

# Educational Services

## 2017 Asia Pacific Training Offerings



Increase profitability, improve retention,  
and enhance safety with world-class  
training solutions.





## Exceed Expectations with Prepared Personnel

Skilled personnel anticipate needs; they solve tough problems; they make an operation run smoothly. That's why training is the cornerstone of maximum availability, sustainability, and operational excellence at your facility.

A well-trained team knows their tools and knows how to use them to meet short-term and long-term goals. Work with a partner — Emerson Educational Services can bring your entire team the expertise they need to face each challenge.

Whether your team must configure and calibrate valves, predict machinery faults, or develop a control strategy, Emerson Educational Services has the coursework to prepare your team. Investing in your team will also:

**Train and keep high-quality team members.**

What if you train personnel and they leave? Worse yet, what if you don't train them and they stay? Train personnel and improve not only operations, but a sense of ownership in the operation's results – a proven ingredient in employee satisfaction and retention.

**Learn best practices to meet profitability goals.**

Emerson instructors reach deep into their decades of product experience and industry best practices. Profit from their experience to meet your business goals.

**Choose a hands-on learning platform and train for real-life challenges.**

Emerson instructors combine hands-on training with real-life examples to prepare your personnel to find solutions in the midst of challenging situations.

## Train and Keep High-Quality Team Members

Consider Emerson training as the effective short- and long-term solution to maximize the return on your most significant investment: your employees.

Through Emerson coursework, employees obtain the knowledge they need to not only perform their jobs, but seek efficient solutions to daily issues. They will perform with a real sense of ownership and satisfaction — resulting in increased retention.

Whether you choose individual classes or a complete education program designed specifically for your organization, Emerson can be your single expert training source and offer flexibility to work within your schedules and shifts.

Your facility will benefit from these options:

- Accelerated boot camp developed for your new recruits.
- Assessments for skill gap analysis specific to your facility.
- Efficiently delivered blended learning approach.

## Competency Development Program



*To create a competency development program, Emerson follows a proven process that starts with Educational Services consultants leading your management team to identify items such as job-role definitions and skills gap analysis. We will also guide the team to discuss methods of assessing the training success.*

## Learn Best Practices to Meet Profitability Goals

Your personnel want to perform high-quality work that shows positive results. Learning best practices, your personnel will avoid inadvertent operator errors and improper maintenance that lead to energy waste, contamination, unplanned shutdowns, and off-spec product.

“The material was good. I needed the review of the PID, the instructor explained it in a way that really helped me to understand it much better than I previously did”

Maintenance Worker in the Refinery Industry

“The training our operators received was second to none. The real-life exercises put our operators at the top of their game and helped make this one of the best startups I’ve ever seen. We finished a day early with no injuries or environmental incidents.”

Maintenance Worker in the Refinery Industry

“The training exceeded my expectations. I wanted information on sizing control valves and I got that plus much other useful information.”

Operations/Production Worker in the Oil and Gas Industry

With world-class training, your personnel will apply best practices to Emerson products and applications throughout your facility.



## Choose Hands-On Learning and Train Real-Life Challenges

Learning styles vary as widely as people do. Proof shows, however, that hands on training and experiential learning bring out questions and solidify ideas for students.

Emerson delivers comprehensive, hands-on blended training programs — including on-site instructor led, virtual, eLearning, and more. Hands-on training provides practical application skills with dedicated hardware at regional training centers or locally.

Because your facility’s requirements extend beyond Emerson products, we offer classes in best practices such as process control design.

### Increased Productivity

Emerson instructors’ application expertise and practical field experience dramatically boost students’ skills and performance. And evergreen training keeps your people up to date on the latest technologies, enabling them to uncover new process improvements.

### Broad Emerson Offerings

In developing courses and education paths, we draw from multiple disciplines: control, measurement, regulation, and automation. In this way your personnel will get the most from the Emerson products and applications at work in your operations.



### IACET Authorized Provider

Emerson Educational Services has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET) Students enjoy a consistent high-quality class experience.

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

Association of Experimental Education

## Train Personnel to be Confident. Capable. Interested. READY .

We hope you will invite Emerson to instill confidence and develop capabilities in your personnel. We will guide them to be interested in potential solutions – ready to move your facility to greater efficiency and profitability.

Whether for a new project or for ongoing operations and maintenance, Emerson provides consulting services, skills assessments, and the right training solutions at the right time.

- Project consultants identify targeted business results where training solutions can improve plant operations.
- A skills assessment identifies skills gaps that can be addressed with training and prescribes the proper training solution.
- Your staff will be prepared when your project comes on line and throughout continuing operations and maintenance.

Across the world over several decades, Emerson has developed and dedicated substantial resources to training operators, engineers, technicians, and maintenance personnel. We are ready for you anywhere and anytime.

**“Course material greatly increased my understanding of control valves and will improve my ability to trouble shoot issues and design control valves when needed. I like the labs and having valve internal parts available for hands on inspection.”**

Engineer in the Chemical Industry



### COURSE TYPES

#### On-site Traditional

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

#### 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.

#### 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.

#### 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's Blended Learning approach combines various learning methods using a variety of digital media. Blended Learning is Emerson's unique approach to delivering quality education while reducing learner time away from the facility.



18 Training centers in 9 countries across Asia Pacific

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## Educational Services

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Analytical  
**Fundamentals of Analyzers**
**Course G2000****Overview**

This course consists of 3 days, covering all the Fundamentals of analyzers.

- Gas Chromatograph
- Process Gas Analyzers
- Combustion Analyzers
- Liquid Analyzers
- Flame and Gas Detectors

Lectures will be given on the principle, understanding the working of analyzers, importance of analyzers in different applications and analyzer sample conditioning system. Students who complete this course will:

- Understand the basic theory of each analyzer
- Know the importance of analyzer in applications
- Understand the operation of analyzer
- Identify the parts of analyzer
- Understand the reasons that will affect the performance of the analyzer
- Understand the sampling system
- concepts used in different analyzer

**Topics**

- Operations and working of gas chromatographs
- Process gas analyzers with different principle
- Operation and working of combustion analyzers
- Operation and working of different liquid analyzers

 Analytical  
**Liquid Analysis: Chlorine, Dissolved Oxygen and Ozone Amperometric Measurement Theory**
**Course 2201****Overview**

This 1-day course provides insight into the complicated amperometric measurements of chlorine, dissolved oxygen and ozone. Students will learn the concepts of how amperometric sensors work and how to calibrate each type of measurement. Students will:

- differentiate the various species of chlorine
- implement a proper maintenance program
- use diagnostics to troubleshoot problems

**Topics**

- Amperometric Measurement Theory
- Chlorine/Dissolved Oxygen/Ozone
- Calibration Procedures for Each Measurement
- Maintenance & Troubleshooting Tips

**Note:** Available on Request or at Customer Site

 Analytical  
**Liquid Analysis: pH, Conductivity and ORP Theory**
**Course 2200****Overview**

This 1-day course provides a solid theoretical background in pH, conductivity, and ORP measurements. Students will:

- understand how each measurement is made
- recognize installation/application problems
- learn configuration/calibrate procedures
- how to implement a maintenance program
- troubleshooting 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

**Note:** Available on Request or at Customer Site

 Analytical  
**Rosemount Analytical 700XA and 1500XA Gas Chromatographs (GC) - Introduction**
**Course R4105****Overview**

This 3-day course gives students a basic understanding of how a 700XA and 1500XA gas chromatograph works, emphasizing chromatograph fundamentals and basic theory.

**Topics**

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

 Analytical  
**Liquid Analysis: Measurement Theory (Customer Specific)**
**Course 2205****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. Select an analyzer (course 2204) or transmitter (course 2202) to accompany the measurement theories for a well-rounded class.

