GAS LEAKAGE DETECTOR AND CONTROL SYSTEM USING GSM MODULE

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ABSTRACT

LPG leakages are a mutual hindrance in household and manufacturing nowadays. It is very life threatening if you will not distinguish and modified right away. The idea behind our project is to give a solution by power cut the gas provision as soon as a gas leakage is perceived apart from activating the sounding alarm. In addition to this, the authorized person will receive a message informing him about the leakage with the increase of natural gas productions in the last 10 years: Philippines gas industry has really taken its toll. However, the Bureau of Fire Protection prompted the society to yield preventive and security measures against defective electrical cabling and dissolved petroleum gas leaks regardless of fire alarming incidents in the first half of 2017.

1.INTRODUCTION

According to ABS-CBN news 2017 that from January to June last 2017, the BFP has recorded a total of 2,522 fire incidents. It was traced that LPG is one of the major cause of fire during that year where half of the total which is 1,253 beside from the electrical causes. " https://news.abs-cbn.com/business/01/12/17/doe-to cancel-scc-of-pasig-lpg-refilling-plant More than the lifetime Arduino has been a reason that thousands of projects from everyday bodies to complicated scientific mechanism. Worldwide societies of scholars, performers, programmers, and specialists have assembled around this open-source program. Their knowledge about the said matter contributions a lot to help the society in this subject area. The project entitled "Gas Leakage Detector and Control System Using GSM Module", will be a great help in terms of preventing any danger caused by gas leakage. The purpose of this project is to detect the presence of LPG leakage as a part of a safety system. Apart from sound alarm, an SMS alert will inform the authorized person and the solenoid valve will be triggered to shut down the gas supply to prevent any harmful effects due to gas leakage.

Descriptively, we use a gas sensor to monitor the LPG if the gas leak reaches beyond the normal level. This proposed project will trigger the sound alarm. In addition, the authorized person will be informed about the leakage via SMS alert and the gas supply will be automatically shut down. The people can be saved from a potential explosion caused by gas leakage consult additional resources that assist you in writing a professional technical paper.

2.METHODS AND MATERIAL

General Objective

To layout and acquire a project "Gas Leakage Detector And Control System Using GSM Module"

Specific Objective

(1)To layout and acquire project that will perceive gas outflow like Methane leak, Butane leak, and LPG leak, Methane outflow or any such petroleum centered on gaseous substance that can be discovered using MQ5 device.

(2)To layout and set up an SMS centered Alert method alert missives to restrict mobile number enter inside the

Arduino program. (3) to layout and acquire a project that will fabricate a sound alarm during gas outflow and rest the alarm once gas outflow is regulated (4) show status in an LCD using a 16×2 LCD component and to rest the gas supply using Solenoid controller.

2.1 PROPOSED METHOD

We purpose a system to come across LPG fuel leakage situations and offer a security alert to supposed customers right here endorse to build the gadget the use of MQ5 Gas Detector Sensor.

If the LPG sensor senses any gas leakage from storage, gas sensor is going stumble on it this sign is monitored by using the Arduino UNO and it'll perceive the gasoline leakage. Now the microcontroller is turn on LCD and buzzer. After few milliseconds put off, Arduino instruction driving force circuitry for exhaust fan to turn the fan on to release the gas outdoor from the room. It's far the complete control of the task. It control the exhaust fan, LCD, Buzzer, And when Gas leak takes place. The SMS has been send.

2.2 Methodology

The methodology is the systematic, theoretical analysis of the method applied to a field of study. It comprises the theoretical analysis of the body of method and principles associated with a branch of knowledge. Typically, it encompasses concept such as paradigm, theoretical model, phases and quantitative techniques. A methodology does not set out to provide solution-it is therefore offers the theoretical offers the theoretical underpinning for understanding which method, set of methods, or best practices can be applied to a specific case. Through a methodology, we are achieving the knowledge about planning, design and implementation and testing.
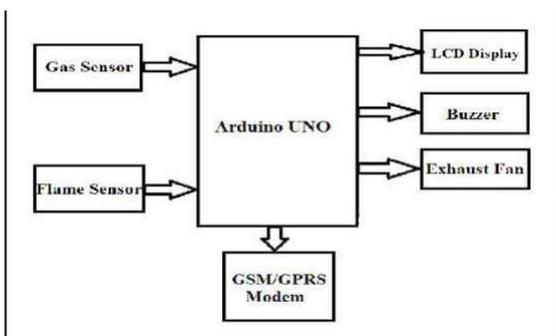
3.BLOCK DIAGRAM

Fig.1 Block Diagram of Gas Detector

Components of System

MQ5 Sensor-

MQ5 sensor is responsible for detecting the gas concentration in the controlled environment.

