Ieee 802154 And Zigbee As Enabling Technologies For Low Power Wireless Systems With Quality Of Service Constraints Springerbriefs In Electrical And Computer Engineering

This new edition of the bestselling Measurement, Instrumentation, and Sensors Handbook brings together all aspects of the design and implementation of measurement, instrumentation, and sensors. Reflecting the current state of the art, it describes the use of instruments and techniques for performing practical measurements in engineering, physics, chemistry, and the life sciences; explains sensors and the associated hardware and software; and discusses processing systems, automatic data acquisition, reduction and analysis, operation characteristics, accuracy, errors, calibrations, and the incorporation of standards for control purposes. Organized according to measurement problem, the Second Edition: Consists of 2 volumes Features contributions from 240+ field experts Contains 53 new chapters, plus updates to all 194 existing chapters Addresses different ways of making measurements for given variables Emphasizes modern intelligent instruments and techniques, human factors, modern display methods, instrument networks, and virtual instruments Explains modern wireless techniques, sensors, measurements, and applications A concise and useful reference for engineers, scientists, academic faculty, students, designers, managers, and industry professionals involved in instrumentation and measurement research and

development, Measurement, Instrumentation, and Sensors Handbook, Second Edition provides readers with a greater understanding of advanced applications.

For engineers, product designers, and technical marketers who need to design a cost-effective, easy-to-use, short-range wireless product that works, this practical guide is a must-have. It explains and compares the major wireless standards - Bluetooth, Wi-Fi, 802.11abgn, ZigBee, and 802.15.4 - enabling you to choose the best standard for your product. Packed with practical insights based on the author's 10 years of design experience, and highlighting pitfalls and trade-offs in performance and cost, this book will ensure you get the most out of your chosen standard by teaching you how to tailor it for your specific implementation. With information on intellectual property rights and licensing, production test, and regulatory approvals, as well as analysis of the market for wireless products, this resource truly provides everything you need to design and implement a successful short-range wireless product.

Comprehensive Materials Processing provides students and professionals with a one-stop resource consolidating and enhancing the literature of the materials processing and manufacturing universe. It provides authoritative analysis of all processes, technologies, and techniques for converting industrial materials from a raw state into finished parts or products. Assisting scientists and engineers in the selection, design, and use of materials, whether in the lab or in industry, it matches the adaptive complexity of emergent materials and processing technologies. Extensive traditional article-level academic discussion of core theories and applications is supplemented by applied case studies and advanced multimedia features. Coverage encompasses the general categories of solidification, powder, deposition, and deformation processing, and includes discussion on plant and

tool design, analysis and characterization of processing techniques, high-temperatures studies, and the influence of process scale on component characteristics and behavior. Authored and reviewed by world-class academic and industrial specialists in each subject field Practical tools such as integrated case studies, user-defined process schemata, and multimedia modeling and functionality Maximizes research efficiency by collating the most important and established information in one place with integrated applets linking to relevant outside sources

This volume presents the new objectives of physics on self-organizing systems composed of multi-components, in order to create a new field and establish universal comprehension in physics. The book covers broad topics such as the thermodynamic time asymmetry in both transient and stationary nonequilibrium states, the seriousness of auxiliary conditions in physicochemical processes and biological systems, the quantum-classical and micro-macro interfaces which are familiar in mesoscopic physics, the purification scheme of quantum entanglement, topics on gamma-ray bursts, and the walking mechanism of single molecular motors.

In smart home automation, several common smart home automation protocols that allow different devices to speak and communicate together have appeared during the last few decades. Some of the smart home protocols come under the umbrella of what is called the "Internet of Things (IoT)". The proposed protocols can be grouped into wired networks e.g. X10, UPB; wireless or radio networks as ZigBee, Z-Wave, Bluetooth; or dual (wired and radio) such as Insteon. This book introduces the reader to some of the most popular microcontroller and smart home networks.

