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Research Paper

Automatic gas booking system using IoT

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Abstract

Gas Booking is a major requirement in every individual life. The need of this project is to save time while booking the gas. When we call to the gas distributor our request may not be recorded or call may not be connected. These all waste the person's time. If we haven't noticed the completion of gas we need to book it in black for more money. By this project the level of gas will be monitored at all the time and we get message when gas is about to complete. In this paper we would like to advocate a micro-controller-based system in which a weight sensor, and load cell are used to discover the weight of the gas present within the cylinder. This unit is integrated into an alarm unit, to sound an alarm or supply a visual indication when the LPG is completed. The sensor has proper sensitivity and a brief reaction time at fewer prices. If gas completion is identified, message to the lawful candidate or family member the usage of cellular network known as GSM is dispatched routinely. It also gives the additional quality to calculate the weight of LPG cylinder and displays its value in Liquid Crystal Display (LCD). Amount of gas less than or equivalent to 10kg the cylinder is booked mechanically by sending textual content message to a provider. Additionally, when the cylinder has a weight of 0.5kg or less, it alerts the lawful candidate or family member by sending a notification to refill the cylinder.

1. Introduction

1.1. Topic

The need of this project is to save time while booking the gas. When we call to the gas distributor our request may not be recorded or call may not be connected. These all waste the person's time. If we haven't noticed the completion of gas we need to book it in black for more money. By this project the level of gas will be monitored at all the time and we get message when gas is about to complete.

1.2. Rationale

LPG, first produced in 1910 with the aid of Dr. Walter Snelling is an aggregate of commercial butane and commercial propane having saturated in addition to unsaturated hydrocarbons. Because of the flexible nature of LPG, it's far used for many fields along with home gas, commercial fuel etc., LPG is an exponential increase daily. Booking an LPG cylinder now-a-days is just a textual content message. Petroleum businesses have released the customer-friendly service called as IVRS approach for customers. For this reason, the requirement of an effective device to weight and show the quantity of LPG is necessary.

2. Description

2.1. System Overview

It consists of elements as shown. It includes micro-controller (ATMEGA 16A), weight sensor (Load Mobile-L6D), gas sensor, GSM module (SIMCOM300), and display(s).

2.2. Micro-Controller

A proficient and quick running controller is expected to continually feel the LPG fuel and its stage (weight) sensor's yield. In conjunction with this a device ought to have capacity to keep some data which can be utilized for also handling. As proven in above determine 1, the micro-controller is on the centre of the device. it's miles having functions like 16kb internal ram making clean garage of whole code in micro-controller itself, also the 1 MIPS according to MHz guidance cycle execution fee more desirable average gadget overall performance.
The LCD module identified with port b of ATMega16A in four-piece mode is utilized to show the predetermined messages. The weight sensor module yield taken from transfer circuit is associated with pins of port which is utilized to uncover fuel degree persistently.

2.3. Weight Sensor Module

To book a cylinder from a wholesaler, we should know about the amount of gas present inside the cylinder. Hence, the amount of gas contained in the cylinder must to identify continuously. The load cell having required weighing ability for domestic cylinder is utilized and for assessment reason the weight sensor module is utilized together

with the load cell. L6d weight sensor module is equipped in the system. The load cell yield drives a transfer circuit which offers two logical pulses (for <=10 kg and <= 0.5 kg), which are correspondingly associated with micro-controller port pins to identify the level of the gas.

2.4. GSM Module

Weight sensor offers the gas level in cylinder, and micro-controller will take essential actions. The status of the cylinder should be passed on to the lawful owner of gadget or housemates by LCD display and GSM module.
GSM module is helpful to send and get messages based on AT commands. These instructions used to control a modem interfacing it to the micro-controller. This utilises SIMCOM 300. It works in 12volt adapter. It requires particularly less memory to send.

2.5. LCD Display

Machine is performing controlling and monitoring operations, apart from that the primary need is to place a display inside the system which indicates numerous text which include gas weight, reserving number of the cylinder in case of fill up of cylinder and display actions will be taken by the micro-controller LCD of 16X2 characters operating on +5Volt supply and 4-bit mode operation is used for the venture of showing messages. Intermix with ATMegaL6D and simple code of a program makes it very beneficial to make system easy to use that is user friendly.

2.6. MQ-6 Sensors

The LPG comprises of propane, propylene, butane, and butylenes etc. A delicate, responsive, capable gas sensor is required that identifies just LPG substances and is less unstable to various gases like cooking exhaust, cigarettes, and so forth. Delicate material of MQ-6 gas sensor is Tin (IV) Oxide (SNO2), which has diminished conductivity in clean air and its affect ability will increment with the concentration of gas, moreover it maintains a strategic distance from gases like cooking vapour. It requires a voltage of 0-5 volts that is low and secure as in accordance with vaporous condition is considered.
This sensor is used to sense the gas and if gas level goes above max level then it turns ON which gives hinder to micro-controller and on the other hand it switches on the alarm and exhaust fan.

