A Project Report on

SMART VEHICLE AUTOMATIC TYRE PRESSURE SYSTEM

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C E R T I F I C A T E

This is to certify that *Mr/Miss. ....*, has successfully completed the project workentitled “AN ECOSYSTEM OF INTERCONNECTED SENSORS AUTOMATED SYSTEM IN VEHICLES” under my supervision, in the partial fulfillment of Bachelor of Engineering - Mechanical Engineering, by **SAVITRIBAI PHULE PUNE UNIVERSITY**.

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ACKNOWLEDGEMENT

I take this opportunity here to thank all those who had helped us in making this project.

First of I express our deep gratitude to our project guide Prof. M.P.Pandagale for his valuable support, help & guidance from time to time during the project work. I am also grateful to our Head of Department, Dr. P. S. Purandare sir and Dr. S. M. Deshpande sir for giving us this opportunity to present this project.

Last but not the least; I would like to thank our entire teaching staff who assisted me directly or indirectly throughout the duration of this time period.

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INDEX

Chapter 1

INTRODUCTION

1.1 Motivation

Security in travel is primary concern for everyone. This paper design a compact system to monitor the tire pressure, level of fuel in the tank, engine oil life and detect the pollutants in the vehicle which could be assembled in the vehicle itself. Tremendous innovations have been made in the technology but still nothing significant is achieved from it. This idea employs pressure sensor to monitor the tyre pressure, the CO2 sensor to sense the CO gas concentration emitted from the vehicle and ultrasonic sensor is used to sense the level of vehicle fuel. In case of abnormal conditions an initial warning is given to the driver with the help of LCD display and later the same information is transferred to the users mobile through an android application. This is done with the help of Arduino Controller that is incorporated in the vehicle. The Arduino Controller is used to transfer the information from the sensors to the commuter. The main aim of this paper is to stabilize all automobile tyres with ideal pressure, pollutant free environment, achieve satisfactory fuel efficiency and construct an affordable system

1.2 Background

In today's scenario we are facing a big problem which is pollution. Not India or only Indian people facing this problem. Our whole world faces this problem of pollution. various sign languages across the world. The sign language used at a particular place depends on the culture and spoken language at that place. It consists of both word level gestures and finger spelling.

But here we are discussing the harmful effects of air pollution and the solution to air pollution.

The level of pollution is increasing day by day due to factors like industries, urbanization, increasing in population, increasing in use of a vehicle which can affect human health. In the Internet Of Things based Air Pollution Monitoring, system monitors Air quality from the above web server using the internet. When air quality goes down it triggers an alarm. Air quality goes down when enough amount of harmful gases present in the air like carbon dioxide, smoke, alcohol, benzene, NH_3, and NO_x. The air quality will be shown in Parts per million on the LCD and as well as on webpage so that air pollution can be monitored very easily. The system uses MQ135 and MQ6 sensor for monitoring Air Quality. It measures their amount exactly and finds out harmful gases.

Headlight intensity of vehicles poses a great danger during night travel. The drivers of most vehicles use high bright beam while driving at night. This causes inconvenience for the person travelling from the opposite direction. To avoid such incidents. The proposed system can be demonstrated with the help of two vehicles where the high beam of vehicle can be controlled with help of other car coming in opposite direction and vice versa using LDR sensor

This work of Fuel Monitoring System is an initial step for better fuel management and also becomes the scope of our work. The data collection with sensors and also by implementing the micro controller is done at different speed range and also with different load condition. Based on the inference from the collected data suggestions are made for better utilization of the fuel. Equation has been developed between the economic factor and its influencing factors like load and speed. In future we hope that this engine performance monitoring will be highly helpful for automation.

Security in travel is primary concern for everyone. This paper design a compact system to monitor the tire pressure, level of fuel in the tank, engine oil life and detect the pollutants in the vehicle which could be assembled in the vehicle itself. Tremendous innovations have been made in the technology but still nothing significant is achieved from it. This idea employs pressure sensor to monitor the tyre pressure, the CO_2 sensor to sense the CO gas concentration emitted from the vehicle and water level sensor is used to sense the level of vehicle fuel.

1.3 Project specification

The high Beam light of the headlights used by them. To avoid such situations, the driver must switch his Vehicles headlight to lower beam to see what's ahead.

The fuel monitoring system too faces such issues, while a vehicle is passing through an inclined plane. The fuel level seems to be changing abruptly. Recently, many incidents of fuel theft were reported at many fuel pumps, this system helps one to be aware of such thefts and to avoid them.

