Plc Power Line Communication

Smart Grid Telecommunications
2021 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA)
Handbook of Green Information and Communication Systems
Advances in Systems, Control and Automation
A Practical Guide to Power-line Communication
Microgrid Technology and Engineering Application
Power Line Communication Systems for Smart Grids
Fieldbus Systems and Their Applications 2005
Power Line Communications in Practice
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Power Line Communication
ICT Analysis and Applications
Smart Industry & Smart Education
From Smart Grid to Internet of Energy
Powerline Communications
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China Standard: GB/T 31983.31-2017 Narrow band power line communication over low-voltage mains—Part 31:Narrow band orthogonal frequency division multiplexing power line—Communication physical layer specification
Automotive Ethernet
Academic Press Library in Mobile and Wireless Communications
Microgrid
Broadband Power-line Communications Systems
Research Anthology on Smart Grid and Microgrid Development
Power Quality in Power Systems and Electrical Machines
Broadband Communications Networks
Wireless Network Simulation
MIMO Power Line Communications
Smart Grids and Their Communication Systems
Prototype of Coupling Unit Network for Power Line Communications
MIMO Power Line Communications
Human Interaction with Electromagnetic Fields
Power Line Communications
Broadband Powerline Communications
Hybrid Wireless-Power Line Communications for Indoor IoT Networks
Smart Grid Test Bed Using OPNET and Power Line Communication
Smart Grid Communications and Networking
Power Line Fire Prevention Field Guide
Power Line Communications
Homeplug AV and IEEE 1901
ICT Systems and Sustainability

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Smart Grid Telecommunications John Wiley & Sons
This book comprises the select proceedings of the ETAEERE 2016 conference. The book aims to shed light on different systems or machines along with their complex operation, behaviors, and linear–nonlinear relationship in different environments. It covers problems of multivariable control systems and provides the necessary background for performing research in the field of control and automation. Aimed at helping readers understand the classical and modern design of different intelligent automated systems, the book presents coverage on the control of linear and nonlinear systems, intelligent systems, stochastic control, knowledge-based systems applications, fault diagnosis and tolerant control, real-time control applications, etc. The contents of this volume will prove useful to researchers and professionals alike.
2021 IEEE International Conference on Computational Intelligence and Virtual Environments for Measurement Systems and Applications (CIVEMSA) Academic Press
The second edition of this must-have reference covers power quality issues in four parts, including new discussions related to renewable energy systems. The first part of the book provides background on causes, effects, standards, and measurements of power quality and harmonics. Once the basics are established the authors move on to harmonic modeling of power systems, including components and apparatus (electric machines). The final part of the book is devoted to power quality mitigation approaches and devices, and the fourth part extends the analysis to power quality solutions for renewable energy systems. Throughout the book worked examples and exercises provide practical applications, and tables, charts, and graphs offer useful data for the modeling and analysis of power quality issues. Provides theoretical and practical insight into power quality problems of electric machines and systems 134 practical application (example) problems with solutions 125 problems at the end of chapters dealing with practical applications 924 references, mostly journal articles and conference papers, as well as national and international standards and guidelines
Handbook of Green Information and Communication Systems John Wiley & Sons
Broadband Powerline Communications: Network Design covers the applications of broadband PLC systems in low-voltage supply networks, a promising candidate for the realization of cost effective solutions for “last mile” communications networks. There are many activities surrounding the development and application of PLC technology in the access area, particularly because of strong interest of new network providers after the deregulation of telecommunications market. Nowadays, there are no existing standards for broadband PLC networks, which use a frequency range up to 30 MHz. This book includes relevant and timely information regarding broadband PLC systems and especially PLC access networks and contributions to the design aspects of broadband PLC access systems and their network components. This book: Offers explanations on how broadband PLC networks are realized, what the important characteristics for the

transmission on electrical power grids are, and which implementation solutions have been recently considered for the realization of broadband PLC systems. Considers various system realizations, disturbance scenarios and their impact the transmission in PLC networks, electro-magnetic compatibility, applied modulation schemes, coding, and error handling methods. Pays particular attention to the specifics of the PLC MAC layer and its protocols, as well as the modelling and performance evaluation of broadband PLC networks.

