



# Advanced Instrumentation and Computer I/O Design: Defined Accuracy Decision, Control, and Process Applications

By Patrick H. Garrett

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## Advanced Instrumentation and Computer I/O Design: Defined Accuracy Decision, Control, and Process Applications By Patrick H. Garrett

Written by an expert in the field of instrumentation and measurement device design, this book employs comprehensive electronic device and circuit specifications to design custom defined-accuracy instrumentation and computer interfacing systems with definitive accountability to assist critical applications.

*Advanced Instrumentation and Computer I/O Design, Second Edition* begins by developing an understanding of sensor-amplifier-filter signal conditioning design methods, enabled by device and system mathematical models, to achieve conditioned signal accuracies of interest and follow-on computer data conversion and reconstruction functions. Providing complete automated system design analyses that employ the Analysis Suite computer-assisted engineering spreadsheet, the book then expands these performance accountability methods—coordinated with versatile and evolving hierarchical subprocesses and control architectures—to overcome difficult contemporary process automation challenges combining both quantitative and qualitative methods. It then concludes with a taxonomy of computer interfaces and standards including telemetry, virtual, and analytical instrumentation.

*Advanced Instrumentation and Computer I/O Design, Second Edition* offers:

- Updated chapters incorporating the latest electronic devices and system applications
- Improved accuracy of the design models between their theoretical derivations and actual measured results
- End-of-chapter problems based on actual industry, laboratory, and aerospace system designs
- Multiple real-world case studies performed for technology enterprises
- Instrumentation Analysis Suite for computer I/O system design
- A separate solutions manual

Written for international engineering practitioners who design and implement industrial process control systems, laboratory instrumentation, medical electronics, telecommunications, and embedded computer systems, this book will also prove useful for upper-undergraduate and graduate-level electrical

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### **Editorial Review**

About the Author

**PATRICK H. GARRETT, PhD, P.E.**, is an Associate Professor of Electrical and Computer Engineering at the University of Cincinnati, where he has developed courses in manufacturing, controls, and process instrumentation. The author of several internationally adopted textbooks on instrumentation and process control, he continues to be involved in long-term research projects, for both government and private sectors, focused on performance advancement of information-intensive real-time systems. A member of the IEEE, Dr. Garrett has been an American Council on Education reviewer, a White House intern, and visiting scientist at the Air Force Materials & Manufacturing Directorate.

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