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Maintenance of Oxygen Level in Car's Interior

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ABSTRACT:
In this modern word, everyone is using a car with an Air Conditioning system. Air conditioner has become necessity in all vehicles now a day. Even though AC has an advantage of cooling system it has a major drawback of leakage hazardous gases when the filter or evaporator fails,also CO level increases when the car's window is closed while AC is in ON condition. Hence it is necessary to govern the oxygen and other gases level inside the car. We propose some electronic system for governing the oxygen level and other hazard gases. The oxygen sensor and microcontroller provide a best way of governing the interior. If the CO level increases more than normal level (30ppm) or if the oxygen level decreases than the normal level (19%), then an alarm beeps out automatically also proper ventilation and vibration of the car seat is provided. Alarm should be put off with in 45 second; if not then backup oxygen is automatically released along with car seat vibration.
Keyword: **Sensor, Carbon monoxide, Microcontroller, Oxygen.**

INTRODUCTION:

Car atmosphere must always good for passengers. It is necessary to govern the car interior atmosphere without any form disturbances. Many people have died because of unfavoured atmosphere inside a car. Unfavoured atmosphere means toxic gases like volatile components, carbon monoxide etc. In general CO causes unconscious to passenger and even causes death because CO is colour less, odourless and poisonous gas.

An increase in CO levels in car compromises the amount of O_2 reaching the blood. This results in the blood carrying more CO which can lead to a shock or in severe cases sudden death.This increase in CO is due to two reasons.

* Leakage of hazardous gases when filter or evaporator fails in AC.

* In some cases AC functions well but breathing air in closed space even if the air circulates in and out of car is not enough which causes increase in level of CO.

Hence it is necessary to govern and maintain the oxygen level inside the car. So embedded electronic system is used inside the vehicles such that presence or leakage of toxic gas can be easily detected by gas sensors and proper precautions can taken.

EXISTING SYSTEM:

"Design and implementation of Remote monitoring system based on GSM", this paper focuses on the wireless monitoring system because the wireless remote monitoring system has more & more application, a remote monitoring system based on SMS of GSM is presented. This result of demonstration shoes that the system can monitor and control the remote communication between monitoring centre and remote monitoring station and remote monitoring function is realized.

PROPOSED SYSTEM:

In this paper, we propose an embedded electronic component to maintain the oxygen level inside the car.

HARDWARE REQUIREMENT:

- Atmel 89C51 Microcontroller.
- CO sensor
- O_2 sensor
- A/D converter

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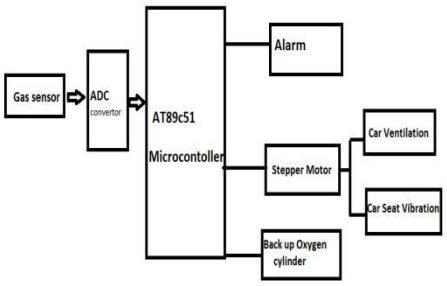
- Alarm beeps
- Stepper Motor
- Backup Oxygen cylinder.
-

SOFTWARE REQUIREMENTS:

- Keil Compiler
- Embedded C.

BLOCK DIAGRAM:

The AT89C51 microcontroller is connected to A/D converter such that signals from gas sensor is converted into digital inputs and sent micro controller. If critical situation experienced then an alarm beeps out automatically also proper ventilation and vibration of the car seat is provided. Alarm should be put off with in 45 second; if not then backup oxygen is automatically along with car seat vibration.



Atmel 89C51 Microcontroller:

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes ofFlash programmable and erasable read only memory (PEROM). The device is manufacturedusing Atmel's high-density non-volatile memory technology and is compatible with the industrystandardMCS-51 instruction set and pin out. The on-chip Flash allows the program memory to bereprogrammed 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 powerfulmicrocomputer which provides a highly-flexible and cost-effective solution to many embeddedcontrol applications. Figure1 shows the model of Atmel 89c51. In addition, the AT89C51 isdesigned with static logic for operation down to zero frequency and supports two softwareselectable power saving modes. The Idle Mode stops the CPU while allowing the RAM,timer/counters, serial port and interrupt system to continue their functioning.