ZigBee is a short-range wireless networking standard backed by such industry leaders as Motorola, Texas Instruments,

Philips, Samsung, Siemens, Freescale, etc. It supports mesh networking, each node can transmit and receive data, offers high security and robustness, and is being rapidly adopted in industrial, control/monitoring, and medical applications. This book will explain the ZigBee protocol, discuss the design of ZigBee hardware, and describe how to design and implement ZigBee networks. The book has a dedicated website for the latest technical updates, ZigBee networking calculators, and additional materials. Dr. Farahani is a ZigBee system engineer for Freescale semiconductors Inc. The book comes with a dedicated website that contains additional resources and calculators: http://www.learnZigBee.com Provides a comprehensive overview of ZigBee technology and networking, from RF/physical layer considerations to application layer development Discusses ZigBee security features such as encryption Describes how ZigBee can be used in location detection applications Explores techniques for ZigBee co-existence with other wireless technologies such as 802.11 and Bluetooth The book comes with a dedicated website that contains additional resources and calculators: http://www.learnZigBee.com

This volume contains the proceedings of UIC 2008, the 5th International C- ference on Ubiquitous Intelligence and Computing: Building Smart Worlds in Real and Cyber Spaces. The conference was held in Oslo, Norway, during June 23–25, 2008. The event was the ?fth meeting of this conference series. USW 2005 (First International Workshop on Ubiquitous Smart World), held in March 2005 in Taiwan, was the ?rst event in the series. This event was followed by UISW 2005 (SecondInternationalSymposiumonUbiquitousIntelligenceandSmartWorlds)

held in December 2005 in Japan, by UIC 2006 (Third International Conference on Ubiquitous Intelligence and Computing: Building Smart Worlds in Real and Cyber Spaces) held in September 2006 in Wuhan and Three Gorges, China, and by UIC 2007 held in July 2007 in Hong Kong. Ubiquitous computers, networks and information are paving the road to a smart world in which computational intelligence is distributed throughout the physical environment to provide trustworthy and relevant services to people.

For many, smart grids are the biggest technological revolutionsince the Internet. They have the potential to reduce carbondioxide emissions, increase the reliability of electricity supply,and increase the efficiency of our energy infrastructure. Smart Grid Applications, Communications, and Securityexplains how diverse technologies play hand-in-hand in building andmaintaining smart grids around the globe. The book delves into thecommunication aspects of smart grids, provides incredible insightinto power electronics, sensing, monitoring, and controltechnologies, and points out the potential for new technologies andmarkets. Extensively cross-referenced, the book contains comprehensivecoverage in four major parts: Part I: Applications provides a detailedintroduction to smart grid applications—spanning thetransmission, distribution, and consumer side of the electricitygrid Part II: Communications discusses wireless,wireline,

and optical communication solutions—from thephysical layers up to sensing, automation, and control protocolsrunning on the application layers Part III: Security deals with cybersecurity—sharpening the awareness of security threats,reviewing the ongoing standardization, and outlining the future ofauthentication and encryption key management Part IV: Case Studies and Field Trials presentsself-contained chapters of studies where the smart grid of tomorrowhas already been put into practice With contributions from majorindustry stakeholders such as Siemens, Cisco, ABB, and Motorola,this is the ideal book for both engineering professionals andstudents.

This practically-oriented, all-inclusive guide covers all the major enabling techniques for current and next-generation cellular communications and wireless networking systems. Technologies covered include CDMA, OFDM, UWB, turbo and LDPC coding, smart antennas, wireless ad hoc and sensor networks, MIMO, and cognitive radios, providing readers with everything they need to master wireless systems design in a single volume. Uniquely, a detailed introduction to the properties, design, and selection of RF subsystems and antennas is provided, giving readers a clear overview of the whole wireless system. It is also the first textbook to include a complete introduction to speech coders and video coders used in wireless systems. Richly

illustrated with over 400 figures, and with a unique emphasis on practical and state-of-the-art techniques in system design, rather than on the mathematical foundations, this book is ideal for graduate students and researchers in wireless communications, as well as for wireless and telecom engineers.

Telemedicine is a rapidly evolving field as new technologies are implemented for example for the development of wireless sensors, quality data transmission. Using the Internet applications such as counseling, clinical consultation support and home care monitoring and management are more and more realized, which improves access to high level medical care in underserved areas. The 23 chapters of this book present manifold examples of telemedicine treating both theoretical and practical foundations and application scenarios.

