Process Automation Learning Services

2021

E-Learning

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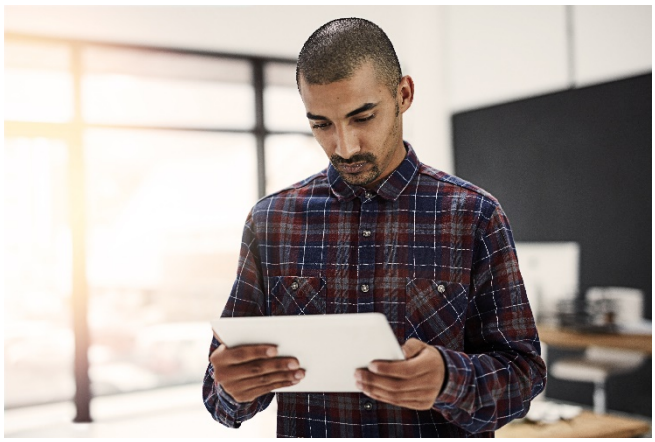
Process Automation Learning Services (PALS)



2. E-Learning

Section Table of Contents (TOC)

Process Automation Basic Collection

This section is organized to show individual e-learning courses in the *Process Automation Basic Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1049 Introduction to Automation Systems

This course provides essential knowledge on the basic concepts of automation systems. The course also covers the fundamental concepts of a Distributed Control System (DCS), a Programmable Logic Controller (PLC) system, and a Supervisory Control and Data Acquisition (SCADA) system

This course is also useful for process automation professionals looking to refresh their knowledge of automation fundamentals.

Learning Objectives

After completing this course, you can:

- Identify different types of control loops.
- Define automatic control systems.
- Explain the different industrial process control systems.
- Identify common components of industrial process control systems.
- Differentiate between the following industrial process control systems:
  - DCS
  - PLC
  - SCADA

Prerequisites

Knowledge of:

- Automation systems and control processes
- DCSs

Audience

- Control Engineers

Available As

E-learning

Part of Process Automation Basic

2 hours

1051 Understanding P&IDs and Control Strategies

Piping and Instrumentation Diagrams (P&IDs) describe the requirements that Schneider Electric receives from customers. These requirements detail the physical sequence of equipment and control logic in a process automation plant. Engineers interpret these requirements and build control loops accordingly.

This foundational course helps you interpret process symbols in P&IDs and identify frequently used control strategies, such as feedback, cascade, ratio, and split-range loops.

This course is also useful for process automation professionals looking to refresh their knowledge of automation fundamentals.

Learning Objectives

After completing this course, you can:

- Read P&IDs effectively.
- Interpret client databases before converting them to control loops.
- Explain key features and various applications of frequently used control strategies.

Prerequisites

Knowledge of process control basics

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Process Automation Basic

2 hours

1159 Measuring Process Variables

Industrial processes involve physical characteristics that can change or vary constantly. These variables form a significant part of process control. Measuring process variables involves quantifying the analog or digital signal of a physical characteristic, resulting in the assignment of a value for a variable in the control process.

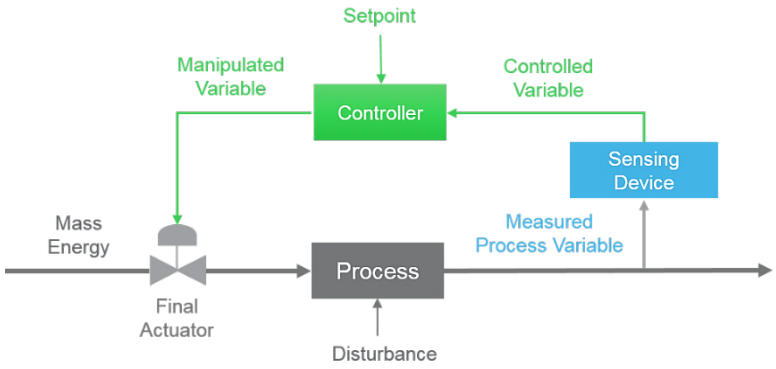
In this course, you learn about common process variables, such as temperature, pressure, level, and flow. You also learn how control systems measure process variables and factors that affect the measurement of these variables.

This course is also useful for process automation professionals looking to refresh their knowledge of automation fundamentals.

Learning Objectives

After completing this course, you can:

- Identify industrial process variables and their physical characteristics.
- Recognize factors that affect the measurement of process variables.



Prerequisites

None

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

Part of Process Automation Basic

1 hour, 15 minutes

1160 Instrumentation for Measuring Process Variables

Instrumentation refers to the devices used to measure values of variables in a process and to send these measurements to another device or control processor. In this course, you learn about commonly used instrumentation for measuring variables and sending this information through analog or digital signals in industrial control applications. You also learn about equipment for translating a control signal into a physical control action.

This course is also useful for process automation professionals looking to refresh their knowledge of automation fundamentals.

Learning Objectives

After completing this course, you can:

- Identify key instrumentation for measuring the temperature, pressure, level, and flow variables of a control process.
- Describe key equipment for conditioning and controlling process variables.

Prerequisites

Knowledge of process variables

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

Part of Process Automation Basic

1 hour, 15 minutes

Control Engineering Foundation Collection

This section is organized to show individual e-learning courses in the *Control Engineering Foundation Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering	• Process Automation	• Control Engineering
	• Control HMI	• Process Automation Security	• Safety Engineering
	• Networking	• Safety Engineering	
	• Safety Engineering	• Virtualization	

1230 Control Systems: Basic Hardware

New

Foxboro™ Distributed Control System (DCS) is an enterprise system that controls and manages all industrial plant activities. Foxboro DCS enables plant engineers to develop, deploy, and manage control configuration and achieve plant automation through efficient tools, process displays, and data storage mechanisms. Proper selection, installation, and maintenance of hardware components for Foxboro DCS are fundamental activities for ensuring fault-tolerant process automation.

This course provides essential knowledge on the basic hardware components you use in Foxboro DCS, including servers, workstations, annunciator keyboards, Ethernet switches, enclosures, baseplates, termination assemblies, and Fieldbus Communication Modules (FCMs).

Learning Objectives

During this course, you acquire knowledge to:

- Choose hardware components that meet the project requirements for a control system.
- Install these hardware components in the control system.
- Perform maintenance activities on each hardware component.

Prerequisites

Basic knowledge of Foxboro DCS

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

1 hour, 45 minutes

Part of Control Engineering Foundation

1231 Control Systems: FCP280 and FDC280

New

Foxboro™ Distributed Control System (DCS) includes several types of controllers, including Field Control Processor 280 (FCP280) and Field Device Controller 280 (FDC280).

- FCP280 is an optionally fault-tolerant station that performs regulatory, logic, timing, and sequential control, together with connected Fieldbus Modules (FBMs). FCP280 also performs data acquisition, alarm detection, and notification.
- FDC280 is a distributed, optionally fault-tolerant, field-mounted controller that performs process control and alarming functions according to a user-defined control strategy. FDC280 provides direct field device integration without the need for additional FBMs.

This course provides essential knowledge on the basic hardware components of FCP280, FDC280, and their baseplates. Additionally, the course covers the similarities and differences between the steps for installing, diagnosing, and maintaining FCP280 and FDC280 in their control networks.

Learning Objectives

During this course, you acquire knowledge to:

- Identify the features and functionality of FCP280 and FDC280.
- Install and maintain FCP280 in a control network.
- Install and maintain FDC280 in a control network.
- Identify faults that inhibit normal fault-tolerant operations in FCP280 and FDC280.

Prerequisites

Basic knowledge of Foxboro DCSs

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

1 hour, 15 minutes

Part of Control Engineering Foundation

1147 Understanding Foxboro System Architecture

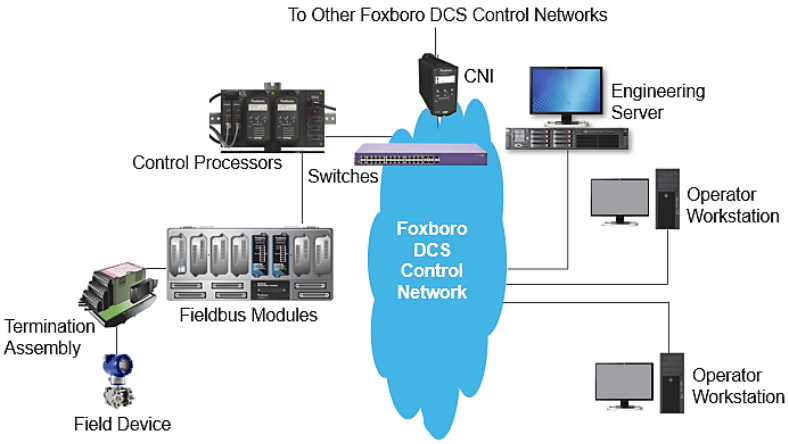
This course provides essential knowledge on the basics of Foxboro™ Distributed Control System (DCS) architecture, including the relationship between hardware and software components. Specifically, this course addresses how different functions in these components automate and control an industrial process.

Foxboro DCS integrates all processes, applications, and field devices in a control system. The architecture in Foxboro DCS helps you manage information and control field devices through a variety of tools.

Learning Objectives

After completing this course, you can:

- Explain the hardware components of Foxboro DCS.
- Recognize the way that data flows from one hardware component to another.
- Define the topologies in Foxboro DCS Control Network.
- Explain the different software components of Foxboro DCS.
- Identify the various tools that support Foxboro DCS.
- List the high-level steps to install Foxboro DCS software components.



Prerequisites

Basic knowledge of process automation and Foxboro DCSs

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

3 hours, 10 minutes

Part of Control Engineering Foundation

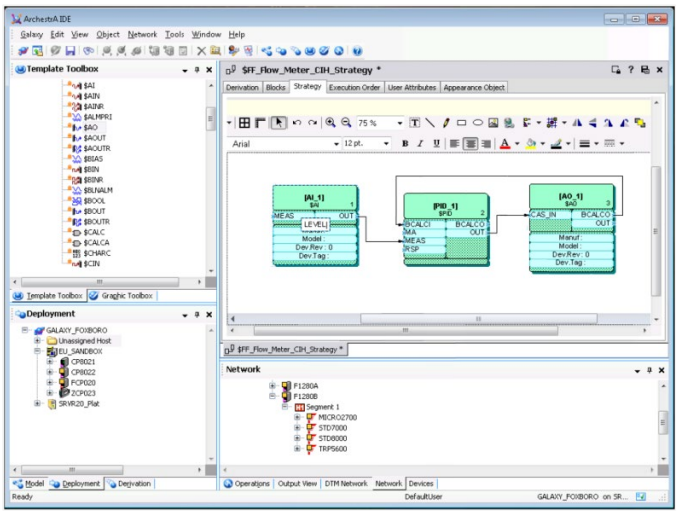
1059 Foxboro Control Software Overview

This foundational course provides an overview of Foxboro™ Control Software (FCS), a powerful and integrated engineering suite of tools that enhance both engineering productivity and quality.

Learning Objectives

After completing this course, you can:

- Describe the fundamentals and salient features of FCS.
- Identify the role of FCS in process control.
- List the functionality of FCS components, including:
  - Historian
  - System Manager
  - Security
  - Alarming



Prerequisites

Completion of courses in the Process Automation Basics Collection or equivalent knowledge

Audience

- Control Engineers
- Plant Operators

Available As

E-learning

Part of Control Engineering Foundation

2 hours

1069 Configuring Sequence Controls

This course provides essential knowledge on the configuration of sequence control blocks in Foxboro™ Distributed Control Systems (DCS). Topics include the features and functions of sequence control blocks, block interaction in a sequence control process, and block programming using High Level Batch Language (HLBL) syntax. Knowledge of sequence control blocks enables plant personnel to configure sequence control in plant processes easily and efficiently.

Learning Objectives

After completing this course, you can:

- Explain the features and functions of sequence control blocks.
- Manage the states and interactions of sequence control blocks in a sequence control process.
- Identify the different sections used in sequence control blocks.
- Program sequence control logic using HLBL syntax.

Prerequisites

Knowledge of:

- Programming using Structured Text
- ArchestrA™ Integrated Development Environment (IDE)

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

Part of Control Engineering Foundation

1 hour, 30 minutes

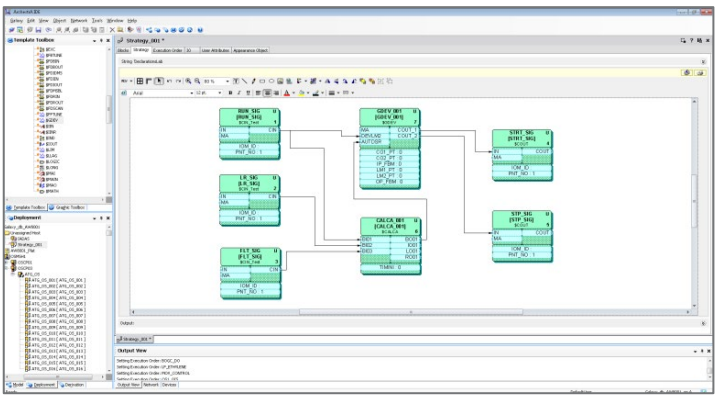
1137 Configuring Discrete Control Loops

This course introduces you to a variety of control blocks in Foxboro™ Distributed Control System (DCS) Control Core Services for processing discrete information to and from digital field devices. Using Foxboro DCS Control Editors, you develop a control loop by selecting input and output blocks, blocks representing devices, and blocks that perform advanced functions. You connect and configure these blocks in control strategies within control compounds. After deployment to a running control processor, you monitor the behavior of the control loop through displays or faceplates in Foxboro Control HMI.

Learning Objectives

After completing this course, you can:

- Recognize the components of a discrete control loop.
- Distinguish the functions and operations of different blocks for discrete control.
- Identify logic, Boolean, and timer functions in LOGIC and CALCA blocks.
- Create and configure a discrete control loop using Control Editors.
- Display the behavior of a discrete control loop using Control HMI.



Prerequisites

None

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

2 hours

Part of Control Engineering Foundation

1141 Processing Field Signals

This course provides essential knowledge on continuous control loops and their configuration for processing signals from field devices. Topics include the process flow for signal conditioning and the configuration of AIN and AOUT blocks for processing field signals. Knowledge of different types of continuous control loops and field signal processing enables you to implement control processes that comply with plant requirements.

Learning Objectives

After completing this course, you can:

- Explain how continuous control loops enable signal processing in Foxboro™ systems.
- Configure an AIN block to process input signals in a plant process.
- Develop an AOUT block to condition signals and relay processed output.

Prerequisites

Knowledge of:

- Distributed Control Systems (DCSs) and control loops
- ArchestrA™ Integrated Development Environment (IDE)

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

1 hour

Part of Control Engineering Foundation

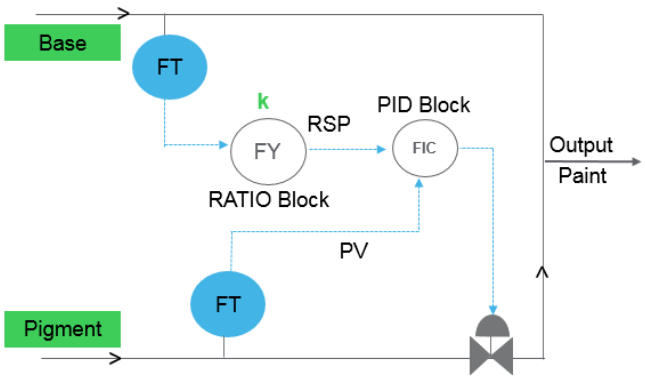
1142 Configuring Ratio Control Loops

This course provides essential knowledge on the operation of a ratio control loop and the configuration of a ratio control loop in Foxboro™ Distributed Control System (DCS) Control Editors. Ratio control is a continuous control mechanism that monitors and controls the blending of a controlled flow variable, in proportion to an uncontrolled flow variable, to create an output. To control and maintain the ratio of these flow variables, you require a ratio control loop.

Learning Objectives

After completing this course, you can:

- Explain the purpose and operation of a ratio control loop in process automation.
- Identify key parameters of the RATIO block in Control Editors.
- Configure a ratio control loop in Control Editors and validate the operation of the loop in Foxboro Control HMI.



Prerequisites

- Knowledge of Distributed Control Systems (DCSs) and ArchestrA™ Integrated Development Environment (IDE)
- Completion of 1149 Configuring Split-Range Control Loops

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

1 hour

Part of Control Engineering Foundation

1143 Configuring Complex Loops

This course provides essential knowledge on the operation and configuration of a complex loop in a control process in Foxboro™ Distributed Control System (DCS) Control Editors. A complex loop includes multiple continuous control loops designed to execute a plant process. By configuring a complex loop, you can ensure continuous operations during process upsets or abnormal conditions.

Learning Objectives

After completing this course, you can:

- Explain the components required for configuring a complex loop.
- Build a complex loop in Control Editors based on project requirements.
- Validate the execution of the complex loop in Foxboro Control HMI.

Prerequisites

- Knowledge of Distributed Control Systems (DCSs) and ArchestrA™ Integrated Development Environment (IDE)
- Completion of 1142 Configuring Ratio Control Loops

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

1 hour, 30 minutes

Part of Control Engineering Foundation

1148 Configuring Feedback Control Loops

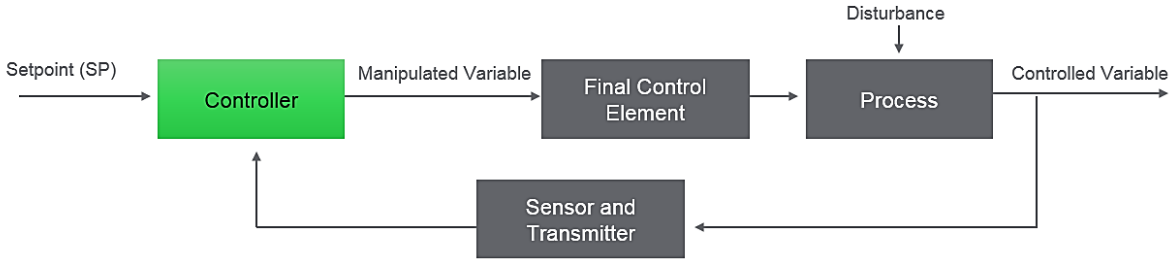
This course focuses on configuring a feedback control loop using Foxboro™ Distributed Control System (DCS) Control Editors. Feedback control is a common and powerful control methodology for designing a control system. Feedback control loops use system output to re-adjust system performance to achieve the expected output response.

This course provides basic knowledge on the concept of feedback control, Proportional Integral Derivative (PID) block parameters in a feedback control loop, and configuration of a feedback control loop.

Learning Objectives

After completing this course, you can:

- Explain the use and operation of a feedback control loop in process automation.
- Configure a PID block in a feedback control loop.
- Build and validate a feedback control loop using Control Editors.



Prerequisites

Knowledge of:

- Process control
- Control Editors
- Microsoft® Office tools

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour, 12 minutes

Part of Control Engineering Foundation

1149 Configuring Split-Range Control Loops

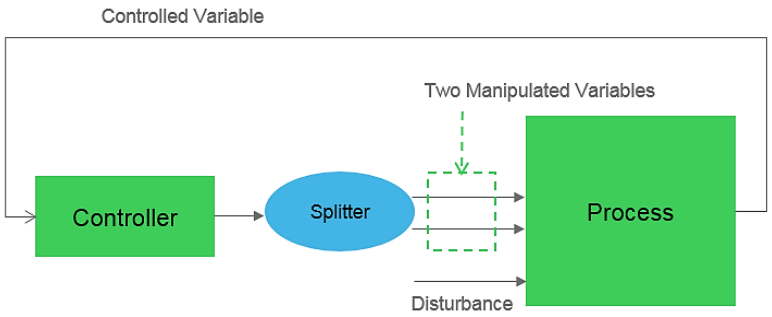
This course focuses on configuring a split-range control loop using Foxboro™ Distributed Control System (DCS) Control Editors. Split-range control is one of the most commonly used techniques to control a single process variable using two manipulated variables.

