



Emerson Education Services

Maximize Your Investment with Well-Trained Personnel

**TRAINING CENTERS
& CONTACTS**

LEARNING PATHS

BRANDS

5 AMS



ON-SITE TRADITIONAL

Through our on-site training services, we provide customers a Certified Instructor, courseware literature, and all hardware associated with supporting hands-on workshops. In North America, we deliver on-site training courses sponsored through our Partners' Education Program. This allows our customers the opportunity to access our Training Courses through their local business partner.



ELEARNING

Emerson eLearning offerings are professionally developed, engaging, flexible and up to date. Emerson online learning programs provide a convenient opportunity to study about our technologies and solutions at any time. Our goal is to provide our customers a competitive advantage by empowering them with the latest knowledge in a growing range of topics.



VIRTUAL LEARNING

Emerson's Virtual Classroom delivers real-time value-based Instructor-Led Training to customers' desktops with full access to software systems. Students connect directly to classroom-based machines for the entire class! There is no travel required, which means fewer expenses for our customers. Class takes place in a live online training room using a teleconference bridge.



BLENDED LEARNING

Blended Learning is a contemporary approach to training that blends different teaching methods and deploys them via digital and online media to maximize the effectiveness and convenience of learning. The Emerson Blended Learning approach combines various learning methods using a wide array of digital media. Blended Learning is Emerson's unique approach to delivering quality education while reducing out-of-production learner time.

MICRO TRAINING

Short "how-to" videos to accomplish specific tasks. The videos are ancillary and complementary to the traditional classroom training. Emerson subject matter experts share their knowledge by providing step-by-step instructions on how to accomplish simple to complex tasks.

Experiential [learning] is a philosophy and methodology in which educators purposefully engage with students in direct experience and focused reflection in order to increase knowledge, develop skills, and clarify values.



IACET ACCREDITED PROVIDER

Education Services is an Accredited Provider of International Association for Continuing Education and Training (IACET) Continuing Education Units (CEU). IACET Accredited Provider Status means our organization:

- Demonstrates compliance with proven, research-based standards created in cooperation with the U.S. Department of Education
- Is dedicated to high standards for quality in continuing education and training
- Awards the IACET EDU, the hallmark for quality in continuing education and training

Education Services is proud to have received Authorized Provider status. We look forward to the opportunity to share our training with you.



QUALIFICATIONS FOR ENROLLMENT

Education Services agrees to accept for training, individuals who are not competitors of Emerson Automation Solutions in the field to which the training pertains. Education Services will provide reasonable accommodations to students who have a physical or mental impairment that substantially limits one or more major life activities, as long as the accommodation does not put undue hardship on the company.



COURSE SCHEDULING, LOCATIONS & PRICING

Course schedule and locations including length, dates of each session and price are listed on the Education Services MyTraining website. All prices are in U.S. Dollars. For the most up to date information call or visit our website at: www.emerson.com/mytraining



TUITION

Methods of payment include: purchase order, acceptable credit cards include: Visa, MasterCard and American Express. All tuition is subject to change without notice. Transportation, personal expenses and most meals are the responsibility of the student.



CANCELLATIONS & TRANSFERS

If your plans or budgets change you may cancel/transfer your reservations up to 14 calendar-days prior to start of the course without incurring a cancellation charge. Limited enrollment makes it necessary to charge 50% of the full tuition for cancellations/transfers received during the 14-days prior to the start of the course, and full tuition for failure to attend without canceling. Substitutions are accepted until the first-days of class.



E-LEARNING

Training courses are available to you on-line. You can learn at your pace and on your time. For more information please visit our web page: www.emerson.com/education



COURSE MATERIALS

All materials presented are copyrighted. Audio and video recording is prohibited and no material or portion of any course may be reproduced in any manner without prior written approval. All necessary documentation, catalogs, and literature are included in the course tuition. The training materials were developed by and for Emerson Education Services exclusive use.



ON-SITE & LOCAL TRAINING

Education Services instructors are available to provide expert training anywhere in the world. We can conduct training tailored to meet your needs at your facility or regional and local sites. To learn more about on-site and local training contact your local Emerson service provider or call 1-800-338-8158.



ARRIVAL & DEPARTURE TIME

Students should plan to arrive the-days prior to the course starting-days, as class typically begins at 8 a.m. If traveling by air, please allow sufficient time to travel to the airport and check-in when scheduling return transportation.

AMS



COURSE 7020

CEUs: 2.1

AMS Device Manager**Overview**

Completing 3-days of AMS Device Manager hands-on instructor assisted training modules and exercises, provides the quickest route to your productive use of this predictive maintenance application.

Topics

- Viewing and Modifying Devices
- Creating a Plant Database Hierarchy and Adding Devices
- Using the Field Communicator with AMS Device Manager
- Using the AMS Device Manager Browser Functions
- Audit Trail
- Calibrating Device - Calibration Assistant
- Configuring and Monitoring System Alerts
- Installing an AMS Device Manager Server Plus Standalone
- Starting AMS Device Manager for the First Time
- Network Communication Interface Setup
- AMS Device Manager Database Management
- Installing a Distributed System
- Installing Device Types from Media
- MV Engineering Assistant SNAP-ON Application
- QuickCheck™ SNAP-ON Application
- AMS Device Manager OPC Server and the Matrikon OPC Explorer
- AMS Device Manager Web Services
- AlertTrack™ SNAP-ON Application
- Wireless SNAP-ON Application

Audience

This course is intended for technicians and engineers who need to configure and use AMS Device Manager.

COURSE 7021

CEUs: 2.1

AMS Device Manager with Rosemount HART Instruments**Overview**

Learn the installation, calibration, maintenance, and troubleshooting of measurement instrumentation using AMS Device Manager. This 3-day course teaches maintenance and calibration of measurement devices using AMS Device Manager software to communicate and track information. The student will learn how pressure and temperature transmitters function, are installed, and calibrated using AMS Device Manager. The course uses hands-on training, labs, and lecture to teach the student how to:

- Configure and use AMS Device Manager correctly perform transmitter installation and setup procedures
- Properly configure HART® transmitters
- Properly calibrate transmitters
- Perform basic troubleshooting-transmitters

Topics

- Configuring and Using AMS Device Manager
- Viewing and Modifying Devices
- Creating a Plant Database Hierarchy and Adding Devices
- AMS Device Manager Browser Functions
- Audit Trail
- HART Communication
- HART Transmitters (3051C, 3144P)
- Test Equipment Selection
- Transmitter Installation and Configuration
- Transmitter Calibration
- AMS Calibration Assistant
- Intelligent Calibrators
- Transmitter Troubleshooting

Audience

The hands-on focus is on skills required by engineers, technicians, or others that are new to the plant or instrument environment.

COURSE 7039

CEUs: 2.8

AMS Device Manager with DeltaV**Overview**

This 4-day course is for instrumentation technicians responsible for all areas of managing and ensuring the reliability of instrumentation in the plant process including startup and commissioning, normal operations, maintenance, and troubleshooting.

Topics

- DeltaV and PlantWeb Overview
- AMS Device Manager Overview
- FOUNDATION™ fieldbus Overview
- ValveLink™ SNAP-ON Introduction
- ValveLink™ DVC Setup
- ValveLink™ SNAP-ON Tests and Diagnostics
- HART® Overview
- PROCONEX QuickCheck SNAP-ON
- PROFIBUS Overview
- PlantWeb Alerts
- AMS Device Manager User Interface
- Setup and use of Alert Monitor in AMS Device Manager
- Device Replacement for HART, Fieldbus, and PROFIBUS Devices
- AMS Device Manager Audit Trail
- AMS Device Manager Calibration Assistant
- Smart Commissioning

Prerequisites

Microsoft windows experience. Minimal DeltaV and AMS experience is recommended but not required. Recommended to take 7018, but not required.

Audience

The target audience usually does following:

- Responds to work orders created to calibrate, troubleshoot, repair, service, and replace instruments and valves
- Monitors alerts to preemptively address problems prior to operators seeing a problem in the control room
- Provides loop testing & assistance with instrumentation in plant turnarounds, startups, and for project work
- Improves process availability & reduces operations and maintenance costs

COURSE E2300

CEUs: 0.1

AMS Trex Device Communicator**Overview**

AMS Trex Device Communicator is an introductory course with lessons on:

- Theory of operation
- Model number
- Spare part selection
- Communicator configuration
- Connecting
- Communicating
- Powering HART™
- FOUNDATION™ Fieldbus
- Wireless devices and positioners
- Unit maintenance
- Troubleshooting the unit
- Device connectivity

Topics

E2300 AMS Trex Device Communicator is an introductory course with lessons on theory of operation, model number and spare part selection, communicator configuration, connecting, communicating, and/or powering HART™, FOUNDATION™ Fieldbus, and wireless devices and positioners, unit maintenance, and troubleshooting the unit and device connectivity

Audience

This is online E-course.



BETTIS



COURSE VA111

CEUs: 1.2

Bettis MCP & M2CP Maintenance & Field Service Introduction**Overview**

Fundamental overview of the construction, assembly, hardware, software and configuration of Emerson's Bettis™ MCP & M2CP actuators. Students attending this program will demonstrate an ability to identify actuators, hardware, components and assemblies. All students will demonstrate the ability to setup, configure, check and verify operation of various actuator configurations using appropriate hardware or software.

Topics

- Identify main mechanical components and understand the function of Emerson's Bettis M2CP and MCP actuators
- Identify main components and understand function of the modular control package (MCP)
- Identify main components and understand function of the second generation modular control package (M2CP)
- Setup and Commissioning
- Identify function and main components of bevel gears and worm gears
- Introduction to DCMLink

Prerequisites

Students should have a minimum of one year field service experience and a working knowledge of Bettis M2CP actuators.

COURSE VA114

CEUs: 1.2

Bettis TEC2 Maintenance & Field Service Introduction**Overview**

Fundamental overview of the construction, assembly, hardware, software and configuration of Emerson's Bettis TEC2000 and TEC2 actuators. Students attending this program will demonstrate an ability to identify actuators, hardware, components and assemblies. All students will demonstrate the ability to setup, configure, check and verify operation of various actuator configurations using appropriate hardware or software.

Duration:

2 Days

Who Should Attend:

- Field Service Technicians
- Sales Engineers
- Quotation Managers
- Instrumentation and Control Technicians

Topics

- Identify main mechanical components and understand the function of Emerson's Bettis TEC2 actuators
- Identify main components and understand function of the non-intrusive TEC2 control package
- Setup and Commissioning
- Identify function and main components of bevel gears and worm gears
- Introduction to DCMLink

Prerequisites

Students should have a minimum of one-year field service experience and a working knowledge of Bettis TEC2 actuators.

COURSE VA134

CEUs: 1.2

Bettis XTE3000 Maintenance & Field Service Introduction**Overview**

This course presents the fundamental aspects of Bettis XTE3000 actuators. Attendees are presented with essentials of design and operation and how they operate the valves. Basic components and assemblies are identified to aid in understanding the basic controls, applications, and mechanical operation. Each student will learn how to set travel limits, torque limits and operate an actuator on or off the valve. Model number interpretation, document relevance (Spec Sheet; Manuals; Wiring Diagrams; Outlines; Assembly Drawing) and support resources will be discussed.

Topics

- Identify main mechanical and electrical components
- Understand the control inputs, feedback outputs, and optional modules for the Bettis XTE3000 actuator
- Setup and Commissioning
- Status LED codes and fixes
- Configuration with AManager software
- Diagnosing and resolving error codes

Audience

- Field Service Technicians
- Sales Engineers
- Quotation Managers
- Instrumentation and Control Technicians

Prerequisites

Students should have a minimum of one-year field service experience and a working knowledge of Bettis XTE3000 actuators.

COURSE VA123**CEUs: 1.2****Bettis RTS Electric Actuator Product & Service Introduction****Overview**

This 2-day course presents the fundamental aspects of RTS actuators. Attendees are presented with essentials of design and operation and how they operate the valves. Basic components and assemblies are identified to aid in understanding the basic controls, applications, and mechanical operation. Each student will learn how to set travel limits, torque limits and operate an actuator on or off the valve. Model number interpretation, document relevance (Spec Sheet; Manuals; Wiring Diagrams; Outlines; Assembly Drawing) and support resources will be discussed. How to identify and order parts from local distributors or online store. Control Package wiring diagram interpretation and basic maintenance are all presented in a combination hands-on / instructor led lecture format. Any original course documentation and certificates are provided to all attendees for company records at the end of the program.

Topics

- Fail-Safe Operational Theory
- Mechanical assemblies for all RTS platforms CM - CL - FL - FQ
- Detailed focus on Ball Screw assemblies & Spring Canisters
- Detailed focus on both Brake (Fail-Safe & Spring Damping) assemblies
- Focus on optional Hand-Wheel over-ride assemblies
- Electronic Board Sets: Logic Board – VFD – Encoder – Motor / location, function, functionality
- Programming / Set-Up including Speed Controls both (pulsing & non-pulsing) speed changes. Binary Inputs / outputs
- Alarm function code identification & clearing.
- Smart Tool II Training

Audience

Repair techs of end users, LBP's, distributors, Final Control Lifecycle Service techs, etc.

Prerequisites

It is recommended that students bring an android device for Smart Tool AppTraining. A dongle is required for IRDA communication. A single demo device is available for the training.

COURSE VA112**CEUs: 1.8****Bettis M2CP & TEC2 Actuator Maintenance & Field Service Intermediate****Overview**

This advanced course teaches students how to install and configure optional control modules for the Bettis M2CP and TEC2 actuators. All students will be tested on the ability to setup, configure, and troubleshoot various actuator control modules. Students will configure DCMLink to utilize advanced diagnostics tools, live monitoring, and transfer configuration files.

Topics

- Install and configure M2CP Intermediate Switch Modules
- Install and configure TEC2 Optional Control Modules
- Interpret and diagnose Error Alarms and Messages
- Installing DCMLink Software, setting up Networks and troubleshooting

Prerequisites

VA111 or a minimum of 2 years of hands on experience with the products.

COURSE VA135**CEUs: 1.6****Bettis XTE3000 Maintenance & Field Service Intermediate****Overview**

This advanced course teaches students how to install and configure optional control modules for the Bettis M2CP and TEC2 actuators. All students will be tested on the ability to setup, configure, and troubleshoot various actuator control modules. Students will configure DCMLink to utilize advanced diagnostics tools, live monitoring, and transfer configuration files.

Topics

- Install and configure M2CP Intermediate Switch Modules
- Install and configure TEC2 Optional Control Modules
- Interpret and diagnose Error Alarms and Messages
- Installing DCMLink Software, setting up Networks and troubleshooting

Prerequisites

VA111 or a minimum of 2 years of hands on experience with the products.

COURSE VA103

CEUs: 2.8

Bettis Pneumatic Rack & Pinion and Scotch Yoke Actuator Maintenance Intermediate

Overview

A 4-day class introducing comprehensive information concerning the installation, operation and maintenance of Emerson Bettis™ Houston WACC products.

Topics

- Valve Automation Center Contract Review
- Installation/Maintenance Instruction Manuals
- Product Serial Numbers Review
- Service Procedure Index Review
- General Operating/Maintenance Instructions
- General Servicing Information on RPB, RPC, RPD, RPE, CB, CBA, CBB, CBAx30, HD, T, and G-Series Actuators Review
- Hands-on Training-EG; Conversions of actuator fail directions from CW to CCW and CWW to CW
- Field Service Work Performed by VAC's, Bettis Houston WACC Procedure Review
- Five days of Practical Exercises Involving the Disassembly and Reassembling of Emerson Bettis™ Houston WACC Products
- Features and Benefits Emerson Bettis Houston WACC Products for field maintenance
- How to trouble shoot field problems
- How to add features (options) to existing actuators
- Introduction to pneumatic controls
- Introduction to actuator to valve mounting hardware

Prerequisites

Students should have a minimum of one year field service experience and a working knowledge of Bettis M2CP actuators.

COURSE VA133

CEUs: 1.2

Bettis SCE 300 & Keystone EPI2 Product & Service Introduction

Overview

This 2-day course presents the fundamental aspects of Bettis SCE actuators and the Keystone EPI2. Attendees are presented with essentials of design and operation and how they operate the valves. Basic components and assemblies are identified to aid in understanding the basic controls, applications, and mechanical operation. Each student will learn how to set travel limits, torque limits and operate an actuator on or off the valve. Model number interpretation, document relevance (Spec Sheet; Manuals; Wiring Diagrams; Outlines; Assembly Drawing) and support resources will be discussed. How to identify and order parts from local distributors or online store. Control Package wiring diagram interpretation and basic maintenance are all presented in a combination hands-on / instructor led lecture format. Any original course documentation and certificates are provided to all attendees for company records at the end of the program.

Topics

- Quarter Turn applications
- Historical Perspective Bettis small ¼ turn electric actuators
- Mechanical Principal of Operation
- Electrical Principal of Operation
- Model number identification
- Wiring diagram interpretation
- Control Inputs- analog and discreet
- Feedback outputs – analog and discreet
- Optional Modules OM1 and OM13
- Optional Module OM3
- Stepper motor theory and practical function
- Speed output adjustment
- Torque output adjustment
- Status LED codes and fixes.
- Bluetooth and Amanager for analog units.
- DeviceNet and Profibus Optional Modules
- Part numbers, ordering and inventory

Prerequisites

Experience with electric actuator (EIM, Biffi, Bettis, etc.)

Audience

Repair techs of end users, LBP's, distributors, Final Control Lifecycle Service techs, etc.

DELTAV



COURSE 7425

CEUs: 3.2

DeltaV Live Graphics Interface Advanced**Overview**

This 3-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements.

Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

Topics

- How to Justify an MPC Project
- Evaluating the Cost of Process Variation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizing throughput when plant production is restricted by Input Limits or Measurable Constraint
- Meeting Application Requirements
- Meeting Control Requirements when the Response Times are Very Different
- Understanding the Design and Testing of an Integrating Process
- Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance when the Process is Dead Time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of Process Noise on Control Performance
- MPC Application
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks
- Optimizing Control
- Optimizing the Control Using the MPC-Pro or MPC-Plus Blocks

Prerequisites

7201 DeltaV Advanced Control Suite

Audience

This course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro.

COURSE 7425V

CEUs: 3.2

DeltaV Live Graphics Interface Advanced [Virtual]**Overview**

This 3-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements.

Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

Topics

- How to Justify an MPC Project
- Evaluating the Cost of Process Variation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizing throughput when plant production is restricted by Input Limits or Measurable Constraint
- Meeting Application Requirements
- Meeting Control Requirements when the Response Times are Very Different
- Understanding the Design and Testing of an Integrating Process
- Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance when the Process is Dead Time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of Process Noise on Control Performance
- MPC Application
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks
- Optimizing Control
- Optimizing the Control Using the MPC-Pro or MPC-Plus Blocks

Prerequisites

7201 DeltaV Advanced Control Suite

Audience

This course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro.

COURSE 7202

CEUs: 2.4

DeltaV Model Predictive Control**Overview**

This 3-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements.

Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

Topics

- How to Justify an MPC Project
- Evaluating the Cost of Process Variation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizing throughput when plant production is restricted by Input Limits or Measurable Constraint
- Meeting Application Requirements
- Meeting Control Requirements when the Response Times are Very Different
- Understanding the Design and Testing of an Integrating Process
- Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance when the Process is Dead Time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of Process Noise on Control Performance
- MPC Application
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks
- Optimizing Control
- Optimizing the Control Using the MPC-Pro or MPC-Plus Blocks

Prerequisites

7201 DeltaV Advanced Control Suite

Audience

This course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro.

COURSE 7202V

CEUs: 2.4

DeltaV Model Predictive Control [Virtual]**Overview**

This 3-1/2-day course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro. It provides practical examples of how to determine the benefits of MPC application and how this control may be used to meet specific application requirements.

Students will gain hands on experience through lab exercises based on realistic dynamic process simulations.

Topics

- How to Justify an MPC Project
- Evaluating the Cost of Process Variation
- Estimating the Reduction in Variation that is possible using MPC
- Calculating the Benefit of Maximizing throughput when plant production is restricted by Input Limits or Measurable Constraint
- Meeting Application Requirements
- Meeting Control Requirements when the Response Times are Very Different
- Understanding the Design and Testing of an Integrating Process
- Tailoring Control Performance
- Placing more Emphasis on Selected Control or Constraint Parameters
- Improving Control Performance when the Process is Dead Time Dominant
- Compensating for Large Changes in Process Gain or Dynamics
- Minimizing the Impact of Process Noise on Control Performance
- MPC Application
- Selecting and Applying MPC, MPC-Pro and MPC-Plus Blocks
- Optimizing Control
- Optimizing the Control Using the MPC-Pro or MPC-Plus Blocks

Prerequisites

7201 DeltaV Advanced Control Suite

Audience

This course is designed for process and control engineers who are applying DeltaV Predict and Predict Pro.

COURSE 7037**CEUs: 2.5****DeltaV Communication Bus Interfaces****Overview**

This 3-1/2-day course covers the integration of fieldbus compliant devices using DeltaV systems. Upon completion of the course the student will be able to install, configure and verify proper operations of AS-I, Profibus DP, DeviceNet Serial, EtherNet IP, and Wireless HART® devices, including proper wiring practices. The AMS Intelligent Device Manager will be used to interrogate PROFIBUS DP and Wireless HART devices. The target audience usually does the following:

- Responds to work orders created to calibrate, troubleshoot, repair, service, and replace instruments and valves
- Monitors alerts to preemptively address problems prior to operators seeing a problem in the control room
- Provides loop testing and assistance with instrumentation on plant turnarounds, startups, and for project work
- Improves process availability and reduces operations and maintenance costs

Topics

- Communication Bus Introduction
- AS-I Overview
- AS-I: Wiring and Installation
- AS-I Network with DeltaV
- PROFIBUS DP Overview
- PROFIBUS Wiring and Installation
- Configuring a PROFIBUS Segment
- Device Net Overview
- Device Net Diagnostics and Configuration
- Troubleshooting
- Serial Interface
- HART® Overview
- Ethernet I/O Overview
- Wireless I/O Overview

Audience

The hands-on workshops with DeltaV along with AMS Device Manager will address areas relating to the instrument technician's daily tasks.

Prerequisites

7009 DeltaV Implementation I or 7018 DeltaV Hardware Installation and Troubleshooting.

COURSE 9025**CEUs: 3.2****DeltaV Control Loop Introduction****Overview**

This 4-1/2-day course for personnel new to automation and covers process control fundamentals as well as the practical aspects of control system design and applications. Upon completion of this course the student will be able to effectively understand and work with single and multi-loop control strategies. Interactive workshops allow the student to apply what they learn in the class.

Topics

- Background — Historic Perspective
- Measurements — Basic Transmitter Types, Limitations
- Analyzers — Examples of On-Line Analyzers
- Final Elements - Valves and Variable Speed Drives
- Field Wiring and Communications — Traditional, HART®, Foundation fieldbus, WirelessHART™
- Control Strategy Documentation — Plot Plan, Flow Sheet, P&ID, Loop Sheet
- Operator Graphics and Metrics — Considerations in Display Design
- Process Characterization — Identifying Process Dynamics and Gain
- Control Objectives
- Single Loop Control — Basis for PID, Guideline in Selecting PID Structure, Action
- Tuning and Loop Performance - Manual and Automated Tuning Techniques
- Multi-loop Control — Feedforward, Cascade, Override, Split-range, Valve Position Control
- Model Predictive Control — Addressing Difficult Dynamics, Interactive Processes
- Process Modeling — Development of Process Simulation for Control System Checkout
- Application Examples — Batch, Continuous, Combustion, Distillation, Unit Coordination

Prerequisites

Windows experience.

Audience

This course is for engineers, managers, technicians, and others that are new to process control. This course includes the practical aspects of control design and process applications that course developers personally learned through years of hands on experience while designing and commissioning process control applications.

COURSE 7026

CEUs: 3.2

DeltaV Cybersecurity

Overview

The 4-1/2-day DeltaV Cybersecurity course focuses on the DeltaV Security Manual and the practical implementation of the guidance provided within. Students will engage in activities to properly apply Emerson's Defense-in-Depth strategies so that students can have the skills to apply these same strategies on their DeltaV systems. Students are encouraged to read the DeltaV Security Manual before attending class.

Topics

- DeltaV Deployment Guidelines & Physical Security
 - Define the expected DeltaV installation environment
 - Define physical access rules (cabinets, switches, consoles, etc.)
- DeltaV Area Control Network
 - Define proper network segmentation and topology rules
 - Use DeltaV Firewall-IPD and Smart Switches
 - Lock and protect embedded nodes
- Communications Security & Remote Access to DeltaV
 - Define communication and security requirements for remote access
 - Use Emerson Smart Firewall
 - Deploy Remote Desktop Gateway server
 - Configure DeltaV remote desktop server
- Active Directory Design & User Account Management
 - Define Active Directory implementation guidelines
 - Create customized DeltaV users and groups
 - Audit user privileges
 - Configure password policies through Group Policy Objects
- Device Hardening & Event Logging
 - Define device internal and interface protection rules
 - Deploy DeltaV Endpoint protection and Application Whitelisting
 - Configure Windows Firewall
 - Create USB/Removable media Group Policy Object
 - Configure syslog and other device logs to report to a System Information and Event Management (SIEM) appliance
 - Configure DeltaV Network Security Monitoring appliance
 - Use and customize SIEM dashboard to show system events
- Software Patching
 - Define how to obtain and install security patches
 - Use Emerson's Automated Patch Management solution
- Backup & Recovery
 - Define best practices and available technologies to backup critical data
 - Use the DeltaV Backup & Recovery (Acronis) software

Prerequisites

7027

Audience

DeltaV System Administrators or IT personnel responsible for implementing DeltaV security.



COURSE 7026V

CEUs: 3.2

DeltaV Cybersecurity(Virtual)**Overview**

The 4-1/2-day DeltaV Cybersecurity course focuses on the DeltaV Security Manual and the practical implementation of the guidance provided within. Students will engage in activities to properly apply Emerson's Defense-in-Depth strategies so that students can have the skills to apply these same strategies on their DeltaV systems. Students are encouraged to read the DeltaV Security Manual before attending class.

Topics

- DeltaV Deployment Guidelines & Physical Security
 - Define the expected DeltaV installation environment
 - Define physical access rules (cabinets, switches, consoles, etc.)
- DeltaV Area Control Network
 - Define proper network segmentation and topology rules
 - Use DeltaV Firewall-IPD and Smart Switches
 - Lock and protect embedded nodes
- Communications Security & Remote Access to DeltaV
 - Define communication and security requirements for remote access
 - Use Emerson Smart Firewall
 - Deploy Remote Desktop Gateway server
 - Configure DeltaV remote desktop server
- Active Directory Design & User Account Management
 - Define Active Directory implementation guidelines
 - Create customized DeltaV users and groups
 - Audit user privileges
 - Configure password policies through Group Policy Objects
- Device Hardening & Event Logging
 - Define device internal and interface protection rules
 - Deploy DeltaV Endpoint protection and Application Whitelisting
 - Configure Windows Firewall
 - Create USB/Removable media Group Policy Object
 - Configure syslog and other device logs to report to a System Information and Event Management (SIEM) appliance
 - Configure DeltaV Network Security Monitoring appliance
 - Use and customize SIEM dashboard to show system events
- Software Patching
 - Define how to obtain and install security patches
 - Use Emerson's Automated Patch Management solution
- Backup & Recovery
 - Define best practices and available technologies to backup critical data
 - Use the DeltaV Backup & Recovery (Acronis) software

Prerequisites

7027

Audience

DeltaV System Administrators or IT personnel responsible for implementing DeltaV security

COURSE 7051C

DeltaV Essential Operator Training Solution**Overview**

DeltaV™ Essential Operator Training Solution is an engineered, hands-on, customized learning environment to up-skill your operations workforce. Operators will learn DeltaV operating concepts using curriculum based on their specific displays as well as hands-on practice workshops relevant to their process.

The DeltaV Essential Operator Training Solution includes instructional materials, customized student curriculum, and workshops all customized to your specific graphics and module types. Student workshops include low fidelity tieback simulation to demonstrate module functionality and perform workshops.

DeltaV Essential Operator Training Solution is available in three delivery formats.

- Traditional classroom with live instructors and equipment
- Virtual classroom environment with live online instruction and DeltaV distributed control systems (DCS)
- A new blended learning environment that uses state-of-the-art technologies to host training in the cloud.

COURSE 7032**CEUs: 2.8****DeltaV Fieldbus Devices Configuration & Control****Overview**

This 4-day lecture/lab course provides maximum hands-on experience working with FOUNDATION™ fieldbus instruments such as: the FIELDVUE™ Digital Valve Controller, Rosemount Pressure and Temperature Transmitters. The student will use the DeltaV control system to commission fieldbus devices, assign foundation fieldbus function blocks to field devices, troubleshoot using diagnostics and AMS Device Manager to manipulate device parameters.

Topics

- DeltaV Saleable System Overview
- Macro Cycle Execution
- Fieldbus Function Blocks
- FIELDVUE™ Theory of Operation
- Transmitter Theory of Operation
- AMS Device Manager Methods
- Fieldbus Wiring Practices
- System Troubleshooting
- Accessing Fieldbus Devices
- Alarms and Alerts at DeltaV Workstations
- Segment Checkout Procedures
- Replace Wizard

Prerequisites

Course 7009, DeltaV Implementation I. or 7018, DeltaV Hardware Installation and Troubleshooting

Audience

This course is for individuals responsible for maintaining, troubleshooting, calibrating, and modifying FOUNDATION™ fieldbus device parameters.

COURSE 7018**CEUs: 2.8****DeltaV Hardware & Troubleshooting****Overview**

This course provides an overview of the DeltaV Control Network, M- and S-series hardware, and software applications. Upon completion, you will be familiar with the hard-ware and be able to perform troubleshooting techniques. This 4-day course focuses on the hardware components that make up the DeltaV system: M-series controllers and I/O, S-series controllers and I/O (including CHARMs), and DeltaV Smart Switches. Using a combination of lectures and workshops, you will learn how to use operator and diagnostic tools to identify and locate hard-ware-related fault conditions. Workshops provide the opportunity to disassemble and reassemble the M- and S-series hardware and return the system to an operating state. If your systems include bus technologies such as Foundation Fieldbus, we recommend courses 7030, 7032, or 7037. The 7018 course satisfies the Prerequisites requirement for these bus course (except 7032)

Topics

- DeltaV Overview
- Operator Alarms
- DeltaV Diagnostics
- DeltaV Smart Switches
- DeltaV I/O Cards and Carriers
- Controllers and Power Supplies
- Electronic Marshalling (CHARMs)
- HART® I/O
- DeltaV & AMS Suite Intelligent Device Manager
- Redundant I/O

Prerequisites

Windows Experience

Audience

This course is recommended for instrumentation and maintenance technicians, managers, and configuration engineers who need to know about DeltaV hardware.

COURSE 7017**CEUs: 3.2****DeltaV Implementation II Intermediate****Overview**

During the 4-1/2-day course, the student will be able to identify function block structures, interpret function block status values, design error masking, define nodes, and configure class-based control modules using the Command-Driven algorithm. This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion. Create custom face plates and dynos, configure modules with analog control palette blocks and create simulation for test purposes. This course includes access to brief recorded demonstrations available after course completion, so students can review exercises completed in class.

Topics

- Function Block Structures & Status Values
- Analog Control Palette Blocks PID Bias/Gain, Dead time, Ratio, Signal Characterizer, Splitter
- HART® Inputs and Outputs
- HART Device Alarms
- Unit Alarms
- DeltaV Tune with InSight
- Device Control Options
- Class Based Control Modules
- Configuration of Equipment Modules for Supervisory Control
- Custom Face plates and Dynamos

Prerequisites

Course 7009, DeltaV Implementation I

Audience

This course is for process control engineers responsible for designing, implementing and testing configuration using the DeltaV system.

COURSE 7017V**CEUs: 3.2****DeltaV Implementation II Intermediate [Virtual]****Overview**

During the 4-1/2-day course, the student will be able to identify function block structures, interpret function block status values, design error masking, define nodes, and configure class-based control modules using the Command-Driven algorithm. This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion. Create custom face plates and dynos, configure modules with analog control palette blocks and create simulation for test purposes. This course includes access to brief recorded demonstrations available after course completion, so students can review exercises completed in class.

Topics

- Function Block Structures & Status Values
- Analog Control Palette Blocks PID Bias/Gain, Dead time, Ratio, Signal Characterizer, Splitter
- HART® Inputs and Outputs
- HART Device Alarms
- Unit Alarms
- DeltaV Tune with InSight
- Device Control Options
- Class Based Control Modules
- Configuration of Equipment Modules for Supervisory Control
- Custom Face plates and Dynamos

Prerequisites

Course 7009, DeltaV Implementation I

Audience

This course is for process control engineers responsible for designing, implementing and testing configuration using the DeltaV system.

COURSE 7201CV**CEUs: 0.7****DeltaV InSight [Virtual]****Overview**

This 1-day course introduces students to DeltaV InSight and how it may be used to improve the plant operations. The measurement of the process dynamics will be discussed, and the DeltaV Tune application will be introduced and used with Adaptive Tuning and Adaptive Control. Also, each student will gain hands on experience with these tools in class exercises based on realistic process simulations.

Topics

- DeltaV Tune with InSight
- Measurement of Process Dynamics
- Tuning Methods
- Tuning Response
- Process Learning
- Adaptive Tuning
- Adaptive Control
- DeltaV Inspect with InSight
- Detection of Abnormal Conditions
- Performance Indices
- Performance Reports

Prerequisites

7009, DeltaV Implementation I or equivalent field experience.

COURSE 7014**CEUs: 1.8****DeltaV Batch Operation****Overview**

This 2-1/2-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. It includes all content in course 7012 plus students will:

- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access the Batch Operator Interface
- Run procedures
- Review batch history data topics
- System Overview
- Accessing DeltaV Operate
- Window, Menus Displays and Directories
- Discrete, Analog, Regulatory and Cascade Control Module Operation
- Motor Control Module Operation
- Accessing Alarm Displays/Alarm Handling
- Accessing Real-time/Historical Trend Data
- Accessing Process History View
- Sequential Function Chart Operation
- Phase and Recipe Controls
- Batch Operator Interface
- Batch Historian
- Campaign Manager

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using DeltaV system.

COURSE 7014V**CEUs: 1.8****DeltaV Batch Operation [Virtual]****Overview**

- This 2-1/2-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. It includes all content in course 7012 plus students will:
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access the Batch Operator Interface
- Run procedures
- Review batch history data topics
- System Overview
- Accessing DeltaV Operate Window, Menus Displays and Directories
- Discrete, Analog, Regulatory and Cascade Control Module Operation
- Motor Control Module Operation
- Accessing Alarm Displays/Alarm Handling
- Accessing Real-time/Historical Trend Data
- Accessing Process History View
- Sequential Function Chart Operation
- Phase and Recipe Controls
- Batch Operator Interface
- Batch Historian
- Campaign Manager

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using DeltaV system.

COURSE 7023**CEUs: 2.1****DeltaV Information Technology for Automation Personnel****Overview**

This 3-day course will provide students with a set of essential information technology (I.T.) skills required to successfully setup, maintain, and troubleshoot a DeltaV distributed control system using a combination of lecture and hands-on workshops. The increase in adoption of technologies such as virtualization, cybersecurity, business system integration, and complex networking demand a new set of skills. This course will distill the core learnings and techniques required from the I.T. skill set, providing a targeted launch point for process control engineers, instrumentation/electrical technicians, I.T. staff, and others whose responsibilities require them to adopt and successfully use these technologies. After attending, students will be prepared to dive deeply into these technologies by attending other higher-level courses.

Topics

- Overview
- Networking
- Virtualization
- Domain
- Servers
- DeltaV
- Security
- Troubleshooting

Prerequisites

None

Audience

DeltaV System Administrators, Process Control Engineers, Instrumentation/Electrical Technicians, and I.T. staff supporting the DeltaV system.

COURSE 7023V**CEUs: 1.8****DeltaV Information Technology for Automation Personnel (Virtual)****Overview**

This 3-day course will provide students with a set of essential information technology (I.T.) skills required to successfully setup, maintain, and troubleshoot a DeltaV distributed control system using a combination of lecture and hands-on workshops. The increase in adoption of technologies such as virtualization, cybersecurity, business system integration, and complex networking demand a new set of skills. This course will distill the core learnings and techniques required from the I.T. skill set, providing a targeted launch point for process control engineers, instrumentation/electrical technicians, I.T. staff, and others whose responsibilities require them to adopt and successfully use these technologies. After attending, students will be prepared to dive deeply into these technologies by attending other higher-level courses.

Topics

- Overview
- Networking
- Virtualization
- Domain
- Servers
- DeltaV
- Security
- Troubleshooting

Prerequisites

None

Audience

DeltaV System Administrators, Process Control Engineers, Instrumentation/Electrical Technicians, and I.T. staff supporting the DeltaV system.

COURSE 7012

CEUs: 1.4

DeltaV Continuous Operation**Overview**

This 2-day course (14 hrs.) uses lectures and hands-on workshops to train operators for continuous process operation using the standard DeltaV Operate user interface (for the DeltaV Live user interface, please select course 7412). Students who complete this course will:

- Access operator main displays
- Manipulate various control module operating parameters to operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- View real-time and historical trend data
- Access historical data and event chronicle

Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of dynamos, where to click to access the Faceplate and Detail Displays. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.

Topics

- DeltaV Distributed Control System Overview
- DeltaV Operator Interface
- DeltaV Multi-Monitor Workstations
- Operating Discrete and Analog Control Modules
- Alarms and Events
- Operating Motor Control Modules
- Operating Regulatory and Cascade Control Modules
- DeltaV Trending
- Unit Alarms
- Operating Equipment Modules
- DeltaV SIS

Prerequisites

None

Audience

This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Operate user interface

COURSE 7012V

CEUs: 1.4

DeltaV Continuous Operation [Virtual]**Overview**

This 2-day course (14 hrs.) uses lectures and hands-on workshops to train operators for continuous process operation using the standard DeltaV Operate user interface (for the DeltaV Live user interface, please select course 7412). Students who complete this course will:

- Access operator main displays
- Manipulate various control module operating parameters to operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- View real-time and historical trend data
- Access historical data and event chronicle

Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of dynamos, where to click to access the Faceplate and Detail Displays. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.

Topics

- DeltaV Distributed Control System Overview
- DeltaV Operator Interface
- DeltaV Multi-Monitor Workstations
- Operating Discrete and Analog Control Modules
- Alarms and Events
- Operating Motor Control Modules
- Operating Regulatory and Cascade Control Modules
- DeltaV Trending
- Unit Alarms
- Operating Equipment Modules
- DeltaV SIS

Prerequisites

None

Audience

This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Operate user interface

COURSE 7012B**CEUs: 1.2****DeltaV Continuous Operation [Blended]****Overview**

This course uses lectures and hands-on workshops to train operators for continuous process operation using the standard generic DeltaV™ Operate user interface (for the DeltaV Live user interface, please select course 7412B). Blended training provides the most flexibility in course scheduling. This is a self-paced training with courses available 24/7 on Emerson's Learning Management System (LMS). Blended courses are comprised of pre-recorded lectures and a cloud based DeltaV machine for workshop exercises using standard generic DeltaV configuration. Even though this is self-paced, ideally this course could be completed in 2-days (14 hrs.) Students who complete this course will:

- Access operator main displays
- Manipulate various control module operating parameters to operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- View real-time and historical trend data
- Access historical data and event chronicle

Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of dynamos, where to click to access the Faceplate and Detail Displays. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal

Topics

- DeltaV Distributed Control System Overview
- DeltaV Operator Interface
- DeltaV Multi-Monitor Workstations
- Operating Discrete and Analog Control Modules
- Alarms and Events
- Operating Motor Control Modules
- Operating Regulatory and Cascade Control Modules
- DeltaV Trending
- Unit Alarms
- Operating Equipment Modules
- DeltaV SIS

Prerequisites

None

Audience

This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Operate user interface.

COURSE 9060**CEUs: 1.0****DeltaV pH Control Solutions**

Contact education@emerson.com or call 800-338-8158 for additional information

COURSE 7076**CEUs: 3.2****DeltaV PMO Configuration Standard****Overview**

This 4-½ day course will introduce students to the PCSD structure and commonly used PCSD templates for analog, discrete and regulatory control. Students will also learn how to implement new DeltaV control modules using the PCSD library.

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

- Modify existing control strategies while maintaining consistency with the PCSD library
- Add control strategies while maintaining consistency with the PCSD library

Topics

- Benefits of a structured approach to configuration
- PCSD Structure
- Operator graphics standards
- Configuration of the following using PCSD class-based modules:
 - Analog value reading and setting
 - Control of discrete devices
 - Loop control
 - Sequential control using Equipment Modules
- Modification of existing PCSD-based control configuration
- PCSD methods for:
 - Module arbitration
 - Mode locking
 - Mode, state and failure propagation
 - Inter-module interfacing
 - Interlocks, permissive and force set points

Prerequisites

Course 7009, DeltaV Implementation I and familiarity with process control.

Audience

This course is designed for engineers and technicians who maintain a DeltaV system configured using the PMO Configuration Standards for DeltaV (PCSD) library.

COURSE 7076V**CEUs: 3.2****DeltaV PMO Configuration Standard [Virtual]****Overview**

This 4-½ day course will introduce students to the PCSD structure and commonly used PCSD templates for analog, discrete and regulatory control. Students will also learn how to implement new DeltaV control modules using the PCSD library.

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

- Modify existing control strategies while maintaining consistency with the PCSD library
- Add control strategies while maintaining consistency with the PCSD library

Topics

- Benefits of a structured approach to configuration
- PCSD Structure
- Operator graphics standards
- Configuration of the following using PCSD class-based modules:
 - Analog value reading and setting
 - Control of discrete devices
 - Loop control
 - Sequential control using Equipment Modules
- Modification of existing PCSD-based control configuration
- PCSD methods for:
 - Module arbitration
 - Mode locking
 - Mode, state and failure propagation
 - Inter-module interfacing
 - Interlocks, permissive and force set points

Prerequisites

Course 7009, DeltaV Implementation I and familiarity with process control.

Audience

This course is designed for engineers and technicians who maintain a DeltaV system configured using the PMO Configuration Standards for DeltaV (PCSD) library.

COURSE 5590**CEUs: 1.4****DeltaV Power & Grounding for Electronic Systems****Overview**

This course focuses on specific power and grounding requirements of a control system. You will learn:

- How to conduct site verifications
- How to audit using hands-on testing labs to detect power and grounding problems on existing sites

Topics

- Review of Power Basics
- Power System Measurements
- Low Voltage Power Systems
- Power System Grounding
- Earthing vs. Grounding
- Connection to Earth
- Equipment Grounding
- Code Requirements
- Building Power Distribution
- Feeders and Branch Circuits
- Separately Derived Systems
- Power & Grounding for the DeltaV System
- Single Point Grounding
- Isolated Ground Installations
- Dedicated Circuits
- DC Grounding
- Verifying New Installations
- Power Quality Problems
- Applying Power Conditioning
- SIS Power and Grounding Installation
- Intrinsic Safety Devices

Prerequisites

A working knowledge of electronics and AC power basics is required.

Audience

This 2-day course is designed for personnel involved with the planning, installation and maintenance of DeltaV digital automation system and provides essential knowledge regarding the power and grounding system for DeltaV equipment.

COURSE 7303**CEUs: 2.1****DeltaV Safety Instrumented System with SLS 1508 Maintenance****Overview**

This 3-day course is a hands-on instructor-led course. The course covers the architecture of the DeltaV SIS including Rosemount SIS instruments and Fisher™ SIS Digital Valve Controllers. Students will gain a working knowledge of the hardware and software allowing them to troubleshoot and maintain the system.

Topics

- Safety Lifecycle
- DeltaV SIS Overview
- DeltaV SLS1508 Hardware
- Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager
- Fisher™ SIS Digital Valve Controller
- SISNet Repeaters

Prerequisites

Course 7018, DeltaV Hardware and Troubleshooting, is a requirement.

Audience

This course is for Electrical & Instrument technicians, maintenance technicians, E&I/reliability engineers and other personnel responsible for maintaining a DeltaV SIS SLS 1508.

COURSE 7074

CEUs: 2.1

DeltaV Operate Batch Operation with PCSD**Overview**

This 3-day course (21 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using generic DeltaV Operate user interface with the PMO Configuration Standards for DeltaV (PCSD) library (for the DeltaV Live user interface, please select course 7474). Students who complete this course will:

- Access operator main displays
- Manipulate various control parameters and operate the process Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- Create real-time and historical data charts
- Access historical data and event chronicle
- Understand basic batch terminology Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

For customized curriculum, designed around your site graphics and processes, please contact Education Services (education@emerson.com).

Topics

- DeltaV Distributed Control System Overview
- DeltaV Operator Interface
- Operating Discrete and Analog Control Modules
- Operating Motor Control Modules
- Operating Regulatory and Cascade Control Modules
- Alarms and Events
- DeltaV Trending
- Unit Alarms
- Operating Equipment Modules
- DeltaV SIS
- Batch Process Simulation
- Batch Process Overview
- Operating Unit Modules
- Batch Operator Interface and/or DeltaV Operate Batch Controls
- Procedures
- DeltaV Batch Historian DeltaV Campaign Manager

Prerequisites

None

Audience

This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Operate user interface

COURSE 7074V

CEUs: 2.1

DeltaV Operate Batch Operation with PCSD [Virtual]**Overview**

This 3-day course (21 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using generic DeltaV Operate user interface with the PMO Configuration Standards for DeltaV (PCSD) library (for the DeltaV Live user interface, please select course 7474). Students who complete this course will:

- Access operator main displays
- Manipulate various control parameters and operate the process Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- Create real-time and historical data charts
- Access historical data and event chronicle
- Understand basic batch terminology Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

For customized curriculum, designed around your site graphics and processes, please contact Education Services (education@emerson.com).