Fig. 2 MQ5 SENSOR

GSM(SIM800)-

SIM800 is quad-band GSM/GPRS module designed for the global market.

Fig. 3 GSM(SIM800)

Buzzer

Piezo buzzer is a device that can create any tone of the desired frequency. It is used as alarm and create high-intensity sound if needed. It is made up of piezoelectric material.

Fig. 4 Buzzer

Arduino UNO

The Arduino UNO is microcontroller board based on the ATmega328. It contain 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.

Fig. 5 Arduino UNO

LCD

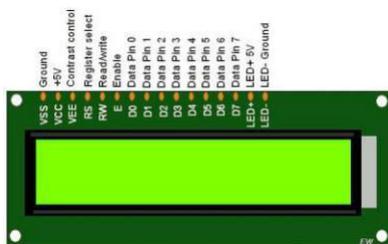LCD using a16x2 LCD component and to rest the gas supply using solenoid controller.

Fig. 6 LCD 16X2

Exhaust Fan

In this system, the gas leakage is detected and controlled by means of exhaust fan.

Fig. 7 Exhaust Fan

Relay

The relay is one of the device that connected to either device to ON and OFF as per the required situation.
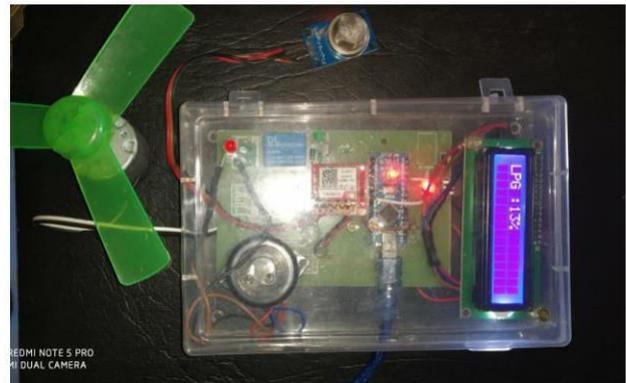

Fig.8 Relay

3.1 Project Description

Fig.9 Gas Leakage Detector Using GSM Module

Gas leakage monitoring and alert system:

Complete connection diagram consist of the microcontroller Circuit, GSM Module, Power Supply, MQ5 Sensor, Buzzer, Relay. The power supply is fed to the GSM Module. The output of the sensor goes low as soon as the MQ5 sensor sense any gas leakage from the storage. The Exhaust fan will be automatically ON. This is detected by microcontroller and the LCD & buzzer turn ON. The microcontroller continues sending message as "Waring LPG GAS DET…" to a pre-defined mobile number using GSM module.

3.2 Working Principle

Arduino will be active with in 5volts power supply. The sensor will be detect gas leakage once the system is launched, if there is no gas leakage, it will be display "Gas Cleaning" on the display. If the gas is leaked otherwise, the following step follow:

Step 1: A signal from the microprocessor will be go to the display and show the gas leakage message there.

Step 2: The signal from the buzzer will signal when the first stem is completed.

Step 3: Lastly, through GSM, there will be a signal message that the gas been leaked to a specific number.

3.2 Advantages & Disadvantages

Advantages

1.Low cost

2.Low power consumption

3.High accuracy

4.The sensor has excellent sensitivity with a quick response time.

Disadvantages

1.No prevention of fire possible with kit.

2.Applicable only as an indicator/alarming device.

3.It work only when 5V power supply is given.

4.It is little sensitive to smoke.

3.3 Limitation

Gas may leaked at various levels in various factories or homes, requiring additional gas sensors to detect it.

4.CONCULUSION

Gas leakage leads to severe accidents resulting in material resulting in material losses and human injuries. Gas leakage occurs mainly due to poor maintenance of equipment and inadequate awareness of the people. Hence, Gas leakage detection is essential to prevent accident and to save human lives. This paper presented Gas leakage detector and alert system. This system triggers LCD and buzzer to alert people when gas leakage is detected. This system is very simple yet reliable.

5.FUTURE SCOPE

Scope are

(1) Notice Methane leak, Butane leak, and LPG leak, or any such petroleum centered gaseous material.

(2) Generate sound alarm when gas outflow is noticed.

(3) Transmit SMS Alert to consent person.

(4) Displaying gas outflow status that signifies if the gas is in normal stage or not.

(5) Automatic closure of gas source using solenoid controller.

6. REFERENCES

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