

GSM BASED LPG DETECTOR WITH SOUND ALARM

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This Report Is Submitted In Partial Fulfilment of Requirements For The Bachelor
Degree of Electronic Engineering (Wireless)

Faculty of Electronic and Computer Engineering UniversitiTeknikal Malaysia
Melaka

June 2017



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To my beloved

Parents

MohdNazim bin Abu Kassim and SarimahbintiMd Saleh

Siblings,

Muhammad Nazmie, Muhammad Hafedz, FarithHafizi

Bestfriends,

Ijoty andBabuji Sunshine

A warm and special thanks for all your doa, support and encouragement.

Thank you for everything and love every single one of you like crazy <3

ACKNOWLEDGEMENT

‘In The Name Of Allah, the Most Gracious and the Most Merciful’

Alhamdulillah for the health, patient and endless courage that has been given to me and my family from The Most Gracious that finally I successfully finished my final year report. First and foremost, I would like to acknowledgement and extend my gratitude to my parents, EncikMohdNazim bin Abu Kassim and PuanSarimahbintiMd Saleh. The calmness and faith of them to me has given me the strength, believe and doa that completing this project was never impossible.

Much thanks to my two awesome supervisors, Puan Noor ShahidabintiMohdKasim and Puan Noor MazlinabintiMahmod who is willing to spend their precious time to give some ideas and suggestion towards this project. This thesis would not have been the same as presented have without continued support and interest from them.

Lastly, I would also like to extend my sincere appreciation to my fellow friends those whom involve directly or indirectly with this project who always willingly to give their time and effort when I need most. This is no much meaningful word that may repay their supportive and creative idea for this project.

ABSTRACT

Leakage of a gas in any segment may reason to many health subjects and therefore in the kitchen it is to be warned against such disaster happenings by applying a safety system that can make an early alert to the users. This paper describes the development of gas detecting for LPG gas leakage detection. The planned design includes an Arduino Uno microcontroller, MQ 5gas sensor and a GSM module. The sensor node will detect a permissible level of concentration of the gas according to the digital output of a sensor and also collects the gas leakage data thereby locating the specific area of the sensor node. GSM sends the message from gas sensor to the user that is sent through the GSM communication. A GSM module was as a communication tool between the microcontroller unit and mobile phone unit. The system could be installed at any remote place and could be controlled by any mobile phone supporting the SMS service. The reliability and productivity of the system are the key concerns and influence the design and development choices for the system in terms of the hardware and software designs.

ABSTRAK

Kebocoran gas di mana-mana segmen mungkin alasan untuk mata pelajaran kesihatan banyak dan oleh itu di dapur ia akan memberi amaran terhadap kejadian bencana itu dengan menggunakan sistem keselamatan yang boleh membuat amaran awal kepada pengguna. Kertas kerja ini menerangkan perkembangan mengesan gas untuk mengesan 'gas petroleum cecair' kebocoran gas. Reka bentuk yang dirancang termasuk mikropengawal Arduino Uno, pengesan MQ 5 dan modul GSM. Nod pengesanan mengesan tahap yang dibenarkan kepekatan gas mengikut output digital sensor dan juga mengumpul data kebocoran gas dengan itumencari yang kawasan tertentu nod pengesan. GSM menghantarmesejdaripengesan gas kepada pengguna yang dihantarmelalui komunikasi GSM. Satu modul GSM adalah sebagai alat komunikasi antara unit pengawal mikro dan unit telefon mudah alih. Sistem ini boleh dipasang di mana-mana tempat jauh dan boleh dikawal oleh mana-mana telefon mudah alih yang menyokong perkhidmatan SMS. Kebolehpercayaan dan produktiviti sistem ini adalah keseimbangan utama dan mempengaruhi reka bentuk dan pembangunan pilihan untuk sistem dari segi perkakasan dan perisian reka bentuk.

TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	Dedication	v
	Acknowledgement	vi
	Abstract	vii
	Abstrak	viii
	Table of Content	ix
	List of Tables	xiv
	List of Figures	xv
	List Abbreviations, Symbols and Nomenclatures	xviii
I	INTRODUCTION	1
	1.1 PROBLEM STATEMENT	2
	1.2 OBJECTIVES	3
	1.3 SCOPE OF PROJECT	3
	1.4 PROJECT SIGNIFICANT	4

1.5	SUMMARY	4
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II LITERATURE REVIEW

2.1	PREVIOUS RELATED WORKS	5
2.1.1	Design and Development of Gas Leakage Monitoring System using Arduino and Zigbee by HUAN HUI YAN AND YUSNITA RAHAYU	6
2.1.2	Controlling and Monitoring System for LPG Detection and Prevention by T.SOUNDARYA AND J.V .ANCHITAALAGAMMAI	8
2.1.3	Toxic Gas Release Alarm System Using PIC Microcontroller by ZARITH SOFIA SURAYA BT HJ BAKERI	9
2.2	SUMMARY OF PREVIOUS RELATED WORKS	9
2.3	GAS	9
2.3.1	Liquefies Petroleum Gas (LPG)	10