Topics

- DeltaV Distributed Control System Overview
- DeltaV Operator Interface
- Operating Discrete and Analog Control Modules
- Operating Motor Control Modules
- Operating Regulatory and Cascade Control Modules
- Alarms and Events
- DeltaV Trending
- Unit Alarms
- Operating Equipment Modules
- DeltaV SIS
- Batch Process Simulation
- Batch Process Overview
- Operating Unit Modules
- Batch Operator Interface and/or DeltaV Operate Batch Controls
- Procedures
- DeltaV Batch Historian DeltaV Campaign Manager

Prerequisites

None

Audience

This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Operate user interface

COURSE 7474

CEUs: 2.1

DeltaV Batch Operations with PCSD using Live**Overview**

This 3-day course (21 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using generic DeltaV Live user interface with the PMO Configuration Standards for DeltaV (PCSD) library (for the DeltaV Live user interface, please select course 7074).

Students who complete this course will:

- Access operator main displays
- Manipulate various control parameters and operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor & acknowledge different alarm conditions
- Monitor process performance
- Create real-time and historical data charts
- Access historical data and event chronicle
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

For customized curriculum, designed around your site graphics and processes, please contact Education Services (education@emerson.com)

Topics

- | | |
|--|--|
| • DeltaV Distributed Control System Overview | • Unit Alarms |
| • DeltaV Operator Interface | • Operating Equipment Modules |
| • Operating Discrete and Analog Control Modules | • DeltaV SIS |
| • Operating Motor Control Modules | • Batch Process Simulation |
| • Operating Regulatory & Cascade Control Modules | • Batch Process Overview |
| • Alarms and Events | • Operating Unit Modules |
| • DeltaV Trending | • Batch Operator Interface and/or DeltaV Live Batch Controls |
| | • Procedures |
| | • DeltaV Batch Historian |
| | • DeltaV Campaign Manager |

Prerequisites

None

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using the DeltaV Live user interface.

COURSE 7474V

CEUs: 2.1

DeltaV Batch Operations with PCSD using Live [Virtual]**Overview**

This 3-day course (21 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using generic DeltaV Live user interface with the PMO Configuration Standards for DeltaV (PCSD) library (for the DeltaV Live user interface, please select course 7074).

Students who complete this course will:

- Access operator main displays
- Manipulate various control parameters and operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor & acknowledge different alarm conditions
- Monitor process performance
- Create real-time and historical data charts
- Access historical data and event chronicle
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

For customized curriculum, designed around your site graphics and processes, please contact Education Services (education@emerson.com)

Topics

- | | |
|--|--|
| • DeltaV Distributed Control System Overview | • Unit Alarms |
| • DeltaV Operator Interface | • Operating Equipment Modules |
| • Operating Discrete and Analog Control Modules | • DeltaV SIS |
| • Operating Motor Control Modules | • Batch Process Simulation |
| • Operating Regulatory & Cascade Control Modules | • Batch Process Overview |
| • Alarms and Events | • Operating Unit Modules |
| • DeltaV Trending | • Batch Operator Interface and/or DeltaV Live Batch Controls |
| | • Procedures |
| | • DeltaV Batch Historian |
| | • DeltaV Campaign Manager |

Prerequisites

None

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using the DeltaV Live user interface.

COURSE 7474B

CEUs: 2.1

DeltaV Batch Operations with PCSD using Live [Blended]

Overview

This 3-day course (21 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using generic DeltaV Live user interface with the PMO Configuration Standards for DeltaV (PCSD) library (for the DeltaV Live user interface, please select course 7074).

Students who complete this course will:

- Access operator main displays
- Manipulate various control parameters and operate the process
- Access face plates and detail displays
- Understand process indications from graphics dynamos
- Monitor & acknowledge different alarm conditions
- Monitor process performance
- Create real-time and historical data charts
- Access historical data and event chronicle
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

For customized curriculum, designed around your site graphics and processes, please contact Education Services (education@emerson.com)

Topics

- | | |
|---|---|
| <ul style="list-style-type: none"> • DeltaV Distributed Control System Overview • DeltaV Operator Interface • Operating Discrete and Analog Control Modules • Operating Motor Control Modules • Operating Regulatory & Cascade Control Modules • Alarms and Events • DeltaV Trending | <ul style="list-style-type: none"> • Unit Alarms • Operating Equipment Modules • DeltaV SIS • Batch Process Simulation • Batch Process Overview • Operating Unit Modules • Batch Operator Interface and/or DeltaV Live Batch Controls • Procedures • DeltaV Batch Historian • DeltaV Campaign Manager |
|---|---|

Prerequisites

None

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using the DeltaV Live user interface.

COURSE 7305

CEUs: 3.2

DeltaV SIS Implementation

Overview

This 4-1/2-day course is a hands-on instructor led course. The course covers complete DeltaV SIS Implementation including hardware and software architecture. Students will be able to design a DeltaV SIS Network and Safety Instrumented Functions (SIFs). Additionally, students will be able to configure smart SIS instruments and their associated alerts, including partial stroke testing.

Prerequisites

Course 7009 is a requirement. Recommend IEC 61511 knowledge.

Topics

- DeltaV SIS Overview
- DeltaV SIS SLS 1508 Hardware Architecture
- DeltaV SIS with Electronic Marshalling Hardware Architecture
- DeltaV Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager relating to DeltaV SIS
- Fisher™ SIS Digital Valve Controllers
- SISNet Repeaters
- DeltaV SIS Security
- DeltaV Version Control
- Local Safety Network Bridges

Audience

This course is for personnel who design, implement, commission and service DeltaV SIS.

COURSE 7305V

CEUs: 3.2

DeltaV SIS Implementation [Virtual]

Overview

This 4-1/2-day course is a hands-on instructor led course. The course covers complete DeltaV SIS Implementation including hardware and software architecture. Students will be able to design a DeltaV SIS Network and Safety Instrumented Functions (SIFs). Additionally, students will be able to configure smart SIS instruments and their associated alerts, including partial stroke testing.

Topics

- DeltaV SIS Overview
- DeltaV SIS SLS 1508 Hardware Architecture
- DeltaV SIS with Electronic Marshalling Hardware Architecture
- DeltaV Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager relating to DeltaV SIS
- Fisher™ SIS Digital Valve Controllers
- SISNet Repeaters
- DeltaV SIS Security
- DeltaV Version Control
- Local Safety Network Bridges

COURSE 7301**CEUs: 2.1****DeltaV SIS Overview**

Contact the registration office for class information at education@emerson.com or 800-338-8158.

COURSE 7304**CEUs: 2.1****DeltaV SIS with Electronic Marshalling Maintenance****Overview**

This 3-day hands-on instructor led course covers the architecture of the DeltaV SIS with Electronic Marshalling including Rosemount SIS instruments and Fisher™ SIS Digital Valve Controllers. Students will be able to identify the DeltaV SIS with Electronic Marshalling hardware and software components. Students will practice troubleshooting and maintenance techniques with DeltaV SIS simulators throughout the course.

Topics

- Safety Lifecycle
- DeltaV SIS Overview
- DeltaV SIS with Electronic Marshalling Hardware architecture including power requirements
- Commissioning and Downloading the DeltaV SIS with Electronic Marshalling components
- Safety Instrumented Functions
- Rosemount SIS Instruments
- AMS Device Manager
- Fisher™ SIS Digital Valve Controller
- DeltaV Diagnostics
- DeltaV SIS with AMS Intelligent Device
- Local Safety Network Bridges

Prerequisites

Course 7018 DeltaV Hardware & Troubleshooting is a requirement.

Audience

This course is for Electrical & Instrument technicians, maintenance technicians, E&I/reliability engineers and other personnel responsible for maintaining DeltaV SIS with Electronic Marshalling.

COURSE 7016**CEUs: 3.2****DeltaV Systems Batch Implementation****Overview**

This 4-1/2-day course covers the implementation of a complete batch application. A process simulator will provide a batch application. Students will use DeltaV Batch software to configure recipe entities including, Aliasing, Equipment Trains, Dynamic Unit Allocation, Phase Logic, Operations and Unit Procedures. Equipment entities will also be configured including, Units modules and Process cells.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

Topics

- Batch Overview
- Unit Phase
- Alias Definition
- Unit Module
- Process Cell
- Class Based Control Modules
- Class Based Equipment Modules
- Operation
- Unit Procedure
- Procedure
- Equipment Trains
- Unit Aliasing
- Dynamic Unit Allocation

Prerequisites

Course 7009, DeltaV Implementation I

Audience

This course is designed for individuals responsible for configuring and commissioning DeltaV Batch software.

COURSE 7016V**CEUs: 3.2****DeltaV Systems Batch Implementation****Overview**

This 4-1/2-day course covers the implementation of a complete batch application. A process simulator will provide a batch application. Students will use DeltaV Batch software to configure recipe entities including, Aliasing, Equipment Trains, Dynamic Unit Allocation, Phase Logic, Operations and Unit Procedures. Equipment entities will also be configured including, Units modules and Process cells.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

Topics

- Batch Overview
- Unit Phase
- Alias Definition
- Unit Module
- Process Cell
- Class Based Control Modules
- Class Based Equipment Modules
- Operation
- Unit Procedure
- Procedure
- Equipment Trains
- Unit Aliasing
- Dynamic Unit Allocation

Prerequisites

Course 7009, DeltaV Implementation I

Audience

This course is designed for individuals responsible for configuring and commissioning DeltaV Batch software.

COURSE 7009

CEUs: 3.2

DeltaV Operate Implementation I Introduction**Overview**

During the 4-1/2-day course, the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, create process alarms, operate the system, troubleshoot the system and modify operator displays.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

Topics

- System Overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Motor Control with Interlocking and Permissive Conditions
- Cascade Control
- Regulatory Control
- DeltaV Operate
- System Operation
- Alarms & Process History View
- Alarm Help
- Sequential Function Charts
- Configure Theme Dynamos
- Electronic Marshalling (CHARMS)

Prerequisites

Microsoft Windows experience. Prospective attendees lacking process control experience should first attend Control Loop Foundation, Course 9025. Prospective attendees new to DeltaV should first attend PlantWeb/DeltaV Introduction, DeltaV Hardware & Troubleshooting, Course 7018.

Audience

This course is designed for process & process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system.

COURSE 7009V

CEUs: 3.2

DeltaV Operate Implementation I Introduction [Virtual]**Overview**

During the 4-1/2-day course, the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, create process alarms, operate the system, troubleshoot the system and modify operator displays.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

Topics

- System Overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Motor Control with Interlocking and Permissive Conditions
- Cascade Control
- Regulatory Control
- DeltaV Operate
- System Operation
- Alarms & Process History View
- Alarm Help
- Sequential Function Charts
- Configure Theme Dynamos
- Electronic Marshalling (CHARMS)

Prerequisites

Microsoft Windows experience. Prospective attendees lacking process control experience should first attend Control Loop Foundation, Course 9025. Prospective attendees new to DeltaV should first attend PlantWeb/DeltaV Introduction, DeltaV Hardware & Troubleshooting, Course 7018.

Audience

This course is designed for process & process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system.

COURSE 7409

CEUs: 3.2

DeltaV Implementation using DeltaV Live – Introduction**Overview**

During the 4-1/2-day course, the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, create process alarms, operate the system, troubleshoot the system and modify operator displays using the DeltaV Live Operator Interface introduced with DeltaV Version 14.3.

This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.

Topics

- System Overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Control Studio
- Motor Control with Interlocking and Permissive Conditions
- Cascade Control
- Regulatory Control
- DeltaV Live
- Graphics Studio
- System Operation
- Alarms & Process History View
- Alarm Help
- Sequential Function Charts
- Configure Theme Dynamos
- Electronic Marshalling (CHARMS)

Prerequisites

Microsoft Windows experience. Prospective attendees lacking process control experience should first attend Control Loop Foundation, Course 9025.

Audience

This course is designed for process & process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system.

COURSE 7409V	CEUs: 3.2
<h3 style="color: #004a87;">DeltaV Implementation Using DeltaV Live Introduction [Virtual]</h3> <p>Overview During the 4-1/2-day course, the student will be able to define system capabilities, define nodes, configure continuous and sequential control strategies, create process alarms, operate the system, troubleshoot the system and modify operator displays.</p> <p>This course includes access to a virtual DeltaV system to practice and review course workshops complete with brief recorded demonstrations available after course completion.</p> <p>Topics</p> <ul style="list-style-type: none"> • System Overview • DeltaV Explorer • DeltaV Diagnostics • Control Modules • Control Studio • Motor Control with Interlocking and Permissive Conditions • Cascade Control • Regulatory Control • DeltaV Live • Graphics Studio • System Operation • Alarms & Process History View • Alarm Help • Sequential Function Charts • Configure Theme Dynamos • Electronic Marshalling (CHARMS) <p>Audience This course is designed for process & process control engineers responsible for obtaining key production data, maintaining, configuring and troubleshooting a DeltaV system.</p>	

COURSE 7412	CEUs: 1.4
<h3 style="color: #004a87;">DeltaV Using DeltaV Live Operator Training for Continuous Operation</h3> <p>Overview This 2-day course (14 hrs.) uses lectures and hands-on workshops to train operators for continuous process operation using the standard generic DeltaV Live user interface (for the DeltaV Operate user interface, please select course 7012). Students who complete this course will:</p> <ul style="list-style-type: none"> • Access operator main displays • Manipulate various control module operating parameters to operate the process • Access face plates and detail displays • Understand process indications from graphic GEMs • Monitor and acknowledge different alarm conditions • Monitor process performance • View real-time and historical trend data • Access historical data and event chronicle <p>Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of GEMs, where to click to access the Faceplate and Detail Displays, etc. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.</p> <p>Topics</p> <ul style="list-style-type: none"> • DeltaV Distributed Control System Overview • DeltaV Live Operator Interface • Operating Discrete and Analog Control Modules • Alarms and Events • Operating Motor Control Modules • Operating Regulatory and Cascade Control Modules • DeltaV Trending • Unit Alarms • Operating Equipment Modules • DeltaV SIS <p>Prerequisites None</p> <p>Audience This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Live user interface.</p>	

COURSE 7412V	CEUs: 1.4
<h3 style="color: #004a87;">DeltaV Using DeltaV Live Operator Training for Continuous Operation [Virtual]</h3> <p>Overview This 2-day course (14 hrs.) uses lectures and hands-on workshops to train operators for continuous process operation using the standard generic DeltaV Live user interface (for the DeltaV Operate user interface, please select course 7012). Students who complete this course will:</p> <ul style="list-style-type: none"> • Access operator main displays • Manipulate various control module operating parameters to operate the process • Access face plates and detail displays • Understand process indications from graphic GEMs • Monitor and acknowledge different alarm conditions • Monitor process performance • View real-time and historical trend data • Access historical data and event chronicle <p>Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of GEMs, where to click to access the Faceplate and Detail Displays, etc. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.</p> <p>Topics</p> <ul style="list-style-type: none"> • DeltaV Distributed Control System Overview • DeltaV Live Operator Interface • Operating Discrete and Analog Control Modules • Alarms and Events • Operating Motor Control Modules • Operating Regulatory and Cascade Control Modules • DeltaV Trending • Unit Alarms • Operating Equipment Modules • DeltaV SIS <p>Prerequisites None</p> <p>Audience This course is for operators, supervisors and managers responsible for the operation of continuous processes using the DeltaV Live user interface.</p>	

COURSE 7029

CEUs: 3.2

DeltaV Virtualization**Overview**

This 4-1/2-day course focuses on the installation, configuration and system administration of a virtualized DeltaV distributed control system. Using a combination of lectures and workshops students will learn skill sets that enable them to properly plan, implement and maintain a robust DeltaV Virtual Studio (DVS) system intended for online (production) use. A key objective of this course is to prepare students for all aspects of owning a DVS system with special emphasis on providing highly available, reliable and secure access for end users of the DVS system.

Topics

- Virtualization Primer — Basics of How Virtualization Works
- Overview of DeltaV Virtualization Solutions
- Planning a DeltaV Virtual Studio System
- Installing and Configuring a VRTX Chassis and Blade Servers
- Creating DeltaV Virtual Machines including a ProfessionalPlus Node
- Configuring a WYSE or a Pepperl+Fuchs Thin Client and Redundant Thin Client Networks
- Create a Highly Available Failover Cluster
- Patching and Hardening of Cluster Nodes
- Cluster Health Monitoring and Troubleshooting
- Disaster Recovery and Replication
- Upgrading and Capacity Expansion

Prerequisites

Course 7027, DeltaV Systems Administration for Windows 7 and Server 2008

Audience

This course is designed for system administrators responsible for installing and maintaining DeltaV Workstations on a virtual platform.

COURSE 7029V

CEUs: 3.2

DeltaV Virtualization [Virtual]**Overview**

This 4-1/2-day course focuses on the installation, configuration and system administration of a virtualized DeltaV distributed control system. Using a combination of lectures and workshops students will learn skill sets that enable them to properly plan, implement and maintain a robust DeltaV Virtual Studio (DVS) system intended for online (production) use. A key objective of this course is to prepare students for all aspects of owning a DVS system with special emphasis on providing highly available, reliable and secure access for end users of the DVS system.

Topics

- Virtualization Primer — Basics of How Virtualization Works
- Overview of DeltaV Virtualization Solutions
- Planning a DeltaV Virtual Studio System
- Installing and Configuring a VRTX Chassis and Blade Servers
- Creating DeltaV Virtual Machines including a ProfessionalPlus Node
- Configuring a WYSE or a Pepperl+Fuchs Thin Client and Redundant Thin Client Networks
- Create a Highly Available Failover Cluster
- Patching and Hardening of Cluster Nodes
- Cluster Health Monitoring and Troubleshooting
- Disaster Recovery and Replication
- Upgrading and Capacity Expansion

Prerequisites

Course 7027, DeltaV Systems Administration for Windows 7 and Server 2008

Audience

This course is designed for system administrators responsible for installing and maintaining DeltaV Workstations on a virtual platform.

COURSE 7028

CEUs: 2.1

DeltaV Virtualization Administration**Overview**

This 3-day DeltaV Virtualization course focuses on the various software that is used in the management of a DeltaV Virtualization environment. Students will engage in workshops that will reinforce the material discussed to successfully run and maintain a Virtualized DeltaV system.

Topics

- Virtualization Hardware Setup
 - Overview of a typical virtualization system
 - Differences between a Host and DC Servers
 - Role of a DC
 - Networks within a virtualized system
 - Clusters
 - Virtual Networks
- Virtual Machines
 - Review Templates
 - Process to create Virtual machines
 - Overview of classroom setup
 - Create additional DeltaV Workstations
- DeltaV Virtual Studio Tools
 - Grouping
 - VM Modifications
 - Edit Collection Settings
- Thin Clients
 - DeltaV Remote Desktop Connection (DRDC)
 - Redundant Thin Client Networks
- Replication & Disaster Recovery
 - Install/Configure Replication
 - Examine replication options
 - Recover from failovers
- Health Monitoring & Troubleshooting
 - Emerson SHM
 - DVS/Cluster Diagnostics
 - DeltaV Alarming
 - Failure Scenarios
- Host Patching & Moving VMs
 - Patching Procedures, Verification

Prerequisites

7027 DeltaV System Administration

Audience

This course is designed for system administration personnel that will be maintaining DeltaV workstations on a virtual platform after installation.

COURSE 7208V

CEUs: 2.1

DeltaV Virtualization Administration [Virtual]

Overview

This 3-day DeltaV Virtualization course focuses on the various software that is used in the management of a DeltaV Virtualization environment. Students will engage in workshops that will reinforce the material discussed to successfully run and maintain a Virtualized DeltaV system.

Topics

- Virtualization Hardware Setup
 - Overview of a typical virtualization system
 - Differences between a Host and DC Servers
 - Role of a DC
 - Networks within a virtualized system
 - Clusters
 - Virtual Networks
- Virtual Machines
 - Review Templates
 - Process to create Virtual machines
 - Overview of classroom setup
 - Create additional DeltaV Workstations
- DeltaV Virtual Studio Tools
 - Grouping
 - VM Modifications
 - Edit Collection Settings
- Thin Clients
 - DeltaV Remote Desktop Connection (DRDC)
 - Redundant Thin Client Networks
- Replication & Disaster Recovery
 - Install/Configure Replication
 - Examine replication options
 - Recover from failovers
- Health Monitoring & Troubleshooting
 - Emerson SHM
 - DVS/Cluster Diagnostics
 - DeltaV Alarming
 - Failure Scenarios
- Host Patching & Moving VMs
 - Patching Procedures, Verification

Prerequisites

7027 DeltaV System Administration

Audience

This course is designed for system administration personnel that will be maintaining DeltaV workstations on a virtual platform after installation.

COURSE 7414

CEUs: 1.8

DeltaV Batch Operation Using Live

Overview

This 2½ - day course (18 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using the standard DeltaV Live user interface (for the DeltaV Operate user interface, please select course 7014). Students who complete this course will:

- Access operator main displays
- Manipulate various control module operating parameters to operate the process
- Access face plates and detail displays
- Understand process indications from graphic GEMs
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- View real-time and historical trend data
- Access historical data and event chronicle
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of GEMs, where to click to access the Faceplate and Detail Displays, etc. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.

Topics

- | | |
|--|--|
| • DeltaV Distributed Control System Overview | • Operating Equipment Modules |
| • DeltaV Live Operator Interface | • DeltaV SIS |
| • Display Navigation | • Batch Process Simulation |
| • Operating Discrete and Analog Control Modules | • Batch Process Overview |
| • Operating Motor Control Modules | • Operating Unit Modules |
| • Operating Regulatory and Cascade Control Modules | • Batch Operator Interface and/or DeltaV Live Batch Controls |
| • Alarms and Events | • Procedures |
| • DeltaV Trending | • DeltaV Batch Historian |
| • Unit Alarms | • DeltaV Campaign Manager |

Prerequisites

None

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using the DeltaV Live user interface.

COURSE 7414V

CEUs: 1.8

DeltaV Batch Operation Using Live [Virtual]

Overview

This 2½ - day course (18 hrs.) uses lectures and hands-on workshops to train operators for batch process operation based on the ISA-88 Standard using the standard DeltaV Live user interface (for the DeltaV Operate user interface, please select course 7014). Students who complete this course will:

- Access operator main displays
- Manipulate various control module operating parameters to operate the process
- Access face plates and detail displays
- Understand process indications from graphic GEMs
- Monitor and acknowledge different alarm conditions
- Monitor process performance
- View real-time and historical trend data
- Access historical data and event chronicle
- Understand basic batch terminology
- Manipulate Unit Module parameters
- Access different Batch Operator Interfaces
- Run recipe batches
- Review batch history data

Generic curriculum uses the out-of-the-box DeltaV configuration standards library. In most cases, the site configuration will differ from the generic library. After taking the generic course, students will be able to understand the basic layout of the graphics - e.g. the toolbar vs alarm banner, how to access the Alarm Summary page and acknowledge alarms, use of GEMs, where to click to access the Faceplate and Detail Displays, etc. This is considered platform training on DeltaV, not process training. For curriculum customized for your site please contact Education Services for a proposal.

Topics

- | | |
|---|--|
| <ul style="list-style-type: none"> • DeltaV Distributed Control System Overview • DeltaV Live Operator Interface • Display Navigation • Operating Discrete and Analog Control Modules • Operating Motor Control Modules • Operating Regulatory and Cascade Control Modules • Alarms and Events • DeltaV Trending • Unit Alarms | <ul style="list-style-type: none"> • Operating Equipment Modules • DeltaV SIS • Batch Process Simulation • Batch Process Overview • Operating Unit Modules • Batch Operator Interface and/or DeltaV Live Batch Controls • Procedures • DeltaV Batch Historian • DeltaV Campaign Manager |
|---|--|

Prerequisites

None

Audience

This course is for operators, supervisors, and managers responsible for the operation of batch processes using the DeltaV Live user interface.

COURSE 7999

CEUs: 1.4

DeltaV New Features

Overview

This 2.0-day course covers the new features and enhancements made to the DeltaV Distributed Control System in v13 and v14 using a combination of lectures, demos and hands-on workshop exercises. Students who complete the course will:

- Understand the new features and enhancements introduced in DeltaV v13 and v14
- Understand the benefits of the new features
- Understand how to apply the new features
- Perform workshop exercises implementing the new features

Topics

The course includes 40 core topics and 32 optional topics categorized under the following functional areas:

- Administration
- Alarm Management
- Batch
- Hardware
- Logic Configuration
- Miscellaneous
- Operator Interface
- Security
- SIS

The 40 core topics require 2 days to complete. The course may be customized based on the individual site's topics of interest. For customized course delivery, the course duration will be determined based on the topics to be included or excluded.

Prerequisites

Course 7009, 7409 or 7018

Audience

This course is intended for plant personnel responsible for configuring, administering, securing, maintaining and operating DeltaV. This includes control system engineers, administrators, maintenance engineers and technicians.

COURSE 7400**CEUs: 0.7****DeltaV Standalone PK Controller****Overview**

This 1-day course provides lectures and hands-on workshops about PK controller, its hardware components and administration for a standalone application.

Topics

- Benefits of PK Controller
- Sizing PK Controller
- PK Controller Capacity and Specifications
- PK Hardware Components
- Installing PK Hardware Components
- PK Controller Administration
- PK Controller Commissioning
- PK Controller Lock and Unlock Functions
- PK Merge Utility

Prerequisites

Windows experience and DeltaV configuration background.

Audience

This course is designed for engineers and technicians responsible for installing and maintaining PK controller standalone application.

COURSE 7400V**CEUs: 0.7****DeltaV Standalone PK Controller [Virtual]****Overview**

This 1-day course provides lectures and hands-on workshops about PK controller, its hardware components and administration for a standalone application.

Topics

- Benefits of PK Controller
- Sizing PK Controller
- PK Controller Capacity and Specifications
- PK Hardware Components
- Installing PK Hardware Components
- PK Controller Administration
- PK Controller Commissioning
- PK Controller Lock and Unlock Functions
- PK Merge Utility

Prerequisites

Windows experience and DeltaV configuration background.

Audience

This course is designed for engineers and technicians responsible for installing and maintaining PK controller standalone application.

ENTECH



COURSE 9036V

CEUs: 0

EnTech Process Troubleshooting & Optimization [Virtual]

Overview

Process Troubleshooting is a practical hands-on course that fills the gap between theory and effective application of a methodical approach to process troubleshooting.

The focus is on process variability: what it is, how it is measured, how it propagates through the process, how it can be identified and how it can be reduced. The students will learn how to troubleshoot process and control problems using the tools available within the DCS, as well as specialized tools like the EnTech Toolkit, to identify sources of variability and opportunities to develop and implement components of a process improvement program that includes topics such as: process design, control equipment design, control strategy design and tuning design with a focus on the process objectives.

The course content includes lectures, process control examples and hands-on lab simulation to enhance the students understanding of lecture material. Approximately 40% of the course is devoted to lab work, where the students learn how to apply the troubleshooting tools and techniques presented in the course.

Objectives

The students will learn how to troubleshoot process and control problems using the tools available within the DCS, as well as specialized tools like the EnTech Toolkit, to identify sources of variability and opportunities to develop and implement components of a process improvement program that includes topics such as: process design, control equipment design, control strategy design and tuning design with a focus on the process objectives.

Prerequisites

Participants should have an understanding of instrumentation and basic knowledge of process control.

Audience

EnTech 9036 Process & Control Troubleshooting is a practical hands-on course that fills the gap between theory and effective application of a methodical approach to process troubleshooting.

The focus is on process variability: what it is, how it is measured, how it propagates through the process, how it can be identified and how it can be reduced. The students will learn how to troubleshoot process and control problems using the tools available within the DCS, as well as specialized tools like the EnTech Toolkit, to identify sources of variability and opportunities to develop and implement components of a process improvement program that includes topics such as: process design, control equipment design, control strategy design and tuning design with a focus on the process objectives.

The course content includes lectures, process control examples and hands-on lab simulation to enhance the students understanding of lecture material. Approximately 40% of the course is devoted to lab work, where the students learn how to apply the troubleshooting tools and techniques presented in the course.



FISHER



E-LEARNING COURSE**CEUs: 0.4****Control Valve Fundamentals****Overview**

This e-course provides basic control valve fundamentals covering industry standards for control valves, flow characteristics, operation and function of sliding stem and rotary valves & actuators, positioners, and control valve accessories.

Topics

- Introduction to Control Valves
- Control Valve flow characteristics
- Sliding Stem Control Valves
- Sliding Stem Actuators
- Ball valves and Eccentric Plug valves
- Butterfly Valves
- Rotary Actuators
- Positioners
- Control Valve Accessories

COURSE 1300**CEUs: 2.8****Fisher Control Valve Engineering I Introduction****Overview**

This 4-day course reviews design and operating principles of control valves, actuators, positioners and related accessories. It describes the sizing and selection methods for a broad variety of control valves assemblies. Students will solve several demonstration sizing and selection problems using Fisher Specification Manager software and published materials, plus participate in equipment demonstrations and hands-on workshops. Students who complete this course will:

- Select the proper valve characteristic for a given process
- Choose suitable styles of control valves for an application
- Size control valves and actuators
- Properly apply positioners and instruments

Topics

- Control valve selection: rotary/sliding stem
- Actuator selection and sizing
- Liquid valve sizing
- Gas valve sizing
- Positioners and transducers
- Valve guidelines
- Valve characteristics
- Valve packing considerations

Delivery Options

This training is also available as a remote virtual classroom course 1300V.

Prerequisites

Some experience with industrial control equipment including control valves and actuators would be helpful.

Audience

This course is for engineers, technicians and others responsible for the selection, sizing, and application of control valves, actuators and control valve instrumentation.

COURSE 1400**CEUs: 2.8****Fisher Valve Trim & Body Maintenance****Overview**

This 4-day course and hands-on workshop explains how valves and actuators function and how they are installed and calibrated. It emphasizes installation, troubleshooting, parts replacement, and calibration of control valves, actuators, and FIELDVUE™ digital valve controllers. Those who complete this course will be able to:

- Correctly perform installation procedures
- Perform basic troubleshooting
- Properly apply and calibrate Fisher FIELDVUE DVC6200 digital valve controllers
- Change valve trim, gaskets and packing

Topics

- Control valve terminology
- Globe valves
- Packing
- Actuators, and digital valve controllers
- Bench set
- Seat leak testing
- Ball valves
- Butterfly valves
- Eccentric disc valves
- Valve characteristics

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Audience

This introductory course is for valve mechanics, maintenance personnel, instrument technicians, and others who are responsible for maintaining control valves, actuators and control valve instrumentation.

COURSE 1450

CEUs: 2.8

Fisher Control Valve & Instrument Troubleshooting Introduction**Overview**

This 4-day course uses a very hands-on approach for troubleshooting and correcting many common control valve problems. The class will be introduced to the practice of basic valve sizing and selection. Valve problems such as cavitation, flashing, and aerodynamic noise are also discussed as well as common solutions to these problems using different control valve trims and materials. Instrumentation topics are expanded from course 1400 and 1700 to include troubleshooting and advanced calibration for split ranging, non-compatible signals, or using additional instruments such as a volume booster and trip valves. Loop performance issues due to stick-slip, high friction, and instrument operation are discussed.

Topics

- Control loop basics
- Influences on loop performance
- Control valve selection and sizing
- Valve troubleshooting
- Actuator troubleshooting
- Instrument selection
- Basic instrument troubleshooting
- Severe service considerations

Prerequisites

Completion of courses 1400 and 1700.

Audience

This course is for experienced valve mechanics and maintenance personnel, instrument technicians, and others who will benefit from a broadened perspective of control valve performance and effect on total loop operation.

COURSE 1751

CEUs: 2.1

Fisher HART based FIELDVUE™ Digital Valve Controllers using Emerson Field Communicators & ValveLink™ Mobile**Overview**

This 3-day course provides hands-on experience working with FIELDVUE™ digital valve controllers using an Emerson 475 or AMS Trex™ Communicator. The class will discuss basic operation and installation of the FIELDVUE digital valve controllers. Students will practice installing and mounting FIELDVUE digital valve controllers onto sliding stem and rotary control valve assemblies, as well as perform basic configuration and calibration of FIELDVUE Instruments. Troubleshooting the digital valve controller using ValveLink™ Mobile software will be performed and basic data interpretation will be introduced.

Topics

- FIELDVUE digital valve controller theory of operation
- FIELDVUE instrument installation
- Diagnostic troubleshooting and data interpretation using ValveLink Mobile with AD and PD tier devices

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Audience

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting Fisher FIELDVUE instruments using the Emerson Field Communicators with ValveLink Mobile.

COURSE 1752

CEUs: 2.1

Fisher HART based FIELDVUE Digital Valve Controllers using Emerson Field Communicators & ValveLink Software**Overview**

This 3-day course provides hands-on experience working with FIELDVUE™ digital valve controllers and ValveLink™ software. Students will be able to execute ValveLink software calibration and diagnostic routines and create an instrument database.

Topics

- Introduction to ValveLink Solo software
- Configuration with ValveLink software
- Calibration with ValveLink software
- ValveLink software advanced and performance Tier Diagnostics
- Troubleshooting
- Introduction to diagnostic data interpretation
-

Delivery Options

This training is also available as a remote virtual classroom course training by attending courses 1760V, 1761V, 1762V, and 1763V

Prerequisites

Some experience in instrument calibration and in control valve maintenance, installation, and operation would be helpful.

Audience

This course is for technicians, engineers and others responsible for installation, calibration and diagnostics for FIELDVUE digital valve controllers and ValveLink software. The primary focus of this course is to provide a comprehensive experience in managing digital valve controllers using the ValveLink software.

COURSE 1759

CEUs: 2.1

Diagnostic Data Interpretation using ValveLink Software for Fisher FIELDVUE Digital Valve Controllers**Overview**

This 3-day course uses practical exercises and discussions to teach the student to interpret and analyze diagnostic data obtained using FIELDVUE™ digital valve controllers and ValveLink software™. Students will perform diagnostic tests on a variety of valve/actuator combinations and use the data to determine bench set, dynamic error band, seat load, spring rate and other pertinent parameters. Students will also perform comparison tests on valve/ actuator assemblies containing configuration or operating flaws and use the data for troubleshooting purposes.

Topics

- Review of ValveLink software diagnostic tests
- Data interpretation
- Troubleshooting techniques
- Comparison testing techniques
- Performance diagnostics

Prerequisites

Students must have completed one of the following: 1751, 1752, or 1760V Series (1760V, 1761V, 1762V, 1763V).

Audience

This course is for technicians, engineers and others responsible to collect and interpret valve diagnostic tests performed using ValveLink™ software.

COURSE 1766

CEUs: 1.4

Fisher FIELDVUE Digital Valve Controller DVC6200 SIS with ValveLink Software**Overview**

This 2-day course provides hands-on experience working with FIELDVUE digital valve controllers DVC6200 Safety Instrument Systems (SIS) and ValveLink software.

Topics

- Safety Instrumented System Basics
- Digital Valve Controllers for Safety Instrumented Systems
- Configuration with ValveLink software
- Calibration with ValveLink software
- Detailed Setup and Device Diagnostics
- Local Control Panel wiring and set-up

Prerequisites

Some experience in instrument calibration and control valve maintenance, installation, and operation would be helpful.

Audience

This course is for technicians, engineers, and others responsible for installation, calibration and diagnostics for FIELDVUE digital valve controllers DVC6200 SIS and ValveLink software.

COURSE 7036

CEUs: 1.4

Fisher FIELDVUE Digital Valve Controller DVC6200 fieldbus with ValveLink Software**Overview**

This 2-day course reviews the role and function of control valve positioners followed by a series of hands-on exercises to disassemble, inspect, assemble, install, and commission a FOUNDATION™ fieldbus FIELDVUE™ digital valve controller.

Topics

- Positioner Basics
- FOUNDATION fieldbus overview
- FIELDVUE digital valve controller installation and mounting
- Modes and status
- Configuration and calibration with AMS Trex™ Communicator and ValveLink Mobile
- ValveLink software guided Setup /Detailed Setup
- Tuning
- Tag management
- Pressure control
- ValveLink software diagnostics
- FIELDVUE instrument troubleshooting

Prerequisites

Some experience in instrument calibration and control valve maintenance, installation, and operation would be helpful.

Audience

This course is for technicians, engineers, and others responsible for installation, calibration and diagnostics of FOUNDATION fieldbus digital valve controller.

MACHINERY HEALTH



COURSE 2070

CEUs: 2.8

AMS Machinery Manager Advanced**Overview**

This 4-day course is the third in our series of AMS Machinery Manager courses. Its focus is on the management, modification and optimization of the existing AMS Machinery Manager database. Students will learn how to modify existing Wizard configurations, add and edit users, statistically adjust alert and fault levels, make global database changes, and many other very useful database functions. This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- Advanced Analysis Features in Vibration Analysis Module
- Problem Reporting
- Status-at-a-Glance Operation and Reporting
- Nspectr®
- Wizard - Reporting Techniques and Modification/Addition of Setup Information
- Austostat
- Database Utility
- Database Zip Utility
- Network Administration
- Data Locker Management

Prerequisites

Intermediate Vibration (course 2032) or one-year vibration analysis experience are recommended. Experience with the Windows operating system is recommended.

Audience

This course is intended for the advanced user who has already created a machinery database and has been acquiring, storing and analyzing data for six months or more.

COURSE 2070V

CEUs: 2.8

AMS Machinery Manager Advanced [Virtual]**Overview**

This 4-day course is the third in our series of AMS Machinery Manager courses. Its focus is on the management, modification and optimization of the existing AMS Machinery Manager database. Students will learn how to modify existing Wizard configurations, add and edit users, statistically adjust alert and fault levels, make global database changes, and many other very useful database functions. This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- Advanced Analysis Features in Vibration Analysis Module
- Problem Reporting
- Status-at-a-Glance Operation and Reporting
- Nspectr®
- Wizard - Reporting Techniques and Modification/Addition of Setup Information
- Austostat
- Database Utility
- Database Zip Utility
- Network Administration
- Data Locker Management

Prerequisites

Intermediate Vibration (course 2032) or one-year vibration analysis experience are recommended. Experience with the Windows operating system is recommended.

Audience

This course is intended for the advanced user who has already created a machinery database and has been acquiring, storing and analyzing data for six months or more.

COURSE 2074

CEUs: 2.8

AMS Machinery Manager Intermediate**Overview**

This 4-day course teaches some of the more advanced machinery analysis techniques available in AMS Suite Machinery Health™ Manager Software. This course focuses more on analysis and reporting with the use of Vibration Analysis module, Reporting module, Exception Analysis, PEAKVUE™ technology and full version of RBMview.

This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- PEAKVUE™ Technology
- Vibration Analysis module
- Reporting Module
- Exception Analysis
- Nspectr
- BMview
- Data Transfer
- Route Modification

Prerequisites

Intro to AMS Machinery Health™ Manager (course # 2068), Basic Vibration Analysis course or 6 months vibration analysis experience are recommended.

COURSE 2074V

CEUs: 2.8

AMS Machinery Manager Intermediate [Virtual]

Overview

This 4-day course teaches some of the more advanced machinery analysis techniques available in AMS Suite Machinery Health™ Manager Software. This course focuses more on analysis and reporting with the use of Vibration Analysis module, Reporting module, Exception Analysis, PEAKVUE™ technology and full version of RBMview. This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- PEAKVUE™ Technology
- Vibration Analysis module
- Reporting Module
- Exception Analysis
- Nspectr
- BMview
- Data Transfer
- Route Modification

Prerequisites

Intro to AMS Machinery Health™ Manager (course # 2068), Basic Vibration Analysis course or 6 months vibration analysis experience are recommended.

COURSE 2068

CEUs: 2.8

AMS Machinery Manager Introduction

Overview

In this 4-day class students learn methods of database creation and vital features of route creation such as collecting reference data, analyzer/ computer communication, and the basic concepts of Analysis Parameter Sets, Alarm Limit Sets, and Fault Frequency Sets. A machinery analyzer is used to demo the process of loading routes for data collection. This course will also include a basic overview of the vibration plotting application and reporting functions.

This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- RBMwizard
- Database Setup
- Route management and Data transfer
- Reports
- Vibration Analysis module

Prerequisites

Computer experience with the Windows operating system and some vibration analysis experience are recommended.

Audience

This course was designed for the new users of AMS Machinery Manager.

COURSE 2068V

CEUs: 2.8

AMS Machinery Manager Introduction [Virtual]

Overview

In this 4-day class students learn methods of database creation and vital features of route creation such as collecting reference data, analyzer/ computer communication, and the basic concepts of Analysis Parameter Sets, Alarm Limit Sets, and Fault Frequency Sets. A machinery analyzer is used to demo the process of loading routes for data collection. This course will also include a basic overview of the vibration plotting application and reporting functions.

This course is based on the current mass release of the AMS Machinery Manager software. Students can call to verify if the course is appropriate to the version they are using. Wireless technology, Infrared Analysis, Motorview, Online Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Topics

- RBMwizard
- Database Setup
- Route management and Data transfer
- Reports
- Vibration Analysis module

Prerequisites

Computer experience with the Windows operating system and some vibration analysis experience are recommended.

Audience

This course was designed for the new users of AMS Machinery Manager.

COURSE E2130

CEUs: 0.6

**Machinery Health Analyzer CSI 2130
Introduction****Overview**

Emerson's Machinery Health™ training now includes Fundamentals of the 2130 eLearning course, designed to provide you with the tools you need to perform data collection using the CSI 2130 Machinery Health Analyzer. This course provides guided demonstrations through the processes of installing necessary drivers, uploading updated firmware, and loading updated or newly-purchased programs necessary for data collection. Learn how to load a pre-defined route into the CSI 2130, gather general data as well as specialized data, and then interface the data back with a computer for further diagnostic analysis.

Topics

- Analyzer-Computer Communication
- Predefined Route Data Collection
- Off-Route Data Collection and Setup
- Monitor Mode Measurements
- Peak and Phase Measurements

COURSE 2076

CEUs: 1.4

**Machinery Health AMS 2140
Introduction****Overview**

This 2-day hands-on course focuses on the basic operation of the AMS 2140 Machinery Health™ Analyzer. Students collect data on lab machines.

Note

You may take with Fundamentals of Vibration as a 4-day course.

Topics

- Analyzer/Computer Communication
- Predefined Route Data Collection
- Job Data Collection and Setup
- Manual Mode Measurements
- Introduction to AMS 2140 Analysis Expert Functions

Prerequisites

Understanding of vibration analysis. Familiar with basic vibration collection principles.

Audience

This course is designed for personnel with little or no experience with Emerson analyzers, but who are experienced in the field of vibration data collection and analysis.

COURSE 2076V

CEUs: 1.4

**Machinery Health AMS 2140
Introduction [Virtual]****Overview**

This 2-day hands-on course focuses on the basic operation of the AMS 2140 Machinery Health™ Analyzer. Students collect data on lab machines.

Note

You may take with Fundamentals of Vibration as a 4-day course.

Topics

- Analyzer/Computer Communication
- Predefined Route Data Collection
- Job Data Collection and Setup
- Manual Mode Measurements
- Introduction to AMS 2140 Analysis Expert Functions

Prerequisites

Understanding of vibration analysis. Familiar with basic vibration collection principles.

Audience

This course is designed for personnel with little or no experience with Emerson analyzers, but who are experienced in the field of vibration data collection and analysis.

COURSE E2069

CEUs: 0.2

Machinery Health Vibration Introduction**Overview**

The course introduces the technology of vibration analysis by explaining what vibration analysis is and how it plays a critical role in any predictive maintenance program. Students are led through a self-paced discussion on how vibration analysis works with many examples of the types of faults that can be detected. Students will also gain an understanding of where and how vibration is measured with an emphasis on good data collection techniques. Students will learn important terminology that will be critical to their success as they progress to the next level of training in vibration analysis; Emerson's Basic Vibration Analysis course.

Topics

- Chapter 1: Fundamentals of Vibration
- Chapter 2: How is Vibration Measured?
- Chapter 3: Understanding the Vibration Signal
- Chapter 4: Vibration Units
- Chapter 5: Analysis Parameters
- Chapter 6: Data Analysis: Where to begin?

Audience

This e-course provides instruction to individuals with no prior experience in vibration analysis.

COURSE 2014V

CEUs: 2.8

Machinery Health Vibration & AMS 2140 Introduction**Overview**

This 4-day course is for those with no prior experience in vibration analysis. Students learn about causes of vibration and methods of measurement. The AMS 2140 analyzer portion of the course focuses on the basic operation of the AMS 2140 Machinery Health Analyzer. Students collect data on lab machines.

Topics

- Introduction to Vibration
- Components of a Predictive Maintenance Program
- Basic Fault Identification
- Vibratory Fault Characteristics and Patterns
- Information to Help Jump Start a Vibration Program.
- Analyzer/computer communication
- Predefined route data collection
- Job data collection and setup
- Manual mode measurements
- Introduction to AMS 2140 Analysis Expert Functions

Prerequisites

None

COURSE E2140

CEUs: 0.6

Machinery Health AMS 2140 Introduction**Overview**

Emerson's Machinery Health™ training now includes the Fundamentals of the AMS 2140 eLearning course, designed to provide you with the tools you need to perform data collection using the AMS 2140 Machinery Health Analyzer. The course leads you through a basic introduction of the analyzer including panel descriptions and reviews of the purpose and function of all connectors, ports, slots, keys, indicators and buttons. The user learns how to load a pre-defined route into the analyzer, take general data as well as specialized data, and then dump that data back into the computer for further diagnostic analysis.

Topics

- Analyzer/Computer Communication
- Predefined Route Data Collection
- Job Data Collection and Setup
- Manual Mode Measurements
- Introduction to AMS 2140 Analysis Expert Functions

Prerequisites

Understanding of vibration analysis. Familiar with basic vibration collection principles.

Audience

This course is designed for personnel with little or no experience with Emerson analyzers, but who are experienced in the field of vibration data collection and analysis.

COURSE 2031

CEUs: 3.0

Machinery Health Vibration Analysis Category I

Overview

This 4-day course complies with Category I Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. Although this training course is not product specific, students will use Emerson's AMS technologies for demonstration purposes. The class shows the student how to use the vibration analyzer in conjunction with Emerson AMS Machinery Manager software to analyze basic vibration defects. Participants will receive a complimentary copy of the Pocket Vibration Analysis Trouble-Shooter Guide

Topics

- Introduction to Vibration
- Measurement Setup
- Data collection and analysis
- Basic analyzer functions
- The class shows the students how to recognize machine defects such as:
 - Imbalance
 - Shaft misalignment
 - Looseness
 - Rolling element bearing defects
 - Gear problems
 - Resonance
 - Belt Defects
 - AC Induction Motors
 - Journal Bearings
 - Rotating Equipment

Prerequisites

Fundamentals of vibration or up to six months of vibration experience is recommended.