This course provides basic knowledge on the concept of split-range control, block parameters in a split-range control loop, and configuration of a split-range control loop.

Learning Objectives

After completing this course, you can:

- Explain the purpose and operation of a split-range control loop in process automation.
- Configure a Characterizer (CHARC) block in a split-range control loop.
- Build a split-range control loop using Control Editors.



Prerequisites

Knowledge of:

- Process control
- Control Editors
- Microsoft® Office tools

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour, 6 minutes

Part of Control Engineering Foundation

1150 Configuring Cascade Control Loops

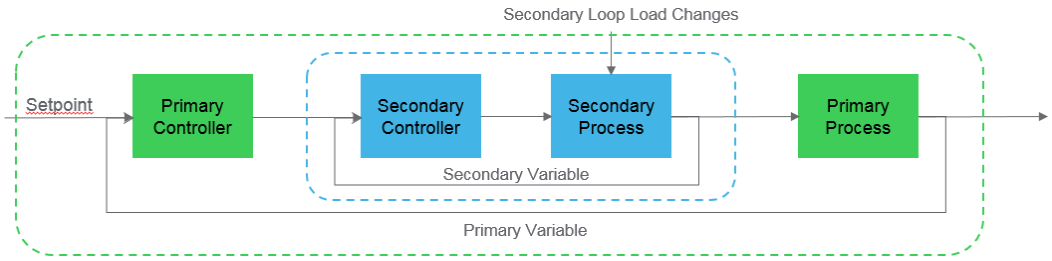
This course focuses on configuring a cascade control loop using Foxboro™ Distributed Control System (DCS) Control Editors. Cascade control enables proactive and corrective system responses to a system fault, instead of reactive responses to negative impact from the fault. To create cascade control loops, you use specific blocks to control the process.

This course provides basic knowledge on the concept of cascade control, Proportional Integral Derivative (PID) block parameters in a cascade control loop, and configuration of a cascade control loop.

Learning Objectives

After completing this course, you can:

- Explain the use and operation of a cascade control loop in process automation.
- Configure Proportional Integral Derivative (PID) blocks in a cascade control loop.
- Build and validate a cascade control loop using Foxboro DCS Control Editors.



Prerequisites

Knowledge of:

- Process control
- Control Editors
- Microsoft® Office tools

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour

Part of Control Engineering Foundation

1151 Understanding the Basics of Control Configuration

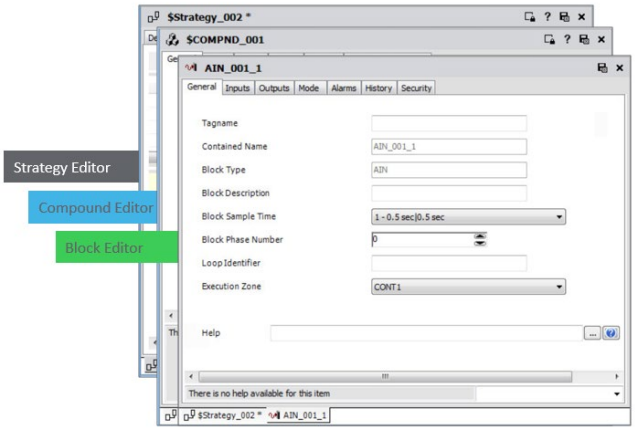
This course provides essential knowledge on the basic concepts of Foxboro™ Distributed Control System (DCS) configuration tools, including Foxboro DCS Control Editors. Specifically, this course focuses on using Control Editors to create and configure process control logic.

Course topics cover creating toolsets and templates, importing and exporting control objects, and backing up and restoring a Galaxy.

Learning Objectives

After completing this course, you can:

- Describe basic concepts of configuring process control logic.
- Explain features and benefits of Control Editors.
- Create toolsets and templates in Control Editors.
- Import and export control objects to and from a Galaxy.
- Back up and restore a Galaxy using System Manager Console.



Prerequisites

Knowledge of:

- Process control
- Process and Instrumentation Diagrams (P&IDs)

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour, 24 minutes

Part of Control Engineering Foundation

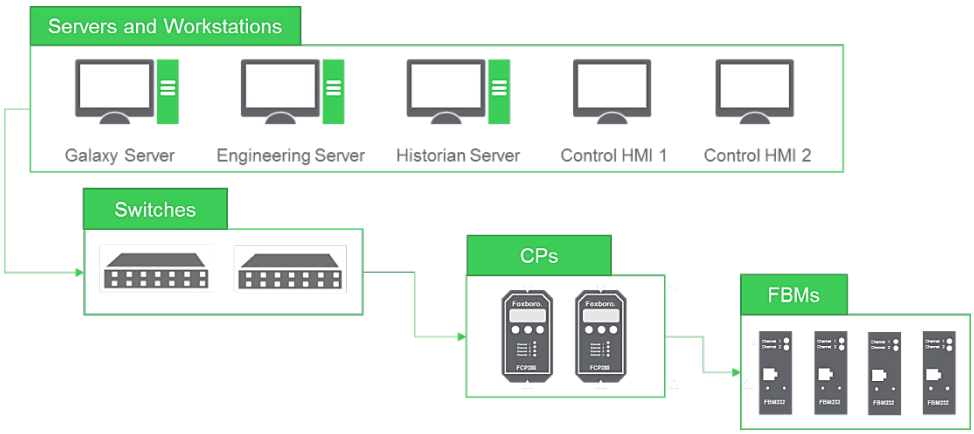
1152 Configuring Hardware Components

This course provides essential knowledge on configuring hardware equipment in a plant, which involves translating physical equipment information into logical representation. In this course, using Foxboro™ Distributed Control System (DCS) Control Editors, you create and configure hardware components, such as Control Processors (CPs), Fieldbus Modules (FBMs), workstations, and switches, into logical groups of equipment units that model plant areas. You also validate and save the hardware configuration.

Learning Objectives

After completing this course, you can:

- Create equipment units.
- Create and configure CPs, switches, workstations, and FBMs.
- Validate, commit, and reconcile hardware configuration.
- Deploy hardware equipment to a running system.



Prerequisites

Knowledge of:

- Process control loops
- Basic control configuration

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

Part of Control Engineering Foundation

1 hour, 12 minutes

1153 Configuring Control Objects

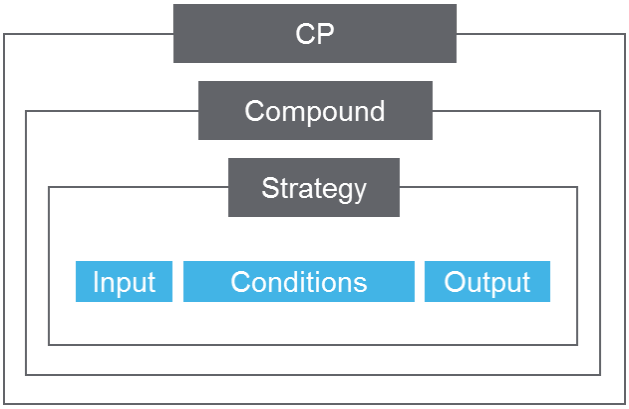
Creating and configuring control objects is referred to as the process of converting customer requirements into logical functions that the Control Processor (CP) executes.

In this course, you learn how to create and configure different control objects, such as compounds, strategies, and blocks, using Foxboro™ Distributed Control System (DCS) Control Editors. You also learn how the CP executes control objects and the sequence of execution the CP follows.

Learning Objectives

After completing this course, you can:

- Create and configure compounds.
- Create block templates.
- Identify the basic process cycle of a CP.
- Build and configure strategies.
- Explain strategy declaration management.



Prerequisites

Knowledge of:

- Process control loops
- Basic control configuration

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour, 30 minutes

Part of Control Engineering Foundation

1154 Deploying and Verifying Control Objects

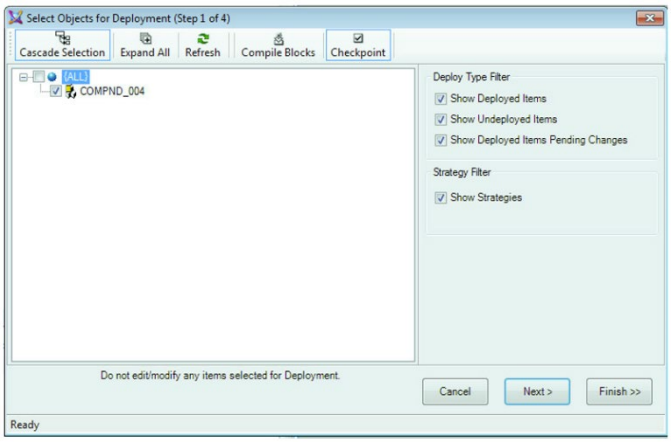
Control object deployment involves the methodical copying of all configurations to the physical CP. These configurations include compounds, strategies, and blocks.

In this course, you use Foxboro™ Distributed Control System (DCS) Control Editors to deploy the control objects for execution by the CP. You also learn how to validate control object configurations using Live Data and Object Viewer in Control Editors.

Learning Objectives

After completing this course, you can:

- Deploy, undeploy, and redeploy control objects.
- Display real-time values using Live Data mode.
- Verify control objects using Object Viewer.



Prerequisites

Knowledge of:

- Process control loops
- Basic control configuration
- Configuration of hardware components and control objects

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour

Part of Control Engineering Foundation

1155 Generating Bulk Data for Control Objects

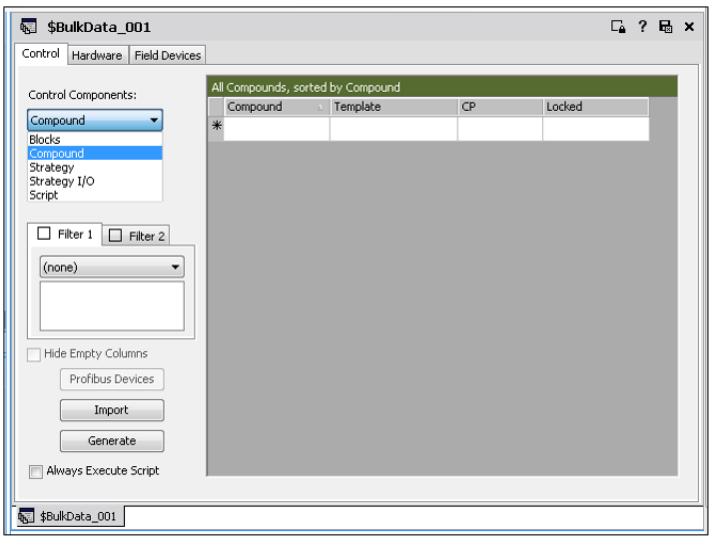
Using the bulk data feature of Foxboro™ Distributed Control System (DCS) Control Editors is like creating multiple copies of the control strategy for identical process loops. This time-saving feature conveniently helps you recreate the control strategy.

In this course, you learn how to generate the bulk data of control applications from stored templates or external project data.

Learning Objectives

After completing this course, you can:

- Create bulk data objects.
- Import and export bulk control data.
- Generate bulk data of control objects.



Prerequisites

Knowledge of:

- Process control loops
- Basic control configuration
- Configuration of hardware components and control objects

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

Part of Control Engineering Foundation

1 hour, 24 minutes

Control HMI Foundation Collection

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1252 Identifying the Fundamentals of Control HMI

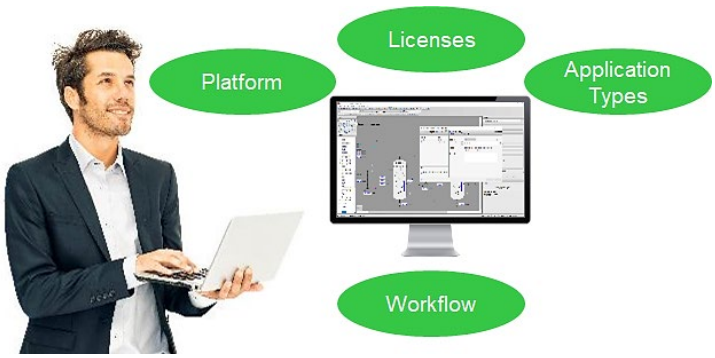
A Human Machine Interface (HMI) enables you to configure and manage industrial processes. Foxboro™ Control HMI is a powerful tool for building HMIs for process control activities. You can use Control HMI to build HMIs for Foxboro Distributed Control System (DCS), Triconex™ Safety System, or any other process automation system.

This course provides fundamental knowledge on Control HMI, including the benefits of using Control HMI, licenses for building Control HMI applications, Control HMI application types, and the workflow for building graphics in Control HMI applications.

Learning Objectives

After completing this curriculum, you can:

- Explain Control HMI and its benefits.
- Describe the functions of System Platform in Control HMI.
- Identify required licenses for building Control HMI applications.
- List the types of Control HMI application.
- Describe the workflow for building graphics in Control HMI applications.



Prerequisites

- Knowledge of Foxboro Distributed Control Systems (DCSs)
- Experience in Foxboro DCS Control Core Services and Control Software

Audience

- Control Engineers

Available As

E-learning

Part of Control HMI Foundation

35 minutes

1253 Exploring the Features of Control HMI

You use a Human Machine Interface (HMI) to manage control processes. Foxboro™ Control HMI is a multi-featured tool that includes high-quality graphics, customizable symbols and libraries, multi-monitor configuration, alarms and trends, and scripts. These features enhance your operational efficiency.

This course provides fundamental knowledge on the standard features of Control HMI.

Learning Objectives

After completing this curriculum, you can:

- Identify the standard features for graphics development in Control HMI.
- Describe alarms, trends, and scripts in Control HMI.

Prerequisites

- Knowledge of Foxboro Distributed Control Systems (DCSs)
- Completion of 1252 Identifying the Fundamentals of Control HMI

Audience

- Control Engineers

Available As

E-learning

Part of Control HMI Foundation

40 minutes

1254 Configuring Managed Control HMI Applications

Foxboro™ Control HMI enables you to develop Managed Human Machine Interface (HMI) applications. For Distributed Control Systems (DCSs), you configure Managed applications. To configure Managed applications, Control HMI provides you with ArchestrA™ Graphic symbols and libraries. When configuring a Managed application, you can adopt best practices and ensure better HMI performance.

This course provides essential knowledge on the configuration of Managed Control HMI applications.

Learning Objectives

After completing this curriculum, you can:

- Explain standard components and libraries in Control HMI.
- Create ArchestrA symbols in Control HMI.
- Develop overlays for symbols in Control HMI.
- Create a process display window and view the window in runtime.

Prerequisites

- Knowledge of Foxboro Distributed Control Systems (DCSs)
- Completion of 1253 Exploring the Features of Control HMI

Audience

- Control Engineers

Available As

E-learning

Part of Control HMI Foundation

1 hour, 25 minutes

1255 Scripting, Alarming, and Maintenance Procedures in Control HMI

A Control HMI application can include scripted functions for executing tasks, such as opening a window or triggering an animation. In addition, Control HMI applications include alarms to alert plant personnel during abnormal situations. Deployed Control HMI applications require routine evaluation and maintenance.

This course provides fundamental knowledge on standard procedures and best practices for scripting, alarming, and maintaining Control HMI applications.

Learning Objectives

After completing this curriculum, you can:

- Implement scripting in Control HMI.
- Summarize best practices to execute scripts in Control HMI.
- Configure alarm monitoring and storing in Control HMI.
- Describe the purpose of generating Graphics Performance Index (GPI) and Object Manager (OM) reports.

Prerequisites

- Knowledge of Foxboro Distributed Control Systems (DCSs)
- Completion of 1254 Configuring Managed Control HMI Applications

Audience

- Control Engineers

Available As

E-learning

Part of Control HMI Foundation

1 hour

Networking Foundation Collection

This section is organized to show individual e-learning courses in the *Networking Foundation Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

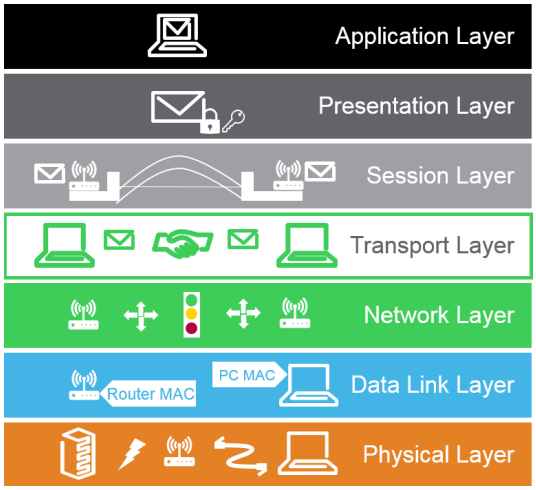
1239 OSI Model for Ethernet Networks

This course introduces the seven layers of the Open Systems Interconnection (OSI) model for Ethernet networks. The OSI model enables different types of network hardware and software to communicate with each other. The OSI model helps you to think about networks in chunks or layers, which you can easily identify and manage.

Learning Objectives

After completing this course, you can:

- Explain the basics of networking.
- Describe the function of each layer in the OSI model.
- Explain how Ethernet encapsulates and transmits data through the seven layers.



Prerequisites

Knowledge of:

- Control systems
- Automation systems

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

30 minutes

Part of Networking Foundation

1240 Ethernet in Data Link and Physical Layers

This course introduces two layers of the Open Systems Interconnection (OSI) model. The Data Link layer and the Physical layer are important to understand when using Ethernet networks.

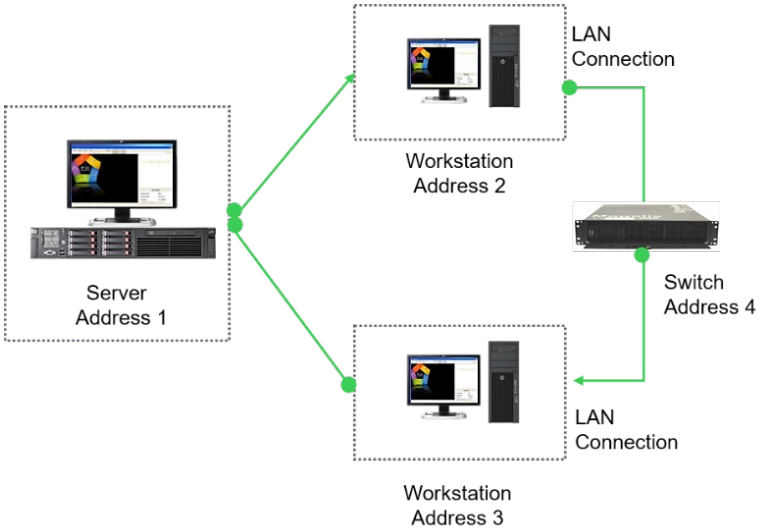
- The Data Link layer creates Ethernet frames and prepares data for transmission.
- The Physical layer represents the actual transmission medium and physical connection between network devices.

Additionally, this course focuses on cable types, network topologies, and their uses.

Learning Objectives

After completing this course, you can:

- Recognize requirements for network addresses.
- Explain different transmission modes.
- Describe common types of network cables.
- Distinguish between half-duplex and full-duplex Ethernet.
- Identify different network topologies.



