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## IoT based smart home security system

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### ABSTRACT

*IOT (Internet of Things) refers to the infrastructure of connected physical devices that is expanding at a fast rate as large range of devices and objects have gotten associated to the Internet. Home security may be a terribly helpful application of IOT (Internet of Things) and that we are mistreatment it to form a cheap security system for homes yet as industrial use. the protection system can utilize a microcontroller called Arduino MEGA 2560 to interface between the parts. A GSM module is employed to Convey Alert SMS for sensing Gas discharge, a water device is employed to sense the amount of water, a fireplace device is used to discover fireplace, a buzzer for sounding the alarm, the main benefits of such a system includes the ease of setting up, affordable prices and low maintenance. After activation of sensors, The Message generated by GSM module will be automatically forward to fire station, Police station and the system user. These indications will help us to decrease the damage cause and danger rate.*

**Keywords**— Home & Industrial system, Arduino MEGA 2560, GSM Module 800A, Fire Sensor, DHT 11, MQ 5 Sensor, Interfacing

### 1. INTRODUCTION

When security mode is turned on, any recognized harmful activities that occurred at intervals the house are going to be detected through put in sensors and mechanically forward the alert message to the home-owner through the net. The main aim of this project is to observe for liquid fossil oil gas (LPG) discharge to avoid hearth accidents, providing house/industry characteristic wherever the safety has been a very important issue. The system detects the LPG discharge employing a gas detector and flames by a flame detector that alerts the buyer concerning the gas discharge by causing SMS with the assistance of GSM module that is connected preprogrammed microcontroller (Arduino Mega).

When the LPG concentration within the air exceeds the sure level, the Gas detector detects the discharge and so it like a shot alert the user by causing SMS to fixed itinerant and alert the individuals reception by activating the Buzzer alarm. Home security is that the most important one for each home-owner either in a personal house or Associate in Nursing flat. To induce absolutely the peace of mind whether or not you're initially time home or out of home you want to make sure that your house is put in with the right home security observance system. This wireless home and industrial automation and security system are often wont to give security system for residential, industrial, and for all domestic and industrial functions mistreatment GSM technique. Security systems area unit sure electronic devices that area unit want to observe intrusions in home or trade. The essential parts of a home automation security system area unit motion detectors, LPG detectors and smoke detector.

During this paper we have a tendency to aim to beat the failings created by several alternative security device because it is only in security purpose. It cheaper and may be maintained simply than the other security device. Security systems are around for an awfully very long time, even before the introduction of microcontrollers. Over the course of all that point, they need return quite a great distance. They need gone from being easy analog circuits with key switches and mechanical bells to being refined digital systems which will mechanically report alarms and standing info to an observance center and even provide home automation to some extent. However, several fashionable security systems have some hidden shortcomings. In this project we have a tendency to area unit providing enough security to satisfy the user's desires. The user are going to be prompted to enter an Arcanum to unlock the door.

On eminent Arcanum entry, the door unlocks for a fixed quantity of your time sanctioning him/her to store or restore his/her valuables. On the opposite hand, if the user enters Associate in Nursing invalid Arcanum then corresponding equivalent message are going to be displayed. This project “Arduino primarily based Arcanum protected lockup system” are often wont to give enough security in varied places like bank lockers, security doors. This project uses Associate in Nursing Arduino kit that consists of AT Mega 2560 that is one in every of the foremost in style microcontrollers that consists of fifty-four digital pins and sixteen analog general purpose pins, EEPROM of capability 1KB and a ram of 2KB.

## **2. LITERATURE**

### **2.1 Sensible Home Security System:**

Internet of Things (IOT) conceptualizes the thought of remotely connecting and observation real world objects (things). Once it involves our house, this idea is often with competence incorporated to create it smarter, safer and automatic. This IOT project focuses on building a smart wireless home security system that sends alerts to the owner and fireplace stations by using GSM Module just in case of associate degree trespass and raises an alarm optionally. Besides, the same may also be utilized for home automation by creating use of a similar set of sensors. The leverage obtained by preferring this method over the similar sorts of existing systems is that the alerts and also the standing sent by the GSM connected microcontroller managed system can be received by the user on his phone. In this project we tend to area unit providing enough security to satisfy the user’s wants.