Audience

This course is intended to enable students to operate single channel machinery analyzers, dump and load routes, recognize the difference between good and bad data, and compare vibration measurements against pre-established alert settings.

COURSE 2032

CEUs: 2.8

Machinery Health Vibration Analysis Category II

Overview

This 4-day course complies with Category II Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. Category II vibration analysts are expected to be able to select appropriate vibration measurement techniques, set up instruments for basic resolution of amplitude, frequency, and time, perform basic spectrum analysis, maintain a database of results and trends, perform single-channel impact tests, classify, interpret, and evaluate test results in accordance with applicable specifications and standards, recommend minor corrective actions, and understand basic single plane field balancing concepts.

This course also features the use of the Emerson Machinery Analyzer in conjunction with advanced machinery analysis techniques. Discussions of case histories on machinery faults are one of the focal points of this course. Students will receive a complimentary copy of the Simplified Handbook of Vibration Analysis, Volume I, by Art Crawford.

Topics

- Recognition of Machine Defects including:
- Reference Standards
 - Imbalance
 - Misalignment
 - Bent Shaft
 - Soft Foot
 - Anti-friction and Journal Bearings
 - Looseness
 - Resonance
 - Electrical Defects
 - Gearboxes
 - Belts

Prerequisites

Basic Vibration Analysis course and a cumulative 18 months of field experience are recommended.

COURSE 2021EX

CEUs: 2.8

Machinery Health Vibration Analyst Exam Category I

Overview

Test Format: Written
Duration: 2 hours
Passing Grade: 70%

Eligibility for Examination

- Min. Duration of Training (hours): 30
- Min. Duration of Cumulated Exp. (months): 6

COURSE 2022EX

CEUs: 2.8

Machinery Health Vibration Analyst Exam Category II

Overview

Test Format: Written
Duration: 3 hours
Passing Grade: 70%

Eligibility for Examination

- Min. Duration of Training (hours): 70
- Min. Duration of Cumulated Exp. (months): 18
- Passing Category I exam is NOT a Prerequisites

COURSE 2023EX

CEUs: 2.8

Machinery Health Vibration Analyst Exam Category III

Overview

Category III exam, available at the end of 2033
Test Format: Written
Duration: 4 hours
Passing Grade: 70%

Eligibility for Examination

- Min. Duration of Training (hours): Category II + 38
- Min. Duration of Cumulated Exp. (months): 36
- Has taken and passed the Category II exam.

COURSE 2032V

CEUs: 2.8

Machinery Health Vibration Analysis Category II [Virtual]**Overview**

This 4-day course complies with Category II Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. Category II vibration analysts are expected to be able to select appropriate vibration measurement techniques, set up instruments for basic resolution of amplitude, frequency, and time, perform basic spectrum analysis, maintain a database of results and trends, perform single-channel impact tests, classify, interpret, and evaluate test results in accordance with applicable specifications and standards, recommend minor corrective actions, and understand basic single plane field balancing concepts.

This course also features the use of the Emerson Machinery Analyzer in conjunction with advanced machinery analysis techniques. Discussions of case histories on machinery faults are one of the focal points of this course. Students will receive a complimentary copy of the Simplified Handbook of Vibration Analysis, Volume I, by Art Crawford.

Topics

Recognition of Machine Defects including:

- Reference Standards
- Imbalance
- Misalignment
- Bent Shaft
- Soft Foot
- Anti-friction and Journal Bearings
- Looseness
- Resonance
- Electrical Defects
- Gearboxes
- Belts

Prerequisites

Basic Vibration Analysis course and a cumulative 18 months of field experience are recommended.

COURSE 2033

CEUs: 2.8

Machinery Health Vibration Analysis Category III**Overview**

This 4-day course complies with Category III Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. This course expands on the subjects covered in the Intermediate Vibration course (Category II), especially in the areas of fault analysis and corrective actions. The class details advanced analysis techniques. The dual channel Machinery Health™ analyzer features are introduced including the use of AMS Machinery Manager Software to set up the advanced analyzer features and the powerful download-able programs for data collection. The transient Machinery Health analyzer capabilities are covered such as long-term time waveform. The class covers advanced resonance detection using a variety of testing methods, including triggered data collection.

Students will receive a complimentary copy of the Simplified Handbook of Vibration Analysis, Volume I, by Art Crawford.

Topics

- Specify Appropriate Vibration Instrumentation Hardware and Software for both Portable and Permanently Installed Systems
- Perform Spectrum and Time Waveform Analysis Under both Steady-State and Unsteady Operating Conditions
- Measure and Analyze Basic Operational Deflection Shapes (ODS)
- Slow Speed Technology (SST®)
- Zoom Analysis
- Transient Techniques
- Digital Signal Processing
- Demodulation
- Resonance Detection

Prerequisites

Intermediate Vibration Analysis course and a cumulative three years of field experience are recommended.

COURSE 2033V

CEUs: 2.8

Machinery Health Vibration Analysis Category III [Virtual]**Overview**

This 4-day course complies with Category III Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics. This course expands on the subjects covered in the Intermediate Vibration course (Category II), especially in the areas of fault analysis and corrective actions. The class details advanced analysis techniques. The dual channel Machinery Health™ analyzer features are introduced including the use of AMS Machinery Manager Software to set up the advanced analyzer features and the powerful download-able programs for data collection. The transient Machinery Health analyzer capabilities are covered such as long-term time waveform. The class covers advanced resonance detection using a variety of testing methods, including triggered data collection.

Students will receive a complimentary copy of the Simplified Handbook of Vibration Analysis, Volume I, by Art Crawford.

Topics

- Specify Appropriate Vibration Instrumentation Hardware and Software for both Portable and Permanently Installed Systems
- Perform Spectrum and Time Waveform Analysis Under both Steady-State and Unsteady Operating Conditions
- Measure and Analyze Basic Operational Deflection Shapes (ODS)
- Slow Speed Technology (SST®)
- Zoom Analysis
- Transient Techniques
- Digital Signal Processing
- Demodulation
- Resonance Detection

Prerequisites

Intermediate Vibration Analysis course and a cumulative three years of field experience are recommended.

COURSE 2088

CEUs: 2.8

Machinery Health AMS Online Prediction Operation & Maintenance**Overview**

This 4-day course best suits those who have a CSI 4500, AMS 6500, AMS 2600 or XP32 system installed and operational prior to attending the course.

Topics

- Vibration basics and terminology relating to the CSI 4500, AMS 6500, AMS 2600 or XP32
- System overview: functionality and system components
- Online Watch - used to monitor the system daily
- Online Config - adding a new machine to an existing database
- Vibration Analysis Module - spectrums, waveforms and trend data
- PEAKVUE™ technology Processing
- Transient setup and capture evaluation
- Review of customer databases

Prerequisites

Knowledge of vibration and industrial machinery is helpful, but not necessary.

Audience

- System users or analysts
- Personnel using the CSI 4500, AMS 6500, AMS 2600 or XP32 daily
- Those responsible for configuring databases and analyzing data

COURSE 2082

CEUs: 2.8

Machinery Health Lubrication – Introduction & Intermediate**Overview**

Guidelines and instruction for starting an oil analysis program will be provided in this 4-day course. The course focuses on the basic properties of lubricants and lubricant specifications including additive packages. An overview of laboratory testing methods and interpretation of test data is taught. In addition, instruction is provided on proper storage and handling of new, unused lubricants, as well as sample point identification and best practices for collecting samples from machinery. Basic contamination control and wear debris analysis and identification is covered. The focus of the level two portion of the course is the use of oil analysis with other predictive technologies to enhance a machinery health program. Machine life extension and reduction of unscheduled downtime will be covered in depth. Training includes introductions to lubricant engineering, failure concepts, and failure prevention. Information will be provided on greases and synthetic lubricants, including advantages and applications. The importance of Wear Debris Analysis and contamination control and their impact on reliability will be stressed. Guidelines and step-by-step procedures will be offered for consolidating lubricants, setting alarm limits, as well as managing and enhancing existing lubrication programs. Optional Level I & Level II Lubrication Certification exams will be administered at the end of the course for no charge.

Topics

- The productive lubricant analysis program
- Analyzing oil data
- Identifying common types of wear debris, their origins, and corrective actions
- The importance of contamination control
- Designing sampling, storage and handling procedures
- The components of RBM lubrication program
- Methods for extending machine life
- The importance of Wear Debris Analysis and
- Contamination Control
- Lubricant consolidation
- Establishing alarms

Audience

This course is designed for individuals who have limited or no oil analysis experience.

COURSE 2082V

CEUs: 2.8

Machinery Health Lubrication – Introduction & Intermediate [Virtual]**Overview**

Guidelines and instruction for starting an oil analysis program will be provided in this 4-day course. The course focuses on the basic properties of lubricants and lubricant specifications including additive packages. An overview of laboratory testing methods and interpretation of test data is taught. In addition, instruction is provided on proper storage and handling of new, unused lubricants, as well as sample point identification and best practices for collecting samples from machinery. Basic contamination control and wear debris analysis and identification is covered. The focus of the level two portion of the course is the use of oil analysis with other predictive technologies to enhance a machinery health program. Machine life extension and reduction of unscheduled downtime will be covered in depth. Training includes introductions to lubricant engineering, failure concepts, and failure prevention. Information will be provided on greases and synthetic lubricants, including advantages and applications. The importance of Wear Debris Analysis and contamination control and their impact on reliability will be stressed. Guidelines and step-by-step procedures will be offered for consolidating lubricants, setting alarm limits, as well as managing and enhancing existing lubrication programs. Optional Level I & Level II Lubrication Certification exams will be administered at the end of the course for no charge.

Topics

- The productive lubricant analysis program
- Analyzing oil data
- Identifying common types of wear debris, their origins, and corrective actions
- The importance of contamination control
- Designing sampling, storage and handling procedures
- The components of RBM lubrication program
- Methods for extending machine life
- The importance of Wear Debris Analysis and Contamination Control
- Lubricant consolidation
- Establishing alarms

Audience

This course is designed for individuals who have limited or no oil analysis experience.

COURSE 2086

CEUs: 2.1

Machinery Health AMS 6500 ATG Operation & Maintenance**Overview**

This 3-day hands-on training course is for any user or analyst involved with operating and maintaining an AMS 6500 ATG System. Workshops include practice with module and software configuration.

Topics

- Overview of hardware and modules
- Rack and module configuration
- Machine Studio software functionality, navigation and configuration
- System troubleshooting and maintenance
- ATG View App

Audience

This 3-day course is a hands-on training for anyone involved with operating and maintaining an AMS6500 ATG System.

COURSE 2081

CEUs: 2.8

Machinery Health Electric Motor Diagnostics & MotorView Introduction**Overview**

This 4-day course is intended for personnel who are experienced in vibration analysis and diagnostics and focuses on the theoretical concepts of motor diagnostics. This course uses labs and case histories to demonstrate the functionality of the MotorView software in determining rotor bar defects using current and flux data. This course is designed for mechanical and electrical skilled personnel who may not have a background in motor theory, operation and construction.

Topics

- Basic electrical principles
- AC/DC motor theory and design
- Variable frequency drives
- Data collection methods
- Current spectra and waveform analysis
- Flux spectra analysis and data evaluation
- Temperature data
- Shaft current
- Analysis of case histories
- Windows configuration for MotorView operation

Audience

The MotorView course is designed for students who are experienced in vibration analysis and diagnostics and focuses on the theoretical concepts of motor diagnostics.

MEASUREMENT SOLUTIONS



Measurement Solutions

Pressure & Temperature

2305, 2307, 2308, 2321, 2324, 2398, 2328, 2310, 2329, 2309, E2309

Level

2332, 2336, 2337, 2395, E2330, E2396, RTG100, RTG102, ERTG200, ERTG212

Flow

2358, 2339C, 2380, 2381, 5708, 5713, 5714, E1010, E1011, E1012, E1013, E1014, E1015, E1016, E1050, 2340, 2341, 2339SM, 2339SV, 2394, E1020, E1021, E1022, E1024, E1030, E1031, E1032, E1033, E1034, D4419, D4230/4280, D4262, D4270, D4530, E1040, E0141, E1042

Learning Paths

2320, 2320V, 2323C, 2326, 2327, 2333, 2370

Wireless

2375, 2376, E2977

Analyzers

R4100, R4105, R4170, R4210, R4213, R4311, 2170, 2205, E2601, E2602

Flame & Gas

2350, 2351

COURSE 2305

CEUs: 0.7

Rosemount 3051 Pressure Transmitter

Overview

This 1-day course uses lectures and labs to teach the student how to install, configure, calibrate and maintain the Rosemount 3051 Pressure Transmitter. The student will also learn the operation of the Field Communicator. Students will:

- Explain the differences between Smart & Analog transmitters
- Identify 3051 parts and functionality
- Explain the principles of operation of the 3051
- Configure, calibrate and test 3051 Smart Pressure Transmitters using the Field Communicator or AMS Device Manager
- Properly install/troubleshoot the 3051 Smart transmitter

Topics

- Smart and Analog Transmitters
- 3051 Overview and Principles of Operation
- Test Equipment Selection
- Bench Testing the 3051 Smart Transmitter
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

Audience

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount 3051 Pressure Transmitter.

Note

This product is also included in the 2-day course 2329

COURSE 2307

CEUs: 0.7

Rosemount 3051 Fieldbus Pressure Transmitter

Overview

This 1-day course uses lectures and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate and maintain the Rosemount 3051 Fieldbus Pressure Transmitter. The student will also learn the operation of the Field Communicator. Students who complete this course will be able to:

- Identify 3051 parts and functionality
- Explain the principles of operation of the 3051
- Design and build a Fieldbus segment
- Configure, test, and calibrate the 3051 Fieldbus Pressure Transmitters using the Field Communicator or AMS Device Manager
- Properly install and troubleshoot the 3051 Fieldbus Transmitter

Topics

- 3051 Overview and Principles of Operation
- FOUNDATION™ Fieldbus Overview
- Fieldbus Wiring/Segment Design/Function Blocks
- Test Equipment Selection
- Bench Testing 3051 Fieldbus Transmitter
- Field Communicator Operation
- AMS Device Manager Operation
- Digital Trims/Calibration
- Installation and Start-Up
- Troubleshooting and Maintenance

Note

Product is also part of course 2370.

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 3051 Fieldbus Pressure Transmitter.

COURSE 2308**CEUs: 0.7****Rosemount 3051S Pressure Transmitter****Overview**

This 1-day course uses lectures and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate, troubleshoot, and maintain the Rosemount 3051S Pressure Transmitter. The student will also learn the operation of the Field Communicator or AMS Device Manager. Students who complete this course will be able to:

- Identify 3051S parts and functionality
- Explain the principles of operation of the 3051S
- Configure and test the 3051S HA
- RT® Pressure Transmitters using the Field Communicator or AMS Device Manager
- Properly install, configure, calibrate, and troubleshoot the 3051S HART transmitter

Topics

- 3051S Overview/Principles of Operation
- 3051S Installation and Options
- Test Equipment Selection
- Configure and Bench Testing the 3051S HART® Transmitter
- Configure & Test 3051S Advanced Features:
 - Alarm & Saturation Levels, Alarm Direction, Write Protection
 - Process Alerts, Scaled Variable
- Digital Trims/Calibration
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting, and maintenance of the Rosemount 3051S Pressure Transmitter.

COURSE 2308**CEUs: 0.7****Rosemount 3051S Pressure Transmitter****Overview**

This 1-day course uses lectures and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate, troubleshoot, and maintain the Rosemount 3051S Pressure Transmitter. The student will also learn the operation of the Field Communicator or AMS Device Manager. Students who complete this course will be able to:

- Identify 3051S parts and functionality
- Explain the principles of operation of the 3051S
- Configure and test the 3051S HA
- RT® Pressure Transmitters using the Field Communicator or AMS Device Manager
- Properly install, configure, calibrate, and troubleshoot the 3051S HART transmitter

Topics

- 3051S Overview/Principles of Operation
- 3051S Installation and Options
- Test Equipment Selection
- Configure and Bench Testing the 3051S HART® Transmitter
- Configure & Test 3051S Advanced Features:
 - Alarm & Saturation Levels, Alarm Direction, Write Protection
 - Process Alerts, Scaled Variable
- Digital Trims/Calibration
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting, and maintenance of the Rosemount 3051S Pressure Transmitter.

COURSE 2321**CEUs: 0.7****Rosemount 3144P Temperature Transmitter****Overview**

This 1-day course uses lecture and labs to teach the student how to install, configure, calibrate and maintain the Rosemount 3144P HART® Temperature Transmitters. The student will also learn the operation of the Field Communicator. Students who complete this course will:

- Identify 3144P parts and explain their functionality
- Explain the principles of operation of 3144P
- Configure, calibrate and test 3144P HART® Temperature Transmitters using the Field Communicator or AMS Device Manager
- Properly install and troubleshoot the 3144P Temperature Transmitters

Topics

- 3144P Overview and Principles of Operation
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing the 3144P HART® Transmitters
- Smart Transmitters
- Field Communicator Operation
- AMS Device Manager Operation
- Digital Trims/Calibration
- 3144P Dual Sensor Setup
- Configuration
- Installation and Start-Up
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 3144P HART® Temperature Transmitters.

Note

This course can also be taught using the Rosemount 644. This product is also included in courses 2326 and 2329.

COURSE 2324**CEUs: 0.7****Rosemount 3144P Fieldbus Temperature Transmitters****Overview**

This 1-day course uses lecture and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate, troubleshoot, and maintain the Rosemount 3144P Fieldbus Temperature Transmitters. The student will also learn the operation of the Field Communicator. Students who complete this course will be able to:

- Identify 3144P parts & explain their functionality
- Explain principles of operation of the 3144P
- Design and build a Fieldbus segment
- Configure, calibrate, and test 3144P Fieldbus Temperature transmitters using the Field Communicator
- Properly install and troubleshoot the 3144P Fieldbus Transmitters

Topics

- 3144P Overview and Principles of Operation
- FOUNDATION™ fieldbus Overview
- Fieldbus Wiring
- Fieldbus Segment Design
- Fieldbus Function Blocks
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing 3144P Fieldbus Transmitters
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-Up
- Troubleshooting and Maintenance

Note

This product is also part of 2370 course.

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

Audience

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 3144P Fieldbus Temperature Transmitters.

COURSE 2398**CEUs: 0.7****Rosemount 3051 Pressure & 3144P Temperature Transmitter****Overview**

This 1-day course uses lectures and labs to teach the student how to install and maintain the Rosemount 3051C Pressure and 3144P Smart Temperature Transmitter. The student will also learn the operation and inter-face capabilities of the Field Communicator. Students will:

- Explain the differences between Smart & Analog transmitters
- Identify 3051C and 3144P parts and functionality
- Explain the principles of operation of the 3051C and 3144P Transmitters
- Configure and test the 3051C Pressure and 3144P Temperature Transmitters using the Field Communicator
- Properly install/ troubleshoot the 3051 Pressure and 3144P Temperature transmitters

Topics

- Smart and Analog Transmitters
- 3051C & 3144P Overview and Principles of Operation
- Test Equipment Selection
- Sensor Selection and Wiring
- Bench Testing the 3051C & 3144P Smart Transmitter
- Field Communicator Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic pressure and temperature fundamentals and instrumentation.

Audience

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount 3051 Pressure, and 3144P Temperature Transmitters.

COURSE 2328**CEUs: 0.7****Rosemount 848 Fieldbus Temperature Transmitters****Overview**

This 1-day course uses lectures and labs to maximize the hands-on experiences and teach the student how to install, configure, troubleshoot, and maintain the Rosemount 848T Fieldbus Temperature Transmitters. The student will also learn the operation of the Field Communicator. Students who complete this course will be able to:

- Explain the principles of operation of the 848T
- Configure, calibrate, and test the 848T Fieldbus temperature transmitter using the Field Communicator
- Design and build a Fieldbus segment
- Properly install and troubleshoot the 848T Fieldbus Transmitter

Topics

848T Overview and Principles of Operation
FOUNDATION™ fieldbus Overview
Fieldbus Wiring
Fieldbus Segment Design
Fieldbus Function Blocks (including the MAI, and ISEL Blocks)
Test Equipment Selection
Sensor Selection and Wiring
Bench Testing the 848T Fieldbus Transmitters
Field Communicator Operation
Digital Trims/Calibration
Installation and Start-Up
Troubleshooting and Maintenance

Note

This product is also included in the 3-day 2370 Fieldbus Course.

Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

Audience

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 848 Fieldbus Temperature Transmitters

COURSE 2310**CEUs: 0.7****Rosemount 3051S Multi-Variable Mass Flow Transmitter****Overview**

This 1-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, calibrate and maintain the Rosemount Model 3051SMV HART® Mass Flow Transmitter. Students who complete this course will:

- Identify transmitter parts and explain their functionality
- Explain the principles of operation of the transmitter
- Configure and test using the Field Communicator, AMS Device Manager, and the 3051SMV Engineering Assistant software
- Configure the compensated flow parameters using the 3051SMV Engineering Assistant Software
- Properly install & troubleshoot the 3051SMV transmitter

Topics

- DP Flow Fundamentals
- Overview and Principles of Operation
- Test Equipment Selection
- Temperature Sensor Wiring
- Bench Testing the Smart Transmitters
- 3051SMV Engineering Assistant Software
- Operation of the Field Communicator and AMS Device Manager
- Digital Trims/Calibration
- Installation and Start-Up
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic Pressure, and DP Flow fundamentals and instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 3051S Multi Variable (MV) Transmitter.

Note

This product is also included in course 2327 & 2329.

COURSE 2329**CEUs: 1.4****Rosemount Pressure, Temperature & Multi-Variable Flow Transmitters****Overview**

This 2-day course uses lectures and labs to maximize the hands-on experiences and teach the student how to install, configure, calibrate, troubleshoot, and maintain the Rosemount 3051, 3144P, and 3051SMV Transmitters.

Topics

- Field Communicator Operation
- 3051 Pressure Transmitter Installation, Configuration, Calibration and Troubleshooting
- 3144P Temperature Transmitter Installation, Configuration, Calibration and Troubleshooting
- 3051SMV Multi-Variable DP Flow Transmitter Installation, Configuration, Calibration and Troubleshooting

Note

Students must attend both days. Reference course, 2305 and 2321 2310 for further details.

Prerequisites

Students should have experience with process instrumentation and measurements.

COURSE 2309

CEUs: 0.7

Rosemount DP Level & Electronic Remote Sensor (ERS) System**Overview**

This 1-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, calibrate, maintain, and troubleshoot the Rosemount 3051S ERS System. Students who complete this course will:

- Identify transmitter parts and explain their functionality
- Identify 3051S ERS Hi & Lo sensors
- Explain the principles of operation of the ERS System
- Configure and test the ERS system using AMS Device Manager and the Field Communicator
- Perform zero trims and calibrate the ERS Sensors
- Properly install & troubleshoot the 3051S ERS System

Topics

- DP Level Technology
- ERS Technology
- ERS Overview and Principles of Operation
- ERS / DP Level Installation
- ERS Wiring
- ERS Configuration with AMS Device Manager and the Field Communicator
- ERS Module Assignments
- ERS Scaled Variable
- Bench Testing the ERS System
- ERS Zero Trims and Calibration
- Troubleshooting and Maintenance

Prerequisites

Knowledge of basic Pressure, and DP Level fundamentals and instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting and maintenance of the Rosemount 3051S Electronic Remote Sensors (ERS) System.

Note

This product is also included in course 2333.

COURSE E2309

Rosemount DP Level & Remote Diaphragm Seal Systems**Overview**

This technical education course covers basic theory of pressure based level measurement (DP Level) and builds to provide in-depth, technical information on how to specify, install, and maintain remote diaphragm Systems. Target students are individuals responsible for the specification, installation, configuration, and/or maintenance of pressure-based level measurement instrumentation including remote diaphragm seals and Electronic Remote Sensors (ERS™) Technology.

Topics

- Learn how pressure based level systems works including wet/dry legs, remote diaphragm seals, level transmitters, and Rosemount 3051S Electronic Remote Sensors (ERS™) Technology
- Specify a Rosemount 1199 remote diaphragm seal, Level Transmitter, and 3051S ERS™ model number
- Discuss the application factors and product selections that affect system performance
- Install and configure both a remote seal and an entire pressure based level system
- Perform common maintenance and troubleshooting techniques on an installed remote diaphragm seal and Electronic Remote Sensors (ERS™) System

Prerequisites

None

Audience

I&E techs, Technicians, Maintenance Engineers and Process Engineers

COURSE 2358**CEUs: 0.7****Micro Motion Coriolis Product Intermediate****Overview**

This one-day course consists of a blend of lectures and hands-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion sensors with the Series 1000/2000 transmitters and peripherals. This course includes hands-on exercises. Courses held at customer specified sites can be customized to address specific transmitters and configuration tools. Public registration classes cover a broader range of equipment based on the needs of the attendees.

After completing this training, students will also get unlimited access to the Micro Motion's Online Training (e1010,e1011,e1012,e1013,e1014) for a year. This online training cost \$400/license per year if purchased separately.

Topics

- Explain the Fundamentals for how a Micro Motion Coriolis Meter Works and the Function of the Key Components
- Be able to apply the installation best practices for orienting, mounting and wiring the sensor and transmitter
- Configure the Metering System to Measure Available Process Variables from the Device for Their Application
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Meter and Process Issues

Prerequisites

A basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing is assumed.

Audience

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion Coriolis flow and density meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

COURSE 239C**CEUs: 0.4****Micro Motion Coriolis Flowmeters Introduction****Overview**

This half day course is a condensed version of the 2358 course. This course briefly reviews the theory of operation, meter components and installation. The focus of the class is to provide a hands-on experience configuring the Micro Motion metering system. Students will learn the Series 1000/2000 transmitters using one of these configuration tools: ProLink III, HC475, AMS Device Manager or the local operator interface. Public classes typically use ProLink III. Customers can choose which device is used for classes held at their site. This course also includes an introduction to Micro Motion's new 5700 transmitter.

After completing this training, students will also get unlimited access to the Micro Motion's Online Training (e1010,e1011,e1012,e1013,e1014) for a year. This online training cost \$400/license per year if purchased separately.

Topics

- Briefly Explain the Fundamentals for How a Micro Motion Coriolis Meter Works and the Function of the Key Components
- Have a basic understanding of the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Perform a Basic Configuration of the Metering System to Measure Flow, Density and Temperature for Various Applications
- Diagnose and Know how to Correct the Most Common Meter and Process Issues

Prerequisites

Some prior experience working with Micro Motion Coriolis meters is recommended. Students with no past experience can benefit if their learning objectives are to get a basic intro to operation, installation, configuration and troubleshooting. For all attendees, it is assumed they have a basic understanding of the fundamentals of flow measurement, electricity, analog and frequency signal processing.

Audience

This class is intended as a refresher course for anyone that is involved with properly configuring and troubleshooting a Micro Motion flow and density meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers. This class is also intended to be taught as two, 1/2-day repeat sessions to accommodate customers who need to train their entire department but must also maintain the operation of their plant by scheduling their employees between an AM/PM training sessions.

COURSE 2380

CEUs: 1.4

Micro Motion Coriolis Product**Overview**

This two-day class is modeled after the 2352 factory course. It consists of a blend of lectures and extensive hands-on exercises that cover the installation, configuration and calibration of the Micro Motion metering system. Students will learn the Series 1000/2000 transmitters using either ProLink® III, AMS Device Manager, HC475 or L.O.I. Students will perform a master reset, configure the Series 1000/2000, perform a flow calibration and solve troubleshooting problems. Based on student need, we will cover one or all of the following topics: RFT9739, 9739MVD transmitter, T-Series, R-Series, or Series 3000 platform. On-site classes can be customized to cover the customer's installed base, preferred configuration tools and application questions. This course also includes an introduction to Micro Motion's new 5700 transmitter. After completing this training, students will also get unlimited access to the Micro Motion's Online Training (e1010,e1011,e1012,e1013,e1014) for a year. This online training cost \$400/license per year if purchased separately.

Topics

- Explain the Fundamentals for how a Micro Motion Coriolis Meter Works and the Function of the Key Components
- Learn the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Configure the Metering System to Measure Flow, Density and Temperature for Various Applications
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Meter and Process Issues

Prerequisites

Basic understanding of the fundamentals of flow measurement, electricity, analog and frequency signal processing are assumed.

Audience

This class is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion flow and density meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

COURSE M2381

CEUs: 0.4

Micro Motion Modbus Digital Communications Intermediate**Overview**

This 1/2-day class consists of a blend of lectures and hands-on exercises. Students will learn the Modbus communications model, including RS-485 network requirements, memory structure, data types, functions, character framing, and message framing. Students will use Micro Motion's Modbus documentation set and Modbus tool to configure transmitter features, read process data, reset totals, read and acknowledge alarms, analyze diagnostic registers, zero the flowmeter, perform a loop test and manage a batch process. Troubleshooting will also be covered.

Topics

- Explain the Fundamentals for the Modbus Protocol Model
- Configure, Commission, Read Process Data, View and Analyze Key Diagnostic Registers and Loop Test a Batch Application using a Micro Motion Meter
- Set up a Host System or PLC to Communicate with a Micro Motion Transmitter via Modbus

Prerequisites

Students should have completed Micro Motion Comprehensive Product Training, Course 2352, or have equivalent knowledge or experience.

Audience

This course is appropriate for personnel who have any of the following responsibilities: Installing a Micro Motion transmitter on an RS-485 network, configuring, calibrating, operating, or troubleshooting a Micro Motion transmitter using Modbus protocol, setting up a Modbus host or PLC to communicate with a Micro Motion transmitter or writing programs that use Modbus protocol to communicate with Micro Motion transmitters.

COURSE 5708**CEUs: 1.4****Micro Motion Density & Viscosity Product Intermediate****Overview**

This two-day course consists of a blend of lectures and hands-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion transmitters and peripherals. Courses held at customer specified sites can be customized to address specific transmitters and configuration tools. Public registration classes cover a broader range of equipment based on the needs of the attendees.

Topics

After attending this course, the student will be able to do the following:

- Explain the principle of operation for how a Micro Motion Density & Viscosity meter works and the function of the key components.
- Apply the installation best practices for orienting, mounting and wiring the sensor and transmitter.
- Configure the metering system to measure flow, density and temperature for their application.
- Apply a step by step process to perform basic troubleshooting of the most common meter and process issues.

Prerequisites

None required. However, basic understanding of the fundamentals of the behavior/properties of liquid density and viscosity measurement are helpful. Basic electricity, analog & frequency signal processing knowledge are also assumed.

Audience

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion Liquid Density and Viscosity meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

COURSE 5713**CEUs: 2.1****Micro Motion Coriolis Product Advanced****Overview**

This three-day course is intended for advanced users of Micro Motion Coriolis products who are responsible for the installation and commissioning, maintenance and troubleshooting and advanced operation of the equipment. The format is a mix of lecture and hands-on activities, heavily weighted toward the latter.

Topics

This course covers the following advanced topics:

- Theory of operation advanced topics.
- Advanced troubleshooting concepts, including performing and evaluating data logging.
- Theory of Zero, Zero offset and Zero verification.
- Custody Transfer and the use of Weights and Measures Software.
- Modbus Read/Writes and the use of the Modbus Interface Tool.
- Concentration Measurement.
- 5700 Historian Files, Downloading and Evaluation.
- Ethernet Basics
- Smart Meter Verification

After completing this training, students will also get unlimited access to the Micro Motion's Online Training (e1010,e1011,e1012,e1013,e1014) for a year. This online training cost \$400/license per year if purchased separately.

Prerequisites

Students should have completed either Micro Motion 2358, 2380, or 2352 or have six months to a year of field experience in the use and maintenance of Micro Motion Coriolis products. A basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing is assumed.

Audience

Typical job functions include: maintenance technicians, instrument technicians and instrumentation engineers.

COURSE 5714**CEUs: 0.7****Micro Motion Compact Density Meter Intermediate****Overview**

This one-day course consists of a blend of lectures and hands-on exercises that cover the installation, configuration, calibration checks and troubleshooting of Micro Motion transmitters and peripherals. Courses held at customer specified sites can be customized to address specific transmitters and configuration tools. Public registration classes cover a broader range of equipment based on the needs of the attendees.

Topics

After attending this course the student will be able to do the following:

- Explain the principle of operation for how a Micro Motion Compact Density meter works and the function of the key components.
- Apply the installation best practices for orienting, mounting and wiring the sensor and transmitter.
- Configure the metering system to measure flow, density and temperature for their application.
- Apply a step by step process to perform basic troubleshooting of the most common meter and process issues.

Prerequisites

None

Audience

This one-day course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion Coriolis flow and density meter. Typical job functions include maintenance technicians, instrument technicians and instrumentation engineers.

COURSE E1010

CEUs: 0.2

Micro Motion Coriolis Flow Meter Technology Introduction**Overview**

This 2 hours E-Learning course consists of a blend of lectures and hands-on exercises that cover an overview of the operating principle, key components and applications of a 3098 Micro Motion Gas Specific Gravity meter. The process of commissioning a 3098 is covered including: installation, wiring, configuration and field calibration at initial startup. Troubleshooting of commonly seen issues is also covered. This course includes hands on demonstrations.

Topics

- Coriolis Flow Meter Technology Overview
- Coriolis Flow Meter Installation Best Practices

Prerequisites

- Explain the benefits of using a Coriolis flow meter.
- Identify the two main components of a Coriolis flow meter.
- Explain the function of each key component of a Coriolis sensor.
- Identify the Coriolis effect.
- Explain how the Coriolis flow meter measures mass flow, density and temperature
- Identify considerations for determining sensor and transmitter location in a process.
- Identify the best sensor orientation based on the application.
- Identify best practices for mounting the sensor.

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1011

CEUs: 0.2

Micro Motion Coriolis 2700 Transmitter Wiring & Configuration Tools Intermediate**Overview**

This course includes 5 lessons:

- Wiring Sensor to Transmitter
- Connecting Power, Inputs & Outputs
- Applying Power to the Transmitter
- Wiring the Configuration Tools to Transmitter
- Navigation of Configuration Tools Menus

Topics

- Wiring Sensor to Transmitter
- Connecting Power, Inputs & Outputs, Applying Power to the Transmitter
- Wiring the Configuration Tools to the Transmitter
- Connecting Between the Configuration Tools & Transmitter
- Navigation of Configuration Tools Menus

Objectives

- Explain how to prepare both ends of a four-wire cable for wiring a sensor to a transmitter.
- Explain how to install a cable between the sensor and the transmitter.
- Explain how connect AC and DC power supply wiring to the 2700 transmitter.
- Identify wiring connections to channel A, B and C.
- Identify which terminals to use for HART communication.
- Identify which terminals to use for Modbus communication.
- Identify which terminals are polarity sensitive.
- Explain how to establish communication using ProLink III, AMS and the HC475 with HART.
- Explain how to establish communication using ProLink III with Modbus.
- Identify the proper path through the ProLink III, AMS and HC475 menus to perform basic commissioning tasks.
- Explain how to perform these tasks using the configuration tool you use with your Micro Motion meters

Prerequisites

None

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1012

CEUs: 0.2

Micro Motion Coriolis 2700 Transmitter Configure Process Measurements - Intermediate - e1012**Overview**

This 2 hours E-Learning course includes: Characterizing the Flowmeter, Configuring Flow Measurement for Liquids, Configuring Flow Direction and Damping, Configuring Density Measurement & Slug Flow Limits, and Configuring Temperature Measurement

Topics

- Characterizing the Flowmeter
- Configuring Flow Measurement for Liquids
- Configuring Flow Direction and Damping
- Configuring Density Measurement & Slug Flow Limits
- Configuring Temperature Measurement

Objectives

- Explain how to characterizing the Flowmeter
- Explain how to configuring Flow Measurement For Liquids
- Explain how to configuring Flow Direction and Damping
- Explain how to configuring Density Measurement & Slug Flow Limits
- Explain how to configuring Temperature Measurement

Prerequisites

None

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1013

CEUs: 0.2

Micro Motion Coriolis 2700 Integrate the Meter with the System Intermediate**Overview**

This online training includes: Configuring the Input & Output Channel Assignments, Configuring Milliamp Outputs, Configuring Frequency Output, Configuring Output Fault Conditions, Configuring Digital Communications, Performing a Loop Test, and Trimming Milliamp Outputs, if required

Topics

- Configuring the Input & Output Channel Assignments
- Configuring Milliamp Outputs
- Configuring Frequency Output
- Configuring Output Fault Conditions
- Configuring Digital Communications
- Performing a Loop Test
- Trimming Milliamp Outputs, if required

Objectives

- Explain how to Configure the Input & Output Channel Assignments
- Explain how to Configure Milliamp Outputs
- Explain how to Configure Frequency Output
- Explain how to Configure Output Fault Conditions
- Explain how to Configure Digital Communications
- Explain how to Perform a Loop Test
- Explain how to Trim Milliamp Outputs, if required

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1014

CEUs: 0.2

Micro Motion Coriolis 2700 Configure Options & Final Checkout Intermediate**Overview**

This online training includes 7 sections. Operating & Viewing Process Variables, Enabling & Disabling Actions and Security, Working with Process & Inventory Totals, Configuring Informational Parameters, Zeroing the Flowmeter, Final Checkout Under Process Conditions, and Backup/Save the Transmitter Configuration

Topics

- Operating & Viewing Process Variables
- Enabling & Disabling Actions and Security
- Working with Process & Inventory Totals
- Configuring Informational Parameters
- Zeroing the Flowmeter
- Final Checkout Under Process Conditions
- Backup/Save the Transmitter Configuration

Objectives

- Know how to operate & view process variables
- Know how to Enable & Disable Actions and Security
- Know how to Work with Process & Inventory Totals
- Know how to Configure Informational Parameters
- Know how to Zero the Flowmeter
- Know how to perform Final Checkout Under Process Conditions
- Know how to Backup/Save the Transmitter Configuration

Prerequisites

None

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1015

CEUs: 0.2

Micro Motion Coriolis 5700 Transmitter Installation & Configuration**Overview**

This course contains an overview of the features and advantages of the Micro Motion Coriolis 5700 transmitter. It also includes how to install, characterize and configure the 5700 transmitter

Topics

- 5700 Transmitter Advantages
- 5700 Transmitter Features and Capabilities
- 5700 Transmitter Wiring and Installation
- 5700 Transmitter Characterization and Configuration

Objectives

- Understand the advantages of the Micro Motion Coriolis 5700 Transmitter
- Know the features and capabilities of the Micro Motion Coriolis 5700 transmitter
- Know how to use these features, such as the fully configurable and customizable display
- Understand how SMV works for the 5700 transmitter
- Know how to characterize and configure the 5700 Transmitter using the display and ProLink

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters.

COURSE E1016

CEUs: 0.2

Micro Motion Coriolis 4200 Transmitter Characterize & Configure Intermediate**Overview**

This course contains an overview of the features and advantages of the Micro Motion Coriolis 4200 transmitter. It also includes how to install, characterize and configure the 4200 transmitters.

Topics

- 4200 Transmitter Advantages
- 4200 Transmitter Features and Capabilities
- 4200 Transmitter Wiring and Installation
- 4200 Transmitter Characterization and Configuration

Objectives

- Understand the advantages of the Micro Motion Coriolis 4200 Transmitter
- Know the features and capabilities of the Micro Motion Coriolis 4200 transmitter
- Know how to use these features, such as how to rotate the display
- Understand how SMV works for the 4200 transmitter
- Know how to characterize and configure the 4200 Transmitter using the display and ProLink

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Micro Motion Coriolis flow meters

COURSE E1050

CEUs: 0.2

Micro Motion Density & Viscosity Measurement in Industry**Overview**

This training is designed to bring awareness about the important role that density and viscosity measurement has in a process, the challenges of good measurement and examples of solutions that Emerson has to offer to help users achieve top quartile performance. This training covers four key industries, however, the challenges and solutions presented can be applied to just about any other industry.

Topics

- Density And Viscosity Measurement In Industry Introduction
- Density And Viscosity Fundamentals
- Importance Of Measuring Density And Viscosity And Sampling Analysis Challenges
- Overview Of Density And Viscosity Measurement Technologies

Audience**Management Team**

Plant Manager, Production Manager, Quality Manager, Plant Controller, Lifecycle/Reliability Manager, Safety Manager, Environmental Manager, and Shipping/Receiving Manager

Engineering Team

Process Engineer, Production Engineer, Quality Engineer, Instrument Engineer, Reliability Engineer, Fiscal Metering Engineer, Safety Engineer, and Environmental Engineer

Objectives

Know common Density and Viscosity industries Understand the fundamentals of density and viscosity Understand the importance of measuring density and viscosity and sampling analysis challenges Know density and viscosity measurement technologies

COURSE 2340

CEUs: 0.7

Rosemount 8700 Series Smart Magnetic Flowmeter Intermediate**Overview**

This 1-day course consists of a blend of lectures and hands-on exercises that cover how to install, configure, and maintain the Rosemount 8700 Series Magnetic Flowmeter Systems composed of the Model 8712 and 8732 transmitters and the 8705 Flanged and 8711 Wafer Sensors. The students will learn the operation and capabilities of Local Operator Interface (LOI), 475 Field Communicator, and/or AMS Device Manager and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Topics

- Explain the Difference and Capabilities of the Rosemount 8700 Series Magnetic Flowmeters
- Identify Transmitter and Sensor Parts and Explain Functionality
- Explain Faraday's Law and the Principles of Operation of Magnetic Flowmeter System
- Configure and Test Transmitters Using the LOI, Field Communicator, or AMS Device Manager
- Properly Install/Troubleshoot the Rosemount Magnetic Flowmeter System

Prerequisites

Knowledge of basic flow fundamentals and instrumentation.

Audience

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Rosemount 8700 Series Magnetic flowmeter. Typical job functions include: maintenance technicians, instrument technicians and instrumentation engineers.

COURSE 2341

CEUs: 0.7

Rosemount 8800 Series Smart Vortex Flowmeter Intermediate**Overview**

This 1-day course consists of a blend of lectures and hands-on exercises that cover how to install, configure, and maintain the Rosemount 8800 Series Smart Vortex flowmeter systems. The students will learn the operation and capabilities of the Local Operator Interface and HC475 Field Communicator and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Topics

- Explain the Differences and Capabilities of the Rosemount 8800 Series Vortex Flowmeters
- Explain the von Karman Effect and the Principles of Operation of Vortex Flowmeters.
- Identify Vortex Parts and Explain Functionality
- Configure and Test Transmitters using Field Communicator or AMS Device Manager
- Properly Install and Troubleshoot the Rosemount 8800 Series Vortex Flowmeter System

Prerequisites

None required. However, basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing are assumed.

Audience

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Rosemount 8800 Series Vortex Flowmeter. Typical job functions include; maintenance technicians, instrument technicians, and instrument engineers.

COURSE 2339SM

CEUs: 0.4

Rosemount 8700 Series Smart Magnetic Flowmeter Introduction**Overview**

This 1/2-day field class is a condensed version of the 2340 course briefly reviewing the theory of operation, meter components and installation. The focus of the class is to provide a hands-on experience configuring and troubleshooting of the 8700 Magnetic metering system composed of the Model 8712 and 8732 Transmitters and the 8705 Flanged and 8711 Wafer Sensors. The students will learn the operation and capabilities of the Local Operator interface & HC475 and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Topics

- Magnetic Flowmeter System
- Smart vs. Analog Transmitters
- Flow Tube Selection
- Configuring Using LOI and AMS Device Manager
- Local Operator Interface Functions
- Positive Zero Return
- Auxiliary Functions and Special Units
- Signal Conditioning
- System Troubleshooting and Maintenance
- Bench Testing/Digital Trims
- Process Noise and Grounding Diagnostics
- Meter Verification Diagnostics

Prerequisites

Some prior experience working with Rosemount Magnetic Flowmeters meters is recommended. However, students with no past experience can also benefit. For all attendees, it is assumed they have a basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing.

Audience

This course is intended as a refresher course for anyone that is involved with properly configuring and troubleshooting a Rosemount 8700 Series Smart Magnetic Flowmeter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers. This class is also intended to be taught as two, 1/2-day repeat sessions to accommodate customers who need to train their entire department but must also maintain the operation of their plant by scheduling their employees between an AM/PM sessions.

COURSE 2339SV

CEUs: 0.4

Rosemount 8800 Series Smart Vortex Flowmeter Introduction**Overview**

This 1/2-day field class is a condensed version of the 2341 course briefly reviewing the theory of operation, meter components and installation. The focus of the class is to provide a hands-on experience configuring and troubleshooting of the 8800 Vortex metering system. The students will learn the operation and capabilities of the Local Operator interface & HC475 and how to use these tools to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

Topics

- Explain the Differences and Capabilities of the Rosemount 8800 Series Vortex Flowmeters
- Explain the von Karman Effect and Principles of Operation of Vortex Flowmeters
- Identify Vortex Parts and Explain Functionality
- Configure and Test Transmitters using the AMS Device Manager
- Properly Install and Troubleshoot the Rosemount 8800 Series Vortex Flowmeter System

Prerequisites

Some prior experience working with Micro Rosemount Vortex Flowmeters meters is recommended. However, students with no past experience can also benefit if their learning objectives are to get a basic introduction to operation, installation, configuration and troubleshooting. For all attendees, it is assumed they have a basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing.

Audience

This class is intended as a refresher course for anyone that is involved with properly configuring and troubleshooting a Rosemount 8800 Series Smart Vortex Flowmeter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers. This class is also intended to be taught as two, 1/2 day repeat sessions to accommodate customers who need to train their entire department but must also maintain the operation of their plant by scheduling their employees between an AM/PM sessions.

COURSE 2394

CEUs: 0.7

Rosemount 8700 Smart Magnetic & 8800 Smart Vortex Flowmeters Introduction**Overview**

This 1-day course is an abbreviated version of the 2340 and 2341 courses for Rosemount 8700 Series Magnetic and 8800 Series Vortex meters. Typically, 2/3 of the course time is spent on Rosemount's 8800 Vortex flowmeter and 1/3 on Rosemount's 8700 Magnetic Flowmeter. Theory of operation, meter components and installation of each flowmeter are covered. The focus of the class is to provide a hands-on experience configuring and reviewing the most common troubleshooting issue and best practices for resolution.

