

## Digital Sensors and Sensor Systems: Practical Design

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### Book Description



Semiconductor and integrated sensor design are heavily driven by technology scaling. Rapid advances in microelectronics and nano-technologies have brought new challenges to the digital, smart, intelligent sensors and sensor systems design.

Because such design approach based on the frequency (time)-to-digital conversion has not been adequately covered in the literature before, this unique book aims to fill a significant gap and presents new knowledge in this emerging area of modern sensors.

The goal of this book is to help the practitioners achieve the best metrological and technical performances of digital sensors and sensor systems at low cost, and significantly to reduce time-to-market. It should be also useful for students, lectures and professors to provide a solid background of the novel concepts and design approach because of till now such topics have been covered adequately only in a few European and American universities.

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### Book features include:

- Each of chapter can be used independently and contains its own detailed list of references
- Easy-to-repeat experiments
- Practical orientation
- Dozens examples of various complete sensors and sensor systems for physical and chemical, electrical and non-electrical quantities
- Detailed description of technology driven and coming alternative to the ADC – a frequency (time)-to-digital conversion, well suited for technology scaling
- Easy design based on novel microelectronic components such as Universal Frequency-to-Digital Converters and Universal Sensors and Transducers Interfaces
- Describes engineering technique how to estimate a resulting, total error of designed sensor system

*Digital Sensors and Sensor Systems: Practical Design* will greatly benefit undergraduate and at PhD students, engineers, scientists and researchers in both industry and academia. It is especially suited as a reference guide for practitioners, working for Original Equipment Manufacturers (OEM) electronics market (electronics/hardware), sensor industry, and using commercial-off-the-shelf components, as well as anyone facing new challenges in technologies, and those involved in the design and creation of new digital sensors and sensor systems, including smart and/or intelligent sensors for physical or chemical, electrical or non-electrical quantities.

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• Grounding in Mixed Signal Systems n Power Supply Noise Reduction and Filtering n Preventing RFI Rectification n Dealing With High Speed Logic n A Review of Shielding Concepts n Isolation Techniques n Overvoltage Protection n Electrostatic Discharge (ESD). Index. Practical design techniques for sensor signal conditioning. Introduction -. 1. PDF | Intelligent sensors and sensor systems are of great interest in many fields of industry, control systems, robotics, biomedical applications, etc. According to new sensors market studies (Freedonia Group), the US sensor demand will grow 4.3 percent annually through 2012 and...

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• Nowadays, intelligent sensors and systems are extremely necessary for such applications, as electronic noses and. tongues, smart vision systems, personnel (human body) detection, authentication systems, building monitoring. system, etc.