

GAS PIPELINE MONITERING AND LEAKAGE DETECTION SYSTEM USING IOT

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Abstract— Day to day life gas leakage and gas detection is a major issues which effecting on our daily lives. Similarly gas wastage is a main concern that requirements to be counteracted. LPG gas in highly flammable and can inflict injury to life. To avoid the circumstances, a substantial total of determination requires remained dedicated towards the improvement of techniques aimed at recognizing gas leakage. The scope of the project is to suggest the intention and creation by through SMS type Gas Leakage signal Method. It applicable to detect gas leakages in a kitchen or industries by using an infrared sensor. This project for safety purpose that will sense flammable gases and alert the applicants. And the signals are passed via audial or visual signals although we are situated, in the system using a stepper motor and gas detectors which supports to turn-off the switch after here an alternative in our absence. Internet of things (IOT) offers real time information offered on internet through earlier retrieving by a gas sensor that can sense several harmful gases. This alerting system it offers the location of the emergency situation. And helps to rescue team.

Keywords — IOT, GAS Sensor, Pressure Sensor, NODE MCU.

I. INTRODUCTION

A active universal system structure by self-configuring abilities built on standard and interpretable communication procedures anywhere physical and virtual thing. IOT is used to communicate and transfer information through implementing an important application to public users or devices and it offers an interface that user can control and monitor several features of system and users to view the system information and consider the processed data and LPG is mostly used in the home and industrial purpose this gas is a flammable gas ,if the gas is leaked it can effect on main harmful to life and it should be used in a safe handling manner and additional case needs taken in order to stop some leakage if possible.it is used in various applications and LPG is used as an alternative fuel in vehicles due to rising in the costs of petrol and diesel.

LPG (Liquefied Petroleum Gas) is a generally cooking fuel and LPG is hydrocarbon gas and It is odorless gas due to Ethanethiol odorant, so easily detected the leakage gas.

Compressed natural gas (CNG) is a fuel and is mostly used for powering automobiles and domestic, industrial purpose. it is nonpolluting nature.

Android based automatic gas detection and indication robot in this method implemented by Bluetooth technology and they used mini mobile robot .the Bluetooth is used for short distance communication and slow data speed, no longer battery life and it join individual two devices on once and mini mobile robot which is accomplished to sense gas leakage in dangerous place[1].in this paper Iot based gas pipeline leakage detector in this paper proposed method is the memory of raspberry pi more limited and does not support likes window and Linux, this is not used real time. Interfacing with hardware can be delayed and no sufficient power and poor expandability, slow operation [2]IOT based hazards gas detection system AVR microcontroller in this method using AVR microcontroller this controller is commonly used in robotics and automobile industry because to wide community[3]Real time gas leakage detection using cloud in this method using ZigBee technology. it has short transmission frequency and it is used for short distance communication, it not protected.

Cannot be used as outdoor wireless communication restricted to processing speed and data, bandwidth. Replacement of components will be costly ZigBee is vulnerable [4]. Design and control of internet things enabled wireless sensor network in this paper using WSN (Wireless Sensor Network) it has limited bandwidth and limited battery and low communication speed, it is not secure. More complicated to configure to a wired network [5]. IOT based smart gas monitoring system in this system using Wi-Fi module is interfacing through arduino .it consumes more power so extra voltage regulator with battery and it is temperamental and he circuit will be complex [6]. By observing the above literature review they have some drawbacks to overcome the above drawbacks proposes a new innovative method. This method is gives better results when compared to the previous methods.

This paper is divided in to five sectors given below as follows: sector I contain Introduction, sector II contains Related Work, sector III Methodology, sector IV contains Results and Discursions and sector V contains Conclusion and Future Scope.

II. RELATED WORK

IOT based smart gas monitoring system in this system using Wi-Fi module is interfacing through arduino .it consumes more power so extra voltage regulator with battery and it is temperamental and he circuit will be complex [6].

