

## 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

## Agenda

### Day 1-2

All day: Technical learning & exercises

### Day 3

Morning: Technical learning & exercises  
Afternoon: Practical exam

### Day 4

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 18 PDH hours and two Certificates (PROFINET Engineer + Installer) from PROFINET International (PI) for completing the course.***

