Practical Industrial Data Communications and Telecommunications Training

Description

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Industrial data communication is characterized by its operating environment. Electromagnetic interference (EMI), long distances and physical barriers set industrial communications apart from typical business office requirements. Conventional equipment usually lacks the versatility to adapt to the unique requirements of data monitoring and process control. In response to the growing needs in industrial data communications, a number of purpose developed industrial data communications devices have entered the marketplace. their designs are a result of field experience in solving difficult data communications problems and optimizing characteristics for all aspects of reliability and economy. With so many different standards on the market today, the debate is not about what is the best – be it Foundation Fieldbus, Profibus, Devicenet or Industrial Ethernet but rather about selecting the most appropriate technologies and standards for a given application and then ensuring that best practice is followed in designing, installing and commissioning the data communications links to ensure they run fault-free. The industrial data communications systems in your plant underpin your entire operation. It is critical that you apply best practise in designing, installing and fixing any problems that may occur. This course distils all the tips and tricks with the benefit of many years of experience and gives the best proven practices to follow.

Course Objective

Ethernet, TCP/IP and the Internet technologies are reshaping the way that control, data transfer, and maintenance are being carried out in industrial plants around the world. In this course, you will learn more about the latest developments in networking, including practical tips on testing TCP/IP based networks and where to safely use an industrial Web intranet. You will also explore the strengths and weakness of competing network technologies, including leased services such T1/T3, Frame Relay or ADSL, and private systems such as short haul modems and fiber optics. Special focus will be placed on the questions of security in the industrial setting.

This course provides a thorough understanding of modern industrial data communication including basic communication principles, hardware interfaces such as RS232, communication protocols: ASCII based protocol, Modbus and other industrial protocols in peer-to-peer or network environment. The

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course provides "hands-on" work experience in using communication protocols handshaking techniques for various modern smart instruments and devices.

Course Outline

Upon the successful completion of the course, participants will be able to:

- Apply traditional and current serial standards, such as EIA-232, 422, 423 and 485, in industrial plant floor settings.
- Learn the inner working of proprietary PLC networks.
- Understand Local Area Network (LAN) topologies and protocols.
- Compare media access techniques such as CSMA/CD, token passing and master/slave.
- Describe design methods for LANs using Ethernet.
- Understand the different Ethernet varieties and which are best for industry.
- Know your options for Ethernet hardware to avoid instant obsolescence and being locked in the past.
- Understand the Open Systems Interconnection (OSI)
- Expand your understanding of LAN, WAN intranet and Internet concepts
- Understand the how structure of the telephone system impacts industrial networks
- Understand analog dial-up connections and modems standards
- Understand modern digital WANs and the service options for corporate intranets
- Learn the basics of fiber-optic networks, including cable selection for the plant floor
- Understand the TCP/IP protocols, addressing, and troubleshooting
- Learn how to create a web server for an industrial intranet
- Understand where web technologies can safely be used for process control
- Learn the basics of network security and the procedures that should be followed for safe operations
- Understand the Smart Instrument Systems such as HART
- Understand the Fieldbus Protocols and Configurations
- Understand the Public Network Transport Technologies
- Understand the Wide Area and Converged Networking (PSTN/PBX/Internet/Intranet)
- Understand the Wireless Communications and their characteristics
- Understand the Enterprise Level Process Data Communications (ERP, MES, SCADA)

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