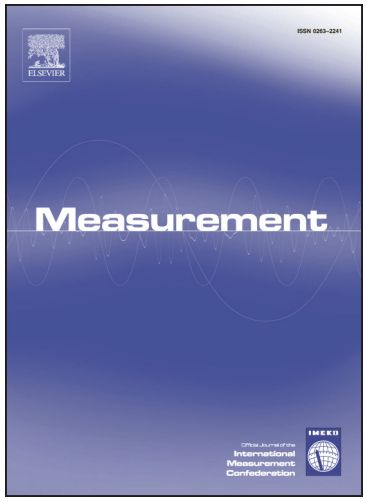

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A new electric conductance conversion method suitable for very low power applications

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Abstract

This article describes a new electrical conductance converter method suitable for low power applications and an implementation in standard CMOS technology. Despite being designed to meet specific measurements requirements, this converter is intended for applications where device power requirements are determinative such self powered sensors networks and implantable devices. The topology is described and an implementation is presented. Results show the possibility of being powered by a single 1.2V accumulator cell with a consumption of 8nJ per conversion.

Keywords:
Conductance measurement, Low-power, CMOS, Lock-in amplifier, Chopper stabilization, Precision agriculture, Artificial insemination

1. Introduction

Many sensory systems rely on power consumption for device size, life cycle or availability. Thus, energy efficiency can rule the device design, may prevail over speed or precision and ultimately dictate the viability of some applications. Implantable devices and autonomous sensory networks are such examples.

Herd management by automatic prediction of optimum time to proceed with artificial insemination is another application. Electric bio-conductance

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