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LPG GAS WEIGHT AND LEAKAGE DETECTION SYSTEM USING AURDUINO BASED IOT SYSTEMAND AUTOMATIC CYLINDER BOOKING WITH ALERT SYSTEM

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ABSTRACT

The liquefied petroleum gas is finding wide usage in homes, industries and in automobiles as fuel because of its desirable properties which include high calorific value, produces less soot, produces very less smoke and does not cause much harm to the environment. Natural gas is another widely used fuel in homes. Both burns to produce clean energy, however there is a serious threat about their leakage. The gases being heavier than air do not disperse easily and may lead to suffocation when in haled; also the leaked gases when ignited may lead to explosion. The number of deaths due to the explosion of gas cylinders has been increasing in recent years. There is a need for a system to detect and also prevent leakage of LPG. The proposed system uses a MQ5 gas sensor which can detect different combustible gases with low cost, and a PIC micro-controller to alert when the levels of gas detected is beyond safety limit and also to take emergency measures including switching on of the exhaust fan and then close the solenoid valve. The alert mechanism in the proposed system includes an LED indication, buzzer and an SMS sent to the stored numbers with the help of GSM. To design and implement the development of a LPG gas detection System. The proposed system is very useful in industry environment.Leakage Detecting System will detect using load cell if there is no load LPG gas. That indicates gas is empty. Send SMS using GSM module like gas is empty.

1. INTRODUCTION

The device is designed for use in homes which use Liquefied Petroleum Gas or natural gas; however it can be used in industries and other applications involving the gas cylinders. There are approximately 30crore LPG users in the country in which mostly 40% of the population. The Several standards have been implemented for the gas leakage detection system. The existing systems provides an alarm system which is mainly meant to detect an Gas leakage in the house and commercial premises The objective of the proposed system is to continuously

NJICE –National Journal on Information and Communication Engineering ISSN: 2231-2099 Volume 6 Issue 1, 2016 Apr-Jun 2016 Pages 8-12

measure the weight of the cylinder and as soon as it reaches the minimum threshold it will automatically sends an SMS alert to the user as well as Authorized LPG agent so that they can act accordingly. This system also designed to detect LPG gases such as propane and butane. The allowed level for butane is 600ppm above which it is considered to be of high level and poses a danger. The threshold level of weight of the cylinder is used for automatic cylinder booking. The main aim of this project is to monitor for liquid petroleum gas (LPG) leakage to avoid major fire accidents and also facilitating safety precautions where security has been an important issue and automatic cylinder booking without human intervention. The system detects the leakage of the LPG using gas sensor and alerts the consumer about the gas leakage by sending SMS. The system measure the weight of cylinder by using weight sensor and display corresponding weight in LPG display The proposed system uses the GSM Modem to alert the person about the gas leakage via SMS and status of automatic cylinder booking. When the system identifies that LPG concentration in the air reaches the specified level then it alert the consumer by sending SMS to registered mobile phone and alert the people at home by activating the alarm which includes Buzzer simultaneously and also display the same message on LCD to take the necessary action and switch on the exhaust fan or opening windows to decrease the gas concentration in the air.



2. BLOCK DIAGRAM

Fig 1. Block Diagram

In this project we are using Arduino as its Controller.IR is placed to track various frequencies emitted. The system is provided with Led and buzzer. If user moves the aircraft, antenna tracks for a corresponding signal the rotation of antenna is based on the signal tracked by IR. Once the signal is traced Led blinks with a buzzer sound and the data is displayed on the LCD.IOT will update or displayed the data on web page in web browser.In this way we can track the signal and can avoid the collision with the desired frequency signal.

NJICE – National Journal on Information and Communication Engineering ISSN: 2231-2099 Volume 6 Issue 1, 2016 Apr-Jun 2016 Pages 8-12

3. HARDWARE DESIGN



The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains 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. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter.

4. SYSTEM DESIGN AND IMPLEMENTATION



Fig3:Design And Implementation

The proposed system can detect LPG Gas in an industrial environment. This system mainly use in industry. It can send a command to the control station using GSM module. The main part of the system contain arduino Uno micro controller, GSM modem. Leakage Detecting System will detect using load cell if there is no load LPG gas that indicates gas is empty. Send SMS using GSM module like gas is empty. All information will be displayed on LCD.