Prerequisites

Knowledge of:

- Control systems
- Automation systems
- The Open Systems Interconnection (OSI) model or completion of 1239 OSI Model for Ethernet Networks

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

1 hour

Part of Networking Foundation

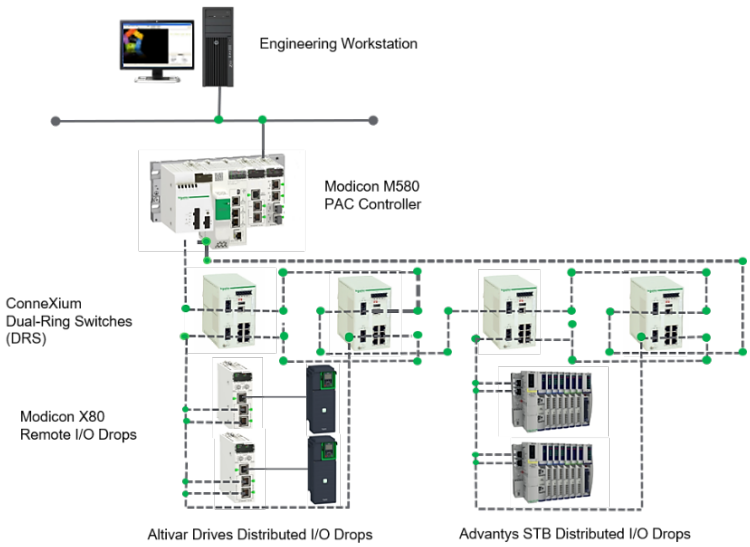
1241 Control Network Implementation

This course introduces network connectivity and explains how to implement an Ethernet network.

Learning Objectives

After completing this course, you can:

- Explain the functions of various network connectivity devices, such as hubs, switches, routers, and gateways.
- Create an Ethernet network.
  - Identify network requirements.
  - Connect the network.
  - Configure addresses for network devices.
- Test and troubleshoot the network for operation.



Prerequisites

Knowledge of:

- Control systems
- Automation systems
- The Open Systems Interconnection (OSI) model or completion of 1239 OSI Model for Ethernet Networks

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour

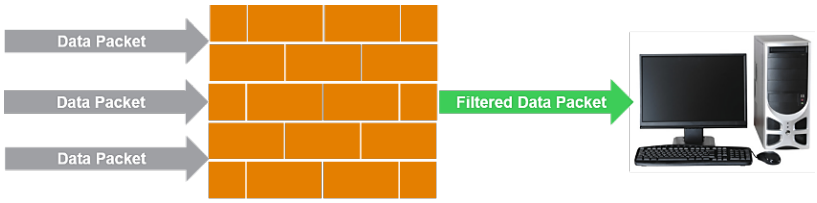
1242 Communication Protocols and Security Configuration

This course provides essential knowledge on the communication protocols within two layers of the Open Systems Interconnection (OSI) model: the Transport layer and the Application layer. The course also introduces different techniques to help secure networks and limit unauthorized access or digital threats to operating networks.

Learning Objectives

After completing this course, you can:

- Explain common communication protocols of the Transport layer.
- Identify common industrial communication protocols.
- Manage overall network operation using Simple Network Management Protocol (SNMP).



Application Layer Firewalls

- Explain the operation of web page, data transfer, and time management protocols.
- Configure and view communication protocols for a Programmable Automation Controller (PAC).
- Secure networks using firewalls and other security techniques.

Prerequisites

Knowledge of:

- Control systems
- Automation systems
- The Open Systems Interconnection (OSI) model or completion of 1239 OSI Model for Ethernet Networks

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour, 30 minutes

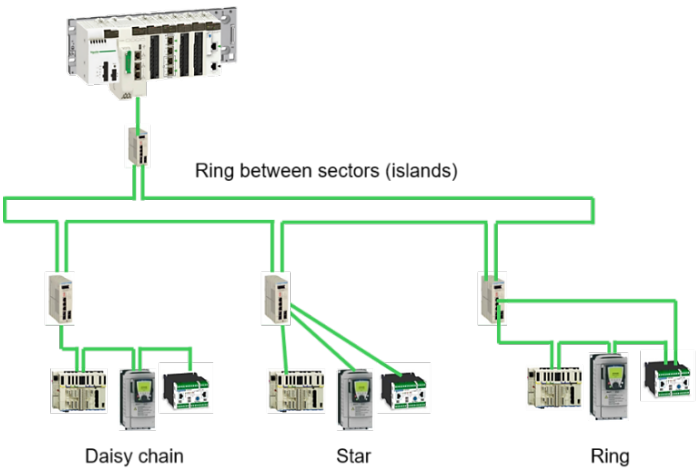
1243 Switch Architecture and Configuration

This course identifies routing resilience methods. The course also addresses many underlying network management issues.

Learning Objectives

After completing this course, you can:

- Manage network availability and configure systems for resiliency.
- Manage traffic with service prioritization and virtual LANs.
- Configure network settings for a ConneXium switch.



Prerequisites

Knowledge of:

- Control systems
- Automation systems
- The Open Systems Interconnection (OSI) model or completion of 1239 OSI Model for Ethernet Networks

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour

1205 Getting Started with Foxboro Control Networks

This course provides essential knowledge on Foxboro™ Control Networks.

Foxboro Control Network is a switched, fast Ethernet network that enables communication between field devices, I/O modules, Control Processors (CPs), workstations, and servers. This advanced network provides redundant data paths and enables standard and security-enhanced features.

The course familiarizes you with the fundamental concepts of Foxboro Control Networks, including topologies, supported Ethernet switches, and loop management algorithms. Additionally, this course also covers leveraging these concepts to design Control Networks.

Learning Objectives

After completing this course, you can:

- Describe the process of building Foxboro Control Networks.
- Design Control Networks.
- Integrate X-Series and legacy switches into Control Networks.

Prerequisites

Knowledge of:

- Ethernet network concepts
- Hardware architecture and components in Foxboro Distributed Control Systems (DCSs)
- System Manager
- System Definition configuration

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour

1206 Configuring, Securing, and Troubleshooting Switches

This course provides essential knowledge on configuring, securing, and troubleshooting switches in Foxboro™ Control Networks.

Switch Configuration Application Software™ (SCAS) is a dedicated tool for configuring Ethernet switches in Foxboro Control Networks. Specifically, SCAS enables you to configure communications, deploy loop management algorithms, and disable unused ports to help avoid potential security breaches to Foxboro Control Networks. After configuring these settings, you generate a configuration file that you download to the switch.

This course helps you configure and deploy switch configuration files using SCAS.

Learning Objectives

After completing this course, you can:

- Configure and secure network switches.
- Deploy and validate switch configuration.
- Monitor and troubleshoot Foxboro Control Networks using SCAS.

Prerequisites

Knowledge of:

- Ethernet network concepts
- Hardware architecture and components in Foxboro Distributed Control Systems (DCSs)
- System Manager
- System Definition configuration

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour

1225 NetSight Suite Console for Foxboro DCS Network Analysis

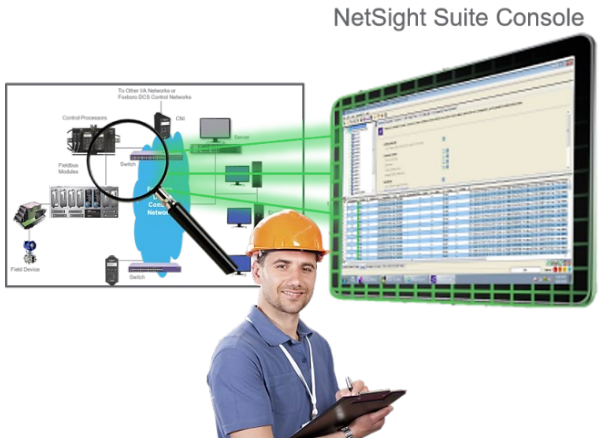
NetSight® Suite Console is a dedicated network tool for monitoring the operational status of switches in plant networks and maintaining network uptime. Features in NetSight Suite Console, such as Discover, Topology Manager, FlexViews, Device Manager, and Alarms and Events, assist you with network monitoring activities.

This course guides you through the fundamentals of NetSight Suite Console and the effective use of features for monitoring plant networks and analyzing network behavior. Practice exercises reinforce application knowledge acquired in this course.

Learning Objectives

After completing this course, you can:

- Explain the features of NetSight Suite Console.
- Summarize the installation procedure for NetSight Suite Console.
- Monitor and diagnose a network using Topology Manager and FlexViews.
- View alarm, event, and trap details for network devices.
- Enable alarm notifications for available network traps using Alarm Manager.



Prerequisites

Knowledge of:

- Networking
- Network topologies
- Network analysis
- Switch configuration

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

2 hours, 30 minutes

1232 Control Systems: Control Network Interface

New

Foxboro™ Distributed Control System (DCS) is a self-contained hardware and software solution for process control systems. Foxboro DCS includes Control Network Interface (CNI), which facilitates Ethernet communication between two Foxboro DCSs over a customer-supplied connection. CNI enables communication between various control processors across the industrial plant.

This course provides essential knowledge on the basic hardware components of CNI and the CNI baseplate. The course also covers how to install, diagnose, and maintain CNI in a control network.

Learning Objectives

During this course, you acquire knowledge to:

- Identify the features and functionality of CNI.
- Install and configure CNI.
- Diagnose and maintain CNI.

Prerequisites

Basic knowledge of Foxboro DCSs

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Networking Foundation

1 hour

Safety Engineering Foundation Collection

This section is organized to show individual e-learning courses in the *Safety Engineering Foundation Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1079 Safety System Basics

This foundational course provides general awareness of safety technology for process automation industrial plants. This course elaborates on safety concepts, safety measures, and global safety standards established to minimize and manage potential risks to acceptable levels. The course describes the protection layers implemented in a plant setup, the three main stages of the safety project life cycle, and the importance of Functional Safety Management (FSM) certification.

This course is also useful for process automation personnel looking to refresh their knowledge of process safety fundamentals.

Learning Objectives

After completing this course, you can:

- Explain the importance of safety and the causes of incidents.
- Distinguish between the prevention and mitigation layers.
- Describe the basic concepts of functional safety standards.
- Explain the purpose of Safety Integrity Levels (SILs) and the different methods to determine a SIL.
- Outline the safety project life cycle.
- Define Process Hazard Analysis (PHA) and the different methods associated with PHA.
- Discuss the Safety Requirements Specification (SRS) for a Safety Instrumented System (SIS).
- Identify the procedures for Management of Change (MOC).
- State the importance of FSM certification.

Prerequisites

None

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

1 hour

Part of Safety Engineering Foundation

1234 Safety Systems: Tricon CX Controller

New

Tricon™ CX controllers are designed for safety and critical control applications in the Oil and Gas, Power, Refining, Chemicals, Pharmaceutical, and Biotech industries. As a safety and security certified system, the Tricon CX controller helps ensure operational integrity and provide protection against both inherent risks and external threats, such as cyberattacks. The Tricon CX controller uses Triple Modular Redundant (TMR) architecture, which integrates three isolated, parallel control systems and extensive diagnostics into one system. Tricon CX controllers offer the best of Tricon and Trident™ Safety Integrity Level 3 (SIL 3) systems with safer, more reliable, and uninterrupted operations; increased plant uptimes; and reduced downtime costs.

This course provides essential knowledge on the hardware components of the Tricon CX controller, including Main Processor (MP), I/O, and communication components.

Learning Objectives

During this course, you acquire knowledge to:

- Select Tricon CX hardware components that meet the project requirements for the safety system.
- Install Tricon CX hardware components in the safety system.
- Diagnose indicators for each Tricon CX hardware component.
- Replace Tricon CX hardware components as required.

Prerequisites

Basic knowledge of Foxboro™ Distributed Control Systems (DCSs)

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

1 hour, 44 minutes

1235 Safety Systems: Tricon Controller

New

The Tricon™ controller is designed for use in safety applications requiring Safety Integrity Level (SIL) 1, 2, or 3. These high-integrity controllers provide fault tolerance using Triple-Modular Redundant (TMR) architecture, which integrates three isolated, parallel control systems and extensive diagnostics into one system. Tricon controllers enable repair without process interruption and help reduce unexpected production outages and downtime.

This course provides essential knowledge on the hardware components of the Tricon controller, including Main Processor (MP), I/O, and communication components.

Learning Objectives

During this course, you acquire knowledge to:

- Select Tricon hardware components that meet the project requirements for the safety system.
- Install Tricon hardware components in the safety system.
- Diagnose indicators for each hardware component.
- Replace Tricon hardware components as required.

Prerequisites

Basic knowledge of safety Programmable Logic Controllers (PLCs)

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

2 hours, 10 minutes

Part of Safety Engineering Foundation

1236 Safety Systems: Trident Controller

New

Certified by TÜV Rheinland, the Trident™ controller is recommended for use in safety applications up to Safety Integrity Level 3 (SIL 3). The Trident controller helps secure the plant environment and reduce unexpected production outages and downtime. Based on Triple Module Redundant (TMR) architecture, the Trident controller includes hardware components that address the requirements of safety and critical control applications, such as Emergency Safety Shutdown (ESD) systems, Burner Management systems, Fire and Gas systems, and High Integrity Pressure and Protection Systems (HIPPS).

This course provides essential knowledge on Trident controller hardware components, including the Main Processor (MP), communication, and I/O modules. The course also covers the diagnosis, proof testing, and replacement of each hardware component.

Learning Objectives

During this course, you acquire knowledge to:

- Select Trident hardware components that meet the project requirements for the safety system.
- Install Trident hardware components in the safety system.
- Diagnose indicators for each hardware component.
- Replace Trident hardware components as required

Prerequisites

Basic knowledge of safety Programmable Logic Controllers (PLCs)

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

2 hours, 14 minutes

1237 Safety Systems: Tri-GP Controller

New

The Triconex™ General Purpose (Tri-GP™) controller is a programmable logic and process controller that provides a high level of system fault tolerance. This controller supports Safety Integrity Level 2 (SIL 2) applications and is based on Triple Module Redundant (TMR) architecture. Due to its scalability, the Tri-GP controller provides safety for small stand-alone and large distributed applications.

This course provides essential knowledge on the hardware components of the Tri-GP controller, including Main Processor (MP), I/O, and communication components.

Learning Objectives

During this course, you acquire knowledge to:

- Select Tri-GP hardware components that meet the project requirements for the safety system.
- Install Tri-GP hardware components in the safety system.
- Diagnose fault and alarm indicators for each hardware component.
- Replace Tri-GP hardware components as required.

Prerequisites

Basic knowledge of safety Programmable Logic Controllers (PLCs)

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

2 hours, 15 minutes

1199 Tricon System Overview

New

This course introduces Tricon™ and Tricon™ CX systems that are designed for use with Emergency ShutDown (ESD) and other critical applications that require Safety Integrity Level (SIL) 1, 2, or 3, as defined in the IEC 61508 standard on Functional Safety.

Learning Objectives

After completing this course, you can:

- Explain Triple Modular Redundant (TMR) architecture.
- Describe the features and functions of Tricon and Tricon CX controllers.
- Identify the hardware components of Tricon and Tricon CX controllers.

Prerequisites

- Knowledge:
  - Programmable Logic Controllers (PLCs)
  - Distributed Control Systems (DCSs)
- Familiarity with safety concepts

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

1 hour

Part of Safety Engineering Foundation

1200 Tricon System Installation

New

Installing a Tricon™ system properly helps ensure that the system operates efficiently. This course helps you install a Tricon system that includes: a main chassis, an expansion chassis, and a Remote Expansion Chassis (RXM) to extend the system to a remote location.

Learning Objectives

After completing this course, you can:

- Install I/O and power modules.
- Connect the main chassis to the expansion panel.
- Install the communication module.
- Connect the controller to the termination panel.
- Connect the power module.
- Ground the Tricon system.

Prerequisites

- Knowledge:
  - Programmable Logic Controllers (PLCs)
  - Distributed Control Systems (DCSs)
- Familiarity with safety concepts

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

1 hour and 15 minutes

Part of Safety Engineering Foundation

1201 Setting Up Tricon Systems for Monitoring

New

This course helps you monitor the status of a Tricon™ system using Triconex™ Enhanced Diagnostic Monitor.

Enhanced Diagnostic Monitor enables you to collect system events that provide real-time information on faults in the Tricon system. You can also collect the history of system errors. You can view and analyze these events to locate the system fault. You can also send these events as a log file to Schneider Electric Global Customer Support for assistance in troubleshooting.

Learning Objectives

After completing this course, you can:

- Identify the workflow of Enhanced Diagnostic Monitor.
- Monitor a Tricon system using Enhanced Diagnostic Monitor.
- Collect and view system events to analyze Tricon system performance.
- Export an event log file for further troubleshooting.

Prerequisites

- Knowledge:
  - Programmable Logic Controllers (PLCs)
  - Distributed Control Systems (DCSs)
- Familiarity with safety concepts

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

50 minutes

Part of Safety Engineering Foundation

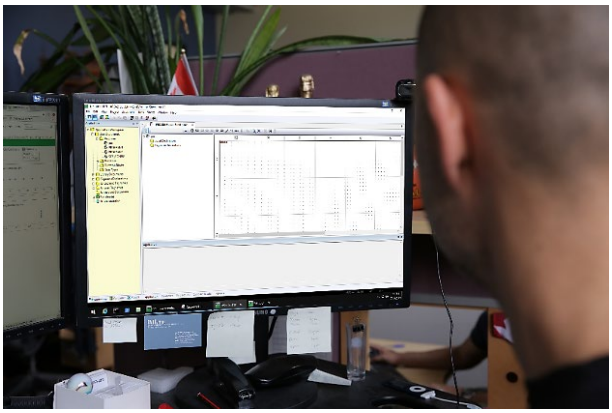
1265 Getting Started with TriStation 1131 Software

This course provides essential knowledge on preparing the project input documents required for developing safety logic for Tricon™ CX controllers using TriStation™ 1131 Developer's Workbench software. Additionally, this course presents the supported programming methods that you can use to build safety-related applications in TriStation 1131 software.

Learning Objectives

After completing this course, you can:

- Identify the project cycle.
- Prepare project input documents.
- Identify the programming methods that TriStation 1131 software supports.
- Install TriStation 1131 software.



Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

30 minutes

1266 Creating Tricon CX Projects in TriStation 1131 Software

This course provides essential knowledge on creating Tricon™ CX projects and configuring settings for the controller, memory allocation, and safety application security in TriStation™ 1131 Developer's Workbench software.

Learning Objectives

After completing this course, you can:

- Create Tricon CX projects.
- Configure the Tricon CX controller and corresponding functional settings.
- Allocate the memory of Tricon CX controllers.
- Configure the security settings of Tricon CX projects.

Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

35 minutes

1267 Developing and Testing TriStation 1131 Applications

This course provides essential knowledge on developing safety applications using TriStation™ 1131 Developer's Workbench software. In this course, you download applications to Triconex™ Emulator, which simulates Tricon™ CX controllers for testing. Using Triconex Safety Validator and Triconex Report Generator, you can create test cases for TriStation 1131 applications and generate reports.

Learning Objectives

After completing this course, you can:

- Create and test safety logic.
- Create custom functions.
- Set up project options.
- Generate reports using Triconex Report Generator.

Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

1 hour, 50 minutes

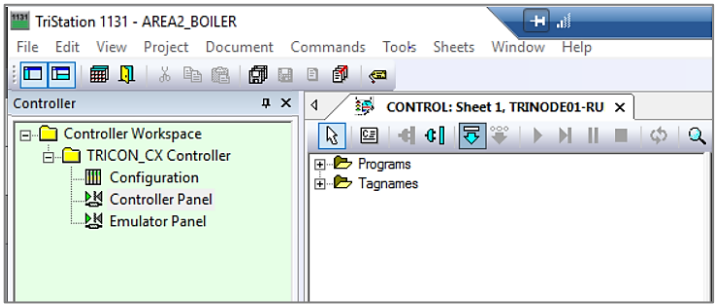
1268 Configuring and Downloading TriStation 1131 Applications

This course provides knowledge on completing the safety project cycle. To complete the safety project cycle, you create and add custom libraries to applications using TriStation™ 1131 Developer's Workbench software. Next, you add tagnames to TriStation 1131 applications. Finally, you download TriStation 1131 applications to Tricon™ CX controllers.

Learning Objectives

After completing this course, you can:

- Create and add custom libraries to TriStation 1131 applications.
- Import tagnames to TriStation 1131 applications.
- Download TriStation 1131 applications to Tricon CX controllers.



Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

2 hours

1269 Retrieving Sequence of Events Data from Tricon CX Controllers

This course provides essential knowledge on using Triconex™ Sequence of Events (SOE) Recorder to analyze shutdowns and define strategies that help improve plant safety. In this course, you install and configure SOE Recorder to retrieve data from TriStation™ 1131 Developer's Workbench software applications.

Learning Objectives

After completing this course, you can:

- Identify key steps for collecting event data.
- Configure SOE blocks in TriStation 1131 software.
- Install SOE Recorder.
- Configure SOE Recorder.

Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

1 hour

1197 Using Cause and Effect Matrix in Safety Applications

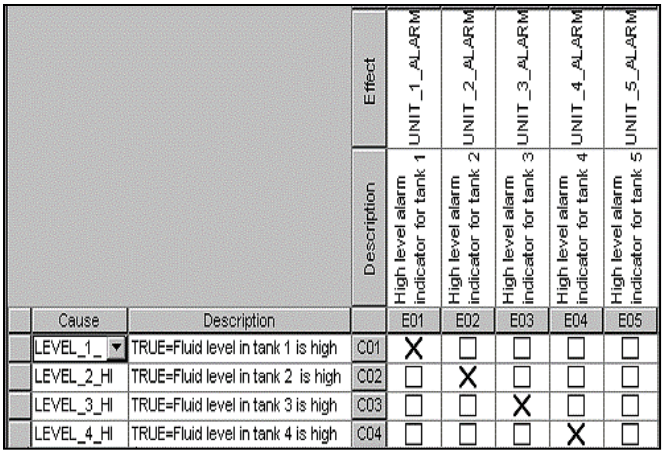
In addition to supporting the standard programming languages Ladder Diagram (LD), Function Block Diagram (FBD), and Structured Text (ST), TriStation™ 1131 Developer's Workbench software provides a special editor for the Cause and Effect Matrix (CEM) programming language. Throughout process automation, CEM programming helps define Emergency Shutdown (ESD) strategies in systems, such as Fire and Gas (F&G) systems.

This course introduces CEM programming.

Learning Objectives

After completing this course, you can:

- Identify the basics of CEM programming.
- Recall best practices before implementing CEM logic.
- Manage the CEM document, in conjunction with other input documents.
- Convert CEM programming into an FBD.
- Perform a functionality test using the CEM document.



	Cause	Description		Effect					
				Description	UNIT_1_ALARM	UNIT_2_ALARM	UNIT_3_ALARM	UNIT_4_ALARM	UNIT_5_ALARM
				High level alarm indicator for tank 1	High level alarm indicator for tank 2	High level alarm indicator for tank 3	High level alarm indicator for tank 4	High level alarm indicator for tank 5	
				E01	E02	E03	E04	E05	
	LEVEL_1_	TRUE=Fluid level in tank 1 is high	C01	X					
	LEVEL_2_HI	TRUE=Fluid level in tank 2 is high	C02		X				
	LEVEL_3_HI	TRUE=Fluid level in tank 3 is high	C03			X			
	LEVEL_4_HI	TRUE=Fluid level in tank 4 is high	C04				X		

Prerequisites

- Knowledge of Programmable Logic Controllers (PLCs)
- Knowledge of Distributed Control Systems (DCSs)
- Familiarity with safety concepts

Audience

- Maintenance Engineers and Technicians
- Safety Engineers

Available As

E-learning

30 minutes

Part of Safety Engineering Foundation

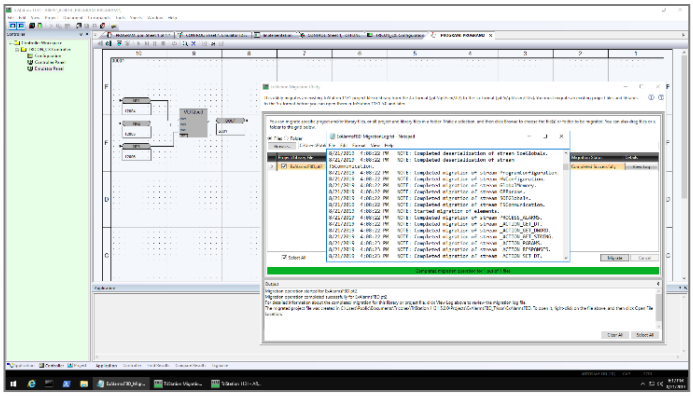
1270 Migrating Previous Projects to TriStation 1131

This course provides essential knowledge on upgrading legacy safety applications using TriStation™ Migration Utility, which is automatically installed with V5.x TriStation 1131 Developer's Workbench software. Using this utility, you can migrate TriStation 1131 projects, libraries, and Tieback simulations.

Learning Objectives

After completing this course, you can:

- Migrate TriStation 1131 applications from version 4.x to 5.x using TriStation Migration Utility.
- Verify successful migration of TriStation 1131 applications.
- Troubleshoot migration issues.



Prerequisites

Knowledge of:

- Process safety applications, such as Emergency Shutdown (ESD) Systems and Fire and Gas Systems
- Triconex™ controllers – Tricon™, Trident™, or Triconex General Purpose (Tri-GP™)

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Foundation

45 minutes

Process Automation Essential Collection

This section is organized to show individual e-learning courses in the *Process Automation Essential Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1173 Integrating Field Devices Using FDC280

Field Device Controller (FDC) 280 is an optionally redundant controller module with the primary purpose of device integration, including interfacing with field devices.

This course provides essential knowledge on installing FDC280 hardware and connecting devices in the physical network. Specifically, this course covers: configuring FDC280 and field devices in ArchestrA™ Integrated Development Environment (IDE); enabling communication between FDC280 and field devices; and monitoring and troubleshooting FDC280.

Learning Objectives

After completing this course, you can:

- Install FDC280 in Foxboro™ Control Network.
- Configure FDC280 to integrate with third-party field devices.
- Monitor FDC280 performance.
- Troubleshoot FDC280.

Prerequisites

- Knowledge of:
  - Hardware and software installation and configuration of Foxboro DCS
  - System Manager
  - Ethernet networks
- Minimum of 6 months of process control experience

Audience

- Control Engineers
- Maintenance Engineers

Available As

E-learning

1 hour, 10 minutes

Part of Process Automation Essential

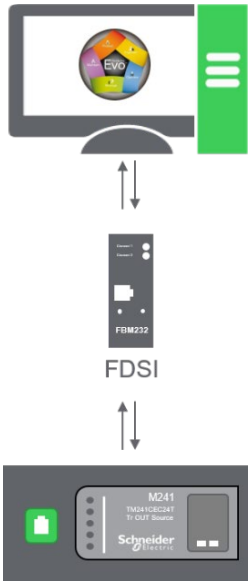
1158 Integrating Field Devices Using FDSI

This course provides essential knowledge on how to use Field Device System Integrators (FDSIs) to integrate Schneider Electric or third-party Modbus field devices into Foxboro™ Distributed Control System (DCS). Course topics address the required hardware for integration, such as FBM230, FBM231, FBM232, and FBM233. Topics also include software configuration using Foxboro DCS Control Editors, System Manager, and FDSI Configurator.

Learning Objectives

After completing this course, you can:

- Explain the process of integrating third-party field devices into Foxboro DCS using FDSI.
- Identify the features and functions of FBM230, FBM231, FBM232, and FBM233.
- Differentiate between communication protocols, such as Modbus, TSAA, and OPC.
- Configure FDSI to communicate with a Modbus field device.
- Recognize the differences between FDSI and FDC280.



Prerequisites

Knowledge of:

- Foxboro DCS architecture
- Foxboro DCS Control Editors
- System Manager

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

1 hour, 40 minutes

Part of Process Automation Essential

1233 Control Systems: Fieldbus Modules

New

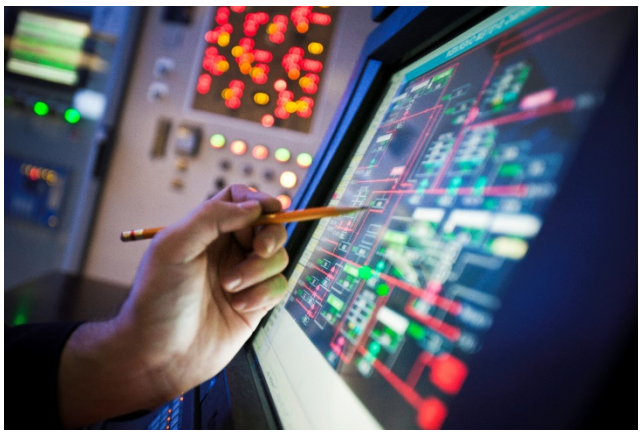
Fieldbus Modules (FBMs) provide an interface between the Foxboro™ control station and a variety of field devices, including valves, flow meters, and positioners. FBMs process I/O signals from field devices, convert these signals to Foxboro format, and send the processed data to the Foxboro control station. You can use different types of FBMs to communicate with analog, discrete, pulse, and Highway Addressable Remote Transducer (HART®) I/O signals.

This course provides essential knowledge on different types of FBMs, including HART FBMs, Analog FBMs, Discrete FBMs, FOUNDATION™ FBMs, and Intelligent Marshalling FBMs. The course covers the importance, functionality, installation, and Light Emitting Diode (LED) diagnosis of each FBM.

Learning Objectives

After completing this course, you can:

- Explain the importance of FBMs.
- Select FBMs that meet project requirements for the control system.
- Choose the correct Termination Assembly (TA) for each FBM.
- Install HART FBMs.
- Diagnose the operational status of FBMs using LED indicators.



Prerequisites

Basic knowledge of Foxboro Distributed Control Systems (DCSs)

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Process Automation Essential

2 hours, 8 minutes

1136 Configuring Process Alarms

This course focuses on configuring process alarms to help Operators quickly detect abnormal conditions and effectively take corrective action. Operator actions help prevent personal injury and plant downtime.

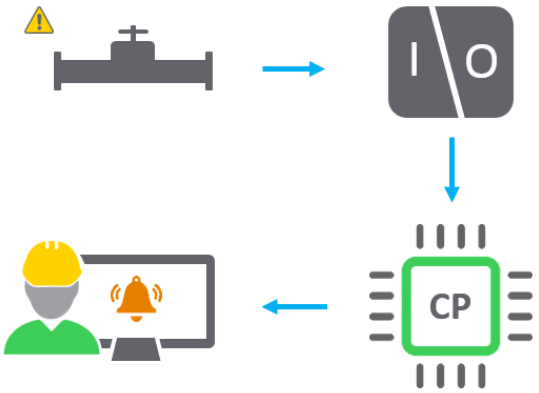
Using Foxboro™ Distributed Control System (DCS) Control Editors, Engineers configure block and compound alarm parameters that notify Operators of any abnormal condition.

This course covers PID block configuration and best practices for using common alarm blocks, including RIN, PATALM, BLNALM, and REALM.

Learning Objectives

After completing this course, you can:

- Identify phases of the alarm management lifecycle according to the IEC 62682 standard.
- Configure compound and block alarm parameters using Control Editors.
- Distinguish between the different methods of acknowledging process alarms.
- Acknowledge process alarms using the Alarm Panel in Control HMI.
- Follow best practices in process alarm configuration when using common alarm blocks.



Prerequisites

Knowledge of configuring control objects in Foxboro DCSs

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Operators

Available As

E-learning

Part of Process Automation Essential

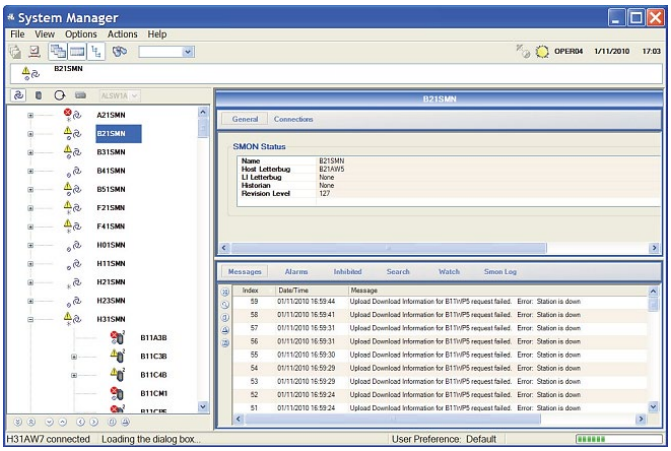
2 hours, 30 minutes

1073 Introduction to I/A Series System Manager

This essential course introduces System Manager, a distributed application for monitoring the health and performance of all components in an I/A Series™ system and managing network operations. System Manager helps monitor various types of devices, analyze communication throughout the control network, and configure alarms.

Learning Objectives

After completing this course, you can:



- State the function of System Manager.
- Describe in detail the main components of System Manager: the service and the client.
- List features of System Manager.
- Explain configuration settings.
- Interact with the System Manager user interface.
- Perform specific activities to:
  - Determine how to locate a failed device.
  - Inhibit device alarming.
  - Set the system time and date.

Prerequisites

- Six months of experience working with plant instrumentation and controls
- Completion of courses in the Process Automation Basic Collection and Control Engineering Foundation Collection, or equivalent knowledge

Audience

- Control Engineers
- Maintenance Engineers and Technicians

Available As

E-learning

Part of Process Automation Essential

2 hours, 30 minutes

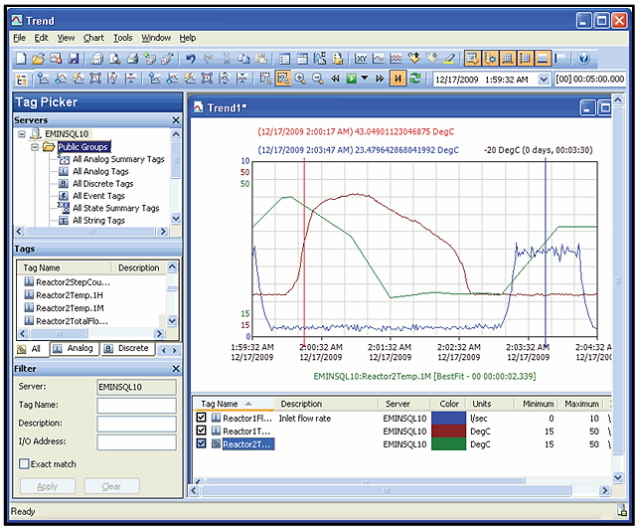
1145 Configuring Historian Client

This course focuses on configuring the Historian Client application to view historized data. Configuring this application is the last step in setting up Historian to collect data from Foxboro™ Distributed Control System (DCS). This course introduces different tools available in Historian Client for viewing and analyzing data to help optimize plant operations and improve plant performance.

Learning Objectives

After completing this course, you can:

- Decide when to use Historian Client.
- Identify the uses of different applications available in Historian Client.
- Configure a trend in Historian Client to view historized data.
- Create a query in Historian Client to retrieve data from the Historian database.
- Configure the Historian Client Workbook to view historized data.
- Configure the Historian Client Report to view historized data.



Prerequisites

Knowledge of:

- Historian configuration
- Foxboro DCS Control Editors
- Microsoft® Office tools

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

2 hours

Part of Process Automation Essential

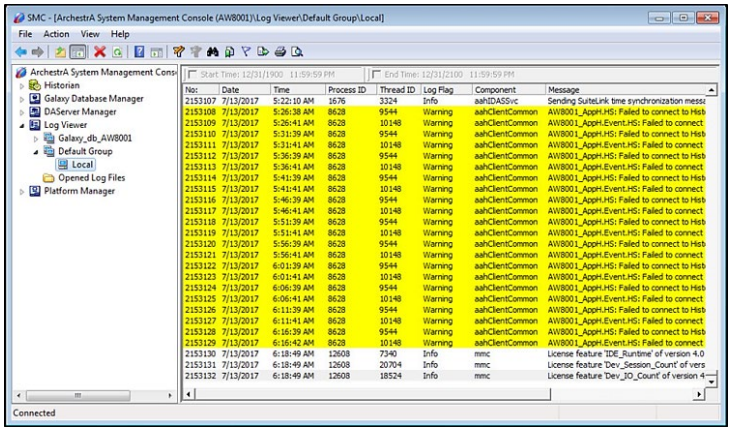
1146 Monitoring Historian and Managing Security

This course covers how to monitor Historian performance and modify configuration information when needed. Specifically, the course covers how to export and modify a configuration information file and import the file back into the system. To help avoid unauthorized modification of configuration information, the course also covers how to manage Historian security. Topics within the course include managing security with Microsoft® SQL Server Management Studio, retrieving data from previous versions with History blocks, and backing up historical records.

Learning Objectives

After completing this course, you can:

- Monitor Historian.
- Export and import configuration information.
- Manage Historian security.
- Create and restore a Historian database backup.



Prerequisites

Knowledge of:

- Historian configuration
- Historian Client
- Foxboro DCS Control Editors
- Microsoft® Office tools

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Managers and Operators

Available As

E-learning

Part of Process Automation Essential

2 hours, 30 minutes

1076 Understanding the Basics of SCADA Systems for Process Control

Supervisory Control and Data Acquisition (SCADA) systems gather real-time data on process variables from remote locations, analyze the data, and monitor and control equipment. This course provides essential knowledge on the fundamental concepts of SCADA and the related hardware and software required for implementing a SCADA system.

The course also covers hardware components used in SCADA systems, namely, EcoStruxure™ Foxboro™ SCADA Remote Terminal Unit (RTU) Station and SCADAPack RTU Station.

Learning Objectives

After completing this course, you can:

- Identify the purpose of SCADA systems in process control operations.
- List the functions, features, and components of a SCADA system.
- Describe the software components required for configuring a SCADA system.
- Explain the hardware components to implement a SCADA system.

Prerequisites

None

Audience

- Control Engineers
- Maintenance Engineers
- System Design Engineers

Available As

E-learning

Part of Process Automation Essential

1 hour

1307 Features and Hardware Components of SCD6000

New

Foxboro™ Station Computing Device 6000 (SCD6000) is a Remote Terminal Unit (RTU) that helps enable efficient and reliable implementation of Supervisory Control and Data Acquisition (SCADA) systems. SCADA systems gather real-time data on process variables from remote locations, analyze the data, and monitor and control equipment.

This course details the features, functions, benefits, and deployment architecture of SCD6000. In addition to the inclusion of high-level information on the system components (hardware and software) of SCD6000, this course covers hardware components in detail.

Learning Objectives

After completing this course, you can:

- List the features and benefits of Foxboro SCD6000.
- Describe SCD6000 system components and architecture.
- Identify SCD6000 hardware components.

