ABSTRACT

DESIGN AND REALIZATION MEASUREMENT DENSITY OF LIQUID BY ARCHIMEDES'S LAW USING PHOTODIODIDE SENSOR

By

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A measuring instrument density of liquid by Archimedes's law has been implemented with photodiode as the detection for floating object volume. Analogue signals produced by photodiode have a range 4,81-2,18 volt with the measurement of distance from 1,0 cm - 9,0 cm and has been variated every 0,2 cm. The object of floating used mahoni's tree with volume 400 cm^3 and mass 238 grams. Software used to this research is CAVR for programming mikrokontroler and the result of measuring a density of liquid shown on the lcd screen 16x2. Calibration instrument is by comparing the value of a density with manual calculate mass and volume use a digital weight in Fisika Material's Laboratorium. Range of measurement this device for distance is 1,0 cm – 9,0 cm from above floating objects. While the volume has fixed that is 500 ml and limit of the height of a liquid substance in a container constant consisting of 5 cm. The liquid samples used for this research are water, kerosene, oil SA-E 40 and cooking oil. From the results, the density of water is 1.04 r/cm^3, kerosene is 0.83 gr/cm^3, oil SA-E 40 is 0.85 gr/cm^3 and 0.92 gr /cm^3 for cooking oil. This measurement have value of accuracy is 98.25% and an error is 3.875%.

Keywords: Density, Archimedes's law, photodiode