Also, while travelling in hot regions, situations arise when the wheel pressure shoots up to a great extent because of the increase in temperature. And due to the increase in pressure there are high chances of tire burst. This might lead to fatal accidents.

Air pollution is a major contributor for global warming which is harmful for us and our planet. Many vehicles running through don't follow the norms and regulations regarding pollution control. Thus the constitution of carbon monoxide from vehicles increases which in results into deadly diseases and environmental conditions.

Chapter 2

LITERATURE SURVEY

Sr. No.	Title of the Paper	Year of Publication	Authors	Methodology	Conclusion
1	IoT Based Air Pollution 6Monitoring System using Arduino	2019	Monika Singh1, Misha Kumari2, Pradeep Kumar Chauhan3	In today's scenario we are facing a big problem which is pollution. Not India or only Indian people facing this problem. Our whole world faces this problem of pollution. Pollution is of many types like air pollution, water pollution, noise pollution,	The air of the environment is a monitor with the help of the system by using Arduino microcontroller, IoT Technology has introduced a system which improves the quality of air. Internet of Things is the technology which amplifies the

				nuclear pollution, etc. But here we are discussing the harmful effects of air pollution and the solution to air pollution. The level of pollution increasing day by day. The level of pollution is increasing day by day due to factors like industries, urbanization, increasing in population, increasing in use of a vehicle which can affect human health. In the Internet Of Things based Air Pollution Monitoring, system monitors Air quality from the above web	monitoring process and various side of the environment such as air quality monitoring issue introduced in this paper. Here, we use two types of sensor which are MQ135 and MQ6 gas sensor gives the senses of different type of dangerous gas and harmful gas. Arduino is the main component of this project and the entire process is controlled by Arduino. Wi-Fi module is the hardware which connects the whole process to the internet and LCD is used for the visual

				server using the internet.	Output. But there are some problems which we can’t rectify in our paper, Firstly it requires high-speed internet connectivity and continuous power supply.
2	Automated Headlight Intensity Control and Obstacle Alerting System	2018	Arpita K , Akhila M Jain, Avi Kumar R	The proposed system can be demonstrated with the help of two vehicles where the high beam of vehicle can be controlled with help of other car coming in opposite direction and vice versa using LDR sensor and zigbee communication which avoid the accidents to greater extent. . We	Glare during driving is a serious problem for drivers. This is caused due to the sudden exposure of our eyes to a very bright light; the bright headlights of vehicles in this case. This causes a temporary blindness called the Troxler effect. Eventually this becomes the major reason for night accidents.

				are designing a prototype of automatic headlight intensity control system and expected to dim the headlight to avoid this glare. This beam causes a temporary blindness to a person resulting in road accidents during the night. This automatically switches the high beam into low beam thus reducing the glare effect by sensing the approaching vehicle. This model concept eliminates the requirement of manual switch by the driver which is not done at all	The driver should actually turn down the bright lights immediately to avoid glare to the other person which is not happening. Hence, is the idea for the design and development of a prototype circuit called the automatic headlight dimmer. It gives the driver to use high beam light when required. But it automatically switches the headlight to low beam when it senses a vehicle approaching from the opposite side. Thus the implementation of this device in every

				time.	vehicle in future will not only avoid accidents but also provide a safe and a comfortable driving.
3	FUEL MONITORING SYSTEM FOR FUEL MANAGEMENT	2017	Mr.Senthil kumar.R1,Ganapathi.M2, Arunkumar.D3, Goutham.G4,Karthick.M5	The focus of the work is in line towards the future development of automobile system, wherein vehicles will be operated with Global Positioning System. We developed a system to find the factor for fuel consuming with on-time reading in the monitor and also this system suggests the driver to use the fuel optimally by regulating the speed of	In future development the data are stored with the big data so it can be easily accessible for every user, so the artificial intelligent can operate every vehicle without the human support. The work can be extended in this aspect.

				vehicle. Two separate petrol engines are used for the analyses. One engine is placed with two-wheeler and another with a four-wheeler. This work of Fuel Monitoring System is an initial step for better fuel management and also becomes the scope of our work.	
4	A SMART MONITORING SYSTEM IN VEHICLES	2018	1Kavitha.N, 2Shakthipriya.P, 3Sivakannan S, 4Greeger Varcky Peter, 5Ragul K, 6Hamlyn Joy	the CO2 sensor to sense the CO gas concentration emitted from the vehicle and ultrasonic sensor is used to sense the level of vehicle fuel. In case of abnormal conditions an initial	The Smart vehicle monitoring System would be definitely exploding as a new product in the automobile supplier industry as such a product does not currently installed for majority of

				warning is given to the driver with the help of LCD display and later the same information is transferred to the users mobile through an android application. This is done with the help of Arduino Controller that is incorporated in the vehicle. The Arduino Controller is used to transfer the information from the sensors to the commuter. The main aim of this paper is to stabilize all automobile tyres with ideal pressure, pollutant free	passenger automobiles, hence the market conditions would be favorable to release such a system. It specially satisfies the user requirement by maintaining ideal tire pressure for under inflated tires.

