

GAS CYLINDER SECURITY ALERT SYSTEM USING IOT

Submitted in partial fulfilment of the requirements for the award of
Bachelor of Engineering degree in Electronics and Communication Engineering

By

ALLURU HAREESH REDDY (37130020)

ADIVISHNU LOKESHWARA RAO (37130008)



**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

SCHOOL OF ELECTRICAL AND ELECTRONICS

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade “A” by NAAC

JEPPIAAR NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600 119

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **ALLURU HAREESH REDDY (37130020)** and **ADIVISHNU LOKESHWARA RAO (37130008)** who carried out the project entitled **GAS CYLINDER SECURITY ALERT SYSTEM USING IOT** under my supervision from September 2020 to April 2021.

Internal Guide

Mrs. L. MAGTHELIN THERASE M.E.,

Head of the Department

Dr. T. RAVI M.E., Ph.D.,

Submitted for Presentation held on_____

Internal Examiner

External Examiner

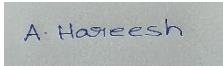
DECLARATION

We, **ALLURU HAREESH REDDY (37130020)** and **ADIVISHNU LOKESHWARA RAO (37130008)** hereby declare that the Project Report entitled “**GAS CYLINDER SECURITY ALERT SYSTEM USING IOT**” done by us under the guidance of **Mrs. L. Magthelin Therase M.E.**, at Sathyabama Institute of Science and Technology is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in Electronics and Communication Engineering.

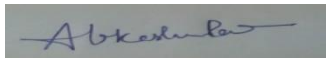
DATE : 19-04-2021

PLACE : CHENNAI

1.

A. Hareesh

2.

Adivishnu Rao

SIGNATURE OF THE CANDIDATES

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We convey our thanks to **Dr. N. M. Nandhitha, M.E., Ph.D.**, Dean, School of Electrical and Electronics and **Dr. T Ravi, M.E., Ph.D.**, Head of the Department, Dept. of Electronics and Communication Engineering for providing us necessary support and details at the right time during the progressive reviews.

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ABSTRACT

At any given point, there are billions of devices connected on the web providing a social cloud beyond imagination. However, the web isn't just limited to computers and mobiles. It's now present in devices like our cars, houses etc. The web of Things (IOT) could be a fast developing area which features a huge scope. Its primary aim is to connect even the foremost mundane objects to supply a cushty lifestyle. LPG chambers are necessary for our homes now. Our kitchens are loaded down with these chambers which help us to make delightful food. However it might be hazardous and perilous. Constant vigilance is required in helping us to reduce the risks of this device. The first objective of the this task is to supply a novel methods for securely recognizing any breakdown of a compressed establishment and to monitor collection of ignitable gases all together that harm and blast on account of such an aggregation of gases is forestalled. The ARDUINO is employed to observe the cylinder and also the readings are passed all the way down to the server. This Project proposed a cylinder level, temperature level and physical phenomenon. The conclusions are analysed and informed to the user via the app then further action can be taken.

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CHAPTER 1

INTRODUCTION

There are approximately 30 cr chamber associations inside our country during where for the most part 40% of individuals. The gas spillage discovery framework incorporates different methodology that overarching framework rings an alert that is particularly used to recognize the Gas spilled inside a house and mechanical purposes. The objective of proposed project is to ceaselessly screen the degree of chamber and at whatever point it arrives at the low level it will consequently text a message alarm to the u ser.

The structure similarly planned to recognize fluid oil gas with gas sensing gadget, gathering of gas in the encompassing air. The temperature of the environmental factors arrives at an edge esteem, at that point the fan is turned on, and messages will be ship off the client. Also, a worldwide situating framework will be fitted to the framework to track down the specific area of the chamber. This area along with the purchaser code are checked by the gas office and by this approval a new cylinder will be conveyed to its area by the gas office. Which helps both the client and gas organization to build up a smooth assistance between them.

CHAPTER 2

LITERATURE SURVEY

1. Arduino Based LPG gas Observing and Programmed Chamber booking with Ready Framework

Author: Naresh Naik, Siva Nagendra Reddy, S.Nanda Kishore .

There's a speedy improvement in development which affecting the human life in a couple of viewpoints as a result of quick headway in a couple of fields yet we really should accept that advancement such we can make human life more easier to check. In our Nation it's unbelievable to make LPG through Lines to each and each home as making of LPG is essentially unreasonably short. nowadays we are having a system Advance LPG chamber booking through IVRS or online which is by and large difficult for the untalented and involved plan people to book the LPG chamber earlier. Another Significant issue LPG chamber customers defying is "customers may not aware of status of LPG gas fulfillment" makes fundamentally greater delay in booking the chamber which is abnormal a huge part of the days.

2. Air Quality Checking Framework

Author: Boyanka Nikolova, Marin B. Marinov, Georgi Todorov Nikolov.

Recognition of low centralization of contamination, similar to tobacco smoke, cooking exhaust, and so on is practical with the blend of an air quality sensor and information securing framework. In present it's introduced a methodology for plan and execution of air quality checking framework upheld tin dioxide gas sensor, incorporated temperature and stickiness sensors, versatile secluded information securing framework and graphical programing language. An interjection strategy decreasing impact from temperature and stickiness is typically suggested.

3. LPG Gas Checking Framework

Author: ARUN RAJ, ATHIRA VISWANATHAN.

The appearance of LPG spillage checking framework is proposed for wellbeing security in kitchen. The mishaps on account of the blast of LPG is expanding now days which turned into a threaten to human existence. During this framework, the gas sensor identifies the spillage of the LPG and caution the proprietor about the break by sending SMS to his own portable and actuate the alert. In extra to the current, the framework persistently screens the degree of the LPG inside the chamber utilizing load sensor and if the degree is beneath as far as possible the framework advise them by SMS and furthermore by the LCD show. So the client have a pondered the maximum time the LPG keeps going.

4. Smart Lpg Gas Checking

Author: M.Anitha, A.Reethika Shree, R.Manjula devi.

Next primary issue confronting clients of LPG chamber is "They are uninformed of the situation with finishing LPG gas" which makes booking the chamber significantly more tedious, which is for the most part awkward. Hence, a large portion of the analphabets can't finish the booking, and generally, these telephone line phones are besides not reachable due to the packed calls or, more than likely phones that are not working a result of about procedural issues .

CHAPTER 3

AIM & SCOPE

The given proposed system is finished by using a Nodemcu based microcontroller. The level monitor sensor is employed to observe the extent of the cylinder. The Pressure factor sensor is used to see the pressuring factor of the chamber gas regulator. Temperature sensor is utilized to notice the temperature level of the gas stockpiling place. These data are analyzed by using Arduino and send to data the processor that sensor data send to the cloud. If we set the edge level for each sensor temperature level, pressure is increased means it automatically sends the alert message to the person likewise because the Gmail alert. The sensor data will be viewed in the computer and mobile also.

CHAPTER 4

MATERIALS AND METHODS

4.1 EXISTING SYSTEM

This existing system focusing only on safety framework configuration comprises of two principle modules: Detection and transmission module, and furthermore the Receiving module. The Detection and sending module distinguish the discovery of progress of gas fixation utilizing a unique detecting circuit worked for this reason. This module is checks if an adjustment in convergence of gas has surpassed a particular foreordained edge. In the event that the sensor is recognizes an adjustment in gas fixation, it actuates and general media caution and sends a proof to the collector module. Beneficiary module goes about as a portable alert gadget to allow the versatility inside the house premises. This method was tried utilizing LPG and consequently, the caution was initiated because of progress in focus.

