



# LED DISTANCE INDICATOR LITERATURE SURVEY

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**ABSTRACT:** This paper describes an ultrasonic sensor that is able to measure the distance from the selected points of a motor vehicle. The sensor is based on the measurement of time of flight of an ultrasonic pulse, which is reflected by the obstacle. The sensor is composed of only low-cost components, thus being apt for distance measurement in many cases, and is able to self-adapt to different conditions in order to give the best results.

## INTRODUCTION

The development of "smart cars" requires new sensors that are able to measure distances in the range of a few centimeters to a few meters. Parking aids, obstacle detection, as well as intelligent suspensions and headlight leveling, are some examples of features that require a distance measurement to be performed with contactless sensors. In this paper the authors describe a low-cost ultrasonic distance measurement that performs contactless measurement of the distance of obstacles from the vehicle body. The sensor performance is better than many commercial devices, the sensors has evaluating the environmental conditions and then self-adapting to these conditions. The sensor has been designed in order to satisfy typical requirements in the automotive field: measured distance in the range of 0.1-0.3m and standard uncertainty of 1mm in the temperature range of 0°C to 40°C. Measurement of the distances can be made up of 1m and in a wider temperature ranges is also possible. Here in order to measure the distance of the obstacle the basic formula used is

$$\text{Distance} = \text{speed} \times \text{time}$$
$$\text{Distance} = \frac{(0.034 \text{ Cm/micro sec}) \times \text{time}}{2}$$

## CONCLUSION

A low-cost distance sensor is described in this paper that is able to self-adapt to the environmental conditions. Despite its simplicity and low cost, the sensor allows resolutions of better than 1mm to be obtained in quiet conditions. The sensor output is updated every 20ms, and as additional digital output allows an easy implementation of smoothing techniques by means of car computing system.

With respect to the requirements for an ultrasonic sensor the following can be concluded:

- The system can calculate the distance of the obstruction with sufficient accuracy.
- This offers a low cost and efficient solution for non-contact type distance measurements.

### 1. An Ultrasonic Sensor for Distance Measurement in Automotive Applications

Abstract

**Abstract:** This paper describes an ultrasonic sensor that is able to measure the distance from the ground of selected points of a motor vehicle. The sensor is based on the measurement of the time of flight of an ultrasonic pulse, which is reflected by the ground.

**Introduction:** The development of "smart cars" requires new sensors that are able to measure distances in the range of a few centimeters to a few meters. Parking aids, as well as intelligent suspensions and headlight leveling, are some examples of features that require a distance measurement to be performed with contactless sensors.

**Conclusion:** A low-cost distance sensor is described in this paper that is able to self-adapt to the environmental conditions. The sensor contains a noise measurement system and an auto-change facility of the signal that is used to drive the transmitter, thus producing the best accuracy under different conditions. The sensor output is updated every 20ms, and an additional digital output allows an easy implementation of smoothing techniques by means of the car computing system.

### 2. Smart Distance Measurement Device Using Ultrasonic Sensor

**Abstract:** Distance measurement plays a vital role in engineering, science, business. The distance is always measured



between two points. Generally, distance measurement is possible only by making contact with the target whose distance is to be measured, but this paper discusses the measurement of distance without making contact with the target.

**Introduction:** This paper discusses the measurement of distance without contacting the target. This is made possible through the ultrasonic waves. Ultrasonic is an application of ultrasound. Measurement is a factor that is frequently used in one's daily life. Generally, measurement is finding a number that shows size or amount of a particular entity. Measure of an entity can be judged by its magnitude and dimension (unit). The distance is measured using scale, ruler, measuring tape etc. which needs physical contact with the target whose distance is to be measured. The distance measurement has three important factors. and medium, source, target. The source is a point from where distance is to be measured and target is the object whose distance is to be measured. The medium lies between source and target.

**Conclusion:** The objective of the project was to design and implement an ultrasonic distance meter. The device described here can detect the target and calculate the distance of the target. The ultrasonic distance meter is a low cost, low a simple device for distance measurement. The device calculates the distance with suitable accuracy and resolution.

### 3. Comparative Study of Burst and Beams Types Ultrasonic Sensor for Distance Measurements

**Abstract:** Ultrasonic sensor is one of most popular sensor types to be used in distance measurement. This sensor generates sound waves to measure the distance between itself and the measurement object by using the calculated time of the waves when the waves are reflected back to the sensor.

**Introduction:** This research is conducted to do a comparative study between 2 types of ultrasonic sensor based on their generated sound waves. The first sensor is Devantech SRF235 which uses a beam type of signal for measurement, and the second is Parallax PING))) which uses burst type of signal. The results show that SRF235 is capable to measure the distance of a small object while the burst type Parallax PING))) has an error approximately of 11.122%.

**Conclusion:** Measure the distance between itself and the measurement object by using the calculated time of the waves when the waves are reflected back to the sensor. he sensor is composed of only low cost components, thus being apt for first car equipment in many cases, and is able to self-adapt to different conditions in order to give the best results.

### 4. Design of an Ultrasonic Distance Meter

**Abstract:** There are several ways to measure distance without contact. One way is to use ultrasonic waves at 40 kHz for distance measurement. Ultrasonic transducers measure the amount of time taken for a pulse of sound to travel to a particular surface and return as the reflected echo.

**Introduction:** This circuit calculates the distance based on the speed of sound at 25°C ambient temperature and shows it on LCD display. Using it, we can measure distance up to 2.5 meters. In this circuit, a 40 kHz transducer is used for measurement in the air medium. In this project, we excite the ultrasonic transmitter unit with a 40 kHz pulse burst and expect an echo from the object whose distance we want to measure. It travels to the object in the air and the echo signal is picked up by another ultrasonic transducer unit (receiver), also a 40 kHz pre-tuned unit. Index IC, LED, LCD, Microcontroller, Rangefinder, Transducer, Ultrasonic Sensors.

**Conclusion:** The device calculates the distance with suitable accuracy and resolution. It is a handy system for non-contact measurement of distance and Low cost.

### 5. Distance Measurement of Object by Ultrasonic Sensor HC-SR04

**Abstract:** — There are several ways to measure distance without contact. The selection of distance measurement sensor in order to apply it in any application is very important to avoid any invalid experimental results. Measurement using ultrasonic sensor is cheapest among various other options. The paper proposed to build an efficient module that consists of ultrasonic sensor HC-SR04 with 89s52 microcontroller for distance measurement.

**Introduction:** A distance detector is any device capable of measuring the distance between two points. The origin the distance between two points. The origins of distance measurement by means of graduated lengths of material such as chain, tape measure. Optical distance measurement, Electro-magnetic measurements are other methods of distance measurement. Since All kinds of devices or equipment nowadays, begin with the basic design, basic theory and then all the weakness followed by improvement step by step. Basically, this ultrasonic technology is based on ultrasound and a common use of ultrasound is in range finding that perfectly related to the objective.

**Conclusion:** This Ultrasonic distance measurement technique is low cost and simple. It is handy system for non-contact measurement of distance. The device calculates the distance with suitable accuracy and resolution. It is better than parallax's PING sensor that can able to detect object in range 3m. This device has application in many fields. Besides, the application of ultrasonic sensors are wider than infrared sensor in robotic or any application. Future enhancement can be done by considering specific object's material or condition in order to avoid unnecessary error.

### REFERENCES:

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