

ABSTRACT

Ultrasonic sensor system on the market (conventional) usually consists of a pair of ultrasonic sensors that have a primary function as a measure of the distance. But the system does not have wide viewing angles, so it can not know the angle or position of its reflective object. In addition, the use of conventional ultrasonic sensor system which resulted in the absence of much economic value and efficiency.

To overcome these problems, then at the end of the assignment is made of a microcontroller-based system of ultrasonic sensors that can be used as rangefinders and radar. The working principle of this system using time of flight, when the microcontroller provides 40 KHz pulses emitted by the U.S. sensor transmitter, the microcontroller starts to do the calculation time, and timing is stopped when the microcontroller is get the pulse reflections are received by the U.S. receiver. After that, do calibrations between the time values obtained on the actual distance, so we get a range of values that correspond to the actual distance. With distance measurements are performed and the positioning of four pairs of ultrasonic sensors that form a circle, and the help of servo motors that can rotate the four pairs of ultrasonic sensors at once, so this system can be utilized as radar that can determine the angle and position of its reflective objects.

The results of the design of this tool is the system can measure distances from 6 cm to 225 cm with an average percentage error was 1.74% overall, and can function as a radar that can determine the angle and position of its reflective objects from 0^0 to 360^0 , either by using the method of scanning or by using the tracking method.

Key words: Ultrasonic Sensors, Microcontroller ATMEGA8535, Scanning, Tracking.