**Topics**

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

**Note:** Available on Request or at Customer Site

 Analytical  
**Rosemount Analytical 700XA Gas Chromatograph - Operation and Maintenance**
**Course R4213****Overview**

This 1-day course provides a solid theoretical background in pH, conductivity, and ORP measurements. Students will:

- understand how each measurement is made
- recognize installation/application problems
- learn configuration/calibrate procedures
- how to implement a maintenance program
- troubleshooting problems using diagnostics

**Prerequisites**

'Introduction to Gas Chromatographs' course or equivalent knowledge.

**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 the Gas Chromatograph
- Conducting Preventative Maintenance
- Communicating to Other Devices
- Reviewing Spare Parts
- Recommendations

**Note:** Available on Request or at Customer Site

Analytical  
**Rosemount Analytical Oxymitter and World Class 3000 Oxygen Flue Gas Analyzer - Maintenance**

**Course 2153****Overview**

This 1-day course covers the service requirements for oxygen analyzers in general and the installation, operation, calibration and maintenance of the World Class and Oxymitter.

**Topics**

- Combustion Requirements
- Methods of Oxygen Analysis
- Typical Uses of Oxygen Analysis
- Combustion Efficiency
- Zirconia (ZrO<sub>2</sub>) Oxygen Analysis
- Theory of Operation
- Oxygen Analyzer: Installation; Hardware; Maintenance; Troubleshooting; Hart Communications

**Oxygen Flue Gas Analyzer Maintenance, OCX8800**

**Course 2154****Overview**

This 1-day course covers the service requirements for oxygen analyzers in general and the installation, operation, calibration, and maintenance of the OCX8800.

**Topics**

- Combustion Requirements
- Methods of Oxygen Analysis
- Typical Uses of Oxygen Analysis
- Combustion Efficiency
- Zirconia (ZrO<sub>2</sub>) Oxygen Analysis
- COe Analysis
- Theory of Operation
- Oxygen Analyzer
  - Installation
  - Hardware
  - Maintenance
  - Troubleshooting
  - HART Communications

**Note:** Available on Request or at Customer Site

Analytical  
**Rosemount Analytical 1056 Dual Input Analyzer (eLearning)**

**Course e2061 NEW****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.

**\$125 per student - unlimited access  
3 months. Duration: 1 hour**

**Rosemount Analytical 500 and 700 Gas Chromatographs (GC) Introduction**

**Course r4100****Overview**

This 3-day course provides students with a basic understanding of how a gas chromatograph works, 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

Analytical  
**Rosemount Analytical 56, 1056 and 1057 Four-Wire Liquid Analyzers**

**Course 2204****Overview**

This 2-hour class covers features, benefits, and operation of the Rosemount Analytical Model 56, 1056, or 1057. Each analyzer family can measure pH, ORP, contacting conductivity, toroidal conductivity, chlorine, dissolved oxygen, and ozone. The Model 56 can also measure turbidity in drinking water and flow from a pulse sensor, and display any 4-20mA signal input. Each instrument has its own available features, and menu tree which will be covered in great detail.

**Topics**

- Installation and Application Problems
- Configuration of Outputs / Alarms (If Applicable)
- Programming of Automated Cleaning Systems (DO, pH)
- Use Diagnostic Features (If Applicable)
- Sensor Calibration
- Troubleshooting

**Note:** Available on Request or at Customer Site

Analytical  
**Rosemount Analytical MLT Process Gas Analyzers**

**Course 2110****Overview**

This 3-day course uses lectures and hands-on service training to provide instruction on MLT analyzers, platforms, and other menu structures. The course will teach the student on how to install, maintain, and troubleshoot the MLT series of analyzers. Application and selection will be briefly covered including the hazardous area requirements. Students will:

- identify modules and their functionality
- understand the basic theory of operation
- set up software variables for proper calibration and operation
- use the software diagnostics to troubleshoot problems

**Topics**

- Overview of MLT
- Theory of Operation
- Installation
- Configuration and Calibration
- Maintenance and Troubleshooting

Analytical  
**Rosemount Analytical pH Measurement Theory - Level 1 (eLearning)**

**Course e2062 NEW****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.

**\$125 per student - unlimited access  
3 months. duration: 1 hour**

**Rosemount Analytical 1066 and 5081 Two-Wire Liquid Transmitters**

**Course 2202****Overview**

This 2-hour class covers features, benefits and operation of any Rosemount Analytical Model 5081 or Model Xmt two wire transmitters. Each transmitter family can measure pH, ORP, contacting conductivity, toroidal conductivity, chlorine, dissolved oxygen and ozone. Both transmitters have advanced diagnostic capabilities and can communicate via HART or Foundation Fieldbus communication protocols.

**Topics**

- Installation and Application Problems
- Configuration of Outputs (HART Only)
- Use Diagnostic Features (If Applicable)
- Sensor Calibration
- Troubleshooting

**Note:** Available on Request or at Customer Site

Analytical  
**On-site Traditional virtual Learning eLearning**

**Rosemount Analytical Wireless Instrumentation Models 6081P and 6081C**

**Course 2203v****Overview**

This 2-hour class covers features, benefits and operation of Rosemount Analytical's Model 6081 wireless device. The Model 6081P measures pH and ORP and is SMART sensor enabled. The Model 6081C measures Contacting Conductivity with sensors that have either 2-wire or 4-wire inputs. Each device communicates back to a 1420 Gateway via Wireless HART communication.

**Topics**

- IConnecting the Model 6081 to a Wireless Mesh Network
- Configuring Update Rates
- Mesh Network Theory
- Sensor Calibration
- Troubleshooting



Analytical  
**X-Stream Process Gas Analyzers**

**Course 2172**

**Overview**

This course consists of a one-day class per selected analyzer with any of the following Principle:

- NDIR
- UV
- VIS
- Paramagnetic and Electrochemical O<sub>2</sub>
- Thermal Conductivity Sensors
- Trace Moisture Sensors

Lectures and hands-on service training are provided on how to install, maintain, and troubleshoot the Extreme series of analyzers. Students who complete this course will:

- Identify individual modules and their functionality
- Understand the basic theory of operation of each module
- Set up the software variables for proper calibration and operation
- Understand and properly use software diagnostics

**Topics**

- Extreme Overview
- Extreme as a System
- Extreme Testing
- Extreme Startup and Installation

Analytical  
**3051s Multivariable™ Mass Flow Transmitter**

**Course 2310**

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

**Prerequisites**

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

**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

**Note:** This product is also included in course 2327 and 2329.

Flow Measurement  
**700xA Gas Chromatograph**

**Course D4313**

**Overview**

This 5-day course is appropriate for those who have either worked with a chromatograph for at least six months or completed the 'Introduction to Gas Chromatographs' course. It prepares participants to operate and repair the new Danalyzer 700XA gas chromatograph for natural gas applications and will focus on the improvements in analyzer design and the new MON 2020 diagnostics and configuration software.

**Topics**

- Hands-on Learning That Explains the Chromatograph, How it Operates, and What it Does to Analyze Natural Gas
- 700XA Chromatograph Hardware
- Installation and Operation of MON2020 Software
- Dual Detector Applications (C9+) and the Hydrocarbon Dew Point Calculation
- Identifying Problems, Setting Timed Events, Preparing Samples, and Implementing Preventive Maintenance Procedures
- Troubleshooting
- Spare Parts and Service Tools

Flow Measurement  
**8700 Series Magnetic Flowmeter**

**Course 2340**

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

**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.

**Prerequisites**

Knowledge of basic flow fundamentals and instrumentation.

**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

Flow Measurement  
**8700 series Magnetic Flowmeter with AMS device Manager**

**Course 2340A**

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.

**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 AMS Device Manager and how to use this tool to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

**Prerequisites**

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

**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 AMS Device Manager
- Properly Install/Troubleshoot the Rosemount Magnetic Flowmeter System

Flow Measurement  
**8800 Series Hart Vortex Flowmeter**

**Course 2341**

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.

**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.

**Prerequisites**

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

**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 vFlowmeter System

Flow Measurement

**8800 Series Vortex Flowmeter with AMS Device Manager****Course 2341A**

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.

**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 Vortex flowmeter systems. The students will learn how to use AMS Device Manager to perform configuration. Common issues encountered and troubleshooting techniques will also be covered.