2.3.2	Combustion Process	12
2.4	GAS SENSOR	13
2.4.1	Working Principle of a Combustible Gas Sensor	14
2.4.1.1	Catalytic Combustible Gas Sensors	14
2.4.2.2	Infrared Gas Sensors	14
2.5	MATERIALS USED	15
2.5.1	Arduino	15
2.5.2	GSM	16
2.5.2.1	AT Command	17
2.5.2.2	Types of AT Command	17
2.6	OUTPUT SYSTEM	18
2.6.1	LED	18
2.6.1.1	Working Principle of LED	18
2.6.2	Buzzer	20
2.7	SHORT MESSAGE SERVICE (SMS)	20
2.8	SUMMARY	21

III

METHODOLOGY

3.1	INTRODUCTION	22
3.2	SOFTWARE IMPLEMENTATION	23

3.2.1	LPG Flammability Limit	23
3.2.2	Measured Value for MQ 5 using LPG	24
3.2.3	Arduino Programming	25
3.2.4	GSM Module Programming	29
3.2.5	Booting the GSM module	30
3.3	HARDWARE IMPLEMENTATION	31
3.3.1	Gas Sensor Circuit	31
3.3.2	Output Indicator	33
3.3.3	PCB development	36
3.3.4	Mobile Phone	37
3.4	SUMMARY	37

IV

RESULT AND DISCISSION

4.1	INTRODUCTION	38
4.2	PROJECT DESCRIPTION	39
4.3	PROJECT SYSTEM OPERATION	39
4.4	PROJECT SETUP	40
4.5	OUTPUT OF SYSTEM	43
4.5.1	Sensor Output	43
4.5.2	Indicator Output	44
4.5.3	Serial Monitor from Arduino Output	45

4.5.4	GSM Module Output	46
4.6	PROJECT RESULT	48
4.7	PROBLEMS ENCOUNTERED AND SOLUTION	50
4.8	ANALYSIS OF THE RESULT	51
4.9	LIMITATION	54
4.10	SUMMARY	55
V	CONCLUSION AND RECOMMENDATION	
5.1	INTRODUCTION	56
5.2	CONCLUSION	57
5.3	RECOMMENDATION	57
5.4	SUMMARY	58
	REFERENCES	59
	APPENDICES	62

LIST OF TABLES

NO	TITLE	PAGE
3.1	Measured Value for MQ 5	24

LIST OF FIGURES

NO	TITLE	PAGE
2.1	The overview design of 'Design and Development of Gas Leakage Monitoring System using Arduino and Zigbee'.	6
2.2	The block diagram of 'Design and Development of Gas Leakage Monitoring System using Arduino and Zigbee'.	7
2.3	Block diagram of the system operation of “Controlling and Monitoring System for LPG Detection and Prevention”	8
2.4	Physical property differences between the three gases	11
2.5	Fire triangle	12
2.6	Arduino Uno Board	15

2.7	GPRS/GSM Module	16
2.8	Electrons and holes are pushed towards the junction so a current can flow	19
2.9	Electrons and holes are pulled away from the junction leaving it insulating	19
2.10	Illustration of buzzer	20
3.1	LPG flammability limit	23
3.2	Flow Chart of Arduino programming for MQ 5	26
3.3	Arduino input and output port initialization	27
3.4	Declaration of the pin	27
3.5	First loop programming	28
3.6	GSM module programming	29
3.7	Gas sensor circuit	31
3.8	System Operation's block diagram	32
3.9	Connection of MQ 5 to Arduino	33
3.10	The circuit constructed on Proteus	34
3.11	The buzzer	35
3.12	The Red LED	35
3.13	The PCB layout in Proteus	36
4.1	The circuit constructed on breadboard	40
4.2	Perspex used in this project	41
4.3	The drilled hole	41

4.4	Gas sensor placement	42
4.5	Lighter used	43
4.6	The LED	44
4.7	The buzzing Buzzer	45
4.8	The written coding to display message on Serial Monitor	45
4.9	The output from the serial monitor	46
4.10	The received message	47
4.11	The message notification	47
4.12	Contain of the message	48
4.13	The overall prototype	49
4.14	The properly sealed component's box	49
4.15	The freeze gas sensor	51
4.16	The gas characteristic – colourless	52
4.17	The gas characteristic – odourless	53
4.18	Specific gravity of natural gas and LPG	54