NJICE –National Journal on Information and Communication Engineering ISSN: 2231-2099 Volume 6 Issue 1, 2016 Apr-Jun 2016 Pages 8-12

5. SOFTWARE IMPLEMENTATION

Plug in your board and wait for Windows to begin it's driver installation processAfter a few moments, the process will fail, despite its best efforts. Click on the Start Menu, and open up the Control Panel.While in the Control Panel, navigate to System and Security. Next, click on System.Once the System window is up, open the Device Manager.Look under Ports (COM & LPT). You should see an open port named "Arduino UNO (COMxx)". If there is no COM & LPT section, look under 'Other Devices' for 'Unknown Device'.



Fig4:Software Design

RESULT

This system is completely automate the process of refill booking without human intervention. This system is used to protect customers' life and property from reputed accidents. In this system used software's are simpler, clear programming environment. It is a open source and extensible software hence we can extend up to customer requirement. This project is easy to use and this project is fully automated so no human attention is required. It avoids the problematic situation or the trouble caused due to unavailability of gas cylinder. This project avoids the accident or the fire which is caused due to leakage of LPG gas.

FUTURE SCOPE

Mainly focusing of industrial application. The device is designed for use in homes to prevent from accident due to leakage of LPG Gas.

NJICE – National Journal on Information and Communication Engineering ISSN: 2231-2099 Volume 6 Issue 1, 2016 Apr-Jun 2016 Pages 8-12

CONCLUSION

The proposed gas leakage detector is promising within the field of safety. The objective of our project is to measure the gas present within the cylinder once weight of the cylinder is below the actual level, this will be done using the load sensors. The gas distributor gets the order for a new cylinder and the house owner (consumer) receives the message regarding the status and the secondary objective is to provide any malfunction in gas coupling system so as to stop harm or explosion of LPG. The future work would create it additional adaptable and additional responsive for any application it must be updated often. In future the system can be modified with the voice recognition system.

REFERENCES

[1] TriveniShinde and B. V. Pawar, —lpggasweight and leakage detection system usinaurduino based iot systemautomaticcylinder booking with alert system International journal of engineering sciencesand research technology ISSN:2319-7064,Volume-2, No-6, pp.187-191, June-2013

[2] S. Saravanan, T. Kavitha, —lpggasweight and leakage detection system usinaurduino based iot system and automaticcylinder booking with alert system Journal of Theoretical and Applied Information Technology, Vol. 38, No2, pp.206-209, 30th April 2012

[3] N. S. Vaidya and A. V. Nikalje, —lpggasweight and leakage detection system usinaurduino based iot system and automaticcylinder booking with alertsystem, International journalofengineeringandinnovativetechnologyISSN:22773754,Volume3,No5,pp.238244,novem ber-2013.

[4] Vivekagarwal, N. VenkataMurali, and C. Chandramouli, —A Cost-Effective Ultrasonic Sensor-Based Driver- Assistance System for Congested Traffic Conditions^{II}, IEEE Trans. Intell. Transp. Syst., vol.10,NO.3, pp. 486-498, Sep -2009

[5] ShivalDubey and Abdul Wahid Ansari, —Design and development of vehicle system using electromagnet and ultrasonic sensors, International Journal on Theoretical and Applied Research in Mechanical Engineering ISSN: 2319 – 3182, Volume-2, No-1, pp.80-83, Jan-2013

[6] J. Pierowicz, E. Jocoy, M. Lloyd, A. Bittner, and B. Pirson."lpggasweight and leakage detection system usinaurduino based iot system and automaticcylinder booking with alert system" Technical Report DOT HS 809 171, NHTSA, U.S. DOT, September 2000.

[7] Giubbolini, L. (2000). "lpggasweight and leakage detection system usinaurduino based iot system and automaticcylinder booking with alert system" Vehicular Technology, IEEE Transactions on 49(6): 2270-2275.

[8] L. E. Mimbela, L. Klein. "lpggasweight and leakage detection system usinaurduino based iot system and automaticcylinder booking with alert system" Vehicle Detection Clearing House.August31,2007.http://www.nmsu.edu/~traffic