**Prerequisites**

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

**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

Flow Measurement

**Advanced Model 500 Gas Chromatograph****Course D4310****Overview**

This 5-day course provides students with an advanced understanding of gas chromatograph operation, troubleshooting, and maintenance. Computer operation skills are a prerequisite, along with either three years of chromatography experience or completion of the DMS Operation & Maintenance of Gas Chromatographs Course. We supply all necessary handouts for the course. Our highly experienced instructor can provide additional insight into your specific applications when you provide your chromatograph sales order number and application information.

**Topics**

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

**Topics**

- Process Chromatograph Flow Configurations
- Overhauling Valves
- Thermal Conductivity, Flame Ionization and Flame Photometric Detectors
- Sample, Carrier and Calibration Gas Systems
- 2350A Controller Hardware
- Installing and Using MON Software for Integration and Calculations
- Setting Timed Events, Retention Times and Response Factor Calculations
- Start up Procedures
- Setting Valve Timing and Flows with Different Flow Configurations
- Checking for Proper Separation and Analyzing Chromatograms
- Verifying that the Chromatograph is Operating Properly
- Troubleshooting the Chromatograph and 2350A Controller
- Configuring Reporting Details and Control Outputs
- Preventative Maintenance Service Procedures
- Communications and Modbus Registers
- Spare Parts and Tools

Flow Measurement

**Basic Fluid Flow Measurement Course****Course D3119****Overview**

This 3-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.

**Prerequisites**

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

**Topics**

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

Flow Measurement

**DanPac Measurement and Control System Introduction to Operation and Maintenance****Course D4540****Overview**

This 2-day generic course\* provides students with an operational introduction to the DanPac Measurement & Control System. The instructor will explain the metering system architecture, its function and administration. As well as showing how to navigate the operator interface, the course covers basic troubleshooting. The instructor will also explain the features and benefits of the control options available within DanPac. Students will receive supporting literature.

**Prerequisites**

A background in flow measurement is required.

**Topics**

- Introduction to the DanPac System Architecture
- Operator Interface Graphics and Controls
- Access and Security
- Communications and Interface to System Field Components
- Reporting and Alarm Functions
- Simple Diagnostics and Troubleshooting

Flow Measurement

**Operation and Maintenance of Daniel Orifice Fitting****Course D4420****Overview**

This 2-day course is for the beginner or experienced technicians. The students will learn the operation, maintenance, repair and troubleshooting Daniel Orifice Fittings.

**Prerequisites**

Participants should be proficient in personal computer operations and have a basic knowledge of flow measurement.

**Topics**

- Purpose of Orifice Fittings
- Identifying Models of Daniel Orifice Fittings
- Main Components of Daniel Orifice Fittings
- Theory of Orifice Flow Measurement
- Installation Requirements
- Proper Operation of the Senior Orifice Fittings
- Orifice Plate Calibration
- Fitting Maintenance

Flow Measurement

**Introduction to Daniel Ultrasonic Flowmeter with Mark III Electronics (eLearning)****Course e4610 NEW****Overview**

This Course introduces the basic elements and concepts of the Daniel Ultra Sonic Flow Meter, equipped with MarkIII Electronics. Historical look at transducers, concepts involved with Flow Meters, Wiring Connections, and MeterLink Software

**\$99 per student - unlimited access for 3 months.**

Flow Measurement

**Introduction to Model 500 and 700 Gas Chromatographs****Course D4100****Overview**

This 3-day course provides students with a basic understanding of how a gas chromatograph works, emphasizing chromatograph fundamentals and basic theory. The only prerequisites are basic computer skills. DMS provides an experienced on-site instructor as well as all necessary equipment and handouts for the course.

**Prerequisites**

Participants should be proficient in personal computer operations and have a basic knowledge of flow measurement.

**Topics**

- Basic Chromatography Principles and Their Application to Gas Measurement
- Basic Chemistry, Flow Configuration and Carrier and Calibration Gas Systems
- Basic Sample Systems
- Basic Chromatograph Hardware Timed Events, Retention Times, Response Factors
- Data Calculations and Control Parameters
- Using Chromatograms to Identify Problems
- Identifying Gas Components
- Calibrating a Gas Chromatograph
- Operation of MON Software

Flow Measurement

**Micro Motion 3098 Gas Specific Gravity**

**Course 2386**

This course is intended for anyone that is involved with properly installing, wiring, configuring and troubleshooting a Micro Motion 3098 Gas Specific Gravity meter. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

**Overview**

This 1-day 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.

**Prerequisites**

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

**Topics**

- Explain the Principle of Operation for how a Micro Motion 3098 Gas Specific Gravity Meter Works and the Function of the Key Components
- Learn the Installation Best Practices for Orienting, Mounting, Piping and Wiring the 3098
- Configure the 3098 and Perform the Required Field Calibration
- Learn a Step by Step Process to Perform Basic Troubleshooting of the Most Common Issues Customers Encounter

Flow Measurement

**Micro Motion Comprehensive Product Training - Field**

**Course 2380**

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.

**Overview**

This 2-day field class covers the same materials that are covered in the 2352 course held at Micro Motion headquarters, in Boulder, Colorado. It is a blend of lectures and hands-on exercises that cover the installation, configuration and calibration of the Micro Motion metering system. Students will learn the Series 1000/2000/3000 transmitters using these configuration tools; Prolink III, HC475, AMS or Display Interface. Students will perform a master reset and use Prolink III to configure the Series 1000/2000/3000, perform a flow calibration check and learn how to diagnose and solve troubleshooting problems. When the class is taught at a customer site the class can be customized to cover RFT9739/9739MVD transmitter with F-Series, T Series or R Series Sensors. This course also includes an introduction to Micro Motion's new 5700 transmitter.

**Prerequisites**

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

**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

Flow Measurement

**Micro Motion Coriolis and Rosemount Smart 8700 Magnetic Flowmeters**

**Course 2384**

This combined class is intended anyone that is involved with properly configuring and troubleshooting a Micro Motion flow and density meter and Rosemount 8700 Smart Magnetic Flowmeters. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

**Overview**

This 1-day field class provides hands-on training on both the Coriolis and Magnetic Flowmeters. Typically 2/3 of the course time is spent on Micro Motion's Coriolis meter 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 troubleshooting best practices. Students will learn the Micro Motion Series 1000/2000 transmitters using one of these configuration tools; Prolink III, HC475, AMS Device Manager or Series 3000 display interface devices. Public field classes typically use Prolink III for configuring the Micro Motion transmitters and the HC475 will be used for the Rosemount 8700 Magnetic flowmeter. Customers can choose which configuration device is used for classes held at their site. This course also includes an introduction to Micro Motion's new 5700 transmitter.

**Prerequisites**

Some prior experience working with Micro Motion Coriolis & Rosemount 8700 Magnetic flowmeters is recommended. However students with no past experience can also benefit. A basic understanding of the fundamentals of flow measurement, electricity, analog and frequency signal processing.

**Topics**

- After attending the course the student will be able to do the following for both Micro Motion's Coriolis and Rosemount 8700 Magnetic flowmeters:
- Briefly Explain the Fundamentals for how Each Flowmeter Works and the Function of the Key Components
- 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

Flow Measurement

**Micro Motion Coriolis and Rosemount Smart 8800 Vortex Flowmeters**

**Course 2387**

This combined class is intended anyone that is involved with properly configuring and troubleshooting a Micro Motion flow and density meter and Rosemount 8800 Smart Vortex Flowmeters. Typical job functions include; maintenance technicians, instrument technicians and instrumentation engineers.

**Overview**

This 1-day field class provides hands-on training on both the Coriolis and Vortex Flowmeters. Typically 2/3 of the course time is spent on Micro Motion's Coriolis meter and 1/3 on Rosemount's 8800 Vortex 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 troubleshooting best practices. Students will learn the Micro Motion Series 1000/2000 transmitters using one of these configuration tools; Prolink III, HC475, AMS Device Manager or Series 3000 display interface devices. Public field classes typically use Prolink III for configuring the Micro Motion transmitters and the HC475 will be used for the Rosemount 8800 Vortex flowmeter. Customers can choose which configuration device is used for classes held at their site. This course also includes an introduction to Micro Motion's new 5700 transmitter.

