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ALCOHOL DETECTOR

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ABSTRACT

INTRODUCTION:

Alcohol detector is a device to measure blood alcohol content (BAC) from breath sample. In most countries 0.08 grams of alcohol per 100 mL of blood (BAC 0.08) is set as the legal limit beyond which the person or driver is considered to be legally drunk.

Technically alcoholism is determined by the driver's blood alcohol level called the 'blood alcohol concentration' (BAC), which indicates the degree of intoxication.

Blood alcohol levels may be evaluated by using the GAS SENSOR. By gas sensor we are able to sense carbon dioxide, ammonia, nitrogen etc.

HISTORY:

DRUNK AND DRIVE LAW:

The blood alcohol content (BAC) legal limit is 0.03% or 30 µl alcohol in 100 ml blood.on 1 March 2012; the Union Cabinet approved proposed changes to the Motor Vehicle Act. Higher penalties were introduced, including fines from 2,000 to 10,000 and imprisonment from 6 months to 4 years. Different penalties are assessed depending on the blood alcohol content at the time of the offence . Now it is necessary to detect how drunk and driving car.This question is becomes more severe to RTO of all states .so we are trying to give one of the solutions on it as a BRETHANALYSER AS A ALCOHOL DETECTER. In this we are trying to detect alcohol in blood by using one gas sensor .This gas sensor helps RTO to detect the drunken people and reduce accidents on roads.In industry there are several alcohol detectors but we are trying to make a model of it in simplest way for small purposes. In most countries 0.08 grams of alcohol per 100 mL of blood (BAC 0.08) is set as the legal limit beyond which the driver is considered to be legally drunk. Blood alcohol levels may be evaluated by using the alcohol detector**.**The Breathalyzer was invented by Dr. Robert Borkenstein of the Indiana State Police in 1954.

MARKET TRENDS:

ALCOHOL DETECTORS IN INDIA

1) MODEL NO.: BID-66AT (USED BY DELHI POLICE)

1) Breathalyzer Alcohol Tester - Dual LCD Display. Low priced BAC Breathalyzer tester for those late nights out drinking, so we can also reliably test ourselves before the police do it for you.

SPECIFICATIONS:

►Primary Function: Breathalyzer with LCD screen

►Analyzing Method: Breath Test

►Sensor: Advanced semiconductor oxide alcohol sensor
►Screen: Dual LCD Display -Alcohol Tester LCD / Clock LCD
►Alcohol Reading: Digital

►Range: 0.00~0.19 BAC & 0.0~1.9g/

►2 Alert Modes:
- Caution: Display Caution symbol and yellow LED flash - .02% ~ .05% BAC - Danger: Display Danger symbol and audible beep alert- equal or over .05% BAC
►Power Source: 2x AAA batteries
►Dimension: 95mm x 35mm x 16mm (L x W x B)

BLOCK DIAGRAM:

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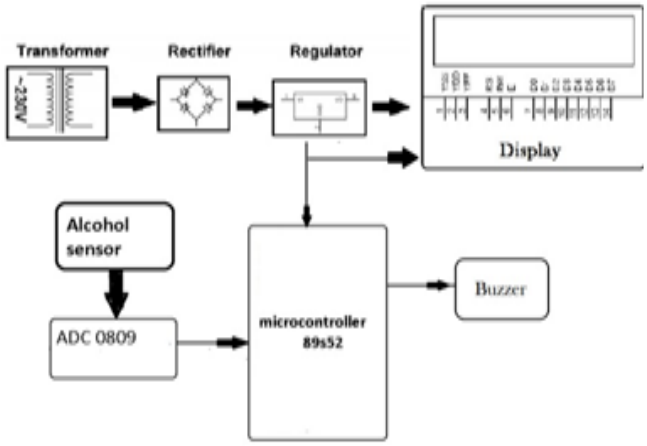


BLOCK DIAGRAM DESCRIPTION:

We here propose an alcohol sensing system that measures alcohol intake, displays percentage of alcohol and also sounds an alarm if it is above a particular threshold.

