

Arduino based LPG gas Monitoring & Automatic Cylinder Booking with Alert System

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Abstract- There is an rapid development in technology which influencing the human life in several aspects due to rapid development in different fields, but we still need to adopt these technology to make human life easier to live. In India it is not possible to supply LPG through Pipes to each and every home as production of LPG is too short. At present we are having a system Advance LPG cylinder booking through IVRS or online which is most difficult to book the LPG cylinder for the illiterate and busy schedule people. Another Major problem LPG cylinder users facing is that “They don’t know exactly the status of LPG gas completion” makes delay in booking the LPG cylinder, which is uncomfortable most of the times.

I. INTRODUCTION

There are many LPG users in our country in which mostly 40% of the population. There are several standards have been implemented for gas leakage detection system. The existing systems provides an alert system, which detect a Gas leakage in the house and commercial premises. The objective of this proposed system is to continuously measure the weight of the LPG cylinder and as it reaches the minimum threshold value, it automatically sends an SMS alert to the user as well as Authorized LPG agent. This system also designed to detect LPG gases such as butane and propane gas. The allowed level for butane is 600ppm above, which is considered as high level and poses a danger.

The threshold level of weight of the LPG cylinder is used for automatic cylinder booking. The main aim of this project is to monitor for LPG (Liquid Petroleum Gas) leakage to avoid major fire accidents and also facilitating safety precautions and automatic cylinder booking without human intervention. This system detects the LPG leakage by using gas sensor

and alerts the consumer about the gas leakage by sending alert SMS. The system measure the weight of LPG cylinder by using weight sensor and display corresponding weight in LPG display.

The proposed system uses the GSM Modem to alert the user about the gas leakage by sending alert SMS and status of automatic cylinder booking. When the system identifies that LPG concentration in the air reaches above the specified level, then it will alert the consumer by sending alert SMS to registered mobile phone number and alert the people at home by activating the alarm which includes Buzzer simultaneously. It also displays the same message on LCD to take the necessary action.

II. PROCEDURE FOR PAPER SUBMISSION

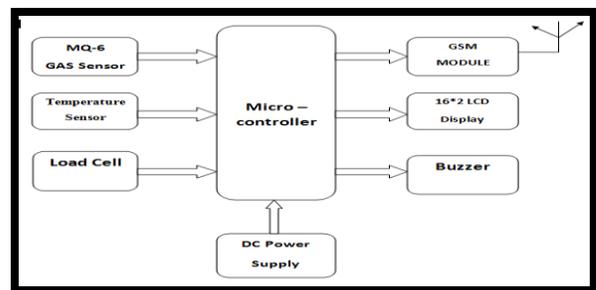
A. Review Stage

Submit your manuscript electronically for review. prepare it in two-column format, including figures and tables (until it don't fit properly and data is not visible).

B. Final Stage

After your paper has been accepted. The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission.

C. Figures



III. CONCLUSION

In this paper we have used automatic gas booking with alert system without human intervention. Our system helps customers to upgrade their safety and protect life and property from reputed accidents. The main objective of our system is to measure the gas present in cylinder when the weight of cylinder is below the fixed load by using weight sensor. The gas agency gets the order of new cylinder and owner received the messages regarding the status

IV. LITERATURE REVIEW

A] The “Smart Gas Cylinder Using Embedded System”, from International Journal of Innovative Research In Electrical and Electronics, Instrumentation And Control Engineering, February 2014

- Meenakshi Vidya proposed the concept of leakage detection and real time gas monitoring system. In this system, the LPG gas leakage is detected and controlled by of exhaust fan.
- K.Padmapiya proposed the concept of design of wireless LPG monitoring system. In this, the user is alerted about the LPG gas leakage through SMS and the power supply is turned off automatically.
- Selvapriya proposed the concept of system in which the leakage is detected by gas sensor and produce the results in the audio and visual forms as outputs.
- B. D. Jolhe proposed the concept of system in which two sensors are used for detecting the gas leakage and for monitoring the level of gas in the cylinder.
- Ashish Shrivastava proposed the concept of system in which two types of gases, LPG and CNG are detected for home safety as well as for vehicles.
- R.Padmapiya proposed the concept of system which ARM7 processor and simulates using keil software to alert the user by sending SMS.
- M.B.Frish proposed the concept of system that uses trace sensing technology and also detects the leakage.