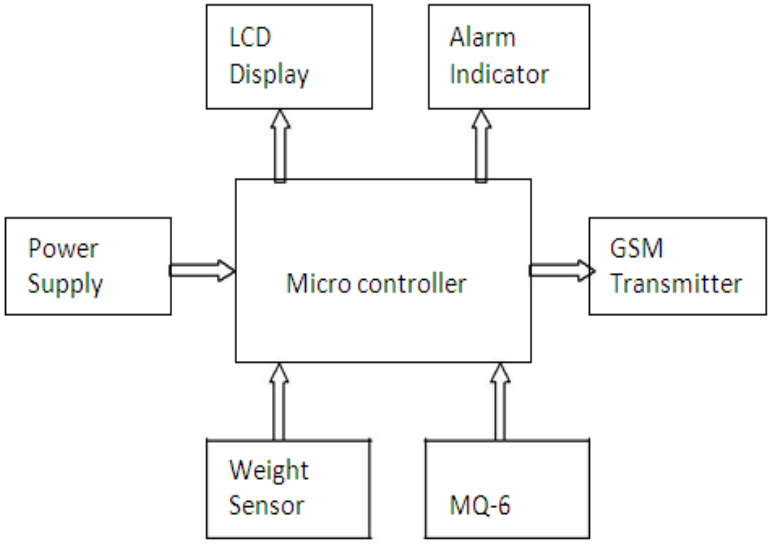

Fig.1: Block diagram of Microcontroller

3. System Operation

The glide chart for computerized gas reserving explains the method of the operation as follows:
In automated gas booking device, L6D regularly checks the weight of the cylinder and displays the weight on seven segment displays. When the weight of the gas is less than or equivalent to 5kg, a logic pulse is fed to a port pin of micro-controller. As this pin is going high, micro-controller will send a reserving message to distributor. Also, at the same time the message may be displayed on liquid crystal display as
"RESERVING CYLINDER". When the weight of the gas is less than 0.5 kg any other logic pulse is fed to some other port of micro-controller. As this port pin is going excessive, micro-controller will ship a message as "fuel last most effective 0.5 Kg. Immediately replace the cylinder" through a GSM module to mobile numbers required members with request whether or not the charge might be on line or cash on shipping. In this undertaking fuel leakage detection is likewise included the use of MQ-6 sensor and an alarm. We can reset with the aid of a manual reset transfer. Also, a common sense excessive (+5 v) is given as an interrupt to int0 pin of ATMega16 A micro-controller. The micro-controller sends a message "EMERGENCY ALERT: LPG gas leakage identified in the house."

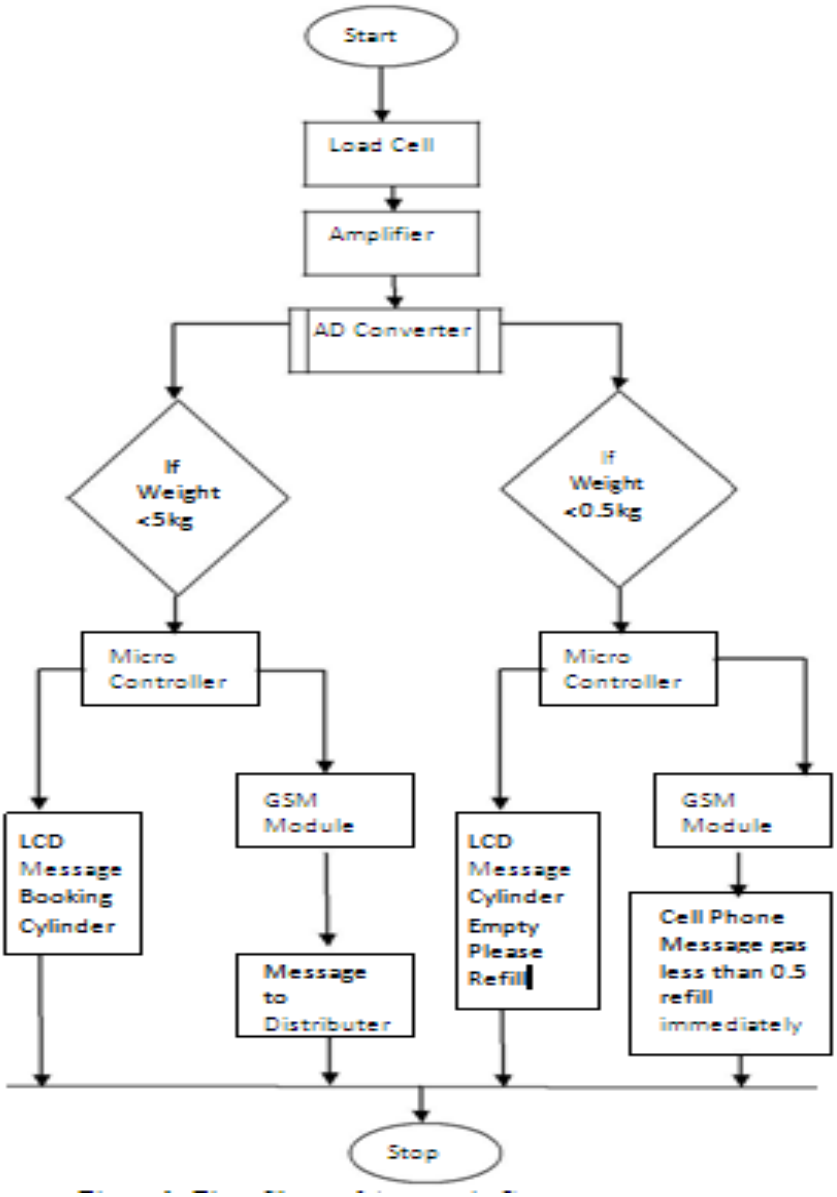

Fig.2: Flow Chart of Automatic Gas Booking

4. Conclusion

The system of detecting gas level and automatically booking it when the gas is about to complete is designed and implemented in this paper is cost-effective. This proposed system fulfils the approach to book the gas efficiently. The features like measuring weight of LPG cylinder and displaying value on LCD makes this system an effective domestic safety machine and can be utilized in factories and different places to discover gas remained in cylinder. The cost for developing this system is extensively less and in a whole much less when compared to the price of fuel detectors commercially available within the marketplace.

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