White Knight Messenger II

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Abstract – The project involves both Software and Hardware fields. It mainly focuses on creating an accident free home by giving alerts to the people who live in the house about any of the hazards that is about to take place through sensor detection, so that proper precautions could be taken in immediately to prevent loss. Sensors used to detect LPG Gas leak. Communication between these sensors and the user through internet and a hand device (A message to the user). This project is about producing an alert warning system based on Global System for Mobile (GSM) network. It will be used to detect the presence of natural gases. Whenever gas leakage occurs, the sensors used in the circuit will detect it and the GSM modem will send out an SMS alert to the user. With the system that provides a real-time notification, it increases the response time of the owner. This will provide the immediate aid to the situation occur. This system can be installed in kitchens, Liquefied Petroleum Gas (LPG) storage rooms.

Index Terms – Arduino Uno, GSM Module and MQ-5.

1. INTRODUCTION

Gas sensor is use to detect the presence of a dangerous LPG leak in your car or in a service station, storage tank environment. This unit can be easily incorporated into an alarm unit, to sound an alarm or give a visual indication of the LPG concentration. The sensor has excellent sensitivity combined with a quick response time. The sensor can also sense iso-butane, propane, LPG. Another object of the present invention is to provide a novel safety means for detecting the leakage of gas into the area of an appliance when the appliance is in a shutdown condition and not in operation. Yet another object of the present invention is to provide a novel gas detection and monitoring system which is economical to manufacture and which may be readily installed in conventional trailers, boats or the like which are normally dependent upon a stored supply of pressurized gas. Typical installation areas being gas yards (Bullets), gas banks with multi cylinders in manifold, user production departments / utility areas like kitchens. Ideal sensor for use to detect the presence of a dangerous LPG leak in your car or in a service station, storage tank environment.

2. RELATED WORK

This system helps you to upgrade your safety standards, comply statutory requirements on environmental commitments and most important and basic function being prevent accidents and protect life and property from disaster. In the past, it has been a conventional practice to employ combustion apparatus such as a furnace,heater, stove or LPG kit in cars, which utilizes a combustible vapor or gas to produce heat energy when properly ignited. In the use of combustible apparatus in which a combustible gas such as natural or liquid propane gas is burned in heating boilers, domestic water heaters, ovens, stoves and the like, the apparatus or appliance is generally of an automatic recycling type. That is to say, the equipment is generally in operation for short periods of time after which is shut down for a short period of time. The equipment has intermediate operation and the appliance is generally started and stopped at the signal of an automatic controller, such as a thermostat, which may be actuated by temperature, pressure, or the like. The LPG Kit installed is many times installed inside the car creating possibilities of large accidents. This type of appliance/Kits is normally unattended by any operating personnel, since it is automatic in operation and, therefore, one hazard encountered in the use of such an appliance is the possibility that during a standby period or a period in which it is not in peration, a gas leak may occur thereby resulting in a large accumulation of combustible gas which can produce an explosion if the detection is not quickly noticed. Although some sophisticated detector means have been provided, it is contemplated that the indicator means should be simple and economical so that the entire system may be readily incorporated into mobile trailers, campers, boats and other vehicles or living quarters having appliances dependent upon storage of pressurized gas.

Issues in Existing System

Does not send any SMS indication. Do not detect LPG properly. Only one gas can be measured with each instrument. When heavy dust, steam or fog blocks the laser beam, the system will not be able to take measurements. This is also the case when a person or vehicle blocks the path.