Features of Atmel 89C51:

*Compatible with MCS-51™ Products

* 4K Bytes of In-System *Reprogrammable Flash Memory

*Endurance: 1,000 Write/Erase Cycles

* Fully Static Operation: 0 Hz - 24 MHz

* Three-level Program Memory Lock

* 128 x 8-bit Internal RAM

* 32 Programmable I/O Lines

* Two 16-bit Timer/Counters

* Six Interrupt Sources

* Programmable Serial Channel

* Low-power Idle and Power-down Modes.

Gas Sensor:

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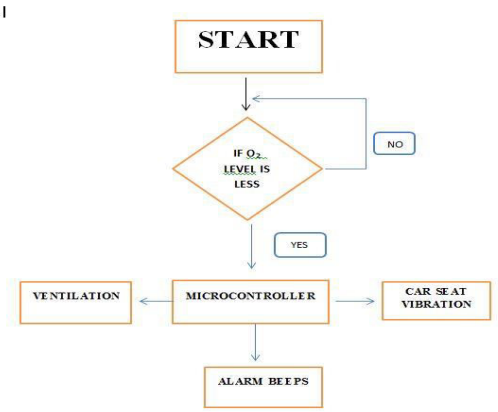
A gas sensor or detector is a device which detects the presence of various gases within the area, usually as the part of a safety system. This type of equipment is used to detect gas leakage and interface with the control system so as to shut down the process easily. A gas detector can also sound an alarm in the area where the leak is occurring, giving them the opportunity to leave the area. This type of devices is important because there are many gases that can be harmful to organic life, such as humans and animals. Gas detectors are used to detect combustible, flammable and toxic gases, and also oxygen depletion. These types of devices are used widely indevices and can found in various locations. These are actually battery operated, and also they transmit warnings via a series of audible signals such as alarms and visible signals such as flashlights, as they meet dangerous levels. Originally detectors were produced to detect a single gas. But the modern units are capable of detecting several toxic gases or combustible gases orboth. These gas sensors can be classified according to the operation mechanism such as semiconductor, oxidation, catalytic, infrared, etc.

A/D Convertor:

The ADC0808 data acquisition component which is monolithic CMOS device with an 8-bit analogue-to-digital converter, 8-channel multiplexer and microprocessor compatible control logic. The 8-bit A/D converter uses successive approximation as the conversion technique. The ADC0808 offers high speed, high accuracy, minimal temperature dependence, excellent long term accuracy and repeatability, and consumes minimal power. These make the device ideally suitable for application processes and machine control to consumer and automotive applications. The ADC0808M consists of an analogue signal multiplexer, an 8-bit successive-approximation converter, and related control and output circuitry.

FLOW CHART:



CASE STUDIES:


Sleeping in the cool comfort of your car can kill you

Experts say that in less than an hour one can die of carbon monoxide poisoning

Image Credit: Francois Nel/Gulf News

Sleeping in your car with the AC on and the engine running could be deadly. Picture forillustrative purposes only.

Published: 09:30 August 25, 2012 By Jumana Khamis, Staff Reporter

GULF NEWS

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TAGS

LATEST COMMENT

This is usual in UAE to drive on highways. If a person who is drivingthe car is not sleeping but his family is sleeping in the car for a drivefrom Abu Dhabi to Fujairah which is more than 1 hour, would it be dangerous for family as according to the news sleeping in the car itself is dangerous? How about this situation?

SYED ASAD ALI

25 August 2012 13:21

JUMP TO COMMENTS

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CONCLUSION:

An embedded system is designed for toxic gas detection inside a vehicle cabin using ATMEL 89C51 microcontroller. Toxic gas like CO is less sensible by human which endangers the human lives. This critical situation can be avoided by implementing the sensors for sensing the level of CO and oxygen level and is displayed every second. When the Co level exceeds normal level that is CO is greater than 30ppm and if the Oxygen level decreases below the normal level of 19ppm then the designed system provides an alarm and also the warning message to the authorized user. Ventilation is immediately provided in the cabin along with vibration of seats. This can be used in vehicle for better governing of oxygen level.

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