

1. Record Nr.	UNINA9910877012403321
Titolo	Systemic design methodologies for electrical energy systems : analysis, synthesis and management // edited by Xavier Roboam
Pubbl/distr/stampa	Hoboken, N.J., : ISTE Ltd., : John Wiley and Sons Inc, 2012
ISBN	1-118-56986-5 1-299-19036-7 1-118-56964-4 1-118-56967-9
Descrizione fisica	1 online resource (392 p.)
Collana	Electrical engineering series
Altri autori (Persone)	RoboamXavier
Disciplina	621.3
Soggetti	Electric power systems - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Systemic Design Methodologies for Electrical Energy Systems; Title Page; Copyright Page; Table of Contents; Preface; Chapter 1: Introduction to Systemic Design; 1.1. The system and the science of systems; 1.1.1. First notions of systems and systems theory; 1.1.2. A brief history of systems theory and the science of systems; 1.1.3. The science of systems and artifacts; 1.2. The model and the science of systems; 1.3. Energy systems: specific and shared properties; 1.3.1. Energy and its properties; 1.3.2. Entropy and quality of energy; 1.3.3. Consequences for energy systems 1.4. Systemic design of energy systems 1.4.1. The context of systemic design in technology; 1.4.2. The design process: toward an integrated design; 1.5. Conclusion: what are the objectives for an integrated design of energy conversion systems?; 1.6. Glossary of systemic design; 1.7. Bibliography; Chapter 2: The Bond Graph Formalism for an Energetic and Dynamic Approach of the Analysis and Synthesis of Multiphysical Systems; 2.1. Summary of basic principles and elements of the formalism; 2.1.1. Basic elements; 2.1.2. The elementary phenomena; 2.1.3. The causality in bond graphs 2.2. The bond graph: an "interdisciplinary formalism" 2.2.1. "Electro-electrical" conversion; 2.2.2. Electromechanical conversion; 2.2.3. Electrochemical conversion; 2.2.4. Example of a causal multiphysical

model: the EHA actuator [GAN 07]; 2.3. The bond graph, tool of system analysis; 2.3.1. Analysis of models properties; 2.3.2. Linear time invariant models; 2.3.3. Simplification of models; 2.4. Design of systems by inversion of bond graph models; 2.4.1. Inverse problems associated with the design approach; 2.4.2. Inversion of systems modeled by bond graph  
2.4.3. Example of application to design problems  
2.5. Bibliography;  
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Chapter 4: The Robustness: A New Approach for the Integration of Energetic Systems; 4.1. Introduction; 4.2. Control design of electrical systems  
4.2.1. The control design is an issue of integration

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### Sommario/riassunto

This book proposes systemic design methodologies applied to electrical energy systems, in particular analysis and system management, modeling and sizing tools. It includes 8 chapters: after an introduction to the systemic approach (history, basics & fundamental issues, index terms) for designing energy systems, this book presents two different graphical formalisms especially dedicated to multidisciplinary devices modeling, synthesis and analysis: Bond Graph and COG/EMR. Other systemic analysis approaches for quality and stability of systems, as well as for safety and robustness analysis

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