

Industrial IoT (IIoT) Development and SCADA System Data Acquisition

Course Description

This comprehensive course delves into the integration of Industrial Internet of Things (IIoT) technologies and the acquisition of Supervisory Control and Data Acquisition (SCADA) systems within industrial environments. Participants will gain a deep understanding of IIoT architecture, data acquisition techniques, communication protocols, and the role of KEPServerEX in industrial automation. Additionally, the course covers SCADA system data acquisition for efficient monitoring and control of industrial processes.

Audience

This course is designed for professionals and enthusiasts in the fields of industrial automation, manufacturing, engineering, and information technology. It is suitable for individuals seeking to enhance their knowledge and skills in IIoT integration, SCADA system acquisition, and industrial connectivity.

Pre-requisite Knowledge/Skills

Participants are expected to have a basic understanding of industrial automation concepts, including PLCs, industrial communication protocols, and networking fundamentals.

Course Objectives

By the end of this course, participants will be able to:

- Understand the significance of IIoT in the industrial landscape and distinguish it from IoT.
- Identify the architecture, components, and communication protocols of IIoT systems.
- Acquire, preprocess, and analyze real-time data in IIoT environments using edge computing techniques.
- Implement industrial connectivity solutions, including wired and wireless options and communication protocols.
- Utilize KEPServerEX for device connectivity, configuration, and data management.
- Explore OPC and OPC UA for secure data transfer and remote communication.
- Navigate the KEPServerEX user interface, configure data sources, and manage tags effectively.
- Diagnose and troubleshoot common issues in KEPServerEX deployment.
- Integrate IIoT technologies with KEPServerEX for efficient industrial connectivity.
- Acquire, install, and utilize SCADA systems for monitoring and controlling industrial processes.
- Implement IoT data analytics and reporting capabilities, including integration with AWS/Azure Cloud platforms

Course Outline

Module 1: Introduction to IIoT

- Overview of IIoT and its significance in the industrial landscape
- Key differences between IIoT and IoT
- Evolution of IIoT and its impact on industries

Module 2: Architecture and Components of IIoT

- IIoT architecture and its layers (cloud)
- Sensors, actuators, and embedded systems in IIoT
- Communication protocols and standards for IIoT

Module 3: Data Acquisition and Processing in IIoT

- Data collection techniques and devices
- Edge computing and data preprocessing
- Real-time analytics and data visualization
- Best Practices for Data Acquisition

Module 4: Industrial Connectivity and Networking

- Wired and wireless connectivity options
- Industrial Communication protocols (e.g., MODBUS, TCP/IP, OPC, Profinet, Profibus, Industrial Ethernet)

Module 5: Introduction to KEPServerEX

- Understanding the role of KEPServerEX in industrial automation
- Exploring the KEPServerEX ecosystem
- Installing and licensing KEPServerEX

Module 6: Device Connectivity

- Connecting PLCs and various industrial devices
- Configuring drivers and protocols for device communication
- Simulating devices for testing and development
- Quality Data Capture - Current and Voltage Capture

Module 7: OPC and OPC UA

- In-depth exploration of OPC (OLE for Process Control) and OPC UA
- Implementing secure data transfer with OPC UA
- Tunneling data for remote communication

Module 8: KEPServerEX Essentials

- Navigating the KEPServerEX user interface
- Configuring data sources and tags
- Data logging and event handling

Module 9: Diagnostics and Optimization

- Diagnosing and troubleshooting common issues
- Strategies for optimizing KEPServerEX performance
- Real-time and historical data analysis

Module 10: Industrial IoT (IIoT) Integration

- Understanding IIoT in the industrial context
- Leveraging KEPServerEX for IIoT connectivity
- IIoT data analytics and reporting
- Reporting to AWS/Azure Cloud
- SCADA System Data Acquisition