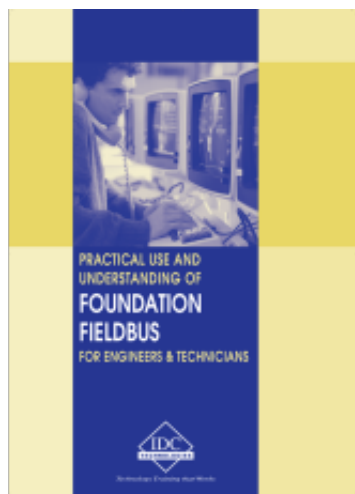


FF-E - Practical use and understanding of foundation FIELDBUS



Availability: In Stock

Price: \$65.95

Ex Tax: \$59.95

Short Description

The Fieldbus and DeviceNet standards are becoming a standard at the field and instrumentation level and replacing the traditional approaches in the plant today. Ethernet is also fast becoming the obvious choice for industrial control networking worldwide. While the basic structure of Ethernet has not changed much, the faster technologies such as Fast Ethernet and Gigabit Ethernet have increased the complexity and choices you have available in planning and designing these systems. There has also been a convergence between Fieldbus and DeviceNet standards in that they are also increasingly becoming based on industrial Ethernet for the higher speed data transfer applications.

Description

The Fieldbus and DeviceNet standards are becoming a standard at the field and instrumentation level and replacing the traditional approaches in the plant today. Ethernet is also fast becoming the obvious choice for industrial control networking worldwide.

While the basic structure of Ethernet has not changed much, the faster technologies such as Fast Ethernet and Gigabit Ethernet have increased the complexity and choices you have available in planning and designing these systems.

There has also been a convergence between Fieldbus and DeviceNet standards in that they are also increasingly becoming based on industrial Ethernet for the higher speed data transfer applications.

Table of Contents

The structure of the book is as follows:

Chapter 1 Fundamental Principles of Industrial Communications

A brief overview of the key building blocks of data communications in an industrial context.

Chapter 2 RS-232 Fundamentals

A detailed discussion of the important issues with RS-232.

Chapter 3 RS-485 Fundamentals

A detailed discussion of the important issues with the balanced and very popular industrial standard RS-485.

Chapter 4 Modbus Overview

A review of the Modbus protocol representing a Data Link and Application Layer implementation.

Chapter 5 AS- interface

A discussion of the important and simple AS-i industrial communications interface.

Chapter 6 DeviceNet

A brief review of the key elements of DeviceNet.

Chapter 7 Profibus PA/DP/FMS Overview

A review of arguably the most popular Fieldbus standard in the world today - Profibus PA and DP.

Chapter 8 Foundation Fieldbus

A review of arguably and technically the most sophisticated Fieldbus with a very well developed user layer.

Chapter 9 Operation of Ethernet Systems

The fundamentals of the operation of Ethernet.

Chapter 10 Physical Layer implementation of Ethernet Media Systems

The fundamentals of the physical part of Ethernet.

Chapter 11 Ethernet Cabling and connectors

The key issues with Ethernet cabling ranging from coaxial, twisted pair and fiber.

Chapter 12 LAN System components

An overview of hubs, repeaters, switches and routers all of which represent key components of Ethernet networks.

Chapter 13 Structured Cabling

Cabling represents one of the most important and often neglected issues with setting up an Ethernet system and this chapter reviews the key issues here.

Chapter 14 Multi segment Configuration guidelines for half duplex Ethernet Systems

A brief review of multi segment configuration guidelines.

Chapter 15 Industrial Ethernet

A summary of the key underlying features of Industrial Ethernet.

Chapter 16 Troubleshooting Ethernet

Typical strategies in troubleshooting Ethernet.

Chapter 17 Network Protocols – Part one - IP

A discussion of the Internet Protocol (IP).

Chapter 18 Network Protocols – Part two – TCP/UDP

A review of the TCP/IP protocols – the connection oriented TCP and the connectionless UDP.

Chapter 19 Ethernet Based Plant Automation Solutions

Chapter 20 Connecting Ethernet, Fieldbus and DeviceNet

A brief description of how to go about connecting the different fieldbus, devicenet, Ethernet.

Appendix A Comparison of the different standards

A tabular comparison of the different Fieldbus, DeviceNet and Ethernet based standards.

Appendix B Exercises

Appendix C Fieldbus Tasks

Preface

The Fieldbus and DeviceNet standards are becoming a standard at the field and instrumentation level and replacing the traditional approaches in the plant today. Ethernet is also fast becoming the obvious choice for industrial control networking worldwide. While the basic structure of Ethernet has not changed much, the faster technologies such as Fast Ethernet and Gigabit Ethernet have increased the complexity and choices you have available in planning and designing these systems. There has also been a convergence between Fieldbus and DeviceNet standards in that they are also increasingly becoming based on industrial Ethernet for the higher speed data transfer applications.

