

## Wireless Communication Techniques, the Right Path to Smart Grid Distribution Systems: A Review.

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### Abstract

The quality and reliability of electric power supply are the key indicators for the comfort of a society. Hence, to serve customers with high quality electricity, the Supervisory Control and Data Acquisition (SCADA) system is being used in the distribution system (DS) for power monitoring and control. The SCADA is feed with operation data like current and voltage via Feeder\_Remote Terminal\_Units (FRTUs). The FRTUs are capable of triggering actions to detach the portion of DS experiencing an unusual condition. Nevertheless, the existing grids do not operate at their optimal capacity due to the usage of one way data communication installations. Thus, to optimize the operation of the legacy power distribution grids, the innovation of the state-of-the-art communication techniques play a vital role-leading to the creation of smart grid Systems. This paper reviews the development of wireless communication technologies envisioned as full-duplex information exchange medium in the on-going development of Smart Grid Systems.

### Keywords

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1. **IEEE Standard for Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)** Times Cited: **19**  
By: [Anonymous].  
IEEE Std 802.15.4&TRADE; Published: 2006  
2006
2. **Links to the Future: Communication Requirements and Challenges in the Smart Grid** Times Cited: **1**  
By: Bouhafs, F.; Mackay, M.; Merabti, M.  
IEEE Power & Energy Magazine Published: 2012
3. **Enhanced Super\_frame Structure of the IEEE802.15.4 Standard for Real-time Data Transmission in Star Network** Times Cited: **3**  
By: El Gholami, K.; Hou, K. M.; Elkamoun, N.  
International Journal of Computer Applications Volume: 51 Issue: 15 Published: 2012
4. Title: [not available] Times Cited: **18**  
By: Gungor, V C; Lu, B; Hancke, G P.  
IEEE Transactions on Industrial Electronics Volume: 57 Issue: 10 Published: 2010
5. **Smart Grid Technologies: Communication Technologies and Standards** Times Cited: **1,062**  
By: Gungor, Vehbi C.; Sahin, Dilan; Kocak, Taskin; et al.  
IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS Volume: 7 Issue: 4 Pages: 529-539 Published: NOV 2011
6. **Enhanced Self-Configuration Scheme for a Robust ZigBee-based Home Automation** Times Cited: **4**  
By: Hwang, K.; Choi, B. J.; Kang, S. k-hoon.  
IEEE Transactions on Consumer Electronics Volume: 56 Issue: 2 Published: May 2010
7. **Analyzing the Low Power Wireless Links for Wireless Sensor Networks** Times Cited: **1**  
By: Mamun, M. M. I.; Tarek, H. M.; Debnath, S. K.; et al.  
Journal of Telecommunications Volume: 1 Issue: 1 Published: 2010  
[\[Show additional data\]](#)
8. **Affect of Disruptive Energy Supply to Different Type of Industrial and Business Players: An Overview of Concepts and Review of Studies from India** Times Cited: **1**  
By: Mangat, H. S.; Singh, H.  
International Journal of Industrial Engineering and Management (IJIEM) Volume: 6 Issue: 3 Published: 2015
9. **A survey on wireless mesh networks** Times Cited: **1**  
By: Mehdi, K. P.  
Communications Magazine, Encyclopedia of Information Science and Technology Published: 2015
10. **Design of Intelligent Terminal Unit for Smart Distribution Grid** Times Cited: **1**  
By: Pang, Q.; Gao, H.; Xiang, M.  
CHIN INT C EL DISTR Published: 2010
11. Title: [not available] Times Cited: **3**  
By: Parikh, Palak P.; Kanabar, Mitalkumar G.; Sidhu, S.  
Opportunities and challenges of Wireless Communication Technologies for Smart Grid Applications Published: 2010  
Publisher: IEEE Power and Energy Society
12. **Assessing Communications Technology Options for Smart Grid Applications** Times Cited: **1**

By: Patel, A.

COMM NETWORKS SMART Published: 2011  
AI

13. Title: [not available] Times Cited: 1  
By: Qingnong, L.  
Techniques of Visualization for Distribution Automation System Published: 2008  
Publisher: Nanjing Nari-Relays Electric CO., LTD
  
14. **End-to-End Communication Architecture for Smart Grids** Times Cited: 4  
By: Sauter, Thilo.  
IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS Volume: 58 Issue: 4 Published: APRIL 2011
  
15. **Smart Zigbee/IEEE 802.15. 4 MAC for Wireless Sensor Multi-Hop Mesh Networks** Times Cited: 1  
By: Shabani, H.; Musse, M. M.; Sheraz, K.; et al.  
IEEE 7 INT POW ENG O Published: 2013  
[\[Show additional data\]](#)
  
16. **Smart Grid for a Sustainable Future** Times Cited: 1  
By: Shafiullah, G. M.; Amanullah, M. T. Oo; Ali, A. B. M. S.; et al.  
Smart Grid and Renewable Energy Volume: 4 Published: 2013  
URL: <http://dx.doi.org.ezproxy.um.edu.my/10.4236/sgre.2013.41004>  
<http://www.scirp.org/journal/sgre>  
[\[Show additional data\]](#)
  
17. **Wireless Sensor Networks for Smart Grid Applications: A Case Study on Link Reliability and Node Lifetime Evaluations in Power Distribution Systems** Times Cited: 28  
By: Tuna, G.; Gungor, V.C.; Gulez, K.  
Int. J. Distrib. Sens. Netw Volume: 2013 Pages: 1-11 Published: 2013
  
18. **Wireless Coexistence between IEEE 802.11-and IEEE 802.15.4-Based Networks: A Survey** Times Cited: 46  
By: Yang, Dong; Xu, Youzhi; Gidlund, Mikael  
INTERNATIONAL JOURNAL OF DISTRIBUTED SENSOR NETWORKS Article Number: 912152 Published: 2011
  
19. **Communication Infrastructures for Distributed Control of Power Distribution Networks** Times Cited: 122  
By: Yang, Qiang; Barria, Javier A.; Green, Tim C.  
IEEE TRANSACTIONS ON INDUSTRIAL INFORMATICS Volume: 7 Issue: 2 Pages: 316-327 Published: MAY 2011

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