The new edition of this popular book has been transformed into a hands-on textbook, focusing on the principles of wireless sensor networks (WSNs), their applications, their protocols and standards, and their analysis and test tools; a meticulous care has been accorded to the definitions and terminology. To make WSNs felt and seen, the adopted technologies as well as their manufacturers are presented in detail. In introductory computer networking books, chapters sequencing follows the bottom up or top down architecture of the seven layers protocol. This

book starts some steps later, with chapters ordered based on a topic's significance to the elaboration of wireless sensor networks (WSNs) concepts and issues. With such a depth, this book is intended for a wide audience, it is meant to be a helper and motivator, for both the senior undergraduates, postgraduates, researchers, and practitioners; concepts and WSNs related applications are laid out, research and practical issues are backed by appropriate literature, and new trends are put under focus. For senior undergraduate students, it familiarizes readers with conceptual foundations, applications, and practical project implementations. For graduate students and researchers, transport layer protocols and cross-layering protocols are presented and testbeds and simulators provide a must follow emphasis on the analysis methods and tools for WSNs. For practitioners, besides applications and deployment, the manufacturers and components of WSNs at several platforms and testbeds are fully explored.

An all-in-one reference to the major Home Area Networking, Building Automation and AMI protocols, including 802.15.4 over radio or PLC, 6LowPAN/RPL, ZigBee 1.0 and Smart Energy 2.0, Zwave, LON, BACNet, KNX, ModBus, mBus, C.12 and DLMS/COSEM, and the new ETSI M2M system level standard. In-depth coverage of Smart-grid and EV charging use cases. This book describes the

Home Area Networking, Building Automation and AMI protocols and their evolution towards open protocols based on IP such as 6LowPAN and ETSI M2M. The authors discuss the approach taken by service providers to interconnect the protocols and solve the challenge of massive scalability of machine-to-machine communication for mission-critical applications, based on the next generation machine-to-machine ETSI M2M architecture. The authors demonstrate, using the example of the smartgrid use case, how the next generation utilities, by interconnecting and activating our physical environment, will be able to deliver more energy (notably for electric vehicles) with less impact on our natural resources. Key Features: Offers a comprehensive overview of major existing M2M and AMI protocols Covers the system aspects of large scale M2M and smart grid applications Focuses on system level architecture, interworking, and nationwide use cases Explores recent emerging technologies: 6LowPAN, ZigBee SE 2.0 and ETSI M2M, and for existing technologies covers recent developments related to interworking Relates ZigBee to the issue of smartgrid, in the more general context of carrier grade M2M applications Illustrates the benefits of the smartgrid concept based on real examples, including business cases This book will be a valuable guide for project managers working on smartgrid, M2M, telecommunications and utility

projects, system engineers and developers, networking companies, and home automation companies. It will also be of use to senior academic researchers, students, and policy makers and regulators.

The concept of medical treatment from a distance (in absentia care) is actually quite ancient, dating back to tribal days where smoke signals were used to warn of serious disease in a community. Nowadays, telemedicine is used to facilitate treatment in rural areas, where the nearest doctor is miles away, through various forms of information technology, including videoconferencing and digital imaging. It can also be used to conveniently monitor chronically ill patients through electronic devices so that they can enjoy a better quality of life. But despite the strides that have been made in utilizing the telemedicine technology, there remain a number of limitations and weaknesses that must be overcome before this treatment paradigm can reach its full potential. In Mobile Telemedicine: A Computing and Network Perspective, noted computer scientists Yang Xiao and Hui Chen examine those computing and networking dilemmas arising from wireless and mobile telemedicine. Comprised of the contributions of many prominent international researchers, the book discusses the relative merits and limitations of the existing technology and sheds light on future developments. It begins with a discussion of patient care and monitoring through items such as personal alarm systems. It then reviews the current methods available to monitor cardiac and diabetic patients, analyzes the security and privacy considerations that arise with respect to the transmission of sensitive information, and examines issues relating to networking support. Finally, it concludes with a section on the opportunities and challenges faced by those involved at this intersection of healthcare and

communications. By bridging the fields of medicine and information technology, this volume serves as a useful springboard for those pioneering IT researchers looking for a comprehensive reference. The book also provides information for those involved with either communications or healthcare who want to learn about the current state and potential use of this technology.