Topics

- After attending the course the student will be able to do the following for both the Rosemount Magnetic and Vortex flowmeters:
- Briefly Explain the Fundamentals for How Each Flowmeter Works and the Function of the Key Components
- Have a Basic Understanding of the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Perform a Basic Configuration of the Metering System for Various Applications
- Diagnose and Know How to Correct the Most Common Meter and Process Issues

Prerequisites

This being a 1-Day class covering two flowmeters, some prior experience working with Rosemount's Magnetic and Vortex flowmeters is recommended. However, students with no past experience can also benefit if their learning objectives are to get a basic introduction to operation, installation, configuration and troubleshooting. For all attendees, it is assumed they have a basic understanding of the fundamentals of flow measurement, electricity, analog & frequency signal processing

Audience

This combined class is intended anyone that is involved with properly configuring and troubleshooting a Rosemount 8700 Smart Magnetic & 8800 Smart Vortex Flowmeters. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

COURSE 2394V

CEUs: 0.7

Rosemount 8700 Smart Magnetic & 8800 Smart Vortex Flowmeters Introduction [Virtual]**Overview**

This 1-day course is an abbreviated version of the 2340 and 2341 courses for Rosemount 8700 Series Magnetic and 8800 Series Vortex meters. Typically, 2/3 of the course time is spent on Rosemount's 8800 Vortex flowmeter and 1/3 on Rosemount's 8700 Magnetic Flowmeter. Theory of operation, meter components and installation of each flowmeter are covered. The focus of the class is to provide a hands-on experience configuring and reviewing the most common troubleshooting issue and best practices for resolution.

Topics

- After attending the course the student will be able to do the following for both the Rosemount Magnetic and Vortex flowmeters:
- Briefly Explain the Fundamentals for How Each Flowmeter Works and the Function of the Key Components
- Have a Basic Understanding of the Installation Best Practices for Orienting, Mounting and Wiring the Sensor and Transmitter
- Perform a Basic Configuration of the Metering System for Various Applications
- Diagnose and Know How to Correct the Most Common Meter and Process Issues

COURSE E1020

CEUs: 0.2

Rosemount Vortex Theory and Specification Introduction

Overview

Vortex Flow Meter Theory of Operation. You will learn about: The von Karman Effect; How vortex flow meters work, Vortex Flow Meter Product Overview. You will learn about: The Rosemount 8800 vortex vs traditional vortex flow meters; The vortex K-factor and how it is determined; The Rosemount vortex flow meter offering; Safety Instrumented Systems SIS. Vortex Flow Meter Sizing . You will learn: Why sizing a vortex meter is critical; Size and select a vortex meter using the Sizing and Selection tool; The considerations when determining vortex meter body style and size. Vortex Flow Meter Model Numbers. You will learn about the Rosemount vortex model string and identify available options.

Topics

This online training consists of 4 sections:

- Vortex Flow Meter Theory of Operation
- Vortex Flow Meter Product Overview
- Vortex Flow Meter Sizing
- Vortex Flow Meter Model Numbers

Objectives

- Explain how vortex flow meters work.
- Define the von Karman Effect
- List advantages and limitations of vortex technology.
- Explain the vortex K-factor and how it is determined.
- Compare the Rosemount 8800 Vortex vs Traditional Vortex Meters.
- Identify the Rosemount Vortex Flow Meter Offering.
- Explain Safety Instrumented Systems (SIS).
- Explain why sizing a vortex meter is critical.
- Describe how to size and select a vortex meter using the sizing and selection tool.
- Describe the considerations when determining vortex meter body style and size.
- Recognize the vortex flow meter model string and identify available options.

COURSE E1021

CEUs: 0.2

Rosemount Vortex Installation Best Practices Intermediate

Overview

This online training includes: Vortex Flow Meter Mounting, Vortex Flow Meter Piping Requirements, Vortex Flow Meter Installation Wiring, Vortex Flow Meter Installation Remote Electronics.

Topics

- Vortex Flow Meter Mounting
- Vortex Flow Meter Piping Requirements
- Vortex Flow Meter Installation Wiring
- Vortex Flow Meter Installation Remote Electronics

Objectives

- Describe the different process connections available with the vortex flow meter.
- Describe meter orientation in specific applications.
- Explain temperature sensor installation on a multivariable flow meter.
- Describe the ideal and acceptable piping requirements for the vortex flow meter.
- Explain the necessary requirements when using a temperature or pressure sensor in conjunction with the vortex flow meter.
- Describe location considerations when using the meter near pumps and valves. Identify the need for piping supports.
- Explain proper conduit installation
- Explain how to wire the vortex flow meter
- Describe the installation procedures for remote mount electronics.
- Describe the installation procedures for the temperature sensor on a remote MTA vortex meter.

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Rosemount Vortex flow meters.

COURSE E1022

CEUs: 0.2

Rosemount Vortex Basic Configuration Intermediate

Overview

This online training includes: Vortex Flow Meter Basic Configuration, Vortex Flow Meter Basic Configuration AMS Demonstration, Vortex Flow Meter Basic Configuration 475 Demonstration, Vortex Flow Meter Basic Configuration ProLink Demonstration.

Topics

- Vortex Flow Meter Basic Configuration
- Vortex Flow Meter Basic Configuration AMS Demonstration
- Vortex Flow Meter Basic Configuration 475 Demonstration
- Vortex Flow Meter Basic Configuration ProLink Demonstration

Objectives

- Describe the key configuration parameters for a vortex flow meter.
- Explain how to configure a vortex meter using AMS, ProLink and the Field Communicator.
- Explain how to configure a vortex meter using AMS device Manager.
- Explain how to perform a basic configuration of a vortex transmitter using the 475 HART Hand Held Field Communicator.
- Identify the following 8 steps in the basic configuration setup of a vortex flow meter using ProLink III: Process Configuration, K-factor, Flange Type, Mating Pipe ID, Variable Mapping, Primary Variable Units, Variable Range Values (Upper Range Value (URV), Lower Range Value (LRV)), Optimize the Flow Range

Prerequisites

None

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Rosemount Vortex flow meters.

COURSE E1023

CEUs: 0.3

Rosemount Vortex Configuration Advanced

Overview

This online training includes: Vortex Flow Meter Advanced Configuration, Vortex Flow Meter Advanced Configuration AMS Demonstration, Vortex Flow Meter Advanced Configuration 475 Demonstration, Vortex Flow Meter Advanced Configuration ProLink.

Topics

- Vortex Flow Meter Advanced Configuration
- Vortex Flow Meter Advanced Configuration AMS Demonstration
- Vortex Flow Meter Advanced Configuration 475 Demonstration
- Vortex Flow Meter Advanced Configuration ProLink

Objectives

- Describe advanced configuration for: Special units of measure, Base volume units - density ratio, Pulse output, Totalizer, Display variables, Saturated steam using the MTA option.
- Explain how to use AMS to perform six advanced configurations on a vortex meter.
- Describe how to perform six advanced configurations on a vortex meter using the HART Field Communicator. Explain how to use ProLink III to perform six advanced configuration setups on a vortex flow meter.

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Rosemount Vortex flow meters.

COURSE E1024

CEUs: 0.3

Rosemount Vortex Troubleshooting Advanced

Overview

This online training : Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment, Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment AMS Demonstration, Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment 475 Demonstration, Vortex Flow Meter Electronics Sensor Process Troubleshooting, Vortex Flow Meter Electronics Sensor Process Troubleshooting AMS Demonstration, Vortex Flow Meter Electronics Sensor Process Troubleshooting 475 Demonstration, Vortex Flow Meter Electronics Sensor Process Troubleshooting ProLink Demonstration, Vortex Flow Meter Troubleshooting Scenarios.

Topics

- Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment
- Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment AMS Demonstration
- Vortex Flow Meter Vibration Mass Balancing and Filter Adjustment 475 Demonstration
- Vortex Flow Meter Electronics Sensor Process Troubleshooting
- Vortex Flow Meter Electronics Sensor Process Troubleshooting AMS Demonstration
- Vortex Flow Meter Electronics Sensor Process Troubleshooting 475 Demonstration
- Vortex Flow Meter Electronics Sensor Process Troubleshooting ProLink Demonstration
- Vortex Flow Meter Troubleshooting Scenarios

Objectives

- Describe how to use AMS to filter out pipe vibration.
- Explain how to use a 475 Field Communicator to filter out pipe vibration.
- Explain how to use meter verification to verify the functionality of the electronics.
- Recognize sensor health and measure the impedance of the vortex piezoelectric sensor.
- Explain process variations that may cause unexpected changes in vortex meter performance.
- Describe some of the tools in AMS that can be used to troubleshoot a transmitter.
- Describe how to use a 475 Field Communicator to follow the ESP troubleshooting method.
- Describe some of the tools in ProLink that can be used to troubleshoot a faulty meter.
- Identify some of the common troubleshooting issues and describe some of the main causes of these issues.

Prerequisites

None

Audience

This course is designed for personnel responsible for the installation, configuration, verification and maintenance of Rosemount Vortex flow meters.

COURSE E1030**Rosemount Magnetic Flow Meter Theory and Specification Introduction****Overview**

This course contains the following lessons:

- Magnetic Flow Meter Theory of Operation
- Magnetic Flow Meter Product Overview
- Magnetic Flow Meter Sizing

COURSE E1031**Rosemount Magnetic Flow Meter Installation Best Practices Intermediate****Overview**

This course contains the following lessons:

- Magnetic Flow Meter Grounding
- Magnetic Flow Meter Sensor Installation
- Magnetic Flow Meter Wiring

COURSE E1032**Rosemount Magnetic Flow Meter Installation Basic Configuration Intermediate****Overview**

This course contains the following lessons:

- Magnetic Flow Meter Operation & Basic Configuration LOI – 8712EM & 8782
- Magnetic Flow Meter LOI Operation - 8732EM
- Magnetic Flow Meter Basic Configuration Overview

COURSE E1033**Rosemount Magnetic Flow Meter Configuration Advanced****Overview**

This course contains the following lesson:

- Magnetic Flow Meter Advanced Configuration

Topics

- LOI (Display)
- Pulse Output
- Totalizer
- DI/DO

COURSE E1034**Rosemount Magnetic Flow Meter Troubleshooting Advanced****Overview**

This course contains the following lesson:

- Magnetic Flow Meter Troubleshooting

Objectives

When finished with this course, you will be able to:

- Identify the common problems that may occur with magnetic flow meters.
- Use the magmeter troubleshooting process to troubleshoot issues: Transmitter, Wiring, Sensor, Installation and Process.

COURSE D4119

CEUs: 1.4

Basic Fluid Flow Measurement**Overview**

This 2-day course is foundation training for technicians, operators, technical support staff, and others who require knowledge of fluid flow measurement, meter selection, maintenance and proving methods. This course relates theory to practice which gives participants a better understanding and appreciation of the oil and gas industry. It is recommended in advance of product specific training courses.

Topics

- Introduction to Fluid Flow Measurement
- Basic Flow Measurement Laws
- Types of Fluid Flow Measurement
- Basic Reference Standards
- From Theory to Practice
- Fluids
- Flow
- Operations Considerations
- Maintenance of Metering Equipment
- Measurement and Meters
- Differential Meters
- Linear and Special Meters
- Read outs and Related Devices
- Proving Systems
- Auditing

Prerequisites

It is recommended that participants have basic understanding of process instrumentation prior to taking this training.

COURSE D4230/D4280

CEUs: 2.1

Gas/Liquid Ultrasonic Meters Operation & Maintenance**Overview**

This 3-day course prepares students to install, operate, and maintain Daniel multipath ultrasonic flow meters. In addition to classroom instruction, the training course includes hands-on experience using the flowmeter, simulator and diagnostic software.

Topics

- Basics of Sound Waves
- How Ultrasonic Flow Meters Work and Their Advantages over other Meters
- The Performance Characteristics of Transit Time Ultrasonic Flow Meters
- System Components and Mark III Electronics, including the Central Processing Unit (CPU) Board and the Option Board
- Meter Mechanics
- Removal and Installation of Transducer Assemblies
- Volumetric and Mass Ultrasonic Gas Flow Measurement
- Meter Installation Considerations
- Inform the Instructor if Working on Liquid Meter

COURSE D4262

CEUs: 1.4

S600 + Flow Computers Operation and Maintenance**Overview**

This 2-day course provides students with an appreciation of the operation, design, capabilities and configuration of the S600+ flow computer. This hands-on course deals with file transfer and machine recovery as part of the maintenance scope. The instructor will make use of the latest configuration software. Full supporting literature will be available to all students.

Topics

- Introduction to the S600+
- Board Removal and Layout
- Keypad Access and Security
- Menu Navigation
- Data/Mode Changing
- Alarm Handling and Configuration
- Configuring and Generating Reports
- Application Specific Functions
- Cold/Warm Starting Modes
- File Back-Up and Download
- Using the Configuration Software

Prerequisites

Basic knowledge of flow measurement

COURSE D4270

CEUs: 1.4

Compact Prover Operation & Maintenance**Overview**

This 2-day course covers the operation, installation and maintenance of the Daniel Compact Prover™.

Topics

- Theory of Operation: Double Chronometry and Specifications
- Overview of the Parts Which Make up the Compact Prover such as Actuator Assembly, Pneumatic Spring Chamber, Piston and Poppet, Optical Switches, Hydraulic Motor and Pump, and Solenoid Valve
- Installation: Prover and Meter Location, Nitrogen Spring Plenum Setting, and Power Requirements
- Troubleshooting and Repair of: Safety Barriers, Seal and O-ring Replacement, Detector Switches, Interface Board, Hydraulic and Nitrogen System, and Spare Parts
- Overview of Calibration: Seal Leak Test, Upstream and Downstream Calibration, and Waterdraw Data Sheet
- Overview of Prover Electronics: Programming, Input and Data Modes Using Software/Local Display, Circuit Module Description, and Diagnostics
- Proving Operations: Direct Proving and Master Meter Proving
- Prover Maintenance

Prerequisites:

Basic knowledge of flow measurement.

COURSE D4530

CEUs: 1.4

Metering Systems: Applications, Operations & Maintenance Introduction**Overview**

This 2-day course is an introduction to high accuracy fluid flow measurement systems and good practice for system operation and maintenance.

Topics

- Background to High Accuracy Fluid Flow Measurement
- Custody Transfer, Fiscal and Allocation Metering
- Commercial Agreements and Legal Requirements
- Flow Measurement Methods
- Qualitative Measurement
- Reference Standards Employed
- Flow and Energy Calculations
- System Maintenance
- Good Metering Practices

Prerequisites

Students should have a background in Process Control and Instrumentation

Audience

The course is aimed at Metering Systems operators and maintainers.

COURSE E1040**Rosemount Ultrasonic Theory and Specification Introduction****Overview**

This course contains the following lessons:

- Ultrasonic Flow Meter Theory of Operation
- Ultrasonic Transducers
- Ultrasonic Flow Meter Product Portfolio
- Ultrasonic Electronics Primer
- Gas Ultrasonic Sizing and Selection
- Liquid Ultrasonic Sizing and Selection

Objective

When finished with this course, you will be able to:

- Discuss Ultrasonic Flow Meter Theory of Operation
- Identify Ultrasonic Transducers
- Describe Ultrasonic Flow Meter Product Portfolio
- Discuss Ultrasonic Electronics Primer
- Describe Gas Ultrasonic Sizing and Selection
- Describe Liquid Ultrasonic Sizing and Selection

Job Roles

Engineering - Other

- I&E Engineer
- Process Engineer

Maintenance/Service

- Instrument Technician

Operations

- Operator

Plant Management/Finance

- Engineering Manager
- Plant Manager
- Production Manager
- Reliability Manager

COURSE E1041**Rosemount Ultrasonic Installation, Wiring and Basic Setup Intermediate****Overview**

This course contains the following lessons:

- Gas Ultrasonic Flow Meter Installation Best Practices
- Liquid Ultrasonic Flow Meter Installation Best Practices
- Ultrasonic Flow Meter Wiring
- Ultrasonic Flow Meter Basic Setup Using MeterLink

Objective

When finished with this course, you will be able to:

- Discuss Gas Ultrasonic Flow Meter Installation Best Practices
- Discuss Liquid Ultrasonic Flow Meter Installation Best Practices
- Describe Ultrasonic Flow Meter Wiring
- Describe Ultrasonic Flow Meter Basic Setup Using MeterLink

Job Roles

Engineering - Other

- I&E Engineer
- Process Engineer

Maintenance/Service

- Instrument Technician

Operations

- Operator

Plant Management/Finance

- Engineering Manager
- Plant Manager
- Production Manager
- Reliability Manager

COURSE E1042**Rosemount Ultrasonic Calibration and Meter Diagnostics Advanced****Overview**

This course contains the following lessons:

- Ultrasonic Flow Meter Gas Calibration
- Ultrasonic Flow Meter Liquid Calibration
- Basic Gas Ultrasonic Meter Diagnostics
- Advanced Gas Ultrasonic Meter Diagnostics

Objective

When finished with this course, you will be able to:

- Describe Ultrasonic Flow Meter Gas Calibration
- Describe Ultrasonic Flow Meter Liquid Calibration
- Explain Basic Gas Ultrasonic Meter Diagnostics
- Explain Advanced Gas Ultrasonic Meter Diagnostics

Job Roles

Engineering - Other

- I&E Engineer
- Process Engineer

Maintenance/Service

- Instrument Technician

Operations

- Operator

Plant Management/Finance

- Engineering Manager
- Plant Manager
- Production Manager
- Reliability Manager

COURSE 2332**CEUs: 0.7****Rosemount 3300 Guided Wave Radar Level Transmitter****Overview**

This 1-day course uses lecture and labs to maximize the hands on experience and teach the student how to install, configure, calibrate, troubleshoot and maintain the Rosemount 3300 GWR Level & Interface Transmitters. Students who complete this course will be able to:

- Explain the principles of operation of the 3300 GWR
- Identify 3300 parts and explain their functionality
- Understand the available probe options and when each should be used
- Properly install the 3300 GWR
- Configure and test the 3300 GWR
- Properly troubleshoot the 3300 GWR transmitter using RCT software

Topics

- 3300 Overview/Principles of Operation
- Installation of the 3300 GWR
- Configuration of the 3300 GWR
- Bench Testing the 3300 GWR
- Field Communicator Operation
- AMS Device Manager Operation
- Radar Configuration Tools Software Operation
- Calibration, Verification and Adjustments
- Troubleshooting and Maintenance
- Troubleshooting and Reading Tank Graphs Using RCT Software

Prerequisites

Knowledge of basic level and interface fundamentals and instrumentation.

Audience

This course is for those individuals responsible for the installation, configuration, verification and maintenance of the Rosemount 3300 Series Guided Wave Radar (GWR) Level Interface Transmitters.

Note

3300 GWR is also included in the 3-day Level course #2333

COURSE 2336**CEUs: 0.7****Rosemount 5408 Non-Contacting Radar Level Transmitter****Overview**

This 1-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount 5408 Radar Level Transmitters. Students who complete this course will:

- Explain principles of operation of 5408 Radar
- 5408 Radar parts & explain functionality
- Properly install and wire the 5408 Radar
- Instrument Inspector & Radar Master plus (RM+) operation
- Configure and test the 5408 Radar
- Understand how to setup the 5408 Radar to work in different applications
- Properly troubleshoot the 5408 Radar
- Transmitter and the Installation using Radar Master plus software

Topics

- 5408 Overview and Principles of Operation
- Installation of the 5408 Radar
- Wiring the 5408 Radar
- Configuration of the 5408 Radar
- Radar Master plus Software Operation
- Troubleshooting and Maintenance
- Tank & Application Troubleshooting and Echo Handling using Radar Master plus Software

Prerequisites

Knowledge of basic fundamentals & instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount Model 5408 NC Radar Level Transmitter.

Note

This product is also included in other Level course: 2333, 2896, & 2396

COURSE 2337**Rosemount 5300 Guided Wave Radar Level Transmitter****Overview**

This 1-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount 5300 High Performance GWR Transmitters. Students who complete this course will be able to:

- Explain principles of operation of 5300 GWR
- Identify 5300 GWR parts & explain functionality
- Understand the available probe options and when each should be used
- Properly install and wire the 5300 GWR
- Configure and test the 5300 GWR
- Understand how to setup the 5300 GWR to work in different applications
- Properly troubleshoot the 5300 GWR Transmitter & Installation using Radar Master software

Topics

- 5300 Overview and Principles of Operation
- Installation of the 5300 GWR
- Wiring the 5300 GWR
- Configuration of the 5300 GWR
- Bench Testing the 5300 GWR
- Field Communicator Operation
- AMS Device Manager Operation
- Radar Master Software Operation
- Troubleshooting and Maintenance
- Tank & Application Troubleshooting and Echo Handling Using Radar Master Software

Prerequisites

Knowledge of basic fundamentals & instrumentation.

Audience

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 5300 High Performance Guided Wave Radar (GWR) Series HART® Radar Level Transmitter.

Note

5300 GWR HART® Level transmitter is also included in the 3-day Level course 2333.

COURSE 2395**CEUs: 0.7****Rosemount 3300 & 5300 Guided Wave Radar Level Transmitters****Overview**

This 1-day course uses lecture and labs to maximize the hands-on experience and teach the student how to install, configure, troubleshoot and maintain the Rosemount 3300 & 5300 Series HART® Radar Level Transmitters.

Topics

Students who complete this course will be able to:

- Explain the principles of operation of the 3300/5300 GWR
- Identify 3300/5300 GWR parts and explain their functionality
- Understand available probe options and when each should be used
- Properly install and wire the 3300/5300 GWR
- Configure and test the 3300/5300 GWR
- Understand how to setup the 3300/5300 GWR to work in different applications
- Properly troubleshoot the 3300 & 5300 GWR and the Installation using Radar Master software

Prerequisites

Knowledge of basic level fundamentals and instrumentation

COURSE E2330**CEUs: 0.2****Rosemount 2140 Level Detector****Overview**

This two-hour eLearning course will teach the student how to install, configure, calibrate, maintain, & troubleshoot the Rosemount 2140 Level Detector.

Audience

Instrument Technicians, I&E, Techs

Objectives

Students who complete this course will be able to:

- Explain the principles of operation of the Rosemount 2140
- Configure the device using various configuration tools, 475 Field Communicator, AMS Trex, AMS Device Manager
- Properly install, adjust the level, and troubleshoot the device

COURSE E2396**CEUs: 0.2****Rosemount 5408 Non-Contacting Radar Level****Overview**

This two-hour eLearning course will teach the student how to: install, configure, calibrate, maintain, and troubleshoot the Rosemount 5408 Non-Contacting Radar Level transmitter.

COURSE RTG101**CEUs: 3.5****Rosemount Tank Gauging Systems****Overview**

This 5-day Tank Gauging Technical Product Training focuses on the 5900S system, our Wireless Tank Gauging System, a little about Rex and Pro, as well as other field equipment relevant for the Rosemount Tank Gauging system. The training covers installation, configuration and troubleshooting of our products, as well as general TankMaster functions. Students who complete this course will:

- Correctly perform installation and setup procedures
- Properly configure Tank Gauging System
- Plan a Wireless installation
- Perform basic troubleshooting

Topics

- System Overview
- Perform basic troubleshooting
- 2410 TankHub
- 5900 Gauges
- Rosemount 2240S
- Rosemount 2230 Display
- 5300/5400 Gauges
- Field Communication
- Electrical and Mechanical Installation
- System Configuration
- LPG/LNG
- Wireless
- AMS Wireless Snap-On
- Gateway
- Emulation
- SIL
- Troubleshooting

Prerequisites

This course is suitable for service, project, and sales engineers, and is a good start for new employees and customers.

Audience

This course is customized for service, project, and sales engineers. The course includes both practical and theoretical training.

COURSE RTG102

CEUs: 2.5

Rosemount TankMaster Software Introduction**Overview**

This 4-day TankMaster Training covers more detailed information about TankMaster functions. Students who complete this course will be able to:

- Perform System Configuration
- Configure Host Communication
- Properly use Redundancy
- Use Batch Handling
- Program Basic Custom Views
- Perform Basic Troubleshooting

Topics

- System Overview
- Volume Calculations
- WinOpi Tools Menu
- Host Communication and OPC
- TankMaster Batch
- Custom Views and Translation
- Network Basics
- TankMaster to Enraf
- Redundancy
- Administrator Program Backup & Restore
- TankMaster Hybrid & HTG
- Troubleshooting

Prerequisites

It is required that you previously attended the RTG101 Technical Product Training course or have very good knowledge of the Rosemount Tank Gauging System.

Audience

This course is suitable for anyone who works with TankMaster, including customers who is using WinOpi as the operator interface. The course includes both practical and theoretical training.

COURSE ERTG200**Rosemount Tank Gauging System Overview****Overview**

- Learn the fundamentals of the Rosemount Tank Gauging System, including basic components and their features, different configurations, and system integration.
- Point out the unique functionality, features and benefits of the Rosemount Tank Gauging System
- Describe the different tank gauging devices
- Compose your own tank gauging system

Course Topics

- Measurement Instrumentation
- Tank Gauging System

Job Roles

- Maintenance/Service
- Instrument Technician

COURSE ERTG212**Rosemount TankMaster Mobile****Overview**

This course will introduce the Rosemount TankMaster Mobile Inventory Management Software.

Objectives

- Explain what TankMaster Mobile is
- Describe the basic features of the software
- Explain the cybersecurity behind the application
- Discuss the benefits of the software

Course Topics

- Measurement Instrumentation
- Tank Gauging System

Job Roles

- Plant Management/Finance
- Engineering Manager
- Plant Manager
- Reliability Manager

COURSE 2320

CEUs: 2.1

Rosemount Process Measurement Instrumentation Introduction**Overview**

This 3-day course explains the measurement technology for Pressure, Temperature, Flow and Level instruments. It will also emphasize proper installation of these instruments.

Topics

- 4-20 mA Electrical Loops
- Pressure Sensors
- Pressure Instruments
- Temperature Sensors
- Temperature Instruments
- Analog Transmitters
- Smart Transmitters
- HART® Communication Protocol
- Field Communicator
- DP Flow
- Flow Technology Overview
- DP Level
- Electronic Remote Sensors
- Guided Wave Radar Level Instruments
- Non-Contacting Radar Level Instruments
- Self-Organizing Wireless Networks

Prerequisites

Students should have experience with process instrumentation and measurements.

Audience

This course is intended for engineers and other persons responsible for the selection and installation of instruments for measurement types of Pressure, Temperature, Level, and Flow.

COURSE 2320V**Rosemount Process Measurement Instrumentation Introduction [Virtual]****Overview**

This 8-hour course introduces the common technologies, basic components, performance considerations and technology selection for pressure, temperature, level, flow and communication.

Topics

- Pressure
- Temperature
- Level
- Flow
- Communication

Prerequisites

None

Audience

Instrument Technicians

COURSE 2323C**Rosemount Process for Measurement Technologies Introduction****Overview**

Learn about the basics of process fundamentals across measurement technologies. This curriculum will give an introduction into the following categories: Amperometric, Combustion, Communication Protocols, Conductivity, Flow, Level, pH, Pressure, Temperature.

Topics

Establish a basic understanding of available measurement technologies within the process automation industries.

Prerequisites

None

Audience

Engineer, technicians, specialists and operators

COURSE 2326**CEUs: 2.8****Rosemount Process Measurement Pressure & Temperature Products****Overview**

This 4-day course explains how pressure and temperature transmitters function and how they are installed and calibrated. It emphasizes installation, proper set-up and calibration of Analog and HART® Pressure and Temperature Transmitters. The course uses lectures and labs to teach the students. Those who complete this class will be able to:

- Correctly perform installation and setup procedures
- Properly configure transmitters
- Properly calibrate transmitters
- Perform basic troubleshooting

Topics

- Basic 4-20 mA Loop Setup
- Pressure Sensors
- Temperature Sensors (TC, RTD)
- Analog Transmitters (1151)
- HART® Communication
- Field Communicator
- Pressure Transmitters
- Temperature Transmitters
- Using AMS Device Manager to Configure and Calibrate Transmitters
- Installation
- Configuration
- Calibration
- Troubleshooting

Prerequisites

Some experience in instrument calibration, maintenance, installation and operation would be helpful.

Audience

This course is intended for technicians, engineers and other plant personnel who need to know installation, calibration, maintenance and troubleshooting of measurement instrumentation.

COURSE 2327**CEUs: 1.4****Rosemount Process Measurement DP Flow Products****Overview**

This 2-day course explains how DP flow instruments function and how they are installed and calibrated. It emphasizes installation, proper setup and calibration/verification of DP flow instruments. The course uses lectures and labs to teach the students. Those who complete this class will be able to:

- Correctly install configure, calibrate multi-variable DP Flow Transmitters
- Perform DP Flow troubleshooting

Topics

- Basic DP Flow Fundamentals
- DP Flow Sizing Calculations
- Multi-variable Flow Transmitters
- AMS Device Manager with Engineering Assistant Snap-ON
- Engineering Assistant for 3051SMV
- Field Communicator
- Test Equipment Selection
- Installation
- Configuration
- Calibration /Verification
- Troubleshooting DP Flow Installations

Prerequisites

Some experience in instrument calibration/verification, maintenance, installation and operation would be helpful.

Audience

This course is intended for technicians, engineers and other plant personnel who need to know installation, calibration, verification, maintenance and troubleshooting of DP flow measurement instrumentation.

COURSE 2333**CEUs: 2.1****Rosemount Process Measurement Level Products****Overview**

This 3-day course explains how level instruments function and how they are installed calibrated/verified. It emphasizes installation, proper setup and calibration/verification of level instruments. The course uses lectures and labs to teach the students. Those who complete this class will be able to:

- Correctly install, configure,calibrate/verify, perform maintenance and troubleshooting on the following:
 - DP Level Transmitters
 - Guided Wave Radar Transmitters
 - Non-contacting Radar Transmitters
- Use Radar software for configuration and troubleshooting

Topics

- DP Level Fundamentals
- Electronic Remote Sensors
- Radar Applications
- Radar Instruments
- Radar PC Software
- Field Communicator
- Test Equipment Selection
- Installation
- Configuration
- Calibration /Verification
- Troubleshooting

Prerequisites

Experience in instrument calibration, maintenance, installation and operation would be helpful.

Audience

This course is intended for technicians, engineers and other plant personnel who need to know installation, calibration, maintenance and troubleshooting of level measurement instrumentation.

COURSE 2370

CEUs: 2.1

Rosemount Fieldbus Measurement Instruments**Overview**

This 3-day class covers the integration of FOUNDATION™ fieldbus compliant measurement devices using the Field Communicator, Emerson USB Fieldbus Modem, AMS Device Manager, and other hosts. Upon completion of this course students will be able to: install, configure, calibrate, and troubleshoot Rosemount Fieldbus devices which include the 3051C and 3051S Pressure Transmitters, 644, 3144P and 848 Temperature transmitters 5600, 5400 and 5300 Radar Level Transmitters, and 752 Indicator.

Topics

- FOUNDATION™ fieldbus Overview
- Fieldbus: Wiring/Segment Design/Function Blocks
- Field Communicator Operation
- AMS Device Manager Operation
- Theory of Operation, Installation, Configuration, Maintenance, Calibration and Troubleshooting on the following:
 - 3051C Pressure Transmitter
 - 3051S Pressure Transmitter
 - 3144P, and 644 Temperature Transmitters
 - 848 Temperature Transmitter
 - 5600, 5400 and 5300 Radar Level Transmitters
 - 752 Fieldbus Indicator

Prerequisites

Experience in instrument calibration, maintenance, installation, and operation would be helpful.

Audience

This course is for individuals responsible for installing, configuring, calibrating, and troubleshooting FOUNDATION™ fieldbus measurement devices.

Note

Course may be conducted using other Fieldbus Hosts, such as AMS Device Manager.



COURSE 2375

CEUs: 1.4

Rosemount Wireless Self Organizing Network with Host Integration

Overview

This 2-day course explains how Self Organizing Wireless Networks function and how they are installed, setup, configured and integrated. It emphasizes planning, proper installation and startup, configuration, maintenance, and integration. The course uses lectures and labs to maximize the hands on experience and teach the students. Students who complete this course will:

- Correctly install and setup the 1420& 1410 Wireless Gateway
- Properly install and configure Wireless Transmitters
- Properly integrate Host interfaces to the Wireless Gateway

Topics

- How Self Organizing Networks Function
- Self Organizing Networks Best Practices
- Network Components
- 1420 & 1410 Installation and Setup
- Network Parameters
- Wireless Transmitters Installation, Configuration, Maintenance and Calibration
- THUM Installation, Wiring and Configuration
- Integrating and Operating AMSDevice Manager with the 1420Wireless Gateway
- Operation of AMS Wireless SNAP-ON
- Modbus Serial Integration
- Modbus TCP Integration
- OPC Integration

Prerequisites

Some experience in Wireless Networks and Host integration would be helpful.

Audience

This course is intended for technicians, engineers and other plant personnel who need to know how to design, install, setup, configure, maintain and troubleshoot Wireless Self Organizing Networks and their components.

COURSE 2376

CEUs: 0.7

Rosemount Wireless Self Organizing Network

Overview

This 1-day course explains how Self Organizing Wireless Networks function and how they are installed, setup, and configured. It emphasizes planning, proper installation and startup, configuration and maintenance. The course uses lectures and labs to maximize the hands on experience and teach the students.

Students who complete this course will:

- Correctly install and setup the 1420 & 1410 Wireless Gateway
- Properly install and configure Wireless Transmitters

Topics

- How Self Organizing Networks Function
- Self Organizing Networks Best Practices
- Network Components
- 1420 & 1410 Installation and Setup
- Network Parameters
- Wireless Transmitters Installation, Configuration, Maintenance and Calibration
- THUM Installation, Wiring, Configuration
- Integrating and Operating AMS Device Manager with the 1420 & 1410 Wireless Gateway and Wireless Devices

Prerequisites

Some experience in Wireless Networks and Host integration would be helpful. Completion of the Wireless classes on Plantweb University would be beneficial.

Audience

This course is intended for technicians, engineers and other plant personnel who need to know how to install, setup, configure, maintain and troubleshoot Wireless Self Organizing Networks and their components.

COURSE E2977

Rosemount Wireless Pressure Gauge

Overview

The Wireless Pressure Gauge on-demand course offers a comprehensive set of “How to” lessons designed to bring an interactive learning environment over the internet directly to you at any time. By the end of the course, you will know how to specify, install, configure, maintain, and troubleshoot the gauge. In addition, the course provides learning to maximize the use of the Wireless Pressure Gauge’s new capabilities.

Course Topics

Measurement Instrumentation
Industrial Wireless Technology
Pressure Measurement
Wireless Networks & Infrastructure

Job Roles

Engineering - Other
I&E Engineer
Reliability Engineer
Maintenance/Service
Electrician
Mechanic
Unit Maintenance Technician

COURSE R4100

CEUs: 2.1

Rosemount 500 Gas Chromatographs - Introduction**Overview**

This 3-day course gives students a basic understanding of how the Rosemount Analytical 500 and 700 gas chromatographs (formerly Danalyzer GCs) work, emphasizing chromatograph fundamentals and basic theory.

Topics

- Reviewing Basic Chromatography Principles
- Understanding Chemistry, Flow Configuration, and Gas Systems
- Understanding Basic Sample Systems
- Working with Chromatograph Hardware
- Setting Timed Events, Retention Times, and Response Factors
- Understanding Data Calculations
- Identifying Problems Using Chromatograms

COURSE R4105

CEUs: 2.1

Rosemount Gas Chromatographs Introduction, Model 700XA**Overview**

This 3-day course gives students basic understanding of how Rosemount Analytical gas chromatographs 700XA (formerly Danalyzer GCs) work, emphasizing chromatograph fundamentals and basic theory.

Topics

- Reviewing Chromatography Principles
- Understanding Chemistry, Flow Configuration, and Gas Systems
- Reviewing Sample Systems
- Working with Chromatograph Hdwe
- Setting Timed Events, Retention Times, and Response Factors
- Understanding Data Calculations
- Reading Chromatograms
- Calibrating a Gas Chromatograph

Note

Classes typically start at 8AM CST on Tuesday and end at 5PM CST on Thursday to accommodate travel.

COURSE R4170

CEUs: 2.1

Rosemount 370XA Gas Chromatograph Intermediate**Overview**

This 3-day training is a level 1 course and includes theory, operations and maintenance practices for the Rosemount Analytical 370XA Gas Chromatograph (formerly Danalyzer GC). Module overview hardware and software overview as well as basic troubleshooting skills.

Topics

- Chromatographic Theory
- Detector Theory
- Understanding Chromatograms
- Startup Procedures
- Natural Gas Sample Handling
- Using 370XA Software Assistants
- Cal-Saver™
- Running Auto Valve Timing
- Module Initializations
- Calibrations, Validation & Routine Maintenance (Valve Rebuilding)
- Troubleshooting the module
- 370XA Hardware
- MON2020 Software

COURSE R4210

CEUs: 2.8

Rosemount 500 Process Gas Chromatograph Intermediate**Overview**

This 5-day course is appropriate for those who have either worked with a Gas Chromatograph for at least six months or completed the Introductory Gas Chromatograph course. It prepares participants to operate and repair a Model 500 Gas Chromatograph.

Topics

- Understanding Gas Chromatography and a Gas Chromatograph
- Using the Basic Chromatograph System in Process Gas Analysis
- Understanding Carrier and Calibration Gas Systems
- Installing and Operating MON Software
- Applying Chromatograph Integration Techniques and Post-Analysis Calculations
- Using the Chromatograph to Identify Problems
- Setting Timed Events, Retention Times, and Response Factors
- Starting Up a Gas Chromatograph
- Understanding Sample Handling Systems
- Verifying Proper Operation of a Gas Chromatograph
- Troubleshooting the 2350A Controller
- Configuring the 2350A Controller User Directory Outputs
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Prerequisites

Students that have at least 6 months experience with Emerson GC's, just purchased an Emerson GC or are seeking a refresher course after having worked on their Emerson GC benefit most from this course. Candidates from non-technical backgrounds should consider taking R4100 Introduction to GC's (for Model 500, 700 or 1000)

COURSE R4213

CEUs: 2.8

Rosemount Process Gas Chromatograph Intermediate**Overview**

This 5-day course is appropriate for those who have either worked with a GC for at least six months or completed the introductory gas chromatograph course. It prepares participants to operate and repair a Rosemount Analytical 700XA Gas Chromatograph.

Topics

- Understanding Gas Chromatography and Gas Chromatographs
- Using the Basic Chromatograph System in Process Gas Analysis
- Understanding Carrier and Calibration Gas Systems
- Installing and Operating MON Software
- Applying Chromatograph Integration Techniques and Post-Analysis Calculations
- Using the Chromatograph to Identify Problems
- Setting Timed Events, Retention Times, and Response Factors
- Starting Up a Gas Chromatograph
- Understanding Sample Handling Systems
- Verifying Proper Operation of the Gas Chromatograph
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Prerequisites

Students that have at least 6 months experience with Emerson GC's, just purchased an Emerson GC or are seeking a refresher course after having worked on their Emerson GC benefit most from this course. Candidates from non-technical backgrounds should consider taking R4105 Introduction to GC's (for 700XA).

Audience

This course is best suited for students working in a technical environment.

COURSE R4311

CEUs: 2.8

Rosemount 500 Process Gas Chromatographs Advanced**Overview**

This 5-day course is most valuable to those with three years of chromatography experience, or those who have completed the introductory 'Operation and Maintenance of Gas Chromatographs' course. Participants will develop an advanced understanding of gas chromatograph operation, troubleshooting, and maintenance. Training becomes customized when students present application information. Given that data, the experienced instructor will look closely at specific applications and offer participants insight.

Topics

- Understanding Chromatograph Flow Configurations
- Overhauling Valves
- Reviewing Thermal Conductivity, Flame Ionization, and Flame Photometric Detectors
- Understanding Sample/Carrier/Calibration Gas Systems
- Working with and troubleshooting the Rosemount Analytical 2350A Controller
- Installing and Using MON Software for Integration and Calibration
- Setting Timed Events, Retention Times, and Response Factor Calculations
- Understanding Startup Procedures
- Setting Valve Timing and Flows with Different Flow Configurations
- Checking for Proper Separation and Analyzing Gas Chromatographs
- Verifying Proper Operation of the Gas Chromatograph
- Troubleshooting the Chromatograph and 2350A Controller
- Configuring Reporting Details and Control Outputs
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts Recommendations

Prerequisites

Students attending this course must have completed either of these Operations & Maintenance courses: R4210, R4212, or have 3 years of advanced chromatography experience

COURSE 2170

CEUs: 2.1

Rosemount X-Stream Process Gas Analyzers**Overview**

This 3-day course is a classroom training where students learn principles and practical operation of X2 analyzers. Through hands-on training, the student will learn on how to install, maintain, and troubleshoot the X2 analyzer. Using X2 Analyzer demo units students will:

- Understand the Photometric measurement principles such as the theory of Infrared and Ultraviolet
- Spectrometry, Paramagnetic and Thermal Conductivity
- Learn the signal processing of the electronic boards.
- Learn the test procedure for troubleshooting and diagnostics

Topics

- Introduction to the function of Physical parts
- Function of Electronic boards
- Test points and procedure
- Mechanical Assembly / Disassembly
- Programming of software parameters
- Calibration setup manual (Auto calibration when available)
- Analog outputs, and Digital Inputs / Outputs and Modbus setup
- Save / Load configuration functionality
- Spare parts
- Troubleshooting Procedure

Prerequisites

Basic Knowledge of PGA Analyzers would be helpful

COURSE 2200

CEUs: 0.7

Rosemount Liquid Analysis pH, Conductivity & ORP Theory**Overview**

This 1-day course provides a solid theoretical background in pH, Conductivity, and ORP measurements. Students who complete this course will be able to:

- Understand how each measurement is made
- Recognize installation/application problems
- Configure and calibrate instruments
- Implement a maintenance program
- Troubleshoot problems using diagnostics

Topics

- What is pH/Conductivity/ORP
- How pH/Conductivity/ORP Measurements are Made
- Physical Process Properties and How They Effect On-Line Measurements
- Proper Calibration Techniques
- Cleaning and Maintenance of a Sensor
- Choosing Correct Sensor for Any Process
- How to Decipher Diagnostics Readouts
- pH/Conductivity Sensor Overview
- pH/Conductivity/ORP Analyzer Overview

COURSE 2205**CEUs: 0.7****Rosemount Liquid Analysis Measurement Theory****Overview**

This 7-hour class is fully customized to cover the specific measurements that the customer requests. A certified trainer will cover up to 4 subjects in one day. The 4 subjects may be measurement or product related. The list of measurements that can be bundled into a tailored made training course are pH, ORP, contacting conductivity, toroidal conductivity, turbidity, chlorine, dissolved oxygen, and ozone. Each measurement theory has its own duration which can be modified to fit the customers' time frame needs.

Topics

- Installation and Application Problems
- Configuration of Outputs / Alarms (If applicable)
- Use Diagnostic Features (If Applicable)
- Sensor Calibration & Maintenance
- Troubleshooting

COURSE E2601**CEUs: 0.1****Rosemount 1056 Dual Input Analyzer****Overview**

Introduction to the 1056 Dual Input Analyzer, including overview of functions, mechanical and electronic installation, adding sensor boards and wiring sensors, and using the interface. Basic installation, configuration and calibration training in the 1056 Analyzer

COURSE E2602**CEUS: 0.1****Rosemount - pH Theory Rosemount - pH Theory****Overview**

Entry level training in pH Theory, including explanation of pH measurement, industries utilizing measurement, types of pH measurement, science of determining pH, and examination of a pH detector and sensor. Explain pH to learner to impart a solid, working knowledge of pH and how it is measured and why, in industry, and understanding of pH scale, and pH sensors.

COURSE 2153

CEUs: 0.7

Rosemount Oxygen Flue Gas & 6888A Analyzers**Overview**

This 1-day course covers combustion measurement principles and the theory of operation of oxygen analyzers. The class will discuss the installation, operation, calibration and maintenance of the Rosemount 6888A Oxygen Analyzer.

Topics

- Combustion Requirements
- Methods of Oxygen Analysis
- Typical Uses of Oxygen Analysis
- Combustion Efficiency
- Zirconia (ZrO₂) Oxygen Analysis
- Theory of Operation
- Oxygen Analyzer
- Installation
- Hardware
- Maintenance
- Troubleshooting
- Hart Communications

COURSE 2154

CEUs: 0.7

Rosemount OCX8800 Oxygen & Combustibles Transmitter**Overview**

This 1-day course covers combustion measurement principles and the theory of operation for oxygen analyzers in general and the installation, operation, calibration and maintenance of the Rosemount OCX8800 Analyzers.

Topics

- Combustion Requirements
- Methods of Oxygen Analysis
- Typical Uses of Oxygen Analysis
- Combustion Efficiency
- Zirconia (ZrO₂) Oxygen Analysis
- Theory of Operation
- Oxygen Analyzer
- COe Analyzer
- Installation
- Hardware
- Maintenance
- Troubleshooting
- Hart Communications



COURSE 2350

CEUs: 0.7

Rosemount Millennium II Gas Detector Transmitter

Overview

This 1-day course covers Gas Detection measurement principles and theory of operation. The class will discuss the installation, configuration, operation, calibration, maintenance and troubleshooting of the Rosemount Millennium II Gas Detectors. Upon completion students will know how to properly install, wire, configure, test with appropriate gases, and basic troubleshooting.

