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IOT BASED SMART GAS MONITORING SYSTEM WITH AUTOMATIC GAS LEAKAGE CONTROLLER

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ABSTRACT

In our day-to day lives, we have a tendency to face such issues that ar concerning to gas instrumentation going empty. watching the gas amount within the instrumentation and to intimate moreover on refill order within the several branch workplace via a message by suggests that of web through IOT module or SMS with the assistance of GSM module. the continual mensuration is completed with the assistance of supersonic device. If the gas level reaches below the edge level of the gas , the previous cylinder is replaced by new in time. The secondary aim of the system is to sense the discharge of the gas through gas device and to mechanically turning down the regulator valve exploitation servo motor. the buyer are going to be alerted concerning the discharge by triggering a buzzer alarm moreover as by receiving a message through SMS and application. At constant time, with the assistance of dirt device, the fan is turned on mechanically for correct ventilation to remain off from unfortunate accidents.

I. INTRODUCTION

Internet of Things aim towards creating life easier by automating each little task around USA. the maximum amount is IoT serving to in automating tasks, the advantages of IoT may also be extended for enhancing the prevailing safety standards. Safety has invariably been a vital criteria whereas coming up with home, buildings, industries additionally as cities. The augmented concentration of sure gases within the atmosphere will influence be extraordinarily dangerous. These gases could be ignitible at sure temperature and humidness conditions, hepatotoxic once extraordinary the desired concentrations limits or perhaps a tributary consider the pollution of a vicinity resulting in issues like smogginess and reducedvisibility which may successively cause severe accidents and even have adverse result on the health of individuals. so as to possess an impact over such conditions this paper proposes a system that uses AN MQ- 2 sensing element that is capable of detection gases like H2, LPG, CH4, CO, Alcohol, Smoke and gas [1]. this method isn't solely capable of detection the leakages and therefore presence of excess amounts of harmful gases and alerting through hearable alarms however conjointly, concerning the condition before any mishap takes place through a private decision and message mistreatment GSM module, AN e-mail concerning the main points of the world mistreatment AN local area network protect. The system cuts off the most power provide of the house or building once the concentration of gas is on the point of reach its Lower Explosion Limit (LEL) that is completed with the assistance of relays. The Gas run Detector System conjointly sends the sensing element reading to cloud so analytics may well be dole out on the readings for increasing the preciseness of the system.

II. LITERATURE SURVAY

PAPER & PUBLISHED YEAR	SENSORS USED	PROS	CONS
Smart Gas Level monitoring, Booking gas leakage detector using IoT (2017)	MQ-2 Gas sensor	GSM with no secure	Avoidance of Gas Leakage to the user
Microcontrolle r Based low cost Gas Leakage Detector with SMS alert. (2016).	GSM and MQ-5	No prevention for fire is possible with kit.	Sensor has sensitively combined with quick responce time
Gas Leakage Detection and smart Alerting and Prediction using IoT(2017)	MQ-2 Gas Sensor	Rise in resistence of gas sensors	Safety against leakage of harmful and toxic gas to minimize

TABLE 1: Literature survey Comparison

III. EXISTING SYSTEM

Now a day's every one want a facility which reduce their efforts, time and provide a way to do their work more easily. In existing system all the things are done manually. The status of the gas container is known when the gas inside container goes empty. Online booking of the container is done and the uneducated people are not able to do these task and busy schedule people they haven't sufficient time to do all the activity. Also safety plays the important role. These things can be overcome with the help of this system.

IV. PROPOSED SYSTEM

The components used in the project are listed below

- MQ -5 Gas Leakage sensor
- Arduino UNO
- Ultrasonic sensor
- Relay
- DC Motor

A. GAS LEAKAGE SENSOR

The figure 1 is MQ-5 gas sensor applies SnO2 which has a lower conductivity in the clear air as a gas-sensing material. In an atmosphere where there may be inflammable gases, the conductivity of the gas sensor raises along with the inflammable gas concentration increases. MQ-5 plays a high performance in detecting butane, propane and methane, and can identify both propane and methane at a same time. MQ-5 is highly sensitive to natural gas. It features with the ability to detect various inflammable gases and lower cost, making it an ideal choice of different applications of gas detection.

B. ARDUINO UNO

Arduino UNO is the microcontroller board which has six analog input and 14 digital input and output pins, a power jack, an ICSO header and a reset button. The arduino board is shown in the figure 2.

