MASS SENSOR SYSTEM DESIGN USING STRAIN GAUGE 120Ω

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ABSTRACT

Theoretical models in physics was much applied in the measurement system. Such as the measurement system that based on material strain caused by the additional of mass, which in this research has been carried out the design and manufacture prototype mass sensor using a uniaxial strain gauge model 10-120-C1-11L1M2R with 120Ω resistance and cantilever made from brass with 0.8 cm of length, 0.3 cm of width, and 6 µm thick. The load calibrated with OHAUS PioneerTM type PA214. With wheatstone bridge, amplifier, and passive low-pass filter circuits, mass system sensor characteristic was got $V=89.45\text{(mV/gram)} \times M(\text{gram}) + 2963.44 \text{(mV)}$ with sensitivity error 2.41%. The hysteresis values obtained from the graphic of increasing and decreasing in mass is 117.19 mV at point 3.8 gr. In this research also have been carried out data acquisition system via serial communication program that runs under linux system.

Key words: cantilever, wheatstone bridge, mass, strain gauge, linux