LPG gas spillage to avoid fire mishaps giving a security where security is a fundamental issue. The structure recognizes the spillage of the lpg gas by utilizing gas sensor and alerts the customer about the gas spillage by sending a caution message. This endeavor uses the gsm to alert the customer with the gas spillage through message.

4.2 BLOCK DIAGRAM

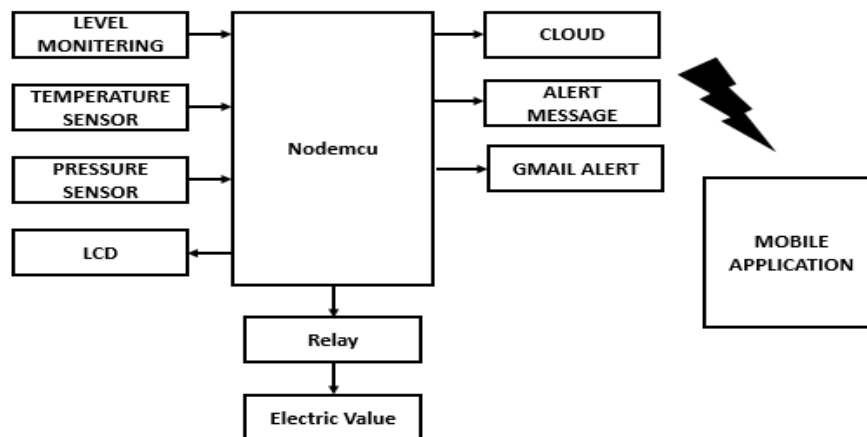


Fig 4.1 Block diagram of overall project

4.3 HARDWARE USED

Nodemcu

Level monitoring

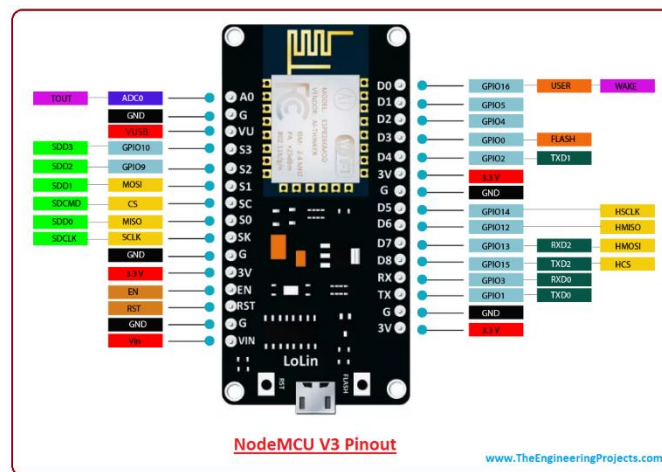
Temperature sensor

Pressure sensor

Relay

Electric Value

4.3.1 NODEMCU



library from Contiki to the ESP8266 SoC stage, and submitted to Nodemcu project, then Nodemcu got prepared to help the MQTT IoT show, using Lua to get admission to the MQTT seller. Another central supersede got made on, when Devsaurus ported the u8glib to Nodemcu project, enabling Nodemcu to without burden power LCD, Screen, OLED, even VGA shows. ESP8266 Arduino Center As Arduino. CC started winding up being new MCU get-togethers kept up non-AVR processors a piece really like the ARM/SAM MCU and applied in the Arduino Due, they expected to run the Arduino IDE all together that it'd be shockingly smooth to extrude the IDE to help alternate toolchains to permit Arduino C/C++ to be assembled for those new processors. A "center" is that the blend of programming program added substances needed with the guide of utilizing the Board Chief and furthermore the Arduino IDE to collect an Arduino C/C++ supply record for the objective MCU's device language. Some ESP8266 fans progressed an Arduino place for the ESP8266 Wi-Fi SoC, comprehensively known as the "ESP8266 Community for the Arduino IDE ", This has ended up range one programming program improvement stage for the several ESP8266-basically based absolutely modules and improvement discussions, including Nodemcu.

Introduction

Nodemcu is one of the open sourced LUA based gadget created for ESP based wi-fi technology. By investigating usefulness with ESP based chip, Nodemcu hardware constructed with ESP based methodology chip, Nodemcu hardware constructed with ESP based chip Development kit.

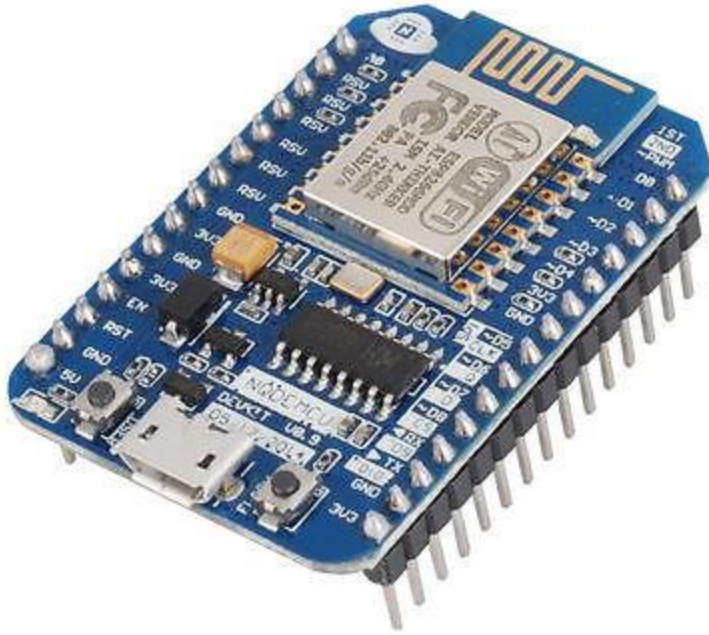


Fig 4.3 Nodemcu Improvement Board/unit

Nodemcu board is one of the contraptions, their firmware is free for adjust/change/gather. Nodemcu Advancement board join ESP based wi-fi enabled chip. The ESP chip may be a straightforwardness Wi-Fi chip made with TCP/IP show. To gain extra info on ESP chip, will need to refer ESP based Wi-Fi chipset also exists second version opened for Nodemcu Advancement Unit .

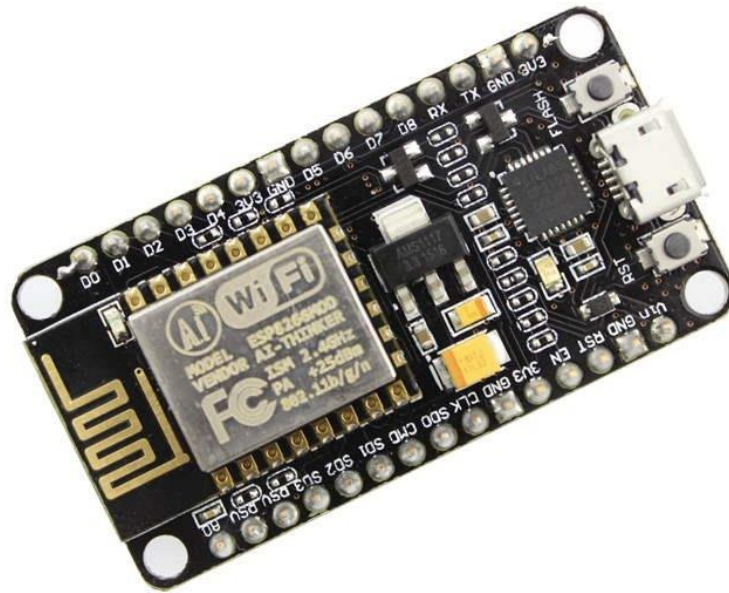


Fig 4.4 Nodemcu Advancement Board/unit

To gain extra knowledge on Nodemcu Sheets open in field insinuate Nodemcu Advancement Sheets Nodemcu advancement Pack has Arduino like Simple and Computerized pins in its hardware kit. The kit maintains successive correspondence Using such consecutive shows it can interface it with consecutive

Nodemcu Improvement kit is incorporated with wi-fi technology capacity, straightforward pin, progressed pins and successive correspondence shows. Nodemcu for IoT applications first we would like to understand a way to deal with install Nodemcu hardware in Nodemcu Advancement Sheets.