Advances in Systems, Control and Automation Cambridge University Press

The book presents a broad overview of emerging smart grid technologies and communication systems, offering a helpful guide for future research in the field of electrical engineering and communication engineering. It explores recent advances in several computing technologies and their performance evaluation, and addresses a wide range of topics, such as the essentials of smart grids for fifth generation (5G) communication systems. It also elaborates the role of emerging communication systems such as 5G, internet of things (IoT), IEEE 802.15.4 and cognitive radio networks in smart grids. The book includes detailed surveys and case studies on current trends in smart grid systems and communications for smart metering and monitoring, smart grid energy storage systems, modulations and waveforms for 5G networks. As such, it will be of interest to practitioners and researchers in the field of smart grid and communication infrastructures alike.

A Practical Guide to Power-line Communication Cambridge University Press

One of the first publications of its kind in the exciting field of multiple input multiple output (MIMO) power line communications (PLC), MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing contains contributions from experts in industry and academia, making it practical enough to provide a solid understanding of how PLC technologies work, yet scientific enough to form a base for ongoing R&D activities. This book is subdivided into five thematic parts. Part I looks at narrow- and broadband channel characterization based on measurements from around the globe. Taking into account current regulations and electromagnetic compatibility (EMC), part II describes MIMO signal processing strategies and related capacity and throughput estimates. Current narrow- and broadband PLC standards and specifications are described in the various chapters of part III. Advanced PLC processing options are treated in part IV, drawing from a wide variety of research areas such as beamforming/precoding, time reversal, multi-user processing, and relaying. Lastly, part V contains case studies and field trials, where the advanced technologies of tomorrow are put into practice today. Suitable as a reference or a handbook, MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing features self-contained chapters with extensive cross-referencing to allow for a flexible reading path.

Microgrid Technology and Engineering Application John Wiley & Sons

The electric power distribution grid is a medium over which fast and reliable communication services can be provided. Power Line Communications

(PLC) systems provide an alternative to wireless communications in the transmission of data within buildings and vehicles. In recent years, increased interest in PLC systems for both commercial and residence applications has resulted in the development of standards for use of the electric power grid as a communications channel conveying messages in addition to power. The types of applications range from simple inexpensive services centered around networked household appliances, where data rates are on the order of kilobits per second, to Internet access via the electrical outlet wall socket, where data rates are on the order of megabits per second. Currently, PLC systems can accommodate high-speed networking that includes broadband Internet access, voice over-IP, and the interconnectivity of home entertainment devices. The development of a Power Line Communications system presents a significant challenge for the communications engineer due to the unusual channel characteristics that affect high-speed signal transmission. The electric power grid is designed for, and operated at, 50/60 Hz throughout the world. Furthermore, the topology of a local electric power grid network is often very irregular resulting in significant dispersion of the transmitted message signals. This thesis presents an overview of the major features and characteristics of PLC systems, the fundamental properties of powerline channels, and an analysis of PLC system performance in the presence of realistic powerline channel conditions. The development of a powerline communication system requires detailed knowledge of the electric power grid channel properties, such as the frequency transfer function and the interference processes, in order to choose a suitable transmission method. The noise interference and channel multipath effects are the main impairments to the performance of PLC systems. This thesis presents appropriate channel models for use in the design of PLC systems. In particular, the Bit Error Rate (BER) performance of a single-carrier Binary Phase Shift Keying (BPSK) system operating over a multipath channel is analyzed and compared with the performance obtained with a multi-carrier data transmission scheme.

Power Line Communication Systems for Smart Grids Springer Nature

The only authorized book explaining the HomePlug networkingstandards HomePlug is a growing technology for creating high-speed PowerLine Communication (PLC) networks by transmitting data over in-homeor in-office power lines. Users only need to plug adapters intowall outlets to create an instant network of computers, printers,routers, home entertainment devices, and appliance controlsystems. HomePlug AV and IEEE 1901: A Handbook for PLC Designers andUsers provides for the first time an opportunity for non-members ofthe HomePlug Alliance to gain in-depth insight into the design andoperation of the HomePlug standards. Offering a clear and simpledescription of the standards, this groundbreaking resource presentsHomePlug AV and the associated IEEE 1901 standards in terms morereadily understood by a much wider audience, including nontechnicalmanagers, engineers, students, and HomePlug designers. The book details the many benefits of HomePlug AV,including: An affordable, secure alternative or complement

