



# Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices

*By David Prutchi, Michael Norris*

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Design and Development of Medical Electronic Instrumentation fills a gap in the existing medical electronic devices literature by providing background and examples of how medical instrumentation is actually designed and tested. The book includes practical examples and projects, including working schematics, ranging in difficulty from simple biopotential amplifiers to computer-controlled defibrillators. Covering every stage of the development process, the book provides complete coverage of the practical aspects of amplifying, processing, simulating and evoking biopotentials. In addition, two chapters address the issue of safety in the development of electronic medical devices, and providing valuable insider advice.

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## **Editorial Review**

### **Review**

"The book is user-friendly, accurate...and will be very useful to anyone with a basic understanding of circuit theory..." (*Annals of Biomedical Engineering*, June 2006)

"This reviewer will find this text a valued part of his library for the several areas extremely well elucidated. And talking with a few colleagues, the reviewer confirmed that this text will have wide appeal..." (*Biomedical Instrumentation & Technology*, July/August 2005)

"...details this application's unique requirements and constraints, exploring with general discussion, schematic diagrams, representative waveforms, and typical-design photos." (*EDN Online*, January 12, 2005)

### **From the Back Cover**

Master the building blocks of medical devices with this hands-on guide

This book provides a uniquely practical approach that enables readers to learn the design of medical electronic devices through the analysis of specific projects. Walking you through the building blocks of implementing medical devices, *Design and Development of Medical Electronic Instrumentation* addresses the practical aspects of amplifying, processing, simulating, and evoking biopotentials. It provides real-world projects that range from simple biopotential amplifiers all the way to a computer-controlled defibrillator. Anyone with a basic understanding of circuit design and electrical engineering mathematics and experience in electronic prototype construction will find these projects accessible. Chapters discuss:

- Biopotential amplifiers, including a refresher on the origin and acquisition of physiological electrical signals
- Spectral content of biosignals, filter design, and the selection of frequency ranges for biopotential amplifiers
- Design of safe medical device prototypes
- International regulations and design practices for electromagnetic compatibility of medical devices
- Data acquisition, smart sensors, analog-to-digital conversion, and high-resolution spectral analysis of physiological signals
- Artificial signal sources for simulating physiological events
- Principles, clinical applications, and design of excitable tissue stimulators
- Design of cardiac pacemakers and defibrillators, including a refresher on the electrophysiology of the heart, its conduction deficiencies, and arrhythmias

With access to an ftp site that contains the software and information needed to successfully complete the projects outlined, plus a special epilogue on how to bring a medical device to market, this book will help one quickly master the essentials of medical device design and build sophisticated instrumentation for a broad range of purposes.

### **About the Author**

DAVID PRUTCHI, PhD, received his doctorate in biomedical engineering from Tel-Aviv University, Israel.

Currently, he is Vice President of Product Development for Impulse Dynamics. He has over fifteen years of experience in biomedical and medical electronic instrumentation research, design, and management. He has published over thirty papers and holds over sixty patents in the field of active implantable medical devices.

MICHAEL NORRIS is a senior electronics engineer for Impulse Dynamics. He has over twenty-five years of experience as a medical device designer, including research, design and development of analog and digital circuits, microprocessors, and embedded software.

## **Users Review**

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#### **Celina Ziolkowski:**

Now a day folks who Living in the era exactly where everything reachable by connect to the internet and the resources included can be true or not call for people to be aware of each facts they get. How people have to be smart in getting any information nowadays? Of course the reply is reading a book. Studying a book can help men and women out of this uncertainty Information particularly this Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices book since this book offers you rich information and knowledge. Of course the data in this book hundred per cent guarantees there is no doubt in it everbody knows.

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Why? Because this Design and Development of Medical Electronic Instrumentation: A Practical Perspective of the Design, Construction, and Test of Medical Devices is an unordinary book that the inside of the e-book waiting for you to snap the item but latter it will shock you with the secret the idea inside. Reading this book adjacent to it was fantastic author who also write the book in such awesome way makes the content within easier to understand, entertaining way but still convey the meaning completely. So , it is good for you for not hesitating having this any longer or you going to regret it. This book will give you a lot of gains than the other book get such as help improving your skill and your critical thinking means. So , still want to hesitate having that book? If I had been you I will go to the book store hurriedly.

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**Alexander Goodman:**

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