Code injection for Nodemcu

Injection of code for nodemcu will be processed by using an IDE called Arduino IDE. IDE should be installed in Pc/Laptop. Generally the connection between Pc/Laptop and to the Hardware kit will be established by using a usb cable, but in this project we are using a wi-fi chipset no need of connecting with cable directly data can be injected to the hardware kit by pairing with wi-fi methodology.

Arduino IDE based Nodemcu

Usage of nodemcu with Arduino ide is easy and it provides simple workspace while working with Arduino ide, nodemcu will be easily coded by using Arduino. Now a days Arduino is the free and open in the technical market. In the field iot Arduino ide plays a major role, there are lot of other ide's which provides data establishments between the hardware kit but Arduino is the fast and accurate ide.

In Arduino ide once a code is written ESP chip toolchain in establishment makes equal firmware record of code we made. Likewise, after we move it to Nodemcu then it will mark all Nodemcu hardware with as of late made combined firmware code. Believe it or not, it creates the entire firmware.

That is the clarification why Nodemcu not acknowledge further Lua contents/code after it's getting streaked by Arduino IDE. Subsequent to getting streaked by Arduino sketch/code it'll be no more Lua mediator and that we got mistake on the off chance that we endeavor to transfer Lua contents.

4.3.2 GAS SENSOR

In the present situation monitoring of leaked gases is very crucial as it comes under category of home safety management not only household purpose, there are lot of resources where they use cylinders and gas connections. When coming to large scale industries and some factories it causes a lot of damages to the properties as well human beings. Gas sensors are the key part of fire safety management in terms of gas explosions. These gas sensors work like a human nose which senses a very little gas also and immediately it responds and corresponding actions, in this way it will keep active all the time and data will be refreshed for every fraction of seconds. Whenever it feels any detection gas it will respond within a fraction of seconds and intimates the info to the central processing circuit to which the sensor is connected and through the central processing circuit it will intimate the user about gas leakage as a text message and buzzers an alarm. And it also shares the information to the gas providing service with gps location of the area where gas leakage occurred.



Fig 4.5 MQ – 2 Gas sensor

The gas sensor module is made up of a steel mesh type sheet covered at the top most surface of a gas sensor. The locator is used to current with partner leads. The external side of a gas sensor module consists of a steel organization, copper cutting ring and interfacing leads. The most raised part may be a chrome steel network which manages the going with:

1. Only vapourous components will be allowed to enter into internal part of a gas sensor
2. The outer surface layer secures the internal parts
3. Maintains a structure to overcome damages due to high temperatures and pressures
4. To protect the sensing element with over capacitized values the steel network is framed into two layers.

The connection leads are made up of thick material and are placed in the sensor inorder to provide a better connection between the circuit and sensing element and the heating factor of the sensor will be controlled with in the sensor. They are casted from copper with Tin plate moulded over it. This sensor consists of totally six leads in which Four of the leads (A, B, C, D) are for signal bringing and remaining two leads (1, 2) are for adjusting the warming level of the sensor. The pins are attached on a plane flattened basement which will easily fits with the partner connecting leads of the sensor.



Fig 4.6 Internal view of MQ-2 sensor

The unfilled device is built with ceramic which contains tin oxide as a covering. To grow the warming capability and tin oxide a terminated substrate is used, it is sensitive in the absorption of needed gas parts gets the job done. The leads responsible for warming related through Nickel-Chromium, outstanding conductive blend. Platinum wires are placed with the body of the sensor and Nickel-Chromium wires get along with its vacant plan.

All the wires of the various parts are placed inside the sensor, only Nickel-Chromium wires are placed inside the segment of the sensor. The mud mixed with tin dioxide on the will be placed at the covering top to absorb. The main aim of this sensor is to figure out the temperature in which the all the gas particles are ionized, by using nickel-chromium wire the dirt will be excluded and only finds the ionized gas which presents in the nearby areas, once the ionization done it will be carried out through the tin dioxide. All this process will be carried out by the central element of gas sensor which controls the working of the gas sensor.

4.3.3 PRESSURE SENSOR

Pressure sensor detects the real zones pressure where the sensor is put, assortment of gases or fluids. Pressing factor is an outflow of the force expected to frustrate a fluid from broadening, and is often communicated with respect to control per unit locale. Pressure sensor fills in as a transducer, it makes a sign as a part of the squeezing factor constrained. For the requirements of this substance, a particularly sign is electrical. BMP180 is one in all sensor of BMP arrangement. They are totally intended to quantify gas pressing factor or gas pressure. BMP180 could likewise be this sensor has a high exactness in the sense of client applications gas pressure is just the pushing pressure of air towards the outlet. The air has weight and any spot there's air its squeezing factor is felt. BMP180 sensor identifies that pressing factor and gives that information in cutting edge yield. Also the temperature impacts the squeezing factor by then we'd like temperature reimbursed pressure scrutinizing. To review, the BM180 also has extraordinary temperature sensor.



Fig 4.7 BMP 180 Pressure sensor

BMP180 Pin Configuration

BMP 180 consists of two modules that is one module with 5 pins , and another module with 4 pins. The difference pin between the two module is the 5 pin module has an +3.3V pin extra when compared to another module.

Pin Name	Description
VCC	Connected to +5V
GND	Connected to ground
SDA	Serial Data pin (12C interface)
SCL	Serial Clock pin (12C interface)
3.3V	If +5V is not present. Can power module by connecting +3.3V to this pin

TABLE 4.1 BMP180 Pin Description

BMP 180 Module Features

- Can measure temperature and altitude.
- Pressure range: 300 to 1100hpa.
- High realative accuracy of $\pm 0.12\text{hPa}$.
- Can work on low voltages.
- 3.4Mhz 12C interface.
- Low power consumption.
- Pressure conversion time:5msec.
- Portable size.

4.3.4 TEMPERATURE SENSOR

The DHT11 is a straightforward computerized temperature and moistness sensor with a low sticker price. It estimates the encompassing air with a capacitive stickiness sensor and a thermistor and yields an automated sign on the data pin It's not difficult to utilize, in any case, information assortment requires cautious planning. At regular intervals, You will get new information from it, so sensor readings can be as long as 2 seconds old while utilizing the Adafruit library. DHT11 has a temperature scope of 0 to 50

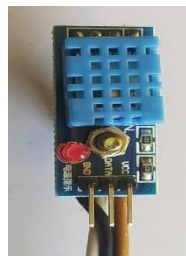


Fig 4.8 DHT 11 Temperature sensor

degrees Celsius also, a 2-degree precision. This sensor's moistness range is 20 to 80 percent, with a 5% accuracy. This sensor's testing rate is 1Hz. It gives one perusing each second, in other words DHT11 is a minimized gadget with a 3 to 5 volt working voltage. While figuring, the most noteworthy current utilized is 2.5mA. A 4.7K or 10K resistor is incorporated, which you can use as a pullup from the information pin to VCC.