toWiFi—especially in buildings where WiFi reception is poor orrunning new network wires is impractical Higher potential data transmission rates up to 200 Mbps Support for multimedia applications such as HDTV and VoIP The book also provides an overview of the HomePlug Green PHYstandard that is targeted for use in smart energy applications, andthe HomePlug AV 2.0 standard that operates at up to 1.5 Gbps. An essential tool for designers of HomePlug devices, networkadministrators, and individual users of HomePlug networks who needto understand the features and capabilities of HomePlug, HomePlugAV and IEEE 1901: A Handbook for PLC Designers and Users will alsoprove useful for researchers in academia and the power linecommunications industry.

Fieldbus Systems and Their Applications 2005 Springer

SMART GRID TELECOMMUNICATIONS Discover the foundations and main applications of telecommunications to smart grids In Smart Grid Telecommunications, renowned researchers and authors Drs. Alberto Sendin, Javier Matanza, and Ramon Ferrús deliver a focused treatment of the fundamentals and main applications of telecommunication technologies in smart grids. Aimed at engineers and professionals who work with power systems, the book explains what smart grids are and where telecommunications are needed to solve their various challenges. Power engineers will benefit from explanations of the main concepts of telecommunications and how they are applied to the different domains of a smart grid. Telecommunication engineers will gain an understanding of smart grid applications and services and will learn from the explanations of how telecommunications need to be adapted to work with them. The authors offer a simplified vision of smart grids with rigorous coverage of the latest advances in the field, while avoiding some of the technical complexities that can hinder understanding in this area. The book offers: Discussions of why telecommunications are necessary in smart grids and the various telecommunication services and systems relevant for them An exploration of foundational telecommunication concepts ranging from system-level aspects, such as network topologies, multi-layer architectures and protocol stacks, to communications channel transmission- and reception-level aspects Examinations of telecommunication-related smart grid services and systems, including SCADA, protection and teleprotection, smart metering, substation and distribution automation, synchrophasors, distributed energy resources, electric vehicles, and microgrids A treatment of wireline and wireless telecommunication technologies, like DWDM, Ethernet, IP, MPLS, PONs, PLC, BPL, 3GPP cellular 4G and 5G technologies, Zigbee, Wi-SUN, LoRaWAN, and Sigfox, addressing their architectures, characteristics, and limitations Ideal for engineers working in power systems or telecommunications as network architects, operations managers, planners, or in regulation-related activities, Smart Grid Telecommunications is also an invaluable resource for telecommunication network and smart grid architects.

Power Line Communications in Practice Risk Management 1 Click Tong

One of the first publications of its kind in the exciting field of multiple input multiple output (MIMO) power line

communications (PLC), MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing contains contributions from experts in industry and academia, making it practical enough to provide a solid understanding of how PLC technologies work, yet scientific enough to form a base for ongoing R&D activities. This book is subdivided into five thematic parts. Part I looks at narrow- and broadband channel characterization based on measurements from around the globe. Taking into account current regulations and electromagnetic compatibility (EMC), part II describes MIMO signal processing strategies and related capacity and throughput estimates. Current narrow- and broadband PLC standards and specifications are described in the various chapters of part III. Advanced PLC processing options are treated in part IV, drawing from a wide variety of research areas such as beamforming/precoding, time reversal, multi-user processing, and relaying. Lastly, part V contains case studies and field trials, where the advanced technologies of tomorrow are put into practice today. Suitable as a reference or a handbook, MIMO Power Line Communications: Narrow and Broadband Standards, EMC, and Advanced Processing features self-contained chapters with extensive cross-referencing to allow for a flexible reading path.