3. PORPOSED MODELLING

This project consists of an Arduino board has taken on the previous abstract. This system does not work on the internet, but works with a network implementation. It consists of an MQ5 Sensor that detects the presence of the methane gas. This sensed gas, sends a message to the user through the GSM module network concept. The improvised version of this project will work on the use of internet and an application and also location tracking.The circuit is basically on the gas sensor and the Programmable Integrated Circuit (PIC). The gas sensor could be treated, basically as variable resistor which value depends on gas concentration in air .This sensor have high

sensitivity. The gas sensor chosen is MQ5. It can detect gas concentration in the air from 100 to 3000ppm. 500 ppm will be set as the dangerous level. This sensor will be connected directly and controlled by a microcontroller. Arduino Board UNO is chosen to make detector highly efficient. Arduino Board UNO also will be integrated to the GSM modem by using MAX232 as the connector. Whenever the reading of the sensors exceeding the limit set, it will automatically send an SMS alert wirelessly by using the GSM Modem through GSM Network to the numbers as being set on the coding.

3.1 ARDUINO UNO R3

Arduino Uno R3 as shown in figure 2. The specifications are ATmega328 microcontroller, operating voltage at 5v, input voltage 7 to 12v, input voltage limit up to 20v, digital I/O pins 14, analog pins 6, DC current 40mA, flash memory 32KB including 0.5KB used by boot loader. SRAM of 2KB, EEPROM of 1KB and clock speed of 16 MHz some of the Features of Arduino UNO are power: can be USB connection or external power supply, with 7 to 12 volts recommended. The Arduino UNO provides power pins for other devices, the variants are 5V 3.3V and Vin I/O, REF pin for optional power [9].

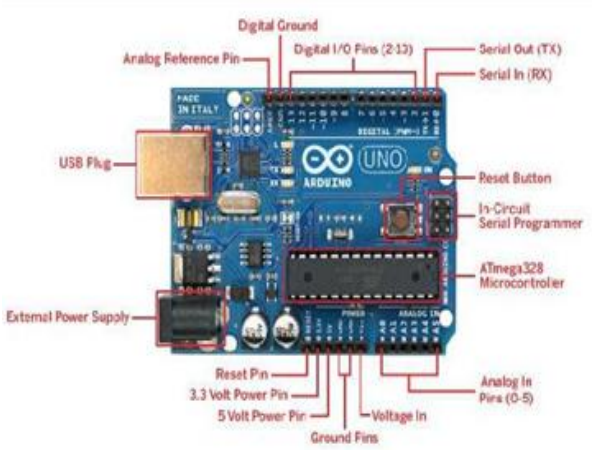

FIGURE 2 Arduino Uno Board

3.2 MQ5 sensor

MQ-5 Semiconductor Sensor for Combustible Gas Sensitive material of MQ-5 gas sensor is SnO2, which with lower conductivity in clean air. When the target combustible gas exist, the sensors conductivity is higher along with the gas concentration rising. We use simple electrocircuit, convert change of conductivity to correspond output signal of gas concentration. MQ-5 gas sensor has high sensitivity to Methane, Propane and Butane and could be used to detect both Methane and Propane. The sensor could be used to detect different combustible gas especially Methane, it is with low cost and suitable for different application.

3.3 User Interface

User receives SMS indication in their mobile with the help of GSM modem connected to the Arduino Uno board. To receive the message, user does not require any internet connectivity, and hence can be worked in any mobile platform.

3.4 Hardware Interface

- Installing the Arduino to the PC
- Interfacing LPG sensor to Arduino
- Interfacing GSM module to Arduino
- Interfacing LED to Arduino

3.5 Software Interface

Develop code in the Arduino Software for app and message delivery in C++ and Upload code to Arduino using a system.

3.6 Communication Interface

GSM Module is a wireless module .it is a complete dual band GSM/GPRS solution in a SMT Module which can be embedded in the application. It will compute a SIM of a registered network which will thus send the message as per the requirements of the user.

4. RESULTS

The system provides control action by closing the regulator knob, after that the system sends a alert message to the user and fire station within short time of leakage. It has more advantageous function than the existing system thus the real-time automatic approach is proposed in case of rebooking of cylinder. This monitoring and detection system is proposed mainly to meet the safety standards and to avoid fire accidents because of leakage.

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