Features

- Ultra low cost.
- 3 to 5V power and I/O.
- 2.5mA max current use during conversion
- Good for 20 – 80% humidity readings with 5% accuracy.
- Good for 0-50°C temperature readings $\pm 2^\circ\text{C}$ accuracy.
- No more than 1Hz sampling rate.
- Body size 15.5mm x 12mm x 5.5mm.
- 4 pins with 0.1 spacing.

4.3.5 RELAY

An exchange is a switch that is coordinated by power. An alluring field is made by current flowing through the circle of the exchange, which controls the switch and changes the contact between switches. This relay has two fold throw switches, so the twist current can be on or off. Moves the grant from one circuit to control second circuit which is independent of first circuit. A hand-off, for example, can be used to switch a 230V AC mains circuit from a low voltage battery circuit. There is no electrical association between the two circuits inside the exchange; the affiliation is appealing and mechanical. The twist of a hand-off passes a ton of current, commonly 30mA for a 12V exchange anyway up to 100mA for moves attempted to run at very low voltages. Many of the planned circuits (ICs) can not give this type of current, semiconductor are used to help the IC current to the higher worth required for the hand-off twist. Since the fundamental 555 clock IC's most limit yield current is 200mA, these contraptions may supply move twists clearly without upgrade.

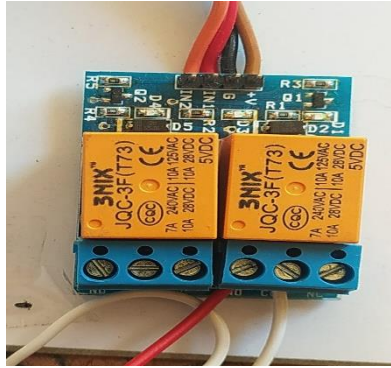


Fig 4.9 Relay

Moves are ordinarily SPDT or DPDT, anyway they may have significantly more switch contacts for example, moves with four game plans of changeover contacts are ordinary. While most exchanges are attempted to be mounted on a PCB, you can tie wires clearly to the pins in case you take care not to condense the hand-off's plastic case. The breathed life into picture depicts an exchange in help, complete with twist and switch contacts. Right when the twist is turned on, you can see a switch on the left being pulled in by fascination. The switch contacts are moved by this switch. The hand-off is DPDT because one social event of contacts (SPDT) is in the front facing region and another is behind them.

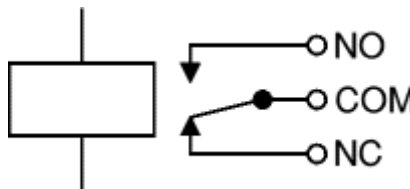


Fig 4.10 Block view of Relay

The relay's switch connections are usually labeled COM, NC and NO.

- **COM** = Common, always connect to this ,it is the moving part of the switch.
- **NC** = Normally Closed, COM is connected to this when the relay coil is **Off**.
- **NO** = Normally Open, COM is connected to this when the relay coil is **On**.

CHAPTER 5

INTERNET OF THINGS

5.1 BACKGROUND

The aim of the Future Internet is to create an infrastructure that allows people to have instant access to knowledge about the real world and its artefacts. Physical artefacts can be used in a variety of applications, including e-health, warehouse management, and so on. Different types of physical devices may be used in different application domains. Each physical system has its own set of standards that must be followed in order to communicate with it. A layered vision that can promote data access is needed to achieve the future Internet target. The Internet of Things (IoT) is a vision that seeks to use a layered architecture to link the virtual world of knowledge to the real world of devices.

The expression "Web of Things" is comprised of two words: Web and Things. The Web is a worldwide organization framework with adaptable, configurable highlights dependent on open, interoperable correspondence conventions. Things are genuine or virtual articles, contraptions, or information with personalities, actual attributes, and virtual characters, as well as intelligent interfaces. A virtual object, for example, may represent an abstract unit of sensor nodes that includes metadata for identifying and discovering its corresponding sensor nodes. As a result, the Internet of Things (IoT) refers to devices that can transmit data from their physical surroundings over the Internet.

Middleware serves as a link between the hardware and application layers, and is in charge of communicating with devices and data management. A middleware's job is to provide a single programming model for interacting with devices. When communicating with computers, a middleware is in control of masking the heterogeneity and delivery issues that we encounter.

5.2 MOTIVATION

The aim of an IoT-based system is to provide information from the environment to a non-expert user. Since an IoT-based framework may be used in a variety of settings, it must be able to address a large number of heterogeneous devices. As a result, a major concern when designing an IoT-based framework is how to manage non-expert users contact with heterogeneous devices. A middleware layer between devices and non-expert users may solve this issue. This layer is responsible for hiding the variety of devices from the user's perspective and providing end users with system control transparency.

The concept of constructing interface abstractions has been discussed in the literature. The middleware we discovered in the literature can provide satisfaction by making user interaction easier, but it does not help low-level device configuration.

5.3 IOT DEFINITION

We will go through some IoT meanings in this section. We also go over IoT's layered architecture.

The Internet of Things (IoT) is gaining popularity in business as a way to communicate with various forms of computers. Through incorporating physical devices into communication networks, the Internet of Things will have an effect on business and society. IoT effects can be seen from a variety of angles, including private and enterprise customers. IoT has an effect on both professional and personal areas, such as smart homes and workplaces, e-health, and assisted living, from the viewpoint of a private customer. From the perspective of a business customer, the implications will be felt in areas such as robotics and industrial processing, logistics, business process control, and intelligent people and products transportation.

The Internet of Things (IoT) connects physical objects to communication networks. IoT refers to the general infrastructure that supports these information networks, including applications, hardware, and utilities. The interconnected physical things will share knowledge and data about their physical properties and their surroundings. Identification technologies such as RFID, which enable each device to be uniquely identified, can be used to categorise gadgets distinct from others

The Internet of Things has a layered infrastructure that is built to meet the needs of different markets, businesses, and culture. Figure 5.1 depicts a generalised layered architecture for IoT, which is made up of five layers, each of which is discussed below:

Layer of Edge Technology

This is the hardware framework, which includes embedded systems, RFID identifiers, sensor networks, and all other types of sensors. This hardware layer can perform a variety of tasks, including gathering data from a device or environment, analysing data, and facilitating communication.

Layer of the Access Gateway

This layer is in charge of data processing and is in charge of publishing and subscribing to the services offered by the Stuff, as well as message routing and hovelling communication between platforms.

Layer of middleware

This layer performs essential functions such as aggregating and filtering data obtained from hardware sensors, performing knowledge exploration, and controlling user access for applications.

Application layer

This layer is in charge of providing a variety of framework resources. These services are delivered to various applications and users in IoT-based systems via the middleware layer. The technology services are applicable to a variety of markets, including logistics, retail, and healthcare.