Prerequisites

- Ability to configure SCADA systems
- Knowledge of RTU configuration

Audience

- Control Engineers
- Maintenance Engineers
- System Design Engineers

Available As

E-learning

55 minutes

Part of Process Automation Essential

1308 Configuring SCD6000 in a SCADA Network

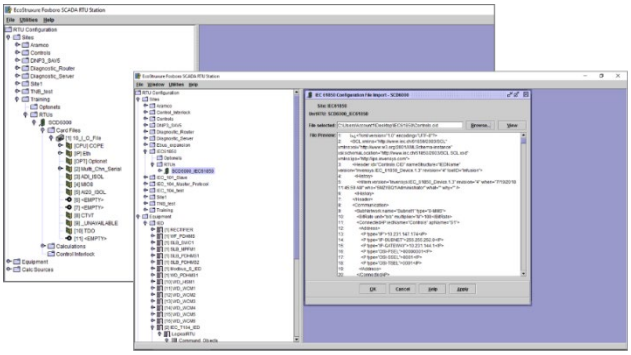
New

Foxboro™ Station Computing Device 6000 (SCD6000) is a Remote Terminal Unit (RTU) that helps enable efficient and reliable implementation of Supervisory Control and Data Acquisition (SCADA) systems.

This course helps you configure SCD6000 using EcoStruxure™ Foxboro SCADA RTU Station, monitor SCD6000 using Foxboro SCADA Remote Terminal Viewer (RTV), and develop Intrinsic Database Function (IDF) calculations and State And Logic Language (SALL) programs for implementation in SCD6000. This course also details the various communication protocols supported by SCD6000 and the configuration of these protocols in SCD6000.

Learning Objectives

After completing this course, you can:



- Configure SCD6000 using Foxboro RTU Station.
- Import an existing configuration file into SCD6000.
- Explain the backup and restoration of the SCD6000 configuration database.
- Monitor the health of SCD6000 RTUs using RTV.
- Identify the communication protocols supported by SCD6000.
- Configure SCD6000 as a Master or Slave device.
- Develop the IDF calculation.
- Develop a SALL program for executing the order of instructions in SCD6000.

Prerequisites

- Ability to configure SCADA systems
- Knowledge of RTU configuration

Audience

- Control Engineers
- Maintenance Engineers
- System Design Engineers

Available As

E-learning

1 hour, 55 minutes

Part of Process Automation Essential

1309 Configuring Communication, Data Logging, and User Access in SCD6000

New

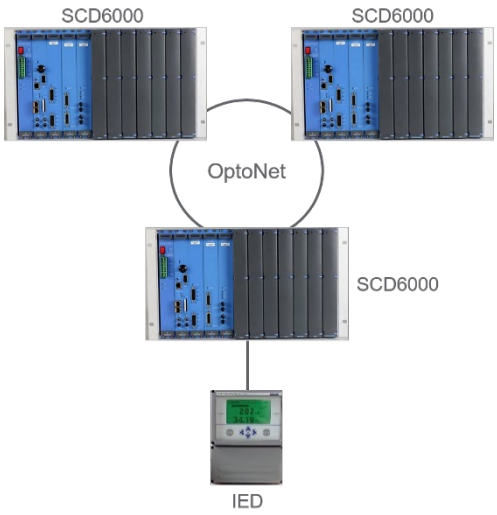
Foxboro™ Station Computing Device 6000 (SCD6000) is a Remote Terminal Unit (RTU) that helps enable efficient and reliable implementation of Supervisory Control and Data Acquisition (SCADA) systems.

This course helps you configure SCD6000 for monitoring device status, running diagnostics, establishing network communications, enabling peer-to-peer communications, and securing devices through the management of user access.

Learning Objectives

After completing this course, you can:

- Configure Diagnostic Server, Diagnostic Router, and Terminal Server functionality in SCD6000.
- Configure the Analog Logger to view system status and the Event Logger to record events.
- Identify the features of the OptoNet configuration.
- Configure SCD6000 in an OptoNet network to support peer-to-peer communication between SCDs in a SCADA network.
- Manage user access to RTUs using the EcoStruxure™ Foxboro SCADA Connect Secure application.
- Configure Secure Authentication (SA) v2 and v5 for DNP3 Slave devices.



Prerequisites

- Ability to configure SCADA systems
- Knowledge of RTU configuration

Audience

- Control Engineers
- Maintenance Engineers
- System Design Engineers

Available As

E-learning

1 hour, 10 minutes

Part of Process Automation Essential

1129 Common Safety: Integration of Control and Safety Systems

This course covers the safety offerings from Schneider Electric. Specifically, this course provides essential knowledge on: safety system concepts, such as Safety Instrumented System (SIS) and Safety Instrumented Function (SIF); safety standards, such as International Electrotechnical Commission (IEC) 61508 and 61511; and features and benefits of Common Safety technology.

Learning Objectives

After completing this course, you can:

- Outline the fundamental concepts of a safety system.
- Explain the requirements for complying with safety standards.
- Summarize the features and benefits of Common Safety technology.

Prerequisites

- Experience in implementing Distributed Control Systems (DCSs) and safety systems
- Knowledge of configuring Programmable Logic Controllers (PLCs) and Programmable Automation Controllers (PACs)
- Completion of 1079 Safety System Basics

Audience

- Maintenance Technicians
- Safety Engineers
- System Design Engineers

Available As

E-learning

30 minutes

Part of Process Automation Essential

Process Automation Security Essential Collection

This section is organized to show individual e-learning courses in the *Process Automation Security Essential Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering	• Process Automation	• Control Engineering
	• Control HMI	• Process Automation Security	• Safety Engineering
	• Networking	• Safety Engineering	
	• Safety Engineering	• Virtualization	

1246 Cybersecurity for Plant Infrastructure

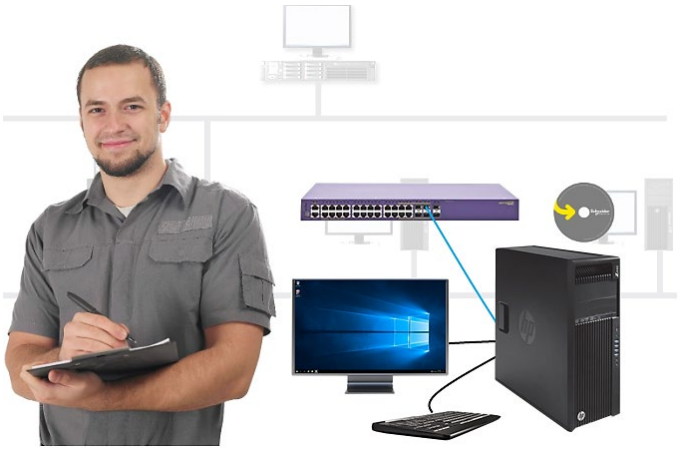
This course provides essential knowledge on the implementation of cybersecurity for plant infrastructure, which includes control rooms, field equipment, workstations, servers, Operating Systems (OSs), network switches, and domain setup.

Topics in this course include physical access restrictions, device and OS hardening, switch configuration, and the implementation of enterprise architecture. In addition, the course includes practice exercises on configuring the Basic Input/Output System (BIOS), remote desktop services, and switch security.

Learning Objectives

After completing this course, you can:

- Implement basic BIOS security for workstations and servers.
- Configure OS-based security.
- Secure industrial Ethernet switches by specifying passwords and disabling unused ports.
- Describe the features of secured architecture.



Prerequisites

Knowledge of:

- Computer hardware
- OS fundamentals
- Switch configuration
- Computer networking

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Process Automation Security Essential

1 hour, 5 minutes

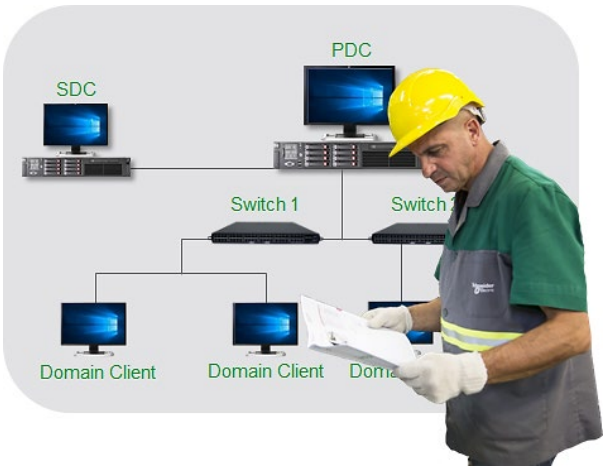
1247 Cybersecurity for Distributed Control Systems

This course provides essential knowledge on the implementation of cybersecurity for Foxboro™ Distributed Control Systems (DCSs). Topics include cybersecurity configuration using Microsoft® Active Directory® Services, Primary Domain Controller (PDC) failure and downtime management, and security settings for control engineering and visualization tools. In addition, the course includes descriptive demonstrations and practice exercises on creating user accounts, transferring Flexible Single Master Operation (FSMO) roles, seizing FSMO roles, and securing Foxboro Control HMI projects.

Learning Objectives

After completing this course, you can:

- Customize Active Directory group policies and manage user accounts to help protect the plant network.
- Manage PDC downtime and restore failed PDC to help ensure continuous cybersecurity.
- Configure security settings in engineering and visualization tools.



Prerequisites

- Experience with DCSs
- Knowledge of computer networking concepts

Audience

- Control Engineers
- System Engineers
- System Technicians

Available As

E-learning

1 hour, 30 minutes

Part of Process Automation Security Essential

1248 Cybersecurity for Industrial Safety Systems

This course provides essential knowledge on the implementation of cybersecurity for industrial safety systems. Topics include security for Safety Instrumented Systems (SISs), physical security measures, Triconex™ Tofino™ firewall configuration, and project-level security. In addition, the course includes practice exercises on configuring the Tofino firewall and user access control settings in TriStation™ 1131 Developer's Workbench software.

Learning Objectives

After completing this course, you can:

- Configure cybersecurity for industrial safety systems.
- Manage user access controls in TriStation™ 1131 software projects.

Prerequisites

- Knowledge of industrial safety systems
- Familiarity with cybersecurity concepts

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Process Automation Security Essential

1 hour

1249 Endpoint Protection Using McAfee Products

This course provides essential knowledge on the implementation of host and network-based security features using McAfee® products. Topics include Endpoint Security (ENS), application and device control, security policy management, and troubleshooting techniques for McAfee products. In addition, the course consists of detailed demonstrations on the configuration of Self-Managed and Managed solutions, application control, the Help Desk, and device access.

Learning Objectives

After completing this course, you can:

- Identify products in the McAfee suite.
- Manage security policies for endpoints.
- Perform maintenance and troubleshooting of McAfee products.

Prerequisites

- Familiarity with cybersecurity concepts
- Knowledge of computer networking

Audience

- System Engineers
- System Technicians

Available As

E-learning

1 hour, 30 minutes

Part of Process Automation Security Essential

1250 Data Backup and Recovery in Industrial Computers

This course provides essential knowledge on data backup and recovery in industrial computers. Topics include the features of Symantec™ System Recovery 2013 and Veritas™ System Recovery 16 software and backup and restoration procedures in workstations and servers. In addition, the course includes best practices for data backup and a realistic practice exercise.

Learning Objectives

After completing this course, you can:

- Identify the features of Symantec System Recovery 2013 and Veritas System Recovery 16 software.
- Back up and restore workstations and servers using Veritas System Recovery 16 software.

Prerequisites

- Familiarity with cybersecurity concepts
- Knowledge of operating systems and computer networking

Audience

- System Engineers
- System Technicians

Available As

E-learning

30 minutes

Part of Process Automation Security Essential

Safety Engineering Essential Collection

This section is organized to show individual e-learning courses in the *Safety Engineering Essential Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering	• Process Automation	• Control Engineering
	• Control HMI	• Process Automation Security	• Safety Engineering
	• Networking	• Safety Engineering	
	• Safety Engineering	• Virtualization	

1257 Fundamentals of Process Safety Advisor On Premise (PSA OP)

New

EcoStruxure™ Process Safety Advisor On Premise (PSA OP) enables you to monitor the status and performance of the Safety Instrumented Functions (SIFs), trips, and Independent Protection Layers (IPLs) implemented in an industrial plant. This course provides detailed information, including features and benefits, about PSA OP profiles, namely SIF Manager, Trip Analyzer, and IPL Manager.

Learning Objectives

After completing this course, you can:

- Explain the features and benefits of the different PSA OP profiles.
- Identify the components of PSA OP.

Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

35 minutes

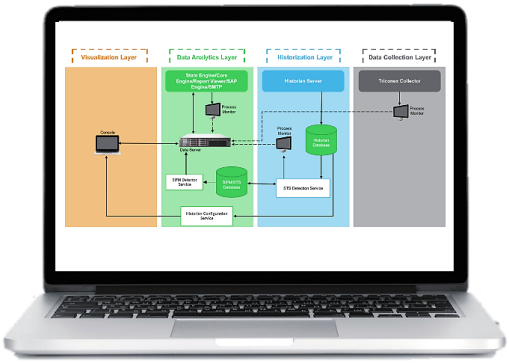
1318 Installing and Licensing PSA OP

New

EcoStruxure™ Process Safety Advisor On Premise (PSA OP) enables you to monitor the status and performance of the Safety Instrumented Functions (SIFs), trips, and Independent Protection Layers (IPLs) implemented in an industrial plant. This course covers the deployment architecture of PSA OP, the installation and licensing of PSA OP software, and post-installation steps, such as generating security certificates and configuring user access permissions for PSA OP. Additionally, the course explains PSA OP User Interface (UI) elements and key processes that help assess the health of PSA OP.

The course includes demonstrations and practices to help you perform these PSA OP tasks.

Learning Objectives



After completing this course, you can:

- Identify the deployment architecture of PSA OP.
- Install and license Triconex Collector and PSA OP software.
- Update the Process Monitor Configuration file.
- Generate security certificates.
- Configure data source and global parameters.
- Configure user roles and assign user access permissions for PSA OP.
- List the processes and services that help monitor the health of PSA OP.
- Identify the User Interface (UI) elements of PSA OP Console.

Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

1 hour, 20 minutes

Part of Safety Engineering Essential

1258 Configuring Components in SIF Manager

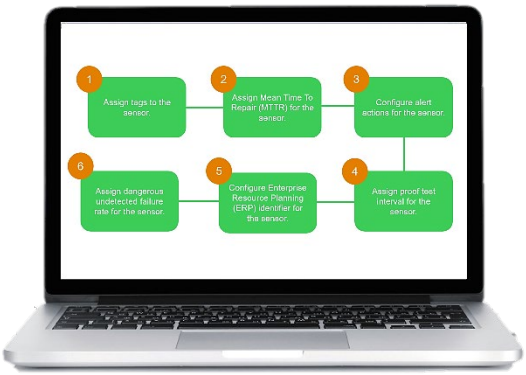
New

Using the SIF Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Safety Instrumented Functions (SIFs). This course includes detailed demonstrations, practices, and job aids to help you effectively configure and deploy essential components, including sensors, logic solvers, and final elements using SIF Manager.

Learning Objectives

After completing this course, you can:

- Create and configure essential components, including sensors, logic solvers, and final elements.
- Deploy the configured components to monitor using SIF Manager.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

1 hour, 5 minutes

1259 Configuring Compounds and SIFs in SIF Manager

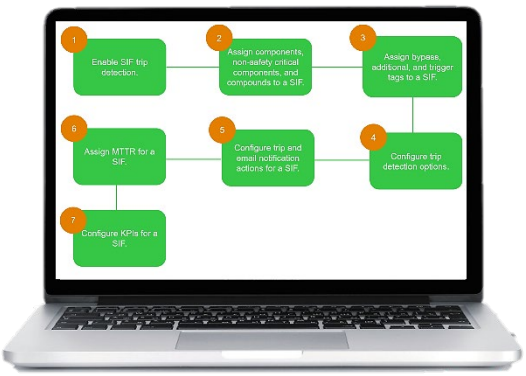
New

Using the SIF Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Safety Instrumented Functions (SIFs). This course includes detailed demonstrations, practices, and job aids to help you effectively configure and deploy essential compounds and SIFs using SIF Manager.

Learning Objectives

After completing this course, you can:

- Create and configure compounds and SIFs.
- Deploy the configured compounds and SIFs.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

1 hour

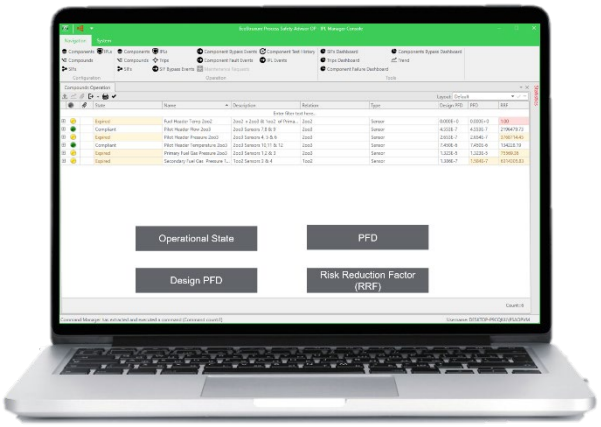
1261 Monitoring SIFs Using the Operation Group

New

Using the SIF Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Safety Instrumented Functions (SIFs). This course includes detailed practices and job aids to help you effectively monitor the operational status and performance of components, compounds, and SIFs using SIF Manager.

Learning Objectives

After completing this course, you can view the operational status of components, compounds, and SIFs using options in the **Operation** group.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

45 minutes

1262 Monitoring Trips and Bypass Events

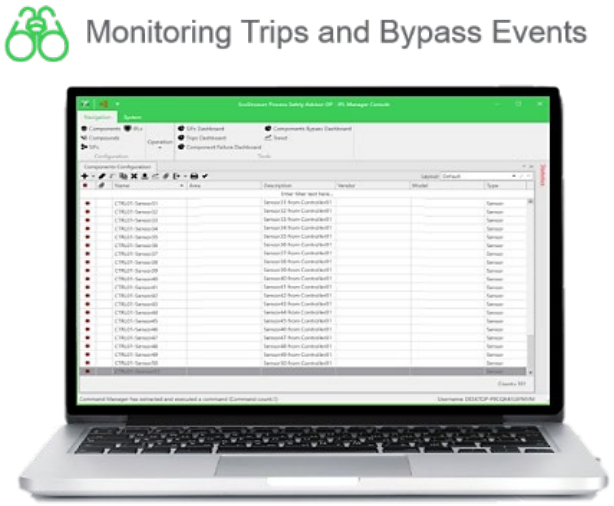
New

Using the SIF Manager and Trip Analyzer profiles within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Safety Instrumented Functions (SIFs) and trips. This course includes detailed practices and job aids to help you effectively monitor trips, bypass events, and fault events.

Learning Objectives

After completing this course, you can:

- Monitor trips using SIF Manager.
- Monitor bypass events and fault events using SIF Manager.
- View and respond to component test history.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

50 minutes

Part of Safety Engineering Essential

1263 Tracking Aggregate SIF Performance

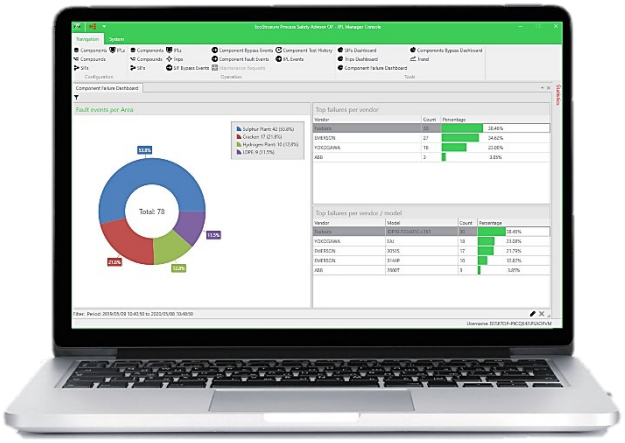
New

Using the SIF Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Safety Instrumented Functions (SIFs). This course describes the various dashboards and a dedicated panel in SIF Manager to help you gain insight into the aggregate performance of the components, compounds, and SIFs that are implemented in the plant.