				environment, achieve satisfactory fuel efficiency and construct an affordable system.	
5					

Table 2.1.1: Literature Survey

Summary of literature survey

From literature survey we have understood that gesture A literature review is a survey of scholarly sources (such as books, journal articles, and theses) related to a specific topic or research question. It is often written as part of a thesis, dissertation, or research paper, in order to situate your work in relation to existing knowledge

In this survey we are implement a new system which include the new technology , this technology is very useful for every all piactions

Chapter 3

METHODOLOGY

3.1 Block diagram

The Block Diagram for the system can be given as:

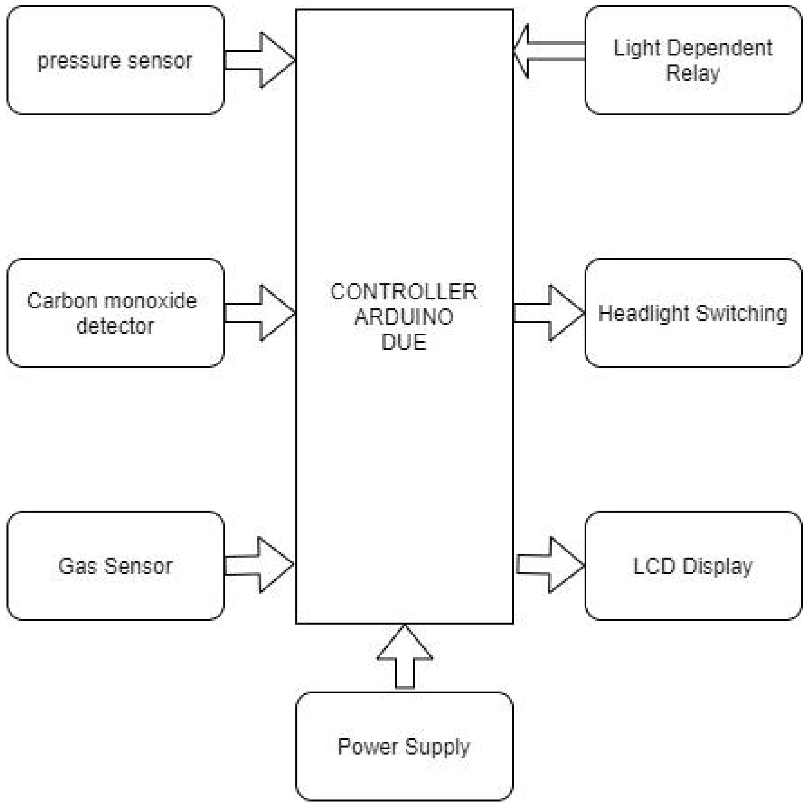


Fig 3.1.1: Block Diagram

3.2 Block diagram components

1) Power supply

2) Controller

3) Pressure Sensor

4) Carbon Monoxide Detector

5) Gas sensor

6) LCD

4) LDR

5) Headlight Switching

3.3 Block Diagram Explanation

When the power supply is given to the circuit the we check the level of fuel as per monitoring then we detect the

- Anti-theft Fuel Tank.
- Vehicular Pollution Monitoring System.
- Switching Lamp.
- Tire Pressure Sensing

Arduino UNO

Fig 3.3.1. Arduino UNO

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino. The board is equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (shields) and other circuits.[1] The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts. It is similar to the Arduino Nano and Leonardo. The hardware reference design is distributed under a Creative Commons Attribution Share-Alike 2.5 license and is available on the Arduino website. Layout and production files for some versions of the hardware are also available.

The word "uno" means "one" in Italian and was chosen to mark the initial release of Arduino Software. The Uno board is the first in a series of USB-based Arduino boards; it and version 1.0 of the Arduino IDE were the reference versions of Arduino, which have now evolved to newer releases. The ATmega328 on the board comes preprogrammed with a bootloader that allows uploading new code to it without the use of an external hardware programmer.

While the Uno communicates using the original STK500 protocol, it differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it uses the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by bootloader

SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically.External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- 5V. The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.
- 3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- GND. Ground pins.

