

Leakage of Gas and Fire detection in LPG dispensing station using Raspberry Pi

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Abstract: *The development in the industrial monitoring system using Internet of Things (IoT) is increased nowadays. Security plays a vital part in the humanity and it is essential that high-quality security systems are to be implemented in the places of Gas dispensing station. The main purpose of the work is that a sensor used for this system is MQ-5 which senses the outflow of gas at any distinctive state. In this method, Raspberry pi plays a significant role such that all the components are interfaced to it. This avails the viewer to observe the alteration from wherever in the world. It can alert the viewer by placing a buzzer and LCD display near the workspace. The necessity of a gas detection system is not only to observe the environment constantly but also to avert the additional leakage of gas in the environment and to reduce the possibility of fire. When gas and smoke is detected, then system will convey alert message to the owner of the dispensing station and to the manager through IoT to take necessary action.*

Key Words: *Internet of Things (IoT), Raspberry pi, Gas Sensor, Fire Sensor.*

1. INTRODUCTION:

Attractiveness of Raspberry pi has developed in the last years, generally as part of the Internet of Things, which produces a significant impact in numerous economic sectors (production, transportations, power, cultivation, residence automation, etc.). Numerous national and European policies have been line-up to guide the EU companies to the implementation and diffusion of the IoT technologies. In this paper we are implementing a gas outflow and fire discovery system which absolutely outperform the performance of the existing systems. In this method, Raspberry pi is used as a control system, MQ-5 gas sensors. The output is confined by the sensors is send into cloud using Internet of Things (IoT). The Internet of Things (IoT) is generally worn for linking electronic devices such as smart phones, TVs, sensors to the Internet where devices are related together providing latest forms of communication between devices and people and between devices themselves. In the IOT field, there have been lots of updates and developments are essential for the individual who makes use of it. Each modernize done with IOT afford us with the recent and highly developed services and quality. The Internet of Things affords admittance to embedded devices and web services for wide range of communication. Adafruit permit you to gather, accumulate and analyze on information using sensors such as Arduino, Raspberry pi.

2. LITERATURE REVIEW:

There are various techniques to identify the outflow of gas over pipelines. But for extended pipeline it is not at all possible because detection of the leakage becomes more complicated and requires more time to recognize the outflow. The existing method is provided for short range and time consumption is more. In order to reduce these effects the system should be modernized and then it's possible to reduce the fire accidents. Therefore the existing system is modified by increasing the amount of sensors used in earlier method. This system performs efficiently and assists us to recognize the leakage effortlessly with the help of IoT. It also permits the consumer to manage and observe irrespective of the location of the consumer.

3. PROPOSED METHOD:

This proposed method contain following module raspberry pi-3, gas sensor, fire sensor, once gas leak is detected it alert indication via IoT to owner of the station and produce alarm in the dispensing station.

A. BLOCK DIAGRAM

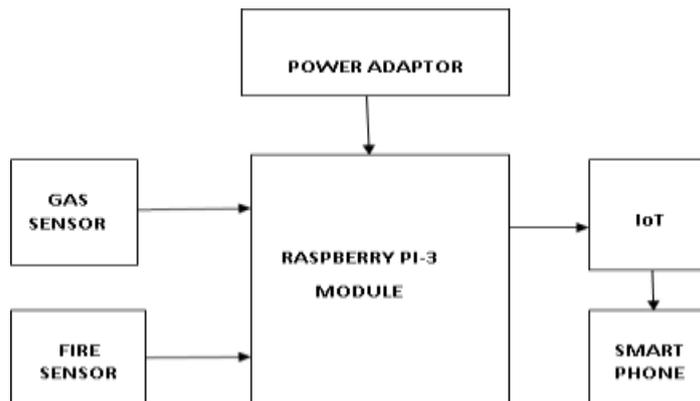


Fig 1. Block diagram

B. WORKING

The outflow of hazardous gas from the gas dispensing station is identified potentially by sensors. These sensors alert user by conveying message through the IoT. In this method, gas sensor and fire sensor are interfaced with Raspberry pi module and from the module it is given to the IoT using blink and from the IoT a message is sent to the user's smart phone. When there is a leakage or fire in gas dispensing station, these sensors detects and required voltage given to raspberry module which sends alert message to user through IoT

**4. COMPONENTS:
 A. RASPBERRY PI**



Fig 2. Raspberry pi

The Raspberry Pi 3 Model B is the third generation of Raspberry Pi . This powerful small sized single board computer can be used for many applications. This model is more powerful processor than the first generation. In addition it also has wireless LAN and Bluetooth connectivity so it is the ideal solution for some specific designs. Raspberry pi has a Broadcom System on Chip (SoC) which includes an ARM compatible Central Processing Unit (CPU) and an On -chip Graphic Processing Unit (GPU). The Data will be stored in micro SDHC slot and power capacity ranges from 1.5w to 6.5w. The setting up of Raspberry Pi consists of selecting rasbian OS from noobs package.

B. GAS SENSOR (MQ-5)



Fig 3. Gas sensor

The gas sensor has a sensitive filament made of SnO₂. In the presence of clean air, this filament tends to have lower electrical conductivity. When a combustible gas such as LPG is introduced, the filament's conductivity rises, and the amount of change in its conductance/resistance can be used to indicate the equivalent gas concentration. This effect tends to be particularly pronounced at higher temperatures, and resistive heating element is present as well. SnO₂ is particularly sensitive to Methane, Butane and Propane, but is also sensitive to other combustible gases as well.

C. FIRE SENSOR

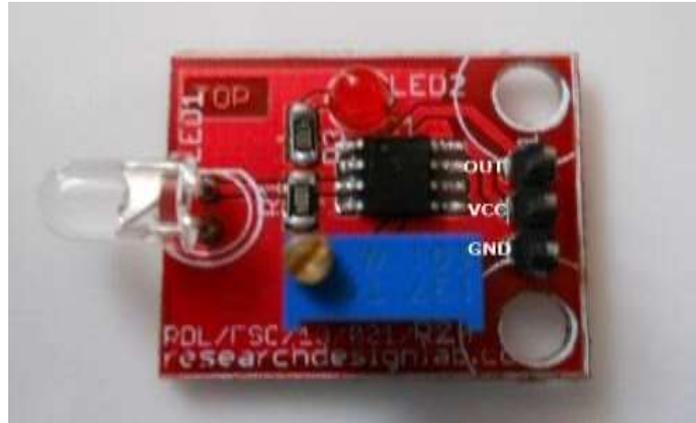


Fig 4. Fire sensor

The Fire sensor is used as a simple device for detection of fire and protection against it. The module has a comparator to detect fire and its range is up to meters and it depends on the density of fire. It has fire indicator LED. Calibration is preset for range adjustment. A fire detector works by detecting smoke and/or heat. These devices respond to the presence of smoke or extremely high temperatures that are present with a fire. After the device has been activated, it will send a signal to the alarm system to perform the programmed response for that zone.

5. CONCLUSION AND FUTURE SCOPE:

The proposed method will discover the outflow of gas and fire and it is knowledge to the user through message. This method is more accurate and cost effective than existing method. This method is more efficient because it uses an advanced controller for ecological environment. The controller accumulate the information from sensors and those updated values are written by python coding in particular file. Depending upon the information gathered the required action will be carried out.

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