


## Original Article

# Design and Uncertainty Evaluation of a Strain Measurement System

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## Abstract

Strain measurement is very important in various industrial applications as well as different disciplines of science and technology for direct and indirect observations of certain parameters. Designing signal conditioning circuit is always a challenging and important task for satisfactory and reliable performance of a sensor as well as the system. The design and implementation details of a signal conditioning circuit of resistive sensor (strain gauge) for strain measurement are presented in this paper. Also the important aspects in designing a signal conditioning circuit for resistive sensor are presented and a novel method for the measurement of strain is discussed. Quarter bridge configuration with AC voltage excitation is used for the measurement along with the necessary circuitry to get a suitable and measurable output DC voltage. The measurement system is calibrated using a cantilever of stainless steel and the details of calibration are presented in the paper. The uncertainty associated with the measurement system is evaluated.

## Keywords

Measurement uncertainty; Strain; Measurement systems; Calibration