

PROFINET with Industrial Ethernet

General Information

Course Code	SCT-PTTIAPNA
Global Code	IK-TIAPN
Length	3 Days
CEUs	1.8

Audience

This course is for PLC users with programming, engineering or maintenance experience who will be maintaining automation systems and their PROFINET networks in the TIA Portal. TIA Portal is the base platform used, however the concepts and practices shown here are transferable to other platforms.

Prerequisites

- MS Windows Expertise
- One of the following courses
- TIA Portal Programming 1
- OR
- TIA Portal Service 2
- OR
- Bridging STEP 7 5.x to TIA Portal Programming

Profile

This course is for PLC users who will be responsible for the maintenance, configuration, planning, and/or commissioning of automation Ethernet networks with PROFIBUS. Siemens, a member of PROFIBUS International (PI), offers you the opportunity to gain experience about the future oriented PROFINET, the open Industrial Ethernet standard for automation.

Through a deeper understanding of Ethernet and PROFIBUS mechanics along with SIMATIC NET components, you will learn how to parameterize commission and troubleshoot a PROFINET network quickly and effectively. Numerous practical exercises reinforce the acquired theoretical knowledge.

Objectives

Upon completion of this course, the student shall be able to:

- Identify many of the various network types used throughout a standard automation system.
- Identify the OSI 7 layers of Ethernet
- Calculate Ethernet IP ranges and subnets
- Configure a PC Ethernet card
- Reset PROFINET devices back to factory default

- Use the Primary Setup Tool (PST)
- Identify the functionality of the PRONETA tool.
- Wire an RJ45 connector.
- Use the TIA Selection Tool.
- Commission a PN system manually, with TIA Portal, using MMC's or C-Plug's.
- Commission a PN-IO system.
- Make use of LLDP for IO commissioning.
- Configure/Detect PN Topology.
- Read diagnostic/status information directly/from the program/HMI.
- Configure web support.
- View S7-1500/Scalance X208 web pages.
- Configure Ring (MRP) architecture.
- Diagnose MRP line defects.
- Configure Module-by Module Shared devices.
- Configure Submodule-by Submodule Shared devices.
- Configure Module-internal Shared inputs and outputs.
- Configure I-Device with/w-out Subordinate PN IO-System.
- Configure Cross-Project I-Device.

Topics

1. Communication in the SIMATIC world
 - a. Industrial Ethernet
 - b. Industrial Wireless Communication
 - c. PROFINET I/O, ASi, IO-Link & their gateways
2. Basics of Industrial Ethernet
 - a. Industrial Ethernet Overview
 - b. ISO / OSI 7 Layer
 - c. IP / MAC / Subnet / Supernetting
 - d. IP Ranges / Calculations
 - e. Packet INternet Groper (PING)
 - f. CSMA/CD, Duplex mode, Telegram types
 - g. HUB, SWITCH basics
 - h. Switching methods / Telegram Forwarding
3. Basics of PROFINET
 - a. PROFINET Basics
 - b. Device Addressing
 - c. Primary Setup Tool (PST)
 - d. PRONETA
4. **Network Components**
 - a. Architecture & Components
 - b. Optical, Wireless Medium
 - c. Communication Processors (CP)

5. PROFINET Configuration
 - a. PN IO - Manual Commissioning
 - b. PN IO – TIA Portal – w/Project
 - c. PN IO – TIA Portal – no Project
 - d. Device Exchange w/MMC or C-Plug
6. Topology Editor
 - a. PN IO - Automatic Commissioning
 - b. Link Layer Discovery Protocol (LLDP)
 - c. Topology Configuration
 - d. Working with Existing Topology
 - e. Device Replacements – no MMC or C-Plug
 - f. Device Name Change
7. Diagnostics
 - a. Diagnostics – LED's
 - b. Diagnostics – S7-1500 CPU System
 - c. Diagnostics – “Display Units” HMI Control
 - d. “IO2MOD” / “GEO2LOG” blocks – HW Identifier
 - e. “D_ACT_DP” block – Activate/Deactivate/Status
 - f. “Get_Name” block – Device Name
 - g. “LED” block – Module LED Status
 - h. “DeviceStates” / “ModuleStates” blocks
8. Web Service for PROFINET
 - a. S7-1500 Web Server Configuration
 - b. Web pgs. – Diag./Info./Alarms/Logs/ & more
 - c. Scalance X208 Web pages
- 9. Ring Redundancy MRP**
 - a. Introduction of the Ring Redundancy
 - b. Media Redundancy Protocol (MRP)
 - c. Diagnostics – Defective MRP line
 - d. MRP Configuration
10. Shared Device
 - a. Introduction Shared Device
 - b. Module-by-Module/Submodule-by-Submodule
 - c. MIS/MSO – Module-internal Shared IO
11. I-Device
 - a. Introduction I-Device
 - b. With/W-out Subordinate PROFINET IO-System
 - c. General Configuration
 - d. Cross-Project Configuration