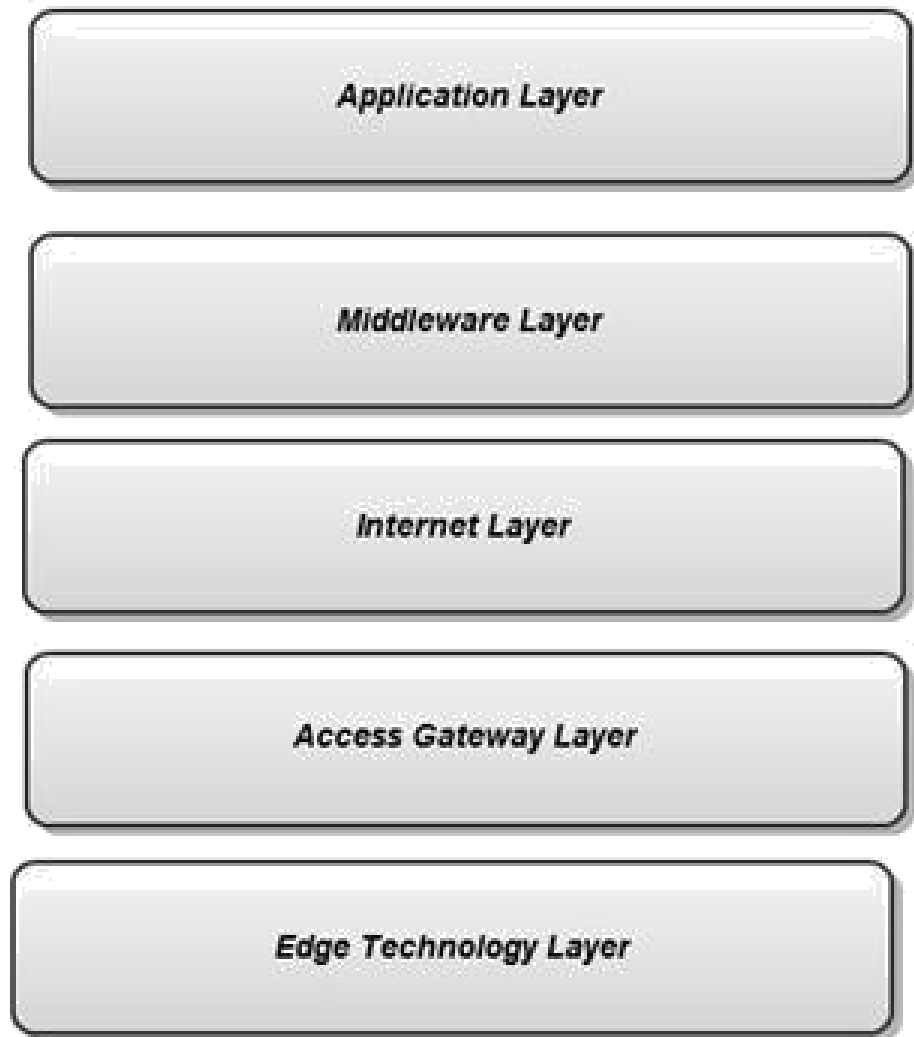


Fig 5.1 Layered architecture of the Internet of Things (IoT)

CHAPTER 6

ARDUINO

The Arduino microcontroller is a simple chipset board that has procured distinction in both the premium and business markets. Since the Arduino is open platform, the gear is conservative and the writing computer programs is free. This instructional exercise is gotten ready for ME 2011 understudies, similarly as understudies any place who are encountering the Arduino curiously. Sneak the web for experienced Arduino customers, there are a great deal of contraptions.

The capacity to write a program on the host PC, download it to the Arduino, and have it run regularly is an essential part of the Arduino. On the off chance that you separate the USB associate from the PC, the thing will keep running from the top any time you press the reset button. Take out the battery and store the Arduino board for a half year in an organization. The last program you saved will run until you reconnect the battery. This recommends you join the board to the host PC to store up and examine the thing, so you don't utilize the PC to execute it until that is done.

The Arduino uno is a microcontroller module which has are 14 data pins, 6 pins for data sources data sources, a 16 MHz earth resonator, a USB interface, a force port, an ICSP header, and a reset button it will work like whatever you require can be performed from the microcontroller. Power supply for this microcontroller will be either USB association or force it with a climate control system to-DC converter or battery. Considering everything, it has a USB-to-consistent connector adjusted on the Atmega16U2 (Atmega8U2 up to variety R2).

Summary:

- Microcontroller ESP8266.
- Operating voltage 5V.
- Input voltage (recommended) 7-12V.
- Input voltage (limits) 6-20V.
- Digital I/O pins 14.
- Analog Input pins 1.
- DC current per I/O pin 40mA.
- DC current for 3.3V pin 50mA.
- Flash memory 32KB .
- SRAM 2KB.
- EEPROM 1KB.
- Clock speed 16Mhz.

6.1 PIN CONFIGURATION

The Arduino uno can be powered by any external power supply and also by usb cable. The force source is naturally picked.

The board can be supplied with an external voltage of 6-20 volts. If the power supplied is under 7V the 5V pin can supply power to the board. The board works smoothly. If the given supply is more than 12V the voltage regulator will get heated up and hurts the functionality of the board. The required power supplied should be between 7 to 12 volts.

The following are the remaining of the board:

- ❖ **VIN:** This pin is used to supply the power to the board either through USB or direct external source.
- ❖ **5V:** This pin gets a controlled voltage of 5V from the board controller. the power for this board can be fed up by a DC jack or USB or VIN.
- ❖ **3.3V:** The controller of the board produces a power of 3.3 volt supply. It can draw a current upto 50 milliamperes.

❖ **GND:** This pin is used to ground the circuit.

❖ **IOREF:** The voltage reference with which the microcontroller works will be given by this pin on the Arduino board.

❖ **Memory :** The memory chip in the Arduino has a 32 KB of memory, and also 2 KB of SRAM and 1 KB of EEPROM .

❖ **Input and Output :**

Utilizing the `pinMode()`, computerized `Write()`, and advanced `Read()` keys, every one of the Uno's 14 advanced pins can be utilized as an information or yield. They are controlled by 5 volts. Each pin has a 20-50 kohm inside pull-up resistor (disengaged naturally) and can supply or get a limit of 40 mA.

- ❖ **Tx and Rx pin:** The Arduino board has one transmitter pin and one receiver which are used to transmit the data to external source or to receive the data from the external source.
- ❖ **External Intrudes:** These pins are used for any additional source.
- ❖ **PWM:** 3, 5, 6, 9, 10, and 11. This pin provides PWM work.
- ❖ **SPI:** These pins provides SPI data from the library.
- ❖ **LED: 13** This pin provides control over the drove system, when the pin is high , the drove will go On. When the pin is low , the drove will goes Off.
- ❖ **TWI: A4 or SDA pin and A5 or SCL pin.** Backing TWI correspondence utilizing the Wire library.

There several different pins on the board:

- ❖ **AREF.** This pin is used to provide a reference voltage to the board
- ❖ **Reset.** This button is used to clear all the data to default data.

6.2 COMMUNICATION

For designing and compiling programmes, microcontrollers depend on a host machine. An integrated development environment, or IDE, is the programme that runs on the host machine. The Arduino's software framework is built on the open source Processing model, which is a "programming language and climate for individuals who need to program pictures, liveliness, and associations," as per its designers. The Arduino programming language depends on wired connection as well wi-fi connection. The programming language used to code for Arduino is C. Don't panic if you're not acquainted with the language, it's not hard to get, and the Arduino IDE gives you ideas when you make mistakes with the programmes.

