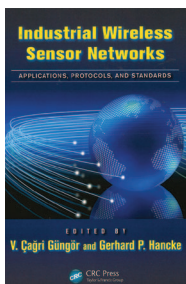by Marian P. Kazmierkowski
and Fernando A. Silva

Industrial Wireless Sensor Networks: Applications, Protocols, and Standards

V. Çağrı Güngör and Gerhard P. Hancke (Editors), CRC Press, Series Industrial Electronics, USA, 2013, hardcover, 406 pages, ISBN: 978-1-4665-0051-8.

Arrays of miniaturized sensors and embedded computing technologies are key parts of today's measuring networks and are essential in modern industrial environments to increase productivity and competitiveness. Sensor networks provide valuable information to detect faults; measure temperature, vibration, pressure, pollutants, motion, and electrical quantities; define or tune parameters or controllers; and warn about critical values or risk of internal and external conditions. Recent developments on wireless devices, on their power harvesting and low consumption capabilities, and on microelectromechanical structure sensors, together with their acceptable reliability levels in most industries has led to a rocket increase of practical wireless sensor networks (WSNs) for demanding industrial applications.

Industrial Wireless Sensor Networks: Applications, Protocols, and Standards is an excellent book edited and coauthored by world-renowned specialists

in the area. Editor V. Çağri Güngör is codirector of the Computer Networks and Mobile Communications Lab at the Department of Computer Engineering at Bahcesehir University in Istanbul, Turkey. Editor Gerhard P. Hancke is from the University of Pretoria, South Africa, and is the founder and head of the Advanced Sensor Networks Group. Both are experts in the field of computer networks, sensor networks, and mobile communications. The editors in cooperation with key researchers (listed with the chapter titles) explore the applications of industrial WSNs (IWSNs), machine condition monitoring, WSNs for intelligent transportation, design challenges of IWSNs, energy harvesting, fault tolerance operation, sensor network architectures, protocols, and specific wireless communication standards for industrial applications. Issues such as synchronization, control networks with real-time constraints, routing, IWSN reliability, robustness and security, cognitive radio, latency, and cross-layer design are also addressed.

The textbook offers an in-depth state of the art in sensor network technologies for industry applications while also dealing with emerging and already deployed industrial WSN applications and technologies. It is divided into 16 chapters:

1) "Applications of Industrial Wireless Sensor Networks" by Milan Erdelj, Nathalie Mitton, and Enrico Natalizio
2) "Machine Condition Monitoring with Industrial Wireless Sensor Networks" by Neil W. Bergmann and Liqun Hou
3) "Wireless Sensor Networks for Intelligent Transportation Applications: A Survey" by Kay-Soon Low and Marc Caesar R. Talampas
4) "Design Challenges and Objectives in Industrial Wireless Sensor Networks" by Johan Åkerberg, Mikael Gidlund, Tomas Lennvall, Krister Landerns, and Mats Björkman
5) "Resource Management and Scheduling in WSNs Powered by Ambient Energy Harvesting" by Neyre Tekbiyik and Elif Uysal-Biyikoglu
6) "Energy Harvesting Techniques for Industrial Wireless Sensor Networks" by Gurkan Tuna, Vehbi Çağri Güngör, and Kayhan Gulez
7) "Fault Tolerant Industrial Wireless Sensor Networks" by Ataul Bari, Jin Jiang, and Arunita Jaekel
8) "Network Architectures for Delay Critical Industrial Wireless Sensor Networks" by Nazif Cihan Tas
9) "Network Synchronization in Industrial Wireless Sensor Networks" by Carlos H. Rentel
10) "Wireless Control Networks with Real-Time Constraints" by Alphan Ulusoy, Ozgur Gurbuz, and Ahmet Onat
11) "Medium Access Control and Routing in Industrial Wireless Sensor Networks" by Aysegul Tuysuz Erman and Ozlem Durmaz Incel
12) "QoS-Aware Routing for Industrial Wireless Sensor Networks" by Berta Carballido Villaverde, Susan Rea, and Dirk Pesch
13) "Reliable and Robust Communications in Industrial Wireless Sensor Networks" by Sasan Khoshroo, Honggang Wang, and Yalin Wang
14) "Network Security in Industrial Wireless Sensor Networks" by Nouha Oualha

15) "Cognitive Radio Sensor Networks in Industrial Applications" by A. Ozan Bicen and Ozgur B. Akan

16) "Industrial WSN Standards," by Tomas Lennvall, Krister Landernäs, Mikael Gidlund, and Johan Åkerberg.

All the chapters are easy to read, and hundreds of references are provided at the end of each chapter. A table of contents, lists of figures and tables, a preface, and an index are also included.

Industrial Wireless Sensor Networks: Applications, Protocols, and Standards is a valuable tool for students, practicing engineers, researchers, entrepreneurs and scientists working in the areas of sensor networks and devices, industrial computer and sensor networks, instrumentation, and electrical and computer engineering.