There is a fair degree of confusion about where Fieldbus, DeviceNet and Ethernet, are applied and the workshop commences with a clear comparison between the different standards and where they are applied. The first day

focuses on ASi-bus, DeviceNet, Profibus and Foundation Fieldbus technologies in a simple and understandable manner. A detailed discussion is then held on the application of the technologies in your plant today. There are many misconceptions on the best standard to apply in a given section of the plant. This workshop will promote the theme which is rapidly growing strength in that you should focus on your application and apply the particular fieldbus or DeviceNet to match this application and ensure easy interconnectivity between the different standards. Selecting one standard to match all applications is not really a practical approach.

On the second day, Ethernet is then discussed with a brief outline of the fundamentals of Ethernet and its operation. The method of access is discussed in depth and topics such as full duplex and auto negotiation are explained. The best methods of designing and installing the cabling systems are then explored with the discussion ranging from 10Base-T over twisted pair to Gigabit Ethernet cabling. Methods of optimizing Ethernet to obtain best performance are then defined.

As Ethernet has become more complex, a number of misconceptions have arisen as to how Ethernet functions and how the system should be optimally configured and what exactly industrial Ethernet means. This workshop addresses these issues in a clear and practical manner, thus enabling you to apply the technology quickly and effectively in your next project. There is also a practical discussion on how to connect Fieldbus and DeviceNet with Ethernet.

We would hope that you gain the following benefits from this book. After reading this book and attending the associated workshop you should be able to:

- Compare the Ethernet and Fieldbus/Devicenet standards
- Troubleshoot and fix simple DeviceNet, Profibus and Foundation Fieldbus problems
- Design and install simple Ethernet networks
- Know when to use repeaters, bridges, switches, and routers
- Apply switched Ethernet systems effectively
- Install the cabling and hardware for a typical industrial Ethernet Network
- Decide on the best cabling and connectors for your harsh or office environment
- Apply the structured cabling system concepts to your next project
- Perform simple troubleshooting tasks on a Network

People who will find this book useful include:

- IT Managers working with Networks
- Electrical engineers
- Project engineers
- Design engineers
- Electrical and instrumentation technicians
- Maintenance engineers and supervisors
- Systems engineers
- Instrumentation and control system engineers
- Process Control Designers and Systems Engineers
- Instrumentation Technologists and Engineers
- Gain useful practical know-how into how to apply the latest Fieldbus, DeviceNet and Ethernet Technologies to your plant
- Anyone involved in the installation, design and support of industrial communications systems

The structure of the book is as follows:

Chapter 1 Fundamental Principles of Industrial Communications

A brief overview of the key building blocks of data communications in an industrial context.

Chapter 2 RS-232 Fundamentals

A detailed discussion of the important issues with RS-232.

Chapter 3 RS-485 Fundamentals

A detailed discussion of the important issues with the balanced and very popular industrial standard RS-485.

Chapter 4 Modbus Overview

A review of the Modbus protocol representing a Data Link and Application Layer implementation.

Chapter 5 AS- interface

A discussion of the important and simple AS-i industrial communications interface.

Chapter 6 DeviceNet

A brief review of the key elements of DeviceNet.

Chapter 7 Profibus PA/DP/FMS Overview

A review of arguably the most popular Fieldbus standard in the world today - Profibus PA and DP.

Chapter 8 Foundation Fieldbus

A review of arguably and technically the most sophisticated Fieldbus with a very well developed user layer.

Chapter 9 Operation of Ethernet Systems

The fundamentals of the operation of Ethernet.

Chapter 10 Physical Layer implementation of Ethernet Media Systems

The fundamentals of the physical part of Ethernet.

Chapter 11 Ethernet Cabling and connectors

The key issues with Ethernet cabling ranging from coaxial, twisted pair and fiber.

Chapter 12 LAN System components

An overview of hubs, repeaters, switches and routers all of which represent key components of Ethernet networks.

Chapter 13 Structured Cabling

Cabling represents one of the most important and often neglected issues with setting up an Ethernet system and this chapter reviews the key issues here.

Chapter 14 Multi segment Configuration guidelines for half duplex Ethernet Systems

A brief review of multi segment configuration guidelines.

Chapter 15 Industrial Ethernet

A summary of the key underlying features of Industrial Ethernet.

Chapter 16 Troubleshooting Ethernet

Typical strategies in troubleshooting Ethernet.

Chapter 17 Network Protocols – Part one - IP

A discussion of the Internet Protocol (IP).

Chapter 18 Network Protocols – Part two – TCP/UDP

A review of the TCP/IP protocols – the connection oriented TCP and the connectionless UDP.

Chapter 19 Ethernet Based Plant Automation Solutions

Chapter 20 Connecting Ethernet, Fieldbus and DeviceNet

A brief description of how to go about connecting the different fieldbus, devicenet, Ethernet.

Appendix A Comparison of the different standards

A tabular comparison of the different Fieldbus, DeviceNet and Ethernet based standards.

Appendix B Exercises

Appendix C Fieldbus Tasks