

ABSTRACT

DEVELOPMENT OF MEASUREMENT TOOLS RESONANT SOUND WAVES USING ULTRASONIC SENSORS AND A MICROPHONE-BASED OF MICROCONTROLLER ATMEGA 8535

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In this research has made an instrumentation system for detecting value of range by using PING))) sensor and condenser mic. LCD generate output of PING))) sensor using Bascom AVR and computer generate output of *condenser mic* using MATLAB programming. Buzzing would be captured by *condenser mic* and saved with **wav* format. After data stored, that would be obtained the plot of distance. DC motor used to drive the reservoir tube, so that water from tube moved up or down. Time of water moved down to the first buzzing is equal to time of recording process so that speed of water move down and recording have considered indentic is 0,0213 m/s. Design of instrumentation has get a relationship of the wavelength and period (T) is $\lambda=321,3T+0,011$ m with a standard deviation value is 4,329 m or percentage value is 1.3% with an average value of the sound velocity 321,95 m/s. Calculation of the average sound velocity for computer display is 330,79 m/s with a standard deviation is 1,325 m or the percentage value is 0,4% and the equation obtained from the graph $\lambda=331,0T-0,0002$ m. The difference in the speed of sound waves on the charts, giving results that approach the average value in this study

Keywords: PING))) Sensor, condenser mic, LCD, MATLAB, Bascom AVR