**Prerequisites**

Some prior experience with Micro Motion Coriolis & Rosemount 8800 Vortex flowmeters. A basic understanding of the fundamentals of flow measurement, electricity, analog and frequency signal processing.

**Topics**

- Students will be able to do the following for both Micro Motion's Coriolis and Rosemount 8800 Vortex flowmeters:
- Briefly Explain the Fundamentals for How Each Flowmeter Works and the Function of the Key Components
- 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

Flow Measurement

**Micro Motion Coriolis Meter: Configure Device Options (eLearning)**

**Course e2359 NEW**

(English, Spanish, German & Chinese versions available)

**\$99 per student - unlimited access for 12 months**



Flow Measurement

**Micro Motion Coriolis Configuring Process Measurements (eLearning)**

**Course e2357 NEW**

(English, Spanish, German & Chinese versions available)

This online training includes: Communicating Between Tools and Transmitter; Navigation of Configuration Tool Menu; Characterizing the Flowmeter Configuring Flow Measurements; Flow Direction and Dampening; Density Measurement and Slug Flow Limits and Configuring Temperature

**\$99 per student - unlimited access**



Flow Measurement

**Micro Motion Coriolis Meter: Final Checkout (eLearning)**

**Course e2360 NEW**

(English, Spanish, German & Chinese versions available)

**\$99 per student - unlimited access for 12 months**



Flow Measurement

**Micro Motion Coriolis Meter: Installation Best Practices (eLearning)**

**Course e2355 NEW**

(English, Spanish, German & Chinese versions available)

This online training includes: Understand the considerations for determining sensor and transmitter location in a process; How to determine the best sensor orientation based on the application; Understand best practices for mounting the sensor

**\$99 per student - unlimited access for 12 months**



Flow Measurement

**Micro Motion Coriolis Meter: Theory of Operation (eLearning)**

**Course e2354 NEW**

(English, Spanish, German & Chinese versions available)

This online training includes: How a Coriolis meter works ; The basic physics behind what the Coriolis Force is, how a Coriolis Sensor uses that principle to measure mass flow directly; How a Coriolis sensor simultaneously measures the density and temperature of the process fluid

Flow Measurement

**Micro Motion Coriolis Meter: Wiring and Navigating Tools (eLearning)**

**Course e2356 NEW**

(English, Spanish, German & Chinese versions available)

This online training includes: Wiring Sensor to Transmitter; Connecting Power and Powering the Transmitter; Wiring the Configuration Tools to the Transmitter & more

**\$99 per student - unlimited access for 12 months**



Flow Measurement  
**Micro Motion Coriolis Short Course**

**Course 2339C**

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, ½ 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.

**Overview**

This 1/2-day field class is a condensed version of the 2358 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 Micro Motion metering system. Students will learn the Series 1000/2000 transmitters using one of these configuration tools; ProLink III, HC475, AMS and Series 3000 display interface devices. Public field classes typically use ProLink III. Customers can choose which configuration device is used for classes held at their site. This course also includes an introduction to Micro Motion's new 5700 transmitter.

**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.

**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

Flow Measurement  
**Micro Motion Online Instrument and Electrical (eLearning)**

**Course e2353 NEW**



(English & Spanish versions available)

This online training is targeted for individuals who startup and maintenance Micro Motion Coriolis meters. Typical job functions include: maintenance and instrument technicians or engineers. This course is made up of a total 26 topics that cover basic installation, wiring and configuration of a Micro Motion 2700 transmitter with configurable input/ outputs and any compatible Micro Motion sensor series. Each module has a short overview of each step of the commissioning process followed by modules that provide the viewer an interactive experience for using the four configuration tools; ProLink III, AMS Device Manager, HC475 Field Communicator or integral display.

**\$400 per student - unlimited access for 12 months**

Flow Measurement  
**Micro Motion Series 1000/2000**

**Course 2358**

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.

**Overview**

This 1-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. This course also includes an introduction to Micro Motion's new 5700 transmitter.

**Prerequisites**

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

**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

Flow Measurement  
**Model 700 Advanced Gas Chromatograph**

**Course D4330**

**Overview**

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

**Prerequisites**

D4210 Operation and Maintenance of Gas Chromatographs. Students should also be proficient in personal computer operations and have a basic knowledge of flow measurement.

**Topics**

- Chromatograph Flow Configurations
- Valve Overhaul
- Thermal Conductivity, Flame Ionization and Flame Photometric Detectors
- Sample, Carrier and Calibration Gas Systems
- Model 700 Hardware
- Installing and Using MON Software for Integration and Calibration
- Setting Timed Events, Retention Times and Response Factor Calculations
- Start-Up Procedures
- Setting Valve Timing and Flows with Different Flow Configurations
- Checking for Proper Separation and Analyzing Gas Chromatographs
- Verifying that the Chromatograph is Operating Properly
- Troubleshooting the Model 700 GC
- Configuring Reporting Details/ Control Outputs
- Preventive Maintenance Service Procedures
- Communications and Modbus Registers
- Spare Parts and Tools

Flow Measurement  
**Operation and Maintenance of the Model 500 Gas Chromatographs**

**Course D4210**

**Overview**

This 5-day course prepares students to operate and/or repair model 500 gas chromatograph. As a prerequisite, a student should either have worked with a chromatograph for at least six months or attended the DMS Introduction to Gas Chromatographs Class. Students receive four days of hands-on instruction and all necessary equipment and training materials.

**Topics**

- What a Gas Chromatograph is and How it Operates
- Using the Basic Chromatograph System in Natural Gas Analysis
- Carrier and Calibration Gas Systems
- Chromatograph Hardware Installation and Operation of MON Software
- Chromatogram Integration and Post-Analysis Calculations
- Using the Chromatogram to Identify Problems
- Setting Timed Events, Retention Times and Response Factors
- Start-Up Procedures
- Sample Handling System
- Verifying that the Chromatograph is Operating Properly
- Troubleshooting the 2350A Controller and the Chromatograph
- Configuring the 2350A Controller User Directory Outputs
- Preventative Maintenance Service Procedures
- Communication of Gas Data to Other Devices, such as a Flow Computer or DCS
- Spare Parts and Necessary Service
- Tools

Flow Measurement  
**Operation and Maintenance of the Model 700 Gas Chromatographs**

**Course D4212**

**Overview**

This 5-day course prepares students to operate and/or repair a gas chromatograph. As a prerequisite, a student should either have worked with a chromatograph for at least six months or attended the DMS Introduction to Gas Chromatographs Class. Students receive four days of hands-on instruction and all necessary equipment and training materials.

**Topics**

- What a Gas Chromatograph is and How it Operates Using the Basic Chromatograph System in Natural Gas Analysis
- Carrier and Calibration Gas Systems
- Chromatograph Hardware Installation and Operation of MON Software
- Chromatogram Integration and Post-Analysis Calculations
- Using the Chromatogram to Identify Problems
- Setting Timed Events, Retention Times and Response Factors
- Start-Up Procedures
- Sample Handling System
- Verifying that the Chromatograph is Operating Properly
- Preventative Maintenance Service Procedures
- Communication of Gas Data to Other Devices, such as a Flow Computer or DCS
- Spare Parts and Necessary Service
- Tools

Flow Measurement

**Operation and Maintenance of Daniel S600 Flow Computers****Course D4260****Overview**

This 3-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 made available to all students.

**Prerequisites**

Basic knowledge of flow measurement.

**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

Flow Measurement

**Micro Motion Online Instrument and Electrical (eLearning)****Course e2353 NEW**

(English & Spanish versions available)

This online training is targeted for individuals who startup and maintenance Micro Motion Coriolis meters. Typical job functions include: maintenance and instrument technicians or engineers. This course is made up of a total 26 topics that cover basic installation, wiring and configuration of a Micro Motion 2700 transmitter with configurable input/ outputs and any compatible Micro Motion sensor series. Each module has a short overview of each step of the commissioning process followed by modules that provide the viewer an interactive experience for using the four configuration tools; ProLink III, AMS Device Manager, HC475 Field Communicator or integral display.

