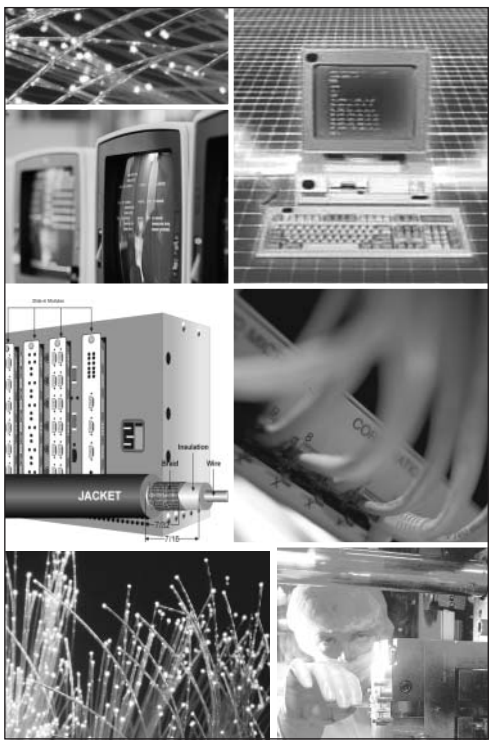
BEST PRACTICE in INDUSTRIAL DATA COMMUNICATIONS SYSTEMS



YOU WILL LEARN:

- **Best practice in industrial data communications design, installation and commissioning**
- **Practical hands-on experience in jointing, splicing and testing of copper and fiber based cabling**
- **How to design and install your own fully operational industrial data communications systems**
- **How to integrate different industrial communications protocols and standards into a complete working system**

WHO SHOULD ATTEND:

Anyone working with or required to follow best practice in the installation of industrial data communications systems ranging from RS-232 to Fieldbus and Ethernet systems, including:

- **Instrumentation and Control Engineers/Technicians**
- **Process Control Engineers**
- **Network Planners**
- **Electrical Engineers**
- **Test Engineers**
- **System Integrators**
- **Designers**
- **Electronic Technicians**
- **Consulting Engineers**
- **Design Engineers**
- **Plant Managers**
- **Systems Engineers**
- **Shift Electricians**

IDC TECHNOLOGIES

Technology Training that Works

THE WORKSHOP

The objective of this workshop is to outline the best practice in designing, installing, commissioning and troubleshooting industrial data communications systems. In any given plant, factory or installation there are a myriad of different industrial communications standards used and the key to successful implementation is the degree to which the entire system integrates and works together. 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 practice in designing, installing and fixing any problems that may occur. This workshop distills all the tips and tricks learnt with the benefit of many years of experience and gives the best proven practices to follow.

The main steps in using today's communications technologies involve selecting the correct technology and standards for your plant based on your requirements; doing the design of the overall system; installing the cabling and then commissioning the system.

Fiber Optic cabling is generally accepted as the best approach for physical communications but there are obviously areas where you will be forced to use copper wiring and, indeed, wireless communications. This workshop outlines the critical rules followed in installing the data communications physical transport media and then ensuring that the installation will be trouble-free for years to come.

The important point to make is that with today's wide range of protocols available, you only need to know how to select, install and maintain them in the most cost-effective manner for your plant or factory - knowledge of the minute details of the protocols is not necessary.

PRACTICAL SESSIONS

There are several practical sessions and exercises which you will undertake to give you a solid basis to the material you cover in the workshop

- Splicing fiber optic cable
- Installing fiber optic connectors
- Installing twisted pair connectors
- Checking copper cable bandwidth and optimising cable termination
- Testing copper cable using a cable tester
- Testing RS-232 links
- Testing RS-485 links
- Setting up networks: Ethernet/DeviceNet
- Using a protocol analyser
- Designing a complete industrial data communications system

THE PROGRAM

DAY ONE

INTRODUCTION

- Overview of the course
- OSI model
- Systems engineering approach
- Attributes of typical communications systems
  - Media
  - Physical connections
  - Protocols
  - Applications
- General issues
  - Noise
  - Earthing and grounding
  - Shielding
  - Protection against dust and moisture (IP ratings)

FUNDAMENTALS

- Copper/fiber
  - Cable standards
  - Cable distribution standards
  - Connector standards
  - EMC conformance standards
  - Splicing
  - Connector attachment
  - Drivers and detectors
  - Grounding
  - Termination
  - Protection against transients
- Physical layer standards
  - EIA-232
  - EIA-485
  - 4-20 mA
  - IEC 61158-2 (Intrinsic safety)
- Industrial networks
  - Industrial Ethernet
  - ASi
  - DeviceNet
  - Profibus
  - Foundation Fieldbus
  - Modbus Plus
  - Data Highway Plus
  - HART
  - Ethernet/IP
  - ControlNet
  - ProfiNet
  - Foundation Fieldbus HSE
- Industrial protocols
  - TCP/IP
  - Modbus
  - Modbus TCP
  - DNP3
  - 60870 SCADA
- Other technologies
  - VSAT
  - Wireless LAN
  - Wireless point to point

DAY TWO

SELECTION METHODOLOGY

- Which standards/technologies to use:
  - Field management (device) level
  - Process management (operator) level
  - Business management (enterprise) level
  - Long distance SCADA/telemetry links

INSTALLATION METHODOLOGY

- Copper cabling and connectors
  - System design
  - Installation
  - Tips, tricks and pitfalls
- Fiber cabling and connectors
  - System design
  - Installation
  - Tips, tricks and pitfalls
- Wireless
  - System design
  - Installation
  - Tips, tricks and pitfalls

COMMISSIONING/TESTING/ TROUBLESHOOTING

- Copper infrastructure
- Fiber infrastructure
- Wireless infrastructure
- Networks
  - Physical layer issues (OSI Layer 1)
  - Data link layer issues (OSI Layer 2)
  - Network layer issues (OSI Layer 3)
  - Transport layer issues (OSI Layer 4)
  - Application and "user" layer issues (OSI Layers 7-"8")
  - Client/server issues

CONCLUSION

- Summary
- Open forum
- Closing of workshop

ON-SITE TRAINING

— contact us for a proposal today

IDC Technologies unique on-site training delivery service can save your company up to 50%, or more, off the total per-head costs associated with delegates attending a public workshop. One of our qualified and experienced Instructors can discuss the content with you, then come to your venue and present a workshop designed to your own specifications!

Why not call or e-mail and ask about having components from a number of courses combined together? It's affordable, effective, convenient and much easier than you may have thought.

"Technology Training that Works" we mean it! Try us soon and see the difference. For more information, or a customized proposal to run any of our practical workshops at your own venue, contact your nearest business development manager for manager (see page 32).