# Oxygen Level Sustainer

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**Abstract – Car interior atmosphere must always be favorable for the passengers to Survive. But if the passengers inside the car experience any of these situations like increased level of Co2, A/C compartment leakage, for a prolonged time all windows of the car are closed with passengers in it then it slowly pave the way to unpleasant situation that is hazardous for the passengers to survive and finally leads to death. All over the world these situation prevailed and are still prevailing. Thus this proposed embedded solution is an alert system that monitors the toxic gases inside the enclosed space. The oxygen and carbon dioxide level indicator, MSP microcontroller and GSM are used for the better monitoring alert system. This alert system automatically opens the windows of the car with the help of the motor using the timer for the safety of passengers inside. This proposed system is applicable in automobiles as well as in industrial purposes.**

*Keywords—MQ 5 sensor,Motor Driver(L293D),MSP430,GSM.*

## 1. INTRODUCTION

Oxygen level sustainer is an automatic alert system which is used in automobiles to avoid the accidental deaths caused due to suffocation by getting locked in a car. In our day-to-day life though death caused due to suffocation is not a frequent problem but it has become a serious concern for death causing issue. Such cases are stated as follows.

Case 1: Two kids suffocated to death in locked car in Jhajjar (May 8, 2016).

Case 2: Two sisters, aged two and four, suffocated to death after they accidentally locked themselves inside a car in Kadarpur village here on Wednesday i.e., September 10, 2015.

Case 3: In the month of August last year four children died in Thoothukodi district of Tamil Nadu after they accidently got stuck in an abandoned car on August 14 2014

Doctors have asserted that the children who were trapped inside the car for around three hours must have died due to suffocation which was caused due to excess of carbon-dioxide and carbon monoxide, which are poisonous and death causing gases. There are many more such unintentional accident cases. Not only in cars, there are so many such accidental cases caused by getting struck in elevators or lifts. Considering these issues as a major alarm we came up with a pioneering idea which can be broadly used and implemented in cars, elevators (lifts) or industries.

## 2. EXISTING DESIGN

There was just an idea of Co2 and O2 level indicator came into existence considering these accidental deaths where System detects levels of oxygen / carbon dioxide and open windows, when oxygen level drops or carbon dioxide level rises, but it was not implemented.

Our project is unique which is in turn connected to central locking system where the lock gets automatically opened. There is no such existing feature evolved till now. And this project can be even used in the lifts where we can save a person from getting struck in it accidentally.

### A. Service Addressable Market (SAM) Identification

Basically our project is preferred to serve automobiles industries. This must be mandatory to all automobiles of four wheelers as most of the manufactured automobiles are of auto lock & anti brake system. But there is no such kind of advanced feature, even in the high-end vehicles. It can also serve the elevator manufacturers & especially chemical industries.

### B. Customer Need Identification

As this project is specifically used in automobile industries in the manufacture of cars, customers are automobiles. And these are served to the public for their security. Although it can be applicable in corporation buildings, hospitals, malls, colleges where ever elevators are in use, this project can be applicable.
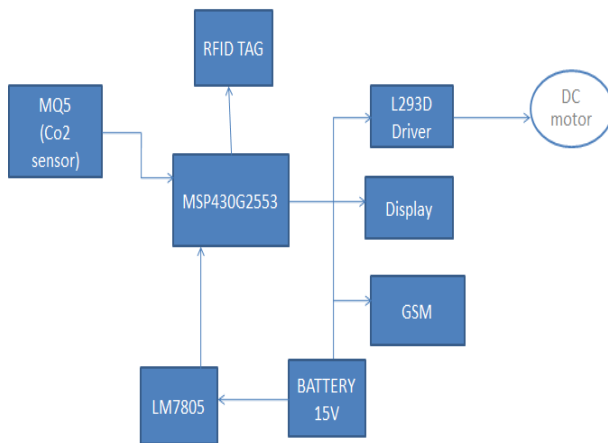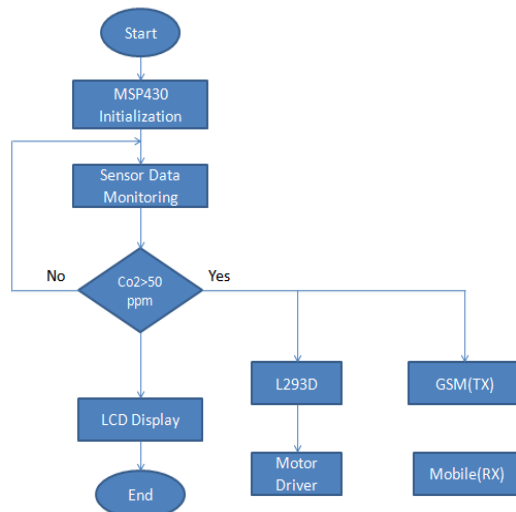
## 3. PROPOSED MODELLING

Objective :

Proposed System ensures to avoid the suffocation to the people who get locked inside the cars or lift or industries. The main motive is to save their lives.

The unit comprises of the gas sensor whose value is given as the input to the microcontroller to drive the window glasses based on the conditions. RFID reader is used to identify the presence of a person in the car. GSM module is also placed in the system to send a message to the contacts saved in the sim which is inserted in the module.

