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Preface

Introduction

The purpose of *Measurement, Instrumentation, and Sensors Handbook CRCnetBase 1999* is to provide a reference that is both concise and useful for engineers in industry, scientists, designers, managers, research personnel and students, as well as many others who have measurement problems. The *CD-ROM* covers an extensive range of topics that comprise the subject of measurement, instrumentation, and sensors.

The *CD-ROM* describes the use of instruments and techniques for practical measurements required in engineering, physics, chemistry, and the life sciences. It includes sensors, techniques, hardware, and software. It also includes information processing systems, automatic data acquisition, reduction and analysis and their incorporation for control purposes.

Articles include descriptive information for professionals, students, and workers interested in measurement. Articles include equations to assist engineers and scientists who seek to discover applications and solve problems that arise in fields not in their specialty. They include specialized information needed by informed specialists who seek to learn advanced applications of the subject, evaluative opinions, and possible areas for future study. Thus, the *CD-ROM* serves the reference needs of the broadest group of users — from the advanced high school science student to industrial and university professionals.

Organization

The *CD-ROM* is organized according to the *measurement problem*. Section I includes general instrumentation topics, such as accuracy and standards. Section II covers spatial variables, such as displacement and position. Section III includes time and frequency. Section IV covers solid mechanical variables such as mass and strain. Section V comprises fluid mechanical variables such as pressure, flow, and velocity. Section VI covers thermal mechanical variables such as temperature and heat flux. Section VII includes electromagnetic variables such as voltage and capacitance. Section VIII covers optical variables such as photometry and image sensors. Section IX includes radiation such as x rays and dosimetry. Section X covers chemical variables in composition and environmental measurements. Section XI includes biomedical variables such as blood flow and medical imaging. Section XII comprises signal processing such as amplifiers and computers. Section XIII covers display such as cathode ray tube and recorder. Section XIV includes control such as optimal control and motion control. The Appendix contains conversion factors to SI units.

Locating Your Topic

To find out how to measure a given variable, do a word or phrase search, select the section and the chapters that describe different methods of making the measurement. Consider the alternative methods of making the measurement and each of their advantages and disadvantages. Select a method, sensor,

and signal processing method. Many articles list a number of vendors to contact for more information. You can also visit the <http://www.sensorsmag.com> site under Buyer's Guide to obtain a list of vendors.

Acknowledgments

I appreciate the help of the many people who worked on this handbook. David Beams assisted me by searching books, journals, and the Web for all types of measurements, then helped me to organize the outline. The Advisory Board made suggestions for revision and suggested many of the authors. Searching the INSPEC database yielded other authors who had published on a measurement method. At CRC Press, Felicia Shapiro, Associate Production Manager; Kristen Maus, Developmental Editor; Suzanne Lassandro, Book Group Production Director; and Susan Fox, Project Editor, produced the book.

John G. Webster
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Editor-in-Chief

John G. Webster received the B.E.E. degree from Cornell University, Ithaca, NY, in 1953, and the M.S.E.E. and Ph.D. degrees from the University of Rochester, Rochester, NY, in 1965 and 1967, respectively.

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