MANTECH Publications

Recent Trends in Computer Science and Software Technology
Volume 8, Issue 1, January-April 2023

IOT Based Gas Leakage Detector

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Abstract

Safety plays a major role in today's world and it is necessary that good safety systems are to be implemented in places of education and work. The presence of hazardous LPG gas leakage in a domestic, work place, also, stored gases container gas which exhibits ideal characteristic is use. For that sake, an alarm unit is used to vibrate an alarm which is buzzer. Buzzer gives an audible sign of the presence of LPG volume. The sensors are widely used to detect essence of propane, iso-butane, LPG and even smoke. The sensor has an advantage to combine a sensitivity response time. If the LPG sensor senses gas leak from work place or home, sensor output goes to active low (logic-0) condition. Arduino UNO is used in the project; low signals are overlooked by the Arduino and gas leakage is been noticed by the Arduino. The Arduino UNO turns on the LCD and buzzer. It even turns on the GSM modem after that, it continues to send messages SMS to mobile number specifically mentioned in the program of the source code for alerting danger to the people.

Keywords: *UNO, LCD, GSM modem.*

INTRODUCTION

The Internet allows devices to technically interconnect and enable new forms of communication. Successful development of LPG gas leak detectors will help to detect LPG gas leaks efficiently, avoid the risk of fire and pollution, and save lives and property Oil and gas industry.

The project is mainly designed by leakage of Gas. Gas leakage detection systems are an integral part of a safety system,

providing the first line of defense against the possible disasters of gas leakage. It detects the gas leakage and triggers an alert system to activate safety precautions. Some leakages are too small to be smelled or are of an unscented gas, so it's a necessary investment to install a gas leakage detection system.

The usage of the gas brings great problems in the domestic as well as working places. The inflammable gas such as Liquidized petroleum gas (LPG), which is excessively used in the house and at work places. Gas leakage detection systems are an integral part of a safety system The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and protects the work places by taken correct precaution at correct time.

Scope and Objective

One of the prophylactic means to stop accidents related to this gas leakage is to mount a gas leakage monitoring device in susceptible places. The system will detect the leakage of liquefied petroleum gas (LPG) using a gas sensor and use the buzzer to alarm the industries, companies, or people about the leakage.

Methodology

That the presence of gas leakage signals on the sensors to work, the MQ-6 is the gas Sensor used to detect leakage gas LPG. The tool is designed to detect gas leaks that are then legible on the LCD screen and alarm, and in certain circumstances, the buzzer will sound.

System Requirements

The Project application is loaded in Android Studio. We used Android Studio for Design and coding of project.

Hardware Requirement

Laptop or PC

a Windows 7 or higher
b I3 processor system or higher
c 8 GB RAM or higher
d 100 GB ROM or higher

Software Requirement

Windows 10 and higher version
Hardware and their Description
-The system comprises 6 major hardware with their discription as follows:

Arduino UNO

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source

microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, and Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.

Gas Sensor

Gas sensors are devices that can detect the presence and concentration of various hazardous gases and vapors, such as toxic or explosive gases, volatile organic compounds (VOCs), humidity. Gas sensor converts the componants and concentrations of various gases into standard electrical signals by using specific physical and chemical effect. It has been widely used in the detection of noxious and harmful gases and natural gas leakage.

Weight Sensor

Weight sensors are a device used to measure force and load. They convert weight into an electrical signal which can be processed and used within various applications. To measure force and weight, most weigh sensors used internal strain gauges to measure the weight. A weight sensor is a type of transducer, specifically a weight transducer.

WIFI Module

WiFi module, also known as serial to WIFI module, which belongs to the transmission layer of IoT. The function is to convert serial port or TTL level into embedded module which can conforming to WiFi wireless network communication standard, with built-in wireless network protocol IEEE802.

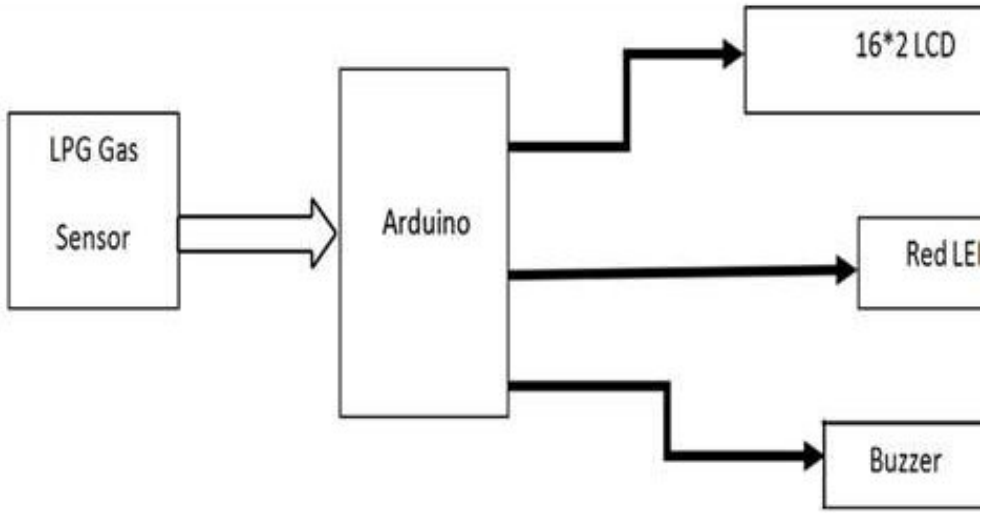
LCD

The liquid crystal display (LCD) panel is designed to project on-screen information of a microcomputer onto a larger screen with the aid of a standard overhead projector, so that large audiences may view on-screen information without having to crowd around the TV monitor.

Bazzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, train and confirmation of user input such as a mouse click or keystroke.

PROPOSED SYSTEM



Represents the block diagram of the gas leakage detection and alerting system. Arduino UNO (Atmega-328) is the main unit of the system which performs the following tasks. A signal conditioning of the Arduino UNO is done by output signal of the sensor, provided input to Arduino. The detection results displayed on LCD. Indicates the people of danger in work place, factory, home.

Buzzer activity with beep(siren) sound is made. Also send alert SMS to the in charge of the plant whose number is saved in SIM card by using GSM modem. The SMS received depends upon the leak of gas in the detection area of the sensor.

Future Scope

- Multiple sensor can be used for backup in case a problem occurs in one sensor.
- Can be implemented in industrial plants with monitoring of leakages of other gases than LPG.

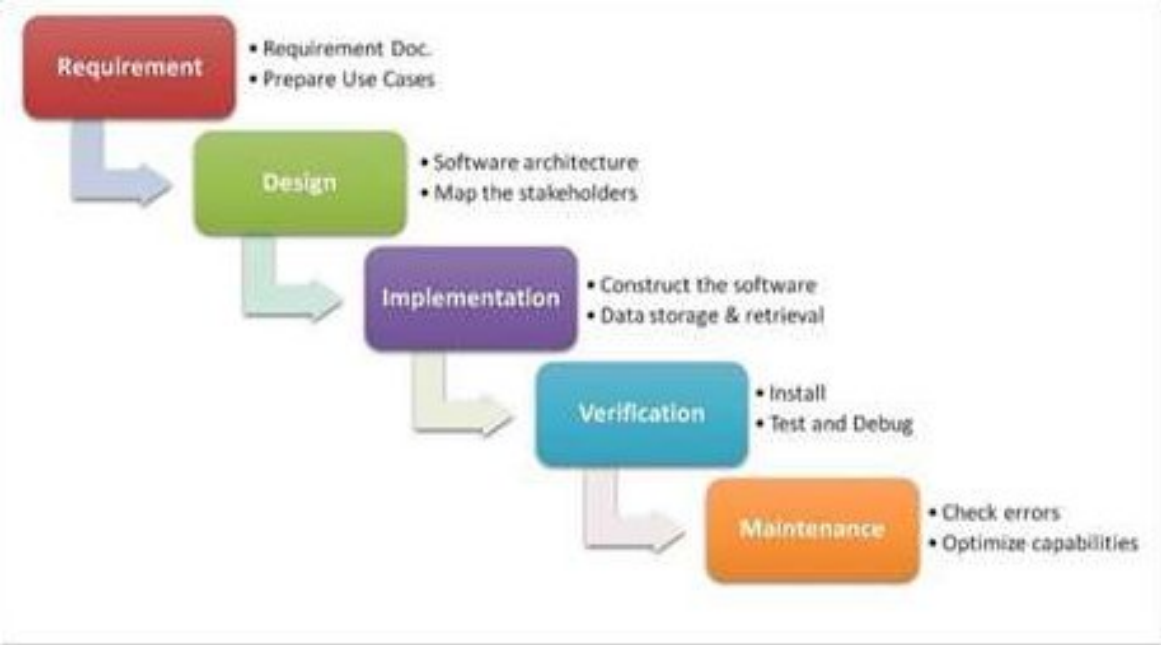
Features

The use of the Internet of Things is worth mentioning and applies to this device as a whole. For example, the Internet of Things (IOT) can be described as connecting everyday objects such as Smartphone's, televisions, sensors, buzzers, emails, sirens, and actuators to the Internet.

The Internet allows devices to technically interconnect and enable new forms of communication. Successful development of LPG gas leak detectors will help to detect LPG gas leaks efficiently, avoid the risk of fire and pollution, and save lives and property Oil and gas industry.

Project Lifecycle Details

Waterfall Model



The Waterfall Model is a linear sequential flow. Which progress is seen as flowing steadily downwards (like a waterfall) through the phases of software implementation. This means that any phase in the development process begins only if the previous phase is complete. The waterfall approach does not define the process to go back to the previous phase to handle requirement changes. The waterfall approach is the earliest approach that was used for software development.

Overviews Used

Introduction to gas leakage detector

The project is mainly designed by leakage of Gas. Gas leakage detection systems are an integral part of a safety system, providing the first line of defense against the possible disasters of gas leakage.

The usage of the gas brings great problems in the domestic as well as working places. The inflammable gas such as Liquidized petroleum gas (LPG), which is excessively used in the house and at work places. The leakage of the gas causes destructible impact to the lives and as well as to the heritage of the people. So, by keeping it in the concept of the project we have determined to develop an examining system which finds the leak of LPG gas and protects the work places by taken correct precaution at correct time.

CONCLUSION

The advantage of this simple gas leak detector is its simplicity and its ability to warn about the leakage of the LPG gas . This system uses GSM technique to send alert massage to respective person if no one is there in the house and then gas leaks occurs, GSM module is there to send immediate messages to the respective person regarding the gas leak. The advantage of this simple gas leak detector is its simplicity and its ability to worn about the leakage of the LPG gas. This system uses push notification to send alert massage to respective person if no one is there in the house and then gas leaks occurs.

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