Human Centred Intelligent Systems

Cambridge University Press

Compared with conventional communications, cooperative communication allows multiple users in a wireless network to coordinate their packet transmissions and share each other's resources, thus achieving high-performance gain and better service coverage and reliability. Energy Efficient Cooperative Wireless Communication and Networks provides a comprehensive look at energy efficiency and system design of cooperative wireless communication. Introducing effective cooperative wireless communication schemes, the book supplies the understanding and methods required to improve energy efficiency, reliability, and end-to-end protocol designs for wireless communication systems. It explains the practical benefits and limitations of cooperative transmissions along with the associated designs of upper-layer protocols, including MAC, routing, and transport protocol. The book considers power efficiency as a main objective in cooperative communication to ensure quality-of-service (QoS) requirements. It explains how to bring the performance gain at the physical layer up to the network layer and how to allocate network resources dynamically through MAC/scheduling and routing to trade off the performance benefits of given transmissions against network costs. Because the techniques detailed in each chapter can help readers achieve energy efficiency and reliability in wireless networks, they have the potential to impact a range of industry areas, including wireless communication, wireless sensor networks, and ad hoc networks. The book includes numerous examples, best practices, and models that capture key issues in real-world applications. Along with algorithms and tips for effective design, the book supplies the understanding you will need to achieve high-performing and energy efficient wireless networks with improved service coverage and reliability.

Power Line Communication Power Line

Communications
Power Line CommunicationsJohn Wiley & Sons
ICT Analysis and Applications John Wiley & Sons
This book proposes new technologies and discusses future solutions for ICT design infrastructures, as reflected in high-quality papers presented at the 6th International Conference on ICT for Sustainable Development (ICT4SD 2021), held in Goa, India, on 5–6 August 2021. The book covers the topics such as big data and data mining, data fusion, IoT programming toolkits and frameworks, green communication systems and network, use of ICT in smart cities, sensor networks and embedded system, network and information security, wireless and optical networks, security, trust, and privacy, routing and control protocols, cognitive radio and networks, and natural language processing. Bringing together experts from different countries, the book explores a range of central issues from an international perspective.
Smart Industry & Smart Education WIT Press
This book gives a comprehensive guide on the fundamental concepts, applications, algorithms, protocols, new trends and challenges, and research results in the area of Green Information and Communications Systems. It is an invaluable resource giving knowledge on the core and specialized issues in the field, making it highly suitable for both the new and experienced researcher in this area. Key Features: Core research topics of green information and communication systems are covered from a network design perspective, giving both theoretical and practical perspectives Provides a unified covering of otherwise disperse selected topics on green computing, information, communication and networking Includes a set of downloadable PowerPoint slides and glossary of terms for each chapter A ‘whose-who’ of international contributors Extensive bibliography for enhancing further knowledge Coverage includes: Smart grid technologies and communications Spectrum management Cognitive and autonomous radio systems Computing and communication architectures Data centres Distributed networking Cloud computing Next generation wireless communication systems 4G access networking Optical core networks Cooperation transmission Security and privacy Core research topics of green information and communication systems are covered from a network design perspective, giving both a theoretical and practical perspective A ‘whose-who’ of international contributors Extensive bibliography for enhancing further knowledge
From Smart Grid to Internet of Energy Springer
This book highlights new trends and challenges in intelligent systems, which play an important part in the digital transformation of many areas of science and practice. It includes papers offering a deeper understanding of the human-centred perspective on artificial intelligence, of intelligent value co-creation, ethics, value-oriented digital models, transparency, and intelligent digital architectures and engineering to support digital services and intelligent systems, the transformation of structures in digital businesses and intelligent systems based on human practices, as well as the study of interaction and the co-adaptation of humans and systems. All papers were originally presented at the International

KES Conference on Human Centred Intelligent Systems 2020 (KES HCIS 2020), held on June 17–19, 2020, in Split, Croatia.

Powerline Communications Academic Press

Power line-based communications networks: research, standards, applications, economics, and more. The state-of-the-art in power line communications: high-speed Internet access and beyond Maximizing data rates and minimizing electromagnetic compatibility problems Up-to-the-minute coverage of economic and regulatory issues For system evaluators, planners, designers, and technical implementers Power line communications (PLC) represents an exceptionally promising alternative for high-speed Internet access and data networking. Until now, however, little credible information has been available concerning R&D in the field. In Power Line Communications, leading researcher Klaus Dostert reviews significant technical progress toward high-speed information access over power lines at data rates of multiple Mbps. He explains how PLC can be integrated into existing telecommunications networks and reviews the economic and regulatory issues associated with deployment - including new opportunities in an era of utility deregulation. Coverage includes: PLC in context: historical roots, limitations, and potential Existing power networks and their characteristics PLC networking based on Europe's CENELEC EN 50065 standard Applications beyond Internet access: from home/building automation to digital audio and video from the wall-socket Technical options for maximizing data rates Solving electromagnetic compatibility problems Promising transmission and access methods The state-of-the-art in device and system development A realistic assessment of the future of power line communications An extensive bibliography, structured by issue Whatever your role in evaluating, designing, or implementing PLC networks, Power Line Communications offers the first single source for authoritative information on the state of the art.