Learning Objectives

After completing this course, you can:

- View SIF performance using Key Performance Indicator (KPI) dashboards in SIF Manager.
- View real-time trending of tags using the **Trend** tool.
- View the critical statistics of SIFs and trips using the **Statistics** panel.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

45 minutes

Part of Safety Engineering Essential

1319 Configuring IPLs in IPL Manager

New

Using the IPL Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Independent Protection Layers (IPLs). This course includes detailed demonstrations, practices, and job aids to help you effectively create, configure, and deploy essential IPLs, including Basic Process Control Systems (BPCSs), alarms, and mechanical devices.

Learning Objectives

After completing this course, you can:

- Create and configure essential IPLs, including BPCSs, alarms, and mechanical devices.
- Deploy the configured IPLs to monitor using IPL Manager.

Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

40 minutes

1321 Monitoring IPLs and IPL Events Using the Operation Group

New

Using the IPL Manager profile within EcoStruxure™ Process Safety Advisor On Premise (PSA OP), you can monitor the status and performance of Independent Protection Layers (IPLs). This course includes detailed practices and job aids to help you effectively monitor the operational status and performance of IPLs and IPL Events using IPL Manager.

Learning Objectives

After completing this course, you can view the operational status of IPLs and IPL events using options in the **Operation** group.

Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

Part of Safety Engineering Essential

30 minutes

1264 Routine Maintenance Activities for PSA OP

New

EcoStruxure™ Process Safety Advisor On Premise (PSA OP) enables you to monitor the status and performance of Safety Instrumented Functions (SIFs), trips, and Independent Protection Layers (IPLs). This course includes detailed demonstrations, practices, and job aids to help you effectively perform key maintenance activities in PSA OP.

Learning Objectives

After completing this course, you can:

- Bulk import and export the PSA OP configuration files.
- Upgrade the PSA OP software.
- Explain the backup and restoration of the PSA OP database.

Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems (ESDs) and Fire and Gas (F&G) systems
  - Programmable Logic Controllers (PLCs), such as Tricon™, Trident™, and Triconex™ General Purpose (Tri-GP™)
  - Testing safety applications using Triconex Emulator
  - Historian
- Experience in creating TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

45 minutes

Part of Control Engineering Essential

Virtualization Essential Collection

This section is organized to show individual e-learning courses in the *Virtualization Essential Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1210 Getting Started with Virtualization

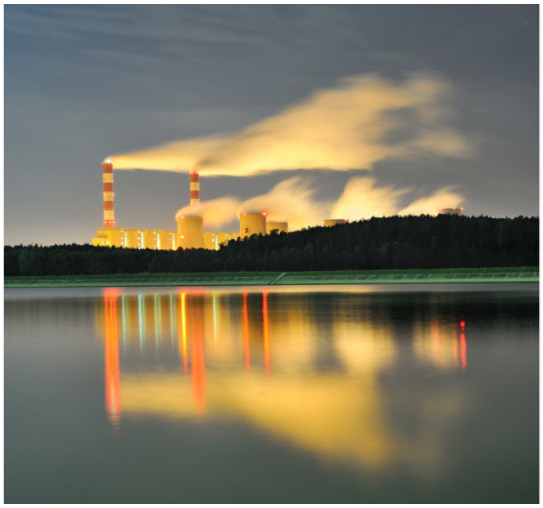
Virtualization technology enables you to consolidate multiple workstations into a single server. This consolidation through virtualization reduces the cost of hardware in comparison to a non-virtualized Foxboro™ Distributed Control System (DCS).

This course presents the benefits of virtualization, the components of virtualized control systems, and the workflow for establishing and maintaining virtualized control systems.

Learning Objectives

After completing this course, you can:

- Explain virtualization and available solutions for system challenges.
- Describe the main components of virtualized control systems.
- Identify the workflow for establishing and maintaining virtualized control systems.



Prerequisites

Basic knowledge of Foxboro DCS architecture

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

45 minutes

1211 Site Planning for Virtualized Control Systems

Virtualization technology enables you to consolidate multiple workstations into a single server. This consolidation through virtualization reduces the cost of hardware in comparison to a non-virtualized Foxboro™ Distributed Control System (DCS). To build a virtualized control system, first you gather system requirements and perform site-planning activities.

This course describes the requirements to consider before configuring a control system. To help you design virtualized control systems, this course introduces sizing guidelines for different Virtual Machines (VMs).

Learning Objectives

After completing this course, you can:

- Identify site-planning requirements and guidelines for virtualized control systems.
- Explain guidelines for virtualized control systems.

Prerequisites

Basic knowledge of Foxboro DCS architecture

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

35 minutes

1212 Configuring V91 Server Virtualization Hosts

Virtualization technology enables consolidation of multiple servers into a single server, known as a V91 server virtualization host. You can easily install and maintain this server to require fewer plant resources.

The course describes the hardware specifications of a V91 server. This course also describes how to set up the physical V91 server and activate the Microsoft® Windows Server® 2012 R2 Standard operating system on V91 servers.

Learning Objectives

After completing this course, you can:

- Install V91 servers in the virtualized control system.
- Set up the V91 server operating system to host Virtual Machines (VMs).

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Ethernet networks
- Foxboro DCS architecture
- Windows Server installation

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

45 minutes

1213 Creating Virtual Networks and Machines for Control Systems

A virtualized Foxboro™ Distributed Control System (DCS) requires two networks: a control network and an Auxiliary Communications Network (ACN). Control networks help manage control data between controllers and workstations while Foxboro DCS ACN helps manage non-control network data.

This course describes how to construct the underlaying network infrastructure of virtualized control systems. The course also describes how to create Virtual Machines (VMs), install Foxboro Control Core Services on these VMs, and connect the VMs through the configured virtual network. All activities leverage software demonstrations and simulations to provide a realistic project experience.

Learning Objectives

After completing this course, you can:

- Connect VMs to control and non-control networks.
- Secure VMs.
- Set up and configure VMs on the V91 server virtualization host.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Ethernet networks
- Foxboro DCS architecture
- V91 server virtualization host configuration

Audience

- System Engineers
- System Technicians

Available As

E-learning

1 hour, 15 minutes

Part of Virtualization Essential

1214 Configuring and Connecting Thin Clients

After creating and configuring Foxboro™ Distributed Control System (DCS) Auxiliary Control Network (ACN), you set up the connection between system users and the server to enable the use of Foxboro Control Core Services. In a virtualized control system, the thin client functions as a workstation for enabling system users to connect to a remote server through a remote desktop connection.

The course presents the steps to configure and connect thin clients to virtualized control systems using Remote Desktop Services (RDS). All activities leverage software demonstrations and simulations to provide a realistic project experience.

Learning Objectives

After completing this course, you can:

- Configure Microsoft® Windows-based, Hewlett-Packard® thin client connections to function as an Operator workstation.
- Configure thin client connections with an RDP host to enable logins to Foxboro DCS.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Ethernet networks
- Foxboro DCS architecture
- V91 server virtualization host configuration
- Configuration of Virtual Machines (VMs)

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

25 minutes

1215 Configuring Centralized Virtualization Management

You can enable redundancy during the implementation of a virtualized Foxboro™ Distributed Control System (DCS). Redundant systems require the configuration of Centralized Virtualization Management (CVM) to back up and replicate identical system data in case of failures.

This course presents the benefits of CVM, system architecture to apply CVM functionality, and the setup and configuration of Virtualization Host Network (VHN). The course also includes steps for setting up primary and secondary domain controllers for CVM. All activities leverage software demonstrations and simulations to provide a realistic project experience.

Learning Objectives

After completing this course, you can:

- Enable redundancy for a virtualized control system.
- Configure VHN to connect redundant V91 servers.
- Manage and monitor multiple V91 servers from a single location.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Ethernet networks
- Foxboro DCS architecture
- V91 server virtualization host configuration
- Configuration of Virtual Machines (VMs)

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

45 minutes

1216 Backing Up and Configuring Failover in Virtualized Control Systems

During the implementation of a virtualized Foxboro™ Distributed Control System (DCS), failures and abnormal termination within the virtualized control system can potentially corrupt configured Virtual Machines (VMs) and configuration settings of the V91 server virtualization host. You can avoid loss of VMs and V91 server configurations by backing up VMs and V91 server configurations and configuring failover.

This course presents the steps for backing up the virtual control system, configuring failover between V91 servers, and testing failover functionality after configuration. All activities leverage software demonstrations and simulations to provide a realistic project experience.

Learning Objectives

After completing this course, you can:

- Back up configured VMs and V91 server configurations.
- Minimize recovery time by automatically replicating VMs from one V91 server to another.
- Perform planned maintenance for V91 servers with zero downtime by configuring live migration.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Ethernet networks
- Foxboro DCS architecture
- V91 server virtualization host configuration
- Configuration of Virtual Machines (VMs)

Audience

- System Engineers
- System Technicians

Available As

E-learning

1 hour, 20 minutes

Part of Virtualization Essential

1217 Adding Endpoint Protection to Virtualized Control Systems

During the implementation of a virtualized Foxboro™ Distributed Control System (DCS), you may require further protection for the control system. Endpoint protection helps you provide additional security against malware threats and preserve the confidentiality of data.

This course guides you on the use of McAfee® ePolicy Orchestrator© (ePO™) to deploy endpoint protection to virtualized control systems. This software helps you monitor and manage McAfee Management for Optimized Virtual Environment (MOVE) AntiVirus software. The course also describes installing McAfee MOVE AntiVirus on a V91 server virtualization host.

Learning Objectives

After completing this course, you can:

- Set up and configure McAfee security products for endpoint protection deployment.
- Update McAfee products continuously in the control system.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Concepts of cybersecurity

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

45 minutes

1219 Configuring Thin Clients

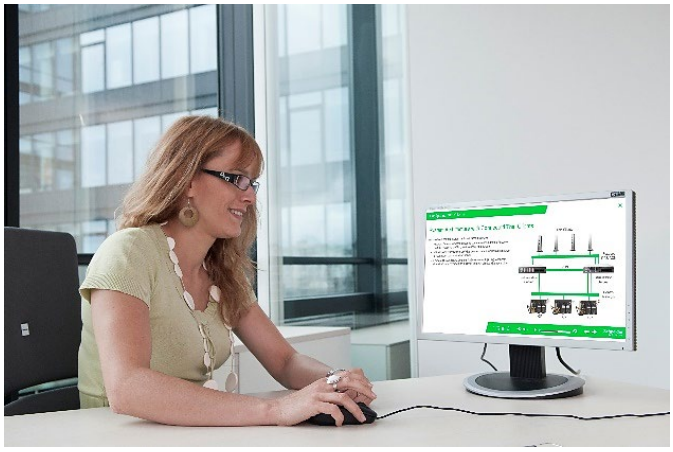
This course provides advanced knowledge on configuring thin clients as Operator workstations in virtualized and non-virtualized Foxboro™ Distributed Control Systems (DCSs). Using Remote Desktop Protocol (RDP) connections, thin clients enable Operators to access process monitoring applications, such as FoxView™ displays and Foxboro Control HMI.

This course helps you configure thin client connections with RDP hosts, set up thin client connection failover, and enable Annunciator Keyboard communications with thin clients.

Learning Objectives

After completing this course, you can:

- Configure and test thin client connections with RDP hosts, including single and redundant connections.
- Enable USB Annunciator Keyboard communications with thin clients.



Prerequisites

Familiarity with:

- Ethernet network concepts
- Virtual Auxiliary Communications Network (ACN) configuration
- USB Annunciator Keyboard configuration

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

45 minutes

1220 Troubleshooting Thin Clients

This course provides essential knowledge on maintaining thin clients in virtualized and non-virtualized Foxboro™ Distributed Control Systems (DCSs). After creating the system, you optimize the performance of thin clients connected to the system to ensure maximum uptime.

This course presents best practices for maintaining single and redundant thin-client connections and maintaining communications between thin clients and Annunciator Keyboards.

Learning Objectives

After completing this course, you can:

- Maintain Annunciator Keyboard communications with thin clients.
- Optimize the performance of Foxboro HMI displays with thin clients.

Prerequisites

Familiarity with:

- Ethernet network concepts
- Virtual Auxiliary Communications Network (ACN) configuration
- USB Annunciator Keyboard configuration
- Thin-client configuration

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

25 minutes

1224 Configuring Virtualization in Server 2016

This course covers the configuration of Centralized Virtualization Management (CVM) in Microsoft® Windows® Server® 2016 Operating System (OS).

The course provides a job aid on the differences in the OS setup for Server 2012 and Server 2016. Additionally, the course provides detailed demonstrations and practice exercises on: setting up Local Group Policies (LGPOs) and McAfee™ Endpoint Security (ENS); configuring Primary Domain Controller (PDC) and Secondary Domain Controller (SDC) settings; and adding the server system to the domain.

Learning Objectives

After completing this course, you can:

- Differentiate OS setup for CVM in Server 2012 and Server 2016.
- Configure security policies and settings for PDC, SDC, and Active Directory in Server 2016.

Prerequisites

Basic knowledge of:

- Components of a virtualized control system
- Cybersecurity concept

Audience

- System Engineers
- System Technicians

Available As

E-learning

Part of Virtualization Essential

30 minutes

Control Engineering Professional Collection

This section is organized to show individual e-learning courses in the *Control Engineering Professional Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1207 Getting Started with EcoStruxure Hybrid DCS

This course provides essential knowledge on EcoStruxure™ Hybrid Distributed Control System (DCS).

Building complex control systems requires the coordinated efforts of multiple team members. EcoStruxure Hybrid DCS integrates control and supervision configurations with field devices into a single software environment.

The course provides essential product knowledge of EcoStruxure Hybrid DCS, highlighting software and hardware components. Additionally, the course includes project scenarios in which EcoStruxure Hybrid DCS represents the most cost-effective solution.

Learning Objectives

After completing this course, you can:

- Describe the architecture of EcoStruxure Hybrid DCS, including software and hardware components.
- Determine when to use EcoStruxure Hybrid DCS.

Prerequisites

Knowledge of:

- Process control concepts
- EcoStruxure Control Expert (formerly Unity Pro™ software) and Citect® Supervisory Control and Data Acquisition (SCADA)
- Ethernet networking concepts
- Modicon™ Programmable Logic Controllers (PLCs)

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

30 minutes

Part of Control Engineering Professional

1208 Activating and Securing EcoStruxure Hybrid DCS

This course provides essential knowledge on activating and securing EcoStruxure™ Hybrid Distributed Control System (DCS).

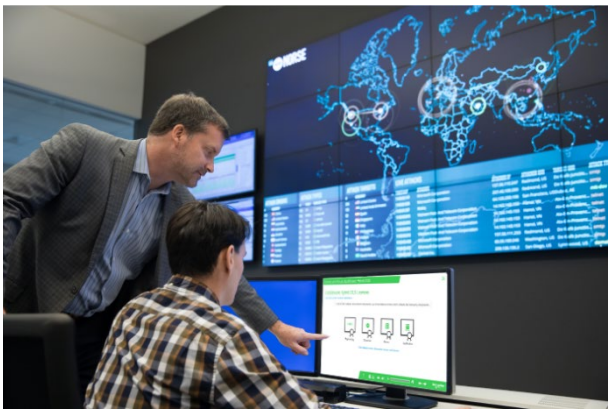
Building complex control systems requires the coordinated efforts of multiple team members. EcoStruxure Hybrid DCS integrates control and supervision configurations with field devices into a single software environment.

The course covers the different licenses required for activation and the steps to secure EcoStruxure Hybrid DCS using certificates and Role-Based Access Control (RBAC) settings. Additionally, software demonstrations and simulations provide hands-on practice for applying knowledge acquired throughout the course.

Learning Objectives

After completing this course, you can:

- Set up and activate EcoStruxure Hybrid DCS software.
- Configure security settings for EcoStruxure Hybrid DCS.



Prerequisites

Knowledge of:

- Process control concepts
- EcoStruxure Control Expert (formerly Unity Pro™ software) and Citect® Supervisory Control and Data Acquisition (SCADA)
- Ethernet networking concepts
- Modicon™ Programmable Logic Controllers (PLCs)

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

45 minutes

Part of Control Engineering Professional

1209 Building and Deploying Systems in EcoStruxure Hybrid DCS

This course provides essential knowledge on building and deploying control systems in EcoStruxure™ Hybrid Distributed Control System (DCS).

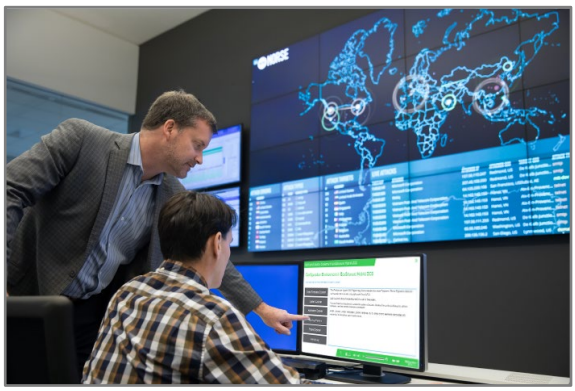
EcoStruxure Hybrid DCS is integrated software that provides the tools to build, deploy, and test a complete control system. This control system includes hardware topology, control and supervision projects, and related system components. Using Explorers in EcoStruxure Hybrid DCS, you can build and configure all these system components.

The course provides essential knowledge on the function of each Explorer and includes the steps for building, deploying, and testing the complete control system. Additionally, software demonstrations and simulations provide hands-on practice for applying knowledge acquired throughout the course.

Learning Objectives

After completing this course, you can:

- Configure control systems in EcoStruxure Hybrid DCS, including hardware configuration, process modeling, and system integration.
- Build, deploy, test, and troubleshoot control systems in EcoStruxure Hybrid DCS.



Prerequisites

Knowledge of:

- Process control concepts
- EcoStruxure Control Expert (formerly Unity Pro™ software) and Citect® Supervisory Control and Data Acquisition (SCADA)
- Ethernet networking concepts
- Modicon™ Programmable Logic Controllers (PLCs)

Audience

- Control Engineers
- Maintenance Engineers
- Plant Operators

Available As

E-learning

1 hour, 30 minutes

Part of Control Engineering Professional

1140 EcoStruxure Modicon Builder

This course provides essential knowledge on EcoStruxure™ Modicon™ Builder, a presales tool for obtaining technical information about products, minimizing dependencies on Subject Matter Experts (SMEs), and generating customer quotations based on project requirements. Course topics include an overview of tool features, project creation, configuration of plant architecture, creation of a Bill of Material (BOM), quotation generation, project reporting, and profile management.

Learning Objectives

After completing this course, you can:

- Describe the capabilities of EcoStruxure Modicon Builder.
- Specify required details to create a project.
- Configure plant architecture.
- Edit a generated plant configuration using the **Graphical view** tab.
- Update a Bill of Material (BOM) and generate a quote.
- Generate a project report.
- Manage device, software, and control network profiles to accelerate the quotation process.

