

PRACTICAL SCADA & RADIO TELEMETRY SYSTEMS FOR INDUSTRY

OBJECTIVES

At the end of this workshop participants will be able to

- ◆ A fundamental understanding of SCADA systems
- ◆ The essentials of SCADA software configuration
- ◆ Tricks and traps in installation of SCADA systems
- ◆ The essentials of telecommunications links
- ◆ Design and install radio and microwave links

WHO SHOULD ATTEND?

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This workshop is designed to benefit engineers and technicians who are involved in specifying, commissioning and debugging industrial SCADA and telemetry systems but who have little previous experience in this field.

It is also of particular benefit to personnel involved in areas of design, specification, installation, commissioning, maintenance and documentation of industrial control and instrumentation systems where IS is used, this includes:

- ◆ Electrical engineers
- ◆ Instrumentation and control engineers
- ◆ Engineering managers
- ◆ Design engineers
- ◆ Instrumentation technicians
- ◆ Project engineers
- ◆ Technicians
- ◆ Process control engineers
- ◆ Maintenance engineers
- ◆ Systems engineers

PRESENTER

TERRY P. BORGEEST, CPEng, MBA, Grad. Dip Bus. Mgmt., Dip Elect. Eng.

Terry has over 30 years experience in the Instrumentation Industry. He has extensive on-site commissioning exposure to the mining/metals, power, petrochemical/chemical and food & beverage industries with clients including WMC, Santos, ABB Lummus and Dow Chemicals.

Terry has managed divisions of Combustion Engineering, Asea Brown Boveri (ABB) and Taylor Instruments. His experience ranges from process measurement (including analytics) through to large scale DCS systems.



Technology Training that Works

PROGRAM

REGISTRATION AND COFFEE

WELCOME AND INTRODUCTION

TELEMETRY AND SCADA SYSTEMS HARDWARE

- ◆ Fundamentals
- ◆ Comparison of SCADA, DCS, PLC and Smart Instruments
- ◆ Remote Terminal Unit (RTU) Structure
- ◆ Analog and Digital Input/Output Modules
- ◆ Application programs
- ◆ PLC's used as RTU's & Master Site Structure
- ◆ Communications Architectures
- ◆ Point-to-Point and Point to Multipoint Systems
- ◆ System Reliability and Availability
- ◆ Configuration of a Master Station

SCADA SYSTEMS SOFTWARE AND PROTOCOLS

- ◆ Fundamentals & Components of a SCADA System
- ◆ Software - Design of Scada Packages
- ◆ Typical Operating Systems
- ◆ Communications Components (include Radio and Data)
- ◆ Specialised SCADA Protocols
- ◆ Configuration of SCADA Systems
- ◆ Error Detection & The twelve golden rules
- ◆ Practical Applications & Review of SCADA products
- ◆ New Technologies with SCADA

LANDLINE SYSTEMS

- ◆ Background to cables
- ◆ Noise and Interference on Cables
- ◆ Types of Cables/Twisted Pair/Fibre Optics
- ◆ Privately Owned Cables
- ◆ Public Network Provided Services
- ◆ Switched Telephone Lines/2 wire - 4 wire Tie Lines/Analog Data
- ◆ Services/Digital Data Services
- ◆ Packet Switched services & ISDN

MODEMS

- ◆ Introduction & Modem Principles
- ◆ Asynchronous/Synchronous & Modulation Techniques
- ◆ Error Detection and Correction & Radio Modems

RADIO TECHNOLOGY

- ◆ Background & Fundamentals of Radio Systems
- ◆ Fundamentals of Propagation/Gain/Attenuation
- ◆ Frequency band selection & Modulation Schemes
- ◆ Equipment - Transmitters/Receivers/Filters etc
- ◆ Antenna Implementation & Cabling (coaxial/audio/signal)
- ◆ Intermodulation/Multicouples/Duplexers etc
- ◆ Practical System Implementation & Design Considerations
- ◆ Path Loss Calculations & Fresnel Zones and K Factors
- ◆ System design practical & Data over radios
- ◆ Diversity and duplication

SATELLITE

- ◆ Background & Classes of service
- ◆ Relevant Organisations & Frequency Band Allocation
- ◆ Theory of operation & Downlinks and Uplinks
- ◆ FDMA/TDMA/CDMA
- ◆ Switched/Dedicated/Packet Switched
- ◆ Practical implementation considerations
- ◆ Available Satellite services

LINE OF SIGHT MICROWAVE

- ◆ Background & Point to Point/Point to Multipoint
- ◆ Equipment - Transmitter/Receiver/Multiplexer
- ◆ Data rates & Dishes and antennas
- ◆ Cables and Waveguides & Multipathing
- ◆ Diversity and Duplication

PERFORMANCE ANALYSIS

- ◆ Availability and Reliability & BER Testing
- ◆ Complete System Testing

INFRASTRUCTURE REQUIREMENTS

- ◆ Location selection & Site works and access
- ◆ Mast selection & Equipment shelters
- ◆ Power supplies - Mains/Solar/Generators
- ◆ Back up Batteries & Air conditioning

FUTURE TRENDS

- ◆ Digital Modulation Radio
- ◆ Impact of software based instrumentation
- ◆ Trends in SCADA

SUMMARY, OPEN FORUM & CLOSING