**\$400 per student - unlimited access for 12 months**

Flow Measurement

**Operation and Maintenance of Gas/Liquid Ultrasonic Meters****Course D4230/D4280****Overview**

This 3-1/2 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 flow meter, 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

Flow Measurement

**Operation and Maintenance of the Daniel Compact Prover™****Course D4270****Overview**

This 3-day course covers the operation, installation and maintenance of the Daniel Compact Prover™.

**Prerequisites**

Basic knowledge of flow measurement.

**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

Flow Measurement

**Operation and Maintenance to Control Valves and Turbines****Course D4290****Overview**

This 3-day course covers the operation, installation and maintenance of the Daniel control valve and turbines.

**Prerequisites**

Basic knowledge of flow measurement.

**Topics**

- Theory of operation: Turbines, Valves, Digital Pilots
- Disassembly and Reassembly of Turbine Internals
- Disassembly and Reassembly of Valve Cylinder Assemblies
- Disassembly and Reassembly of Digital Pilots
- Valve Needle Valve Adjustment
- 'A' series vs. 'B' Series Control Valves
- Turbine Pick-Off Sensor and Preamp
- Flow Conditioning
- Parity vs UMB Series Turbine Meter
- Troubleshooting

Flow Measurement

**Process Measurement Products II (DP Flow)****Course 2327**

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.

**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 multivariable DP Flow Transmitters
- perform DP Flow troubleshooting

**Prerequisites**

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

**Topics**

- Basic DP Flow Fundamentals
- DP Flow Sizing Calculations
- Multivariable Flow Transmitters
- AMS Device Manager with Engineering Assistant Snap-ON (3095)
- Engineering Assistant for 3051SMV
- Field Communicator
- Test Equipment Selection
- Installation
- Configuration
- Calibration / Verification
- Troubleshooting DP Flow Installations

## Rosemount 8700 Smart Magnetic and 8800 Series Vortex Flowmeters

### Course 2394

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.

#### 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.

#### 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.

#### 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

## 8700 Series Smart Magnetic Flowmeter Short Course

### Course 2339SM

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, ½ 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.

#### 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.

#### 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.

#### 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

## 8800 Series Smart Vortex Flowmeter Short Course

### Course 2339SV

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, ½ 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.

#### 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.

#### 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.

#### 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

## Roxar CorrLog - Intrusive Corrosion Monitoring System

### Course ROX008

#### Overview

Corrosion is a major cost in the oil and gas as well as other industries, and frequently the reason for accidents and unplanned interruptions in production plans. Corrosion monitoring is thus important for verification of the assets integrity. Our intrusive corrosion monitor 2-day training course will provide your personnel with the knowledge of the Roxar intrusive corrosion monitoring system, providing understanding of the different system infrastructures, components and measurement principles. The course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision-making. The course is available in two versions: MultiTrend and Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

#### Topics

- Introduction to Corrosion Monitoring
  - Overview of Corrosion Issues
  - Why Corrosion Monitoring?
    - Corrosion Control and Process Optimization
    - Integrity Management and Safety
  - Basic Principles for Selecting Locations for Corrosion Monitoring
  - Overview of the Roxar Intrusive Corrosion Monitoring System
  - Instrumentation
  - System Software
- Measurement Principles
  - Weight Loss Coupons
  - Electrical Resistance Probes
  - Linear Polarization Probes
  - Galvanic Probes
- Software Operations
  - Verification of the Software
  - Configuration and Installation
  - Architecture
  - Instrument Specific Parameters
  - Raw Data Verification
  - Engineer Values
    - Data Handling and Presentation
    - Data Interpretation Reporting
- Maintenance
  - Battery Replacement (Offline Systems Only)
  - System Health Check
  - Replacing Interface Cards

## Roxar FSM

### Course ROX010

#### Overview

Corrosion is a major cost in the oil and gas as well as other industries, and frequently being the reason for accidents and unplanned interruptions in production plans. Corrosion monitoring is thus important for verification of the assets integrity. Roxar's FSM (Field Signature Method) system is a non-intrusive system for monitoring internal corrosion in pipes, pipelines or vessels directly in the pipe wall. Our Non-Intrusive Corrosion Monitor 2-day training course will provide your personnel with the knowledge of the Roxar non-intrusive corrosion monitoring system, understanding of the different system infrastructures, components and measurement principles. The course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision making. The course is available in two versions: MultiTrend and Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

#### Topics

- Introduction
  - Overview of Corrosion Issues
  - Why Corrosion Monitoring?
    - Corrosion Control and Process Optimization
    - Integrity Management and Safety
  - Basic Principles for Selecting Locations for Corrosion Monitoring
  - Overview of the Roxar FSM System
    - Mechanical Components
    - Buried System
  - Instrumentation
  - System Software
  - System Infrastructure
  - Integrated Flow Assurance Monitoring Systems
- Measurement Principles
  - Field Signature Method
- Software Operations
  - Verification of the Software
  - Configuration and Installation Architecture
  - Instrument Specific Parameters
  - Raw Data Verification
  - Signature

- Engineer Values
  - Data Handling and Presentation
  - Data Interpretation
  - Reporting
- Exporting Data
- Maintenance
  - Battery Replacement (EX Version)
  - System Health Checks

## Roxar Hydraulic Retrieval and Access Fitting System

### Course ROX011

#### Overview

Hydraulic Retrieval System, the probe/coupon holder is connected to a hollow or solid plug, which is installed in a hydraulic access fitting. Installation and retrieval of the plug/probe assembly under pressure is done by pumping the plug in and out of the hydraulic access fitting using the double acting hydraulic retrieval tool. The objective of this course is to give the participant an overview of the Hydraulic Retrieval & Access Fitting System. The focus of this 3-day course is to bring awareness of working safely and efficiently with the tool and safe work practices. It will explain the design and operations of the tool and the fitting, and is recommended for anyone who will work with retrieval operations using our hydraulic retrieval system. Physical demonstrations with retrievers, service valves, and retractors on non-pressurized stands may be arranged by special request.

#### Topics

- Introduction
  - The Hydraulic Access Fitting and its Components
  - The Hydraulic Tool Retrieval and its Components
  - Different Variations of the Tool (PED/Non-PED)
- Theoretical Operation
  - Videos
  - Theoretical Run through the Operation
  - Understanding How the Tool Works
  - Safe Operation of the Tool
  - Troubleshooting and Maintenance
- Practical Operation
  - Get to Know the Tool and its Components
  - Safe Operation of the Tool
  - Do's and Don'ts
  - Practical Troubleshooting
  - Focus on Getting Comfortable using the Tool
  - Repeated Operations
  - Maintenance After Use
  - Practical Exam

## Roxar Multiphase Meter 2600

### Course ROX002

#### Overview

The Roxar Zector technology provides accurate and real-time characterization of flow patterns. The voxel-based signal processing and electrode geometry provides information, including multiple flow velocity data and near wall measurements. The objective of the Roxar MPFM2600 3-day course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set up and configuration; calibration data, reference fluid parameter set up and operation of the meter. The course will cover interpretation and correlation of MPFM parameters versus influences of process conditions. Understanding the data is the key in order to make the right decisions for reservoir management.

