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Gas Level and Fire Prevention Monitoring using Arduino

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Article Info
Volume 83
Page Number: 8554 - 8558
Publication Issue:
March - April 2020

Article History
Article Received*: 24 July 2019*
Revised*: 12 September 2019*
Accepted*: 15 February 2020*
Publication*: 09April 2020*

Abstract
we face more problems with gas containers going dry in day-to-day life. Checking the gas quantity in the gas container and notifying and placing a refill order at the respective office (gas agency) via an internet message via GSM and GPS module. The sensor calculation is done with the help of charging cell. If the gas level exceeds an excessive gas value, so the user can replace the old cylinder with new in time. A gas explosion can be defined as an explosion which results from combining a gas with air, typically from a fuel movement. With the help of the scheme, we could create and increase people's awareness of this method, and protect people from the danger.

Keywords: *Arduino, GPS module, GSM Module, Flame sensor, Gas sensor.*

I. INTRODUCTION

Detection of Liquefied petroleum gas and notification systems won't just be warm us about the gas leakage physically, but also shut off the petrol cylinder pushbutton to prevent any leakage of fuel. In addition, this proposed device configuration notifies the person inquired by sending an email and a message to their mobile phone. It gives any gas setup a greater degree of safety under any circumstances. The presence of flammable substance in the site and its connection with the fuel can cause a problem, losses of assets, losses of life, and waste of resources and only adds the list. Under continuous risk, the highest priority sectors are high-budget relay industries, vehicles such as a car, buses, trucks, etc., as well as places where they are processed and treated.

This proposed method or server edition is lightweight for safety broadcasting because it includes many good features of positive importance and it carries an automatic gas USP shutdown feature; this feature is of great significance in the lack of any human assistance in the field of leakage. Reports of life-accidents leading to gas leakage are many. Some papers [2][3][4] are published on the detection of fuel movement in which use of the gas sensor with leakage detection and also provide users with an alert via SMS using GSM Module. Users are alerted in this paper via the Internet of things, cloud concept, a physical tools, home appliances, automative, and other products injected with electronics, software, actuators, sensors and connectivity network that allows such artifacts are for communication and data sharing. The idea of IOT is the network of physical modules, vehicles, home appliances and other items that combine hardware implementation and software implementation with applications, circuitry, sensors, actuators, and the network enabling the communication and sharing of data between these objects.

II. LITERATURE SURVEY

In [1] Dr. S. Akshay offers high safety standards wherever possible. There are now a few days of devices available that provide refuge for all of humanity. We all burn fuel in our lives to prepare our daily routine, but if this gas was leaked because of some issues or there is a great chance of disaster to arise around it.

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In [2] Aastha Singh, Mr. Manish Verma, Mr. LumeshSahu suggested that home security should be given. This is the prevention measures associated with the fuel movement to exhibit the incident is to mount a package for detecting gas leakage at many locations. The objective of this proposed project is to give security by identifying the movement of LPG applicable to the residential premises.

In [3] AnkitaSone based on a schemes that is used with the aid of arduino to detect various hazardous gases. This work modifies the existing systems that are applied to industrial areas, and this device is used in homes and workplaces.

III. EXISTING SYSTEM

Currently each have need a facility which minimize their try, time and supply the simplest manner try to to their job better very well. In existing system all the items are done manually. The status of the gas container is thought when the gas inside container goes empty. The container is booked online and therefore the uneducated people do not appear to be able to do this job and are busy scheduling humans who do not have enough time to try all the operation.Safety also plays a decisive role. this stuff are often overcome with the assistance of thistechnique.

Disadvantages

- Safety measures are not taken.
- Level of the gas is not measured.
- No awareness is created among the people.

IV. PROPOSED SYSTEM

The methodology of the set-up detects LPG leakage and warns the user using the GSM module, about the leakage by SMS message. If some fire happens, the Flame sensor will sense a high temperature change and send a pulse to the microcontroller, which internally will give the user an update and activate a siren warning as well. The location will be shared to fire service to send information including first aid by pouring water automatically being done using GSM Module.

Advantages

- Determined leakage.
- Level is continuously measured.
- Awareness is created.

V. IMPLEMENTATION DETAILS

The methodology of the system is described with proper

Diagram.