Fig: 1 Arduino UNO Board

C. ULTRASONIC SENSOR

Ultrasonic ranging module HC - SR04 provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules includes ultrasonic transmitters, receiver and control circuit. The basic principle of work:

Using IO trigger for at least 10us high level signal,

The Module automatically sends eight 40 kHz and detect whether there is a pulse signal back.

IF the signal back, through high level , time of high output IO duration is the time from sending ultrasonic to returning.

Test distance = (high level time×velocity of sound (340M/S) / 2

D. RELAY

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

Relays work on electromagnetism, When the Relay coil is energized it acts like a magnet and changes the position of a switch. The circuit which powers the coil is completely isolated from the part which switches ON/OFF, This provides electrical isolation. This is the reason we can control a relay using 5V's from an arduino and the other end of it could be running an 220 to 240V appliance, the 240V end is completely isolated from the 5V arduino circuitry.

Fig: 2 RELAY

E. DC MOTOR

A DC motor is designed to run on DC electric power. Two examples of pure DC designs are Michael Faraday's homopolar motor (which is uncommon), and the ball bearing motor, which is (so far) a novelty.

By far the most common DC motor types are the brushed and brushless types, which use internal and external commutation respectively to create an oscillating AC current from the DC source—so they are not purely DC machines in a strict sense.

We in our project are using brushed DC Motor, which will operate in the ratings of 12v DC 0.6A which will drive the flywheels in order to make the robot move.

Fig: 3 DC Motor

I. SYSTEM ARCHITECTURE

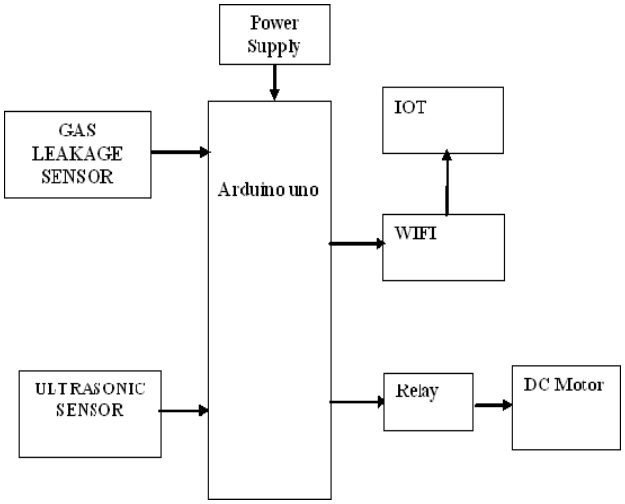

Fig: 4 Architecture Diagram

II. METHODOLOGY

This system detects the leakage of the LPG and alerts the consumer about the leak by Notifications with the help of ioT and Android App. The additional advantage of the system is that it continuously monitors the level of the LPG present in the cylinder using load sensor. If any fire is to be happened then the temperature sensor will sense a high change in temperature and will send a pulse to microcontroller which intern will send an update to the user, and as well it will trigger a siren alarm. The gas booking/order is being done with the help IOT after the container goes empty.

III. WORKFLOW DIAGRAM

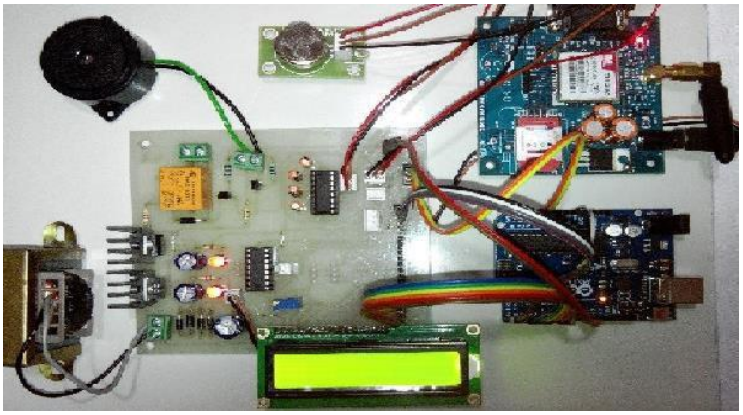

Fig: 5 Workflow Diagram

IV. CONCLUSION

The proposed gas leakage detector is promising in the field of safety. The attempt while making this prototype has been to bring a revolution in the field of safety against the leakage of harmful and toxic gases to minimize and hence nullify any major or minor hazard being caused due to them. Nevertheless there is always scope of improvement and some of the features that will improve the system and make it even better and reliable

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