

DISADVANTAGES

- Implementing in older cars might be hard
- Maintenance required
- Easily fool-able
- Can detect alcohol from other sources (hand sanitizer)

APPLICATIONS

- 1) “Alcohol Detector project” can be used in the various vehicles for detecting whether the driver has consumed alcohol or not.
- 2) This project can also be used in various companies or organization to detect alcohol consumption of employees

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 are 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 mechanisms 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.

REFERENCES

1. www.wikipedia.org
2. www.atmel.com
3. Passive Alcohol Sensors Tested in 3 States of Youth Alcohol EnforcementNHSA(1996)
4. Muhammad Ali Mazidi,Janice Gillispie Mazidi “The 8051 Microcontroller and Embedded Systems Using Assembly and C-2nd-ed”