V. HARDWARE REQUIREMENT / SOFTWARE REQUIREMENT

A. HARDWARE REQUIREMENT

- AVR Microcontroller (At mega 16)
- Methane gas sensor MQ-6
- Temperature sensor LM35
- LCD Display
- Load cell
- Voltage Regulator IC (7805)
- Piezoelectric buzzer
- GSM Module

B. SOFTWARE REQUIREMENT

Atmel Studio: Release 6.0

Atmel Studio is the new integrated development environment by Atmel. It also provides you a modern and powerful environment for doing development of AVR and ARM. You get started by exploring the included example projects. Run your solution on a starter or evaluation kit .A program and debug your project with the included simulator or use one of the powerful on-chip debugging and programming tools from Atmel. Get productive with the various navigate and intelligence features in the included editor. Experience seamless integration with various Atmel WEB services like Atmel Video Lounge and Atmel Store, datasheets to keep you updated and help you for design your solutions. For best use and productivity, it is possible for both designers and 3rd party to provide plug-ins and customize the environment with strong extension possibilities and online gallery

Atmel Studio also carries and integrates the GCC tool chain for AVR and ARM, AVR assembler and simulator, Atmel Software framework. All new Atmel tools are supported including the AVR ONE! JTAGICE mkII, JTAGICE3, AVRISP mkII, STK500, STK600, QT600, AVR Dragon and SAM-ICE.

PCB Artist

PCB Artist is PCB layout software tools available to use and an understanding of one layout tool can easily transfer to any PCB design tool.PCB Artist is an free software tool .It can be downloaded for free at www.4pcb.com.The only restriction is that, PCB Artist will not output a Gerber file for general use to

be fabricated anywhere but a fab file that must be fabricated through Advanced Circuits.

The process for PCB design is first create a list of parts you have to use in the circuit, then search for these parts in the libraries available. If the required parts are not in any of the available libraries then you must create the components. The process includes making a schematic symbol, PCB symbol and then creating a component that will connect the two together in order for the program to relate the schematic to the PCB design. Then next create the schematic which is a symbolic representation of the required circuit, configuring the functionality of the circuit. Then the final step is to tell the software to import all the components' PCB symbols that are in the schematic and then arrange them physically how you want them to be fabricated on the PCB board. After ordering the completed PCB you must then order the parts to populate the board. The parts can be professionally soldered or you can solder the parts by yourself.

- PCB Fabrication

The printed circuit boards can be fabricated by following:-

- Using Paints and Acid Resist Inks
- Screen Printing Method
- Photographic Method

First the copper sheet is cut according to the size and then it is mechanically and chemically cleaned by using thinner.

REFERENCES

- [1] K. Galatsis, W. Woldarsla, Y.X. Li and K. Kalantar-zadeh, "A Vehicle air quality monitor using gas sensors for improved safety", report in Recent Researches in Applications of Electrical and Computer Engineering.
- [2] K. Galatsis , W. Wlodarsla , K. Kalantar-Zadeh and A. Trinchi, "Investigation of gas sensors for vehicle cabin air quality monitoring", National Conference on Synergetic Trends in engineering and Technology (STET-2014), International Journal of Engineering and Technical Research ISSN: 2321-0869
- [3] "Design and Implementation of an Economic Gas Leakage Detector" A. MAHALINGAM, R. T. NAAYAGI, N. E. MASTORAKIS Department of Engineering Systems school of

Engineering, University of Greenwich (Medway Campus)Chatham Maritime, Kent ME4 4TBUNITED KINGDOM, article in Recent Researches in Applications of Electrical and Computer Engineering.