

Class Syllabus

Introduction and Overview

- PI Introduction (Technology and Organization)
- PROFINET in Factory and Process Automation
- Benefits of Horizontal and Vertical Integration
- Application Profiles Overview
(PROFIsafe, PROFIenergy, PROFIdrive, Encoder, PA Profile 4)

Ethernet Basics

- Introduction to Ethernet, TCP, UDP, IT Protocols

Network Installation and Infrastructure

- Topologies and Network Design *
- Building and Testing an Industrial Ethernet Cable *
- Installation Guidelines and Best Practices
-Laying Cables, Grounding, Power System
- Network Load Calculation and Rules *
- Commissioning Checklist

PROFINET Device Integration

- Conformance Classes
- Implementation Methods
- PROFINET Device Certification

PROFINET GSDML *

- Device Description Files
- Vendor and Device ID
- GSD Module & Submodule Identification
- File Structure and Parameters
- GSD Check

PROFINET Configuration and Application

- PROFINET Device Names – Rules and Assignment
- I/O Device Update Rates and Data Hold Timer
- PROFINET Controller Configuration *
- PROFINET Protocol – Startup, Cyclic & Acyclic Data Exchange *
- Diagnostics *, Troubleshooting
-Records *, Alarms *, Error Codes *

Wireshark Capture and Analysis

- Ethernet Capture Guide (Port Mirror, TAPs, Capture Tools)
- Ethernet Monitor, Setup *
- PROFINET Startup Sequence *, Alarms *, Records*,
Troubleshooting *

Profinet Commander *

- IO Controller
- Name Assignment
- Factory Reset
- Identification and Maintenance
- Data Record Objects

Additional Topics

- Simple Device Replacement *
- Fast Start Up, Shared Device, I-Device
- Time Critical Applications (IRT/TSN)
- OPC UA, IO-Link
- Redundancy
- Network Security

* sections with a hands-on lab

Extending PROFINET into Process Automation

- PA Profile 4.02 – Motivation and Features
- Diagnosis and Status
- Device Replacement Strategies

Ethernet Advanced Physical Layer (APL)

- Ethernet-APL Fundamentals, 2-wire Communication
- Topologies, Switches, Trunk & Spur Concept
- Network Design Considerations (Netload, Quality, Energy)
- Migration from PROFIBUS

Ethernet-APL Configuration and Application

- Wiring of APL Switch and Instrument *
- APL Device Configuration *
- Troubleshooting Tools, Device Replacement *

Introduction to hazardous areas

- Zones and Divisions, Protection Classes
- Validation of Intrinsic Safety
- Example Calculation for Ethernet-APL Application
- Tools for Measurements in Hazardous Areas

Agenda

Day 1-3

All day: Technical learning & exercises

Day 4

Morning: Technical learning & exercises
Afternoon: Practical exam

Day 5

Morning: Written exam

*Our certification classes are intense, hands-on courses. We give you the practical knowledge to install and build your own systems and enable you to troubleshoot networks using tried and true diagnostic methods and tools. These courses are never based on sales or marketing pitches and focus on the vendor neutral details of the technology. You learn how the underlying technology works from the frame level to applications, and pass both a practical and written exam to become certified. **You will receive 26 PDH hours and three Certificates (PROFINET Engineer + Installer + PA) from PROFINET International (PI) for completing the course.***

