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ANTI-HOARDING LPG MODULE WITH ACCIDENT AVOIDANCE AND AUTO REBOOKING MECHANISM

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Abstract **--- In present scenario we commonly face a problem in LPG gas scarcity. This is due to the hoarding of LPG cylinders by distributors, at home etc. The major aim of the project is to eliminate LPG gas hoarding and to autonomously book gas by sending message to the corresponding gas refill agency. It uses NFC wireless technology which is safe to operate in hazardous gas environment. Since NFC technology have coverage range of only 10 to15 cm it may not be used to turn on the valve by connecting the non-corresponding NFC tagged device which ensures the security concept is not been fooled. In addition, we are adding LPG gas accident avoidance circuit which detects the presence of leakage of gas and autonomously control its regulator valve to seal the gas leakage.It uses RF technology to wirelessly operate multiple fan for ventilating the room when gas is leaked.It alerts the consumer about the gas leakage by sending SMS, and it autonomously ventilates the air in the room where the gas is leaked**

I. I INTRODUCTION

There are approximately 30 crore LPG users in the country accounting for 40% of the population. The objective of the proposed system is to check Hoarding of domestic cylinders and to increase the cylinder cost. The Problem is overcome in this System. It is a new concept. Every House is using two cylinders. The cylinders are set a Code using in a NFC (Near Field Communication) Tag and Reader. tag is fixed in Cylinder part and reader device is fixed in gas regulator. The Two devices are nearly placed in proximity. If the two code are matching then the cylinder will be ON but if not matching then the gas system is not operated. It rectifies most of the hoarding problems leading to gas being provided in a cheap and fixed rate by the sellers. The other features are that the system detects the leakage of the LPG using gas sensor and alerts the consumer about the gas leakage by sending SMS. Also it closes regulator using stepper motor and also switch on the exhaust fan. The wireless communication is used between the exhaust fan and the LPG gas module. The proposed system uses the GSM to alert the person about the gas leakage via SMS. When the system detects the LPG concentration in the air exceeding the certain level then it immediately takes action by closing the regulator and switch ON the exhaust fan and alert the consumer by sending SMS to specified mobile phone. The gas sensor is used to monitor the leakage of gas and RF is used to ON the exhaust fan. This project is also used for automatic booking of the cylinder by using pressure sensor. When the pressure is low, it indicates the cylinder is going to empty. At that time, the gas cylinder is automatically booked through SMS

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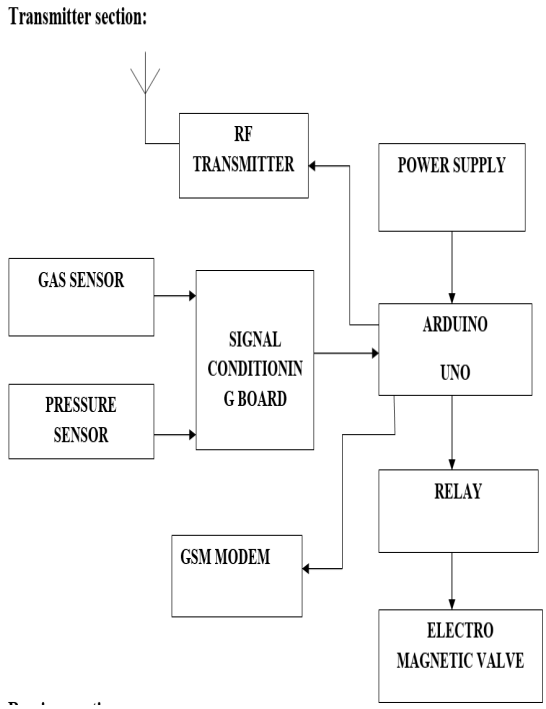
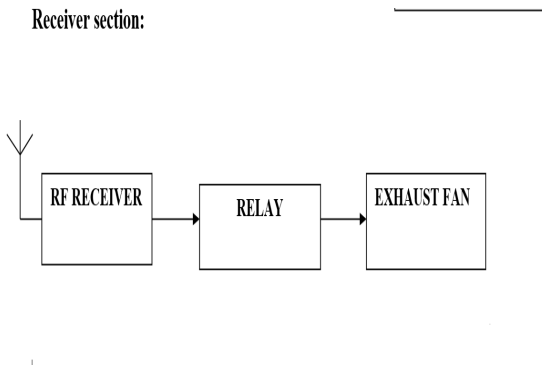
BLOCK DIAGRAM:





II. GAS SESOR

A. MQ-5 Gas Sensor

MQ5 is a semiconductor type gas sensor which detects the gas leakage. The sensitive material of MQ-5 is tin dioxide (SnO2) MQ-5 Gas sensor module is usefull for gas Leakage detection. It sense a CH_4 ,H_2, LPG and Alcohol.

