jcom Automation Inc.

Certified PROFINET Network Engineering Course

Agenda

Day 1: Introduction, Ethernet Protocols and devices

- Introduction
  - Agenda review
  - Company history
  - House keeping
  - General introduction to Industrial Ethernet
- Introduction to PROFINET
  - Overview of the protocol
  - What is PI
  - How it basically works
  - Conformance levels
  - Exercise: Conformance levels and devices – what does it mean
- Ethernet Protocols
  - OSI 7-layer model
  - Addressing
  - ARP, RARP
  - LLDP
  - Demo: Easy device exchange
  - DHCP, DCP
  - TCP, UDP
  - SNMP, ICMP
  - Lab: IP and Ping
- Hubs switches routers and firewalls
  - Terms
  - Hubs
  - Bridges
  - Switches
  - Lab: Switch
  - Routers
  - Firewalls
  - Lab: Firewall

Day 2: Design and Installation, setup

- Network Design Part 1
  - Basic design rules
  - Topology structure
  - Update rate and reduction ratio
  - Response time
  - Lab: Response time

- Network Design Part 2
  - Network load
  - Retry Threshold
  - Line depth
  - Load calculations
  - Lab: Load calculations
  - Security
  - Lab: Design Verification

- Installation best practices
  - Different physical layers
  - Wiring
  - Connectors
  - Grounding
  - Installation best practices
  - Lab: Wiring
- The Device Model, Profiles, PROFINET for Process Automation
  - Profiles
  - PROFINET for Process Automation
  - Device Model
  - Addressing
  - Lab: Using an IO-Supervisor to get I&M data
- Setting up an IO-Controller
  - General method
  - GSD File
  - PROFINET Device Names
  - Detail Setup
  - Lab: Setting up a PROFINET Network

Day 3: PROFINET Acceptance, Redundancy and Theory

- Acceptance test
  - Introduction
  - Communication Monitoring
  - Full commissioning process in review
  - Steps of PROFINET acceptance test
  - Lab: Commissioning Wizard

- Wireshark and the Start-up Cycle
  - Introduction to Wireshark
  - How to connect Wireshark to the network
  - Example: PROFINET Start-up Cycle
  - Lab: Wireshark and the start-up cycle
- Redundancy
  - Introduction
  - Media Redundancy
  - System Redundancy
  - Lab: Redundancy
- PROFINET Theory
  - Real Time classes
  - Application Relationships
  - Communication Relationships
  - Data Frames
  - PROFINET commands
  - Lab: Start-up cycle revisited

Day 4: Acyclic Communications, Diagnostic model and troubleshooting

- Isochronous Real-Time Communications
  - Introduction
  - Different types of Ethernet
  - RT_Class_3
  - Configuration of IRT
- Acyclic Communications
  - Introduction
  - Why use Acyclic
  - Data map
  - Commands
  - Lab: Acyclic communications

- Diagnostic Model
  - Diagnostic Model
  - Severity
  - Alarms
  - Statuses
  - Summary
  - Lab: Diagnostics
- Troubleshooting PROFINET
  - Types of errors
  - Tools
  - Lab: Troubleshooting

- Open review period (Q&A)

Day 5:

- Open review period (Q&A)
- Written test
- Practical test