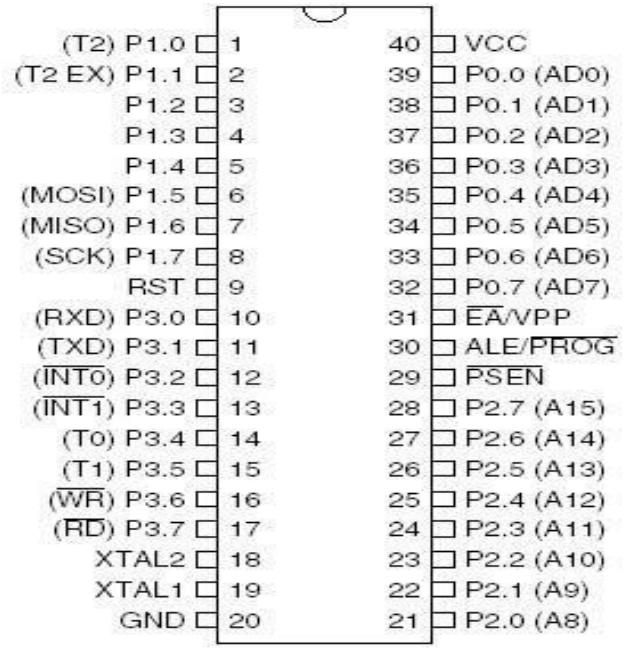
Here we use an alcohol sensor(MQ3) circuit along with LCD display(16*2) and a buzzer alarm. Our system first uses the alcohol sensor in order to detect alcohol. The sensor

provides analog output. This analog output is now provided to ADC(0809) and then to microcontroller (89s52) for further processing. Based on the input the microcontroller calculates the percentage of alcohol and displays the same on an LCD display. It also sounds an alarm if the amount of alcohol exceeds a particular amount i.e. if it is greater than 100%.

Our system thus allows to measure amount of alcohol and then display percentage of alcohol measured. Also a alarm is sounded that indicates that measured alcohol is above a particular percentage

4.**1.1MICROCONTROLLER**

SURVEY OF MICROCONTROLLERS:



PARAMETERS	8051	89C51	89S52	8052
ROM	4KB	FLASH 4KB	FLASH 8KB	8KB
RAM	128B	128B	256B	256B
C/T	2	2	3	3
INTERRUPTS	6	6	8	8

As shown in table, as per specifications we selected 89s52 microcontroller.

MICROCONTROLLER 89s52:

The AT89s52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high- density nonvolatile memory technology and is compatible with the industry-standard 80C51 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 in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which provides a highly-flexible and cost-effective solution to many embedded control applications. The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry.

In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM con-tents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset.

FEATURES:

8K Bytes of In-System Programmable (ISP)
Flash Memory

2) 4.0V to 5.5V Operating Range

3) Three-level Program Memory Lock

4) 256 x 8-bit Internal RAM

5) 32 Programmable I/O Lines

6) Three 16-bit
Timer/Counters
7)Eight Interrupt
Sources
8)Full Duplex UART Serial Channel

9) Watchdog Timer

PIN DIAGRAM

4.1.2ADC0809:

The ADC0808, ADC0809 data acquisition component is a monolithic CMOS device with an 8- bit analog-to-digital converter, 8-channel multiplexer and microprocessor compatible control logic. The 8-bitA/D converter uses successive approximation as theconversion technique. The converter features a highimpedance chopper stabilized comparator, a 256voltage divider with analog switch tree and asuccessive approximation register. The 8-channelmultiplexer can directly access any of 8-single-endedanalog signals.