COURSE 2351

CEUs: 0.7

Rosemount 975 Flame Detector Transmitter

Overview

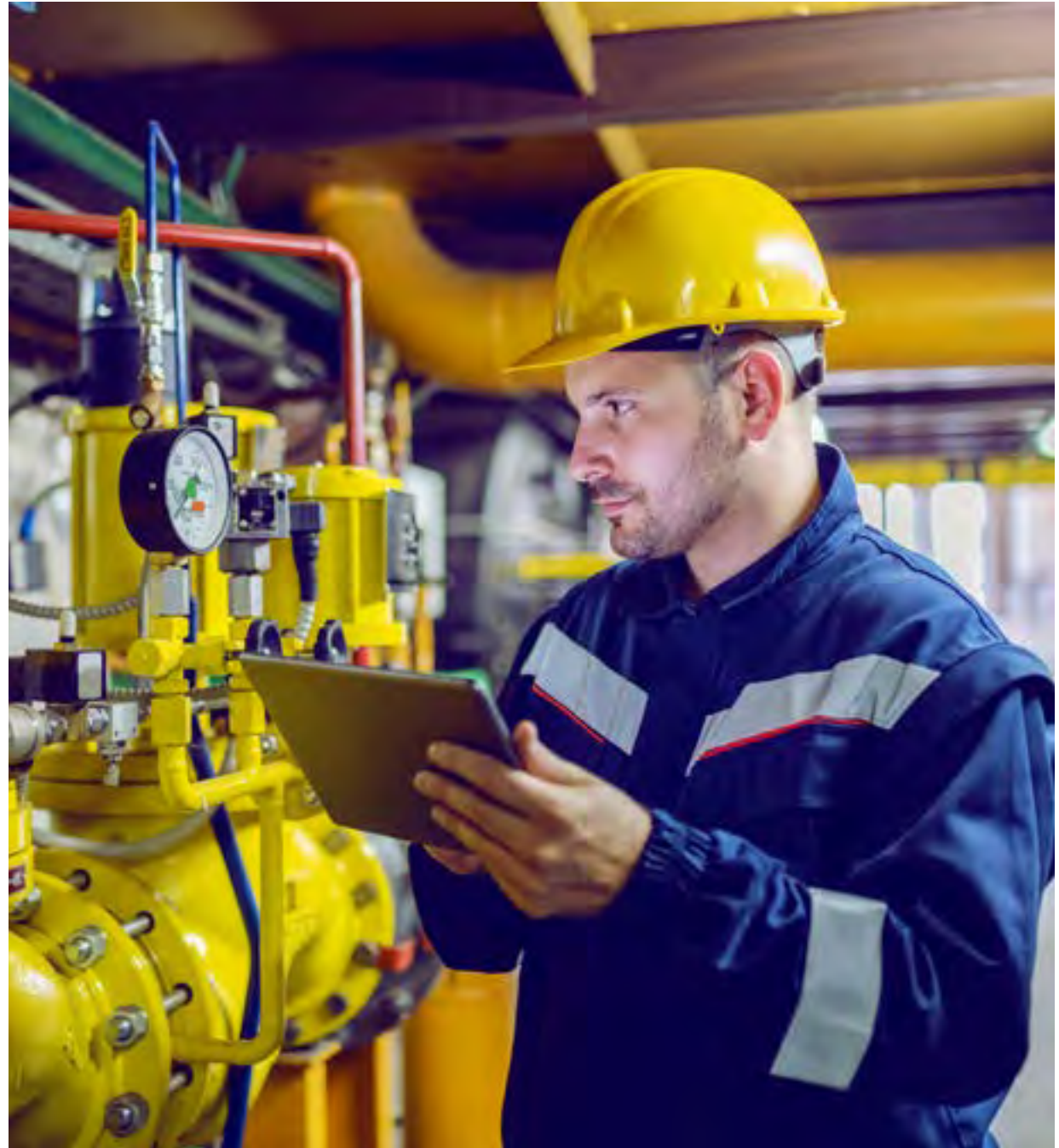
This 1-day course covers Flame Detection measurement principles and theory of operation. The class will discuss the installation, configuration, operation, calibration, maintenance and troubleshooting of the Rosemount 975 Flame Detectors.

Topics

- Optical sensors technology: UV, UV/IR, Multi IR
- Fuel types
- System design considerations
- Installation
- Proper wiring: terminals, 4-20mA current output
- Optical path components
- Configuration using: 475 Field Communicator, WinHost software
- Testing with flame simulator
- Optics maintenance

Prerequisite

None



OVATION



COURSE OV275**Ovation AMS Suite Intelligent Device Manager****Overview**

The OV275 - Virtual course is designed to enable the end-user to configure and use the Emerson's AMS Suite: Intelligent Device Manager with the Ovation™ control system. Students will receive hands-on experience using the Ovation and AMS Device Manager to configure Smart Devices on the Ovation network. Students will also configure and examine Ovation PlantWeb Alerts generated from the Smart Devices. This course will provide instruction on how to configure and troubleshoot the Ovation system and AMS Device Manager.

Topics

- Upon successful completion of this course, using the reference material provided, the student will be able to:
- Understand the basic topology of an Ovation network that includes an AMS Intelligent Device Manager Station
- Recognize AMS Suite software applications
- Understand AMS Intelligent Device Manager licensing
- Complete normal AMS Intelligent Device Manager administrative functions
- Use basic AMS Intelligent Device Manager functions
- Understand AMS Intelligent Device Manager SNAP-ON capabilities
- Update AMS Intelligent Device Manager DD files

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – HART and Smart Devices – OV270

COURSE OV275V**Ovation AMS Suite Intelligent Device Manager [Virtual]****Overview**

The OV275 - Virtual course is designed to enable the end-user to configure and use the Emerson's AMS Suite: Intelligent Device Manager with the Ovation™ control system. Students will receive hands-on experience using the Ovation and AMS Device Manager to configure Smart Devices on the Ovation network. Students will also configure and examine Ovation PlantWeb Alerts generated from the Smart Devices. This course will provide instruction on how to configure and troubleshoot the Ovation system and AMS Device Manager.

Topics

- Upon successful completion of this course, using the reference material provided, the student will be able to:
- Understand the basic topology of an Ovation network that includes an AMS Intelligent Device Manager Station
- Recognize AMS Suite software applications
- Understand AMS Intelligent Device Manager licensing
- Complete normal AMS Intelligent Device Manager administrative functions
- Use basic AMS Intelligent Device Manager functions
- Understand AMS Intelligent Device Manager SNAP-ON capabilities
- Update AMS Intelligent Device Manager DD files

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – HART and Smart Devices – OV270

COURSE OV345**Ovation Applications with DeviceNet****Overview**

The OV345 is designed to provide the end-user with a thorough knowledge of DeviceNet applications as applied to an Ovation™ system. Taught subjects include: Ovation DeviceNet Module, segment design, device commissioning, point mapping and basic troubleshooting. Students will be provided with hands-on experience implementing DeviceNet architecture.

Prerequisites

OV100 - Starting with Data Acquisition and OV200 - Building and Maintaining Ovation Control. OV275 - AMS Suite: Intelligent Device Manager - is recommended but not required.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Define Ovation DeviceNet architecture
- Understand DeviceNet operation and communication
- Implement an Ovation specific DeviceNet scheme and topology
- Build Ovation points for use in DeviceNet architecture
- Implement control loops in fieldbus and feedback to Ovation
- Configure Ovation graphics to function with a fieldbus system
- Analyze the timing of the system when fully operational

COURSE OV350**Ovation Applications with Profibus****Overview**

The OV350 course is designed to provide the end-user with a thorough knowledge of Profibus applications as applied to the Ovation™ system. Topics for discussion include: Ovation Profibus Module, segment design, device commissioning, point mapping and basic troubleshooting. Students will gain hands-on experience implementing Profibus architecture.

Topics

Upon successful completion of this course, using the reference material provided, and the student will be able to:

- Define Ovation Profibus architecture
- Understand Profibus operation and communications
- Identify the required hardware and software needed for an Ovation Profibus interface
- Update the Ovation/Sycon Device list
- Demonstrate the Sycon engineering tool to configure Profibus devices
- Build Ovation points for use in Profibus architecture
- Implement an Ovation specific Profibus scheme and topology

Prerequisites

Ovation – Data Acquisition -OV100

COURSE OV367**Ovation AV Management****Overview**

The OV367 course is designed for the end-user charged with maintaining the anti-virus solutions for the Ovation™ System. Course will focus on installing endpoint software, obtaining and distributing virus definitions, upgrading anti-virus versions and configuring the AV servers..

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Configure the anti-virus server
- Run reports
- Update virus definitions
- Install anti-virus software on endpoints

COURSE OV367V**Ovation AV Management [Virtual]****Overview**

The OV367 course is designed for the end-user charged with maintaining the anti-virus solutions for the Ovation™ System. Course will focus on installing endpoint software, obtaining and distributing virus definitions, upgrading anti-virus versions and configuring the AV servers..

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Configure the anti-virus server
- Run reports
- Update virus definitions
- Install anti-virus software on endpoints

COURSE OV400**Ovation Base Certification****Overview**

The OV400 course is offered to the end-user as a stand-alone or web-based exam or implemented with a pre-testing review at the Training Center. The student's proficiency is measured in areas related to database building, control implementation, control graphic linkage and troubleshooting on a system-wide basis. For both offerings, a multi-point examination is administered, and participants are required to achieve a grade score >80% to successful gain certification.

Topics

Upon completion of this course and achieving a successful level of competency in the online examination, the student will receive an Ovation™ certification award. This achievement affirms and recognizes that the student is fully cognizant and possesses the necessary skills to successfully engineer and maintain an Ovation control system for their organization. The student has demonstrated proficiency in the following areas:

- Building saving and implementing the Oracle database
- Constructing control sheets using both Boolean and Analog logic
- Loading and configuring the Ovation™ Controller
- Designing graphics with control implementation
- Troubleshooting procedures as related to I/O and Controller modules

Prerequisites

Ovation – Data Acquisition – OV100, Ovation – Building and Maintaining Ovation Control – OV200, Ovation - Building Ovation Graphics – OV210 and Ovation Troubleshooting - OV300

COURSE OV400V**Ovation Base Certification [Virtual]****Overview**

The OV400 course is offered to the end-user as a stand-alone or web-based exam or implemented with a pre-testing review at the Training Center. The student's proficiency is measured in areas related to database building, control implementation, control graphic linkage and troubleshooting on a system-wide basis. For both offerings, a multi-point examination is administered, and participants are required to achieve a grade score >80% to successfully gain certification.

Topics

Upon completion of this course and achieving a successful level of competency in the online examination, the student will receive an Ovation™ certification award. This achievement affirms and recognizes that the student is fully cognizant and possesses the necessary skills to successfully engineer and maintain an Ovation control system for their organization. The student has demonstrated proficiency in the following areas:

- Building saving and implementing the Oracle database
- Constructing control sheets using both Boolean and Analog logic
- Loading and configuring the Ovation™ Controller
- Designing graphics with control implementation
- Troubleshooting procedures as related to I/O and Controller modules

Prerequisites

Ovation – Data Acquisition – OV100, Ovation – Building and Maintaining Ovation Control – OV200, Ovation - Building Ovation Graphics – OV210 and Ovation Troubleshooting - OV300

COURSE OV301**Ovation AV Management****Overview**

The OV301 course is designed to provide the end-user with the knowledge and methods to maintain a reliable Ovation™ DCS working system with regard to: Ovation database, OPH configuration techniques, network monitoring, control task monitoring, best graphics practices, I/O reliability, patching, backups, Anti-Virus and engineering gathered utilities.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Perform backups on the Ovation system
- Install anti-virus programs on the Ovation system
- Monitor the overall reliability of the Ovation system
- Install software patches on the Ovation System
Install anti-virus software on endpoints

Prerequisites

Ovation - Data Acquisition - OV100, Ovation – Building and Maintaining Ovation Control – OV200 and Ovation – Building Ovation Graphics – OV210

COURSE OV301V**Ovation AV Management [Virtual]****Overview**

The OV301 course is designed to provide the end-user with the knowledge and methods to maintain a reliable Ovation™ DCS working system with regard to: Ovation database, OPH configuration techniques, network monitoring, control task monitoring, best graphics practices, I/O reliability, patching, backups, Anti-Virus and engineering gathered utilities.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Perform backups on the Ovation system
- Install anti-virus programs on the Ovation system
- Monitor the overall reliability of the Ovation system
- Install software patches on the Ovation System
Install anti-virus software on endpoints

Prerequisites

Ovation - Data Acquisition - OV100, Ovation – Building and Maintaining Ovation Control – OV200 and Ovation – Building Ovation Graphics – OV210

COURSE OV380**Ovation Boiler Control****Overview**

The OV380 course is an introduction to boiler control for those who interface with control programs or may make modifications to their existing control programs. Using previous control-building knowledge, the student will learn how to implement and design pertinent boiler control logic in an Ovation™ environment. Instruction will emphasize the proper selection, configuration and application of algorithms in a typical Ovation boiler control system. The writing of control logic is included as course work.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Review the history of boilers
- Review the development of boiler safety and the development of standards
- Discuss the typical control logic used in the water, steam, air and fuel systems
- Discuss and review SAMA and ISA control symbols
- Discuss and review measuring elements and final control elements used in boiler control
- Discuss and review compensations, conversions and voting in measuring elements
- Discuss and review three element drum control, cross limiting control, de-superheat control, furnace pressure control, fuel calculations and O2 correction
- Discuss and review stoichiometric relationships in boiler control
- Discuss the typical types of control utilized in boilers: ratio, feed forward, cascade, single element, two element, and three element
- Discuss and review the different components of a boiler: reheat, wall burners, tangentially fired burners, ID and FD fans, mills and feed pumps

Prerequisites

Ovation - Data Acquisition - OV100, Ovation - Building and Maintaining Ovation Control - OV200

COURSE OV200**Ovation Building & Maintaining Ovation Control****Overview**

The OV200 course is designed to provide proficiency in reading Ovation™ functional control schemes. Tuning, building and implementing new control schemes to improve performance are covered. Both modulating (analog) and discrete digital control schemes are included in the scope of the course. Discussions include the various types of control algorithms available and how they can be used to create effective control. The course is further intended for people who work with Ovation Controllers to tune and build analog and digital control schemes in a Windows environment.

Topics

Upon successful completion of this course and using the reference materials provided, the student will be able to:

- Interpret and apply a control functional to the Ovation Windows-based system.
- Interpret and tune implemented control using the available tools.
- Edit existing control schemes
- Demonstrate proficiency in building digital and analog control.
- Design and implement a tracking scheme to meet specific control requirements.
- Recognize the relationship between control schemes and graphic diagrams.
- Implement given control requirements using the Control Builder.
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided.

Prerequisites

Students must have a good understanding of the Ovation system architecture and how database point records are built and maintained in the Ovation Windows-based system. Student should attend the OV100 prior to attending this course.

COURSE OV210**Ovation Building Ovation Graphics****Overview**

The OV210 course was designed to teach the end-user how to construct graphic diagrams that depict the controlled process. Students will use the Ovation™ Graphics Builder program to build process diagrams, implement the display of static and dynamic objects, and provide for control linkage and conditional changes that occur due to alarm conditions or process changes. Methods for standardizing information entities, control interfaces and troubleshooting problems within the graphics code are also covered.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the different building areas within the graphic source code
- Build graphics to display static and dynamic plant data
- Employ various drawing techniques to create 3D graphics
- Directly link graphics to actual control using poke fields
- Design and implement MACROS used within graphics
- Implement conditional statements to create dynamic indications within the graphic
- Employ various techniques that enable the graphic code to execute more efficiently
- Use various application programs within a graphic to perform a specific function
- Assess and correct problems in graphics using available tools

Prerequisites

OV100 and OV200 are strongly recommended

COURSE OV210V**Ovation Building Ovation Graphics [Virtual]****Overview**

The OV210 course was designed to teach the end-user how to construct graphic diagrams that depict the controlled process. Students will use the Ovation™ Graphics Builder program to build process diagrams, implement the display of static and dynamic objects, and provide for control linkage and conditional changes that occur due to alarm conditions or process changes. Methods for standardizing information entities, control interfaces and troubleshooting problems within the graphics code are also covered.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the different building areas within the graphic source code
- Build graphics to display static and dynamic plant data
- Employ various drawing techniques to create 3D graphics
- Directly link graphics to actual control using poke fields
- Design and implement MACROS used within graphics
- Implement conditional statements to create dynamic indications within the graphic
- Employ various techniques that enable the graphic code to execute more efficiently
- Use various application programs within a graphic to perform a specific function
- Assess and correct problems in graphics using available tools

Prerequisites

OV100 and OV200 are strongly recommended

COURSE OV330**Ovation Control Techniques Advanced****Overview**

The OV330 - Virtual offered course is designed for end-users who will implement their own control programs or who will make significant modifications to existing programs. Using previous control-building knowledge, the student will learn how to implement control design in an Ovation™ environment. The course will emphasize the proper selection, configuration and application of algorithms in the Ovation control system.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Apply, tune and track all appropriate algorithms in open-and-closed loop configurations
- Select, filter and compensate transmitter inputs
- Implement complex sequential control
- Appreciate important closed-loop control forms
- Configure general math computations
- Describe the interface of selected algorithms to I/O hardware
- Use algorithms for timing, counting, accumulation and system-time applications

Prerequisites

Ovation - Building and Maintaining
Ovation Control – OV200

COURSE OV330V**Ovation Control Techniques Advanced [Virtual]****Overview**

The OV330 - Virtual offered course is designed for end-users who will implement their own control programs or who will make significant modifications to existing programs. Using previous control-building knowledge, the student will learn how to implement control design in an Ovation™ environment. The course will emphasize the proper selection, configuration and application of algorithms in the Ovation control system.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Apply, tune and track all appropriate algorithms in open-and-closed loop configurations
- Select, filter and compensate transmitter inputs
- Implement complex sequential control
- Appreciate important closed-loop control forms
- Configure general math computations
- Describe the interface of selected algorithms to I/O hardware
- Use algorithms for timing, counting, accumulation and system-time applications

Prerequisites

Ovation - Building and Maintaining
Ovation Control – OV200

COURSE OV302**Ovation Database/
Troubleshooting Advanced****Overview**

This course is designed for engineers and technicians that have used Ovation Developer Studio on a consistent basis. Troubleshooting is a primary role for technicians and engineers. Topics covered include controller failures, networking, algorithm troubleshooting, Ovation services, NTP problems, HART, 3rd party and remote I/O issues.

Topics

- Review Ovation tools for troubleshooting
- Identify and solve advanced troubleshooting problems

COURSE OV302V**Ovation Database/
Troubleshooting Advanced
[Virtual]****Overview**

This course is designed for engineers and technicians that have used Ovation Developer Studio on a consistent basis. Troubleshooting is a primary role for technicians and engineers. Topics covered include controller failures, networking, algorithm troubleshooting, Ovation services, NTP problems, HART, 3rd party and remote I/O issues.

Topics

- Review Ovation tools for troubleshooting
- Identify and solve advanced troubleshooting problems

COURSE OV100**Ovation Data Acquisition****Overview**

For those new to the Ovation™ system, the Ovation Data Acquisition course covers Ovation terminology, Operator functions and the Ovation Controller physical layout. The course offers practice using the Ovation engineering tools that are designed to simplify data acquisition. Data acquisition types include digital, analog and analog temperature sensing sources, as well as introducing the end-user to the Developer Studio for point building and I/O module configuration.

Topics

- Identify the major components in an Ovation™ system
- Understand basic Ovation terminologies
- Identify the major devices and subsets in an Ovation Controller Cabinet
- Demonstrate basic Ovation operator functions
- Understand data movement in an Ovation system
- Utilize the Ovation Developer Studio to create and modify digital and analog process points
- Configure I/O modules for temperature data acquisition
- Address, hardwire and test I/O modules

Prerequisites

Ovation - Building and Maintaining Ovation Control – OV200

COURSE OV376**Ovation Digital Generator Control****Overview**

The OV376 is designed for the end-user that will interface and maintain the DGC system. The course provides the history and fundamentals of generator excitation with an overview of the excitation types and concepts of SCR bridges. Course topics include the DGC and its elemental components, maintenance and troubleshooting, data retrieval and analysis.

Topics

- Upon successful completion of this course, using the reference material provided, the student will be able to:
- Navigate the control software and review alarm
 - Understand basic DGC troubleshooting and maintenance procedures
 - View the DGC Application Software Display, Log-view and Sequence of Events
 - Understand basics of Amplifiers, Firing Circuits and the Controller
 - Review the fundamentals and technology associated with the DGC

COURSE OV248**Ovation EDS Enterprise Data Server****Overview**

This [Virtual] course is designed to give students a detailed understanding of the EDS™. Upon completion of this course, the student will be able to configure an EDS server to collect point data from an existing Ovation™ system. An EDS client will be properly configured and the applications of the EDS station will be covered extensively. This course is designed for anyone who will be using or managing the EDS.

Topics

- Upon successful completion of this course, using the reference material provided, the student will be able to:
- Illustrate the functions of the EDS system and architecture
 - Explain how an EDS server is loaded and configured
 - Configure and EDS client to communicate with an existing EDS
 - Manage the data storage of the EDS
 - Demonstrate how to view and interpret error messages
 - Build reports using the EDS Report Builder

COURSE OV115**Ovation Evergreen Upgrade****Overview**

This course is designed to teach the Ovation™ Windows software utility packages from a higher level. The course provides instruction on the Ovation Windows studio of application programs including the building of point records, control sheets, graphic displays and the loading, saving and downloading of each entity. Topics for discussion include: basic networking, Ovation architecture and components, Operator functions, Developer Studio features, control and graphics building and basic system configuration.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Describe the functions and differences of the Ovation Windows network and its components.
- Monitor plant processes using Ovation Windows data acquisition tools.
- Navigate and understand the Ovation Developer Studio.
- Demonstrate a basic level of proficiency using the Ovation Control Builder.
- Demonstrate a basic level of proficiency using the Ovation Graphics Builder.
- Understand and implement some basic Ovation Windows configuration changes.

COURSE OV246**Ovation OPH Report Building****Overview**

The OV246 - Virtual offered course was designed to teach the end-user how to configure and retrieve historical data using the Ovation™ Process historian (OPH) and Crystal Reports. Students will use the OPH Report Manager to define (Alarm, SOE, and Operator Event) reports. Using the same manager, students will learn how to configure (On-Demand, Triggered and Timed) reports. Students will also use Crystal Reports to create new report formats for use in the OPH Report Manager.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the functions of the Ovation™ Process Historian and its related components
- Recognize the Ovation Process Historian Database Schema
- Understand the concept of a Relational Database Management System
- Schedule, automate and manipulate reports
- Distribute reports using printers and various output files
- Create custom reports using 3rd party applications such as Crystal Reports and MS Excel

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV248V**Ovation EDS Enterprise Data Server Virtual****Overview**

This [Virtual] course is designed to give students a detailed understanding of the EDS™. Upon completion of this course, the student will be able to configure an EDS server to collect point data from an existing Ovation™ system. An EDS client will be properly configured and the applications of the EDS station will be covered extensively. This course is designed for anyone who will be using or managing the EDS.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Illustrate the functions of the EDS system and architecture
- Explain how an EDS server is loaded and configured
- Configure and EDS client to communicate with an existing EDS
- Manage the data storage of the EDS
- Demonstrate how to view and interpret error messages
- Build reports using the EDS Report Builder

COURSE OV249V**Ovation Enterprise Data Server Administration [Virtual]****Overview**

This course is designed to give students a more in-depth understanding of the EDS server and feeders. Upon completion of the course, students will be able to configure an EDS server to collect point data from an existing Ovation system. An EDS client will be properly configured as well as an EDS feeder. The course is designed for anyone managing the EDS server & feeders. Report building from terminal and the Excel plug-in will also be incorporated into the 5-day training.

Topics

- Describe the functions of the EDS and related components
- Recognize the hardware used in an EDS
- Understand EDS server configuration and setup
- Load and configure data interfaces to ovation
- Load and configure an EDS server
- Load and configure database access software components
- Navigate and understand the database access application
- Load and configure EDS terminal software components
- Troubleshoot common EDS issues
- Maintain the EDS
- Define reports using the report editor application
- Building reports in excel
- Monitor reports using the report monitor application
- Recognize the function of the messages application

COURSE OV296**Ovation Ethernet Link Controller with Third Party I/O****Overview**

The OV296 course was designed to enable the end-user to configure, network and troubleshoot Ethernet Link Controllers and third-party I/O points. Topics covered include: configuration of the ELC in Developer Studio, using the ELC Configuration Tool, simplex and redundant ELC's, networking, communication protocols, editing XML files, graphics, troubleshooting and building third-party I/O points. Students will configure the ELC to communicate with RTU's via both the Ethernet and Serial links.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Explain the workings of an ELC as well as its purpose
- Distinguish differences between switches and routers
- Explain how IP addresses and subnet masks work
- Differentiate between TCP and serial products
- Configure both simplex and redundant ELC's in Developer Studio
- 6. Install the ELC Configuration Tool and license the communication protocols
- Download firmware to the ELC module
- Utilize the ELC Configuration Tool to build servers, ports, lines, RTU's and scan-blocks
- Edit XML files to perform mass edits of the ELC
- Build graphics to monitor and troubleshoot the ELC
- Configure third-party I/O points
- Map Ovation™ points to third-party RTU's over various protocols

COURSE OV265**Ovation Expert Transition****Overview**

The OV265 course was designed to provide the end-user with proficiency in updating the Ovation™ interface after a change has been made to the Bailey I/O. Students will learn the basic mechanics of using the Ovation OPC client and OPC90 Server (ROVISYS) applications. Course elements include layout and implementation of the hardware and software required for the migration. Simple methods for troubleshooting faults will also be discussed.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Understand the different methods of a Bailey to Ovation™ migration
- Recognize hardware components used for the Bailey to Ovation migration
- Recognize software components used for the Bailey to Ovation migration
- Understand Bailey block to Ovation point mapping
- Use the Bailey to Ovation migration tool
- Update the Ovation interface when changes are made to the Bailey I/O
- Troubleshoot the Ovation interface using ROVISYS and OPC Client Mapper

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV265**Ovation Expert Transition****Overview**

The OV265 course was designed to provide the end-user with proficiency in updating the Ovation™ interface after a change has been made to the Bailey I/O. Students will learn the basic mechanics of using the Ovation OPC client and OPC90 Server (ROVISYS) applications. Course elements include layout and implementation of the hardware and software required for the migration. Simple methods for troubleshooting faults will also be discussed.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Understand the different methods of a Bailey to Ovation™ migration
- Recognize hardware components used for the Bailey to Ovation migration
- Recognize software components used for the Bailey to Ovation migration
- Understand Bailey block to Ovation point mapping
- Use the Bailey to Ovation migration tool
- Update the Ovation interface when changes are made to the Bailey I/O
- Troubleshoot the Ovation interface using ROVISYS and OPC Client Mapper

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV310**Ovation Graphics Advanced****Overview**

The OV310 course is designed to provide the end-user with enhanced graphic programming skills: Topics for discussion include: Macros, Pointers, special application programs, trigger statements, sub-routines and correct coding for increased graphic execution speed.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Define the different memory segments available in the graphic subsystem
- Build graphics utilizing pointer commands with segmented memory
- Interpret and use the library of application programs
- Use the trigger section of the graphics code for efficiency
- Use graphic commands only available in a text editor
- Troubleshoot graphics code using available tools

Prerequisites

Ovation - Data Acquisition – OV100
 Ovation – Building & Maintaining Ovation Control – OV200
 Ovation – Building Ovation Graphics – OV210

COURSE OV310V**Ovation Graphics Advanced [Virtual]****Overview**

Uses application programs and advanced programming techniques, including the use of memory segments combined with pointer manipulation, to enhance advanced graphic programming skills. Builds several graphics utilizing pointers and memory segments. Teaches students to assess problematic graphics and solve them with available tools.

Topics

- Define the different memory segments available in the graphics subsystem
- Build several graphics utilizing pointers and memory segments
- Interpret application programs
- Use the trigger section of the graphics code for efficiency
- Use graphic commands only available in a text editor
- Troubleshoot graphics with available tools
- Define and implement different types of Variables
- Build Graphics Utilizing Variables
- Build Graphics using embedded macros

Prerequisites

OV100, OV200, OV210

COURSE OV216**Ovation Hardware Project****Overview**

The OV216 course is designed for the end-user whose primary interest and/or assignment is maintaining Ovation™ hardware. Selected topics from several courses are incorporated and expanded upon. Topics included are the replacement and set-up of an Ovation Controller and Flask Disk. Several different power supply configurations are discussed. Attendees will install new I/O Thermocouple/RTD modules and build several temperature-derived points. Students will install a HART® (4-20) ma analog input module and transmitter. Each student will install and configure an Ovation Remote Node Controller with fiber connections.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Utilize documentation to analyze faults or problem conditions in the Ovation™ System
- Interpret Ovation system error messages
- Demonstrate remote I/O technology
- Understand recovery or hard-drive failures on MMI's
- Configure CISCO switches & routers
- Monitor status LED's of the Ovation system
- Build various RM records
- Implement closed loop control strategies
- Evaluate and determine operation of power supplies

Prerequisites

Ovation - Data Acquisition – OV100 , Ovation - Building and Maintaining Ovation Control – OV200 and Ovation – Software Project – OV215a

COURSE OV270**Ovation HART & Smart Devices****Overview**

The OV270 - Virtual offered course was designed to provide the end-user with the skills to fully utilize the special features of I/O related to HART® and Smart Field Devices attached to the Ovation™ system. Students will learn the basic components of an Ovation system. Items discussed will include physical attachment of field devices to the Ovation I/O modules, and diagnosis of problems that may occur.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify the configuration of components in an Ovation™ system using HART/Smart Devices
- Attach HART/Smart Field Devices to the Ovation I/O cards
- Build database point for the Field Devices
- Use AMS Suite to obtain data from the Field Devices
- Diagnose common problems and configuration errors

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV270V**Ovation HART & Smart Devices [Virtual]****Overview**

The OV270 - Virtual offered course was designed to provide the end-user with the skills to fully utilize the special features of I/O related to HART® and Smart Field Devices attached to the Ovation™ system. Students will learn the basic components of an Ovation system. Items discussed will include physical attachment of field devices to the Ovation I/O modules, and diagnosis of problems that may occur.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify the configuration of components in an Ovation™ system using HART/Smart Devices
- Attach HART/Smart Field Devices to the Ovation I/O cards
- Build database point for the Field Devices
- Use AMS Suite to obtain data from the Field Devices
- Diagnose common problems and configuration errors

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV277**Ovation Machinery Health Monitor Vibration****Overview**

This course will cover general concepts regarding the Ovation Machinery Health Monitor I/O module for measuring and recording plant vibration data. The student will configure the I/O module, install multiple types of vibration inputs and monitor the feedback data utilizing Emerson vibration sensors. Configuration of the Machine Works Application will also be discussed.

Topics

- Introduction to MHM and types of Vibration Sensors
- Inserting the MHM module into Ovation
- Verification of IO module Firmware and updating firmware
- Build Vibration points
- Setting Up Ovation Machine Works Application

Note

At the current time this course does not cover the utilization of Bentley Nevada or other Manufacturers vibration sensors into the MHM Module.

COURSE OV280**Ovation SCADA System****Overview**

The OV280 - Virtual offered course was designed to provide the end-user with knowledge on the Ovation™ SCADA system. Student will learn the basic components of an Ovation SCADA system with discussions centered on SCADA servers, (RTU's) Remote Terminal Units, scan blocks, lines, ports, configuration tool, protocol analyzers and etc. Students will engage and establish communication using a variety of Allen-Bradley, MODBUS or DNP 3.0 protocols.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify the purpose and components in an Ovation™ SCADA system
- Identify the licensing requirements of an Ovation SCADA system
- Use the configuration tool to access and modify the system
- Analyze the communication protocols used with and Ovation SCADA system
- Utilize the protocol analyzer to interpret signal traffic between the SCADA Server and the RTU's
- Interpret scan block data
- Create Ovation graphics to interface to the Ovation SCADA system

Prerequisites

Ovation - Data Acquisition – OV100 and Ovation – Building Ovation Graphics – OV210

COURSE OV320**Ovation Network Administration****Overview**

The OV320 course is designed to provide the end-user with a general understanding of networking concepts as well as Ovation™-specific network configurations for Fast Ethernet systems. Students will learn the basic networking skills required for general network administration and troubleshooting. Students will also be provided with hands-on knowledge of switch and route configurations for use in Ovation systems. This course will serve as one of the pre-requisites toward completing the Ovation Certification program.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Explore basic networking concepts including the OSI reference model, MAC addressing, TCP/IP, IP addressing, multi-cast addressing and local area networks
- Implement an Ovation™-specific network addressing scheme and network topology
- Define and explore basic network commands
- Define network devices and media and their relation to the OSI reference model
- Configure CISCO 2600 series routers, CISCO 3550 series switches and CISCO 2950 series switches for use in an Ovation network
- Configure and implement SNMP for Ovation
- Troubleshoot inter-networked systems with network tools and software
- Configure and apply third-party networking software

Prerequisites

Ovation – System Administration – OV230

COURSE OV246V**Ovation OPH Report Building [Virtual]****Overview**

The OV246 - Virtual offered course was designed to teach the end-user how to configure and retrieve historical data using the Ovation™ Process historian (OPH) and Crystal Reports. Students will use the OPH Report Manager to define (Alarm, SOE, and Operator Event) reports. Using the same manager, students will learn how to configure (On-Demand, Triggered and Timed) reports. Students will also use Crystal Reports to create new report formats for use in the OPH Report Manager.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the functions of the Ovation™ Process Historian and its related components
- Recognize the Ovation Process Historian Database Schema
- Understand the concept of a Relational Database Management System
- Schedule, automate and manipulate reports
- Distribute reports using printers and various output files
- Create custom reports using 3rd party applications such as Crystal Reports and MS Excel

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV010**Ovation Operator****Overview**

This course is designed to provide students with the ability to efficiently perform routine plant operations using the Ovation control system. Key topics include data acquisition, process analysis and control interfaces. Students will be able to use the tools provided to monitor processes controlled by the Ovation system and will learn to take appropriate actions to control these processes. This course is intended for all Operations personnel using the Ovation system.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- List the major components of the Ovation control system.
- Display process diagram graphics.
- Use process diagrams to interface with the control system
- Evaluate point alarm conditions and acknowledge emergent alarms.
- Differentiate various point types and use the Point Information system to find and edit point records.
- Create live and historical trends.
- Navigate through control tuning diagrams.
- Analyze system problem conditions.
- Use system reporting procedures.
- Describe the function of Ovation application icons.
- Demonstrate familiarity with menu bars and tool bars in various process diagram windows.
- Demonstrate familiarity with the task bar and other Windows utilities.

COURSE OV010V**Ovation Operator [Virtual]****Overview**

This course is designed to provide students with the ability to efficiently perform routine plant operations using the Ovation control system. Key topics include data acquisition, process analysis and control interfaces. Students will be able to use the tools provided to monitor processes controlled by the Ovation system and will learn to take appropriate actions to control these processes. This course is intended for all Operations personnel using the Ovation system.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- List the major components of the Ovation control system.
- Display process diagram graphics.
- Use process diagrams to interface with the control system
- Evaluate point alarm conditions and acknowledge emergent alarms.
- Differentiate various point types and use the Point Information system to find and edit point records.
- Create live and historical trends.
- Navigate through control tuning diagrams.
- Analyze system problem conditions.
- Use system reporting procedures.
- Describe the function of Ovation application icons.
- Demonstrate familiarity with menu bars and tool bars in various process diagram windows.
- Demonstrate familiarity with the task bar and other Windows utilities.

COURSE OV377**Ovation Excitation System****Overview**

This course is for Ovation excitation. The course is intended for engineers and I&C Technicians that interface and maintain an Ovation excitation system and includes a review of the history and fundamentals of excitation, types of excitation, and the concepts of SCR bridges. The course discusses excitation and its elemental components, maintenance and troubleshooting, data retrieval and analysis. No required Prerequisites as this course does not require knowledge of Ovation DCS. Course content is primarily by lecture with minimal hands-on equipment.

Topics

- Review fundamentals of excitation
- Use ovation applications to maintenance and troubleshooting

COURSE OV245**Ovation Excitation System****Overview**

The OV245 course was designed to teach the end-user how to configure the Ovation™ Process Historian (OPH) to retrieve real-time and historical data. The Ovation Process Historian hardware and database schema is reviewed in detail and various methods or data retrieval will be discussed including Report Manager, Crystal Reports, Historical Reviews and Trends.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the functions of the Ovation™ Process Historian and related components
- Configure scanners and points for collection
- Recognize the Ovation Process Historian database scheme
- Understand the concept of a Relational Database Management System
- Install and configure the Ovation Process Historian Report Manager
- Schedule, automate and manipulate reports
- Create custom reports using third-party applications such as Crystal Reports, MS Excel, MS Access and SQL
- Create historical trends and build global trend groups
- Create historical Point, Alarm, Operator-Event, ASCII and common reviews
- Analyze the Ovation Process Historian with the diagnostic tools available

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV245V**Ovation Excitation System [Virtual]****Overview**

The OV245 course was designed to teach the end-user how to configure the Ovation™ Process Historian (OPH) to retrieve real-time and historical data. The Ovation Process Historian hardware and database schema is reviewed in detail and various methods or data retrieval will be discussed including Report Manager, Crystal Reports, Historical Reviews and Trends.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Describe the functions of the Ovation™ Process Historian and related components
- Configure scanners and points for collection
- Recognize the Ovation Process Historian database scheme
- Understand the concept of a Relational Database Management System
- Install and configure the Ovation Process Historian Report Manager
- Schedule, automate & manipulate reports
- Create custom reports using third-party applications such as Crystal Reports, MS Excel, MS Access & SQL
- Create historical trends and build global trend groups
- Create historical Point, Alarm, Operator-Event, ASCII and common reviews
- Analyze the Ovation Process Historian with the diagnostic tools available

Prerequisites

Ovation - Data Acquisition – OV100

COURSE OV370**Ovation Turbine Control****Overview**

The OV370 is designed to afford the end-user with in-depth knowledge on the Ovation™ Turbine Control System (TCS). A hydraulic test stand with LVDT's and Servo Valves will be used to demonstrate turbine operation and graphics. The course includes defining I/O points, RVP and speed modules, calibration and troubleshooting exercises of the speed detector and valve positioner modules. Students will also demonstrate RVP card tuning.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Review the history of the steam turbine
- Review and evaluate typical turbine control logic
- Discuss the LVDT and speed probe functionality
- Configure I/O points for RVP and speed cards
- Configure and set up the RVP and speed I/O modules
- Using a hydraulic valve test stand connect an LVDT and servo valve for simulation
- Discuss troubleshooting procedures for LVDT's and servo valves
- Discuss and setup hyperlink terminal to RVP cards
- Perform LVDT tests and setup using the valve calibration graphic and hyperlink terminal
- Tune the RVP card in conjunction with the hydraulic test stand
- Using a speed wheel test the speed probes

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – Building and Maintaining Ovation Control – OV200

COURSE OV370V**Ovation Turbine Control [Virtual]****Overview**

The OV370 is designed to afford the end-user with in-depth knowledge on the Ovation™ Turbine Control System (TCS). A hydraulic test stand with LVDT's and Servo Valves will be used to demonstrate turbine operation and graphics. The course includes defining I/O points, RVP and speed modules, calibration and troubleshooting exercises of the speed detector and valve positioner modules. Students will also demonstrate RVP card tuning.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Review the history of the steam turbine
- Review and evaluate typical turbine control logic
- Discuss the LVDT and speed probe functionality
- Configure I/O points for RVP and speed cards
- Configure and set up the RVP and speed I/O modules
- Using a hydraulic valve test stand connect an LVDT and servo valve for simulation
- Discuss troubleshooting procedures for LVDT's and servo valves
- Discuss and setup hyperlink terminal to RVP cards
- Perform LVDT tests and setup using the valve calibration graphic and hyperlink terminal
- Tune the RVP card in conjunction with the hydraulic test stand
- Using a speed wheel test the speed probes

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – Building and Maintaining Ovation Control – OV200

COURSE OV280V**Ovation SCADA System [Virtual]****Overview**

The OV280 - Virtual offered course was designed to provide the end-user with knowledge on the Ovation™ SCADA system. Student will learn the basic components of an Ovation SCADA system with discussions centered on SCADA servers, (RTU's) Remote Terminal Units, scan blocks, lines, ports, configuration tool, protocol analyzers and etc. Students will engage and establish communication using a variety of Allen-Bradley, MODBUS or DNP 3.0 protocols.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify the purpose and components in an Ovation SCADA system
- Identify the licensing requirements of an Ovation SCADA system
- Use the configuration tool to access and modify the system
- Analyze the communication protocols used with and Ovation SCADA system
- Utilize the protocol analyzer to interpret signal traffic between the SCADA Server and the RTU's
- Interpret scan block data
- Create Ovation graphics to interface to the Ovation SCADA system

Prerequisites

Ovation - Data Acquisition – OV100 and Ovation – Building Ovation Graphics – OV210

COURSE OV360**Ovation Security Administration****Overview**

The OV360 course is designed as a guide for the end-user in the proper planning and installation of security for Ovation™ 2.4 and higher-level systems. Students will understand Ovation external and internal security concerns and learn how to apply safeguards. Students will install and configure Ovation compatible Windows Server 2003 Domain Controllers, Windows XP service packs and Windows security patches. Students will configure Ovation security using the Ovation Security Manager.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify and explain Ovation-specific internal and external security threats
- Plan and implement Ovation software installation including Windows 2003
- Server, Windows service packs and Windows security patches
- Describe the function of the Ovation Security Manager
- Create and manage user accounts, computer accounts and Ovation roles and group policies
- Create and manage Ovation point security groups
- Manage and understand domain policies
- Create and manage Ovation domain administrators
- Design and implement a specific Ovation security configuration
- Explore the Windows group policy objects

Prerequisites

Ovation – System Administration – OV230

COURSE OV365**Ovation Security Center****Overview**

The OV365 consists of a suite of security modules designed to assist the end-user in reducing the cost of complying with the NERC CIP standards. The security modules functions include Vulnerability Scan and Patch Management (VSPM), Malware Prevention (MP) and Security Incident and Event Management (SIEM). The course covers the configuration, implementation and administration of the modules. The course supports Ovation™ 2.4 and newer for the Windows environment and Ovation 1.7.2 and newer for the Solaris environment.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify the modules of the Ovation Security center
- Demonstrate the Patch Management module
- Demonstrate the Malware Prevention module
- Demonstrate the Security Incident and Event Management module
- Demonstrate the Anti-Virus module
- Implement new Virtual Machines into the Virtual Host machine
- Recommend proper management techniques for the modules

Prerequisites

Ovation – Network Administration – OV320 and
Ovation – Security Administration - OV360

COURSE OV365V**Ovation Security Center [Virtual]****Overview**

The OV365 consists of a suite of security modules designed to assist the end-user in reducing the cost of complying with the NERC CIP standards. The security modules functions include Vulnerability Scan and Patch Management (VSPM), Malware Prevention (MP) and Security Incident and Event Management (SIEM). The course covers the configuration, implementation and administration of the modules. The course supports Ovation™ 2.4 and newer for the Windows environment and Ovation 1.7.2 and newer for the Solaris environment.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify the modules of the Ovation Security center
- Demonstrate the Patch Management module
- Demonstrate the Malware Prevention module
- Demonstrate the Security Incident and Event Management module
- Demonstrate the Anti-Virus module
- Implement new Virtual Machines into the Virtual Host machine
- Recommend proper management techniques for the modules

Prerequisites

Ovation – Network Administration – OV320 and
Ovation – Security Administration - OV360

COURSE OV295**Ovation Serial Link Controller/RLC****Overview**

The OV295 - Virtual offered course provides the end-user with the knowledge of how to create specialized I/O links to non-Ovation™ field devices using both serial-link modules and the Ovation Ethernet Highway. Topics include configuring and loading link controller modules, creating third-party points, memory mapping, adding third-party drivers to controllers and the Ovation addressing requirements.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Understand the architecture and functionality of the Ovation Fast Switched Ethernet highway and the need to protect it from external sources
- Apply the RLC module
- Define MAC and IP addressing and Ethernet protocols
- Understand how Ethernet switches work
- Understand the various options for connecting third-party I/O to the Ovation highway
- Understand the Modbus register concept
- Understand the Modbus commands available in Ovation releases
- Apply and install Ovation Modbus drivers
- Apply and build Ovation point records for communication to Modbus
- Verify successful communications between Ovation and the PC Modbus simulation

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – Building and Maintaining Ovation Control – OV200

COURSE OV295V**Ovation Serial Link Controller/RLC [Virtual]****Overview**

The OV295 - Virtual offered course provides the end-user with the knowledge of how to create specialized I/O links to non-Ovation™ field devices using both serial-link modules and the Ovation Ethernet Highway. Topics include configuring and loading link controller modules, creating third-party points, memory mapping, adding third-party drivers to controllers and the Ovation addressing requirements.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Understand the architecture and functionality of the Ovation Fast Switched Ethernet highway and the need to protect it from external sources
- Apply the RLC module
- Define MAC and IP addressing and Ethernet protocols
- Understand how Ethernet switches work
- Understand the various options for connecting third-party I/O to the Ovation highway
- Understand the Modbus register concept
- Understand the Modbus commands available in Ovation releases
- Apply and install Ovation Modbus drivers
- Apply and build Ovation point records for communication to Modbus
- Verify successful communications between Ovation and the PC Modbus simulation

Prerequisites

Ovation – Data Acquisition – OV100 and Ovation – Building and Maintaining Ovation Control – OV200

COURSE OV366**Ovation Security Incident & Event Management Report Building****Overview**

The OV366 course focuses on Security Incident and Event Management (SIEM) reporting through the Nitroview/McAfee SIEM module of the Ovation™ Security Center. The course centers on managing preloaded templates, manipulating the templates and also creating reports utilizing the report building features of the SIEM. Attendees will have a clear understanding of the available templates and demonstrate the ability to add, modify, delete and export reports upon completion.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Describe the basic functions of the Security Incident and Event Management tool
- Identify differences between Signature and Normalized ID's and how they are essential to reporting
- Identify the templates available and how they relate to different regulations and determine the most useful
- Locate the area where reports are saved
- Demonstrate knowledge of SIEM report building features
- Build reports using the correct templates
- Replace already built templates with custom templates
- Prepare reports for export to a Windows machine

Prerequisites

Ovation – Network Administration – OV320, Ovation - Security Administration – OV360 and Ovation - Security Center - OV365

COURSE OV366V**Ovation Security Incident & Event Management Report Building [Virtual]****Overview**

The OV366 course focuses on Security Incident and Event Management (SIEM) reporting through the Nitroview/McAfee SIEM module of the Ovation™ Security Center. The course centers on managing preloaded templates, manipulating the templates and also creating reports utilizing the report building features of the SIEM. Attendees will have a clear understanding of the available templates and demonstrate the ability to add, modify, delete and export reports upon completion.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Describe the basic functions of the Security Incident and Event Management tool
- Identify differences between Signature and Normalized ID's and how they are essential to reporting
- Identify the templates available and how they relate to different regulations and determine the most useful
- Locate the area where reports are saved
- Demonstrate knowledge of SIEM report building features
- Build reports using the correct templates
- Replace already built templates with custom templates
- Prepare reports for export to a Windows machine

Prerequisites

Ovation – Network Administration – OV320, Ovation - Security Administration – OV360 and Ovation - Security Center - OV365

COURSE OV315**Ovation Smart Process Global Performance Advisor****Overview**

The OV315 course is designed for the end-user who will install, maintain and/or use the Global Performance Advisor (GPA) in power plants. It offers a good resource to those who have not purchased a GPA but are interested in understanding the true potential of a GPA. The course describes the capabilities and limitations of a GPA, hardware and software requirements and provides exercises to install, use and backup the GPA. Hands-on exercises to include: Building Feed-Water Heater Performance Calculations, Building Steam Turbine Performance Calculations and Building Condenser Calculations.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify and explain the GPA's capabilities and limitations
- Recognize the process data required to use the GPA effectively
- Understand GPA hardware and software requirements
- Load GPA software on a Workstation
- Create and reopen GPA projects and Workspaces
- Understand GPA tools and algorithms
- Understand Data Agents
- Create tags and import data
- Build and display example performance calculations
- Recognize communication techniques
- Understand backing up a GPA system

Prerequisites

Basic knowledge in power plant processes, Microsoft Windows Operating System, Ovation™ hierarchy of drops.

