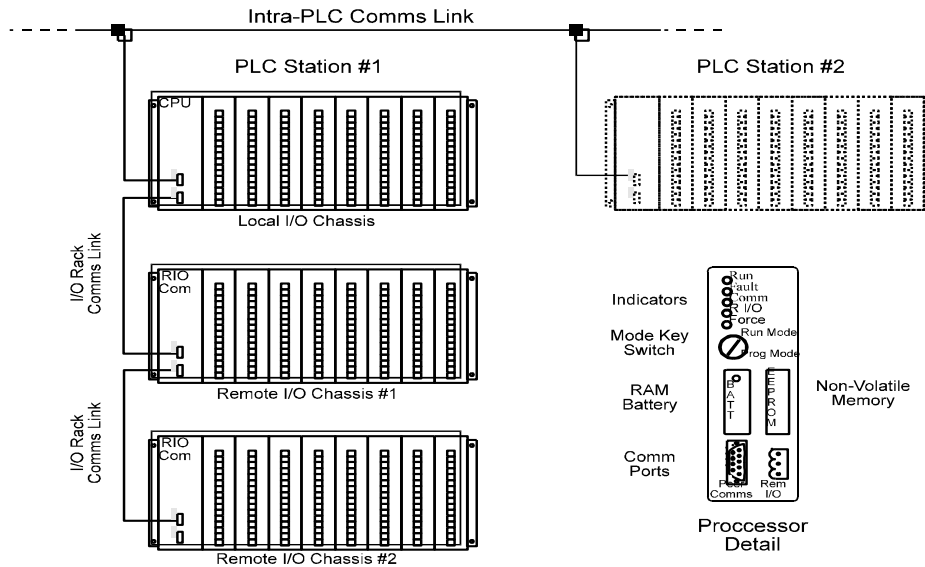




Technology Training that Works

Practical Troubleshooting and Problem Solving of Industrial Data Communications



4 hour live, practical online course

YOU WILL LEARN:

- Identify, prevent and troubleshoot industrial communications problems
- Fix the most common problems that occur in industrial communications systems
- Troubleshoot industrial communications systems
- Analyse, diagnose and fix problems

WHAT'S INCLUDED?

- Four 50 minute live, practical sessions with your instructor and attendees
- The full technical eBook manual for "Practical Troubleshooting and Problem Solving of Industrial Data Communications" which includes course slides, cases studies, calculations and practical exercises
- Four hours of additional in-depth video sessions covering many additional areas – yours to keep and watch any time you want

THE COURSE

The objective of this course is to help you identify, prevent and fix common industrial data communication problems. The focus is "outside the box" with the emphasis on practicals that go beyond the typical communications issues and theories. The course will provide you with the necessary toolkit of skills to solve industrial data communication problems, whether they are RS-232/RS-485, Modbus, Fieldbus and DeviceNet or a Local Area Network (LAN), such as Ethernet.

The communications system on a plant affects the entire operation. It is critical that you have the knowledge and tools to quickly identify and fix problems as they occur to ensure you have a secure system. No compromise is possible here. This course highlights and explains all the tips and tricks that would usually take years of experience to learn.



Technology Training that Works

ONLINE COURSE PRESENTER



Edwin Wright
B.Sc B.E. (Hons) (Elec) MIPENZ

Edwin has over 40 years of practical experience in the planning, design, construction and operation of telecommunications systems, data networks, SCADA and Ethernet systems. He has also been involved as Project Manager on many projects and has a passion for technology topics.

Edwin has published numerous papers and consulted widely on Ethernet, data communications and telecommunications issues in the USA, Canada, UK, Australia and New Zealand. Over the past 19 years more than 20,000 engineers and technicians have attended his workshops worldwide. Delegates attending his workshop will benefit from his tremendous knowledge and enthusiasm for the topics and his entertaining instructing style. When not working in the communications world, Edwin relaxes by reading and writing on technology issues at his beachside home.

WHO SHOULD ATTEND?

Anyone working with or required to trouble shoot industrial communications systems ranging from RS-232 to Fieldbus and Ethernet systems, including:

- Consulting engineers
- Designers
- Design engineers
- Electrical engineers
- Electronic technicians
- Instrumentation and control engineers and technicians
- Plant managers
- Process control engineers
- Network planners
- Shift electricians
- Systems engineers
- System integrators
- Test engineers

PRE-REQUISITES:

Not applicable.

CONTENT SUMMARY

INTRODUCTION

*This is an intensive four (4) hour presentation; we will be emphasising sections marked in **BOLD** below. Full recordings will be provided for the lower intensity sessions (another four hours of video as detailed below) to review after the course.*

LIVE SESSION

SESSION ONE

INTRODUCTION

- List of typical problems

OVERALL METHODOLOGY

- Common symptoms, problems and solutions
- How to quickly identify likely causes
- Overall basic steps
- Communications issues
- Grounding/shielding/noise



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Pre-recording 1:

- BASIC STANDARDS (RS-232)
- Fundamentals
- Problems: cabling, male/female, DTE/DCE, 9-pin, handshaking, voltages, noise, isolation

SESSION TWO

INDUSTRIAL AUTOMATION STANDARDS

Modbus

- Fundamentals
- Problems: no response, exception reports, noise, radio interfaces, physical and application layers

Modbus Plus

- Fundamentals
- Problems: cabling, grounding, shielding, terminators, token passing

Data Highway Plus/DH485

- Fundamentals
- Problems: cabling, grounding, shielding, terminators, token passing

Pre-recording 2:

- HART
- Fundamentals
- Problems: cabling, configuration, intrinsic safety

- ASI Bus
- Fundamentals
- Problems: cabling, connections, gateways

SESSION THREE

PROFIBUS PA/DP/FMS

- Fundamentals
- Problems: cabling, fibre, shielding, grounding, segmentation, colour coding, addressing, token bus, unsolicited messages, fine tuning of impedance terminations, drop-line lengths, GSD files, intrinsic safety

FOUNDATION FIELDBUS

- Fundamentals
- Problems: wiring, grounds, shielding, wiring polarity, power, terminations, intrinsic safety, voltage drop, power conditioning, surge protection, configuration

INDUSTRIAL ETHERNET

- Fundamentals
- Protocol analysis
- Problems: noise, thin and thick coax and connectors, UTP cabling, wire types, components, incorrect media selection, jabber, too many nodes, excessive broadcasting, bad frames, faulty auto-negotiation, 10/100MBit/s mismatch, full/half duplex mismatch, faulty hubs, switched networks, loading



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Pre-recording 3:

– BASIC STANDARDS

(RS-485)

- Fundamentals
- Problems: cabling, common mode voltage, converters, isolation, idle state, terminations, control – hardware/software

Current Loop

- Fundamentals
- Problems: cabling, isolation

Fibre Optics

- Fundamentals
- Problems: splicing, interface to cable, connectors, multimode, monomode, laser vs LED transmitters, driver incompatibility, bending radius, shock, installation issues

SESSION FOUR

TCP/IP

- Fundamentals
- Software utilities (ping, arp, netstat)
- Protocol analysis
- Problems: internet layer, IP addresses, subnet mask, routers, transport layer, triple handshake, incorrect ports

RADIO AND WIRELESS COMMUNICATIONS

- Fundamentals
- Problems: reliability, noise, interference, power, distance, licences, frequency, over and under modulation

Pre-recording 4:

– DEVICENET

- Fundamentals
- Problems: topology, power and earthing, signal voltage levels, common mode voltage, terminations, cabling, noise, node, communication problems, creeping errors

SUMMARY, OPEN FORUM

CLOSING