A microchip, another Arduino, or other microcontrollers will all talk with the Arduino Uno. On optical pins 0 (RX) and 1 (TX), the ATmega328 gives UART TTL (5V) sequential network (TX). This sequential network is directed this will be connected by usb to the board. As the Arduino is provided with COM port no other outer driver is required. in any case. A sequential presentation is remembered for the Arduino program.

A piece of programming Serial correspondence should be possible on any of the Uno's advanced pins utilizing the sequential library. 12C (TWI) and SPI network are both upheld by the ATmega328. The Wire library is incorporated with the Arduino program to make utilizing the I2C transport simpler, see the documentation for additional subtleties. Utilizing the SPI library for SPI correspondence.

The Arduino IDE (Integrated Development Environment) is utilized to compose and transfer the product to the Arduino Board.

6.3 ARDUINO IDE

1. Open Arduino IDE as shown below.

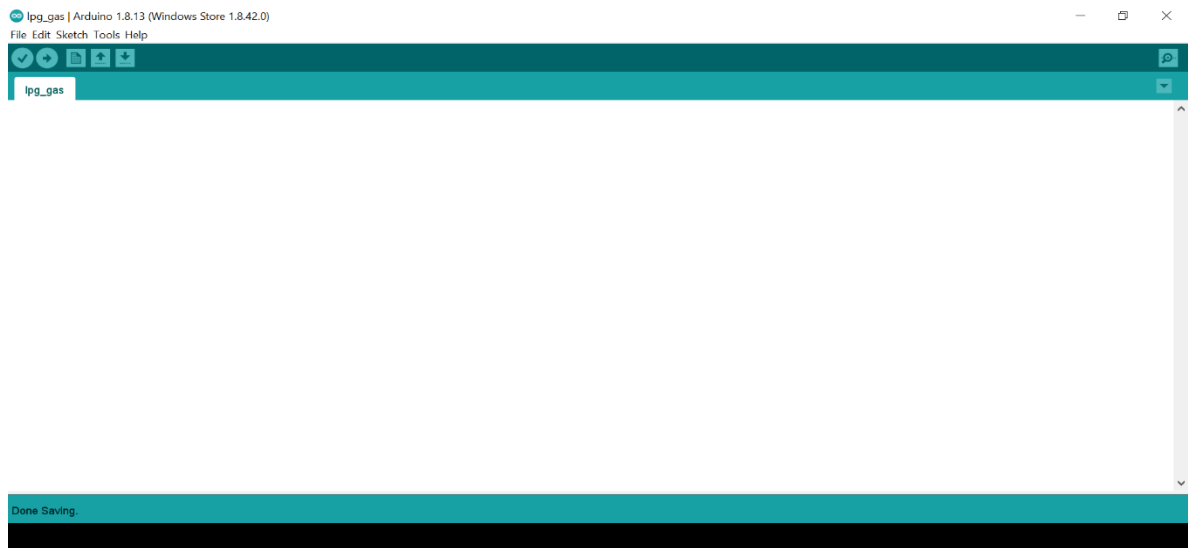


Fig 6.1 Interface of Arduino IDE

2. Select the required Arduino board from Tools as shown below

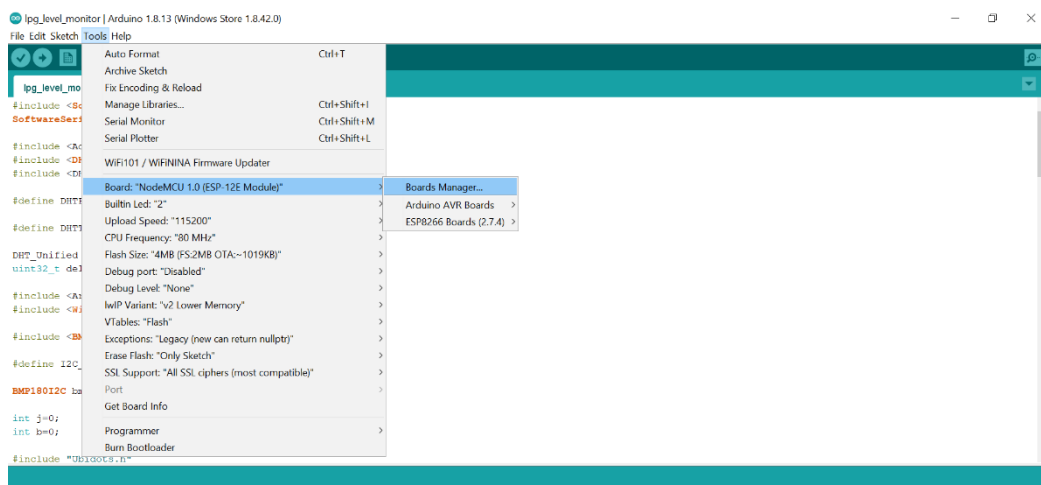


Fig 6.2 Board selection

3. Write the sketch in Arduino

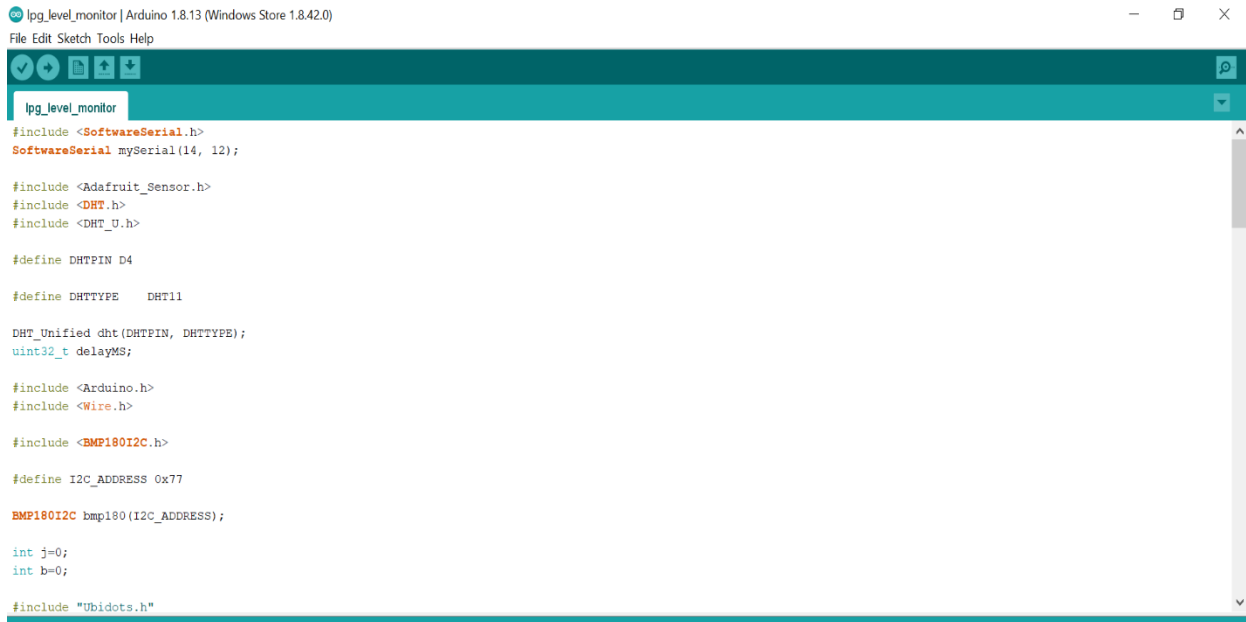


Fig 6.3 Sketch writing

4. Upload the compiled program to the board

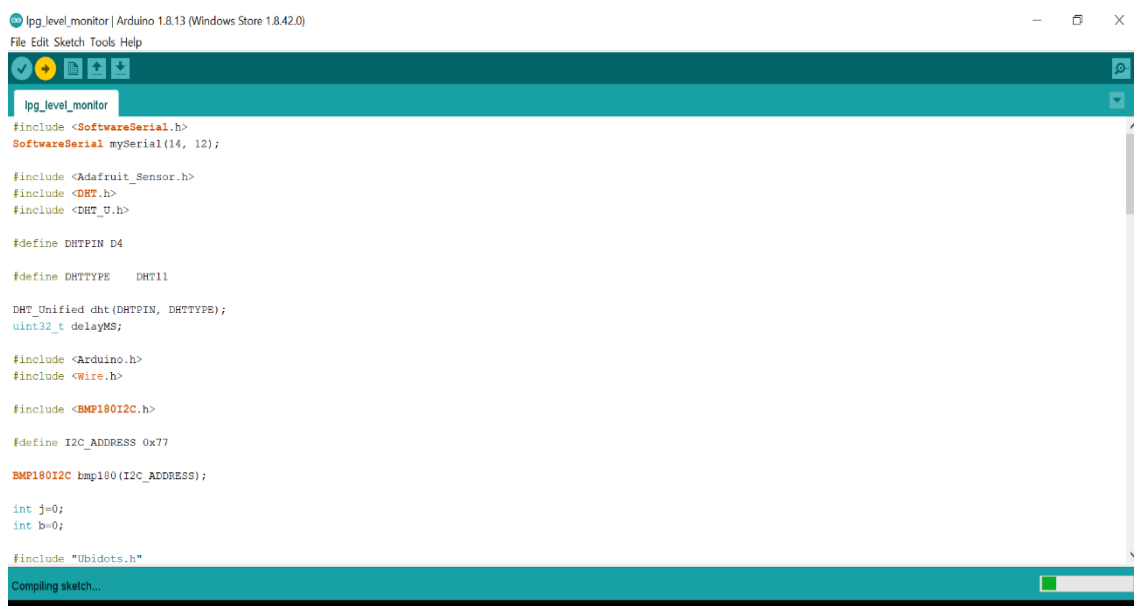


Fig 6.4 Code Compiling

CHAPTER 7

RESULTS AND CONCLUSION

OVERVIEW OF PROJECT

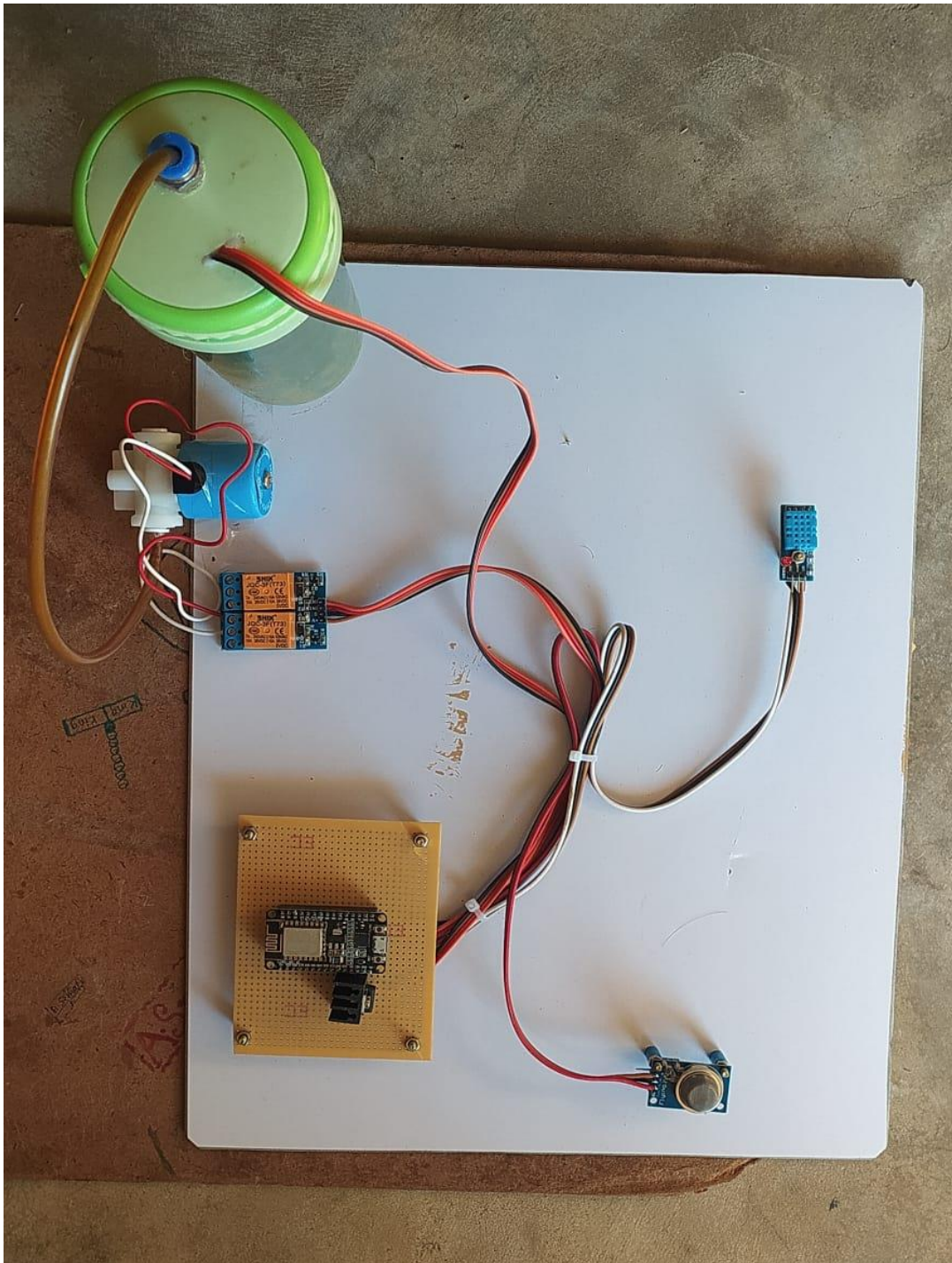


Fig 7.1 Overview of Project

READINGS BEFORE DETECTION

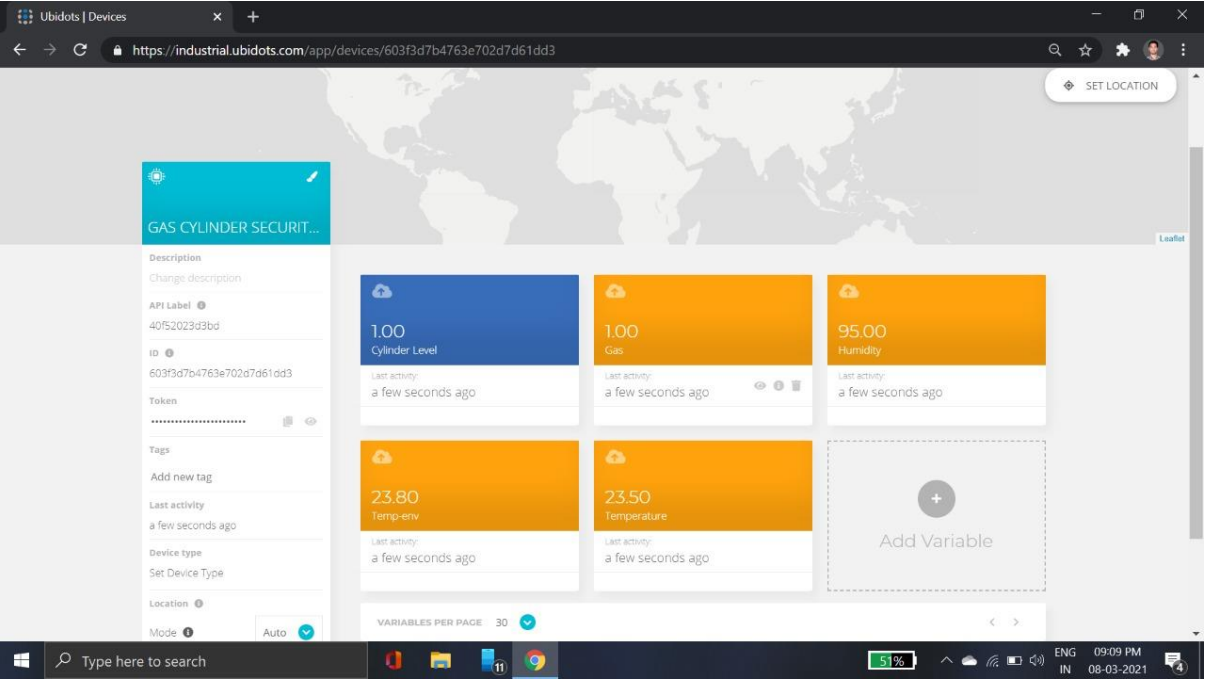


Fig 7.2 Readings before detection