FEATURES DESCRIPTION:

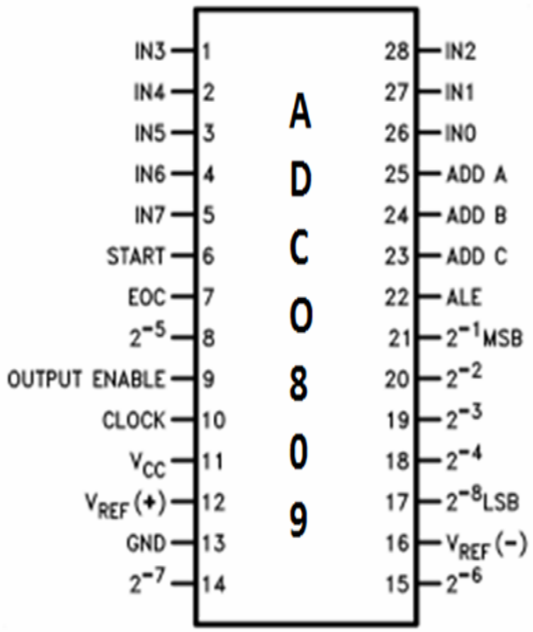
1) Easy Interface to All Microprocessors
2) Operates Ratiometrically or with 5 VDC or Analog Span Adjusted VoltageNo Zero or Full-Scale Adjust Required
3) 8-Channel Multiplexer with Address Logic
4) 0V to VCC Input Range
5) Outputs meet TTL Voltage Level Specifications
6) ADC0809 Equivalent to MM74C949-1

KEY SPECIFICATIONS :

1) Resolution: 8 Bits
2) Total Unadjusted Error: ±½ LSB and ±1 LSB

3) Single Supply: 5 VDC
4) Low Power: 15 mW
5) Conversion Time: 100 µs

PIN DIAGRAM



SENSOR MQ3 FEATURSE

a) High sensitivity to alcohol and small sensitivity to Benzene
b) Fast response and High sensitivity
c) Stable and long life
d) Simple drive

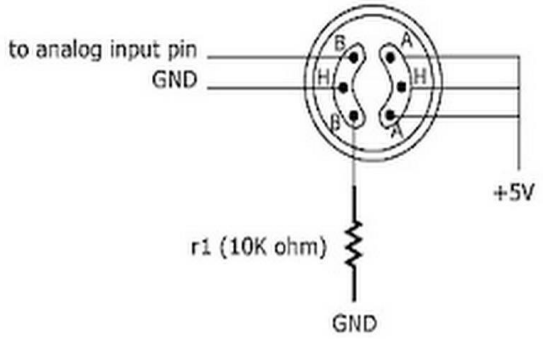
circuit Applications:

They are suitable for alcohol checker, Breathalyzer.

Operation of Alcohol MQ3 sensor:

This is an alcohol sensor from futurelec, named MQ-3, which detects ethanol in the air Itis one of the straightforward gas sensors so it works almost the same way with other gas sensors.
Typically, it is used as part of the breathalyzers or breath testers for the detection of ethanol in the human breath.
Basically, it has 6pins, the cover and the body. Even though it has 6 pins, you can use only 4 of them. Two of them are for the heating system, which I call H and the other 2 are for connecting power and ground, which I called A and B. If you look at the inside of the sensor, you will find the little tube. Basically, this tube is a heating system that is made of aluminum oxide and tin dioxide and inside of it there are heater coils, which practically produce the heat. And you can also find 6 pins. 2 pins that we called Pin H are connected to the heater coils and the other ones are connected to the tube. The core system is the cube. As you can see in this cross-sectional view, basically, it is an Alumina tube cover by SnO2, which is tin dioxide. And between them there is an Aurum electrode, the black one. And also you can see how the wires are connected . Basically, the alumina tube and the coils are the heating system, the yellow, brown parts and the coils in the picture. In the air meet the electrode that is between alumina and tin dioxide, ethanol burns into acetic acid then more current is produced. There is the more current we will get

MQ3 PIN DIAGRAM:



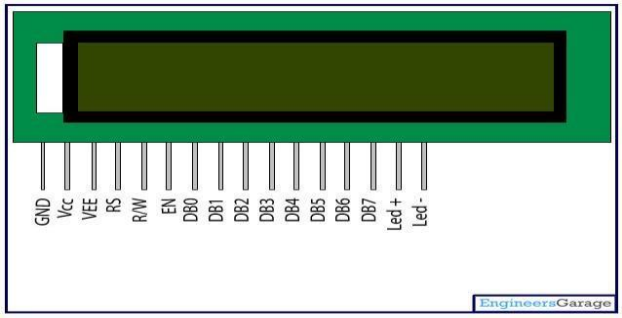
LCD DISPLAY:

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.

