

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 very 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, and 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.

Key Words: 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) leakage to avoid hearth accidents, providing house/industry characteristic wherever the safety has been a very important issue. The system detects the LPG leakage using 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 can be used to provide to give security system for residential, industrial, and for all domestic and commercial purpose using GSM technique. 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's cheaper and may be maintained simply than the other security device. Security systems are around for a 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.

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 comes to our house,

this idea is often with aptly 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 status 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 present in 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 can be used to convert the amendment in resistance to vary in terms of concentration of explosive gases. If due to gas leakage, any fireplace accident occurred, then the flame detector can send associate degree tuned in to the microcontroller and that information also 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. An audio and visual display alarm provided to immediately alert the people at home in an abnormal condition. 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. There was a necessity to alter home in order that user will profit of the GSM technology and laptop system. Literature survey is carried to gain information and knowledge. Before beginning with the analysis and design of project, we tend to referred several analysis papers, manuals, documents related to the concept of the project.

2.2 Applications

The Home and Industry Safety using Fire and Gas Detection using GSM system is used to detect any fire, smoke or gas leakage in any premises, building or industry. It is used for detecting any leakage of gas or smoke due to

fire or any chemical reaction. Here some of the real-time applications are 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 very helpful in-house for detecting LPG gas, which may cause vast loss of Property and life.

2.3 Advantage

- 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

Variety of microprocessors and controllers are used in the design of Arduino. Digital and analog input/output (I/O) pins are equipped in boards that may be interfaced to various expansion boards and other circuits. Serial communications interfaces is a feature in this board, including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are programmed using features from the programming languages C and C++.

3.2 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 fast time-to-market for client applications.

3.3 Fire Sensor

A Fire Sensor is a sensor designed to detect and respond to the presence of a flame or fire. These types of sensors are used for short range fire detection and can be used to monitor projects or as a safety precaution to cut devices on/off. The flame sensor is very sensitive to IR wavelength at 760 nm ~ 1100 nm light. The range of these sensor is mostly accurate up to 3Feet.

3.4 Gas Sensor (MQ5)

Gas Sensor (MQ5) module is useful for gas leakage detection (in home and industry). It is suitable for detecting H₂, LPG, CH₄, CO, Alcohol. Due to its high sensitivity and fast response time, measurements can be taken as soon as possible. The sensitivity of the sensor can be adjusted by using the potentiometer.

4. CONCLUSION

The System Installed Successfully and detect the fire, gas and send the messages to pre-defined user fire station and police station. The sensible Home Security System integrates devices like Gas detector, hearth detector, Water Level detector, and Temperature & wetness detector system. During this system we tend to be planning to management the Gas leak, observe hearth, to observe the water available within the storage tank.

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.

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