Pressure Sensor :

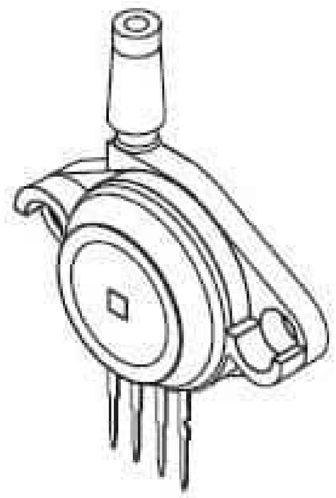


Fig 3.3.2. Pressure Sensor

The MPX5700GP is a single-port integrated silicon Pressure Sensor features on-chip signal conditioned, temperature compensated and calibrated. The MPX5700 series piezoresistive transducer is a state-of-the-art monolithic silicon pressure sensor designed for a wide range of applications, but particularly those employing a microcontroller or microprocessor with A/D inputs. This patented, single element transducer combines advanced micromachining techniques, thin-film metallization and bipolar processing to provide an accurate, high level analogue output signal that is proportional to the applied pressure. Ideally suited for microprocessor or microcontroller-based systems.

- Patented silicon shear stress strain gauge
- Durable epoxy unibody element
- Available in gauge configuration

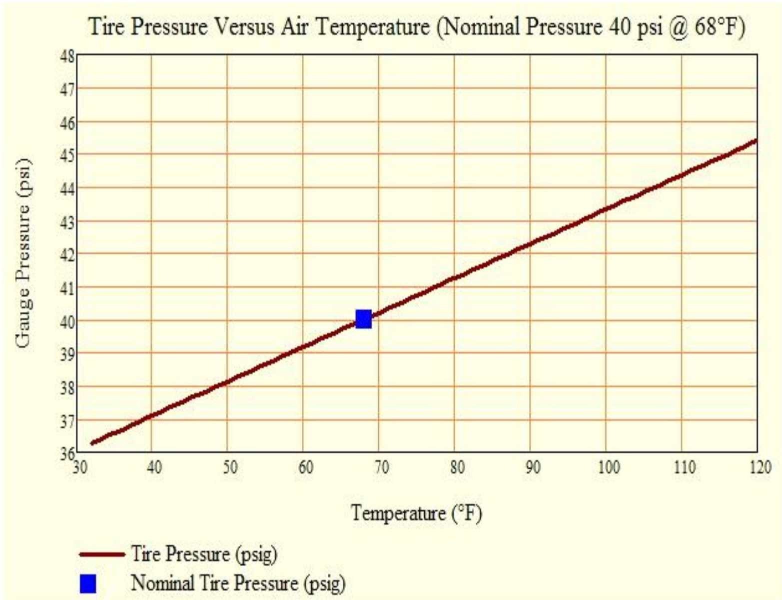
Pressure Monitoring System:

The MPX5700GP is selected for the purpose. The MPX5700GP sense pressure from 0-700kpa (0-101.526 psi).

The maximum pressure wheel can sustain is around 44psi.

The allowable pressure in bike and car it's considered is 30-35 psi.

Using MPX5700GP, the pressure increased by temperature can be measured and tire burst condition can be avoided .Pressure drop can be calculated in tire and driver can be warned about tire puncture according to the data.



Applications

Computers & Computer Peripherals

Carbon Monoxide detector:

Fig 3.3.3. Carbon Monoxide Detector

This is a simple-to-use carbon oxide (CO) sensor, suitable for sensing CO concentrations in the air. The MQ-7 can detect CO-gas concentrations anywhere from 10 to 500ppm.

This sensor has a high sensitivity and fast response time. The sensor's output is an analog resistance. The drive circuit is very simple; all you need to do is power the heater coil with 5V, add a load resistance, and connect the output to an ADC.

This sensor comes in a package similar to our MQ-3 alcohol sensor, and can be used with the breakout board below.

For the pollution control we have used a carbon monoxide sensor (MQ-7).

In India allowable pollution in vehicles is up to 100ppm.Using mq7 data is collected and converted into digital using ADC. Controller detects collected data with predefined data, it it exceeds the limits using buzzer it is indicated to the deiver.