COURSE OV215**Ovation Software Project****Overview**

The OV215 course was designed for end-users that require a good overall understanding of the Ovation™ system software utility packages. The course contains selected elements from the OV100, OV200, OV210, OV230 and OV300 courses. The topics covered include Ovation application functions: Developer Studio, process-point building, creating and modifying process control sheets and graphics, backing-up MMI's and the Domain Controller.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify the major components of an Ovation system
- Understand basic Ovation terminologies
- Demonstrate basic Ovation Operator functions
- Understand data movement within the Ovation system
- Understand the hierarchy and basic functions within the Ovation Developer Studio
- Use the Ovation Developer Studio to create process points
- Monitor control previously implemented in an Ovation system
- Interpret and tune implemented control using available tools
- Build and modify control schemes using the Developer Studio
- Interpret and modify tracking schemes to meet specific control requirements
- Recognize the relationship between control schemes and graphic diagrams
- Implement given control requirements using the Developer Studio
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided

COURSE OV215V**Ovation Software Project [Virtual]****Overview**

The OV215 course was designed for end-users that require a good overall understanding of the Ovation™ system software utility packages. The course contains selected elements from the OV100, OV200, OV210, OV230 and OV300 courses. The topics covered include Ovation application functions: Developer Studio, process-point building, creating and modifying process control sheets and graphics, backing-up MMI's and the Domain Controller.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Identify the major components of an Ovation system
- Understand basic Ovation terminologies
- Demonstrate basic Ovation Operator functions
- Understand data movement within the Ovation system
- Understand the hierarchy and basic functions within the Ovation Developer Studio
- Use the Ovation Developer Studio to create process points
- Monitor control previously implemented in an Ovation system
- Interpret and tune implemented control using available tools
- Build and modify control schemes using the Developer Studio
- Interpret and modify tracking schemes to meet specific control requirements
- Recognize the relationship between control schemes and graphic diagrams
- Implement given control requirements using the Developer Studio
- Evaluate and determine the proper operation of a control scheme using the tools and methods provided

COURSE OV375**Ovation Steam Turbine Mechanical Hydraulics****Overview**

The OV375 course is designed to give the end-user expert knowledge of the Emerson Mechanical Hydraulic products. Students will learn how to maintain the Emerson equipment.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Understand the basic function and turbine components
- Identify primary hydraulic components, pumps, accumulators and etc.
- Trace components using hydraulic diagrams and drawings
- Identify and describe operational characteristics of directional, proportional and servo valves
- Identify common problems with LVDT, settings, RVP basic settings and etc.
- Understand the Speed Probe operation
- Demonstrate knowledge on hydraulic oil used - type, temperature, gasket materials, tank filling and the need for cleanliness.

Prerequisites

Ovation - Turbine Control – OV370

COURSE OV230**Ovation System Administration****Overview**

The OV230 course was designed for the end-user charged with maintaining the integrity of the Ovation™ DCS. Students who attend this course will learn all the configuration parameters of the Ovation Developer Studio tree (ex. Quality Configuration, Alarm Configuration, Point Review Configuration, Right Click Menu Configuration), as well as all right click functions (ex. Control functions, Search, Engineer, Back/Restore). Backups will be discussed in detail and each student will perform a database restore.

Topics

Upon successful completion of this course and using the reference material provided, the student will be able to:

- Navigate and understand the Ovation™ Developer Studio
- Understand Ovation system licensing
- Implement Process control and user security in the Ovation system
- Apply system configuration changes to the Ovation system
- Add new and modify existing drops to the Ovation system
- Navigate and understand Ovation file systems, structure, sharing and security
- Backup the Ovation database and required files to various media
- Load an Ovation system
- Recover the Ovation database and required files from backup
- Understand upgrading and maintaining the Ovation hardware
- Use Developer Studio to implement given control requirements
- Map and share directories and files in the Windows environment

Prerequisites

OV100 and OV200 highly recommended

COURSE OV305**Ovation System Troubleshooting Advanced****Overview**

The OV400 course is offered to the end-user as a stand-alone or web-based exam or implemented with a pre-testing review at the Training Center. The student's proficiency is measured in areas related to database building, control implementation, control graphic linkage and troubleshooting on a system-wide basis. For both offerings, a multi-point examination is administered, and participants are required to achieve a grade score >80% to successful gain certification.

Topics

Upon completion of this course and achieving a successful level of competency in the online examination, the student will receive an Ovation™ certification award. This achievement affirms and recognizes that the student is fully cognizant and possesses the necessary skills to successfully engineer and maintain an Ovation control system for their organization. Student proficiency has been demonstrated in the following areas:

- Building saving and implementing the Oracle database
- Constructing control sheets using both Boolean and Analog logic
- Loading and configuring the Ovation™ Controller
- Designing graphics with control implementation
- Troubleshooting procedures as related to I/O and Controller modules

COURSE OV296/OV300**Ovation Third Party ELC/ Troubleshooting****Overview**

The OV296/OV300 is a combined and condensed version of the two courses. Offered over a 5-day period the condensed course will enable the students to configure, network, troubleshoot the Ethernet Link Controllers, third-party I/O and the Ovation™ system as-a-whole. Students will configure an ELC in Developer Studio and learn best practices when troubleshooting the Ovation DCS.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Configure third-party points
- Explain the purpose of an ELC and its addressing
- Download firmware to ELC module
- Interpret DCS error messages
- Perform systematic approach to fault analysis; isolate & correct the fault

COURSE OV11**Ovation Troubleshooting Using Applications****Overview**

This 5 - day course, as the title suggests, is to understand how to troubleshoot using the alarm package, point information and control logic. Trending, point review and system viewer are also presented. These necessary software tools are available without the use of Ovation Studio. Explore a device's alarm through point information and/or control schemes. Understand a controller's fault diagnostics using system status and system viewer. This course is taught with the support of Ovation workstations and controllers

Topics

- Review the major components of a typical Ovation Distributed Control System
- Review usage of Ovation Applications
- Utilize the Ovation Applications for live troubleshooting of processes and instruments

COURSE OV300**Ovation Troubleshooting****Overview**

The OV300 course is designed to provide the end-user with the skills and methods to troubleshoot and repair faults in the data acquisition and control functions of the Ovation™ system. Students will be required to isolate faults through-out the signal path- from field terminations to I/O modules, through the controller, across the network and onto the graphic display. Multiple problem scenarios will be presented.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify and resolve selected hardware, system administration and software problems
- Troubleshoot the system using documentation and available tools to analyze system faults or problem conditions
- Interpret system error messages
- Recognize and resolve problems with the system administration tool
- Using a systematic approach to fault analysis, isolate and correct selected network, port and printer faults

Prerequisites

Ovation – Data Acquisition – OV100,
Ovation – Building and Maintaining Ovation Control – OV200 and Ovation – Building Ovation Graphics – OV210

COURSE OV300V**Ovation Troubleshooting
[Virtual]****Overview**

The OV300 course is designed to provide the end-user with the skills and methods to troubleshoot and repair faults in the data acquisition and control functions of the Ovation™ system. Students will be required to isolate faults through-out the signal path- from field terminations to I/O modules, through the controller, across the network and onto the graphic display. Multiple problem scenarios will be presented.

Topics

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Identify and resolve selected hardware, system administration and software problems
- Troubleshoot the system using documentation and available tools to analyze system faults or problem conditions
- Interpret system error messages
- Recognize and resolve problems with the system administration tool
- Using a systematic approach to fault analysis, isolate and correct selected network, port and printer faults

Prerequisites

Ovation – Data Acquisition – OV100,
Ovation – Building and Maintaining
Ovation Control – OV200 and Ovation
– Building Ovation Graphics – OV210



PLC



COURSE 7700**PLC Controller Maintenance Logic Developer****Overview**

The Controller Maintenance - Logic Developer PLC course provides the student with the skills necessary to troubleshoot and repair faults in PLCs (90-30, 90-70, VersaMax, RX7i and RX3i). The class is taught using Logic Developer PLC software, which is part of the Machine Edition family of products and features the PACSystems RX3i Controller. The focus is on interpreting existing ladder logic programs for troubleshooting purposes. Students are taught how to use the troubleshooting tools to determine where faults have occurred and how to correct them.

Topics

- Control System Fundamentals
- Application components and Logic Structure
- Basic Controller Variables, Data Types, and Numbering Systems
- Controller Scan
- Controller Hardware Overview
- System hardware components
- Finding Information
- Operating Proficy Machine Edition
- Orientation to programming environment and tools
- Best-Kept Secrets
- Projects and Targets
- Configuring Controller and IO
- Configure Controller, IO, and Option Modules
- Status indicators
- Assign Reference Addresses
- Hardware Reference View
- Import/Export
- Reports
- Working with Controllers
- Establish communications
- Project Validation
- Upload / Download / Verify
- Fault Tables
- Controller Status
- Working with Variables
- Variable concepts
- Variable Types
- Variable Access
- Variable attributes
- Introduction to LD Programming
- Basic operation
- LD Editor
- Basic LD logic elements (contacts, coils, counters, timers, and relational operators)
- Monitor LD logic execution
- Monitor Application Variables
- Data Watch, Data Monitor Utility, and Reference View Tables
- Modify application Variables
- Using Variable References
- Monitor Controller Without Original Project
- Modify Existing Program
- Working with Rungs
- Connecting LD Logic
- Creating New Variables
- Controller Equality Status
- Equality Status indicators
- Determine Controller component equality
- How to gain Controller and Project Equality
- Manage Controller Forces
- Detect and locate Controller Forces
- Clear and Unforce Variables
- Application Troubleshooting
- Using Search, Cross References, and References
- Controller and IO Faults
- Use Faults to diagnose system issues
- Fatal and Nonfatal Faults
- Clear and print Faults
- Save Fault Tables to file

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of electrical/control fundamentals.

Audience

This course is intended for anyone who will be troubleshooting GE Intelligent Platforms PLC control systems using Proficy Logic Developer PLC Machine Edition software. The course is designed for electrical technicians, electricians, and/or engineers beginning to work with Logic Developer PLC, who will be tasked with modifying and maintaining PLC programs and hardware.

COURSE 7700V**PLC Controller Maintenance Logic Developer [Virtual]****Overview**

The Controller Maintenance - Logic Developer PLC course provides the student with the skills necessary to troubleshoot and repair faults in PLCs (90-30, 90-70, VersaMax, RX7i and RX3i). The class is taught using Logic Developer PLC software, which is part of the Machine Edition family of products and features the PACSystems RX3i Controller. The focus is on interpreting existing ladder logic programs for troubleshooting purposes. Students are taught how to use the troubleshooting tools to determine where faults have occurred and how to correct them.

Topics

- Control System Fundamentals
- Application components and Logic Structure
- Basic Controller Variables, Data Types, and Numbering Systems
- Controller Scan
- Controller Hardware Overview
- System hardware components
- Finding Information
- Operating Proficy Machine Edition
- Orientation to programming environment and tools
- Best-Kept Secrets
- Projects and Targets
- Configuring Controller and IO
- Configure Controller, IO, and Option Modules
- Status indicators
- Assign Reference Addresses
- Hardware Reference View
- Import/Export
- Reports
- Working with Controllers
- Establish communications
- Project Validation
- Upload / Download / Verify
- Fault Tables
- Controller Status
- Working with Variables
- Variable concepts
- Variable Types
- Variable Access
- Variable attributes
- Introduction to LD Programming
- Basic operation
- LD Editor
- Basic LD logic elements (contacts, coils, counters, timers, and relational operators)
- Monitor LD logic execution
- Monitor Application Variables
- Data Watch, Data Monitor Utility, and Reference View Tables
- Modify application Variables
- Using Variable References
- Monitor Controller Without Original Project
- Modify Existing Program
- Working with Rungs
- Connecting LD Logic
- Creating New Variables
- Controller Equality Status
- Equality Status indicators
- Determine Controller component equality
- How to gain Controller and Project Equality
- Manage Controller Forces
- Detect and locate Controller Forces
- Clear and Unforce Variables
- Application Troubleshooting
- Using Search, Cross References, and References
- Controller and IO Faults
- Use Faults to diagnose system issues
- Fatal and Nonfatal Faults
- Clear and print Faults
- Save Fault Tables to file

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of electrical/control fundamentals.

Audience

This course is intended for anyone who will be troubleshooting GE Intelligent Platforms PLC control systems using Proficy Logic Developer PLC Machine Edition software. The course is designed for electrical technicians, electricians, and/or engineers beginning to work with Logic Developer PLC, who will be tasked with modifying and maintaining PLC programs and hardware.

COURSE 7701

PLC Controller Maintenance Logic Developer

Overview

Learn programming for PACSystems, 90/70, 90/30, and VersaMax controllers in this Machine Edition class featuring the PACSystems RX3i Controller. This class covers programming techniques and the advanced features of the PACSystems Controller using Logic Developer PLC Machine Edition software. Starting with the controller software architecture, students are taught how to effectively develop control applications using building block concepts. This course builds upon Object-Oriented concepts with PACSystems User-Defined Function Blocks (UDFBs), as well as the development of application components using Ladder Diagram (LD), Structured Text (ST), and Function Block Diagram (FBD) programming languages. An optional PROFINET module is available.

Topics

- Control System Fundamentals
- Application components and Logic Structure
- Basic Controller Variables, Data Types, and Numbering Systems
- Controller Scan
- Operating Proficy Machine Edition
- Orientation to programming environment & tools
- Best-Kept Secrets
- Projects and Targets
- Machine Edition Options
- Working with Controllers
- Establish communications
- Project Validation
- Upload / Download / Verify
- Fault Tables
- Controller Status
- Controller Hardware Overview
- System hardware components
- Finding Information
- Configuring Controller and IO
- Configure Controller, IO, and Option Modules
- Status indicators
- Assign Reference Addresses
- Hardware Reference View
- Import/Export
- Reports
- Ladder Diagram Basics
- Ladder Diagram (LD) programming language basics
- Simple LD program with Contacts and Coils
- Assigning Variables
- Tool chest Drawer usage
- Proficy Machine Edition Tool chest
- Create and Share Tool chest Drawers
- Saving, using, and modifying Tool chest logic
- Universal Variables \$
- Online Monitoring Tools
- Logic Monitoring
- Data Watches
- Reference View Tables
- Data Monitor
- Online Application Modification
- Program changes while Controller is running
- Word-for-Word, Run Mode Store, and Test Edit
- Contacts and Coils
- Series and Parallel LD logic
- System Bits
- Find Variable references
- Monitor, modify, and force Boolean Variables
- Program Flow Operations
- Controller Block Architecture
- Operation of _MAIN and Interrupt Blocks
- Create and call Program Blocks
- Including Tool chest Program Blocks
- Timers and Counters
- Timer and Counter Instance Data
- Conversion Operations
- Change data display formats in LD Editor
- Math Operations
- Typed Instructions
- Change Variable data values directly in LD Editor
- Relational Operations
- Understand the basic operation of LD Relational instructions.
- Data Operations
- Initialize application data using Data Move Functions
- Basic Shift Register operation
- Control Operations
- PID Function Block
- Service Request Function
- Display Controller ASCII String information
- Bit Operations
- Masked Compare Function
- Working with Variables
- Variable concepts
- Variable Types
- Variable Access
- Variable attributes
- FBD Programming
- Create FBD Blocks and Logic
- Logic solve order
- FBD Comments and Instructions
- Edit and wire FBD logic
- Negative Boolean flow
- Assign FBD logic variables
- Change online values
- Monitor FBD logic
- Call UDFBs
- Editor configuration options
- Print logic
- FBD programming considerations
- Programming Guidelines
- Program organization and naming conventions
- User Defined Function Blocks
- UDFB Input, Output, and Member Variables
- UDFB operation
- Create and monitor UDFB
- UDFB Tool chest considerations
- Update existing UDFB
- Introduction to PROFINET [OPTIONAL]
- PROFINET overview
- PROFINET resources

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of electrical/control fundamentals.

Audience

This course is intended for those who are or will be involved in the development, modification, and troubleshooting of control systems using Proficy Logic Developer PLC and PACSystems Controllers.

COURSE 7702**PLC Operator Interface Programming QuickPanel & View****Overview**

The Operator Interface Programming - QuickPanel & View course familiarizes the student with operating in the Proficy View Machine Edition development environment, the QuickPanel+ machine level operator interface, creating operator interface graphical panels, writing scripts, configuring alarm & logging schemes, and running Projects on the operator interface device. Students are also introduced to the built-in Data Historian, Web Publishing, and Web Documents. An experienced instructor guides the student using demonstrations and hands on lab exercises.

Topics

- Introduction to Operator Interfaces
- Basic HMI Types, Benefits of an Operator Interface.
- Introduction to QuickPanel+ and to Proficy View.
- Open HMI Project, Download and Run on QuickPanel+.
- Operating Proficy Machine Edition
- Use the Machine Edition environment and its tools: Navigator, Inspector, Companion, Editor Workspace, Feedback Zone, Data Watch, InfoViewer, & Tool chest.
- Use the Tool chest for HMI development.
- Create a new Project with Logic and HMI Components.
- . Download and Run Project Using the Simulator.
- Going Online and use the Quick Test.
- Download and Run Project on QuickPanel+.
- Map the Machine Edition Controller's I/O.
- Create an HMI Project
- Working with View Targets in a Project.
- Configure PLC Access Drivers.
- Use Variables shared from a Controller Project.
- HMI Development Tools
- Build Operator Interface Panels using the Proficy View Graphic Editor and graphic drawing tools.
- Use Basic, Dynamic, Interactive, and Complex graphical objects.
- Animate objects and modify their appearance.
- Use Indexed Image and Message Grids.
- Create and Download an HMI Project Process Summary screen.
- Scripting
- Recognize how to apply scripts.
- Find help for scripting language commands, keywords, & functions.
- Create Panel, Application, & Touch Animation scripts.
- Validate, Run, & Debug an Active Script.
- Logging and Analyzing Data
- Create Logging Groups.
- Assign Project Variables to logging groups.
- Use TrendX chart to view logged data.
- Create a Chart object and view real-time data.
- Configure the View Historian Collector to archive device data.
- Alarms
- Differentiate variable alarm categories.
- Create and configure alarm groups.
- Assign alarms and alarm limits to Project Variables.
- Log Alarm Data and Track Alarm Events.
- Set up an alarm history file.
- Web Publishing and Access.
- Configure content for Web Access by publishing data.
- Create custom Web Documents.
- Interact with Project data through remote viewing.
- Conversion to QuickPanel+
- QuickPanel to QuickPanel+ conversion considerations.
- Convert QuickPanel Project to QuickPanel+.

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of control fundamentals.

Audience

This course is designed for programmers, operators, and application designers who are beginning to work with the QuickPanel+ Operator Interface that is programmed using Proficy View, who will be tasked with developing, modifying, and maintaining Operator Interface applications.

COURSE 7702V

PLC Operator Interface Programming QuickPanel & View [Virtual]**Overview**

The Operator Interface Programming - QuickPanel & View course familiarizes the student with operating in the Proficy View Machine Edition development environment, the QuickPanel+ machine level operator interface, creating operator interface graphical panels, writing scripts, configuring alarm & logging schemes, and running Projects on the operator interface device. Students are also introduced to the built-in Data Historian, Web Publishing, and Web Documents. An experienced instructor guides the student using demonstrations and hands on lab exercises.

Topics

- Introduction to Operator Interfaces
- Basic HMI Types, Benefits of an Operator Interface.
- Introduction to QuickPanel+ and to Proficy View.
- Open HMI Project, Download and Run on QuickPanel+.
- Operating Proficy Machine Edition
- Use the Machine Edition environment and its tools: Navigator, Inspector, Companion, Editor Workspace, Feedback Zone, Data Watch, InfoViewer, & Tool chest.
- Use the Tool chest for HMI development.
- Create a new Project with Logic and HMI Components.
- . Download and Run Project Using the Simulator.
- Going Online and use the Quick Test.
- Download and Run Project on QuickPanel+.
- Map the Machine Edition Controller's I/O.
- Create an HMI Project
- Working with View Targets in a Project.
- Configure PLC Access Drivers.
- Use Variables shared from a Controller Project.
- HMI Development Tools
- Build Operator Interface Panels using the Proficy View Graphic Editor and graphic drawing tools.
- Use Basic, Dynamic, Interactive, and Complex graphical objects.
- Animate objects and modify their appearance.
- Use Indexed Image and Message Grids.
- Create and Download an HMI Project Process Summary screen.
- Scripting
- Recognize how to apply scripts.
- Find help for scripting language commands, keywords, & functions.
- Create Panel, Application, & Touch Animation scripts.
- Validate, Run, & Debug an Active Script.
- Logging and Analyzing Data
- Create Logging Groups.
- Assign Project Variables to logging groups.
- Use TrendX chart to view logged data.
- Create a Chart object and view real-time data.
- Configure the View Historian Collector to archive device data.
- Alarms
- Differentiate variable alarm categories.
- Create and configure alarm groups.
- Assign alarms and alarm limits to Project Variables.
- Log Alarm Data and Track Alarm Events.
- Set up an alarm history file.
- Web Publishing and Access.
- Configure content for Web Access by publishing data.
- Create custom Web Documents.
- Interact with Project data through remote viewing.
- Conversion to QuickPanel+
- QuickPanel to QuickPanel+ conversion considerations.
- Convert QuickPanel Project to QuickPanel+.

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of control fundamentals.

Audience

This course is designed for programmers, operators, and application designers who are beginning to work with the QuickPanel+ Operator Interface that is programmed using Proficy View, who will be tasked with developing, modifying, and maintaining Operator Interface applications.

COURSE 7703**PLC PAC Productivity Suite Introduction****Overview**

The Proficy Process Systems Fundamentals course is designed to provide a good working knowledge of Proficy Process Systems. This course explores the solution architecture, features and configuration tools from the controller, through Data Acquisition and Management to Visualization. Valuable hands-on lab exercises are provided to guide students through the building and modification of the system and its constituent components.

Topics

- Introduction to Proficy Process Systems
- An overview of the Proficy Process Systems and its solutions.
- Eng. Workstation: Controllers & IO
- Use the EWS to prepare a PPS controller
- Creating a Project
- Configure fundamental project settings to prepare for development.
- Hardware Configuration
- Configure the controllers.
- Programming with Logic Developer
- Provide an orientation to the control programming environment.
- PPS Function Blocks
- Use PPS Function Blocks to build controller logic.
- Ethernet Global Data (EGD)
- See how the Global Namespace is constructed and driven by EGD.
- EWS- CIMPLICITY Project Essentials
- Prepare CIMPLICITY for PPS visualization.
- EWS- iFIX Project Essentials
- Prepare iFIX for PPS visualization.
- EWS- CIMPLICITY visualization
- Use CIMPLICITY to build displays using PPS face plates and the Global Namespace.
- EWS iFIX visualization
- Use iFIX to build displays using PPS face plates and the Global Namespace.
- Hardware and IO Networks
- Receive an overview of PPS Hardware and IO design principles.
- Controller-Based Alarming
- Set Alarming in the Controllers.
- Building Alarm Displays – CIMPLICITY
- Use EWS-CIMPLICITY to view
- Building Alarm Displays – iFIX
- Use EWS- iFIX tools to build Alarm Displays.
- EWS utilities
- Explore useful EWS utilities for development, troubleshooting and maintenance.
- Build Reusable Code
- Discover the power of User Defined Function Blocks (UDFBs).
- Historian
- Archive important system data values.
- Change Management
- Control access and changes to system files. Provide version control of critical configuration files.
- Explore a Sample Project
- Work inside a fully functioning sample system.

Prerequisites

Participants should have a working knowledge of Windows operating systems. Control Systems experience and knowledge is an asset.

Audience

This course is designed for process, automation or instrumentation engineers and system integrators who will be developing, configuring and using applications on a fully integrated Proficy Process System.

COURSE 7704V

CEUs: 2.4

Movicon NExT Introduction [Virtual]**Overview**

This course explains the basic fundamentals of the Movicon.NExT industrial software solution. The course uses lectures and labs to teach the students.

Topics

- · Introduction
- · Software Installation
- · Programming Environment
- · I/O Data Server
- · Client and Surroundings
- · Alarms
- · Historian and Data Logger
- · Trend and Data Analysis
- · Text and Languages
- · Security and User Management
- · Schedulers and Events
- · Recipes
- · WebClients

Objectives

Those who complete this class will be able to:

- Create a Movicon.NExT Project along with basic HMI screen layout with animated elements.
- Configure I/O communications with multiple I/O data sources.
- Configure Alarms, Data Logging, and Data Trending for collection and display on HMI screens.

Prerequisites

Participants should be comfortable operating in a Microsoft Windows environment, and have a basic understanding of control fundamentals

Audience

This course is designed for process, automation or instrumentation engineers and system integrators who will be developing and configuring HMI solutions using the Movicon.NExT industrial software solution.

COURSE 7705V

CEUs: 2.4

Movicon NExT Advanced [Virtual]**Overview**

This follow-up course builds on the basic fundamentals of the Movicon.NExT industrial software solution to learn how to utilize advanced features such as Power Template and 3D Graphics. The course uses lectures and labs to teach the students.

Topics

- Screen Parametrization
- Power Templates
- Alias on Objects
- OPC-UA - Setting up and configuring in software
- VB.NET Scripting
- 21 CFR Part11 compliance
- D Graphics
- Alarm Dispatcher

Objectives

Those who complete this class will be able to:

- Apply Movicon.NExT tools, such as Screen Parametrization, Power Templates, and Aliases for effective HMI application development.
- Set up and configure OPC-UA communications.
- Create and debug logic written in VB.NET Script
- Understand basic concepts of using 3D graphics
- Configure and apply the Alarm Dispatcher.

Prerequisites

Participants should be familiar with the Movicon.NExT programming environment and its basic functions.

Audience

This course is designed for process, automation or instrumentation engineers and system integrators who will be developing and configuring HMI solutions using the Movicon.NExT industrial software solution.

REGULATORS & RELIEF VALVES



COURSE 8000	CEUs: 3.2	COURSE 8005V	CEUs: 1.8	COURSE 1100	CEUs: 2.1	COURSE 1100V	CEUS 2.1
<p>Regulators Gas Control Conference</p> <p>Overview This 4-1/2 day conference demonstrates the fundamentals of natural gas regulators in gas pressure control. This course emphasizes natural gas distribution and also covers natural gas transmission.</p> <p>Topics Students who complete this conference will be able to:</p> <ul style="list-style-type: none"> Evaluate the difference between direct-operated and pilot-operated regulators Evaluate the different methods of overpressure protection Properly size regulators for natural gas applications Troubleshoot a wide variety of regulator types <p>Prerequisites At least one year's experience in the field of natural gas pressure regulation is recommended.</p> <p>Audience This conference is for those responsible for the selection, application, and operation of regulators in the natural gas industry.</p>	<p>Regulators Gas Control Seminar [Virtual]</p> <p>Overview This virtual seminar is for those responsible for the selection, application, and operation of regulators in the natural gas industry. The seminar will last for 5 half-days and be presented Monday through Friday, 8:00 a.m. - noon each day. The seminar emphasizes natural gas distribution and also covers natural gas transmission.</p> <p>Topics</p> <ul style="list-style-type: none"> Self-Operated Regulators Regulator Design & Technology Testing Regulators Disassembling regulators Sizing Pilot-Operated Regulators Overpressure Protection Safety Relief Valves Second Layers of Overpressure Protection Testing Relief Valves Wide-Open Monitors and Working Monitors Troubleshooting Safety Relief Severe Service <p>Prerequisites None</p> <p>Audience Natural Gas Industry Engineers and Engineering Management who work with Pressure Relief Valves and Regulators</p>	<p>Regulators & Relief Valves Gas Regulator</p> <p>Overview This 3-day course is designed primarily for technicians responsible for the installation and maintenance of natural gas regulators. Emphasizing hands-on training, this course teaches students to install and adjust regulators. Students who complete this course will be able to:</p> <ul style="list-style-type: none"> Perform maintenance on regulators Understand field problems <p>Topics:</p> <ul style="list-style-type: none"> Self-Operated Regulators Pilot-Operated Regulators Overpressure Protection Series Regulation Monitors Slam Shut Options Regulator Failure Analysis Installation Guidelines <p>Prerequisites: At least one year's field experience with natural gas regulators is recommended.</p> <p>Audience This course is designed primarily for technicians responsible for the installation and maintenance of natural gas regulators.</p>	<p>Regulators & Relief Valves Gas Regulator [Virtual]</p> <p>Overview This course is designed primarily for technicians responsible for the installation and maintenance of natural gas regulators. Emphasizing hands-on training, this 5 day (1/2 days) course teaches students to install and adjust regulators.</p> <p>Topics</p> <ul style="list-style-type: none"> Self-Operated Regulators Pilot-Operated Regulators Overpressure Protection Installation and Troubleshooting Failure Analysis <p>Prerequisites None</p> <p>Audience Natural Gas Regulator Technicians</p>				

COURSE E7601

CEUs: 0.5

Regulators & Relief Valves Principles of Self-Operated Regulators

Overview

This online training includes audio presentations to provide an in-depth overview of available Mimic features and applications. Better understand how to easily build and maintain your Mimic simulation system.

Note

Course access is 12 months.

Topics

- Accessing and starting Mimic applications
- Setup procedures for Simulated I/O Drivers
- Navigation in Mimic Explorer
- Modeling in the Simulation Studio interface
- Discrete and Analog modeling
- Building unit operation models
- Configuring Advanced Modeling Objects
- Database generation utilities
- Using Operator Training Manager
- Building training scenarios and instructor screens
- Freezing and restoring process snapshots

Prerequisites

At least one year's experience in the field of natural gas pressure regulation is recommended.

Audience

Operators, supervisors, and managers responsible for operating and maintaining the Mimic simulation system.

COURSE 8

CEUs: 1.8

Regulators & Relief Valves Industrial Regulator

Overview

Emphasizing hands-on training, this course teaches students to install, troubleshoot, and adjust regulators specific to the Industrial Market.

Topics

Students who complete this course will be able to do the following:

- Perform maintenance on regulators
- Troubleshoot field problems

Audience

This course is designed primarily for technicians responsible for the installation and maintenance of industrial regulators.

COURSE 1114

CEUs: 2.1

PRV University

Overview

This course is designed for those responsible for the sizing, selection, application, and operation of pressure relief devices across industries. Technical expertise is provided to help designers and engineers meet pressure vessel code requirements and attain optimum pressure relief valve performance. During this 3-day course, each attendee will receive an engineering handbook containing materials covered in the seminar and a Certificate of Achievement that will contain the name, date, title, and material content of the seminar. This course may be used to fulfill the continuing education requirements for Professional Engineering certifications. Contact the state or local agency in your area to determine if this seminar can be used for your program

Topics:

- Principles of Operation
- ASME Pressure Vessel Code Requirements
- API Storage Tank Standards and Recommended Practices
- Advantages and Limitations of PRV Types
- Installation and Applications of Pressure Relief Devices
- Pressure Relief Device Hands-on Circuit | Assembly and Testing Facility Tour
- Operational Demonstrations of Devices at our ASME Certified Testing Laboratory

Audience

Customers of Anderson Greenwood, Crosby, and Varec. This would include designers and engineers.

COURSE 1106

CEUs: 2.1

Regulators & Relief Valves Gas Regulators Troubleshooting

Overview

This 3-day course is designed primarily for technicians responsible for the installation and maintenance of natural gas regulators. Emphasizing hands-on training, this course teaches students to install and adjust regulators. Students who complete this course will be able to:

- Efficiently and safely troubleshoot common regulator operational performance problems
- Understand the influence of the service environment on regulator performance
- Understand the importance of correct installation procedures
- Understand the role of correct sizing as it impacts regulator performance
- Perform maintenance on regulators and troubleshoot field problems

Topics

- Review Self-Operated and Pilot-Operated Regulator Fundamentals and Overpressure Protection
- Sizing Overview for Technicians (as requested)
- Overpressure Protection
- Sizing Overview for Technicians
- Regulator Troubleshooting Principles, Procedures, and Best Practices including:
- Failure Analysis
- Stability Issues
- Installation Practices
- Pilot Interchangeability Practices
- Advanced Monitor Operations & Maintenance

Prerequisites

Completion of Gas Regulators - 1100 Or two years' experience with regulators.

Audience

This course is designed primarily for technicians with responsibility for installing, maintaining, and troubleshooting gas regulators.

ENERGY & TRANSPORTATION SOLUTIONS



COURSE RA1100

CEUs: 1.4

Energy & Transportation Solutions Electronic Gas Measurement API 21.1 Standard & Emerson Flow Computer

Overview

This 2-day course will provide a hands-on overview of API 21.1 standard for Electronic Gas Measurement and the Emerson FB1000/2000 Series Flow Computers. Participants are presented with the API standards while engaging in direct hands-on correlation to the flow computer's features for measurement, auditing and archiving, and more. Gain the necessary knowledge to effectively installation, configuration and maintenance. Each student will be provided with a PC with preinstalled software and all necessary hardware and courseware for the duration of the class. Participants are encouraged to bring their PC.

Topics

Introduction

- Hardware Options
- I/O Options
- Calibrating the AI and AO
- FBxConnect Software
- Elements of Basic Configuration

Configuring the Flow Computer

- Communication Basics
- Setting the Flow Computer clock
- Alarm and Events Logs
- History layout
- Backing Up and Restoring Configurations
- Logic Blocks / Math Blocks
- Final Exercise
- Summary of course

Prerequisites

Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems.

Audience

This Energy & Transportation Solutions course is for engineers, technicians, and others involved with the configuration and operation of the FBXX series products.

COURSE RA1100V

CEUs: 1.4

Energy & Transportation Solutions Electronic Gas Measurement API 21.1 Standard & Emerson Flow Computer [Virtual]

Overview

This 2-day course will provide a hands-on overview of API 21.1 standard for Electronic Gas Measurement and the Emerson FB1000/2000 Series Flow Computers. Participants are presented with the API standards while engaging in direct hands-on correlation to the flow computer's features for measurement, auditing and archiving, and more. Gain the necessary knowledge to effectively installation, configuration and maintenance. Each student will be provided with a PC with preinstalled software and all necessary hardware and courseware for the duration of the class. Participants are encouraged to bring their PC.

Topics

Introduction

- Hardware Options
- I/O Options
- Calibrating the AI and AO
- FBxConnect Software
- Elements of Basic Configuration

Configuring the Flow Computer

- Communication Basics
- Setting the Flow Computer clock
- Alarm and Events Logs
- History layout
- Backing Up and Restoring Configurations
- Logic Blocks / Math Blocks
- Final Exercise
- Summary of course

Prerequisites

Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems.

Audience

This Energy & Transportation Solutions course is for engineers, technicians, and others involved with the configuration and operation of the FBXX series products.

COURSE RA331

CEUs: 1.8

Energy & Transportation Solutions ControlWave Troubleshooting Configuration

Overview

This 2-1/2-day hands-on course covers the hardware, troubleshooting, configuration and maintenance of the ControlWave product family. This course will equip you with the necessary knowledge and practice needed to troubleshoot common problems and configure the ControlWave hardware. Learn to utilize software application programs to perform diagnostics and monitor live data and communication statistics.

Topics

- Overview of ControlWave Hardware
- Overview of OpenBSI Software Utilities
- Basic Troubleshooting
- Basic ControlWave Configuration

Prerequisites

Participants must be thoroughly familiar with Windows 2000/ XP or later versions. Participants should have formal instrument technician training and a working knowledge of their application/process.

Audience

Field personnel whose responsibilities may include: installation, wiring, start-up, troubleshooting, configuration or maintenance of the ControlWave products. An individual who seeks a more thorough understanding of the ControlWave products.

COURSE RA331V

CEUs: 1.8

Energy & Transportation Solutions ControlWave Troubleshooting Configuration [Virtual]

Overview

This 2-1/2-day hands-on course covers the hardware, troubleshooting, configuration and maintenance of the ControlWave product family. This course will equip you with the necessary knowledge and practice needed to troubleshoot common problems and configure the ControlWave hardware. Learn to utilize software application programs to perform diagnostics and monitor live data and communication statistics.

Topics

- Overview of ControlWave Hardware
- Overview of OpenBSI Software Utilities
- Basic Troubleshooting
- Basic ControlWave Configuration

Prerequisites

Participants must be thoroughly familiar with Windows 2000/ XP or later versions. Participants should have formal instrument technician training and a working knowledge of their application/process.

Audience

Field personnel whose responsibilities may include: installation, wiring, start-up, troubleshooting, configuration or maintenance of the ControlWave products. An individual who seeks a more thorough understanding of the ControlWave products.

COURSE RA441

CEUs: 3.2

Energy & Transportation Solutions ControlWave Designer Introduction

Overview

This 4-1/2-day hands-on course covers programming the ControlWave product family using the ControlWave Designer IEC61131-3 software and the Designer function block library. This course will provide the participant the necessary knowledge and skills required to define and control inputs and outputs of related real-world applications. Participants will generate and debug simple control strategy programs using Function Block, Ladder Logic, Structured Text, and Sequential Function Chart programming. They will also learn the basics of ControlWave communications, historical data storage, alarming, hardware configurations and much more.

Topics

- Ladder Logic
- Structured Text
- Function Block Diagram
- Creating User Function Blocks

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version. Participants should have a strong working knowledge of their application/process

Audience

Personnel responsible for programming and debugging in ControlWave Designer programming software.

COURSE RA441C

Energy & Transportation Solutions ControlWave Designer Introduction (Custom)

Overview

This ControlWave Designer 2 day course provides the knowledge and skill required to define and control inputs and outputs of related real world applications, including basic communications and troubleshooting in an Interactive Plant Environment (IPE), with live equipment. The class project will help students generate and debug simple control strategy programs using Function Block, Ladder Logic, and Structured Text programming languages.

Topics

Day 1

- ControlWave Designer Overview
- ControlWave File Conventions
- Program Organization Units (POU)
- Functions, Function Blocks, Programs
- Variables/ Types
- Tasks/ Program Instances
- Configuring ControlWave Flash Memory Parameters

Day 2

- I/O Configuration to Field Equipment
- Verify that Values on Software match Field Equipment and Troubleshoot as needed
- Programming Languages Ladder Logic, Function Block Diagram, Structured Text
- Class Exercise with PID, verify Control Valve Responds Accordingly based on changes in Pressure in IPE.
- ALARM Function Blocks
- Programming for Alarms
- Programming for Audits/ Archives
- Debugging Techniques on Live Equipment
- Troubleshooting tips
- Establishing User Libraries
- Creating User Library of Function Blocks

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version. Participants should have a strong working knowledge of their application/process.

Audience

A hands-on course that will give you as much exposure to ControlWave programming as possible in the shortest amount of time. Using the Interactive Plant Environment you will be connected to field devices and see live values from those devices as well as troubleshooting when necessary.

COURSE RA441V

CEUs: 3.2

Energy & Transportation Solutions ControlWave Designer Introduction [Virtual]

Overview

This 4-1/2-day hands-on course covers programming the ControlWave product family using the ControlWave Designer IEC61131-3 software and the Designer function block library. This course will provide the participant the necessary knowledge and skills required to define and control inputs and outputs of related real-world applications. Participants will generate and debug simple control strategy programs using Function Block, Ladder Logic, Structured Text, and Sequential Function Chart programming. They will also learn the basics of ControlWave communications, historical data storage, alarming, hardware configurations and much more.

Topics

- Ladder Logic
- Structured Text
- Function Block Diagram
- Creating User Function Blocks

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version. Participants should have a strong working knowledge of their application/process

Audience

Personnel responsible for programming and debugging in ControlWave Designer programming software.

COURSE RA440

CEUs: 1.8

Energy & Transportation Solutions ControlWave Designer Programming

Overview

A hands-on course that will give you as much exposure to ControlWave programming as possible in the shortest amount of time. The ControlWave Designer short 2 ½ day course provides the knowledge and skill required to define and control inputs and outputs of related real-world applications, including basic communications and troubleshooting. The class project will help students generate and debug simple control strategy programs using Function Block, Ladder Logic, and Structured Text programming languages, including programming for Modbus communications.

Topics

- Understand How IEC-61131-3, ControlWave Designer and On-Line Utilities Work
- Master Skills Necessary to Create a Program for ControlWave Controllers
- Learn the Bristol Library of Function Blocks for Measurement, Calculations, Process Control, Data Storage
- Understand OpenBSI Communications Software
- Master How to Establish Ethernet/IP Communications using ControlWave Designer
- Learn to Program Polling and Data Transfers in BSAP and an I/O Environment
- Understand How to Define a Hierarchical Network of ControlWave Controllers using NetView
- Understand the Configuration of Communication via other Protocols such as Modbus

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version. Participants should have a strong working knowledge of their application/process. Participants should have programming experience (this course is not recommended for beginner programmers).

COURSE RA440V

CEUs: 1.8

Energy & Transportation Solutions ControlWave Designer Programming [Virtual]

Overview

A hands-on course that will give you as much exposure to ControlWave programming as possible in the shortest amount of time. The ControlWave Designer short 2 ½ day course provides the knowledge and skill required to define and control inputs and outputs of related real-world applications, including basic communications and troubleshooting. The class project will help students generate and debug simple control strategy programs using Function Block, Ladder Logic, and Structured Text programming languages, including programming for Modbus communications.

Topics

- Understand How IEC-61131-3, ControlWave Designer and On-Line Utilities Work
- Master Skills Necessary to Create a Program for ControlWave Controllers
- Learn the Bristol Library of Function Blocks for Measurement, Calculations, Process Control, Data Storage
- Understand OpenBSI Communications Software
- Master How to Establish Ethernet/IP Communications using ControlWave Designer
- Learn to Program Polling and Data Transfers in BSAP and an I/O Environment
- Understand How to Define a Hierarchical Network of ControlWave Controllers using NetView
- Understand the Configuration of Communication via other Protocols such as Modbus

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version. Participants should have a strong working knowledge of their application/process. Participants should have programming experience (this course is not recommended for beginner programmers).

COURSE RA443**CEUs: 3.2****Energy & Transportation Solutions ControlWave® Designer Programming Accelerated****Overview**

Save time and money by attending this fast-paced, hands-on course for programming the ControlWave® product family using IEC-61131-3 standard software and Bristol®-supplied functions. This course provides you with the knowledge and skills required to define and control inputs and outputs of related real-world applications, including communications and troubleshooting. Students will generate and debug control strategy programs using several programming languages while learning the basics of ControlWave network communications, historical data storage, alarming, and hardware configurations, including MODBUS communications.

Topics

- Flash Memory Communication Configuration via Local View
- Ladder Logic
- Function Block Diagram
- Debugging Techniques
- Programming for Audits/Archives/Alarms
- Establishing User Libraries

Prerequisites

- Participants must have a strong working knowledge of personal computers and Windows 2000/ XP or a later version
- Participants must have a strong working knowledge of their application/ process
- Participants should have some programming experience.
- Participants should have completed Creating a Simple Project.

Audience

Personnel responsible for the establishing of communication interfaces to ControlWave Automation products.

COURSE RA445**CEUs: 1.8****Energy & Transportation Solutions ControlWave® Gas Measurement Products****Overview**

The ControlWave Gas Measurement 2-1/2-day course provides participants with a thorough understanding of configuring the ControlWave® GFC, EFM, and XFC Flow Computers for single or multiple-run gas measurement. As a hands-on course, students will use TechView to collect historical logs, calibrate internal and external pressure sensors, and gain troubleshooting techniques for real world applications.

Topics

- Hardware Configuration
- TechView Software Overview
- Log Collection
- Troubleshooting
- Configuring 4-Run Gas Application

Prerequisites

The following are suggested, not mandatory:

- Participants should have a working knowledge of their application/process
- Participants should be familiar with Windows 2000/ XP or later versions and possess a general knowledge of gas measurement and production

Audience

Personnel responsible for the installation, wiring, start-up, configuration and maintenance of ControlWave gas flow computers

COURSE RA444V**CEUs: 0.4****Energy & Transportation Solutions ControlWave Modbus Programming for ControlWave Devices [Virtual]****Overview**

This 4-hour Virtual Course provides the knowledge and skill required to programming for Modbus communications in ControlWave Devices. Each student will be provided remote access to a PC (ControlWave Designer installed), and connection to ControlWave device for programming and downloading capability.

Prerequisites

Participants should have:

- Completed course RA441 or have sufficient programming experience in ControlWave Designer.
- A strong working knowledge of personal computers and Windows XP or a later version.
- A strong working knowledge of their application/process.

Audience

This course is for engineers, technicians, and others involved with programming the ControlWave for Modbus communications.

COURSE RA447

CEUs: 1.8

Energy & Transportation Solutions ControlWave® Station Manager Configuration

Overview

The Gas Measurement Applications for technicians 2 ½ day course provides students with a thorough understanding of configuration of the Station Manager application for the ControlWave Micro. Participants will use TechView to configure the ControlWave Micro application to establish multiple gas measurement and control scenarios, historical log collections, calibrations, and much more.