Prerequisites

Knowledge of EcoStruxure Control Expert (formerly Unity Pro™ software)

Audience

- System Design Engineers

Available As

E-learning

2 hours

Part of Control Engineering Professional

1300 System Advisor for Process Control Architecture

New

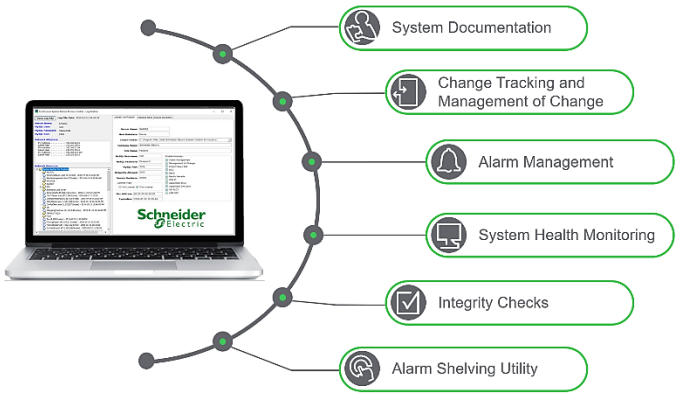
EcoStruxure™ System Advisor for Process Control software helps you document system information, track system changes, monitor system health, perform integrity checks, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course guides you through the main features of System Advisor for Process Control. The course also presents network architecture and helps you identify network components.

Learning Objectives

After completing this course, you can:

- Explain the features of System Advisor.
- Explore the different architecture configurations for a System Advisor network.
- Identify the main components of different network configurations.



Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

45 minutes

Part of Control Engineering Professional

1301 Navigating Key Features of System Advisor for Process Control

New

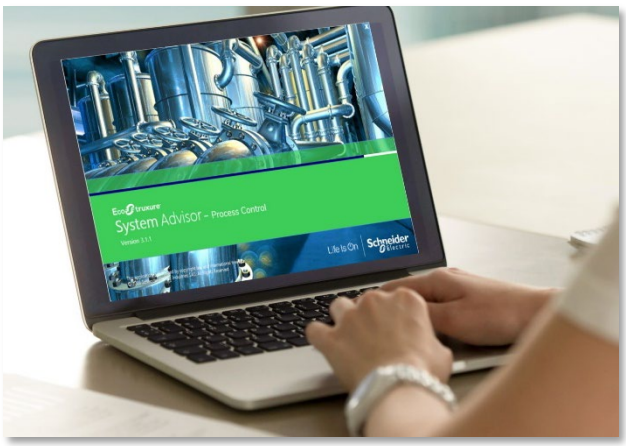
EcoStruxure™ System Advisor for Process Control software helps you document system information, track system changes, monitor system health, perform integrity checks, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course details the block and tag-related features of System Advisor for Process Control for viewing basic information about Foxboro DCS in one location.

Learning Objectives

After completing this course, you can:

- Access and navigate the System Advisor interface.
- Explore basic functions and block features of System Advisor.
- View and track tag-related information in System Advisor.



Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

Part of Control Engineering Professional

50 minutes

1302 Identifying System Information Using System Advisor for Process Control

New

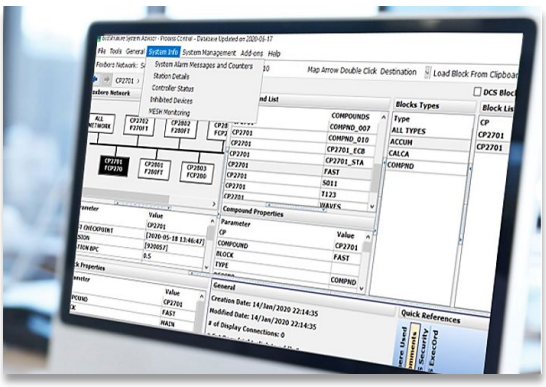
EcoStruxure™ System Advisor for Process Control software helps you document system information, track system changes, monitor system health, perform integrity checks, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course details function-related features that help you manage I/O channels in Foxboro DCS and reserve I/O spares. The course covers some advanced function-related features of System Advisor for Process Control, including FBM Manager, Mapping Tool, and Comments.

Learning Objectives

After completing this course, you can:

- Demonstrate the FBM Manager feature.
- View block mapping in the entire I/O organization using the Mapping Tool feature.
- Explore the Comments feature.
- Explore the System Messages and Counters feature.
- View complete information about selected controllers using the Controller Status feature.



Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

Part of Control Engineering Professional

45 minutes

1303 System Management with System Advisor for Process Control

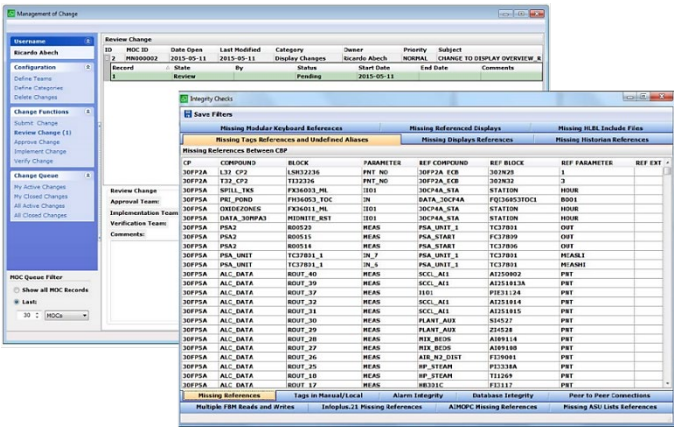
New

EcoStruxure™ System Advisor for Process Control software helps you document system information, track system changes, monitor system health, perform integrity checks, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course details the System Advisor for Process Control features for viewing system management information about Foxboro DCS. Specifically, the course covers features for performing changes to the Foxboro DCS configuration in bulk, managing configuration changes, and monitoring system events.

Learning Objectives

After completing this course, you can:



- View the results from system configuration checks using the Integrity Checks and Displays features.
- Implement a group of changes simultaneously to the Foxboro DCS configuration using Historians and Bulk Configuration features.
- Manage system changes using Management of Change (MOC).
- View system events recorded by System Advisor using the Sequence of Events (SOE) Messages feature.

Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

Part of Control Engineering Professional

65 minutes

1304 Generating Reports in System Advisor for Process Control

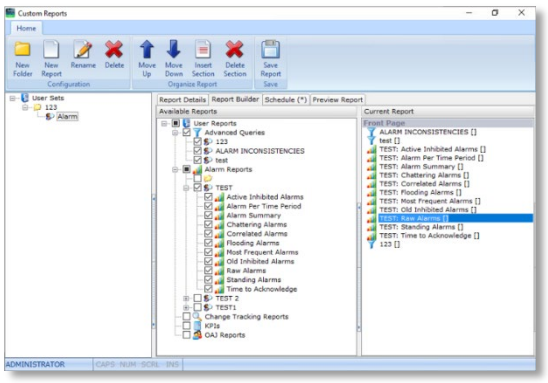
New

EcoStruxure™ System Advisor for Process Control software helps you document system information, track system changes, monitor system health, perform integrity checks, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course helps you create custom reports using the system management features of System Advisor for Process Control. These reports enable you to address system status and enhance system performance and engineering efficiency.

Learning Objectives

After completing this course, you can:



- Query and view required system information using the Advanced Queries feature.
- Filter and view alarm-related information using the Alarm Statistics feature.
- Track and view changes to the Foxboro DCS configuration using the Change Tracking and Operator Action Journal (OAJ) Messages features.
- Calculate and view the performance of various components in a Foxboro DCS network using the Key Performance Indicators (KPIs) Configurator feature.
- Combine multiple reports into a single custom report using the Custom Report feature.

Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

Part of Control Engineering Professional

90 minutes

1305 Maintaining Data Within System Advisor for Process Control

New

EcoStruxure™ System Advisor for Process Control software helps you document and track system changes, manage I/O modules, and create advanced queries for Foxboro™ Distributed Control System (DCS) projects.

This course outlines maintenance activities that you perform on System Advisor for Process Control. The course guides you through performing timely maintenance of the MySQL database and System Advisor data in the MySQL database to help prevent unexpected application downtime.

Learning Objectives

After completing this course, you can:

- Explain the General Configuration and Add-on features of System Advisor.
- Manage the MySQL database and System Advisor data.

Prerequisites

- Knowledge of:
  - Basic concepts of Ethernet networks
  - Foxboro DCS architecture
- Understanding of:
  - Foxboro control configuration and hardware configuration
  - Content from *2001V8 Configuration Essentials* or *5001 Control Software Configuration*

Audience

- Control Engineers
- Technicians

Available As

E-learning

55 minutes

Part of Control Engineering Professional

1172 Troubleshooting Foxboro DCS Control Processor

Schneider Electric provides different tools to help you monitor and troubleshoot Foxboro™ Distributed Control System (DCS).

This course conveys comprehensive knowledge to help newly hired personnel monitor and troubleshoot Foxboro DCS during project commissioning or system maintenance. The course explains commonly used tools for troubleshooting Foxboro DCS Control Processor (CP).

Learning Objectives

After completing this course, you can:

- Monitor Foxboro DCS using System Manager.
- Diagnose CP status using Fault Tolerant History Script (FTHS).
- Extract CP Memory Dump.
- Capture network data using Wireshark® network protocol analyzer.

Prerequisites

Knowledge of:

- Foxboro DCS architecture
- System Manager
- Ethernet networks

Audience

- Maintenance Engineers
- Plant Operations Managers

Available As

E-learning

Part of Control Engineering Professional

45 minutes

1202 Troubleshooting Foxboro DCS Using Scripts

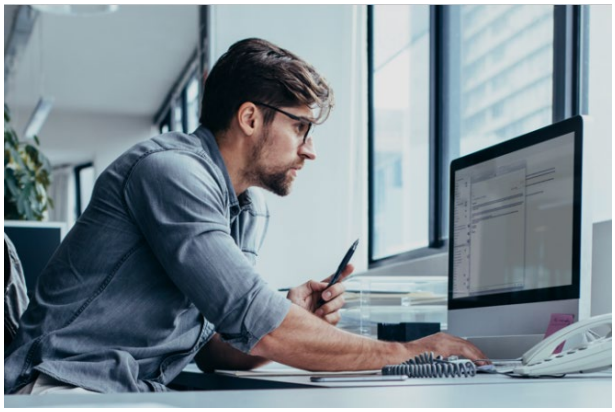
Schneider Electric provides different tools to help you monitor and troubleshoot Foxboro™ Distributed Control System (DCS).

This course conveys comprehensive knowledge to help newly hired personnel monitor and troubleshoot Foxboro DCS during project commissioning or system maintenance. The course introduces four scripts and when to use each script to solve system challenges.

Learning Objectives

After completing this course, you can troubleshoot Foxboro DCS using the following scripts:

- Database synchronization
- Save all and load all
- dbvu
- ICC Print



Prerequisites

Knowledge of:

- Foxboro DCS architecture
- System Manager
- Ethernet networks

Audience

- Maintenance Engineers
- Plant Operations Managers

Available As

E-learning

Part of Control Engineering Professional

45 minutes

1157 Monitoring Control System Performance

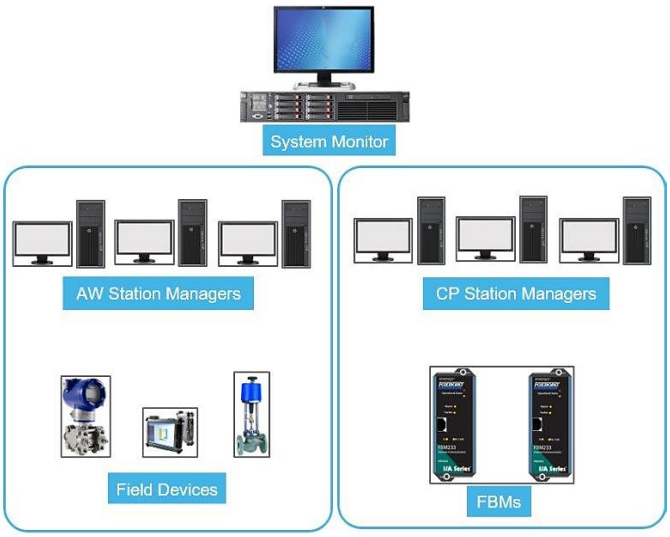
This course provides essential knowledge on key functions in System Manager for monitoring a Foxboro system. Topics include the features and functions of System Manager; interaction between System Manager components; user interface navigation; and routine procedures, such as installation, configuration, equipment maintenance, and troubleshooting, using System Manager.

Knowledge of System Manager helps plant personnel effectively ensure the health and performance of the entire control system and manage network operations.

Learning Objectives

After completing this course, you can:

- List the features, functions, and benefits of System Manager.
- Describe how different components in System Manager work together.
- Install System Manager software and identify major user interface elements.
- Perform the appropriate maintenance activity on different types of equipment.
- View and acknowledge system alarms using System Manager.
- Locate and troubleshoot a failed device using System Manager.



Prerequisites

Knowledge of:

- Foxboro DCS architecture
- Foxboro Control HMI

Audience

- Control Engineers
- Maintenance Engineers and Technicians
- Plant Operators

Available As

E-learning

2 hours

Part of Control Engineering Professional

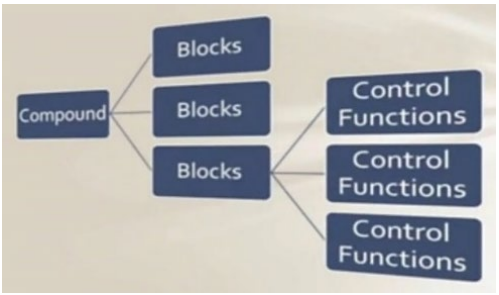
5111 Configuring the PIDA Control Block

4 videos

This course helps you acquire a sound foundation of the features and functionality of the PIDA block. The PIDA block implements continuous PID or dead-time feedback and additive or multiplicative feedforward control of an analog loop, providing more advanced features than the PID and PIDX blocks. Principal inputs of the PIDA block—setpoint and measurement—compute the block's output, referred to as the manipulated variable, based on user-set or adaptively tuned values. These values include tuning parameters, proportional band, integral time, derivative time, delay time, and setpoint relative gain (SPLLAG). Additionally, pre-tuning can adjust the measurement filter time constant factor (KD) to adapt the deviation alarm delay (DEVTIM).

Learning Objectives

After completing this course, you can:



- Process a control block.
- Link and condition PIDA input and output signals.
- Configure PIDA control modes and tuning parameters.
- Configure PIDA auto and manual modes, initialization, and back-calculations.
- Configure PIDA alarms, including condition types, actions, message groups, priorities, alarm indicators, and status.
- Suspend, inhibit, and enable PIDA alarms.
- Secure write access and PIDA operation HMI screens for viewing the PIDA block.
- Use PIDA block and PID functions with control inputs, setpoint clamping, and impact of setpoint changes.
- Perform advanced control functions, such as non-linear control, cascade control, feedforward control, and batch operations, using the PIDA block.

Prerequisites

- High school Calculus
- *2101 Foxboro Continuous Control, 5101 Control Software Continuous Control,* or *5101FV Control Software Continuous Control with FoxView*

Audience

- Control Engineers
- System Administrators

Available As

E-learning

3 hours, 55 minutes

Part of Control Engineering Professional

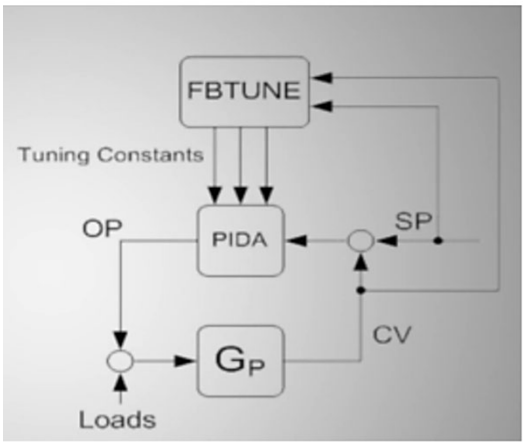
5112 Configuring the FBTUNE Feedback Tuner Block

5 videos

This course helps you acquire a sound foundation of the features and functionality of the FBTUNE block. The FBTUNE block helps you adaptively tune gain schedules for proportional band (PBAND), integral time (INT), derivative time (DERIV), dead time (DTIME), and relative gain on the setpoint (SPLLAG) of PIDA and DPIDA blocks. The FBTUNE block also helps you set deviation alarm delay (DEVTIM) and filter time constant (FILTER) to prevent high-frequency instability in the PITAU and PIDTAU deadtime controller modes.

Learning Objectives

After completing this course, you can:



- Describe basic concepts of controller tuning.
- Explain the functions of the FBTUNE block.
- Compare auto-tuning and self-tuning.
- Configure the connection between an FBTUNE block and a PIDA block.
- Identify parameters and parameter options for configuring the FBTUNE block.
- Set boundaries on the FBTUNE block.
- Configure the Pre-Tune function in the FBTUNE block.
- Operate the FBTUNE block using the detail display.
- Indicate appropriate scenarios for using the FBTUNE block.
- Maximize performance of FBTUNE through the proper setting of key block parameters.

Prerequisites

- 5111 Configuring the PIDA Control Block

Audience

- Control Engineers
- System Administrators

Available As

E-learning

Part of Control Engineering Professional

55 minutes

1292 Analyze Plant Performance Using Control Advisor

New

The EcoStruxure™ Control Advisor software application continuously monitors and assesses plant performance for inefficiencies. Control Advisor gathers control loop data from the plant, identifies potential issues with control loops, prioritizes the most defective loops, and diagnoses root causes of these defects. Additionally, Control Advisor recommends new tuning parameters to deliver optimal loop performance.

This course provides essential knowledge on monitoring and analyzing plant performance effectively using Plant Performance Dashboard of Control Advisor. Practice exercises and demos reinforce application knowledge acquired through this course.

Learning Objectives

After completing this curriculum, you can:

- Monitor plant data using Plant Performance Dashboard.
- Create performance reports for a plant.
- Analyze root causes of plant performance issues.

Prerequisites

Knowledge of

- Foxboro™ Distributed Control Systems (DCSs)
- Control loop configuration

Audience

- Control Engineers

Available As

E-learning

Part of Control Engineering Professional

40 minutes

Safety Engineering Professional Collection

This section is organized to show individual e-learning courses in the *Safety Engineering Professional Collection*. Other available e-learning collections are listed below as hyperlinks for quickly navigating to a section.

Available E-Learning Collections			
Basic	Foundation	Essential	Professional
• Process Automation	• Control Engineering • Control HMI • Networking • Safety Engineering	• Process Automation • Process Automation Security • Safety Engineering • Virtualization	• Control Engineering • Safety Engineering

1175 Testing Safety Applications Using Triconex Safety Validator

Triconex™ Safety Validator enables the creation and execution of tests that help verify TriStation™ 1131 safety applications through customizable and easy-to-develop Test Cases.

This course conveys knowledge on the workflow for testing safety applications in Triconex Safety Validator and includes software simulation to allow you to practice the safety validation process from start to end.

Learning Objectives

After completing this course, you can:

- Identify the process of testing TriStation 1131 safety applications.
- Extract configuration data from a TriStation 1131 Project File using Triconex Report Generator.
- Create Test Suites, Test Cases, and Test Steps using Triconex Safety Validator.
- Execute Tests on Triconex Emulator using Triconex Safety Validator.
- Generate Test Procedure and Results documents using Triconex Safety Validator.

Prerequisites

Familiarity with:

- Process safety applications, such as Emergency Shutdown systems and Fire and Gas systems
- Triconex controllers: Tricon™, Tricon-CX, Trident™, or Tri-GP™
- Creation of TriStation 1131 safety applications

Audience

- Safety Engineers

Available As

E-learning

1 hour

Part of Safety Engineering Professional

1203 Testing Safety Functionality Using Triconex Safety Validator Tieback

The Triconex™ Safety Validator TieBack application enables you to test the functionality of safety applications in response to simulated field device failures through the creation of tiebacks.