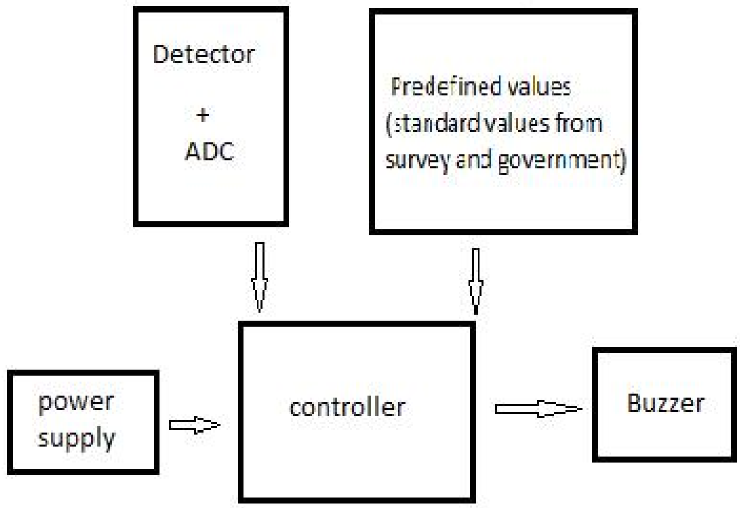


Fig.3.3.4 System Architecture Carbon Monoxide Detector

LDR(Light Dependent Resistor):

Fig. 3.3.5 Light Dependent Resistor

Light dependent resistors, LDRs are often used in electronic circuit designs where it is necessary to detect the presence or the level of light.

These electronic components can be described by a variety of names from light dependent resistor, LDR, or even photo cell, photocell or photoconductor.

Although other electronic components such as photodiodes or photo-transistor can also be used, LDRs or photo-resistors are a particularly convenient to use in many electronic circuit designs. They provide large change in resistance for changes in light level.

In view of their low cost, ease of manufacture, and their ease of use, LDRs have been used in a variety of different applications. At one time LDRs were used in photographic light meters, and even now they are still used in a variety of applications where it is necessary to detect light levels.

A light dependent resistor is an electronic component that is sensitive to light. When light falls upon it, then the resistance changes. Values of the resistance of the LDR may change over many orders of magnitude the value of the resistance falling as the level of light increases.

It is not uncommon for the values of resistance of an LDR to be several mega ohms in darkness and then to fall to a few hundred ohms in bright light. With such a wide variation in resistance, LDRs are easy to use and there are many LDR circuits available. The sensitivity of light dependent resistors also varies with the wavelength of the incident light.

Application

LDR are found in many different applications and can be seen in many different electronic circuit designs. They have a very simple structure and they are low cost and rugged devices. They are widely used in many different items of electronic equipment and circuit designs including photographic light meters, fire or smoke alarms as well as burglar alarms, and they also find uses as lighting controls for street lamps.

Extrinsic LDR are providing sensitivity for longer wavelengths and as a result they are popular in various electronic circuit designs as info-red LDR. LDR can also be used to detect nuclear radiation.

Gas sensor:

Fig.3.3.6 Gas sensor

A gas sensor is a device which detects the presence or concentration of gases in the atmosphere. Based on the concentration of the gas the sensor produces a corresponding potential difference by changing the resistance of the material inside the sensor, which can be measured as output voltage. Based on this voltage value the type and concentration of the gas can be estimated.

The type of gas the sensor could detect depends on the sensing material present inside the sensor. Normally these sensors are available as modules with comparators as shown above. These comparators can be set for a particular threshold value of gas concentration. When the concentration of the gas exceeds this threshold the digital pin goes high. The analog pin can be used to measure the concentration of the gas.

Chapter 4

HARDWARE IMPLEMENTATION:

