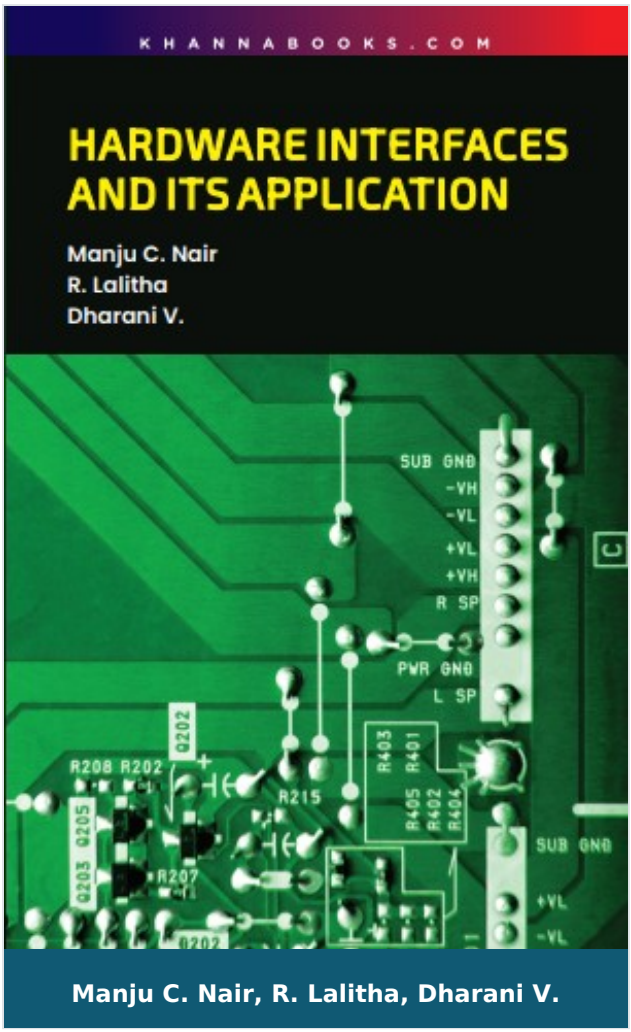


Hardware Interfaces and Its Application

Author :	Manju C. Nair, R. Lalitha, Dharani V.
ISBN 13 :	978-93-55386-43-4
ISBN 10 :	9355386435
E-ISBN 13 :	978-93-55386-43-4
Edition :	First
Pages :	176
Type of book :	Physical
Year :	2026
Language :	English
Publisher :	Khanna Publishing House
M.R.P :	Rs 298.00
Categories :	New Arrivals, Book Store, Sathyabama Series
Condition Type :	New
Country Origin :	India

Khanna Publishing House
4C/4344, Ansari Road, Daryaganj, New Delhi-110002
Email: contact@khannabooks.com | Tel: 011-2324 44 47 - 48 | Mobile: +91-99109 09320

Product Description

Hardware Interfaces and Its Application

The foundation of modern technology—from high-performance computing to advanced networking and Artificial Intelligence—rests on the seamless integration of hardware interfaces. Hardware Interfaces and Its Application serves as a comprehensive and structured guide, providing a crucial understanding of the intricate connections that determine the performance, reliability, and functionality of modern computing systems. This book meticulously covers the evolution of personal computers, delves into essential components like processors, memory, and storage, and explores the crucial interfaces of motherboard designs, power management, and bus architectures.

The core purpose of this resource is to bridge the gap between foundational theoretical concepts and real-world, practical applications. It progresses logically, beginning with the history of computing and culminating in advanced topics such as modern CPU concepts, high-speed storage interfaces (NVMe, Hybrid), and network security protocols. The text ensures readers gain both theoretical expertise and practical insights for system optimization and maintenance.

Tailored for a broad audience, including students, aspiring engineers, IT professionals, and researchers, the content is carefully curated to cater to different levels of expertise. Whether you are a beginner seeking solid grounding or an experienced professional aiming to deepen your knowledge, this book is an invaluable reference for navigating the complexities of modern hardware architecture and staying updated with emerging industry trends.

Salient Features:

- **Foundational Architecture**: Explores the evolution of computing from mechanical devices to modern AI-powered systems and establishes the core principles of the

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Von Neumann architecture.

- Modern CPU Concepts: Detailed coverage of processor modes (Real, Protected, Virtual) and modern multi-core architectures, including CPU overclocking and performance optimization techniques.
- **Advanced Storage Solutions**: Comprehensive comparison of HDD vs. SSD technologies and in-depth discussions on RAID configurations, cloud storage, and high-speed NVMe interfaces for data management.
- **System Interconnectivity**: Focuses on core interfaces, including motherboard form factors, chipset roles, BIOS/UEFI firmware, and bus architectures like PCI Express and Thunderbolt.
- **Practical I/O & Networking**: Dedicated units on I/O peripherals (Serial/Parallel Ports) and network components (Switches, Routers, Cabling), crucial for system integration and performance.
- **Real-World Troubleshooting**: Includes practical case studies and solved problems for troubleshooting power failures, boot issues, and implementing efficient thermal management (air/liquid cooling).
- **Sustainability Focus**: Integrates discussions on environmental sustainability, e-waste management, and the ethical responsibilities associated with technology upgrades and hardware maintenance practices.

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