A gas detector is a device that detects the presence of gases in an area, often as part of a safety system.This sensor used in home, industry.due to its fast response time and high sensitivity; measurement can be adjusted by using the potentiometer. The range of concentrations over which the gas sensor works is 300 –1000 ppm. The sensor is fabricated with 6 pins out of which 4 pins are utilized for fetching signals and the remaining two account for the production of heat current. This sensor is characterized by fast response time. It operates under the supply of 5 V.

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B. Features

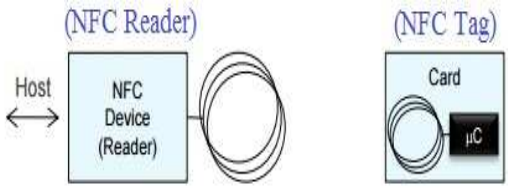
Wide detecting scope
Stable and long life
Fast response and High sensitivity

III. ARDUINO UNO:

The Arduino Uno is a microcontroller board based on the ATmega328 . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller.. "Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduno, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

IV. NFC TAG AND READER:

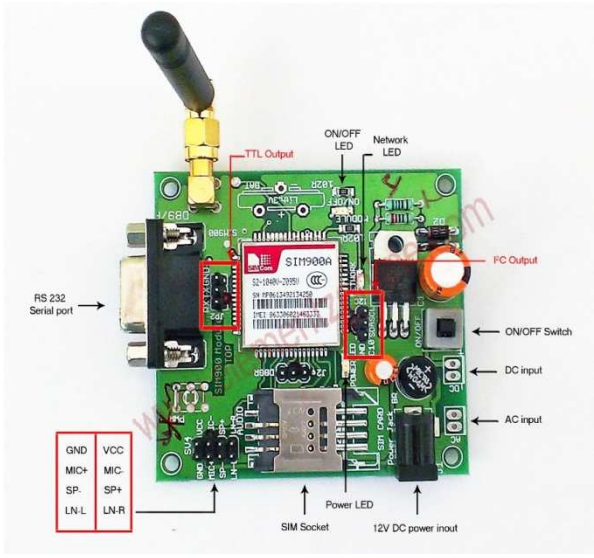
NFC network is composed of two devices namely initiator and target. There are two modes of operation in the NFC network called active and passive. In NFC active mode, both initiator and target devices would have their own power supply or battery for operation. In NFC passive mode, one of the NFC devices will be having its own power whereas other device are passive and derive their power from active powered device.



NFC Reader Reading Card

Both NFC tag and NFC reader communicate via 13.56MHz frequency for . They put to use ASK modulation for modulating the data for transmission before translating on RF carrier of 13.56 MHz.The NFC devices use concept of electromagnetic induction in between loop antennas for connection purpose. The Different types of tag developed in an Different methods of applications

C. GSM MODEM:



GSM (Global System for Mobile)

A modem is modulator from a one form to another form. It is a device that modulates one or more carrier wave signals to encode digital information for transmitting and demodulates signals to decode the transmitted information. The aim is to get a signal that is transmitted and decoded to get the original data. Modems can be put to use with any of the transmitting analog signals. A usual type of modem is one that changes the digital data into modulated signal for transmission through telephone lines and then demodulated by another modem present at the receiver to recover the digital data by using the GSM technique.

GSM is mainly used for this system. It is intended to check Gas leakage. Gas sensor signal is fed to Arduino and its signal is passed through GSM modem to alert the user and another application of GSM is pressure sensor which is monitoring it and on sensing low level of gas in the cylinder it automatically rebooks via GSM modem by placing an order with the gas agent.

V. WORKING PRINCIPLE

NFC (Near Field Communication) Tag and Reader. tag is fixed in Cylinder part and reader device is fixed in gas regulator. The Two devices are nearly placed in proximity. If the two code are matching then the cylinder will be ON and not if matching fails.

Arduino board is connected to the gas sensor, Pressure sensor, RF Transmitter and GSM Modem and these components are controlled and operated through Arduino uno They are fed to IDE programming in Arduino . It detects the gas that signal is fed to a signal conditioning board and gas detect signal is amplified after

The detection signal is reaches the arduino board. The arduino sends this signal to the succeeding part which is the relay. This relay is a kind of switch. This relay works only under the reception of signal from the board. The signal progressively passes next to the electromagnetic valve which finds place in the cylinder ooze. It closes the valve in order that the gas movement is checked.

At the same time other two operations are also on. They are 1. Message is sent to the user via GSM 2. An intimation

is fed to the RF receiver which turns on the exhaust fan which expels out the leaked gases if any. This too operates using relay.

All the above mentioned aspects are for avoiding accidents. The supplementary actions follow in tandem.

There is a pressure sensor which is used to sense the pressure inside the cylinder. By constant monitoring it is possible to note the gas falling below the critical level. If the level falls so then a message is sent to the booking centre and after the completion of the booking process an intimation is fed to the consumer

VI. CONCLUSION:

Thus this system based on a novel approach to avoid hoarding of LPG cylinders would be of immense use to the public and results in better dispense of resources to all people alike. Also it comes with many convenient features such as auto booking, accident prevention and intimation of peril etc.

VII. REFERENCE

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