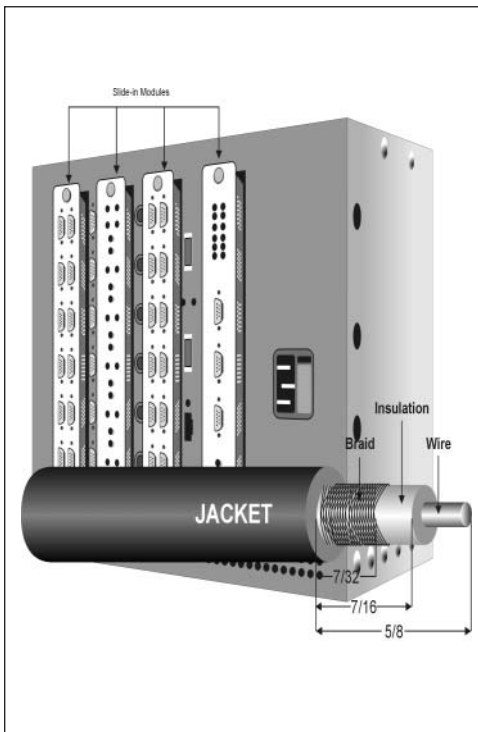# Practical
INDUSTRIAL
NETWORKING
for Engineers & Technicians

YOU WILL LEARN:

- **Practical hands-on approaches to setting up a LAN including a comprehensive overview of current industrial networking technology**

- **The fundamental rules for cabling of industrial networking**

- **How to install and configure a network under expert guidance during practical sessions**

- **The most effective approaches to troubleshooting from the experts**

- **The important steps in designing, installing and managing an industrial network system**

- **How to improve the performance of your system, save your company money and relieve the frustrations of your co-workers and management**

WHO SHOULD ATTEND:

- **Instrumentation and Control System Engineers**
- **Electrical Engineers**
- **Project Engineers**
- **Design Engineers**
- **Electrical & Instrumentation Technicians**
- **Process Control Engineers**
- **Maintenance Engineers & Supervisors**
- **Systems Engineers**

IDC TECHNOLOGIES

Technology Training that Works

THE WORKSHOP

Practical Industrial Networking is a comprehensive two-day practical workshop covering the main concepts and design components for industrial Local Area Network systems (LAN).

This workshop equips you with the tools to analyse, specify and debug LAN (especially Ethernet) systems in the automation, instrumentation and control environments.

This workshop is designed to benefit engineers, scientists and technicians who are involved in specifying, commissioning and debugging LANs and related systems in the instrumentation and control environment but who have little experience of LANs. The workshop also gives a significant review of LANs in office type systems.

WORKSHOP OBJECTIVES

The challenge for engineers, technicians and scientists today is to use proven networking technology such as Ethernet to transfer information efficiently within a control and instrumentation system or the office environment. This LAN system must be correctly specified, designed and implemented to ensure the optimum throughput of data and yet remain cost effective.

After attending this practical workshop, you will be able to:

- describe how to put a Local Area Network together
- install and configure a simple Ethernet Network
- install the cabling and hardware for a typical Ethernet Network
- perform simple troubleshooting tasks on a Network
- use a Protocol Analyser to analyse Network activity
- assess the performance characteristics of a typical Network
- configure and show how TCP/IP is used in a typical Network
- list the main features of High speed (and Gigabit) Ethernet

PRACTICAL SESSIONS

This workshop contains **eight practical sessions:**

- Connecting up hubs and cables for network
- Selecting a protocol and binding it to a Network Interface Card
- Setting up and configuring a simple network
- Setting up a peer to peer connection in Windows
- Static and Dynamic TCP/IP addressing
- Performing typical network operations on the network
- Applying a simple Protocol Analyser to review typical Frames and Packets
- Performing simple troubleshooting of the network

THE PROGRAM

DAY ONE

INTRODUCTION
- Background
- Network Communications
- LANs, MAN's, WANs
- The Open Systems Interconnection model (OSI)
- Interoperability
- Network topologies
- Transmission media and access techniques

MAIN LAN STANDARDS
- Main LAN types
- Ethernet
- Token ring
- Token bus
- Fiber Distributed Data Interface (FDDI)

FUNDAMENTALS OF ETHERNET
- Introduction
- Ethernet standards
- Ethernet hardware requirements
- Logical Link Control (LLC) frames
- Ethernet Media Access Control (MAC)
- Ethernet performance predictions
- Ethernet collisions

FAST ETHERNET & GIGABIT LANS
- Fast Ethernet (100Mb/s)
- Gigabit Ethernet (1000 Mb/s)

NETWORK OPERATING SYSTEMS
- Introduction
- TCP/IP - Transmission Control Protocol / Internet Protocol
- NetBIOS
- Netware IPX / SPX
- NetBEUI
- Windows NT/95/98

DAY TWO

INTERNET PROTOCOL SUITE
- Background
- Protocol layering
- Internet address
- Internet addresses and physical addressing
- Reverse address resolution problem
- The TCP/IP Protocol structure
- Routing in an Internet
- Error and Control Messages (ICMP)
- User Datagram Protocol (UDP)
- Transmission Control Protocol (TCP)
- TCP/IP application protocols
- Client server model
- Bootstrap Protocol (BOOTP)

LAN INTERCONNECTION COMPONENTS
- Introduction
- Repeater, bridges
- Router, gateways, switches

NETWORK DESIGN CONCEPTS
- Introduction
- System design
- Design simplicity
- Design documentation

STRUCTURED CABLING

INSTALLATION & MANAGEMENT ISSUES
- Operational issues
- Reliability
- Security
- SNMP

TROUBLESHOOTING & DIAGNOSTICS
- Introduction
- Hardware tests
- Diagnostic software packages
- Protocol analysis

WIRELESS LANS

> ❝
> *This workshop broadened my knowledge of networks and networking such that I am confident I will be an improved value to my IT dept.*
>
> Brian Gough
> ❞

ON-SITE TRAINING

✔ **SAVE** over 50% by having an IDC workshop presented at your premises.

✔ Customise the training to **YOUR** workplace.

✔ Have the training delivered when and where you need it.

Contact us for a **FREE** proposal.