LIST ABBREVIATIONS, SYMBOLS AND NOMENCLATURES

LPG	-	Liquefied Petroleum Gas
GSM	-	Global System for Mobile
NG	-	Natural Gas
LED	-	Light Emitting Diode
SMS	-	Short Message Service
CO	-	Carbon Oxide
CH ₄	-	Methane
GUI	-	Graphical User Interface
LCD	-	Liquid Crystal Display
PPM	-	part per million
PC	-	Personal Computer
USB	-	Universal Serial Bus
ADC	-	Analog-Digital-Converter
SIM	-	Subscriber Identification Module
GPRS	-	General Packet Radio Service

AT	-	Attention
DC	-	Direct Current
LEL	-	Lower Exposer Limit
UEL	-	Upper Exposer Limit
MCU	-	Micro Control Unit
PCB	-	Printed Circuit Board
Tx	-	transmitter
Rx	-	receiver
mm	-	millimetre

CHAPTER 1

INTRODUCTION

In this progressgrowth of technology, society failed to take care about the neighbouring in which they living in. Most people infested the atmosphere which could shamshazard to them. There are numerousfeatures of pollutions such as air, sound and water which can be noticed by barejudgements. As for air pollution that caused by sure gas, it cannot be noticed visually as it is odourless, tasteless and colourless. Some of the blasts are very beneficial in our everyday life.

Liquefied Petroleum Gas (LPG) is one of the corporateother fuels used in the domain today. It been used in heating system and cookery in Malaysia. LPG is a relic fuel. Two types of LPG are butane and propane. Benefits of LPG are most of propane comes from inland sources, less expensive than gasoline and potentially lower toxic.

Ignition gas includes a biochemical response. It will yield temperature as the gas response deviations into a new composite. Examples of combustion gas are Nitrogen oxide and Carbon Monoxide. These two will effect health.

Gas indicator is a gas sensing device. It can only detect if there is any irregular existence of the gas concentrations. The sensing system use to alert people using Global System for Mobile (GSM) network.

Thus, the gas detecting system offers benefits to users as they can be alert from the system as gas there are any leaking or absence of hazardous gas an allowed them to take an action.

1.1 Problem statement

Numerous broadcast frequently year wig about exposure coincidences in households related to LPG cylinders. The LPG cylinders have made a ruthless name since the blasts and fires are credited to these. Lot of evaluation groups have been examining these blasts but did not alert if any answer has been suggested. These blasts are many times overwhelming, failing the top of the construction and murdering many people. Now most city households have LPG cylinders in the kitchenettes. Some replacement filled LPG cylinders may also be kept inside. In compare, very few blasts of local LPG or propane cylinders are stated overseas where these cylinders are used in large statistics. LPG may escape as liquid and gas. Unlike Natural gas (NG) is lighter when compare to LPG, if there is a NG leakage, it will disperse in there air but when it comes to LPG, it will accumulate at the very bottom of the ground if there is a gas leakage.

1.2 Objectives

1. To develop a circuit that able to detect the outflow of LPG gas and alerts the user via audio and visual indications.
2. To develop a gas detecting system using GSM communication system to send alert after detecting a gas leak.
3. Produce a sound alarm upon gas leak and stop the alarm once gas leak is under control.
4. To implement the uses of sensor and GSM and Arduino in this project.

1.3 Scope of Project

For hardware part of this project, it is consists of four parts which is gas sensor system, indicator system, Arduino UNO board and GSM module.

In the gas sensor, MQ 5 gas sensor is used to detect LPG. MQ 5 gas sensor applies SnO₂ which has a lesser conductivity in the pure air. In an air where there may be harmful gases, the conductivity of the gas sensor increases laterally with the harmful gas concentration rises. The indicator system are red LED and Buzzer.

Arduino microcontroller is the best equipment to start with integrated circuit technology, through lot of mini projects taught in the web. This microcontroller is easy as most of people get hang of it. It is boundless for educate the fundamentals of how instruments works, and an essential tool for rapid prototyping needs. Next, GSM module is used as the communication system between the hardware and the software.

For software programming, it will categorize into two which is Arduino programming and GSM programming. Arduino software is used to write the programming for the Arduino board microcontroller. On the other hand, GSM programming will use certain library in order to allow the system to send alert to mobile phone.

1.4 Project Significant

A better system needs to be developed to reduce the accidents because of gas leakage. Gas alert system is suitable to be used in the kitchen. People will get benefits, as this system able to alert people after detecting an abnormal gaseous condition. It helps to monitor gas condition when there is nobody around. Lastly, gas alert also able to activating a LED and buzzer as a precaution step to avoid explosion or get burned.

1.5 Summary

The main aim of this project is to monitor for liquefied petroleum gas (LPG) leakage to avoid fire accidents providing house safety feature where security has been an important issue. The system detects the leakage of LPG using gas sensor and alerts the consumer about the gas leakage by sending SMS along with the light up of LED and Buzzer as indicator