



DISTANCE MEASUREMENT BY USING ULTRASONIC SENSOR

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TABLE OF CONTENTS

LIST OF FIGURES

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ABSTRACT

CHAPTER 1 INTRODUCTION

1.1 Background of Study.....	1
1.2 Problem Statement.....	1
1.3 Objectives of Research.....	2
1.4 Scope of work.....	2

CHAPTER 2 MATERIALS AND METHODS

2.1 Methodology.....	3
2.1.1 Flow Chart.....	4
2.2. Equipment and Component Required Hardware.....	5

CHAPTER 3 CIRCUIT DESIGN AND OPERATIONS

3.1 Schematic Diagram.....	18
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CHAPTER 4 RESULT AND DISCUSSION

4.1 Software Simulation Result.....	19
4.2 Hardware Implementation Result.....	20
4.3 Circuit Testing and Troubleshooting.....	21
4.4 Discussions.....	22

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1 Conclusion.....	23
5.2 Recommendation.....	24

REFERENCES.....	25
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APPENDICES.....	26
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ABSTRACT

Distance measurement by using ultrasonic sensor is an device to measure a distance just by using a sensor. Ultrasonic sensor is use and this sensor measures the time it takes an ultrasonic ping to go out, bounce off a target, and come back. The time it takes for the ping to leave and come back to the sensor depends on the speed of sound and the distance to the target. This sensor works in the same way a bat uses high pitched tones to navigate in the dark. It is also the same principle used in submarine sonar. This sensor is fairly easy to use. To hook it up, sensor VCC pin and hook it to the arduino 5V pin. The sensor GND is connect to Arduino GND. The Trig pin on the sensor we take to pin 13 on the arduino and the Echo pin on the sensor we connect to the arduino pin 11. Since we know the speed of sound, we can use it to measure distance, since $d = r*t$ (distance = rate * time). You know the rate, that is the speed of sound. You can measure the 'time' using the ultrasonic sensor, just as you did in Lesson 17. This is the time for a ping to go from the sensor to the target and back. Knowing this, you can then calculate the distance to the target. LCD is also use, These LCD are tricky to hook up because there are so many wires. Once the LCD is wired up, it is fairly straightforward to use. The connection is hook up to LCD after we program it. Last but not least, potentiometer is use to set the contrast of the LCD backlight by rotate the button.

CHAPTER 1

INTRODUCTION

1.1. Background of study

Distance measurement by using ultrasonic sensor is a device that can measure a distance an object from the ultrasonic sensor. With this device we do not need to use a ruler to measure a certain distance. This device can measure below 40 meter object.

This project use an Arduino main board to control the appliances which are LCD, ultrasonic sensor and potentiometer. In this project, once the microcontroller gets the signal, it will generate the ultrasonic sensor. The sensor measures the time it takes an ultrasonic ping to go out, bounce off a target, and come back. Then the LCD will display the distance of the object by centimetre. In this project, potentiometer is use to set the contrast of the LCD so that even though this device is use in different light situation.

1.2. Problem statement

Nowadays , there are many types of measurement device that is used to measure all kind of things. There are also many types of unit of measurements. Out of the many unit of measurements that exist today, the main one among them are measuring distance. There are many apparatus and equipment that can measure distance. However, due to the standard nature of human and the environment, many error may occurs when measuring distance. Reading or parallax error are the most common mistake that human sometimes do. Also, there are some situation when a measuring device is not portable and cannot be carry everywhere. This can cause massive trouble among the consumer. High risk profession such as architect and engineer needs a portable measuring equipment that can measure distance accurately and without any error.