#### 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.

#### Topics

- Introduction to Multiphase Metering
  - Single Phase Metering/ Multiphase Metering
  - Flow Regimes
  - Roxar's Experience in Multiphase Metering
  - Roxar MPFM2600
  - Mechanical Design
- Mechanical Specifications
  - Installation and Commissioning
  - Instructions
- Measurement Technology
  - Overview of the Measurement System
  - The Principle of Operation (Phase Fraction Measurement, the Gamma Densitometer, Velocity Measurement, PVT Tables, Phase Slip, Static Properties)
- Software Operations
  - Overview of Roxar MPFM Operation System
  - Installation and Start Up of the Service Console Software Operations: Practical Information on How to Access and Save Parameter Files, Logging and Retrieving data, Well Test Options

- Maintenance
  - Overview of the Mechanical
  - System Maintenance
  - Gamma System
  - Electrical System
  - Calibration
  - Replacement of Parts
- PVT
  - What is PVTx
  - Fluid Analysis: Sampling, Compositional Data
  - Tempest PVTx
  - Import Tables

## Roxar Multiphase Meter 1900VI

### Course ROX001

#### Overview

The Roxar topside Multiphase meter measures accurately the flow rates of oil, gas and water without separation, mixing or moving parts. Field experience shows long-term stability, high accuracy and very good repeatability. The objective of the 3-day Roxar MPFM 1900VI course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set-up and configuration; calibration data, reference fluid parameter set-up and operation of the meter. The course will cover interpretation and correlation of MPFM parameters versus influences of process conditions.

#### Topics

- Introduction to Multiphase
  - Metering of Oil and Gas Production
  - Purpose of the Roxar Multiphase Meter
  - Multiphase Flow and Terminology
  - Roxar Multiphase Sensors and Electronics
- Measurement Technology
  - Overview of the Measurement System
  - Measurement Principles used in Roxar MPFM 1900VI
  - Determination of Flow Rates
  - Velocity Measurements: Pressure, Temperature and Volume
  - Verification of the Measurements - which Factors have Vital Importance for Design and Process Calculation
- Operations
  - Overview of the Roxar MPFM 1900VI
- Operation System
  - Service Console Software Installation and Main Screen Presentations
  - Communication Set-Up
  - Calibration and Reference Fluid
  - Parameter Set-Up
  - Purpose of the Service Console Program (SCP)
  - Interpretation of the SCP screen — Diagnostics
  - SCP Screen Alarm Indication, Configuration of the Multiphase Meter
  - Practical Information on How to Access and Save Parameter Files; Practical Information on How to Log and Retrieve Data; Well Test Options

## Roxar Sand Monitor

### Course ROX007

#### Overview

Optimizing production is becoming more and more important, as reservoirs are facing declining curves while the demand for oil and gas is increasing. One consequence of optimization can be increased sand production which can lead to serious damage to production equipment. The Roxar Sand Monitor is a non-intrusive acoustic sand monitoring system that identifies in real-time sand production in any water, oil, gas or multiphase flow lines for onshore and offshore locations. This 2-day training course focuses on teaching the participants what valid and non-valid data are; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision-making. The course is available in two versions: SAM Server and Fieldwatch, depending on the system software that your installation is using to operate the instrumentation.

- Maintenance
  - Test Equipment and Recommended Spare Parts
  - Main Checks and Intervals
  - Radiological survey (Topside)
  - Reference Fluid Density Parameter Set-Up
  - Reference Permittivity and Conductivity
  - Temperature, Pressure and Differential Pressure Function Check
  - Capacitance Unit Function Check
  - Inductive Unit Function Check
  - Densitometer Unit Function Check
  - Parameter Save and Download; Diagnostics; Troubleshooting

#### Topics

- Introduction to Sand Metering
  - Causes of Sand Production
  - Why Do we Need Sand Detection System?
  - Roxar Sand and Pig Detection System
  - System Enclosure, History; Challenge, Integration with Other Products
- Measurement Technology
  - How Do We Measure Sand?; —Interface
  - Sand Rate Calculation; — Sand Detector
  - Product Optimization
- Operations
  - Software and General Set-Up; — System Overview
  - Configure Sensor Parameters
  - Process Data Interface: Flow Rate Input, Velocity Input, Choke Input, Well Test Data Interface
  - Alarm Settings Interface, Data Logging
  - Basic Interpretation: Basic Noise Estimation, Sand Production Estimation
  - Adv. Interpretation: Velocity in Signal Interpretation
  - Flow Regime Consideration

#### Maintenance

- Detector Installation: Locations on Pipe, Temperature Considerations; - Wiring
- Communication Digital Output, Analogue Output, Volt Free Contact, Lamp Output
- Calibration: Factory Calibration, Background Noise Calibration, Automatic Background Noise Curve (ABA), Sand Noise Calibration
- Sand Transport Capability Indicator
- Sand Mass Correction (L/X)
- Choke Calibration
- Filtering Settings: Alpha and Beta Filtering of Raw Data, K-Factor
- Preventative Maintenance: Visual Inspection and Routine Testing
- Calibration Adjustment:
- Background Noise Calibration (Zero Calibration)
- Sand Calibration, Hardware Maintenance: Checking Sensor Connections, Reinstalling or Replacing the Detector

## Roxar SandLog - Intrusive Sand Monitoring System

### Course ROX009

#### Overview

Optimizing production is becoming more and more important as reservoirs are facing declining curves while the demand for oil and gas is increasing. One consequence of optimization can be increased sand production which can lead to serious damage to production equipment. Our intrusive sand monitor 2-day training course will provide your personnel with the knowledge of the Roxar Sand Monitoring System, providing understanding of the different system infrastructures, components and measurement principles. The course focuses on teaching the participants what valid and non-valid data is; provides knowledge on how to create reports from data received by the instrument in order to provide input to integrity managers to enable better decision-making. The course is available in two versions: MultiTrend and Fieldwatch, depending on the system software that your installation is using for operations of the instrumentation.

#### Topics

- Introduction to Intrusive Sand Metering
  - Overview of Sand/Erosion Issues
  - Basic Principles for Selection
  - Locations for Sand/ Erosion Monitoring
  - Erosion Control – Integrity and Safety
  - Optimizing Flow Rates and Production
  - Overview of the Roxar Intrusive Sand/Erosion Monitoring System
    - Mechanical Accessories
    - Sand Erosion Probes
      - Combined Sand Erosion and Corrosion Probe
    - Electrical Resistance Probes
    - Instrumentation
    - System Software
    - Integrated Flow Assurance Monitoring Systems
  - Measurement Principles
    - Electrical Resistance Probes
      - Sand Erosion Measurements
      - Correlations with Sand Production
    - Combined Sand Erosion and Corrosion Probe

- Software Operations
  - Verification of the Software
  - Configuration and Installation Architecture
  - Instrument Specific Parameters
  - Raw Data Verification
  - Engineer Values
    - Data Handling and Presentation
    - Data Interpretation
    - Reporting
- Maintenance
  - Battery Replacement (Offline Systems Only)
  - System Health Check
  - Replacing Interface Cards

## Roxar Subsea Multiphase Meter

### Course ROX003

#### Overview

The Roxar subsea Multiphase meter provides flow rates for oil, gas and water; vital information for managing reservoirs and processes. The objective of the Roxar SMPFM 3-day course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The objective of the Roxar MPFM2600 course is to provide the participant with an understanding of the multiphase flow, components and measurement principles of the instrument. The course focuses on providing the participants with detailed understanding of the set up and configuration; calibration data, reference fluid parameter set up and operation of the meter. The course will cover interpretation and correlation of SMPFM parameters versus influences of process conditions. Understanding the data is the key in order to make the right decisions for reservoir management.

