



# Handbook of Ultra-Wideband Short-Range Sensing: Theory, Sensors, Applications

By Jürgen Sachs

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Ranging from the theoretical basis of UWB sensors via implementation issues to applications, this much-needed book bridges the gap between designers and appliers working in civil engineering, biotechnology, medical engineering, robotic, mechanical engineering, safety and homeland security.

From the contents:

- \* History
- \* Signal and systems in time and frequency domain
- \* Propagation of electromagnetic waves (in frequency and time domain)
- \* UWB-Principles
- \* UWB-antennas and applicators
- \* Data processing
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## **Editorial Review**

From the Back Cover

The book covers the theoretical basis of UWB sensors, implementations issues, and applications. It bridges the knowledge and communication gap between UWB sensor designers and appliers working in radar communications systems, civil engineering, biotechnology, medical engineering, robotic, mechanical engineering, safety and homeland security.

The objective of this book is to introduce the reader into some aspects of ultra-wideband (UWB) sensing. Such sensors use very weak and harmless electromagnetic sounding waves to “explore” their surroundings. Sensor principles using electromagnetic waves are not new and are in use for many years. But they are typically based on narrowband signals. In contrast to that, the specific of UWB-sensors is to be seen in the fact that they apply sounding signals of a very large bandwidth whereat bandwidth and centre frequency are of the same order.

About the Author

**Jürgen Sachs** earned a Doctorate (Dr.-Ing.) in Electrical Engineering (surface acoustic wave devices) and a Dipl.-Ing. degree in Electrical Engineering (semi-conductor technology and components). Since 1985, he is Senior Lecturer at TU Ilmenau, Germany. He teaches "Basics of Electrical Measurement Technology", "Methods of measurement for the information and communication technique", and "Eateellite navigation and radar". He is head of several research projects, and inter alia coordinator of European projects for humanitarian demining. His research areas cover RF-signal analysis and RF-system identification; Surface Penetrating Radar, Impulse Radiating Antennas; Ultra wideband (UWB) methods and their application in high resolution radar and impedance spectroscopy, digital processing of UWB-signals; UWB-Array-processing; and humanitarian anti-personal mine detection.

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