Since its recent introduction, the ZigBee protocol has created an enormous amount of buzz in venues from magazine covers to trade show floors to water coolers. Its promise of providing a simpler, cheaper, more power-efficient WPAN (Wireless Personal Area Network) alternative to WiFi and Bluetooth has opened up new data collection possibilities in application areas from industrial controls to medical devices to intruder alarms. Yet, despite this widespread interest, there is still little information available that goes beyond detailing the spec itself. Missing from the current ZigBee lexicon is practical, application-oriented guidance from an expert, specifically geared to aid engineers in implementing this new technology. Enter respected designer and popular columnist Fred Eady! With his new book, Hands-On ZigBee, he provides the only comprehensive how-to ZigBee guide available. The ONLY one-stop Zigbee resource available- from basics to sniffers to specs 7 easy-to-assemble ZigBee projects allow the reader to follow along...hands-on! Working hardware and software examples included in every chapter This book systematically summarizes the fundamentals of WiFi and ZigBee from different levels and provides the detailed theoretical and experimental results for signal interference between these two wireless data transmission technologies. The existing mechanisms and methods of interference mitigation, avoidance and co-existence are carefully explored. Both collaboration and cross-technology communication between WiFi and ZigBee are also introduced

as key research trends. Due to the popularity of WiFi and ZigBee, which share the same ISM frequency band, interference is a common problem and addressed in a wide range of literature. This book condenses the newest research results into an approachable format. This is an essential resource for professionals and students in wireless networks as well as network engineers, designers, or planners seeking a backbone of knowledge in WiFi and ZigBee networks.

This book outlines the most important characteristics of IEEE 802.15.4 and ZigBee and how they can be used to engineer Wireless Sensor Network (WSN) systems and applications, with a particular focus on Quality-of-Service (QoS) aspects. It starts by providing a snapshot of the most relevant features of these two protocols, identifying some gaps in the standard specifications. Then it describes several state-of-the-art open-source implementations, models and tools that have been designed by the authors and have been widely used by the international community. The book also outlines the fundamental performance limits of IEEE 802.15.4/ZigBee networks, based on well-sustained analytical, simulation and experimental models, including how to dimension such networks to optimize delay/energy trade-offs.

This book constitutes the refereed proceedings of the 11th International Conference on Principles of Distributed Systems, OPODIS 2007, held in Guadeloupe, French West Indies, in December 2007. The 32 revised full papers presented were carefully reviewed and selected from 106 submissions. The papers address all current issues in theory, specification, design and implementation of distributed and embedded systems. A broad range of topics are addressed.

This book discusses the security issues in a wide range of wireless devices and systems, such as RFID, Bluetooth, ZigBee, GSM, LTE, and GPS. It collects the findings of recent research by the UnicornTeam at 360 Technology, and

reviews the state-of-the-art literature on wireless security. The book also offers detailed case studies and theoretical treatments – specifically it lists numerous laboratory procedures, results, plots, commands and screenshots from real-world experiments. It is a valuable reference guide for practitioners and researchers who want to learn more about the advanced research findings and use the off-the-shelf tools to explore the wireless world.

"This book examines critical issues involved with telematics such as vehicular network infrastructure, vehicular network communication protocols, and vehicular services and applications"--Provided by publisher.

Receive comprehensive instruction on the fundamentals of wireless security from three leading international voices in the field Security in Wireless Communication Networks delivers a thorough grounding in wireless communication security. The distinguished authors pay particular attention to wireless specific issues, like authentication protocols for various wireless communication networks, encryption algorithms and integrity schemes on radio channels, lessons learned from designing secure wireless systems and standardization for security in wireless systems. The book addresses how engineers, administrators, and others involved in the design and maintenance of wireless networks can achieve security while retaining the broadcast nature of the system, with all of its inherent harshness and interference. Readers will learn: A comprehensive

introduction to the background of wireless communication network security, including a broad overview of wireless communication networks, security services, the mathematics crucial to the subject, and cryptographic techniques An exploration of wireless local area network security, including Bluetooth security, Wi-Fi security, and body area network security An examination of wide area wireless network security, including treatments of 2G, 3G, and 4G Discussions of future development in wireless security, including 5G, and vehicular ad-hoc network security Perfect for undergraduate and graduate students in programs related to wireless communication, Security in Wireless Communication Networks will also earn a place in the libraries of professors, researchers, scientists, engineers, industry managers, consultants, and members of government security agencies who seek to improve their understanding of wireless security protocols and practices.

