

Embedded system design and implementation of
standard auto-calibrated measurement chain

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Abstract

This paper presents the design and the implementation of a standard auto-calibration system, to correct measurement chain and ensure its accuracy. The adopted solution consists in designing a reconfigurable instrumentation based on the use of a programmable analog circuit (FPAA), allowing the automation of various test and adjustment operations. The measurement chain transfer curve is periodically corrected using the progressive polynomial calibration method, ensuring systematic correction of each taken measurement. The hardware/software implementation of the system was carried out in an embedded configuration based on a FPGA platform. The obtained results highlight adaptability of the proposed calibration method at various sensors kinds as well as the implementation simplicity, and shows how the measuring accuracy can be considerably improved.