The main perform of gas run detection module that consists of the gas detector to continuously find the gas run within the air. Here for the gas run detection, a solid-state gas detector MQ-5 is employed. Once the LPG gas or flammable gases gift within the environment the resistance of the detector changes with the concentration of flammable gases. The conduction of gas detector will increase and whose conduction is a smaller amount within the air. A simple electronic circuit are often wont to convert the amendment in resistance to vary in terms of concentration of explosive gases. If thanks to gas run, any fireplace accident occurred, Then the flame detector can send associate degree tuned in to the microcontroller which info conjointly send to the user through GSM module. Any range of client mobile numbers area unit enclosed while programming the microcontroller in embedded C language, to that SMS should be sent concerning the gas run and fireplace accident details. This wireless GSM module is employed to alert the buyer even once they area unit removed from home. Associate degree audio and visual show alarm provided to right away alert the folk’s reception in associate degree abnormality. Various management systems are designed over the years to stop access to unauthorized user. The most aim for providing locks for our home, school, office, and building is for security of our lives and property. It’s so necessary to possess convenient manner of achieving this goal. Automatic door system became a regular feature on several different types of buildings and houses. And that they are getting widespread each day to develop an effective electronic device which give security. Home security has been a significant issue because of the rise in rate and everyone needs to require correct action to stop Unauthorized user. There was a necessity to alter home in order that user will profit of the GSM technology and laptop system. Literature survey is distributed to realize info and information. Before beginning with the analysis and style of project, we tend to referred several analysis papers, manuals, documents related to the construct of project.

### **2.2 Applications**

The Home and trade Safety exploitation fireplace and Gas Detection exploitation GSM system is employed to detect any fireplace, smoke or gas run in any premises, building or trade. It’s used for detecting any run of gas or smoke thanks to fireplace or any chemical change. Here a number of the Real-time applications area unit given below.

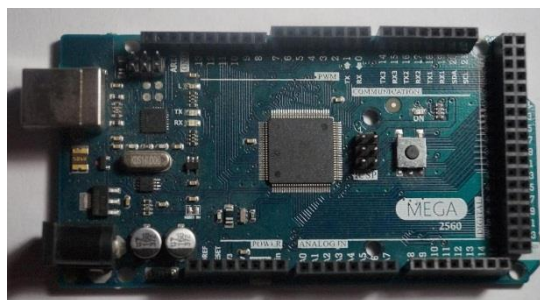
- This project is employed as a security system in applications like homes, Hospitals, Hostels, industries. thanks to its low power consumption, dependableness, movability this method employed in other applications like smoke detection.
- It’s terribly helpful in-house for detection LPG gas, which may cause vast loss of Property and life.

### **2.3 Advantages**

- Sensitive and fast response
- Reliable stability and long life
- This easy circuit are often used at residential places to confirm higher safety.
- It is often used at organizations to confirm approved access to extremely secured places.

## **3. HARDWARE AND SOFTWARE COMPONENTS**

### **3.1 Arduino Mega 2560**



**Fig. 1: Arduino Mega 2560**

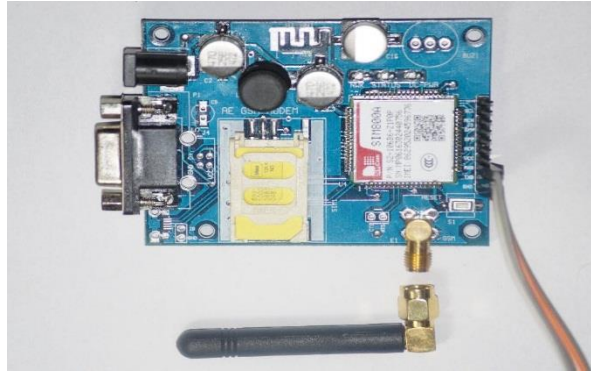
Variety of microprocessors and controllers square measure utilized in the look of Arduino. Digital and analog input/output (I/O) pins square measure equipped in boards that will be interfaced to varied enlargement boards and alternative circuits. Serial communications interfaces may be a feature during this board, as well as Universal Serial Bus (USB) on some models that are used

for loading programs from personal computers. The microcontroller’s square measure programmed exploitation options from the programming languages C and C++.

**Table 1: Arduino Specification**

Parameter	Description
Microcontroller	ATmega2560
Operating Voltage	5v
Input Voltage(recommended)	7-12v
Digital I/O Pins	54(of which 15 provide PWM output)
Analog Input Pins	16

**3.2 GSM Module 800A**



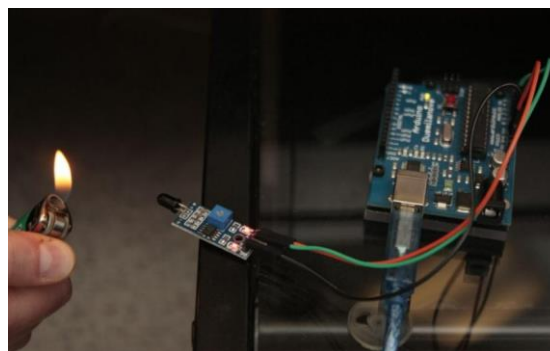
**Fig. 2: GSM Module 800A**

SIM800A could be a complete Quad-band GSM/GPRS resolution during a LGA kind which might be embedded within the client applications. SIM800A support Quad-band 850/900/1800/1900MHz, it will transmit Voice, SMS and knowledge info with low power consumption. With small size of fifteen.8\*17.8\*2.4 mm, it will work into slim and compact demands of client style. That includes and Embedded AT, it permits total price savings and fasttimeto-market for client applications.

