15ST091 A numerical method of correcting the influence of the additional quantities for nonselective sensors

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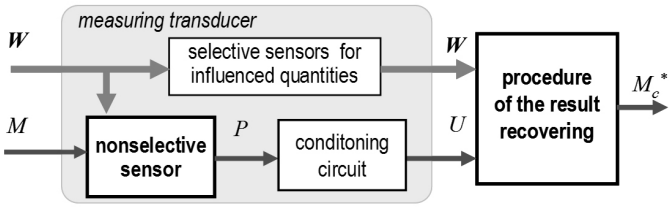
Contemporarily worked out sensors have very wide possibilities of application in various fields, both to the measurement of physical quantities, and also to the measurement of chemical or biological parameters. Such sensors have essential advantages, e.g. the miniaturization, sensitivity on miscellaneous quantities, the possibility of application in multiparameter measurements (matrix sensors), simple integration with other parts of the measuring chain, low costs. On the other hand, the current condition of technology development does not allow to obtain a good propriety of sensors in metrological sense. To apply such sensors, for example in gas concentration measurement transducers, some effective methods of correction are required.

A numerical method based on model with variable coefficients is described in this paper. An example of application of this method to correct of temperature and humidity influence for a gas concentration measuring transducer based on Figaro TGS2442 carbon monoxide sensor.



Structure of the measuring chain with the nonselective sensor

15ST117 Study of a Hall Effect Brake Wear Sensor using Finite Element Modelling and Analysis

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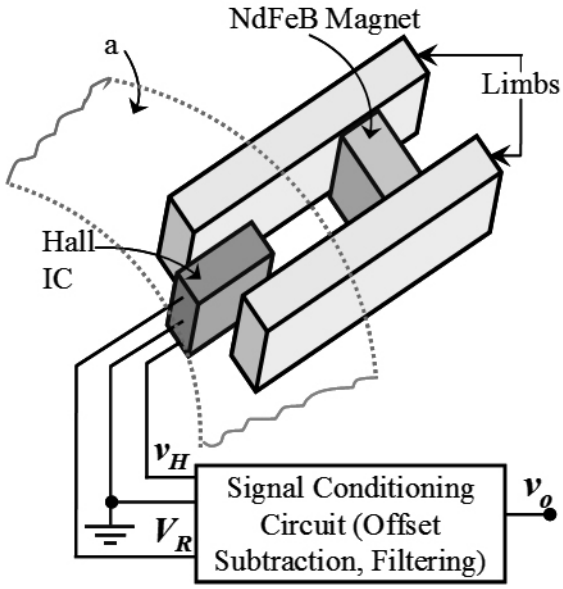
Monitoring of brake wear and warning the driver to replace it at the appropriate time is a critical safety requirement. Recently, basic concept of a new, simple and low-cost Hall-Effect (HE) based angle sensor, which continuously monitors brake wear, by sensing the angle rotated by the Cam Shaft (CS) with-respect-to the Slack Adjuster (SA) in the brake assembly has been presented. The sensor has a spiral shaped moving part. It rotates along with CS and changes the magnetic field seen by a HE sensor, whose output is directly proportional to angle between CS and SA, for a wide range. A prototype angle sensor has been developed and test results showed a linear range of 0-220o, which is sufficient for monitoring brake wear. In the sensor, parameters like positioning of the HE sensor, relative permeability of the materials used, thickness of the moving part, etc. play a crucial role as far as the linearity of output and sensitivity are concerned. Sensor optimisation based on hardware implementation is time consuming, inefficient and less accurate. Hence, a finite element model of the sensor has been developed, and various studies have been conducted to optimise the parameters for best performance of the sensor. This also enables to achieve a linear output without using complex circuitry.



A 3D view of sensor