Considered a standard industry resource, the Embedded Systems Handbook provided researchers and technicians with the authoritative information needed to launch a wealth of diverse applications, including those in automotive electronics, industrial automated systems, and building automation and control. Now a new resource is required to report on current developments and provide a technical reference for those looking to move the field forward

yet again. Divided into two volumes to accommodate this growth, the Embedded Systems Handbook, Second Edition presents a comprehensive view on this area of computer engineering with a currently appropriate emphasis on developments in networking and applications. Those experts directly involved in the creation and evolution of the ideas and technologies presented offer tutorials, research surveys, and technology overviews that explore cutting-edge developments and deployments and identify potential trends. This second self-contained volume of the handbook, Network Embedded Systems, focuses on select application areas. It covers automotive field, industrial automation, building automation, and wireless sensor networks. This volume highlights implementations in fast-evolving areas which have not received proper coverage in other publications. Reflecting the unique functional requirements of different application areas, the contributors discuss inter-node communication aspects in the context of specific applications of networked embedded systems. Those looking for guidance on preliminary design of embedded systems should consult the first volume: Embedded Systems Design and Verification. Provides a detailed analysis of the standards and technologies enabling applications for the wireless Internet of Things The Wireless Internet of Things: A Guide to the Lower Layers presents a practitioner’s

perspective toward the Internet of Things (IoT) focusing on over-the-air interfaces used by applications such as home automation, sensor networks, smart grid, and healthcare. The author—a noted expert in the field—examines IoT as a protocol-stack detailing the physical layer of the wireless links, as both a radio and a modem, and the media access control (MAC) that enables communication in congested bands. Focusing on low-power wireless personal area networks (WPANs) the text outlines the physical and MAC layer standards used by ZigBee, Bluetooth LE, Z-Wave, and Thread. The text deconstructs these standards and provides background including relevant communication theory, modulation schemes, and access methods. The author includes a discussion on Wi-Fi and gateways, and explores their role in IoT. He introduces radio topologies used in software-defined radio implementations for the WPANs. The book also discusses channel modelling and link budget analysis for WPANs in IoT. This important text: Introduces IEEE 802.15.4, ITU-T G.9959, and Bluetooth LE as physical layer technology standards enabling wireless IoT Takes a layered approach in order to cultivate an appreciation for the various standards that enable interoperability Provides clarity on wireless standards with particular focus on actual implementation Written for IoT application and platform developers as well as digital signal

processing, network, and wireless communication engineers; The Wireless Internet of Things: A Guide to the Lower Layersoffers an inclusive overview of the complex field of wireless IoT, exploring its beneficial applications that are proliferating in a variety of industries.

This book is supposed to serve as a comprehensive and instructive guide through the new world of digital communication. On the physical layer optical and electrical cabling technology are described as well as wireless communication technologies. On the data link layer local area networks (LANs) are introduced together with the most popular LAN technologies such as Ethernet, Token Ring, FDDI, and ATM as well as wireless LAN technologies including IEEE 802.x, Bluetooth, or ZigBee. A wide range of WAN technologies are covered including contemporary high speed technologies like PDH and SDH up to high speed wireless WANs (WiMAX) and 4th generation wireless telephone networks LTE. Routing technologies conclude the treatment of the data link layer. Next, there is the Internet layer with the Internet protocol IP that establishes a virtual uniform network out of the net of heterogeneous networks. In detail, both versions, IPv4 as well as the successor IPv6 are covered in detail as well as ICMP, NDP, and Mobile IP. In the subsequent transport layer protocol functions are provided to offer a connection-oriented and reliable transport

service on the basis of the simple and unreliable IP. The basic protocols TCP and UDP are introduced as well as NAT, the network address translation. Beside transport layer security protocols like SSL and TLS are presented. On the upmost application layer popular Internet application protocols are described like DNS, SMTP, PGP, (S)FTP, NFS, SSH, DHCP, SNMP, RTP, RTCP, RTSP, and World Wide Web.
Because of the wide spread of serial communication from home automation to sensor and controller networks, there is a need for a very large number of serial communication standards and protocols. These have been developed over recent decades and range from the simple to the highly complicated. This large number of protocols was necessary to guarantee the optimum performance for the targeted applications. It is important for communication engineers to have enough knowledge to match the right protocol and standard with the right application. The main aim of this book is to provide the reader with that knowledge.
Contains the latest research, case studies, theories, and methodologies within the field of wireless technologies.
Readers learn about the most popular wireless data communications technologies in use today as GUIDE TO WIRELESS COMMUNICATIONS, 4Ed examines Bluetooth, ZigBee, Wi-Fi, cellular and satellite communications while providing a broad

industry perspective. Readers develop a solid base of knowledge in Wireless Personal Area Networks (WPANs), Wireless Local Area Networks (WLANs), Wireless Metropolitan Area Networks (WMANs), and Wireless Wide Area Networks (WWANs) to better understand the most popular wireless communications available today. This book's comprehensive approach to wireless communication technology provides the solid background readers need to prepare for a future career in today's information and communications technology field. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

