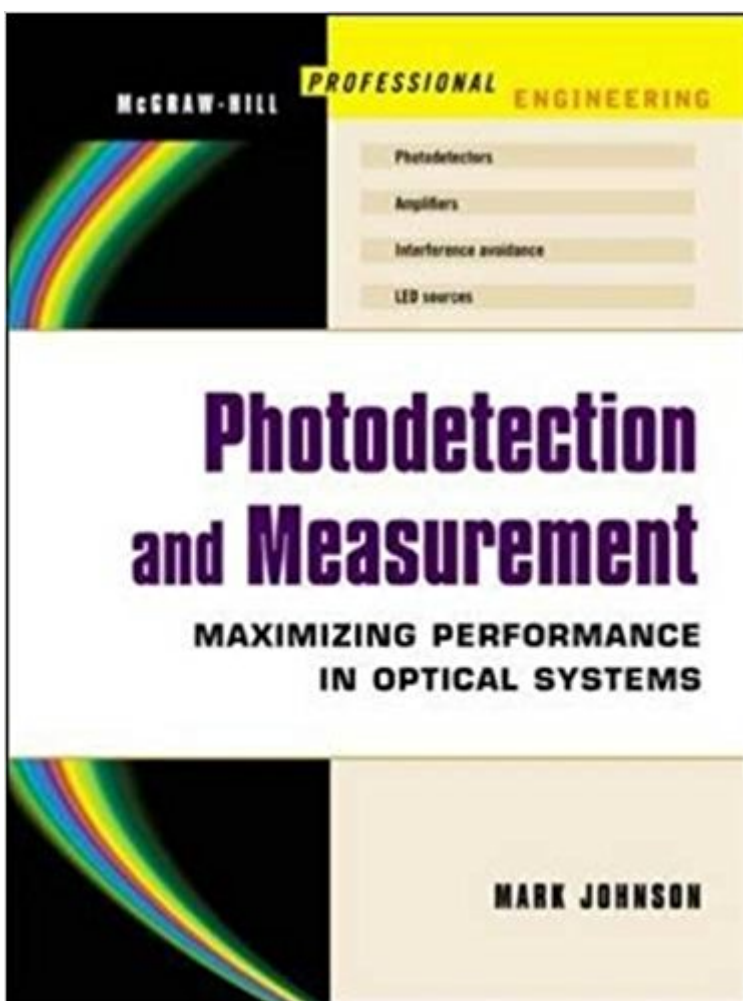


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# Photodetection And Measurement: Maximizing Performance In Optical Systems



## Synopsis

This text takes an interdisciplinary approach to international business, building on the various business disciplines that make up the field. In-depth integration is provided throughout the book, as well as via a concluding section on international strategic alliances and a series of integrated case studies. The book is aimed at providing cutting-edge, rigorous knowledge, while incorporating a solid theoretical base and information from research and the corporate world in an accessible format.

## Book Information

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**MAKE OPTICAL MEASUREMENTS WITH MAXIMUM ACCURACY AND MINIMUM COST** The "opto-electronics revolution" has made the art and science of making sensitive, accurate, and inexpensive optical measurements must-know information for legions of electronic engineers and research students. And there's no faster or easier way to master photodetection and measurement techniques than with this hands-on tutorial written by a teacher with experience enough to know the questions you would ask. A clear, easy-to-understand "rules-of-thumb" approach shows you how to make high-performance optical measurements by getting the fundamentals right, often with simple, inexpensive equipment commonly found in laboratories. It includes treatment of: \* Photodetectors \* Amplifiers \* LED sources \* Electronic modulation and

demodulation \* Interference avoidance \* Data acquisition and basic DSP Youâ™ll also gain a firm understanding of noise-reduction techniques and the essentials of building-in speed, sensitivity, and stability. If you want to learn the secret of making sound optical measurements without expensive equipment, this is the one resource you shouldnâ™t work without.

Mark Johnson, Ph.D is an independent consultant in opto-electronics and measurement innovation. He is a visiting professor at Salford University in England and St. Etienne University in France and has managed corporate research teams in the United Kingdom, the United States, and Germany. Dr. Johnson resides in Cheshire, England.

This book will help a lot of people, especially students and young researchers in optics, engineering science, and experimental physics, to stay out of a lot of trouble. I predict that many students and professors are going to be very grateful to Mark Johnson! \*Photodetection and Measurement\* is all about how to make optical measurements work \*in real life\*. Starting from an elementary level, it takes you from the source, through the optical system, the crucial front end amplifier, the analogue signal processing and digitizing. I especially liked the "TRY IT!" sections--guided tours that will give you an excellent intuitive and quantitative understanding of how lock-in amplifiers, frequency compensation, fibre coupling, and many other things work. Lab work and simple analytical calculations generate intuition faster than anything. There's a detailed section on lock-ins, with lots of hands-on stuff to show that they work just like bandpass filters plus downconverters. My favourite part is the section on turbidity measurements--the author was head of the R&D team at a large water utility for some years, so he knows this stuff cold. He gives many different methods of avoiding or compensating for fouling, and of improving accuracy, e.g. rejecting background by modulating the sample absorption using wedge-shaped sample cells. This is typical of the thoroughly practical attitude Johnson displays throughout--it's always the things you haven't thought about that will bite you, and he's usually thought about them. There are a thousand good tricks here. If you're starting out with a photodiode in one hand, a data acq system in the other, and no idea how to connect the one to the other, this is definitely your book.

Mark Johnson does an excellent job with this material. I can't recommend it enough for those working in this field or entering it. It is written clearly with tons of invaluable practical information. Whenever I need to implement or design a photodetector circuit, I keep this book close at hand.

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