Powerline Communications Systems Artech House

The REV conference aims to discuss the fundamentals, applications and experiences in remote engineering, virtual instrumentation and related new technologies, as well as new concepts for education on these topics, including emerging technologies in learning, MOOCs & MOOLs, Open Resources, and STEM pre-university education. In the last 10 years, remote solutions based on Internet technology have been increasingly deployed in numerous areas of research, science, industry, medicine and education. With the new focus on cyber-physical systems, Industry 4.0, Internet of Things and the digital transformation in industry, economy and education, the core topics of the REV conference have become indispensable elements of a future digitized society. REV 2018, which was held at the University of Applied Sciences in Duesseldorf from 21–23 March 2018, addressed these topics as well as state-of-the-art and future trends.

China Standard: GB/T 31983.31-2017 Narrow band power line communication over low-voltage mains—Part 31:Narrow band orthogonal frequency division multiplexing power line—Communication physical layer specification Institution of Engineering and Technology

This one-stop reference provides the

state-of-the-art theory, key strategies, protocols, deployment aspects, standardization activities and experimental studies of communication and networking technologies for the smart grid. Expert authors provide all the essential information researchers need to progress in the field and to allow power systems engineers to optimize their communication systems.
Springer
Smart grid and microgrid technology are growing exponentially as they are adopted throughout the world. These new technologies have revolutionized the way electricity is produced, delivered, and consumed, and offer a plethora of benefits as well as the potential for further growth. It is critical to examine the current stage of smart grid and microgrid development as well as the direction they are headed as they continue to expand in order to ensure that cost-effective, reliable, and efficient systems are put in place. The Research Anthology on Smart Grid and Microgrid Development is an all-encompassing reference source of the latest innovations and trends within smart grid and microgrid development. Detailing benefits, challenges, and opportunities, it is a crucial resource to fully understand the current opportunities that smart grids and microgrids present around the world. Covering a wide range of topics such as traditional grids, future smart grids, electrical distribution systems, and microgrid integration, it is ideal for engineers, policymakers, systems developers, technologists, researchers, government officials, academicians, environmental groups, regulators, utilities specialists, industry professionals, and students.
Automotive Ethernet Apress
Microgrids: Advanced Control Methods and Renewable Energy System Integration demonstrates the state-of-art of methods and applications of microgrid control, with eleven concise and comprehensive chapters. The first three chapters provide an overview of the control methods of microgrid systems that is followed by a review of distributed control and management strategies for the next generation microgrids. Next, the book identifies future research directions and discusses the hierarchical power sharing control in DC Microgrids. Chapter 4 investigates the demand side management in microgrid control systems from various perspectives, followed by an outline of the operation and controls of the smart microgrids in Chapter 5. Chapter 6 deals with control of low-voltage microgrids with master/slave architecture. The final chapters explain the load-Frequency Controllers for Distributed Power System Generation Units and the issue of robust control design for VSIs, followed by a communication solution denoted as power talk. Finally, in Chapter 11, real-time implementation of distributed control for an autonomous microgrid system is performed. Addresses issues of contemporary interest to practitioners in the power engineering and management fields Focuses on the role of microgrids within the overall power system structure and attempts to clarify the main findings relating to primary and secondary control and management at the microgrid level Provides results from a quantified assessment of benefits from economic, environmental, operational, and social point-of-views Presents the hierarchical control levels manifested in microgrid operations and evaluates the principles and main functions of centralized and decentralized control
Academic Press Library in Mobile

and Wireless Communications CRC Press
This book, edited and authored by world leading experts, gives a review of the principles, methods and techniques of important and emerging research topics and technologies in wireless communications and transmission techniques. The reader will: Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Reviews important and emerging topics of research in wireless technology in a quick tutorial format Presents core principles in wireless transmission theory Provides reference content on core principles, technologies, algorithms, and applications Includes comprehensive references to journal articles and other literature on which to build further, more specific and detailed knowledge