The First Practical Guide to Advanced Wireless Development with ZigBee Technologies Supported by more than a hundred companies, the new ZigBee standard enables powerful new wireless applications for safety, security, and control, ranging from smart energy to home automation and medical care to advanced remote control. ZigBee Wireless Sensor and Control Network brings together all the knowledge professionals need to start building effective ZigBee solutions. The only simple, concise guide to ZigBee architecture, concepts, networking, and applications, this book thoroughly explains the entire ZigBee protocol stack and covers issues ranging from routing to security. It also presents detailed, practical coverage of ZigBee features for

home automation, smart energy networking, and consumer electronics. Topics include • Fundamental wireless concepts: OSI Model, error detection, the ISM Band, modulation, WLAN, FHSS, DSSS, Wireless MANs, Bluetooth, and more • ZigBee essentials: applications, characteristics, device types, topologies, protocol architecture, and expanded ZigBee PRO features • Physical layer: includes frequency bands, data rate, channels, data/management services, transmitter power, and receiver sensitivity • MAC layer: data/management services, MAC layer information base, access methods, and frames • Network layer: data entities, NIB, device configuration, starting network, addressing, discovery, channel scanning, and more • Application support sublayer and application layer: includes profiles, cluster format, attributes, device discovery, and binding • ZigBee network security: includes encryption, trust center, security modes, and security management primitives • Address assignment and routing techniques • Alternative technologies: 6lowpan, WirelessHART, and Z-wave Learn to design, implement and secure your IoT infrastructure Key Features Build a complete IoT system that is the best fit for your organization Learn about different concepts, technologies, and tradeoffs in the IoT architectural stack Understand the theory, concepts, and implementation of each element that comprises IoT design—from sensors to the cloud

Implement best practices to ensure the reliability, scalability, robust communication systems, security, and data analysis in your IoT infrastructure Book Description The Internet of Things (IoT) is the fastest growing technology market. Industries are embracing IoT technologies to improve operational expenses, product life, and people's well-being. An architectural guide is necessary if you want to traverse the spectrum of technologies needed to build a successful IoT system, whether that's a single device or millions of devices. This book encompasses the entire spectrum of IoT solutions, from sensors to the cloud. We start by examining modern sensor systems and focus on their power and functionality. After that, we dive deep into communication theory, paying close attention to near-range PAN, including the new Bluetooth® 5.0 specification and mesh networks. Then, we explore IP-based communication in LAN and WAN, including 802.11ah, 5G LTE cellular, SigFox, and LoRaWAN. Next, we cover edge routing and gateways and their role in fog computing, as well as the messaging protocols of MQTT and CoAP. With the data now in internet form, you'll get an understanding of cloud and fog architectures, including the OpenFog standards. We wrap up the analytics portion of the book with the application of statistical analysis, complex event processing, and deep learning models. Finally, we conclude by providing a holistic

view of the IoT security stack and the anatomical details of IoT exploits while countering them with software defined perimeters and blockchains. What you will learn Understand the role and scope of architecting a successful IoT deployment, from sensors to the cloud Scan the landscape of IoT technologies that span everything from sensors to the cloud and everything in between See the trade-offs in choices of protocols and communications in IoT deployments Build a repertoire of skills and the vernacular necessary to work in the IoT space Broaden your skills in multiple engineering domains necessary for the IoT architect Who this book is for This book is for architects, system designers, technologists, and technology managers who want to understand the IoT ecosphere, various technologies, and tradeoffs and develop a 50,000-foot view of IoT architecture.

ZigBee is a standard based on the IEEE 802.15.4 standard for wireless personal networks. This standard allows for the creation of very lost cost and low power networks - these applications run for years rather than months. These networks are created from sensors and actuators and can wireless control many electrical products such as remote controls, medical, industrial, and security sensors. Hundreds of companies are creating applications including Mitsubishi, Motorola, Freescale, and Siemens. This book is written for engineers who plan

to develop ZigBee applications and networks, to understand how they work, and to evaluate this technology to see if it is appropriate to a particular project. This book does not simply state facts but explains what ZigBee can do through detailed code examples. *Details how to plan and develop applications and networks *Zigbee sensors have many applications including industrial automation, medical sensing, remote controls, and security *Hot topic for today's electrical engineer because it is low cost and low power