Topics

- Hardware Overview
- Writing/Saving Configurations
- I/O Controls
- MVT Calibration
- Station Configuration

Prerequisites

The following are suggested, not mandatory:

- Participants should have a working knowledge of their application/process.
- Participants should be familiar with Windows XP or later versions and poses a general knowledge of gas measurement and production.

Audience

Personnel responsible for the installation, wiring, start-up, configuration and maintenance of ControlWave gas flow computers

COURSE RA447V

CEUs: 1.8

Energy & Transportation Solutions ControlWave® Station Manager Configuration [Virtual]

Overview

The Gas Measurement Applications for technicians 2 ½ day course provides students with a thorough understanding of configuration of the Station Manager application for the ControlWave Micro. Participants will use TechView to configure the ControlWave Micro application to establish multiple gas measurement and control scenarios, historical log collections, calibrations, and much more.

Topics

- Hardware Overview
- Writing/Saving Configurations
- I/O Controls
- MVT Calibration
- Station Configuration

Prerequisites

The following are suggested, not mandatory:

- Participants should have a working knowledge of their application/process.
- Participants should be familiar with Windows XP or later versions and poses a general knowledge of gas measurement and production.

Audience

Personnel responsible for the installation, wiring, start-up, configuration and maintenance of ControlWave gas flow computers

COURSE RA441C

CEUs: 1.4

Energy & Transportation Solutions ControlWave® Designer Introduction (Custom)

Overview

This ControlWave Designer 2.5 day course provides the knowledge and skill required to define and control inputs and outputs of related real world applications, including basic communications and troubleshooting in an Interactive Plant Environment (IPE), with live equipment. The class project will help students generate and debug simple control strategy programs using Function Block, Ladder Logic, and Structured Text programming languages.

Topics

Day 1

- ControlWave Designer Overview
- ControlWave File Conventions
- Program Organization Units (POU)
- Functions, Function Blocks, Programs
- Variables/ Types
- Tasks/ Program Instances
- Configuring ControlWave Flash Memory Parameters

Day 2

- I/O Configuration to Field Equipment
- Verify that Values on Software match Field Equipment and Troubleshoot as needed
- Programming Languages Ladder Logic, Function Block Diagram, Structured Text
- Class Exercise with PID, verify Control Valve Responds accordingly based on changes in Pressure in IPE.
- ALARM Function Blocks
- Programming for Alarms Programming for Audits/ Archives
- Debugging Techniques on Live Equipment
- Troubleshooting tips
- Establishing User Libraries
- Creating User Library of Function Blocks

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or a later version Participants should have a strong working knowledge of their application/process Participants should have programming experience (this course is not recommended for beginning programmers).

Audience

A hands-on course that will give you as much exposure to ControlWave programming as possible in the shortest amount of time. Using the Interactive Plant Environment you will be connected to field devices and see live values from those devices as well as troubleshooting when necessary.

COURSE RA442

CEUs: 3.2

Energy & Transportation Solutions ControlWave® Designer Communication Programming

Overview

This 4-1/2-day course is a continuation of ControlWave® Designer Fundamentals course focusing on networking and communications. Participants will program the ControlWave to communicate to other devices in a network, as well as transfer and receive signal lists using serial and IP communications. Other application software will be utilized to configure, establish, and debug communications with these devices. Participants will learn the advanced methods of communicating to Bristol and ControlWave devices using Client/Server modules, and to Modbus protocol devices using custom function blocks.

Topics

- Client/Server Function Blocks
- Modbus Programming
- System Communication Variables
- BSAP Network Communications

Prerequisites

Successful completion of course RA441, ControlWave Designer Fundamentals. Participants must have a strong working knowledge of personal computers and Windows XP or later version. Participants should have a strong working knowledge of their application/process

Audience

Personnel responsible for the establishing of communication interfaces to ControlWave Automation products

COURSE RA442V

CEUs: 3.2

Energy & Transportation Solutions ControlWave® Designer Communication Programming [Virtual]

Overview

This 4-1/2-day course is a continuation of ControlWave® Designer Fundamentals course focusing on networking and communications. Participants will program the ControlWave to communicate to other devices in a network, as well as transfer and receive signal lists using serial and IP communications. Other application software will be utilized to configure, establish, and debug communications with these devices. Participants will learn the advanced methods of communicating to Bristol and ControlWave devices using Client/Server modules, and to Modbus protocol devices using custom function blocks.

Topics

- Client/Server Function Blocks
- Modbus Programming
- System Communication Variables
- BSAP Network Communications

Prerequisites

Successful completion of course RA441, ControlWave Designer Fundamentals. Participants must have a strong working knowledge of personal computers and Windows XP or later version. Participants should have a strong working knowledge of their application/process

Audience

Personnel responsible for the establishing of communication interfaces to ControlWave Automation products

COURSE RA443V

CEUs: 4.5

Energy & Transportation Solutions ControlWave® Designer Programming Accelerated

Overview

Save time and money by attending this fast-paced, virtual course for programming the ControlWave® product family using IEC-61131-3 standard software and Bristol-supplied functions. This course provides you with the knowledge and skills required to define and control inputs and outputs of related real world applications, including communications and troubleshooting. Students will generate and debug control strategy programs using several programming languages while learning basics of CONTROLWAVE® network communications, historical data storage, alarming and hardware configurations, including MODBUS communications.

Topics

- Flash Memory Communication Configuration via Local View
- Ladder Logic
- Function Block Diagram
- Debugging Techniques
- Programming for Audits/Archives/Alarms
- Establishing User Libraries

Prerequisites

Participants must have strong working knowledge of personal computers and Windows 2000/XP or a later version. Participants must have a strong working knowledge of their application/process. Participants should have some programming experience.

Audience

Personnel responsible for the establishing of communication interfaces to ControlWave products.

COURSE RA446V**CEUs: 0.4****Energy & Transportation Solutions
Creating Your Own Function Block Using
ControlWave Designer****Overview**

This 4-hour virtual course provides the knowledge and skill required to create your own Function Block from existing Function Blocks using ControlWave Designer software to test and trouble shoot the final project. Each student will be provided remote access to a PC (ControlWave Designer installed).

Prerequisites

Participants should have completed courses RA440 and RA441 or have sufficient programming experience in ControlWave Designer. Participants should have a strong working knowledge of personal computers and Windows 7 or a later version. Participants should have a strong working knowledge of their application/process.

Audience

This course is for engineers, technicians and others involved with programming ControlWave.

COURSE RA1220**CEUs: 3.2****Energy & Transportation Solutions
FloBoss™ Configuration & Operations****Overview**

This 4-1/2-day course will provide an overall working knowledge of the FloBoss™ 103, FloBoss 107. Participants are presented with a comprehensive view of the FloBoss 103/107 hardware and ROCLINK800 software to obtain the necessary knowledge needed to effectively install, configure and maintain the FloBoss 103/107 products. Each student will be provided with a PC (ROCLINK800 preinstalled), a FloBoss 107RTU, a communications cable and a workbook for the duration of the class. However, participants are encouraged to bring their laptop to class.

Topics

- Flow Measurement Review
- FloBoss™ 103/107 Hardware Overview
- FloBoss
 - Check and Set ROC Information
 - Check and Set ROC System Flags
 - Communication Basics
 - Elements of a Basic Configuration
 - Configuring I/O Points
 - Calibrating AI and AO Points
 - Overview of MVS Products
 - Setup of Multi-dropping of MVS
 - Configuring AGA Flow Calculations
 - Configuring FloBoss History
 - Modbus Tables
 - PID Configuration
 - Building FloBoss Displays
 - FST Workshop

Prerequisites

Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy & Transportation Solutions course is for engineers, technicians and others involved with the configuration and operation of the FloBoss™ 103 and 107 products.

COURSE RA601**CEUs: 0****Energy & Transportation Solutions DNP3
Protocol Introduction****Overview**

This 1/2 day hands on virtual course provides a basic understanding of DNP3 Protocol used in the FB3000 RTU. Participation will include configurations to map the FB3000 and monitor live data.

Topics

- SCADA overview
- History of DNP
- DNP Terms and Definitions
- DNP Pros / Cons
- Understanding a DNP Network
- Understanding Events and Event Buffering
- Understanding DNP3 Groups, Classes and Variations
- FB3000 supported Groups and Variations

Objectives

- To provide basic understanding of DNP3 protocol.
- To ensure users understand how to configure the FB3000 for DNP3 communications

Audience

SCADA and field personnel whose responsibilities may include:

- Installation
- Start up
- Troubleshooting
- Configuration or maintenance of the FB3000 products

COURSE RA1250V CEUs: 0.35**Energy & Transportation Solutions FloBoss Modbus Configuration for ROC800 & FloBoss [Virtual]****Overview**

This 4-hour Virtual Course will provide an overall working knowledge of configuring the ROC800 and FloBoss™ Series for Modbus communications. Each student will be provided remote access to a PC (ROCLINK preinstalled), and a Energy & Transportation Solutions RTU device

Topics

- Configuration for Modbus Slave
- Configuration for Modbus Master
- Modbus Serial IP
- Basic Modbus Troubleshooting

Prerequisites

Completed course RA1220 or RA1240 or have sufficient working knowledge of configuring the ROC800 or FloBoss. Basic PC knowledge and familiar with Microsoft Windows operating systems (XP or later version).

Audience

This course is for engineers, technicians, and others interested in understanding the configuration and operation of the ROC800 using the SmartProcess Oil and Gas Applications.

COURSE RA1160V**Energy & Transportation Solutions FB3000 Demo Introduction [Virtual]****Overview**

This no-cost 2 hour short course utilizes the Virtual Classroom to provide a basic configuration of the FB3000 RTU device.

Topics

- How Virtual Learning works
- Basic configuration selections using Field Tools software.

Prerequisites

None

Audience

This Energy & Transportation Solutions course is for engineers, technicians and others involved with the configuration and operation of the FloBoss™ 103 and 107 products.

COURSE RA620**CEUs: 1.4****Energy & Transportation Solutions FB3000 Hardware Configuration****Overview**

This 2-day hands-on course covers the hardware, configuration and maintenance of the FB3000 RTU. This course will equip you with the necessary knowledge and practice needed to configure the FB3000 hardware for communications and I/O as well as Field Tools Software. Learn how to troubleshoot and utilize software application programs to monitor live data and communication statistics.

Topics**Day 1**

- Intro to the FB3000
- Hardware Options
- Personality Modules
- Downloading/ Uploading a Configuration
- Saving a Configuration
- Local Serial Communications
- Mini USB Communications
- I/P Communication Setup
- Flashing Firmware
- File Types Used
- Replacing Boards
- Interpreting Status LED's?
- Memory Types Used

Day 2

- Using Field Tools Software
- Replacing Battery on CPU and Power Modules
- Setting up a AGA3 Configuration
- Setting up a AGA7 Configuration
- Configuring for History and Events
- Creating and Saving Configurations
- Cold Start/Warm Start Differences
- Configuring for Alarms
- Basic Troubleshooting Examples
- Using the Guided Setup Wizard
- Intro to Math Blocks
- Calibration

Prerequisites

Participants should have formal instrument technician training and a working knowledge of their application/process

- Participants must be thoroughly familiar with Windows10

Audience

Field personnel whose responsibilities may include:

- Installation
- Wiring, start-up
- Troubleshooting
- Configuration or maintenance of the FB3000 products
- An individual who seeks a more thorough understanding of the FB3000 products

COURSE RA620V

CEUs: 1.4

Energy & Transportation Solutions FB3000 Hardware Configuration [Virtual]**Overview**

This 2-day hands-on course covers the hardware, configuration and maintenance of the FB3000 RTU. This course will equip you with the necessary knowledge and practice needed to configure the FB3000 hardware for communications and I/O as well as Field Tools Software. Learn how to troubleshoot and utilize software application programs to monitor live data and communication statistics.

Topics

Day 1

- Intro to the FB3000
- Hardware Options
- Personality Modules
- Downloading/ Uploading a Configuration
- Saving a Configuration
- Local Serial Communications
- Mini USB Communications
- I/P Communication Setup
- Flashing Firmware
- File Types Used
- Replacing Boards
- Interpreting Status LED's?
- Memory Types Used

Day 2

- Using Field Tools Software
- Replacing Battery on CPU and Power Modules
- Setting up a AGA3 Configuration
- Setting up a AGA7 Configuration
- Configuring for History & Events
- Creating and Saving Configurations
- Cold Start/Warm Start Differences
- Configuring for Alarms
- Basic Troubleshooting Examples
- Using the Guided Setup Wizard
- Intro to Math Blocks
- Calibration

Prerequisites

Participants should have formal instrument technician training and a working knowledge of their application/process

- Participants must be thoroughly familiar with Windows10

Audience

Field personnel whose responsibilities may include:

- Installation
- Wiring, start-up
- Troubleshooting
- Configuration or maintenance of the FB3000 products
- An individual who seeks a more thorough understanding of the FB3000 products

COURSE RA900

CEUs: 1.8

Energy & Transportation FloBoss S600+ Operator Introduction**Overview**

The 2-day FloBoss™ S600+ Fundamentals course will have participants become familiar with the FloBoss S600+ hardware, the startup menu, fundamental features of the S600+ applications. Be able to operate FloBoss S600+ front panel and web-server. Be able to download and upload configurations. Be able to edit S600+ configuration files using PC Setup, Report Editor, Modbus Editor and Display Editor. The FloBoss S600+ Fundamentals course provides an overview into the hardware and operational aspects of the FloBoss S600+ flow computer.

Topics

- Introduction to S600+
- Standard Application Overview
- S600+ Hardware Overview
- Navigating Displays
- Editing Display Items
- Editing Configurations with Config600
- Using Config600 Transfer

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should preferably have administrator privileges. Participants must be PC literate.

COURSE RA901

CEUs: 1.8

Energy & Transportation Solutions FloBoss S600+/Config600 Advanced**Overview**

The 2-1/2-day advanced course provides an insight into the generation of application configurations for the FloBoss™ S600+.

Topics

- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should preferably have administrator privileges. Participants must be PC literate

Audience

This FloBoss S600+ Advanced Course is aimed at application engineers and system integrators who design and develop FloBoss S600+ applications for integration with metering systems and skids.

COURSE RA901V

CEUs: 1.8

Energy & Transportation Solutions FloBoss S600+/Config600 Advanced [Virtual]**Overview**

The 2-1/2-day advanced course provides an insight into the generation of application configurations for the FloBoss™ S600+.

Topics

- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

COURSE RA1230

CEUs: 1.8

Energy & Transportation Solutions FloBoss Troubleshooting Configuration for Gas Measurement

Overview

This 2.5 day course will provide a basic overall working knowledge of the FloBoss 107 Controller. (Contact Education Services for special discounting when enrolling in both course RA1230 Troubleshooting Configuration and course RA1231 Configurations - Advanced at 1-800-338-8158). Participants are presented with a basic view of the FloBoss 107 hardware and software to obtain the necessary knowledge needed to configure, calibrate, view live data and trouble shoot the FloBoss 107.

Topics

Day 1

- Introduction and Overview of FloBoss
- FloBoss 107 CPU and I/O Cards
- ROCLINK 800 Configuration Software Overview Creating a Connection to the FloBoss 107 Local Operator Interface Port Ethernet Port
- Elements of Basic Configuration
- Configuring from Factory Defaults Reset System in ROC Flags Configure System Information

Day 2

- Configuring Communications
- Configuring Field I/O
- Calibrating the AI, AO, and RTD
- Configuring Station and Runs for the AGA3 and AGA7 Flow Calculations
- Configuring Historical Database

Day 3

- Alarm and Events Logs
- Saving and Restoring Configurations
- Using the System Utilities
- Troubleshooting

Prerequisites

None

Audience

This course is for engineers, technicians, and others involved with the configuration and operation of the FloBoss 107.

COURSE RA1230V

CEUs: 1.8

Energy & Transportation Solutions FloBoss Troubleshooting Configuration for Gas Measurement

Overview

This 2.5 day course will provide a basic overall working knowledge of the FloBoss 107 Controller. (Contact Education Services for special discounting when enrolling in both course RA1230 Troubleshooting Configuration and course RA1231 Configurations - Advanced at 1-800-338-8158). Participants are presented with a basic view of the FloBoss 107 hardware and software to obtain the necessary knowledge needed to configure, calibrate, view live data and trouble shoot the FloBoss 107.

Topics

Day 1

- Introduction and Overview of FloBoss
- FloBoss 107 CPU and I/O Cards
- ROCLINK 800 Configuration Software Overview Creating a Connection to the FloBoss 107 Local Operator Interface Port Ethernet Port
- Elements of Basic Configuration
- Configuring from Factory Defaults Reset System in ROC Flags Configure System Information

Day 2

- Configuring Communications
- Configuring Field I/O
- Calibrating the AI, AO, and RTD
- Configuring Station and Runs for the AGA3 and AGA7 Flow Calculations
- Configuring Historical Database

Day 3

- Alarm and Events Logs
- Saving and Restoring Configurations
- Using the System Utilities
- Troubleshooting

COURSE RA900V

CEUs: 1.8

Energy & Transportation FloBoss S600+ Operator Introduction

Overview

The 2-day FloBoss™ S600+ Fundamentals course will have participants become familiar with the FloBoss S600+ hardware, the startup menu, fundamental features of the S600+ applications. Be able to operate FloBoss S600+ front panel and web-server. Be able to download and upload configurations. Be able to edit S600+ configuration files using PC Setup, Report Editor, Modbus Editor and Display Editor. The FloBoss S600+ Fundamentals course provides an overview into the hardware and operational aspects of the FloBoss S600+ flow computer.

Topics

- Introduction to S600+
- Standard Application Overview
- S600+ Hardware Overview
- Navigating Displays
- Editing Display Items
- Editing Configurations with Config600
- Using Config600 Transfer

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should preferably have administrator privileges. Participants must be PC literate.

COURSE RA902

CEUs: 3.2

Energy & Transportation Solutions FloBoss S600+ Combined Config600

Overview

The 4-1/2-day course will provide participants hardware knowledge of the S600+. How to navigate the keypad display and be able to create and edit S600+ configurations using Config600 software. The FloBoss™ 600+ Combined Course is a combination of both the fundamentals course and the advanced course in one.

Topics

- Standard Application Overview S600+
- Hardware Overview Navigating Displays
- Editing Display Items
- Editing Configurations with Config600 Using Config600 Transfer
- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should have administrative privileges. Participants must be PC literate.

COURSE RA1220V

CEUs: 3.0

Energy & Transportation Solutions FloBoss Configuration & Operations [Virtual]

Overview

This 2-1/2-day virtual course will provide an overall working knowledge of the FloBoss™ 103, FloBoss 107. Participants are presented with a comprehensive view of the FloBoss 103/107 hardware and ROCLINK800 software to obtain the necessary knowledge needed to effectively install, configure and maintain the FloBoss 103/107 products. Each student will be provided access to a PC (ROCLINK800 preinstalled), a FloBoss 107RTU, a communications cable and a workbook for the duration of the class.

Topics

- Flow Measurement Review
- FloBoss™ 103/107 Hardware Overview
- FloBoss
 - Check and Set ROC Information
 - Check and Set ROC System Flags
 - Communication Basics
 - Elements of a Basic Configuration
 - Configuring I/O Points
 - Calibrating AI and AO Points
 - Overview of MVS Products
 - Setup of Multi-dropping of MVS
 - Configuring AGA Flow Calculations
 - Configuring FloBoss™ History
 - Modbus Tables
 - PID Configuration
 - Building FloBoss Displays
 - FST Workshop

Prerequisites

Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy & Transportation Solutions course is for engineers, technicians and others involved with the configuration and operation of the FloBoss™ 103 and FloBoss 107 products.

COURSE RA443V

CEUs: 0.2

Energy & Transportation Solutions ControlWave Programming Introduction

Overview

This FREE 2-hour short course utilizes the Virtual Classroom to provide basic programming steps in programming the ControlWave device using Ladder Logic and Function Block languages.

Topics

- How Virtual Learning works
- Programming in Ladder Logic
- Compiling & downloading application project
- Using Stimulation Mode
- Inserting a Function Block

Prerequisites

None

Audience

All personnel interested in a brief overview of programming ControlWave devices.

COURSE RA630

Energy & Transportation Solutions FB3000 Programming & Configuration Advanced**Overview**

This 3-day hands-on course covers the Software and Advanced Configuration of the FB3000 RTU. This course will equip you with the necessary knowledge and practice needed to configure the FB3000 using Field Tools and FBxDesigner. Learn how to troubleshoot and utilize software application programs to monitor live.

Topics

Day 1

- Intro to the FB3000
- Hardware Options
- Personality Modules
- Downloading/ Uploading a Configuration
- Using Field Tools Software and Menus
- Modbus Communications between FB3000's
- Using the Point Pickers to Configure
- Setting up a Station with Two Runs
- Engineering Units Setup

Day 2

- Setting up the Clock
- PID Configuration
- Using FBxDesigner
- Create a Small Project in FBxDesigner
- Programming Languages Available in FBxDesigner
- Creating a Simple Display
- Setting up a AGA7 Configuration
- Configuring for History and Events
- Creating and Saving Configurations

Day 3

- Application Management
- Application Information
- Viewing Reports
- Effects Examples
- Math Block Examples
- Device Licenses

Prerequisites

Participants should have formal instrument technician training and a working knowledge of their application/process.

- Participants must be thoroughly familiar with Windows 10.

Audience

Field personnel whose responsibilities may include:

- Installation
- Wiring, start-up
- Troubleshooting
- Configuration or maintenance of the FB3000 products
- An individual who seeks a more thorough understanding of the Programming Capabilities of the FB3000 products

COURSE RA630V

Energy & Transportation Solutions FB3000 Programming & Configuration Advanced [Virtual]**Overview**

This 3-day hands-on course covers the Software and Advanced Configuration of the FB3000 RTU. This course will equip you with the necessary knowledge and practice needed to configure the FB3000 using Field Tools and FBxDesigner. Learn how to troubleshoot and utilize software application programs to monitor live.

Topics

Day 1

- Intro to the FB3000
- Hardware Options
- Personality Modules
- Downloading/ Uploading a Configuration
- Using Field Tools Software and Menus
- Modbus Communications between FB3000's
- Using the Point Pickers to Configure
- Setting up a Station with Two Runs
- Engineering Units Setup

Day 2

- Setting up the Clock
- PID Configuration
- Using FBxDesigner
- Create a Small Project in FBxDesigner
- Programming Languages Available in FBxDesigner
- Creating a Simple Display
- Setting up a AGA7 Configuration
- Configuring for History and Events
- Creating and Saving Configurations

Day 3

- Application Management
- Application Information
- Viewing Reports
- Effects Examples
- Math Block Examples
- Device Licenses

Prerequisites

Participants should have formal instrument technician training and a working knowledge of their application/process.

- Participants must be thoroughly familiar with Windows 10.

Audience

Field personnel whose responsibilities may include:

- Installation
- Wiring, start-up
- Troubleshooting
- Configuration or maintenance of the FB3000 products
- An individual who seeks a more thorough understanding of the Programming Capabilities of the FB3000 products

COURSE RA504V

CEUs: 1.4

Energy & Transportation Solutions Marine Terminal Management Introduction

Overview

This 2-day virtual course helps participants understand the overall terminal process, the basic Terminal Manager software system, and how it works. Additional topics include understanding the elements of a terminal, Terminal Manager Architectures, system configuration, and more.

Topics

Day 1

- Discussion of Terminal Manager systems
- Elements of a Terminal
- Applications for Terminal Manager
- What is ISA-95 and how Terminal Manager works
- Terminal Manager Hardware
- Communication Protocols

Day 2

- Terminal Manager Architectures
- Software Overview
- Post Installation Setup
- System Setup
- System Configuration

Prerequisites

- Participants must have a strong working knowledge of personal computers and Windows 7 or a later version
- Participants must have a strong working knowledge of their application/process
- Participants should have a strong working knowledge of Energy & Transportation Solutions RTU's

Audience

The class is intended for users who have experience with programming and configuration of Energy & Transportation Solutions RTU's in terminal storage arena.

COURSE RA703

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems Accelerated V2.8x

Overview

This 4 ½ day course provides an accelerated approach to learning about the OpenEnterprise 2.8x SCADA System. At the conclusion of the class, students will be able to install a very simple OpenEnterprise Server and Workstation, configure communications with Energy and Transportation Solutions' RTU's, build basic HMI displays, configure trends and alarm windows, collect historical data, perform basic SQL queries, and develop a basic user interface using these products.

Topics

- Basic Concepts
- Product Architecture
- Database Explorer
- Database Structure
- Display Building
- Aliasing
- History
- SQL Queries
- OE Desktop
- Alarm Priorities
- Security

Prerequisites

- Participants must have a strong working knowledge of personal computers and Windows XP or a later version
- Participants must have a strong working knowledge of their application/process
- Participants should have a strong working knowledge of OpenBSI and ControlWave Designer and ROC Configuration

Audience

The class is intended for users who will install, configure and design a basic OpenEnterprise SCADA system.

COURSE RA902V

CEUs: 3.2

Energy & Transportation Solutions FloBoss S600+ Combined Config600

Overview

The 4-1/2-day course will provide participants hardware knowledge of the S600+. How to navigate the keypad display and be able to create and edit S600+ configurations using Config600 software. The FloBoss™ 600+ Combined Course is a combination of both the fundamentals course and the advanced course in one.

Topics

- Standard Application Overview S600+
- Hardware Overview Navigating Displays
- Editing Display Items with Config600 Using
- Config600 Transfer
- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should have administrative privileges. Participants must be PC literate.

COURSE RA11412V

CEUs: 0.2

Energy & Transportation Solutions ROCLink Configuration Introduction [Virtual]

Overview

This FREE 2-hour demo provides a brief overview of the Virtual Classroom. In this demonstration, you will learn what the Virtual Classroom is and how it works. Learn some basics of configuring of the ROC800 or FloBoss.

Topics

- What is virtual training
- What is required
- Hands-on exercises
- Basic Configurations of the ROC800 or FloBoss

Audience

All personnel whose responsibilities may include: configuring, start-up, troubleshooting, of maintenance of the ROC800 or FloBoss products.

Prerequisites

None

COURSE RA703

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems Accelerated V2.8x

Overview

This 4 ½ day course provides an accelerated approach to learning about the OpenEnterprise 2.8x SCADA System. At the conclusion of the class, students will be able to install a very simple OpenEnterprise Server and Workstation, configure communications with Energy and Transportation Solutions' RTU's, build basic HMI displays, configure trends and alarm windows, collect historical data, perform basic SQL queries, and develop a basic user interface using these products.

Topics

- Basic Concepts
- Product Architecture
- Database Explorer
- Database Structure
- Display Building
- Aliasing
- History
- SQL Queries
- OE Desktop
- Alarm Priorities
- Security

Prerequisites

- Participants much have a strong working knowledge of personal computers and Windows XP or a later version
- Participants much have a strong working knowledge of their application/process
- Participants should have a strong working knowledge of OpenBSI and ControlWave Designer and ROC Configuration

Audience

The class is intended for users who will install, configure and design a basic OpenEnterprise SCADA system.

COURSE RA442V

CEUs: 3.2

Energy & Transportation Solutions FloBoss S600+ Combined Config600 [Virtual]

Overview

The 4-1/2-day course will provide participants hardware knowledge of the S600+. How to navigate the keypad display and be able to create and edit S600+ configurations using Config600 software. The FloBoss™ 600+ Combined Course is a combination of both the fundamentals course and the advanced course in one.

Topics

- Standard Application Overview S600+
- Hardware Overview Navigating Displays
- Editing Display Items
- Editing Configurations with Config600 Using Config600 Transfer
- Loading Config600 Pro Software License
- Firmware Versions
- Using System Editor Object Types
- Logical Editor
- Registering Tickets - Do's and Don'ts

Prerequisites

Participants should be familiar with metering techniques and standards. Participants should bring their own laptop computers to the course and should have administrative privileges. Participants must be PC literate.

COURSE RA1141V

CEUs: 0.2

Energy & Transportation Solutions ROCLink Configuration Introduction [Virtual]

Overview

This FREE 2-hour demo provides a brief overview of the Virtual Classroom. In this demonstration, you will learn what the Virtual Classroom is and how it works. Learn some basics of configuring of the ROC800 or FloBoss.

Topics

- What is virtual training
- What is required
- Hands-on exercises
- Basic Configurations of the ROC800 or FloBoss

Prerequisites

None

Audience

All personnel whose responsibilities may include: configuring, start-up, troubleshooting, of maintenance of the ROC800 or FloBoss products.

COURSE RA802**CEUs: 3.2****Energy & Transportation Solutions
OpenEnterprise SCADA Systems V3.x
Intermediate****Overview**

This 4 ½ day course will equip the participant to be able to; configure the communications, security, historical, alarming, asset modeling and other major subsystems of an OpenEnterprise and Workstation (version 3.x). Most of the tools within the OpenEnterprise Administrative Tools will be covered during this class.

Topics

- Configure Security
- Historical Collections
- Alarming
- Asset Modeling
- Work Flows
- Local Signals and Alarms
- Administrative Tools

Prerequisites

Participants should have formal RTU configuration training and a working knowledge of their application/process. Participants must be thoroughly familiar with Windows 7. Participants should have advanced PC and networking skills. Participants must have completed course RA801 Basic OpenEnterprise Course version 3.x.

Audience

The course is intended for users who have experience with programming and configuration of Energy & Transportation Solutions RTUs.

COURSE RA850V**CEUs: 1.8****Energy & Transportation Solutions
OpenEnterprise Enhancements for
SCADA Systems - Ver. 3.x [Virtual]****Overview**

This 2 ½ day virtual course addresses these new subsystems and improvements which were added to the previous 2.8x OpenEnterprise Server system. These enhancements are on a Windows 7 platform and will enable you to install an OpenEnterprise Server/Workstation and configure and perform various Server/Workstation functions. These functions include the ease of adding devices to the system, configuring database calculations, work flows, asset modeling, communicating to Modbus devices and more.

Topics

- Calculations
- Work Flows
- Administrative Tools
- MODBUS Data Collection
- Database Asset Modeling

Prerequisites

Participants should have formal RTU configuration training and a working knowledge of their application/process. Participants must be thoroughly familiar with Windows 7. Participants should have advanced PC and networking skills. Participants must have completed course RA701 Basic and RA702 Intermediate Courses version 2.8x.

Audience

This class is intended for engineers who have OpenEnterprise systems, version 2.8x transitioning to version 3.x.

COURSE RA701**CEUs: 3.2****Energy & Transportation Solutions
OpenEnterprise SCADA Systems Basics
Ver. 2.8x****Overview**

This 4-1/2-day course provides a very brief introduction to the OpenEnterprise Server, and more detailed coverage of the OpenEnterprise Workstation and OpenEnterprise Reporting packages (version 2.8X). At the conclusion of the class, students will be able to install a very simple OpenEnterprise Server and Workstation; configure communications with ControlWaves RTU's and then begin building HMI displays, trends, alarm windows, and develop a basic user interface using these products.

Topics

- Database Explorer and Structure
- Creating Display Objects
- Alarm Windows, Alarm & Event History
- Creating and Configuring Trends
- Data Export
- Creating Reports
- System Troubleshooting

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows XP or later version. Participants must have a strong working knowledge of their applications/process. Participants should have a strong working knowledge of OpenBSI and ControlWave Designer.

Audience

The class is intended for users who have experience with programming and configuration of Energy & Transportation Solutions RTUs.

COURSE RA702

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems Ver. 2.8x Intermediate

Overview

This 4-1/2-day course will equip you to be able to install an OpenEnterprise Server and Workstation; configure the communications, security, historical, alarming, messaging, and other major subsystems. Most of the tools within the OpenEnterprise toolbox will be covered during this class.

Topics

- Learn Advanced Configurations of the OpenEnterprise Systems
- Perform Alarming and Messaging Configurations
- Learn to Configure, Diagnose and Troubleshoot OpenEnterprise Systems
- Creating Calculations from RTU Data

Prerequisites

Participants should have formal RTU configuration training and a working knowledge of their application/process. Participants must be thoroughly familiar with Windows XP or later versions. Participants should have advanced PC and networking skills. Participants must have completed the Basic OpenEnterprise Class course RA701.

Audience

This class is intended for engineers who will be designing and building complete OpenEnterprise systems

COURSE RA801

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems V3.x Introduction [Virtual]

Overview

This 4-1/2-day course provides a very brief introduction to the OpenEnterprise Server, and more detailed coverage of the OpenEnterprise Workstation and OpenEnterprise Reporting packages (version 3.x). At the conclusion of the class, students will be able to install a simple OE Server and Workstation, configure communications with Remote Automation Solution's RTU's and then begin building HMI displays, trends, alarm windows, and develop a basic user interface using these products.

Topics

- Database Structure
- Creating Display Objects
- Alarm Windows, Alarm & Event History
- Creating and Configuring Trends
- Data Export
- Creating Reports
- Calculation Server
- Communications Manager
- Data Collection
- Plant Area Grouping

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows 7. Participants must have a strong working knowledge of their application/process. Participants should have a strong working knowledge of Energy and Transportation Solutions RTUs.

Audience

The class is intended for users who have experience with programming and configuration of Energy and Transportation Solutions RTUs.

COURSE RA801V

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems V3.x Introduction [Virtual]

Overview

This 4-1/2-day course provides a very brief introduction to the OpenEnterprise Server, and more detailed coverage of the OpenEnterprise Workstation and OpenEnterprise Reporting packages (version 3.x). At the conclusion of the class, students will be able to install a simple OE Server and Workstation, configure communications with Remote Automation Solution's RTU's and then begin building HMI displays, trends, alarm windows, and develop a basic user interface using these products.

Topics

- Database Structure
- Creating Display Objects
- Alarm Windows, Alarm & Event History
- Creating and Configuring Trends
- Data Export
- Creating Reports
- Calculation Server
- Communications Manager
- Data Collection
- Plant Area Grouping

Prerequisites

Participants must have a strong working knowledge of personal computers and Windows 7. Participants must have a strong working knowledge of their application/process. Participants should have a strong working knowledge of Energy and Transportation Solutions RTUs.

Audience

The class is intended for users who have experience with programming and configuration of Energy and Transportation Solutions RTUs.

COURSE RA802V

CEUs: 3.2

Energy & Transportation Solutions OpenEnterprise SCADA Systems V3.x Intermediate [Virtual]

Overview

This -1/2-day virtual course will equip the participant to be able to; configure the communications, security, historical, alarming, asset modeling and other major subsystems of an OpenEnterprise and Workstation (version 3.x). Most of the tools within the OpenEnterprise Administrative Tools will be covered during this class.

Topics

- Configure Security
- Historical Collections
- Alarming
- Asset Modeling
- Work Flows
- Local Signals and Alarms
- Administrative Tools

Prerequisites

Participants should have formal RTU configuration training and a working knowledge of their application/process. Participants must be thoroughly familiar with Windows 7. Participants should have advanced PC and networking skills. Participants must have completed course RA801 Basic OpenEnterprise Course version. 3.x.

Audience

The course is intended for users who are responsible for installing and configuring the Open Enterprise system.

COURSE RA1244

CEUs: 2.1

Energy & Transportation Solutions ROC800L Configuration

Overview

This 2-1/2-day course will provide an overall working knowledge of the ROC800L. Participants are presented with a comprehensive view of the ROC800L hardware and software to obtain the necessary knowledge and practice needed to install and configure a ROC800L. Participants will know the differences between the ROC809 and ROC800L. Each student will be provided with a PC (ROCLINK preinstalled), a Energy & Transportation Solutions RTU (ROC800L), a communications cable, and a workbook for the duration of the class. However, participants are encouraged to bring their laptop to class.

Topics

- Basic Concepts and Product features
- Install and configure a ROC800L RTU
- Convert ROC800 to RO800L
- Configuring an Application
- Updating Firmware and Software

Prerequisites

Participants should have formal RTU training, preferably with ROC800 series products, ROCLINK800 software and a working knowledge of their application/process. Participants should have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy & Transportation Solutions course is for engineers, technicians and others involved with the operation and maintenance of the ROC800L.

COURSE RA1244V

CEUs: 2.1

Energy & Transportation Solutions ROC800L Configuration [Virtual]

Overview

This 2-1/2-day course will provide an overall working knowledge of the ROC800L. Participants are presented with a comprehensive view of the ROC800L hardware and software to obtain the necessary knowledge and practice needed to install and configure a ROC800L. Participants will know the differences between the ROC809 and ROC800L. Each student will be provided with a PC (ROCLINK preinstalled), a Energy & Transportation Solutions RTU (ROC800L), a communications cable, and a workbook for the duration of the class. However, participants are encouraged to bring their laptop to class.

Topics

- Basic Concepts and Product features
- Install and configure a ROC800L RTU
- Convert ROC800 to RO800L
- Configuring an Application
- Updating Firmware and Software

Prerequisites

Participants should have formal RTU training, preferably with ROC800 series products, ROCLINK800 software and a working knowledge of their application/process. Participants should have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy & Transportation Solutions course is for engineers, technicians and others involved with the operation and maintenance of the ROC800L.

COURSE RA1240

CEUs: 3.2

Energy & Transportation Solutions ROC800 Configuration & Operations

Overview

This 4-1/2-day course will provide an overall working knowledge of the ROC800 series RTU. Participants are presented with a comprehensive view of the ROC800 series hardware and ROCLINK800 software to obtain the necessary knowledge needed to effectively install, configure and maintain the ROC800 series products. Each student will be provided with a PC (ROCLINK800 preinstalled), a Energy & Transportation Solutions RTU, a communications cable and a workbook for the duration of the course. However, participants are encouraged to bring their laptop to class.

Topics

- Flow Measurement Review
- ROC800 Series Hardware Overview
- Introduction to ROCLINK800 Software
 - ROC800 Series Configuration
 - Check and Set ROC Information
 - Check and Set ROC System Flags
 - Communication Basics
 - Elements of a Basic Configuration
 - Configuring I/O Points
 - Calibrating AI and AO Points
 - Overview on MVS Product
 - Setup Multi-Dropping of MVS
 - Configuring AGA Flow Calculation
 - Configuring ROC History
 - Modbus Tables
 - PID Configuration
 - Building ROC Displays
 - FST Workshop

Prerequisites

Participants should have a working knowledge of their application/process and should be thoroughly familiar with Microsoft Windows operations systems (XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the operation and maintenance of the ROC800 Series products.

COURSE RA1240V

CEUs: 2.5

Energy & Transportation Solutions ROC800 Configuration & Ops. [Virtual]

Overview

This 4-1/2-day course will provide an overall working knowledge of the ROC800 series RTU. Participants are presented with a comprehensive view of the ROC800 series hardware and ROCLINK800 software to obtain the necessary knowledge needed to effectively install, configure and maintain the ROC800 series products. Each student will be provided with a PC (ROCLINK800 preinstalled), a Energy & Transportation Solutions RTU, a communications cable and a workbook for the duration of the course. However, participants are encouraged to bring their laptop to class.

Topics

- Flow Measurement Review
- ROC800 Series Hardware Overview
- Introduction to ROCLINK800 Software
 - ROC800 Series Configuration
 - Check and Set ROC Information
 - Check and Set ROC System Flags
 - Communication Basics
 - Elements of a Basic Configuration
 - Configuring I/O Points
 - Calibrating AI and AO Points
 - Overview on MVS Product
 - Setup Multi-Dropping of MVS
 - Configuring AGA Flow Calculation
 - Configuring ROC History
 - Modbus Tables
 - PID Configuration
 - Building ROC Displays
 - FST Workshop

Prerequisites

Participants should have a working knowledge of their application/process and should be thoroughly familiar with Microsoft Windows operations systems (XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the operation and maintenance of the ROC800 Series products.

COURSE RA1241

CEUs: 1.8

Energy and Transportation Solutions ROC800 Series DS800 Programming

Overview

This 2-1/2-day course will provide an overall working knowledge of the five different programming languages for the ROC800 series. The course emphasizes hand-on exercises using DS800 Development Suite to program the ROC800 series products. Each participant will be provided a PC (ROCLINK800 & DS800 preinstalled), a Energy and Transportation Solutions RTU, a communications cable and a workbook for the duration of the course. However, participants are encouraged to bring their laptop to class.

Topics

- DS800 Software Overview
 - Sequential Function Chart
 - Ladder Logic of Ladder Diagram
 - Function Block Diagram
 - Structured Text
 - Instruction List
- ROCLINK 800 Software

Prerequisites

Participants should have experience with ROC800 series hardware and ROCLINK800 software. A working knowledge of their application/process and should be thoroughly familiar with Microsoft Windows operating Systems (XP or later versions). Familiarity with IEC-61131 programming languages is not required, since it is covered in this course.

Audience

This Energy and Transportation Solutions Course is for engineers, technicians, and others involved with configuring the ROC800 products.

COURSE RA1241V

CEUs: 1.8

Energy and Transportation Solutions ROC800 Series DS800 Programming [Virtual]

Overview

This 2-1/2-day course will provide an overall working knowledge of the five different programming languages for the ROC800 series. The course emphasizes hand-on exercises using DS800 Development Suite to program the ROC800 series products. Each participant will be provided a PC (ROCLINK800 & DS800 preinstalled), a Energy and Transportation Solutions RTU, a communications cable and a workbook for the duration of the course. However, participants are encouraged to bring their laptop to class.

Topics

- DS800 Software Overview
 - Sequential Function Chart
 - Ladder Logic of Ladder Diagram
 - Function Block Diagram
 - Structured Text
 - Instruction List
- ROCLINK 800 Software

Prerequisites

Participants should have experience with ROC800 series hardware and ROCLINK800 software. A working knowledge of their application/process and should be thoroughly familiar with Microsoft Windows operating Systems (XP or later versions). Familiarity with IEC-61131 programming languages is not required, since it is covered in this course.

Audience

This Energy and Transportation Solutions Course is for engineers, technicians, and others involved with configuring the ROC800 products.

COURSE RA1242

CEUs: 2.1

Energy and Transportation Solutions DL800 Preset System Configuration

Overview

This 2-1/2-day course will provide an overall working knowledge of the DL8000 Preset System Controller. Participants will be enabled to configure, operate and diagnose the DL8000 Preset System Controller. Each student will be provided with a PC (ROCLINK preinstalled), a Energy and Transportation Solutions RTU (DL8000), a communications cable, and a workbook for the duration of the class.

Topics

- Basic Concepts and Product features of the DL8000
- Set Up Parameters
- Meter Proving
- Hardware Diagnostics & Troubleshooting
- DL8000 Configuring Dynamic, Real-Time Display of Flow Parameters
 - Configuring for Additive Injection
 - Temperature Compensation
 - Data Logging
 - Communications
- Blending Methods and Flow Sequencing

Prerequisites

Participants should have formal RTU configuration training preferably with ROC800 series hardware and a working knowledge of their application/process. Participants should have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (2000/XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the operation and maintenance of the DL8000 Preset System Controller product.

COURSE RA3012V

CEUs: 0.5

Energy and Transportation Solutions SmartProcess Production Applications- Introduction [Virtual]

Overview

Production Manager (PM) Series: Overview and Surface Controls Manager for ROC and FloBoss™ Overview. This 1-day virtual training class will provide an overview of the Production Manager Series, the cornerstone of Emerson's SmartProcess Oil and Gas Applications. This class will focus two of applications, Surface Controls Manager and Local Display Manager, utilized in conjunction with the balance of the applications. Some of the configuration activities will include: control logic, maintenance bypassing, and use of accumulators, advanced calculations configuration, user lists, and display navigation.

Topics

- Surface Controls Applications
- Local Display Manager

Prerequisites

Participants should have a strong working knowledge of personal computers and Windows XP or a later version.

Audience

This course is for engineers, technicians, and others interested in understanding the configuration and operation of the ROC800 using the SmartProcess Oil and Gas Applications.

COURSE RA502V

CEUs: 0.7

Energy and Transportation Solutions Terminal Manager Business Management Intermediate [Virtual]

Overview

This 1-day virtual course helps participants understand the business components of the terminal process. This online customer order management process includes the execution of scheduling, delivery, and receipt of order. Other business entity topics include allocations of accounts, shippers, drivers and clients.

Topics

- Business Entity Configuration
- Order Management
- Allocations
- Inventory Management

Prerequisites

- Participants must have completed course RA501 Terminal Manager Basics and Operations
- A strong working knowledge of personal computers and Windows 7 or later
- Participants must have a strong working knowledge of their application/process

Audience

The class is intended for users requiring the understanding of the business components of the terminal process.

COURSE RA3014V

CEUs: 1.4

Energy and Transportation Solutions Terminal Manager Business Management Advanced [Virtual]

Overview

This 1-day course helps participants understand the advanced business components of the terminal process which includes aspects of invoicing, net receipts and inventory requests.

Topics

- Net Receipts
- Invoicing
- Terminal Tank Inventory
- Tariff Requests
- Inventory Management
- Product Rebranding

Prerequisites

- Participants must have completed course RA501 Terminal Manager Basics and Operations and RA502 Terminal Manager Business Management (Limited)
- A strong working knowledge of personal computers and Windows 7 or later
- Participants must have a strong working knowledge of their application/process

Audience

The class is intended for users requiring the understanding of the business components of the terminal process.

COURSE RA1260

CEUs: 1.4

Energy and Transportation Solutions ROC800 Operations & Configuration - Introduction

Overview

This 2-day course will provide a basic overall working knowledge of the ROC800 Controller. (Contact Education Services for special discounting when enrolling in both course RA1260 Operation and Configurations Basic and course RA1261 Advanced Configurations at 1-800-338-8158). Participants are presented with a comprehensive view of the ROC800 hardware and software to obtain the necessary knowledge needed to configure, calibrate and view live data. PC's will be provided along with necessary hardware and courseware for the duration of the class but each participant is encouraged to bring their own PC.

Topics

Day 1

- Introduction
- Overview of ROC
- Wiring CPU and I/O Cards
- ROCLINK 800 Configuration Software Overview
- Elements of Basic Configuration
- Configuring Field I/O
- Firmware updates
- Configuring from Factory Defaults

Day 2

- Alarm and Events Logs
- Saving and Restoring Configurations
- Configuring Station and Runs for (AGA3 and AGA7) Flow Calculations
- Configuring Communications
- Calibrating the AI and AO module
- Configuring Historical Database

Prerequisites

Participants should have a working knowledge of their application/process and should also have advanced PC knowledge and be thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the configuration and operation of the ROC800.