Real time gas leakage detection using cloud in this method using ZigBee technology .it has short transmission frequency and it is used for short distance communication, it not protected.Cannot be used as outdoor wireless communication restricted to processing speed and data, bandwidth. Replacement of components will be costly ZigBee is vulnerable [4].

III. METHODOLOGY

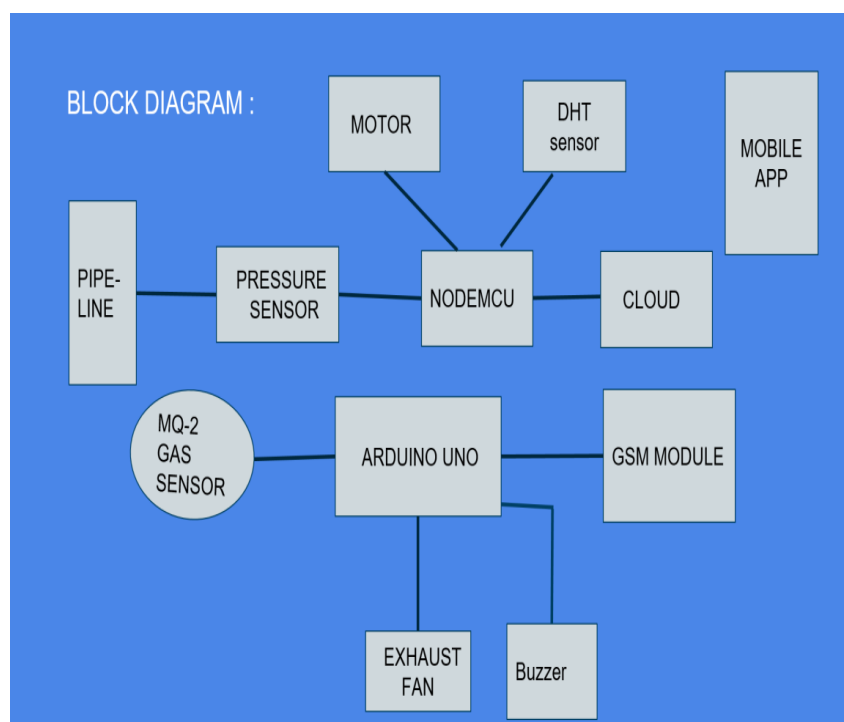


Fig.1Block diagram of proposed system

MQ-2 SENSOR:

The MQ-2 device is SnO₂.it has low conductivity. While the objective flammable gas occurs, the sensor's conductivity is more than the gas it will increasing. It is electronic circuit, for change of the conductivity to parallel output indication of leakage gas hazards. It ensures more sensitivity and and suitable for several uses.

DHT SENSOR

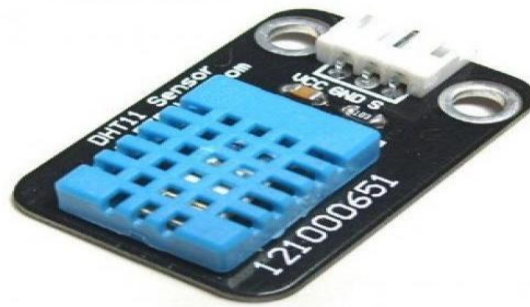


Fig.2 Humidity and Temperature Sensor

The temperature and humidity device is a resistive type humidity measurement sensor. And it has NTC (negative temperature component). The sensor is connected to the node MCU (micro controller unit) the output of the device is standardized numerical indication output. And it offers more durable and stable and small size and low cost.

2ESP8266-12E (Node MCU 1.0 Development Board):



Fig.2.2: ESP8266-12E board Description

In thi board contain a internal wi-fi module and it can be operated with both andriod and Ios platform.in this uses a firm ware is a LUA scripting language,is operated with 2.4-2.6Ghz and low cost. And existingUART serial connection in this project.802.11 protocal wi-fi direct and intreagted TCP/IP protocol.