FEATURES

- 5 x 8 dots with cursor.
- + 5V power supply (Also available for + 3V).
- 1/16 duty cycle.
- B/L to be driven by pin 1, pin 2 or pin 15, pin 16 or A.K (LED).
- N.V. optional for + 3V power supply.



BUZZER:

Buzzers are available in a variety of styles. Magnetic buzzers emit audio via a coil, while electromechanical buzzers may use a bell in their design.

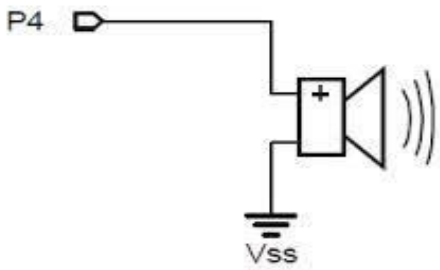
Mechanical buzzers do not operate with electricity. Instead, they rely on a tightly wound spring. Hand buzzers and alarm clocks that are manually wound are mechanical in design. Piezo buzzers can emit a variety of beeps and buzzes and are often used on car doors and to indicate computer errors.

Buzzers are employed for use on microwave ovens and conventional ovens as well. Timing devices depend on buzzers, as do alarms for seat belts and dashboard warning lights

BUZZER WORKING:

A buzzer takes some sort of input and emits a sound in response to it. They may use various means to produce the sound; everything from metal clappers to electromechanical devices.

A buzzer needs to have some way of taking in energy and converting it to acoustic energy. Many buzzers are part of a larger circuit and take their power directly from the device's power source. In other cases, however, the buzzer may be battery powered so that it will go off in the event of a mains outage. Some devices that provide emergency power have buzzers on them so that the user knows that they are running on backup power and not on mains power.



BUZZER ADVANTAGE:

1) The MQ3 takes few minutes to retrace back to its normal condition after a positive test (alcohol present in the breath).

2) If there is no alcohol in the breath the sensor output will swing back to its normal condition very fast.

3) "Alcohol Detection System in Cars" provides an automatic safety system for cars and other vehicles as well.

4) Breathalyzers present a correct outcome so helping to maintain safe and sound environment

5) Easy circuit design.

6) Simple for handling.

7) Low cost.

DISADVANTAGES:

1) This breathalyzer circuit is just an entry level one and is not suitable for high end applications such as law enforcement or laboratory application.

2) When heavy dust, steam or fog blocks the laser beam, the system will not be able to take measurement.

APPLICATIONS:

1) By increasing its sensitivity it can be precisely used as breathalyzer.

2) MQ3 is a stable and sensitive gas sensor which can detect ammonia, carbon dioxide, alcohol, smoke, nitrogen dioxide etc. The sensor consists of a tin dioxide sensitive layer inside aluminum oxide micro tubes, measuring electrode and a heating element inside a tubular aluminum casing. The front end of the sensor is covered using a stainless steel net and the rear side holds the connection terminals. That is it is ammonia, carbon dioxide, alcohol, smoke, nitrogen dioxide etc analyzer also.

3) It can be used in all STATE BUS driver cabin with interrupted as big sirens.

4) It can be useful in highly sensitive areas like HOSPITALS, REASEARCH LAB ETC.

5) "Alcohol Detector project" can be used in the various vehicles for detecting whether the driver has consumed alcohol or not.

6) This project can also be used in various companies or organization to detect alcohol consumption of employees.