4.1 Circuit Diagram:

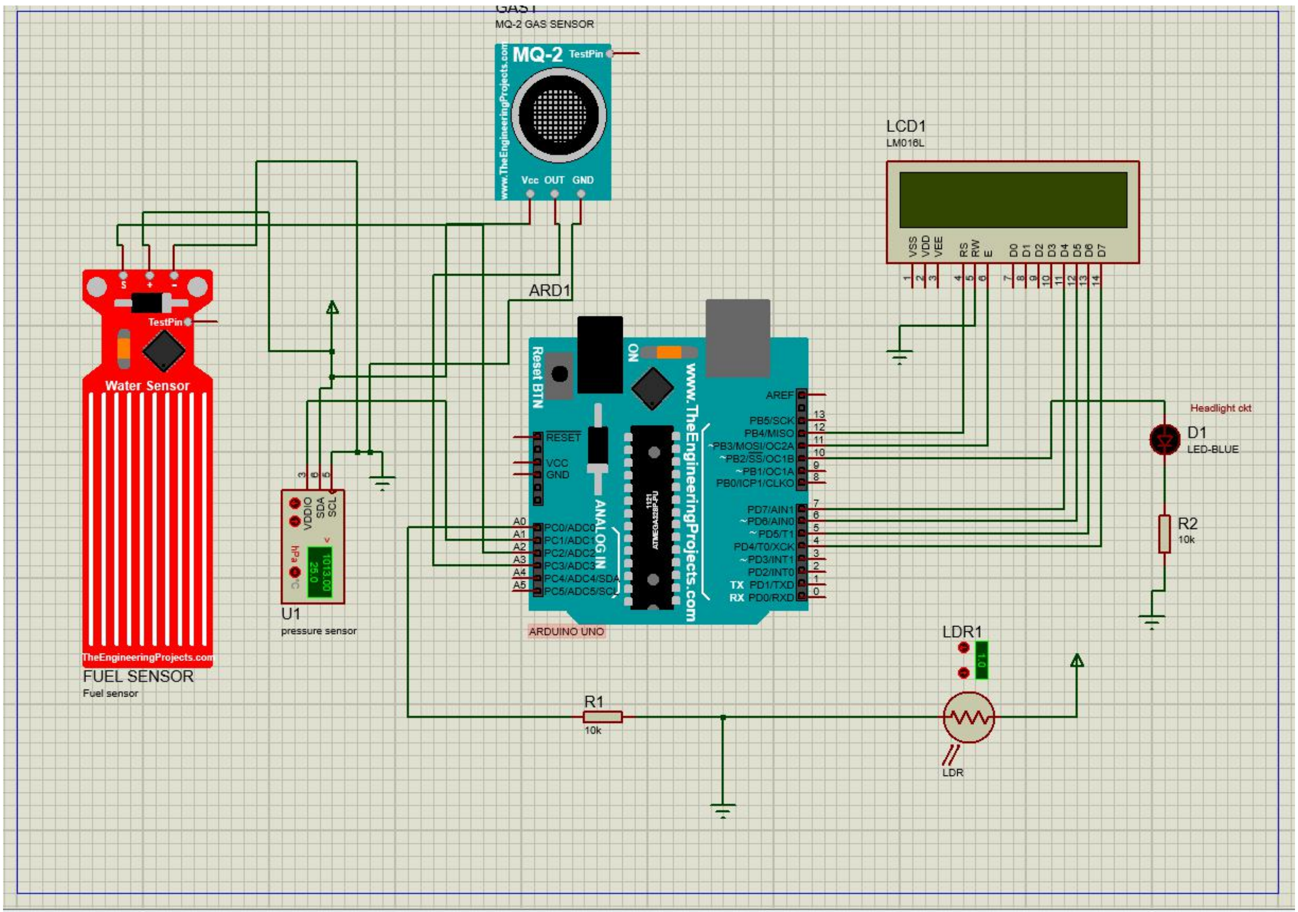


Fig 4.1.1: Circuit diagram

4.2 Hardware specifications:

- **Power supply**: Power supply of 5V is required.

B. Arduino UNO

Fig 4.2.1: Arduino UNO

- Microcontroller: Microchip ATmega328P [7]
- Operating Voltage: 5 Volts
- Input Voltage: 7 to 20 Volts
- Digital I/O Pins: 14 (of which 6 can provide PWM output)
- UART: 1
- I2C: 1
- SPPI: 1
- Analog Input Pins: 6
- DC Current per I/O Pin: 20 mA
- DC Current for 3.3V Pin: 50 mA
- Flash Memory: 32 KB of which 0.5 KB used by bootloader

- SRAM: 2 KB
- EEPROM: 1 KB
- Clock Speed: 16 MHz
- Length: 68.6 mm
- Width: 53.4 mm

C. Liquid crystal display(16x2)

Fig 4.2.2: Liquid Crystal Display

Specifications

- Operating Voltage is 4.7V to 5.3V
- Current consumption is 1mA without backlight
- Alphanumeric LCD display module, meaning can display alphabets and numbers
- Consists of two rows and each row can print 16 characters.
- Each character is built by a 5×8-pixel box

- Can work on both 8-bit and 4-bit mode
- It can also display any custom generated characters
- Available in Green and Blue Backlight

The specifications of Camera which we are to used are

- Operating Voltage is 4.7V to 5.3V
- Current consumption is 1mA without backlight
- Alphanumeric LCD display module, meaning can display alphabets and numbers
- Consists of two rows and each row can print 16 characters.
- Each character is built by a 5×8-pixel box

D. Gas Sensor

Fig 4.2.3: Gas sensor

- Displays the Gas sensor.

The specifications of Gas sensors are :

2.Vcc – Power supply

3.GND – Power supply

4.Digital output – This pin gives an output either in logical high or logical low (0 or 1) that means it displays the presence of any toxic or combustible gases near the sensor.