PRESSURE TRANSDUCER

This device used for pressure measurement of gas or liquids and it exchanges force into electrical signals and it is used for regulator and monitoring uses.it act as transducer, it has more temperature dependence.



GSM MODULE

In this project the gsm will be connected with the controller .the controller is sense the signal to the gsm in this gsm already pre-defined number will be saved through EEPROM .then the message is send to the rescue team it will alerted if any gas is leakage detection issue then we take the precisions.

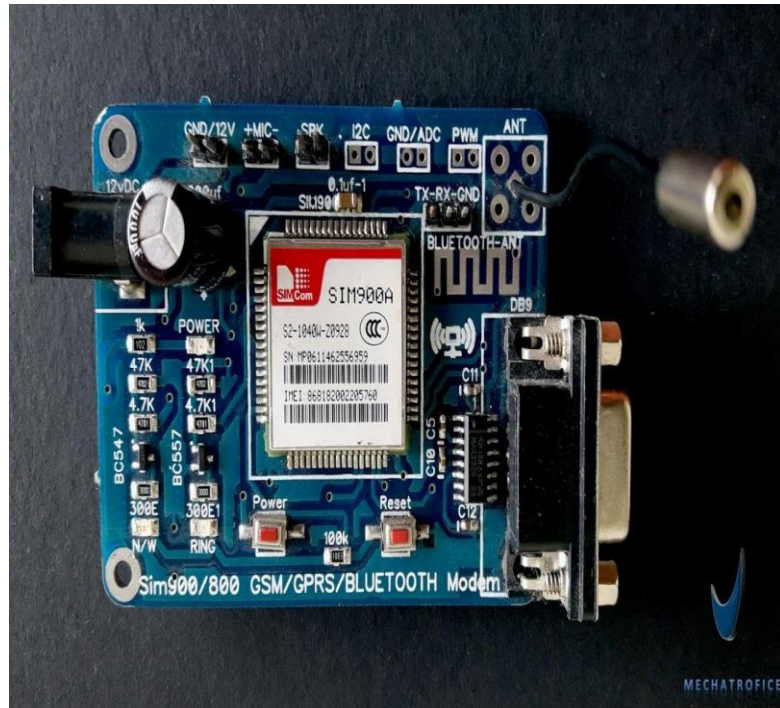
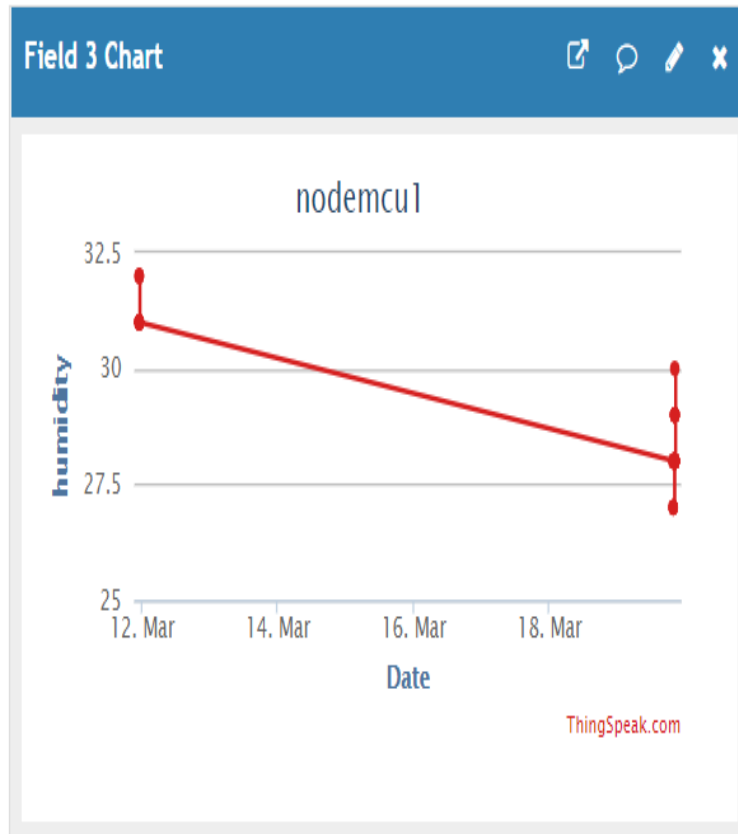


