

# 5G and Fiber Optics Security Technologies for Smart Grid Cyber Defense

Part of Advances in Information Security, Privacy, and Ethics

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## Description:

In the digital age, smart grids stand as the backbone of modern energy systems, facilitating efficient energy distribution and management. However, this sophistication comes at the cost of heightened vulnerability to cyber threats. Standing on the precipice of a hyper-connected future, the inadequacies of current cybersecurity measures loom large, demanding urgent attention from academic scholars and industry experts.

**5G and Fiber Optics Security Technologies for Smart Grid Cyber Defense** addresses the challenges of securing smart grid systems through communication technologies. The book navigates through 5G wireless and fiber optics, offering a nuanced understanding of their application in the context of grid security. The book begins by exploring the inherent vulnerabilities in smart grid architecture and the imperative role of cybersecurity in modern energy systems. Subsequently, it delves into the specifics of 5G network architectures, dissecting the technologies and standards underpinning the new radio (NR) while emphasizing the significance of network slicing and security isolation. Concurrently, the book unveils the intricacies of fiber optic communication in smart grids, elucidating network design, security measures, and integrating fiber optic sensors for grid monitoring and intrusion detection. As a contribution to the discourse on smart grid cyber defense, the book highlights the importance of encryption protocols and data privacy. It expounds on applying blockchain technology for secure and tamper-proof data storage in the context of energy systems. This work lies in its pragmatic approach, offering real-world strategies, case studies, and lessons learned. Catering to the academic community, it provides precise content suitable for courses and is a reliable reference for advanced electrical engineering, telecommunications, and cybersecurity research. Industry professionals in utility companies and technology solution providers will find practical insights, ensuring the effective and secure deployment of smart grid infrastructures. Moreover, government officials and regulators will discover invaluable content aiding in formulating robust policies and standards to safeguard national energy infrastructures against cyber threats.

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## Topics Covered:

5G Wireless Technology	Grid Automation
Communication Technologies	Network Slicing
Cybersecurity	Quantum Communication
Data Privacy	Real-world Applications
Edge Computing	Smart Grid
Encryption Protocols	Supervisory Control and Data Acquisition (SCADA) Systems
Energy Systems; Fiber Optics	

**Subject:** Security and Forensics

**Readership Level:** Advanced-Academic Level (Research Recommended)

**Classification:** Edited Reference

**Research Suitable For:** Advanced Undergraduate Students; Graduate Students; Researchers; Academicians; Professionals; Practitioners

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