COURSE RA803V

CEUs: 1.4

Energy and Transportation Solutions OpenEnterprise SCADA Troubleshooting Introduction [Virtual]

Overview

This 2-day course provides a common approach to OpenEnterprise SCADA troubleshooting. At the conclusion of the class, students will be equipped with a practical guide to solving basic problems regarding OE Server and Workstation, RTU configurations, communications, alarms and more.

Topics

At the conclusion of the class, students will be equipped with a practical guide to solving basic problems regarding OE Server and Workstation, RTU configurations, communications, alarms and more.

Day 1

- Troubleshooting Common Database Problems
- Troubleshooting Common ControlWave Problems
- Communications
- Project / FCP Concerns
- Alarms
- History
- Database Updating
- Troubleshooting Common ROC/FloBoss Problems
- Communications
- TLP Concerns
- Alarms
- History
- Database Updating

Day 2

- Common Troubleshooting Graphworx Display Aids
- Troubleshooting Common License Concerns
- Troubleshooting Common Server/Workstation Problems
- Troubleshooting Basic History Reporting Problems for ROC and CW

Prerequisites

- Participants must have completed the RA801 OpenEnterprise for SCADA Systems Basics Course
- Participants must have a strong working knowledge of their application/process

Audience

The class is intended for users who have experience with OpenEnterprise 3.2.

COURSE 804V

CEUs: 1.1

Energy and Transportation Solutionsra803 OpenEnterprise SCADA Troubleshooting Advanced [Virtual]

Overview

This 1 1/2-day course provides a common approach to OpenEnterprise SCADA advanced troubleshooting. At the conclusion of the class, students will be equipped with a practical guide to solving basic problems regarding OE Server and Workstation, RTU configurations, communications, alarms and more.

Topics

Day 1

- Troubleshooting Case 1 Archiving
- Troubleshooting Case 2 MODBUS
- Troubleshooting Case 3 Asset Modeling
- Troubleshooting Case 4 Backfilling a Trend
- Troubleshooting Case 5 Alarm Condition
- Database not starting problems

Objectives

- Participants must have completed the RA801 OpenEnterprise for SCADA Systems Basics Course and RA802 OpenEnterprise Intermediate.
- Participants must have a strong working knowledge of their application/process.

Prerequisites

Participants should be familiar with the Movicon.NEXt programming environment and its basic functions.

Audience

The class is intended for users who have experience with OpenEnterprise 3.2.

COURSE RA1261

CEUs: 1.8

Energy and Transportation Solutions ROC800 Troubleshooting & Configurations Advanced**Overview**

This 2 ½ day course will help participants build upon the basic knowledge of configuring the ROC800 device. (Contact Education Services for special discounting when enrolling in both course RA1260 Operation and Configurations Basic and course RA1261 Advanced Configurations at 1-800-338-8158). Participants will learn how to diagnose symptoms and troubleshoot common field problems, create FST's, configure for Modbus communications to third part devices, and more. PC's will be provided along with necessary hardware and courseware for the duration of the course. Each participant is encouraged to bring their own PC.

Topics

Day 1

- Configuring Station and Runs for (AGA3 and AGA7) Flow Calculations
- Saving and Restoring Configurations
- Configuring Historical Database
- Sampler Odorizer Control
- PID Configuration
- Radio Controls
- Troubleshooting

Day 2

- Setting up Modbus Tables
- Wireless HART
- Network Radio Communications
- FST Workshop
- Displays
- Troubleshooting

Day 3

- Troubleshooting

Prerequisites

Participants should have completed the ROC800 Basic course or have a comparable working knowledge of the ROC800 product. A good understanding of their application/process is helpful along with advanced PC knowledge, thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the configuration and operation of the ROC800.

COURSE 1261C

CEUs: 2.1

Energy and Transportation Solutions - ROC800 Troubleshooting and Configurations Advanced (Custom)**Overview**

This 1 ½ day course will help participants build upon the basic knowledge of configuring the ROC800 device. (Contact Education Services at 1-800-338-8158 for special discounting when combined with RA1260 Operation and Configurations Basic the discounted price will be \$500). Participants will learn how to diagnose symptoms and troubleshoot common field problems, create FST's, configure for Modbus communications to third part devices, and more. PC's will be provided along with necessary hardware and courseware for the duration of the course. Each participant is encouraged to bring their own PC.

Topics

Day 1

- Configuring Field I/O (Review)
- Configuring Stations and Runs for (AGA3 and AGA7) Flow Calculations (Review) Saving and Restoring Configurations (Review)
- Configuring Historical Database (Review)
- Configuring Control Items
 - Sampler/Odorizer
 - Control Radio
 - Controls Configure PID in Interactive Plant Environment

Day 2

- Setting up Modbus Tables
- FST Workshop
- Displays Wireless HART to Rosemount Transmitters in IPE
- Network Radio Communications

Prerequisites

Participants should have completed the ROC800 Basic course or have a comparable working knowledge of the ROC800 product. A good understanding of their application/process is helpful along with advanced PC knowledge, thoroughly familiar with Microsoft Windows operating systems (XP or later versions).

Audience

This Energy and Transportation Solutions course is for engineers, technicians, and others involved with the configuration and operation of the ROC800.

SYNCADE



COURSE 7087**CEUs: 1.4****Syncade Administration****Overview**

This 2-day Syncade Administration Course will provide an overview of Syncade administration functions, tools and practices to successfully maintain the MES platform. Students will engage in lectures reinforced by practical hands-on labs.

Topics

- Syncade System Requirements
- User Accounts
- Syncade Installation
- Network Load Balancing
- Service Controller (Consumer and Scheduler)
- Integration Types
- Internet Information Services
- Errors Logging
- Administration Tool
- Hot fix Installation
- SQL discussion
- Reporting
- Troubleshooting Tips
- System Management Recommendations

Prerequisites

7080 - Syncade Overview

Audience

This course is designed for System Administration personnel responsible for administering and successfully managing Syncade MES platforms.

COURSE 7087V**CEUs: 1.4****Syncade Administration [Virtual]****Overview**

This 2-day Syncade Administration Course will provide an overview of Syncade administration functions, tools and practices to successfully maintain the MES platform. Students will engage in lectures reinforced by practical hands-on labs.

Topics

- Syncade System Requirements
- User Accounts
- Syncade Installation
- Network Load Balancing
- Service Controller (Consumer and Scheduler)
- Integration Types
- Internet Information Services
- Errors Logging
- Administration Tool
- Hot fix Installation
- SQL discussion
- Reporting
- Troubleshooting Tips
- System Management Recommendations

Prerequisites

7080 - Syncade Overview

Audience

This course is designed for System Administration personnel responsible for administering and successfully managing Syncade MES platforms.

COURSE 7180**CEUs: 3.2****Syncade Operations Implementation****Overview**

This 4.5-day course aims to equip the students to understand where Syncade fits on a production environment. This includes the applications of different modules that Syncade has in a manufacturing environment. These modules are Security & Audit (SA), Document Control & Archiving (DCA), Training & Development (TD), Equipment Tracking (ET), Materials and Inventory Management (MM & IM), Order Management (OM), Weigh & Dispense (WD), and Quality Review Manager (QRM). This course also allows the students to build a basic recipe to be created via Recipe Authoring (RA) application and simulate it via Workflow (WF).

Topics

- Manufacturing Operations Management
- Security and Audit (SA)
- Portal
- Document Control & Archiving (DCA)
- Training & Development (TD)
- Process Simulation
- Equipment Tracking (ET)
- Materials Management (MM)
- Inventory Management (IM)
- Recipe Authoring (RA) Overview
- Enumeration Sets
- Work Instruction (WI)
- RA Database Items
- Operations (OP), Unit Procedures (UP), Procedures (PRC)
- Process Segment (PS)
- Master Recipe (MR)
- Order Management (OM)
- Weigh & Dispense (WD)
- Workflow (WF)
- Manufacturing and Quality Review (MR/QRM)

Prerequisites

None

Audience

Engineers and IT professional who are new to Syncade and will be involved in usage and configuration of Syncade modules.

COURSE 7181**CEUs: 2.8****Syncade Recipe Authoring Principles****Overview**

A 4-day intensive recipe authoring course, which focuses on how users can effectively write recipes in Syncade Recipe Authoring application using different strategies. These may include combination of principles in defining the work instruction and its parameters, configuring effective recipe steps pathways, automating tasks through behaviors, and understanding parameter data links implementation. Other recipe authoring functions are also discussed with respect to its formula and recipe hierarchy definitions. Supplementary recipe authoring tools, which includes RA Behavior Editor and Resource Editor, will also be discussed. An overview on DeltaV-Syncade integration options will also be explored.

Topics

- Batch Process Overview
- Defining the Batch Process
- Configuring Work Instructions
- Recipe Steps Pathway
- Behaviors
- Parameter Data Link
- Formula
- Resource Editor
- Configuring Recipes
- RA Database Update
- DeltaV Recipes
- Integrated Recipes Overview

Prerequisites

7180 Syncade Operations Implementation

Audience

Engineers and IT professionals who will be involved in authoring and validating Syncade recipes.

COURSE 7181V**CEUs: 2.8****Syncade Recipe Authoring Principles [Virtual]****Overview**

A 4-day intensive recipe authoring course, which focuses on how users can effectively write recipes in Syncade Recipe Authoring application using different strategies. These may include combination of principles in defining the work instruction and its parameters, configuring effective recipe steps pathways, automating tasks through behaviors, and understanding parameter data links implementation. Other recipe authoring functions are also discussed with respect to its formula and recipe hierarchy definitions. Supplementary recipe authoring tools, which includes RA Behavior Editor and Resource Editor, will also be discussed. An overview on DeltaV-Syncade integration options will also be explored.

Topics

- Batch Process Overview
- Defining the Batch Process
- Configuring Work Instructions
- Recipe Steps Pathway
- Behaviors
- Parameter Data Link
- Formula
- Resource Editor
- Configuring Recipes
- RA Database Update
- DeltaV Recipes
- Integrated Recipes Overview

Prerequisites

7180 Syncade Operations Implementation

Audience

Engineers and IT professionals who will be involved in authoring and validating Syncade recipes.

COURSE 7182V**CEUs: 2.1****Syncade Quality Review Manager [Virtual]****Overview**

This course aims to equip students how to effectively configure and operate manufacturing review via review-by-exception methodology using the Quality Review Manager (QRM) of Syncade Operations suite. This course discusses QRM settings and exception generation methodologies with hands on workshop to facilitate learning. Exception reviews, resolution, and manufacturing review through the QRM will also be explored. This course allows the students to see the entire review-by-exception approach of closing an order.

Topics

- Quality Review Manager Overview
- QRM Administration
- General Settings
- Severities
- Resolutions
- Exception Types
- Perspectives
- Email Templates
- Subscriptions
- Manufacturing Review
- Syncade Exception Triggers
- Automation Exception Triggers
- Quality Review Manager Operations

Prerequisites

7181 (Recipe Authoring Principles)

Audience

MES Engineers, Process Engineers, Business Analyst, System Administration, Quality and Validation Engineers

COURSE 7183V**CEUs: 2.1****Syncade Equipment Management [Virtual]****Overview**

This 3-day course will provide the user with the necessary skills to create, configure and maintain equipment used in the production process. Users will configure equipment classes and equipment that will provide a solution for managing equipment use, maintenance and calibration information. Events will be set upon the equipment class that define actions that can be performed, or need to be performed, on equipment created from the equipment class. Rules and groups will be configured to assist in implementing controls on equipment and when certain events need to occur. Schedules will be created to set up periodic preventive maintenance and work orders will be created to cover the unscheduled activities that may be needed to fully utilize production equipment. Recipes will be created to manage equipment hygienic, assembly, and usage states using default behaviors.

Topics

- Equipment Management Overview
- Equipment Class
- Equipment Instance
- Performing Events
- Groups & Rules
- Container Contents
- Parameter, Materials, Labor, & References
- Equipment Management Recipes
- Equipment Workflow
- Calibration
- Work Order
- Equipment Tracking Administration

Prerequisites

7181 (Recipe Authoring Principles)

Audience

MES Engineers, Recipe Authors, Process Engineers, and Quality Engineer

COURSE 7184V**CEUs: 2.1****Syncade Suite Operations [Virtual]****Overview**

This course is for operators, supervisors, and managers responsible for fulfilling manufacturing activities using Syncade Operations. This 2.5-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the Syncade Operations modules. Activities that will be explored on a specific Syncade module in this course are as follows:

- Viewing effective documents (DCA)
- Training self-certification (TD)
- Perform equipment events and launch equipment workflows (ET)
- Understand basic batch terminology
- Understand order lifecycle and performing electronic workflows (OM, WD, and WF)
- Respond to batch exceptions and generating batch reports (QRM)

Topics

- Operations Management
- Documents and Trainings
- Simulated Process
- Equipment Management
- Materials and Inventory Management
- Recipe Overview
- Order Management and Execution
- Weigh & Dispense
- Workflows
- Manufacturing Review
- Quality Review Manager
- Syncade Portal

Prerequisites

None

Audience

Production personnel especially operators, supervisors, managers, or quality engineer.

COURSE 7185V**CEUs: 2.8****Syncade Manufacturing Management [Virtual]****Overview**

This class will provide the user with the necessary skills to create and manage all types of materials as they flow into, through and out of the production environment during order execution. Users will create material masters to define the material characteristics, create inventory, create and execute orders, allocate materials, create material samples, track lots and containers and perform weigh and dispense activities. Recipes will also be created to accomplish these activities using Emerson standard behaviors.

Topics

- Manufacturing Management Overview
- Materials Management
- Inventory Management
- Lots and Containers
- Order Management
- Creating Orders.
- Material Allocation
- Material Dispensing
- Trusted Dispensing
- Consuming Inventory
- WD Equipment Recipes
- Material Handling Recipes
- Manufacturing and Quality Review
- Manufacturing Administration
- Materials Transaction

Prerequisites

7181 - Syncade Recipe Authoring Principles

COURSE 7186V

CEUs: 2.8

Syncade Recipe Authoring Advanced [Virtual]

Overview

This course aims to equip advanced users who are already familiar with elementary principles of creating recipes using the Syncade Recipe Authoring (RA) application and its interaction with other Syncade modules by building even more complex recipes. These complex recipes are designed to work with other systems, such as DeltaV. The recipe to be developed in this course explores different integration approach with DeltaV recipes such as early binding and late binding recipes. To understand these approaches, other Syncade tools are also to be discussed in this course such as Service Controller (SC) Consumer, Event Monitor, and Business Integrator.

Topics

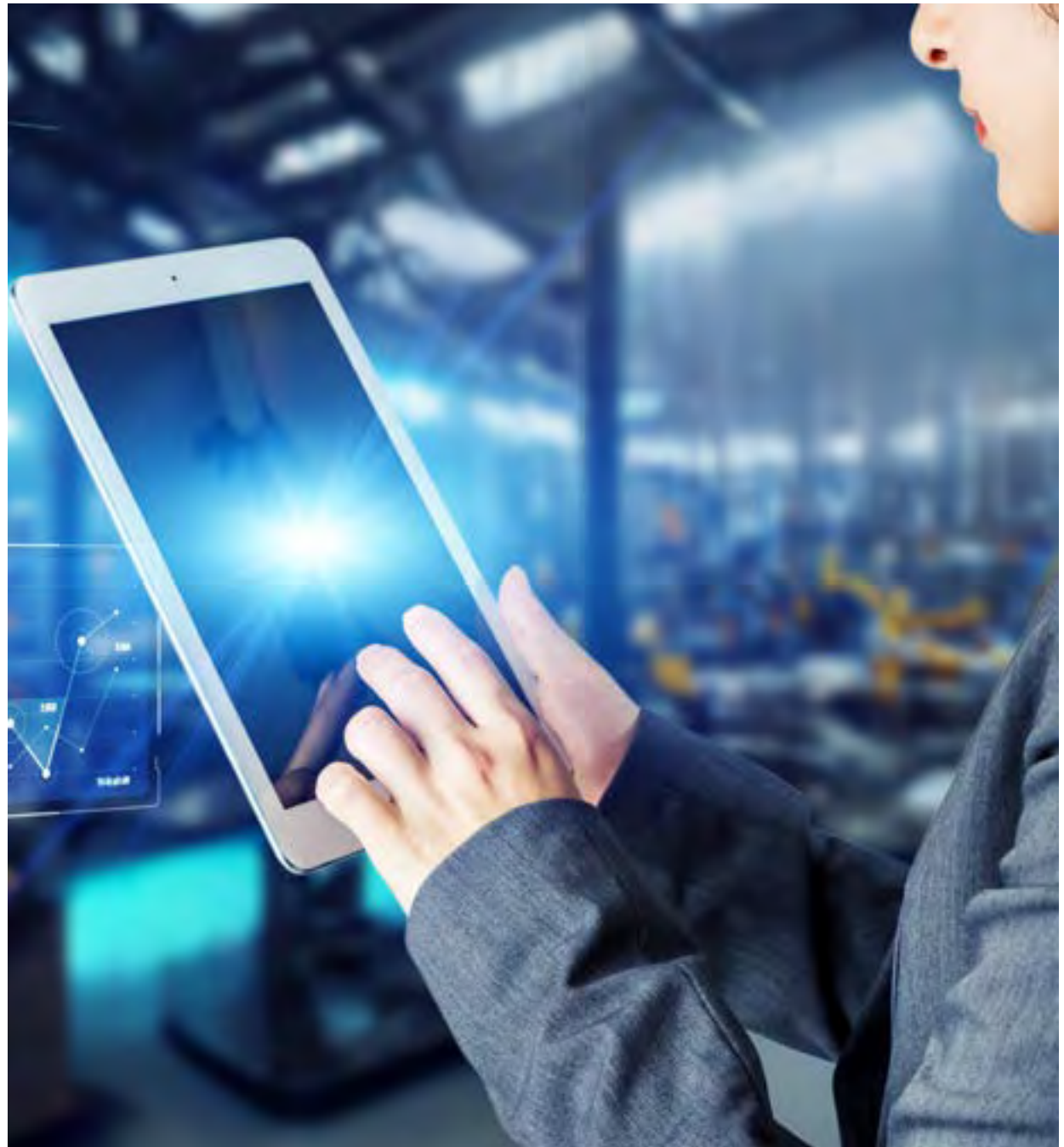
- Recipe Fundamentals
- Simulated Process
- Parameters
- SC Consumer
- Event Monitor
- Bill of Materials
- Business Integrator
- Workflow Types
- Recipe Objects
- OPC Communications
- DeltaV Batch Modules and Recipes
- Integration Options

Prerequisites

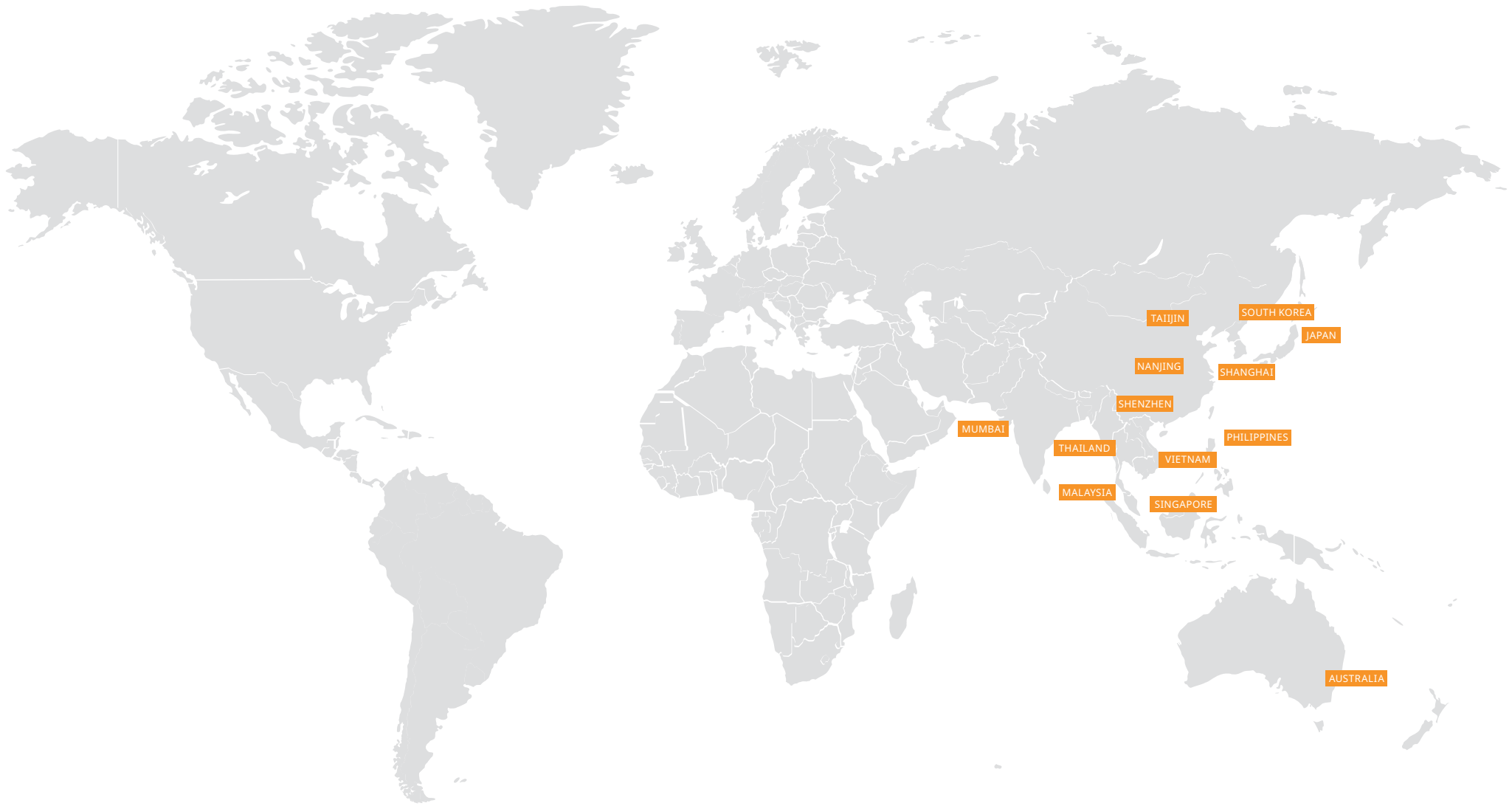
7009/7409, 7016 (DeltaV Batch Implementation), 7183 (Equipment Management), 7185 (Manufacturing Management)

Audience

MES Engineers, DCS Engineers, Recipe Authors



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Australia

Emerson
471 Mountain Highway
Bayswater, Victoria Australia 3153
Phone: + 61 3 9721 0200
Fax +61 3 9720 6614

China

Emerson Process Management Co., Ltd.
No.1277 Xin Jin Qiao Road Pudong
New District Shanghai 201206, China
Phone: 86-21-2892 9640

Emerson Process Management
Tianjin Service Center
6B Building, Saida Jimei Industrial Park,
Xiqing Economic Development Area
Tianjin 300385 China
Phone: 86-22-58680700

Emerson Process Management
Shenzhen Service Center
Floor 1,8th Building,
Liangchuang Technology Park,
No.21 Bulan Rd, Nanwan Street,
Buji Town, Longgang District
Shenzhen 518112 China

Emerson Process Management
Flow Technologies Co., Ltd.
No.111, Xing Min South Road,
Jiangning District
Nanjing 211100 China
Phone: 86-25-51177888

India

Emerson Process Management (India) Private Ltd.
Delphi, B-Wing, 601-603,
Central Avenue, Hiranandani Business Park,
Powai, Mumbai 400-076
Phone: +91 22 6662 0566

Japan

Chiba Solution Center
2-5-1 Yawata Kitacho, Ichihara-shi
Chiba-ken 290-0069
Japan
Phone: 81 436 44 8311

Mizushima Solution Center
36-8 36-8, Tsurajima Tsurajima-chou
Kurashiki-shi
Okayama-ken 712-8011 Japan
Phone: 81 86-445-7270

Malaysia

Emerson Process Management
(Malaysia) Sdn Bhd
No. 1, Block A, Jalan SS 13/5,
47500 Subang Jaya,
Selangor Darul Ehsan, Malaysia
Phone: +60 3 5624 2888

Philippines

Emerson Process Management
19F Cyberscape Alpha Building,
Sapphire & Garnet Rds
Ortigas Center Pasig City
Philippines 1605
Phone: 63 2 7021107

Emerson Electric Asia Ltd.
16/F SM Cyber West Avenue, EDSA
Quezon City Philippines 1105
Phone: 63 2 4793399

Singapore

Emerson Asia Pacific Pte. Ltd.
Educational Services, Singapore
1 Pandan Crescent
Singapore 128461
Phone: (65) 6770 8587
Fax: (65) 6774 6970

South Korea

Emerson Korea Ltd.
259-1 Daeji-ro Suji-gu
Youngin-Si Gyeonggi-Do (16882)
South Korea
Phone: +82 31 8034 0000

Thailand

Emerson (Thailand) Limited
88/4 Mabya Road, Map Ta Phut,
A. Muang Rayong, Rayong 21150
Thailand
Phone: +66 38 691 353

Vietnam

Emerson Process Management (Vietnam) Co. Ltd
Room 09.04, Level 9, Block A,
Viettel Complex Tower,
285 Cach Mang Thang Tam,
Ward 12, District 10, HCMC, Vietnam
Phone: +(84 28) 6290 3031
Fax: +(84 28) 6290 3035

LEARNING PATHS



PLANT PERSONNEL / ENGINEERING
7009V DELTAV OPERATION IMPLEMENTATION 1 - INTRODUCTION [Virtual]
7016V DELTAV SYSTEMS BATCH IMPLEMENTATION
7017V DELTAV SYSTEMS BATCH IMPLEMENTATION II [INTERMEDIATE]

ENGINEERING
7025V DELTAV OPERATE GRAPHICS INTERFACE ADVANCED
7076V DELTAV PMO CONFIGURATION STANDARD [Virtual]
7201V ADVANCED CONTROL SUITE [Virtual]

ADMINISTRATION / TECHNICIANS
7202V DELTAV MODEL PREDICTIVE CONTROL
E7046 DELTAV BATCH ANALYTICS MODEL BUILDER INTRODUCTION
7305V DELTAV SIS IMPLEMENTATION [VIRTUAL]
7027 DELTAV SYSTEM ADMINISTRATION
7029 DELTAV VIRTUALIZATION
7039 AMS DEVICE MANAGER WITH DELTAV
5590 DELTAV POWER & GROUNDING FOR ELECTRONIC SYSTEMS
7018 DELTAV HARDWARE & TROUBLESHOOTING
7030 DELTAV SIS IMPLEMENTATION [VIRTUAL]

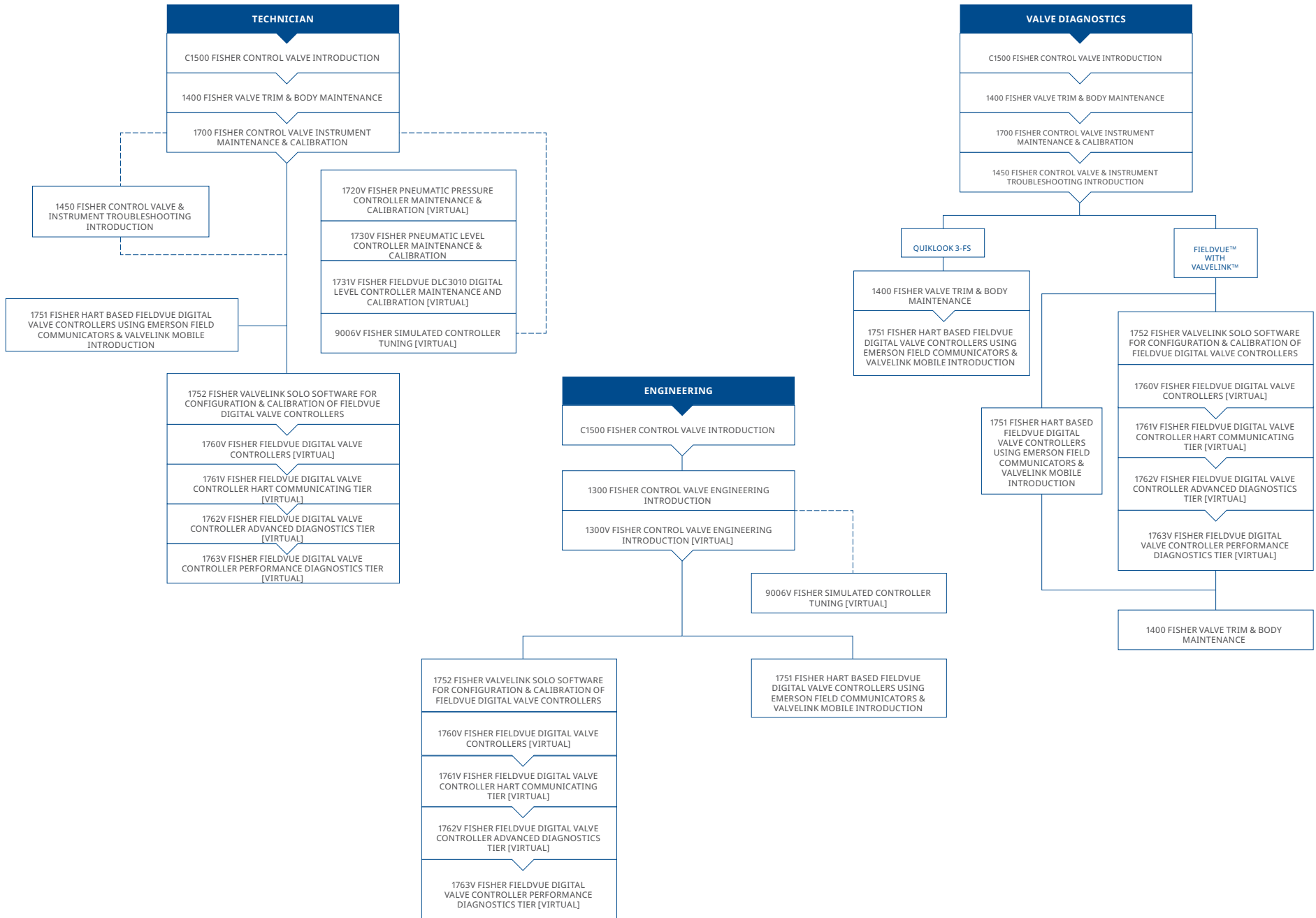
PLANT PERSONNEL / ENGINEERING
7032 DELTAV FIELDBUS DEVICES CONFIGURATION & CONTROL
7037 DELTAV & COMMUNICATION BUS INTERFACES
7303 DELTAV SAFETY INSTRUMENTED SYSTEM WITH SLS 1508 MAINTENANCE

ENGINEERING
7304 DELTAV SIS WITH ELECTRONIC MARSHALLING MAINTENANCE
7014V DELTAV BATCH OPERATION - VIRTUAL
E7044 DELTAV CONTINUOUS OPERATION (V11/V12)
DELTAV ESSENTIAL OPERATOR TRAINING SOLUTION
2370 ROSEMOUNT FIELDBUS MEASUREMENT INSTRUMENTS
7030 DELTAV FIELDBUS DEVICES MAINTENANCE
7032 DELTAV FIELDBUS DEVICES MAINTENANCE

COURSE NUMBER	COURSE NAME	PLANT ENGINEERS	MAINTENANCE TECHNICIANS	PLANT OPERATORS	CONTROL SYSTEM ADMINISTRATORS	PLANT MANAGEMENT
5590	Power Quality & Grounding For Electronic Systems		A			
7009	DeltaV Implementation I	C	A		C	
7012	DeltaV Operator Interface For Continuous Control			C		A
7014	DeltaV Operator Interface For Batch Control			C		A
7016	DeltaV Systems Batch Implementation	C				
7017	DeltaV Implementation Ii	A				
7018	DeltaV Hardware & Troubleshooting	A	C		A	
7020	AMS Device Manager	A	C			
7025	DeltaV Advanced Graphics	A				
7026	DeltaV CyberSecurity	A			C	
7027	DeltaV Systems Administration For Windows 7 & Server 2008				C	
7028	DeltaV Virtualization Administration	A			C	
7029	DeltaV Virtualization				A	
7030	Fieldbus Devices		A			
7032	Fieldbus Systems & Devices	A	A			
7037	Communication Interfaces With The DeltaV System	A	A			
7039	AMS Device Manager With DeltaV	A	C			
7076	DeltaV PMO Configuration Standard	A				
7201	DeltaV Advanced Control	A				
7201cv	DeltaV Insight	A				
7202	DeltaV Model Predictive Control	A				
7203cv	DeltaV Advanced Control - Custom	A				
7303	DeltaV Safety Instrumented Systems With SIS Maintenance		A			
7304	DeltaV Safety Instrumented Systems With Electronic Marshalling Maintenance		A			
7305	DeltaV SIS Implementation	A				
7409	DeltaV Implementation Using DeltaV Live	C	A		C	
7412	DeltaV Live Continuous Operations			C		A
7414	DeltaV Live Batch Operations			C		A
7425	DeltaV Live Graphics Interface - Advanced	A			A	
9025	Control Loop Foundation	P	P			P

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KEY: P - Primer C - Core A - Advanced / Additional Competencies



TECHNICIAN
2326 ROSEMOUNT PROCESS MEASUREMENT PRESSURE & TEMPERATURE PRODUCTS
2327 ROSEMOUNT PROCESS MEASUREMENT DP FLOW PRODUCTS
2333 ROSEMOUNT PROCESS MEASUREMENT LEVEL PRODUCTS
7021 AMS DEVICE MANAGER WITH ROSEMOUNT HART INSTRUMENTS

ENGINEERING
2326 ROSEMOUNT PROCESS MEASUREMENT PRESSURE & TEMPERATURE PRODUCTS
2327 ROSEMOUNT PROCESS MEASUREMENT PRODUCTS (DP FLOW) II
2333 ROSEMOUNT PROCESS MEASUREMENT LEVEL PRODUCTS
7021 AMS DEVICE MANAGER WITH ROSEMOUNT HART INSTRUMENTS
2370 ROSEMOUNT FIELDBUS MEASUREMENT INSTRUMENTS
2375 ROSEMOUNT WIRELESS SELF ORGANIZING NETWORK WITH HOST INTEGRATION

CONTINUOUS CONTROL OPERATORS

Your operators' process knowledge and skill levels affect how your process is run, which can directly impact your facility's bottom line.

Emerson Education Services can dramatically boost your personnel skills and performance and reinforce job competencies.

Emerson Operator Curriculum Path provides focused, in-depth, objective-based training on product-specific procedures for proper operation and maintenance of your DeltaV distributed control system. Your operators get practical application skills through dedicated classroom facilities and hardware. Train your operator for peak performance and process profitability.

SELF-GUIDED PRIMERS

- e9025, Control Loop Foundation

CORE COMPETENCIES

- 7012, DeltaV Operator Interface for Continuous Control
- DeltaV Essential Operator Training Solution

ADDITIONAL COMPETENCIES

- 7009, DeltaV Implementation I

JOB COMPETENCIES

- Ensure Safe and Effective Operation
- Communicate production status
- Work turnaround projects
- Management of Change process of standard operating procedures
- Recognize and effectively respond to unusual process issues
- Troubleshoot difficult production issues
- Suggest Production improvements
- Alarm Management
- Tune loops

I&E MAINTENANCE TECHNICAL

Your maintenance technicians' process knowledge and skills can affect your facility's performance, up-time, and maintenance cost—and ultimately your bottom line.

Emerson Education Services can dramatically boost your personnel skills and performance and reinforce job competencies.

Emerson I&E maintenance Technician Curriculum Path provides focused, in depth, objective-based training on product-specific procedures for proper maintenance of your DeltaV distributed control system. Your maintenance technicians get practical applications skills through dedicated classroom facilities and hardware.

SELF-GUIDED PRIMERS

- e9025, Control Loop Foundation

CORE COMPETENCIES

- 7018, DeltaV Hardware & Troubleshooting
- 7020, AMS Device Manager or 7039, AMS DeviceManager with DeltaV

ADDITIONAL COMPETENCIES

- 7009, DeltaV Implementation I
- 7016 DeltaV Batch Implementation
- 7030 Fieldbus Devices
- 5590, Power Quality and Grounding
- 7303/4, DeltaV SIS Maintenance
- 7037, Communication Bus Interfaces with DeltaV Systems

JOB COMPETENCIES

- Maintain, troubleshoot, and make configuration changes to Basic Process Control System and Safety Instrumented Systems (SIS)
- Connect to HART® & Fieldbus devices
- Calibrate & commission devices, instruments and valves
- Proactively monitor devices for alerts, troubleshoot device problems & faulty assets
- Effectiveness of Maintenance Reliability Program

BATCH OPERATORS

Your batch operators' process knowledge and skills levels affect how your process is run, which can directly impact your facility's bottom line.

Emerson Education Services can dramatically boost your personnel skills and performance and reinforce job competencies.

Emerson Batch Operator Curriculum Path provides focused, in depth, objective-based training on product-specific procedures for proper operation and maintenance of your DeltaV distributed control system. Your batch operators get practical application skills through dedicated classroom facilities and hardware.

SELF-GUIDED PRIMERS

- e9025, Control Loop Foundation

CORE COMPETENCIES

- 7014, DeltaV Operator Interface for Batch
- DeltaV Essential Operator Training Solution

ADDITIONAL COMPETENCIES

- 7009, DeltaV Implementation I
- 7016 DeltaV Batch Implementation

JOB COMPETENCIES

- Safely operate batches from start to finish
- Monitor batch for actionable information to keep batch within specification
- Perform manual batch tasks
- Update, review and report operator log book
- Manage sample collection with LIMS
- Provide production status during shift, anomalies, equipment, etc.



FINAL CONTROL										
PLANT MANAGEMENT & ENGINEERING LEARNING PATHS	PLANT MANAGEMENT					PLANT CONTROL & ENGINEERING				
	PLANT ENGINEERS	PRODUCTION MANAGER	ENGINEERING MANAGER	RELIABILITY MANAGER	OPERATOR	CONTROL SYSTEM ENGINEER	CONTROL SYSTEM ADMIN.	E&I ENGINEER	ENGINEER	PROCESS ENGINEER
Control Valve Engineering I	A	A	A	A		A			C	C
Control Valve Engineering II									C	A
Valve Technician I	A	A	A	A	A		A			A
Flow Scanner Data Acquisition & Interpretation									A	
Advanced Flow Scanner Diagnostic Interpretation									A	
Valve Technician II									A	
Instrument Technician							A	A		
FIELDVUE™ Digital Valve Controller Setup & Diagnostics using 475 Field Communicator & ValveLink™			A	A	A				A	A
ValveLink Software for Diagnostics of FIELDVUE – Digital Valve Controller									A	A
FOUNDATION™ fieldbus FIELDVUE Digital Valve Controller			A	C	A				A	A
Introduction to Fisher™ Control Valves	P	P	P	P	P	P	P	P	P	P

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PLANT MAINTENANCE & IT LEARNING PATHS	FINAL CONTROL									
	INSTRUMENT TECHNICIAN	VIBRATION ANALYST	ROTATING EQUIPMENT MECHANIC	RELIABILITY DATA COLLECTOR	ELECTRICIAN	LUBRICATION SPECIALIST	IT ADMIN.	INSTRUMENT. ENGINEER	UNIT MAINTENANCE ELECTRICIAN	MECHANIC
Control Valve Engineering I								C		
Control Valve Engineering II										
Valve Technician I	C				A			A	C	C
Flow Scanner Data Acquisition & Interpretation	C			C					A	A
Advanced Flow Scanner Diagnostic Interpretation	A			C						A
Valve Technician II	C								A	C
Instrument Technician	C			C				C	A	
FIELDVUE™ Digital Valve Controller Setup & Diagnostics using 475 Field Communicator & ValveLink™	A			C				A		A
ValveLink Software for Diagnostics of FIELDVUE – Digital Valve Controller	A			C				A		
FOUNDATION™ fieldbus FIELDVUE Digital Valve Controller	A			A	A			A	A	A
Introduction to Fisher™ Control Valves	P	P	P	P	P	P	P	P	P	P

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FLOW METERING				
PLANT MAINTENANCE LEARNING PATHS	MAINTENANCE MANAGER	MAINTENANCE SUPERVISOR	MAINTENANCE TECHNICIAN	INSTRUMENT TECHNICIAN
Basic Instrumentation (4-5)	X	X	X	
Flow Measurement (4-5)	X	X	X	X
Flow Measurement: Sizing And Selection (3)		X	X	X
Mmi Coriolis Technician (2)			O	X
Mmi Coriolis Advanced (2)			O	X
Mmi Coriolis Bi-Annual Refresher (1)				
Qualified Technician Mmi Coriolis (4-5)				
Bi-Annual Re-qualification Mmi Coriolis (2)				
RF Vortex Technician (1)		X	X	X
RF Vortex Advanced (1)			O	X
RF Vortex Bi-Annual Refresher (0.5)			O	X
Qualified Technician RF Vortex (3)				
Bi-Annual Re-qualification RF Vortex (0.5)				
RF Magmeter Technician (1)		X	X	X
RF Magmeter Advanced (1)			O	X
Bi-Annual Re-qualification RF Vortex (0.5)			O	X
Qualified Technician RF Magmeter (2)				
Bi-Annual Re-qualification RF Magmeter (0.5)				
Density Measurement (2)		X	X	X
Viscosity Measurement (2)		O	O	X
D4230 Gas Ultrasonic Flowmeter (2)		X	X	X
D4280 Liquid Ultrasonic Flowmeter (2)		X	X	X
D4270 Compact Prover (2)		X	X	X
D4260 FloBoss™ S600 Flow Computer (2)		X	O	X
D4530 Metering Systems Introduction (2)		O	X	X
D4540 DanPac Metering Supervisory (2)		X	X	X
D4109 Qualitative Measurement and Properties of Natural Gases (2)		X	X	X
D4520 Hydrocarbon Gas Flow Measurement Systems (2)		O	X	X
D4510 Hydrocarbon Liquid Flow Measurement Systems (2)		O	X	X

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KEY: 0 - Course Duration in Days X - Core Competencies O - Optional Additional Competencies

FLOW METERING					
PLANT ENGINEERING LEARNING PATHS	PLANT ENGINEERING MANAGER	ELECTRICAL & INSTRUMENT ENGINEER	PROCESS ENGINEER	CONTROL SYSTEM ENGINEER	METROLOGIST
Basic Instrumentation (4-5)	X		X	X	X
Flow Measurement (4-5)	X	X	X	X	X
Flow Measurement: Sizing and Selection (3)		O	X		
MMI Coriolis Technician (2)		X	O		X
MMI Coriolis Advanced (2)		X		O	X
MMI Coriolis Bi-Annual Refresher (1)		X			
Qualified Technician MMI Coriolis (4-5)					
Bi-Annual Re-qualification MMI Coriolis (2)					
RF Vortex Technician (1)		X	O	O	
RF Vortex Advanced (1)		X			
RF Vortex Bi-Annual Refresher (0.5)		X			
Qualified Technician RF Vortex (3)					
Bi-Annual Re-qualification RF Vortex (0.5)					
RF Magmeter Technician (1)		X	O	O	
RF Magmeter Advanced (1)		X			
RF Vortex Bi-Annual Refresher (0.5)		X			
Qualified Technician RF Magmeter (2)					
Bi-Annual Re-qualification RF Magmeter (0.5)					
Density Measurement (2)		X		O	X
Viscosity Measurement (2)		X		O	
D4230 Gas Ultrasonic Flowmeter (2)		X	X		X
D4280 Liquid Ultrasonic Flowmeter (2)		X	X		X
D4270 Compact Prover (2)		X	O		X
D4260 FloBoss™ S600 Flow Computer (2)		X	X		X
D4530 Metering Systems Introduction (2)	O	O	O		
D4540 DanPac Metering Supervisory (2)		X	O	X	
D4520 Hydrocarbon Gas Flow Measurement Systems (2)		X	X	O	O
D4510 Hydrocarbon Liquid Flow Measurement Systems (2)		X	X	O	O

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KEY: **O** - Course Duration in Days **X** - Core Competencies **O** - Optional Additional Competencies

FLOW METERING					
PROJECT MANAGEMENT TEAM PATHS	PROJECT MANAGER	PROJECT ENGINEER	INSTRUMENT ENGINEER	INSTRUMENT TECHNICIAN	COMMISSION LEAD
Basic Instrumentation (4-5)	X	X			X
Flow Measurement (4-5)	X	X	X	X	X
Flow Measurement: Sizing and Selection (3)	O	X	O		
MMI Coriolis Technician (2)		O	X	X	X
MMI Coriolis Advanced (2)			X	O	O
MMI Coriolis Bi-Annual Refresher (1)					
Qualified Technician MMI Coriolis (4-5)					
Bi-Annual Re-qualification MMI Coriolis (2)					
RF Vortex Technician (1)			X	X	X
RF Vortex Advanced (1)			X	O	O
RF Vortex Bi-Annual Refresher (0.5)			X	O	O
Qualified Technician RF Vortex (3)					
Bi-Annual Re-qualification RF Vortex (0.5)					
RF Magmeter Technician (1)			X	X	X
RF Magmeter Advanced (1)			X	O	O
Bi-Annual Re-qualification RF Vortex (0.5)			X	O	O
Qualified Technician RF Magmeter (2)					
Bi-Annual Re-qualification RF Magmeter (0.5)					
Density Measurement (2)			X	X	X
Viscosity Measurement (2)			X	X	O
D4230 Gas Ultrasonic Flowmeter (2)		O	X	X	X
D4280 Liquid Ultrasonic Flowmeter (2)		O	X	X	X
D4270 Compact Prover (2)		O	X	X	
D4260 FloBoss™ S600 Flow Computer (2)		O	X	X	O
D4530 Metering Systems Introduction (2)	X	X	X	X	X
D4520 Hydrocarbon Gas Flow Measurement Systems (2)	O	O	X	X	X
D4510 Hydrocarbon Liquid Flow Measurement Systems (2)	O	O	X	X	X

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