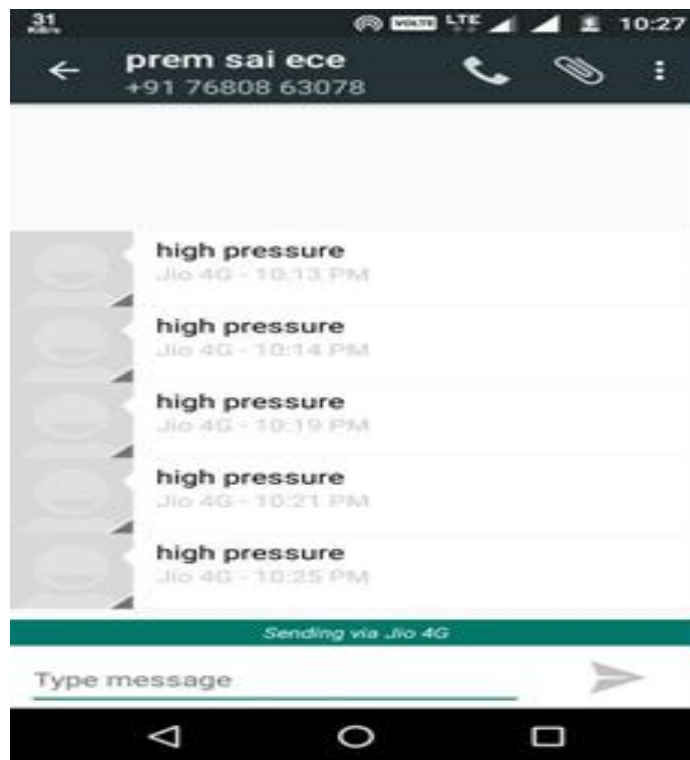
Fig.3. GSM Module

IV. RESULTS &DISCUSSION

Overview of gas pipeline monitoring and uploading program code to Node MCU. Now the sensor values are uploaded to cloud (Thing speak). First we have to create channel in Thing speak and the sensor values are represented graphically.







If any is pressure increases, then message will be send to the registered mobile number, we can also send the message to alternate numbers.

If the leakage occurs, then the MQ-2 sensor will identify the gas and a message will be sent to the registered mobile number.



V.CONCULSION & FUTURE SCOPE

Gas pipeline monitoring and leakage detection using IOT enable us to detect increasing pressure in the pipelines and control the pressure through mobile app It also helps in sending out the leaked gas which saves the human lives and property loss. We can also add the automation system for opening and closing the valve without the forward and reverse buttons. The pressure transducer is not only used for the gas, but also liquid .So we can extend it to the compressed gas in the industry in the liquid state.

REFERENCES

- [1] “*Android based automatic gas detection and indication robot*” in international journal of computer engineering and applications.
- [2] “*IOT based gas pipeline leakage detector*” international journal of electronics, electrical and computational system, volume 7, issue 3, march 2018.
- [3] “*IOT based hazardous gas detection system using AVR microcontroller*” International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 03 | Mar -2017.
- [4] “*Real time gas leakage detection using cloud*” international journal of innovative research in science, engineering and technology vol 6 issue April 2007.
- [5] “*Design and control of internet things enabled wireless sensor network*” international journal of engineering science & research technology.
- [6] “*IOT based smart gas monitoring system*” iosr journal of electrical and electronics engineering.

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