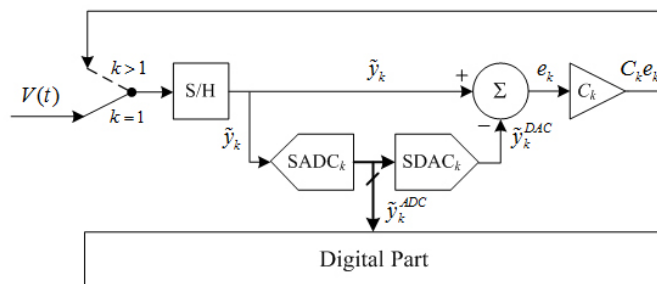




26RE079 New Effective Architectures and Conversion Algorithms for Adaptive Sub-ranging A/D Converters

Konrad Jedrzejewski¹⁵⁹

The paper is devoted to new effective architectures and conversion algorithms used in adaptive sub-ranging analog-to-digital converters (ADCs) whose digital parts permit to calculate iteratively output codes in a form of binary words using adaptive estimation algorithms. Two classes of adaptive sub-ranging ADCs, i.e. recursive and pipeline, are considered in the paper. The paper develops the earlier research on the adaptive sub-ranging ADCs and removes some disadvantages of these converters, simplifying their architecture as well as enabling further increase of their effective number of bits. Application of the proposed converters architectures results in some changes in the conversion algorithm.



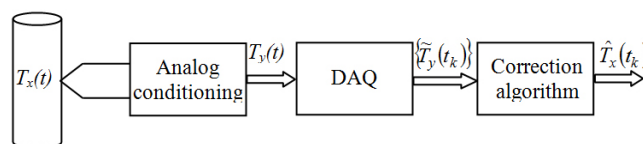
Architectures of new modified adaptive recursive

26RE122 Thermocouple Dynamic Errors Correction for Instantaneous Temperature Measurements in Induction Heating

Krzysztof Konopka¹⁷⁷

The most commonly used thermometer to measure high temperatures in metallurgy is the thermocouple, but because of its long response time it can be used mainly for measuring time-averaged temperatures. Research on steel wire patenting using inductive heating required instantaneous temperature values. Pyrometers or thermographic cameras could be used, however they are generally expensive, and temperature measurements are not always reliable due to differing emissivities. In described case expensive infrared thermometers could be replaced by cheap thermocouple provided that dynamic errors were corrected. Correction algorithm would not increase the total cost of the measuring system as no additional hardware is required. Correction algorithm was implemented in LabVIEW. The time constant was determined experimentally. Experiments were carried out to examine improvement in response time of thermocouple with correction algorithm. Additionally the temperature dynamics was verified by pyrometer. Finally the effect of dynamic correction algorithm on measurement uncertainty was analyzed.

Keywords: thermocouple dynamic errors, correction algorithm, steel wire patenting, inductive heating.



Thermocouple measuring chain