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| **Title:** | Design, Implementation and Testing of Ultrasonic High Precision Contactless Distance Measurement System Using Microcontroller | | |
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| **Abstract:** |  |
| Abstract— This paper reports on design, implementation and testing of an ultrasonic high precision and low cost noncontact distance measurement system using microcontroller. Use of PIC16f877a microcontroller lowers the system cost and the use of ultrasonic transducer module HC-SR04 makes the system non-contact. Recommended range for the ultrasonic sensor is 2 cm to 4 m at accuracy of 3 mm. The ultrasonic module transmits ultrasonic sound waves at non-audible frequency of 40 kHz, then picks up its echo that comes from an object to the source. Time period of the output waveform is proportional to the distance between the sourceand the object whose distance is being measured. The microcontroller receives the output signal, performs the necessary information processing inside it and finally displays the corresponding measured distance on the LCD screen. The sample test results reveal that the system can calculate distances accurately from any object to the source of the ultrasonic wave generator between which the distances are being measured. Percentage of  error is then calculated between the measured and actual distances. It is found from the performance test that the designed system works very well. | |