ENGINEERING

McMaster University

Project 3 – Independent Research Summary

Ultrasonic Distance Sensor

ENGINEER 1P13 – Integrated Cornerstone Design Projects

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Summary of Working Principle

The main function of the Ultrasonic Distance Sensor is to find the distance between the sensor and the desired object. [1] In order to do this, the sensor emits an ultrasonic wave in the direction of the target. [1] It then waits for the reception of the reflected wave and uses the amount of time passed and the speed of sound to calculate the distance. [1] The use of ultrasonic sensors in mobile robots is widely applied due to the fact that it has an extremely high cost performance. [2] Furthermore, the ultrasonic sensors are specifically used for information retrieval and processing in order to accurately outline the unknown environment. [2] In conclusion, the Ultrasonic Distance Sensor is a highly versatile sensor used to determine the distance to an object through ultrasonic waves which can then be used to find the surrounding layout.

Summary of Significant Material Properties

The main function of the Ultrasonic Distance Sensor is to determine the distance between the sensor and the desired object. In order to do this, the Ultrasonic Sensor uses a transmitter – this is the component that emits the sound. The crucial material used to create the transmitter are piezoelectric crystals.[3] These crystals are used because of their high sensitivity in regards to simple structures and affordability. [3] Additionally, it is crucial that whatever material used for the transmitter is able to hold a charge long enough to be detected by the electronic system. [4] Due to the fact that piezoelectric crystals possess this property, they are a good choice to use as they are essential to the performance of the device. [4] Overall, one of the crucial materials in the Ultrasonic Distance Sensor are piezoelectric crystals and are commonly used due to their accuracy, affordability, and ability to hold charges.

References

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