READINGS AFTER DETECTION

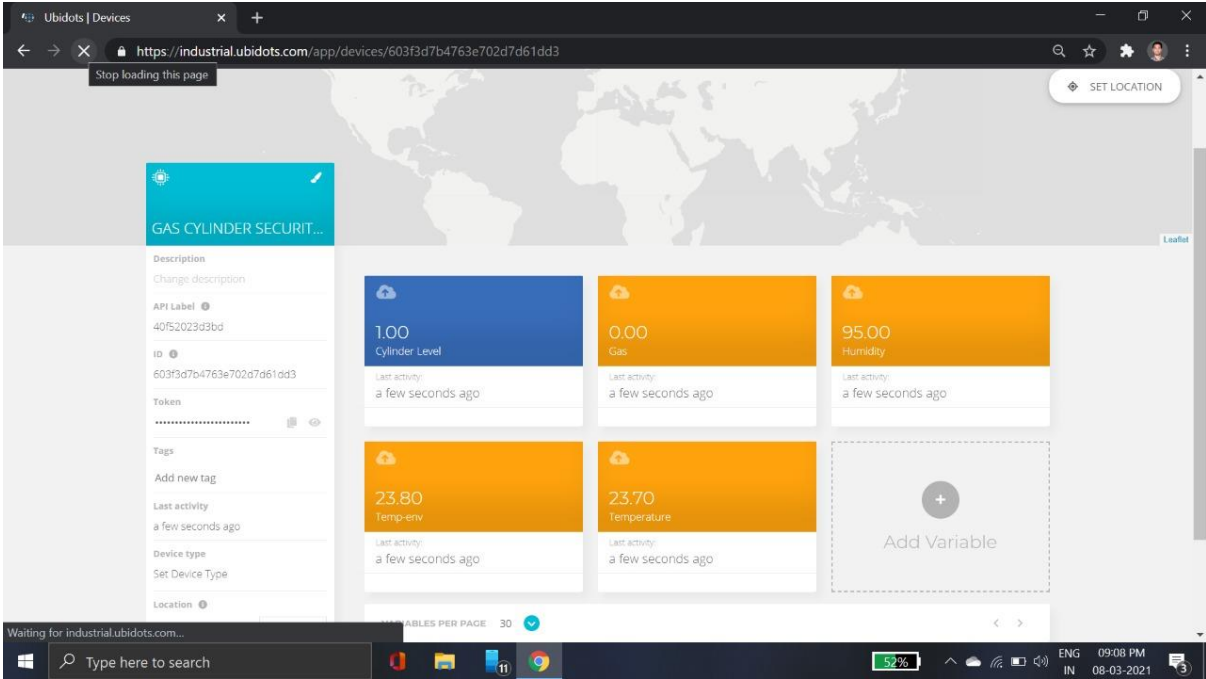


Fig 7.3 Readings after detection

GMAIL AND SMS ALERT

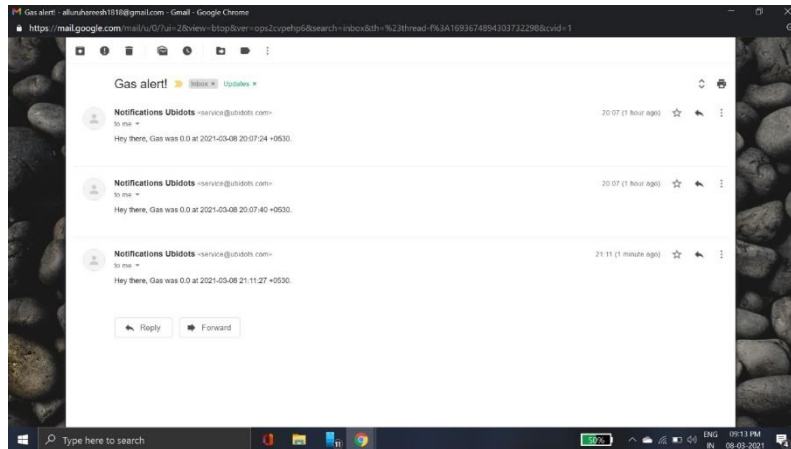


Fig 7.4 Gmail Alert

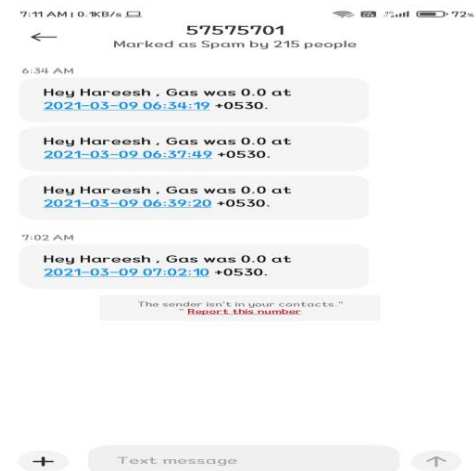


Fig7.5 SMS Alert

CONCLUSION

The point of this task is to make a model for an IoT-based LPG chamber observing gadget. The gadget proposed is both practical and ongoing. It ceaselessly distinguishes gas spillage and showcases the weight and gas level on a cell phone. The client will be educated regarding the LPG spill, and any individual who is close to their home right now will be informed also. Clients will get an admonition message on their telephones from an IoT-based application, making them more aware of the gas level and LPG spillage.

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