**Table 2: GSM 800A Specification**

Parameter	Description
GSM Module	SIM800A
Operating Frequency	850MHz/900MHz/1800MHz/1900MHz
Interface	RS232 Serial Interface
Baud Rate	9600bps
Power Requirement	4.5v to 12v

**3.3 Fire Sensor**



**Fig. 3: Fire Sensor**

A Fire detector may be a detector designed to discover and reply to the presence of a flame or fireplace. These forms of sensors square measure used for brief vary fireplace detection and might be used to monitor comes or as a security precaution to chop devices on/off. The flame detector is incredibly sensitive to IR wavelength at 760 nm ~ 1100 nm lightweight. The range of these detector is generally correct up to 3Feet.

**Table 3: Fire Sensor Specification**

Parameter	Description
Working Voltage	3.3v to 5v
Detect Range	60degrees
Dimension	3.2cm to 1.4cm

## 3.4 Gas Sensor (MQ5)



Fig. 4: Gas Sensor (MQ5)

Gas Sensor (MQ5) module is beneficial for gas escape detection (in home and industry). It is suitable for sleuthing H<sub>2</sub>, LPG, CH<sub>4</sub>, CO, Alcohol. Thanks to its high sensitivity and quick response time, measurements will be taken as shortly as doable. The sensitivity of the sensing element can be adjusted by victimization the potentiometer.

Table 4: Gas Sensor (MQ5) Specification

Parameter	Description
Working Voltage	4.9v to 5.1v
Heating Consumption	0.5mW to 800mW
Sensing Resistance	10k $\Omega$ to 60 k $\Omega$

## 4. CONCLUSION

Conclusion heading should have the correct numbering as per the number of heading above the conclusion. This is also a paragraph so all font styling described above for a paragraph will be applicable here. The sensible Home Security System integrates devices like Gas detector, hearth detector, Water Level detector, Temperature & wetness detector and Door protection system. During this system we tend to are planning to management door lock & monitor the Gas leak, observe hearth, to observe the water available within the storage tank. The door protection system is enclosed to supply security to homes, it is often controlled employing a data input device and servo motor.

Security by the higher than enhancements so as to utterly satisfy user's wants. Hence, a common man will afford to buy such protection system in lowest value to stay his valuables safely with none worries. The main advantage of this easy gas leak detector is its simplicity and its ability to warn its stakeholders concerning the leak of the LPG gas. This detector is enforced with success and is simple to use and additionally an occasional value product. Another advantage of this device is that even though if nobody is there within the house so gas leaks happens, GSM module is there to send immediate messages to the stakeholders concerning the gas leak and therefore it lowers the intensity of accidents.

GSM module during this device ensures higher safety concerning the gas leaks. This system is often of nice in domestic furthermore as industrial settings to observe smoke and alert individuals on an close hearth since smoke may be a precursor for hearth, rather than counting on heat/temperature sensors that sounds alarm once the hearth has already started. This will go a long method in serving to save lots of human life. This technique may be accustomed observe and deter smokers in areas wherever smoking is prohibited. The price of implementing this technique is relatively low since the parts used area unit comparatively low-cost and area unit simply obtainable within the market.

## 5. ACKNOWLEDGEMENT

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## 6. REFERENCES

- [1] Getting started with Arduino-by Massimo Banzi
- [2] Getting started with Arduino-by Massimo Banzi
- [3] Beginning Arduino –by Michael McRoberts
- [4] Associate Editor, Sensor Review –by Rob Bogue
- [5] Sensor Technology –by John Wison 2008
- [6] <https://www.circuitstoday.com/interfacing-mq5-lpg-sensor-to-arduino>
- [7] [https://wiki.seeedstudio.com/Grove-Gas\\_Sensor-MQ5/](https://wiki.seeedstudio.com/Grove-Gas_Sensor-MQ5/)
- [8] <https://store.arduino.cc/usa/mega-2560-r3>
- [9] <https://www.electronicshub.org/arduino-flame-sensor-interface/>