5.Analog output – This pin gives an output continuous in voltage which varies based on the concentration of gas that is applied to the gas sensor.

E. Light Dependent Resistor

1. **Resistance** : 400ohm to 400Kohm

2. **Normal resistance variation**: 1Kohm to 10Kohm (in the robots which i used for line

following for identifying black and white strips)

- **Sensitivity**: about 3msec(Sensitivity is defined as the time taken for output to change when

input changes,sensitivity of LDR's is in milliseconds. This is the best sensitivity obtained to

me).Voltage

- **Ratings**: I used it on 3V,5V and 12V

Fig 4.2.4: Light Dependent Resistor

D. Pressure Sensor

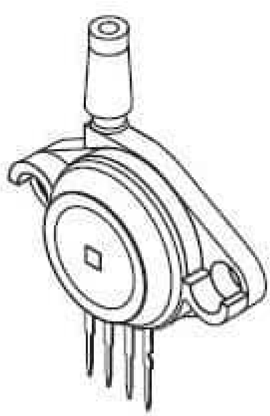


Fig 4.2.5. Pressure Sensor

- Accuracy (% Error) (Max) (%) - 2.5
- Ambient Operating Temperature (Min to Max) (°C) - -40 to 125
- Level of Integration – integrated
- Output Type – analog
- Porting - side port

- Pressure Range Min-max (MIN-MAX) (kPa) - 0.0 - 700.0
- Pressure Rating (MAX) (psi) – 102
- Supply voltage [min] (V) - 4.75

Chapter 5

Software Implementation:

Overview

The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features an ATmega16U2 programmed as a USB-to-serial converter. This auxiliary microcontroller has its own USB bootloader, which allows advanced users to reprogram it.

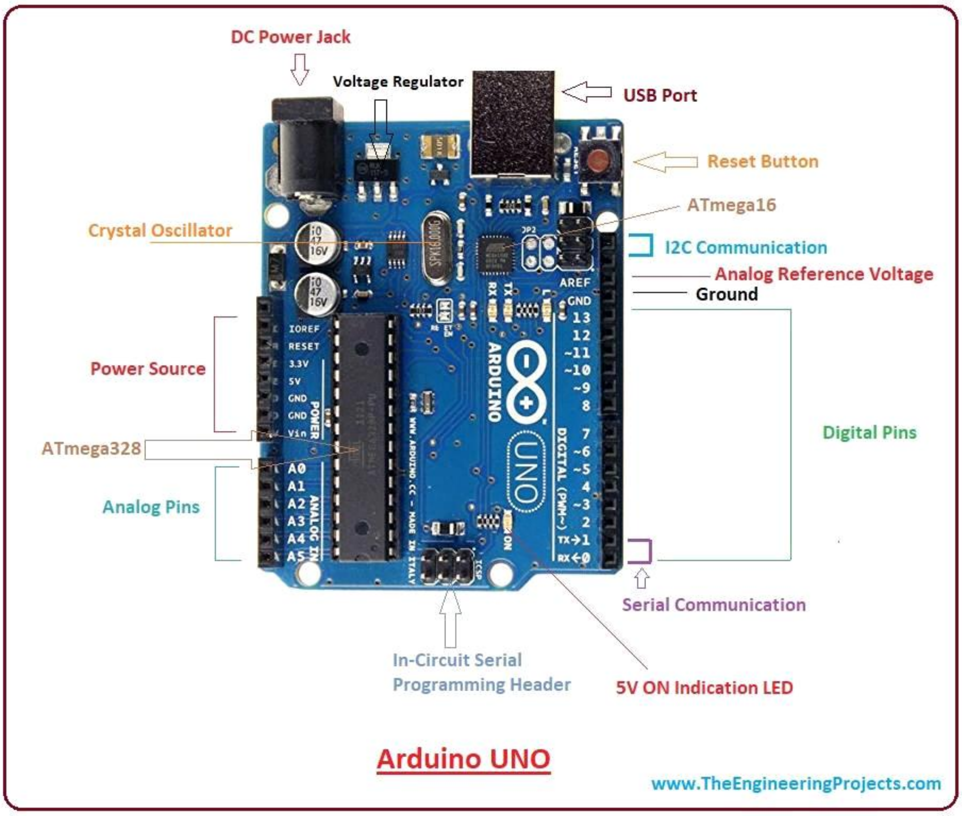
This is the 3rd revision of the Uno (R3), which has a number of changes:

- The USB controller chip changed from ATmega8U2 (8K flash) to ATmega16U2 (16K flash). This does not increase the flash or RAM available to sketches.

