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Course Name

Industrial Ethernet and Network Security for Control Systems

Sector Name

Instrumentation & Controls

Document Type

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Industrial Ethernet and Network Security for Control Systems

Course Introduction

This course provides an in-depth understanding of Industrial Ethernet and network security in control systems. Participants will explore the fundamentals of Ethernet-based communication in industrial automation, including protocols, network architectures, and best practices for securing critical infrastructure.

The course also covers cybersecurity threats, risk mitigation strategies, and industrial network hardening techniques to ensure reliable and secure operations.

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Industrial Ethernet and Network Security for Control Systems

Target Audience

- ✓ Industrial automation and control engineers
- ✓ Network and IT professionals managing industrial networks
- ✓ Cybersecurity specialists securing control systems
- ✓ Maintenance and reliability engineers for industrial networks
- ✓ Process control specialists ensure secure communication
- ✓ Operational Technology (OT) professionals handling ICS security

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Industrial Ethernet and Network Security for Control Systems

Learning Objectives

- ✓ Understand Industrial Ethernet and its role in process automation and control systems.
- ✓ Learn about key communication protocols such as PROFINET, EtherNet/IP, Modbus TCP, and OPC UA.
- ✓ Design and configure Ethernet-based industrial networks.
- ✓ Implement redundancy and reliability strategies for industrial networks.
- ✓ Identify cybersecurity threats to industrial control systems (ICS).
- ✓ Apply network security best practices to protect industrial systems from cyberattacks.
- ✓ Explore firewalls, VLANs, VPNs, and intrusion detection systems (IDS) for industrial environments.
- ✓ Conduct network troubleshooting and diagnostics to ensure uptime and efficiency.

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Industrial Ethernet and Network Security for Control Systems

Course Outline

✓ 01 Day One

Module 1: Introduction to Industrial Ethernet

- ✓ Basics of Ethernet technology and its application in industrial automation
- ✓ Comparison of traditional fieldbus vs. Industrial Ethernet
- ✓ Overview of Ethernet topologies (star, ring, mesh) and network components

Module 2: Industrial Ethernet Communication Protocols

- ✓ PROFINET, EtherNet/IP, Modbus TCP/IP, OPC UA – features and use cases
- ✓ Real-time communication and deterministic behavior in Ethernet networks
- ✓ Network design considerations for low-latency and high-availability

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Course Outline

✓ 02 Day Two

Module 3: Network Infrastructure and Redundancy

- ✓ Network switching, routing, and segmentation
- ✓ Redundancy protocols: Rapid Spanning Tree Protocol (RSTP), Media Redundancy Protocol (MRP), Device Level Ring (DLR)
- ✓ Best practices for high-availability industrial networks

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Course Outline

✓ 03 Day Three

Module 4: Cybersecurity in Industrial Control Systems (ICS)

- ✓ Cyber threats and vulnerabilities in industrial networks
- ✓ Differences between IT and OT (Operational Technology) security
- ✓ Case studies on real-world cyber incidents in industrial automation

Module 5: Industrial Network Security Strategies

- ✓ Network segmentation using VLANs to isolate control networks
- ✓ Firewalls and Intrusion Detection/Prevention Systems (IDS/IPS)
- ✓ Secure remote access using VPNs and encrypted communication

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Course Outline

✓ 04 Day Four

Module 6: Hardening Industrial Ethernet Networks

- ✓ Role of zero-trust architecture in industrial cybersecurity
- ✓ Secure device authentication and role-based access control (RBAC)
- ✓ Implementing patch management and endpoint security

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Course Outline

✓ 05 Day Five

Module 7: Network Monitoring, Troubleshooting, and Maintenance

- ✓ SNMP (Simple Network Management Protocol) and network monitoring tools
- ✓ Identifying and resolving latency, jitter, and packet loss issues
- ✓ Logging, auditing, and compliance with IEC 62443 and NIST cybersecurity frameworks

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Jan. 18, 2027	Jan. 22, 2027	5 days	4250.00 \$	UAE , Dubai
May 10, 2027	May 14, 2027	5 days	4250.00 \$	UAE , Dubai
Nov. 8, 2026	Nov. 12, 2026	5 days	4250.00 \$	Morocco , Casablanca
July 12, 2027	July 16, 2027	5 days	4950.00 \$	Spain , Madrid

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