#### Topics

- Introduction to Multiphase Metering
  - Single Phase Metering/ Multiphase Metering
  - Flow Regimes
  - Roxar's Experience in Multiphase Metering
  - Roxar SMPFM
  - Well Testing, Monitoring and Allocation
- Mechanical Specifications
  - Roxar SMPFM Components
  - Versions of the Meter
- Measurement Technology
  - Overview of the Measurement System
  - The Principle of Operation (Phase Fraction Measurement, the Gamma Densitometer, Velocity Measurement, PVT Tables, Phase Slip, Static Properties)
- Software Operations
  - Overview of Roxar SMPFM operation system
  - Installation and Start-Up of the Service Console
  - Software Operations: Practical Information on How to Access and Save Parameter Files, Logging and Retrieving Data, Well Test Options
  - Well Test
  - Creating Diagnostic Files
  - Setting Up Fluid Parameters
- Maintenance
  - Gamma System
  - Electrical System
  - Calibration
  - Software Updates
  - Sensory Geometry
- PVT
  - What is PVTx
  - Fluid Analysis: Sampling, Compositional Data
  - Tempest PVTx
  - Import Tables

## Roxar Watercut Meter

### Course ROX006

#### Overview

The Roxar Watercut meter measures water in oil (0% to 100%) and is used in process control on test separators, fiscal metering, on- and offloading, export metering, desalting in refineries, two phase flow metering. The Roxar Watercut meter uses a unique and patented microwave resonance technology to measure the permittivity of an oil/water mixture with an extremely high level of accuracy and sensitivity. The aim of this 2-day course is to enable participants to take full advantage of the meter in real applications. Upon completion of the course participants should be able to efficiently run the instrument on their own, including delivering on-site quality reliable data, do normal routine maintenance, fault finding and troubleshooting.

#### Topics

- Introduction to Watercut Metering and Technology
  - Why Measure Water Cut?
  - Water Cut Metering Challenges
  - Water Cut Metering Requirements
  - Technology for Water Cut Measurement
- Measurement Technology
  - How Do We Measure Water Cut Installation
  - Microwave Signal Path
  - Entrapment of Microwaves in a Pipe
  - Microwave Resonance
  - Permittivity of Oil and Water
  - Water Continuous and Oil Continuous Phase
  - The Tables of Water Cut Made from the First Meter
  - The Production of the Meters to Fit the Model of the First Meter
  - The Production Sequence in a Meter
  - Measurement Uncertainty and Initial Explanation
- Operations
  - Connecting to the Meter
  - Software Operations: Entering the Meter, Configuration Measurement
  - Inline Calibration of the Meter
  - Measurement Uncertainty
  - Practical Exercises on Meter Electronics

- Maintenance
  - Overview of Recommended Maintenance
  - Turning Diagnostics and Logging of Hyper Terminal
  - Taking a 50dB Plot of Microwave Electronics
  - Common Error Messages
  - Sending Diagnostic Data to Roxar for Analysis and Filing
  - Download New Code for a Meter
  - Erasing Battery Backed RAM in a Meter
  - Troubleshooting the Temperature Transmitter
  - Practical Exercises

## Roxar Subsea Wetgas Meter

### Course ROX004

#### Overview

The Roxar Wetgas Meter is a unique instrument allowing accurate measurement of hydrocarbon flow rates and water production, with a very compact mechanical solution. The aim of this 2-day training is to provide the participants with in-depth knowledge of instrument operation, which enables participants to take full advantage of the meter in real applications. Course participants will be taught the intricacies of the meter and measurement technology, understanding of the data and the measurement principles will allow better decision making when it comes to reservoir management and optimizing the production process.

#### Topics

- Introduction to Wetgas
  - Introduction
  - Wet Gas
  - Why Measure Water?
  - Multiphase Flow
  - Flow Conditions
  - Ranges and Specifications
  - Installation Examples
- Mechanical Specifications
  - Material Overview
  - Design Standards
  - WGM Components
  - Cathodic Protection and HISC
  - Insulation and Coating
  - Testing
- Measurement Technology
  - Overview of the Measurement System
  - The Principle of Operation
  - Direct Measurement and Required Inputs
  - Fraction Calculations
  - Formation Water Detection
  - Calculation Modes
  - Redundancy
- Operations and Maintenance
  - Pre-Commissioning Phases
  - Commissioning and Start Up
  - Communication
  - Roxar WGM Console
  - Meter Operation
  - Alarms and Warnings
  - Calibration (Describe All Alternatives)
  - Maintenance



Flow Measurement  
**Vortex Device Configuration and Using Configuration Tools (eLearning)**

**Course c6003 NEW**



(English, Spanish, German & Chinese versions available)

This curriculum is part of the Vortex Online Instrument and Electrical (I&E) Technician Training. It may be purchased individually or with the c6000 curriculum. This course group covers the key parameters for a basic vortex configuration, how to use AMS and the Field Communicator to configure an 8800D vortex meter, and advanced configuration for special units of measure, base volume units - density ratio, pulse output, totalizer, display variables and saturated steam using the MTA option. unlimited access for 3 months.

**Duration: 1 HR**

Flow Measurement  
**Vortex Installation and Best Practices (eLearning)**

**Course c6002 NEW**



(English, Spanish, German & Chinese versions available)

This curriculum is part of the Vortex Online Instrument and Electrical (I&E) Technician Training. It may be purchased individually or with the c6000 curriculum. This course group covers the key parameters for a basic vortex configuration, how to use AMS and the Field Communicator to configure an 8800D vortex meter, and advanced configuration for special units of measure, base volume units - density ratio, pulse output, totalizer, display variables and saturated steam using the MTA option. unlimited access for 3 months.

**Duration: 1 HR**

Flow Measurement  
**Vortex Online Instrument and Electrical (E&I) Technician Training (eLearning)**

**Course c6000 NEW**



This curriculum group contains c6001, c6002, c6003 and c6004. This entire curriculum may be purchased at a discounted price, or each section of the curriculum may be purchased individually. The content for this curriculum group includes theory, product offering and model selection, and vortex sizing; installation best practices for piping, mounting, remote electronics and wiring; device configuration for the 475 HART Field Communicator and the AMS Device Manager and using the configuration tools; electronics, sensor and process troubleshooting and vibration, mass balancing and filter troubleshooting.

**Duration: 3 HR**

Flow Measurement  
**Vortex Theory and Specification (eLearning)**

**Course c6001 NEW**



This curriculum is part of the Vortex Online Instrument and Electrical (I&E) Technician Training. It may be purchased individually or with the c6000 curriculum. This course group covers the theory of operation, provides an overview of the vortex meter product offering and model selection, and discusses vortex sizing. \$95 per student - unlimited access for 3 months.

**Duration: 0.5 HR**

Flow Measurement  
**Vortex Troubleshooting (eLearning)**

**Course c6004 NEW**



This curriculum is part of the Vortex Online Instrument and Electrical (I&E) Technician Training. It may be purchased individually or with the c6000 curriculum. This course group covers troubleshooting scenarios; electronics, sensor and process troubleshooting; and vibration, mass balancing and filtering troubleshooting. unlimited access for 3 months.

**Duration: 1 HR**

Level Measurement  
**Process Measurement Products III (Level)**

**Course 2333**

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

**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 DP Level Transmitters
- correctly install Guided Wave Radar Transmitters
- correctly install Non-contacting Radar Transmitters
- properly calibrate/verify Level Instruments
- perform basic troubleshooting

**Prerequisites**

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

**Topics**

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

Level Measurement  
**Rosemount 3051S Electronic Remote Sensors Systems**

**Course 2309**

**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

**Prerequisites**

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

**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

**Note:** This product is also included in course 2333.

Level Measurement  
**Rosemount 5300 and 5400 Radar Level Contacting and Non-Contacting Radar Transmitters**

**Course 2396**

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 5400 & 5300 Series HART 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 5400 & 5300 Series HART Radar Level Transmitters. Students who complete this course will be able to:

- explain the principles of operation of the 5300/5400 radar
- identify 5300/5400 parts and explain their functionality
- properly install and wire the 5300/5400 Radar
- configure and test the 5300/5400 Radar
- properly troubleshoot the 5300/5400 Radar transmitter and installation using Radar Master software

**Prerequisites**

Knowledge of basic level and interface fundamentals and instrumentation.

**Topics**

- 5300/5400 Overview and Principles of Operation
- Installation of the 5300/5400 Radar
- Configuration of the 5300/5400 Radar
- Bench Testing the 5300/5400 Radar
- Field Communicator Operation
- AMS Device Manager Operation
- Radar Master Software Operation
- Calibration, Verification and Adjustments
- Troubleshooting and Maintenance
- Tank & Application/Probe Troubleshooting and Echo Handling Using Radar Master Software

Level Measurement  
**Rosemount 5300 High Performance Guided Wave Radar HART Level Transmitter**

**Course 2337**

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.