- Three new pins were added, all of which are duplicates of previous pins. The I2C pins (A4, A5) have been also been brought out on the side of the board near AREF. There is a IOREF pin next to the reset pin, which is a duplicate of the 5V pin.

- The reset button is now next to the USB connector, making it more accessible when a shield is used.

- Arduino Uno is a microcontroller board developed by Arduino.cc which is an open-source electronics platform mainly based on AVR microcontroller Atmega328.
- First Arduino project was started in Interaction Design Institute Ivrea in 2003 by David Cuartielles and Massimo Banzi with the intention of providing a cheap and flexible way to students and professional for controlling a number of devices in the real world.
- The current version of Arduino Uno comes with USB interface, 6 analog input pins, 14 I/O digital ports that are used to connect with external electronic circuits. Out of 14 I/O ports, 6 pins can be used for PWM output.
- It allows the designers to control and sense the external electronic devices in the real world.
- You can download the Arduino UNO datasheet bu clicking below button:



- This board comes with all the features required to run the controller and can be directly connected to the computer through USB cable that is used to transfer the code to the controller using IDE (Integrated Development Environment) software, mainly developed to program Arduino. IDE is equally compatible with Windows, MAC or Linux Systems, however, Windows is preferable to use. Programming languages like C and C++ are used in IDE.

- Apart from USB, battery or AC to DC adopter can also be used to power the board.

Chapter 6

ADVANTAGES AND APPLICATIONS

7.1 Advantages

- Tire pressure sensor- Continuously checks pressure and temperature of wheel and alerts the driver.
- Gas sensor is one which comes handy in applications where we have to detect the variation in the concentration of toxic gases in order to maintain the system safe and avoid/caution any unexpected threats.
- Switching lamp- Quick switching headlights gives a better and safe night driving experience.
- Vehicle Pollution monitoring system- A little modification in the system will help the government in tracking polluting vehicles.

- **Applications**

1. **Gas monitoring system :-**

There are many applications for toxic, flammable, and asphyxiant gas detection.
Manufacturing processes around the world increasingly involve the manufacturing and byproduct of these types of gases.
Workers and residents nearby are in danger of exposure and require reliable gas detection to keep them safe.
DOD Technologies is a global gas detection provider in a wide array of industries.
Our service and technical knowledge can provide you with top-of-the-line safety and gas detection solutions.

2. **Automatic Headlight switching system :-**

They allow for safer drive.

They avoid blinding other vehicles or pedestrians.

They improve driving in adverse weather.

- **Real time tire pressure monitoring system:-**

Check tire pressure continuously.

Alerts if pressure crosses threshold limit.

Detects punctures in tires also.

- **Vehicle pollution monitoring system :-**

Alerts if the vehicle is emitting greater quantity of carbon monoxide.

A major factor contributing to a greener environment.

Chapter 7

EXPECTED CONCLUSION

We have developed a real time embedded system by using various electronic sensors, actuators which would solve the safety issues of vehicles while driving on highways, using gas sensor shows leakage of gas, using LDR system accidents can be reduce using headlight switching and by MQ7 sensor pollution in vehicles can be detected using buzzer.

Arduino is the main component of this project and the entire process is controlled by Arduino. LCD is used for the visual Output automatic headlight dimmer. It gives the driver to use high beam light when required. But it automatically switches the headlight to low beam when it senses a vehicle approaching from the opposite side.

Thus the implementation of this device in every vehicle in future will not only avoid accidents but also provide a safe and a comfortable driving.

REFRENCES

[1] **IoT Based Air Pollution 6Monitoring System using Arduino**

Monika Singh1, Misha Kumari2, Pradeep Kumar Chauhan3

1,2Department of CSE, Bharat Institute of Technology, Meerut, Uttar Pradesh, India

3Assistant Professor, Dept. of CSE, Bharat Institute of Technology, Meerut, Uttar Pradesh,

India .

[2] **Automated Headlight Intensity Control and Obstacle Alerting System**

Arpita K , Akhila M Jain, Avi Kumar R Students, BE, Department of TCE, GSSSIETW,

Mysuru, Karnataka, India, Assistant Professor, Department of TCE, GSSSIETW, Mysuru, Karnataka, India.

[3] **Fuel Monitoring System For Fuel Managemant**

Mr.Senthil kumar.R1,Ganapathi.M2, Arunkumar.D3, Goutham.G4,Karthick.M5,

[4] **A Smart Monitoring System In Vehicles**

Kavitha.N, 2Shakthipriya.P, 3Sivakannan S, 4Greeger Varcky Peter, 5Ragul K, 6Hamlyn

Joy