—*Fernando A. Silva*

Power Electronics for Renewable Energy Systems, Transportation and Industrial Applications
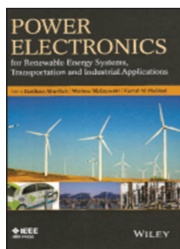
Haitham Abu-Rub, Mariusz Malinowski, and Kamal Al-Haddad (Editors), IEEE Press–Wiley, Chichester, United Kingdom, 2014, hardcover, 795 pages, ISBN: 978-1-118-63403-5.

Power electronics and drives control is an extremely complex and multidisciplinary field in electrical engineering, and it is practically impossible for one individual specialist to write a book covering the entire area, especially since, recently, we have observed fast development in neighboring fields such as control theory, signal processing, and applications in renewable energy systems and electric and plug-in hybrid vehicles, which all strongly influence new solutions in power electronic systems. Therefore, the presented book (see also [1], [2]) is written by the key specialists working in areas that penetrate

the current implementation of power converters and energy systems. Among them the editors have invited several world-renowned professors: Bimal K. Bose (United States), Frede Blaabjerg (Denmark), Carlo Cecati (Italy), Leopoldo G. Franquelo (Spain), Jose Rodriguez (Chile), Ralph Kennel and Joachim Holtz (Germany), Fang Z. Peng (United States), and others. This international collaboration makes a good recommendation for the book.

The material of *Power Electronics for Renewable Energy Systems, Transportation and Industrial Applications* is presented in the following 24 chapters:

1) "Energy, Global Warming and Impact of Power Electronics in the Present Century" by Bimal K. Bose

2) "Challenges of the Current Energy Scenario: The Power Electronics Contribution" by Leopoldo G. Franquelo, Jose I. Leon, and Sergio Vazquez

3) "An Overview on Distributed Generation and Smart Grid Concepts and Technologies" by Concettina Buccella, Carlo Cecati, and Haitham Abu-Rub

4) "Recent advances in power semiconductor technology" by Jacek Rabkowski, Dinosthenis Peftitsis, and Hans-Peter Nee

5) "AC-Link Universal Power Converters: A New Class of Power Converters for Renewable Energy and Transportation" by Mahshid Amirabadi and Hamid Toliyat

6) "High Power Electronics—Key Technology for Wind Turbines" by Frede Blaabjerg and Ke Ma

7) "Photovoltaic Energy Conversion Systems" by Samir Kouro, Bin Wu, Haitham Abu-Rub, and Frede Blaabjerg

8) "Controllability Analysis of Renewable Energy Systems" by Hossein Karimi-Davijani and Olorunfemi Ojo

9) "Universal Operation of Small/Medium Size Renewable Energy Systems" by Marco Liserre, Rosa A. Mastromauro, and Antonella Nagliero

10) "Properties and Control of a Doubly Fed Induction Machine" by Gonzalo Abad and Grzegorz Iwanski

11) "AC-DC-AC Converters for Distributed Power Generation Systems" by Marek Jasinski, Sebastian Stynski, Pawel Mlodzikowski, and Mariusz Malinowski

12) "Power Electronics for More Electric Aircraft" by Kaushik Rajashekara

13) "Electric and Plug-in Hybrid Electric Vehicles" by Arash Shafiei, Giampaolo Carli, and Sheldon S. Wiliamson

14) "Multilevel Converter/Inverter Topologies and Applications" by Baoming Ge, Fang Zheng Peng, and Yongdong Li

15) "Multi-phase Matrix Converter Topologies and Control" by S.K. Moin Ahmed, Haitham Abu-Rub, and Atif Iqbal

16) "Boost Pre-Regulators for Power Factor Correction in Single-Phase Rectifiers" by Hadi Y. Kanaan and Kamal Al-Haddad

17) "Active Power Filter" by Ahmed M. Massoud, Shehab Ahmed, and Ayman S. Abdel-Khalik

18) (A) "Hardware-in-the-Loop Systems with Power Electronics—A Powerful Simulation Tool" by Ralph M. Kennel, Till Boller, and Joachim Holtz and (B) "Real-Time Simulation of Modular Multi-Level Converters MMC" by Luc A Gregorie, Jean Belanger, Christian Dufour, Handy F. Blanchette, and Kamal Al-Haddad

19) "Model Predictive Speed Control of Electrical Machines" by Jose Rodriguez, Marcelo A. Perez, Hector Young, and Haitham Abu-Rub

20) "The Electrical Drive Systems with the Current Source Converter" by Marcin Morawiec and Zbigniew Krzeminski

21) "Common Mode Voltage and Bearing Currents in PWM Inverters—Causes, Effects, and Prevention" by Jaroslaw Guzinski

22) "High-Power Drive Systems for Industrial Applications—Practical Examples" by Lazhar Ben-Brahim and Teruo Yoshino

23) "Modulation and Control of Single-Phase Grid-Side Converters" by Sebastian Stynski and Mariusz Malinowski

24) "Impedance Source Inverters" Yushan Liu, Haitham Abu-Rub, and Baoming Ge.

The work has typical attributes of a state-of-the-art book and discusses