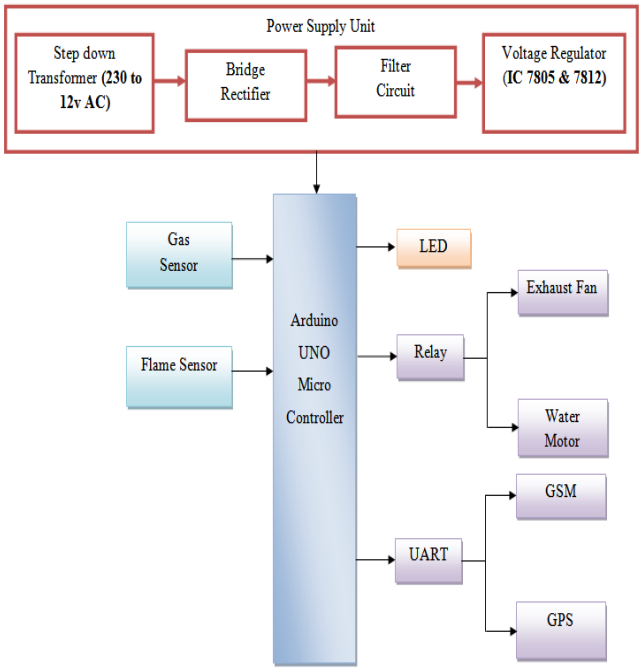

Figure 1. Block Diagram –Main Unit

VI. MODULE DESCRIPTION

A. Power Supply Unit

Every stage of the DC power supply unit is converted to a electronic system. Thus the DC power supply circuit will be mandatory demand for all of these processes. Every low voltage power system with a battery can be implemented. Yet batteries could be expensive and difficult for long-term power supply applications. In the form of an unregulated power supply, the best method used is a

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combination of a step down transformer, bridge rectifier and an electrolyte filter.

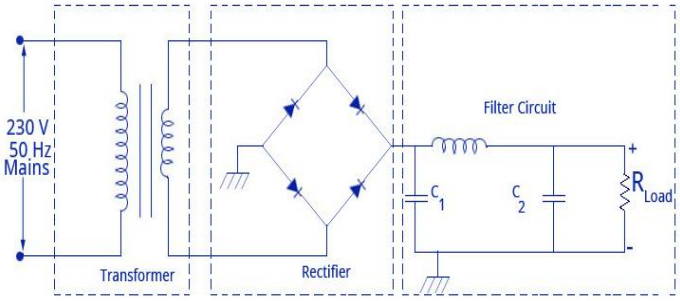

Figure 2. Power supply unit

B. Arduino UNO

Arduino UNO Microcontroller is open source hardware software and real-time embedded system business, project, and user group system software that depiction and fabricate on-chip microcontrollers and kits to create digital devices and objects capable of sensing and controlling objects around the world. Product of the project are distributed as licensed under the GNU General Public License (GPL) or the GNU Lesser General Public License (LGPL) permitting manufacture by anyone Ardunio UNO, MEGA etc boards and software distribution. Arduino boards are available commercially in pre-assembled form, or as do-it-individualy kits (DIY).

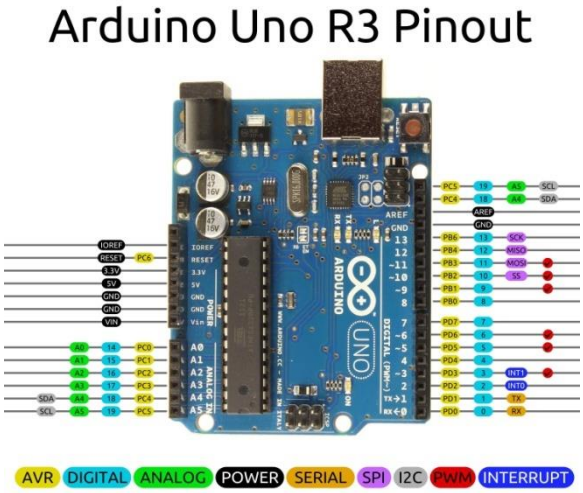

Figure 3. Arduino UNO

Arduino designs useful for microprocessors and controllers of various types. The boards are involved in digital input/output (I/O) and analog pins that may be connect with various Arduino expansion boards and certain platforms. The boards feature serial communications interfaces, to certain types like USB, SPI, and I2C are used to launch personal computer programs.

C. RELAY

It can be defined as an electro-magnetic relay surrounded by an iron core with a wire coil. The armature is attached to the coupling which is mechanically connected to the contacts at the switch-point. These are kept cautiously with the help of a spring.

Figure 4. Relay

D. DC MOTOR

A DC motor is an electrical machine which converts electrical DC into a mechanical one, when fire is detected it is used to spray water.