This course provides essential knowledge on the features and functions of the TieBack application. The course also provides information on the workflow for creating tiebacks to test the functionality of the safety application.

Learning Objectives

After completing this course, you can:

- Explain the features and functions of the TieBack application.
- Summarize the process for creating tiebacks in a project.
- Create and attach a simulation file to a test project in Triconex Report Generator.
- Map tagnames in the Unit Under Test (UUT) file to tagnames in the tieback simulation file.
- Connect the safety logic to Emulators and run simulations.
- View tieback results in the TieBack application and in TriStation™ 1131 Developer's Workbench software.
- Explain how to run tiebacks in Triconex Safety Validator.

Prerequisites

Familiarity with:

- Process safety systems; for example, Emergency Shutdown and Fire and Gas
- Triconex controllers: Tricon™, Tricon CX, Trident™, and Tri-GP™
- Creation of TriStation 1131 safety applications
- Triconex Safety Validator and Triconex Report Generator

Audience

- Safety Engineers

Available As

E-learning

1 hour, 15 minutes

Part of Safety Engineering Professional

1192 Troubleshooting Triconex Safety Systems

Triconex™ Safety System provides diagnostic tools to record data and diagnose errors during project commissioning or system maintenance.

This course covers troubleshooting Triconex hardware using Triconex Enhanced Diagnostic Monitor and the DiagRead utility. The course also covers troubleshooting the industrial process using Triconex Sequence of Events (SOE) Recorder.

Learning Objectives

After completing this course, you can:

- Troubleshoot Triconex hardware using Enhanced Diagnostic Monitor.
- Generate and interpret the firmware version report and the events log.
- Set up and extract the DiagRead file to troubleshoot Triconex hardware.
- Collect and analyze data using SOE Recorder.

Prerequisites

- Knowledge of:
  - Triconex system fundamentals and installation
  - Triconex controllers: Tricon™, Tricon CX, and Trident™ and Tri-GP™
  - Ethernet networks
- Working experience creating TriStation™ 1131 safety applications

Audience

- Maintenance Engineers
- Safety Engineers

Available As

E-learning

2 hours

Part of Safety Engineering Professional

1314 Configure System Advisor Components to Collect TriStation 1131 Data

New

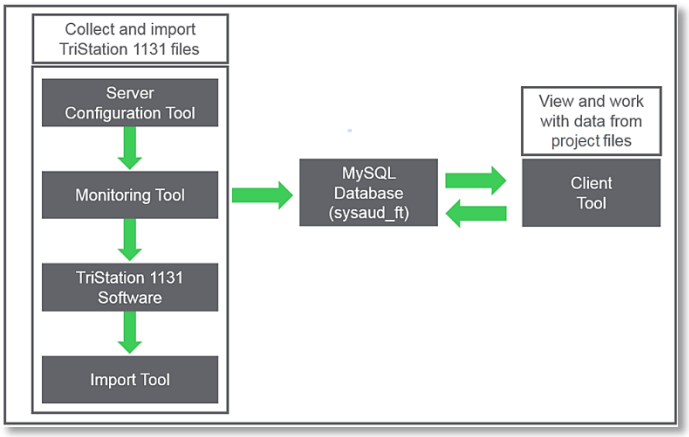
This course provides essential knowledge on collecting data from TriStation™ 1131 Developer's Workbench software. Data collection includes setting up the server for EcoStruxure™ System Advisor for Process Safety and selecting, printing, and importing TriStation 1131 project files into the MySQL database of System Advisor for Process Safety.

For data collection, System Advisor contains three tools for documenting and tracking changes in TriStation 1131 project files: Server Configuration Tool, Monitoring Tool, and Import Tool. System Advisor also includes Client Tool, which supports other System Advisor features, such as managing comments and user privileges.

Learning Objectives

After completing this course, you can:

- Configure System Advisor components to collect TriStation 1131 data.
- Search for data within System Advisor.
- Add and manage comments to System Advisor data.
- Manage user access to System Advisor.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
  - Triconex controllers: Tricon™, Tricon CX, and Trident™ and Tri-GP™
- Working experience creating TriStation™ 1131 safety applications

Audience

- Maintenance Engineers
- Safety Engineers

Available As

E-learning

1 hour

Part of Safety Engineering Professional

1315 Manage TriStation 1131 I/Os Using System Advisor

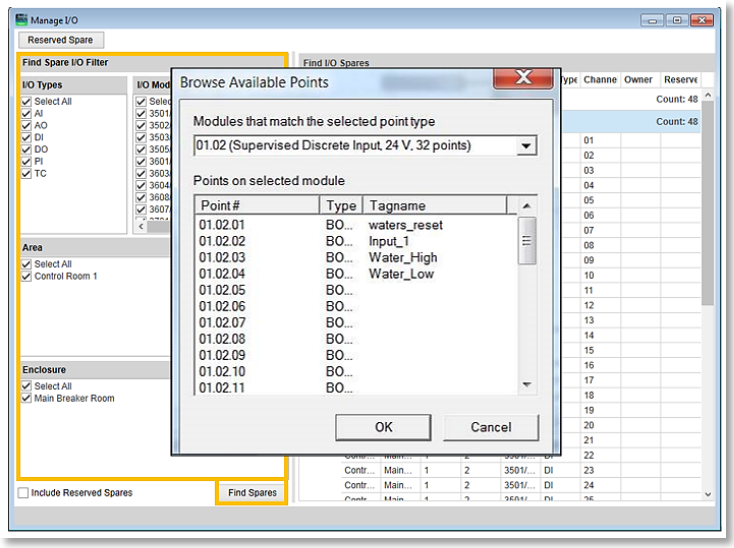
New

EcoStruxure™ System Advisor for Process Safety provides you with the tools to manage the I/Os of TriStation™ 1131 Developer's Workbench software. This course provides essential knowledge on how to use System Advisor to map the plant hierarchy for easy location of I/Os and effective management of I/O spares within the system.

Learning Objectives

After completing this course, you can:

- Configure plant hierarchy within System Advisor.
- Manage I/O spares using System Advisor.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
  - Triconex controllers: Tricon™, Tricon CX, and Trident™ and Tri-GP™
- Working experience creating TriStation™ 1131 safety applications

Audience

- Maintenance Engineers
- Safety Engineers

Available As

E-learning

Part of Safety Engineering Professional

40 minutes

1316 Track Configuration Changes Using System Advisor

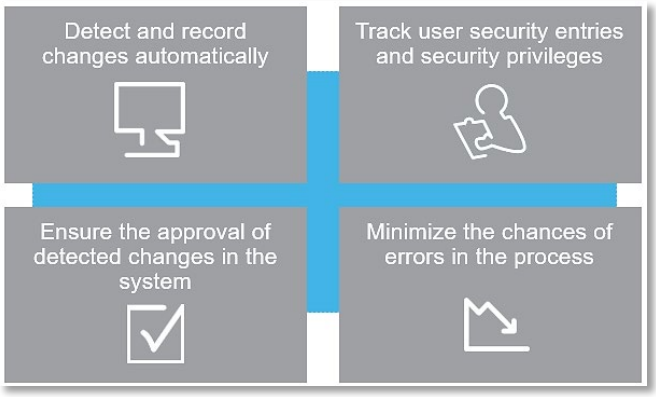
New

Tracking changes is the main feature of EcoStruxure™ System Advisor for Process Safety. This feature helps you document modifications to TriStation™ 1131 Developer's Workbench software. This course explains how to track changes in different areas of TriStation 1131.

Learning Objectives

After completing this course, you can:

- Track changes to TriStation 1131 logic.
- Audit TriStation 1131 changes using Audit Manager.
- Track changes to Controller Workspace.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
  - Triconex controllers: Tricon™, Tricon CX, and Trident™ and Tri-GP™
- Working experience creating TriStation™ 1131 safety applications

Audience

- Maintenance Engineers
- Safety Engineers

Available As

E-learning

Part of Safety Engineering Professional

1 hour

1317 Perform Advanced Tasks in System Advisor: SQL Queries and System Maintenance

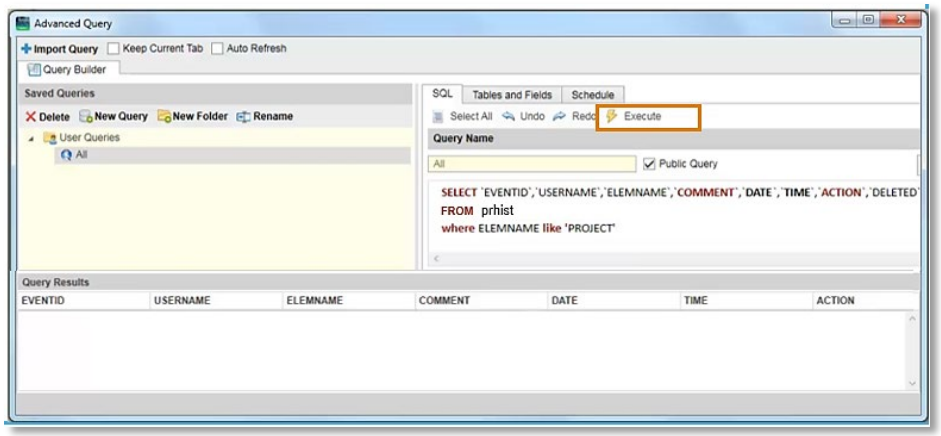
New

This course provides essential knowledge on writing SQL search queries and generating reports using EcoStruxure™ System Advisor for Process Safety. The course also explains best practices for performing routine maintenance on System Advisor.

Learning Objectives

After completing this course, you can:

- Build advanced queries and generate reports using System Advisor.
- Maintain the System Advisor database.



Prerequisites

- Knowledge of:
  - Process safety applications, such as Emergency Shutdown Systems and Fire and Gas Systems
  - Triconex controllers: Tricon™, Tricon CX, and Trident™ and Tri-GP™
- Working experience creating TriStation™ 1131 safety applications

Audience

- Maintenance Engineers
- Safety Engineers

Available As

E-learning

50 minutes

Part of Safety Engineering Professional

Legacy Courses

Courses in this section are available for on-demand purchase and listed numerically in the following table. Contact your local Service Sales representative for more information.

Course Title and Scope	
1053 Introduction to Foxboro I/A Series DCS Architecture This foundational course identifies the architecture, components, and functions of a Distributed Control System (DCS) to help you install and maintain Foxboro™ system effectively.	3 hours, 30 minutes
1054 Introduction to Foxboro Control Software DCS Architecture This foundational course illustrates the integration of Foxboro™ Distributed Control System (DCS) hardware components with Control Software to form an enterprise control system platform. You use the ArchestrA™ Integrated Development Environment (IDE) to configure Foxboro DCS.	1 hour, 45 minutes
1056 (Part 1) and 1061 (Part 2) Continuous Control Concepts Using IACC This two-part foundational course introduces the basic concepts of continuous control. The course also covers the use of I/A Series™ Configuration Component (IACC) blocks in simple control applications. Part 2 builds upon Part 1 by providing practice with the CHARC, ACCUM, and OUTSEL control blocks. This course is also useful for engineers who are working at or supporting sites with legacy Foxboro™ I/A Series control systems.	6 hours, 40 minutes
1057 (Part 1) and 1062 (Part 2) Continuous Control Concepts Using FCS This two-part foundational course introduces the basic concepts of continuous control. The course also covers the use of Foxboro™ Control Software (FCS) blocks in simple control applications. Part 2 builds upon Part 1 by providing practice with the CHARC, ACCUM, and OUTSEL control blocks. This course is also useful for process automation professionals looking to refresh their knowledge of control engineering fundamentals.	6 hours, 40 minutes
1060 FCS Configuration Tools This foundational course helps you become proficient at using Foxboro™ Control Software (FCS) Configuration Tools. FCS Configuration Tools enable the configuration of applications and control objects. FCS Configuration Tools provide a consistent graphic environment and a common method for design implementation.	10 hours
1063 FoxDraw – Designing and Building an HMI This foundational course explains how to use FoxDraw™ software to create and configure displays that represent a plant or process area. This course also introduces the procedure for configuring I/A Series™ environments tailored to your control system and users of this system.	7 hours, 30 minutes

Course Title and Scope	
1064 Design and Build HMIs Using InFusion View (Control Edition) Tools This foundational course details how to use the HMI construction tool and other visual tools in the InFusion™ View CE suite. This course includes the procedure for designing various types of windows and process graphic displays for a plant process that operates with I/A Series process control logic.	10 hours
1066 Control Loop Configuration Using IACC This foundational course covers discrete input, discrete output, LOGIC, and CALC blocks for configuring an I/A Series™ system. Leveraging relevant examples, this course also helps you understand how to configure feedback and cascade loops with control blocks using I/A Series Control Configurator (IACC) functionality. This course is also useful for engineers who are working at or supporting sites with legacy Foxboro™ I/A Series control systems.	6 hours, 30 minutes
1067 Control Loop Configuration Using FCS This foundational course covers discrete input, discrete output, LOGIC, and CALC blocks for configuring an I/A Series™ system. Leveraging relevant examples, this course also helps you understand how to configure feedback and cascade loops with I/A Series control blocks using Foxboro™ Control Software tools. This course is also useful for process automation professionals looking to refresh their knowledge of control engineering fundamentals.	6 hours, 30 minutes
1068 Configuring Sequence Controls Using IACC Sequence control strategies help you perform normal and exception control functions during a process operation. This foundational course explains how to configure Sequence (SEQ) control blocks using I/A Series™ Configuration Component (IACC) functionality. SEQ blocks enable you to implement sequential, time-based, and event-oriented batch control applications. In this course, you use High-Level Batch Language (HLBL) or a Sequential Function Chart (SFC) graphical configuration to program various SEQ blocks, including: Monitor (MON), Timer (TIM), Independent (IND), Dependent (DEP), and Exception (EXC). This course is useful for engineers who are working at or supporting sites with legacy Foxboro™ I/A Series control systems.	3 hours

Course Title and Scope	
1070 I/A Series System – Field Device Integration This essential course explains how to integrate field devices with an I/A Series™ system. Device integration is the process of connecting all devices in a plant to the I/A Series system to enable efficient management and control. When devices are correctly integrated, you can control hardware in all supervisory, plant performance, and production management activities. A variety of integration options are available to help you effectively track processes, maximize control, and ensure optimum output.	3 hours
1071 Alarm Configuration Using IACC This essential course introduces alarm configuration using I/A Series™ Configuration Component (IACC) functionality. Alarm configuration is an essential plant activity for notifying plant personnel of deviations or abnormal conditions in a process. This course also introduces the Alarm Manager and other alarm displays for acknowledging and clearing alarms. This course is also useful for engineers who are working at or supporting sites with legacy Foxboro™ I/A Series control systems.	4 hours
1072 Alarm Configuration Using FCS This essential course introduces alarm configuration using Foxboro™ Control Software (FCS). Alarm configuration is an essential plant activity for notifying plant personnel of deviations or abnormal conditions in a process. This course also introduces the Alarm Manager and other alarm displays for acknowledging and clearing alarms.	4 hours
1074 AIM* -- Designing and Building a Historian Database AIM*Historian™ enables you to collect and analyse data generated in a plant. The key objective of this course is to help you design and build an AIM*Historian database.	5 hours, 35 minutes
1075 Configuring Wonderware Historian (Foundation Edition) This essential course introduces you to Wonderware™ Historian, a high-performance process historization tool capable of storing significant volumes of data generated from industrial facilities.	6 hours, 20 minutes

Course Title and Scope	
1081 TriStation 1131 Application This foundational course covers the use of the TriStation™ 1131 application with the Tricon™ controller. The application helps you detect unsafe conditions and take early corrective actions to minimize potential failures or accidents. Specifically, in this course, you develop, configure, and download the TriStation 1131 application for the Tricon controller. You create safety logic using the Cause and Effect Matrix (CEM). You retrieve events from the Tricon controller by configuring the Sequence of Events (SOE) Recorder	6 hours, 50 minutes
1127 Maximizing Productivity Using Unity Pro This course provides time-saving techniques to maximize productivity in Unity Pro™ software.	30 minutes
1132 Cabinet Engineering Basics This foundational course helps you design cabinets for distributed control systems and emergency shut-down systems. Because these cabinets contain electrical wiring and electronic equipment, careful design is required to prevent electrical shock to equipment users and to protect cabinet contents from environmental exposure. The course covers the different types of cabinets, including K and G Series cabinets, cabling and mounting, protective grounding and power distribution, operating environments, and the cabinet engineering workflow.	1 hour, 36 minutes
1133 Cabinet Design This course focuses on designing cabinets, the first phase in the three-phase cabinet engineering process. Specifically, this course covers creating documents, drawings, and test procedures for project hardware. These materials form the basic design, including cabinet layouts, of the automation system. Course *1134 Cabinet Integration and Testing* focuses on the other two phases of the cabinet engineering process: integrating cabinets and testing cabinets.	2 hours, 5 minutes

Course Title and Scope	
1134 Cabinet Integration and Testing This course focuses on the second and third phases of the cabinet engineering process: integrating cabinets and testing cabinets. Course *1133 Cabinet Design* focuses on the first phase: designing cabinets. • In the *integration* phase, Technicians use design documents to integrate cabinet components properly. Engineers refer to these documents to help ensure proper integration. • In the *testing* phase, Engineers use Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) documents to perform validation activities. These activities ensure cabinet construction and transportation do not lead to faulty performance on site. The course includes pictures of actual cabinets from typical projects and a template for creating punch lists and performing visual inspections.	2 hours
1144 Configuring Historian in a Foxboro System This course provides essential knowledge on the basic concepts of Wonderware® Historian, including an architectural overview and details on functional operation. Additionally, the course covers installing, licensing, and configuring Wonderware Historian to collect data from Foxboro™ Distributed Control System (DCS). Lastly, the course covers the activities of starting, stopping, and restarting Wonderware Historian.	2 hours, 15 minutes
1176 Feedback and Cascade Control Solutions Using IACC This course provides knowledge and practice on configuring feedback and cascade control loops using IACC. Feedback and cascade control loops are common and powerful control solutions for designing a control system. Feedback control uses system output to re-adjust system performance to achieve the expected output response, while cascade control enables proactive and corrective system responses to a system fault, instead of reactive responses.	3 hours
1177 Feedback and Cascade Control Solutions Using FCS This course provides knowledge and practice on configuring feedback and cascade control loops using FCS. Feedback and cascade control loops are common and powerful control solutions for designing a control system. Feedback control uses system output to re-adjust system performance to achieve the expected output response, while cascade control enables proactive and corrective system responses to a system fault, instead of reactive responses.	3 hours

Course Title and Scope	
1183 Discrete Control Solutions Using FCS This course introduces you to a variety of control blocks in Foxboro™ Control Software (FCS) for processing discrete information to and from digital field devices. Using FCS, you develop a control loop by selecting input and output blocks, blocks that represent devices, and blocks that perform advanced functions. You connect and configure these blocks in control strategies within control compounds and deploy the compounds to the control processor for execution.	3 hours, 30 minutes
1184 Discrete Control Solutions Using IACC This course introduces you to a variety of control blocks in I/A Series™ Configuration Component (IACC) for processing discrete information to and from digital field devices. Using IACC, you develop a control loop by selecting input and output blocks, blocks that represent devices, and blocks that perform advanced functions. You connect and configure these blocks in control strategies within control compounds and deploy the compounds to the control processor for execution.	3 hours, 30 minutes