Block Diagram:



Deisgn flow:



Working Principle:

A 15V battery is used to give power supply to the microcontroller. Since the controller's supply voltage is 1.8-3.3V, we convert 15V to 5V using diode and resistor circuit and passed through a voltage regulator LM7805 to MSP430G2553 which internally takes 3V as input voltage.

The CO2 sensor (MQ5) senses the presence of harmful gases i.e., carbon dioxide and passes the level of the gas to the microcontroller (MSP430) as an input. The levels of the gas

are displayed on the LCD by the commands given in the program which is coded in MSP430. The microcontroller (MSP430) is programmed using energia software in embedded c code which has default threshold values of CO2.

From the block diagram, RFID reader which is given as an output device connected to the output pins of MSP430 operates at 434MHZ and when the frequency matches with the sequence of the tag, the circuit is activated that means it identifies the presence of a person in the car.

The gas levels are continuously checked. Once the levels of the gases reach the threshold value mentioned in the program, the controller is triggered. The motor driver L293D is used to drive the dc motor which acts as another output device connected to the port1 pins of microcontroller (MSP430). One input to L293D is from the power supply and the other input is from MSP430. As the condition mentioned, when the gas level increases beyond threshold, the values low and high are passes to the two input pins respectively and the motor rotates in the reverse direction and performs an action of opening the windows of the car. At the same time GSM module which is another output devise of MSP430 connected to one of the pin from port1 gets activated and message will be sent through the sim placed in the GSM to the mobile phone of the saved contacts.

A timer which is inbuilt in MSP430 helps in limiting the time duration, where the circuit is active only for a certain time i.e., motor should stop rotating in a period of time which is set in it. Once amount of oxygen is sufficiently available in the car which is continuously checked by the sensor and monitored by MSP430, the windows should be closed. To perform this, the inputs to L293D are given as high and low respectively which drives the motor in the forward direction. Then the windows get closed and the circuit becomes inactive in order to maintain safety.

Tool used:

- Energia

Energia is an open source & community-driven integrated development environment (IDE) & software framework. Based on the Wiring framework, Energia provides an intuitive coding environment as well as a robust framework of easy-to-use functional APIs & libraries for programming a microcontroller.

Understanding of customer & user :

As the components used in this project are simple and affordable, it can be easily implemented. This circuit is very simple and works very effectively and efficiently, the customers who are automobile industries and elevator constructs can implement it in their respective fields.

Distribution Channel Identification :

This project can be delivered or publicized by the means of social media so that maximum number of people could get an idea about it. Even automobile engineers should contribute in sharing among the about this feature.

### 4. RESULTS AND DISCUSSIONS

Displaying Contents LCD via MSP430 through commands



This shows that the GSM module is getting initialized



The CO2 is sensed through the sensor and the value is displayed on the LCD.
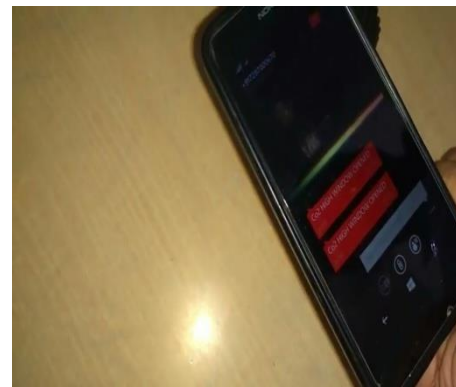


As the value of the gas crosses the threshold, the motor driver is triggered and the windows are getting opened



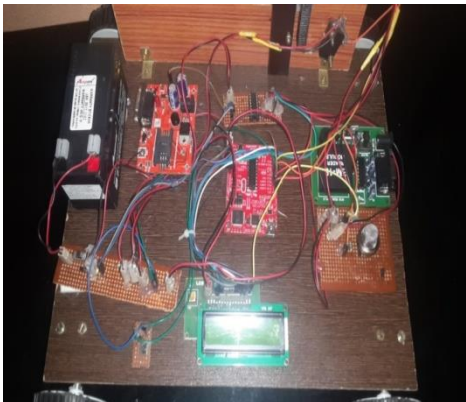At the same time the message is sent through GSM module



The message is sent to the contact saved in the sim which is placed in the GSM module



The CO2 gas levels are decreased



As soon as the level of the gas decreases the windows get closed and the circuit becomes inactive.

Circuitry connection for proposed system



Hardware design

## 5. CONCLUSION

This project provides an approach for development of an alert system that automatically opens the windows of the car with the help of the motor using the timer for the safety of the passengers inside the car. The proposed solution monitors the toxic gases inside the enclosed space. The carbon dioxide level indicator, MSP microcontroller and GSM help to be better monitoring alert system.

The Proposed system overcomes the problem of suffocation in cars, lifts, industries exclusively for infants or pets, which are automated with the central lock, as soon as there is a decrease in the oxygen level, windows or doors get opened. Thus this proposed system has more advantage of real time scenarios

## FUTURE SCOPE

This project can be extended to chemical industries, as industries dealing with chemicals are prone to hazardous region which risk the lives of the employees over there. So to overcome that situation GSM module is implied in order to get an acknowledgment to vacate the region as soon as possible. So project can applicable not only for individual cases but also for many. Hence it's worth being in been in market.

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