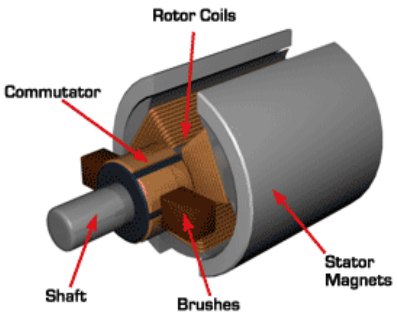

Figure 5. DC Motor

E. LED:

LED (LIGHT EMITTING DIODE) consists of a chip of impregnated, or doped semi-conducting material with impurities to create a p-n junction. LED is used to detect abnormal values. When sensor

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going to abnormal values, LED will be ON else OFF.

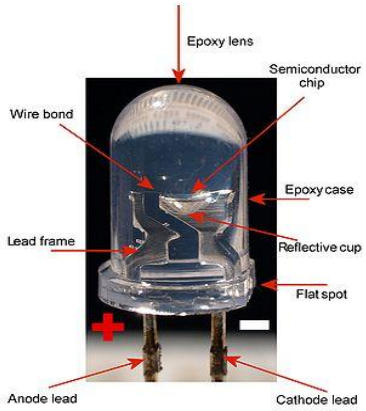

Figure 6. LED

F. Gas Sensor

The detection and monitoring of the gasses produced ids very essential in the current trend mechanics scenario. From home appliance system such as air conditioners to electrical chimneys and safety systems monitoring of gasses is industries is extremely decisive. MQ2 Gas sensors called Co2 respond to the gas present simultaneously, thus keeping the proposed system up-to-date on any other changes that occur in gaseous molecular concentration. The MQ2 gas sensor module consists of an exoskeleton of steel underneath those houses a sensing portion below.

Figure 7. Gas sensor

G. Flame Sensor

A flamming detector sensor is a digital sensor designed to detect a fire or explosion within the environment and respond to it. An analog-based flame detector sensor can frequently reply more accurately and faster than a smoke or heat detector because of the mechanisms it uses to observe the flame.

Figure 8. Flame Sensor

H. GPS:

GPS stands for Global Positioning System and was developed as navigation and positioning system for military and civilian use around the world by the U.S. Department of Defense. It's a radio-navigation space-based system consisting of 24 satellites and ground support. Global Positioning System gives users with effective information about their position, latitudes, longitudes and velocity, due to time, anywhere in the world and the entire climate.

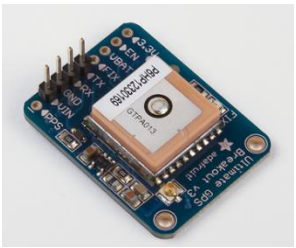

Figure 9. GPS

I. GSM:

GSM's a handheld modem for communication. Also known as Global Mobile Communication System (GSM). Around1970 Bell Labs introduced the idea of a global network for mobile communication. Global mobile communication network is an open and automated wireless infrastructure that works in multiple frequency bands.

Figure 10. GSM

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VII. RESULT AND DISCUSSION

The system consists of a controller module input, output and. Input modules are gas sensor, Flame sensor module, interface with Ardunio. DC motor (Exhaust fan), and Water motor, GSM module, GPS module are the performance components. The controller used in the Arduino Uno package .The controller guides the output elements based on the variations in the module values of the input sensors. When the sensor detects gas the presence of harmful fuel it reveals a gas leakage to the user. It takes the remedial step automatically to drain the gas using a dc-motor fan running on 5v DC.

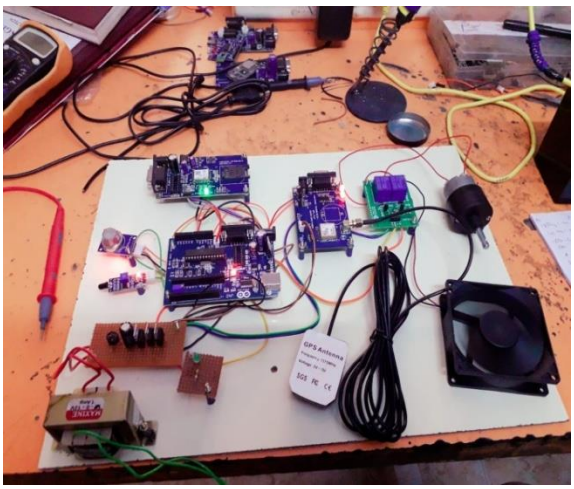

Figure 11. Hardware implementation of the system

VIII. CONCLUSION

This system is extremely useful for preventing accidents because of gas and fire leakage. It is a very good thing if we incorporate this in the broadest sense. We will get a portion of your time remotely informed. Detection system isn't expensive, so that it can be used an everyone.

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