**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 the principles of operation of the 5300 GWR
- identify 5300 GWR parts and explain their 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 and Installation using Radar Master software

**Prerequisites**

Knowledge of basic level fundamentals and instrumentation.

**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

**Note:** 5300 GWR Hart Level transmitter is also included in the 3-day Level course 2333.

Level Measurement  
**Rosemount 5400 Series HART Radar Level Transmitter**

**Course 2336**

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the Rosemount 5400 HART 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 5400 Radar Transmitters. Students who complete this course will be able to:

- explain the principles of operation of the 5400 Radar
- identify 5400 Radar parts and explain their functionality
- properly install and wire the 5400 Radar
- configure and test the 5400 Radar
- understand how to setup the 5400 Radar to work in different applications
- properly troubleshoot the 5400 Radar Transmitter and the installation using Radar Master software

**Prerequisites**

Knowledge of basic level fundamentals and instrumentation.

**Topics**

- 5400 Overview and Principles of Operation
- Installation of the 5400 Radar
- Wiring the 5400 Radar
- Configuration of the 5400 Radar
- Bench Testing the 5400 Radar
- Field Communicator Operation
- AMS Device Manager Operation
- Radar Master Software Operation
- Troubleshooting and Maintenance
- Tank and Application Troubleshooting and Echo Handling using Radar Master Software
- 

**Note:** This product is also included in the 3 day Level course 2333.

Measurement Instrumentation  
**AMS Device Manager with Rosemount HART Instruments**

**Course 7021**

Learn the installation, calibration, maintenance, and troubleshooting of measurement instrumentation using AMS Device Manager. The hands on focus is on skills required by engineers, technicians, or others that are new to the plant or instrument environment.

**Overview**

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
- Transmitter Configuration
- Transmitter Calibration
- AMS Calibration Assistant
- Intelligent Calibrators
- Transmitter Troubleshooting

Measurement Instrumentation  
**Fieldbus Measurement Instruments**

**Course 2370**

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

**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 3051 and 3051S Pressure transmitters, 644, 3144P and 848 Temperature transmitters, 5600, 5400 and 5300 Radar Level Transmitters, and 752 Indicator.

**Prerequisites**

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

**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:
  - 3051 Pressure Transmitter
  - 3051S Pressure Transmitter
  - 3144P, and 644 Temperature Transmitters
  - 848 Temperature Transmitter
  - 5600/5400/5300 Radar Level Transmitter
  - 752 Fieldbus Indicator

Measurement Instrumentation  
**Instrument Fundamentals Overview**

**Course 2320**

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.

**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.

**Prerequisites**

Students should have experience with process instrumentation and measurements.

**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

Measurement Instrumentation  
**Measurement Instrument Fundamentals**

**Course 2322**

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.

**Overview**

This 2-day course explains the measurement technology for Pressure, Temperature, Flow and Level instruments. It will also emphasize proper installation of these instruments.

**Prerequisites**

Students should have experience with process instrumentation and measurements.

**Topics**

- 4-20 mA Electrical loops
- Pressure Sensors
- Pressure Instruments
- Temperature Sensors
- Temperature Instruments
- Analog Transmitters
- HART Transmitters
- HART Communication Protocol
- Field Communicator
- DP Flow
- Guided Wave Radar Level Instruments
- Non-Contacting Radar Level Instruments

Measurement Instrumentation  
**Pressure, Transmitter & Multi-Variable Flow Transmitters**

**Course 2329**

This course uses lectures and labs to maximize the hands on experiences and teach the student how to install, configure, calibrate, troubleshooting, and maintenance of the Rosemount 3051 Pressure Transmitter, 3144P Temperature Transmitter, and the 3051S MultiVariable™ (MV) Flow Transmitter. This course is a combination of courses: 2305, 2321, and 2308MV.

**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.

**Prerequisites**

Students should have experience with process instrumentation and measurements.

**Topics**

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

**Note:** Students must attend both days. Reference course, 2305, 2321 and 2308MV for further details.

Pressure Measurement  
**Process Measurement Products I  
 (Pressure and Temperature)**

**Course 2326**

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

**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

**Prerequisites**

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

**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

Pressure Measurement  
**Rosemount 3051 Fieldbus  
 Pressure Transmitter**

**Course 2307**

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the 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

**Prerequisites**

Knowledge of basic pressure fundamentals and pressure instrumentation.

**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

Pressure Measurement  
**Rosemount 3051 Pressure and  
 3144 Temperature Transmitters**

**Course 2398**

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

**Overview**

This 1-day course uses lectures and labs to teach the student how to install and maintain the Rosemount 3051C Smart Pressure, and 3144P Smart Temperature Transmitter. The student will also learn the operation and interface 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

**Prerequisites**

Knowledge of basic pressure fundamentals and pressure instrumentation.

**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

Pressure Measurement  
**Rosemount 3051 Pressure  
 Transmitter**

**Course 2305**

This course is designed for those individuals responsible for the installation, configuration, calibration and maintenance of the 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. The student will also learn the operation of the Field Communicator. Students will:

- explain the differences between HART and Analog transmitters
- identify 3051 parts and functionality
- explain the principles of operation of the 3051
- configure, calibrate and test 3051 HART pressure transmitters using the Field Communicator or AMS Device Manager
- properly install/troubleshoot the 3051 transmitter.

**Prerequisites**

Knowledge of basic pressure fundamentals and pressure instrumentation.

**Topics**

- 3051 Overview and Principles of Operation
- Test Equipment Selection
- Bench Testing the 3051 HART Transmitter
- Field Communicator Operation
- AMS Device Manager Operation
- Digital Trims/Calibration
- Installation and Start-up
- Troubleshooting and Maintenance

**Note:** This product is also included courses 2326 and 2329.

Pressure Measurement  
**Rosemount 3051S Pressure  
 Transmitter**

**Course 2308**

This course is designed for those individuals responsible for the installation, configuration, calibration, troubleshooting, and maintenance of the 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 HART Pressure Transmitters using the Field Communicator or AMS Device Manager
- properly install, configure, calibrate, and troubleshoot the 3051S HART transmitter

**Prerequisites**

Knowledge of basic pressure fundamentals and pressure instrumentation.

**Topics**

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

Safety Monitoring  
**Advanced Course for Flame and  
 Gas**

**Course FG2200**

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

**Overview**

This is a 3 days advanced course about Flame and Gas systems with Hands ON.

**Prerequisites**

Knowledge of basic pressure fundamentals and pressure instrumentation.

**Topics**

- Flame Detection:
  - Covering all topics in Basics FG 2100
  - Hands ON Wiring and Commissioning the Flame Detectors – Different types of outputs
  - Trouble-shooting and Fault finding procedures. How to identify and localize False Alarms.
- Gas Detection - Flammable and Toxic Gas:
  - Covering all topics in Basics FG 2100
  - Hands ON Wiring and Commissioning the Gas Detectors – Different types of outputs; Setting up the M21
  - Detector and its Menu options. Calibrating the gas sensor – using M2B/M21 Trouble-shooting and Fault finding procedures. How to identify and localize False Alarms.
- Smoke/Oil Mist Detector (EExd model):
  - Covering all topics in Basics FG 2100
  - Hands ON Wiring and Commissioning the APM Detector – Different types of outputs; Setting up the detector and its Menu options. Trouble- shooting and Fault finding procedures. How to identify and localize False Alarms.
- Ultrasonic Gas Leak Detector
  - Covering all topics in Basics FG 2100
  - Hands ON Wiring and Commissioning the UGLD Detector – Different types of outputs; Setting up the detector. Trouble-shooting and Fault finding procedures. How to identify and localize False Alarms.

### Safety Monitoring Basic Course for Flame and Gas

#### Course FG2100

##### Overview

This is a 2 days basic course about Flame and Gas systems.

##### Topics

- Flame Detection:
  - Introduction to Flame detection principals
  - Types of flame detectors and its application:
  - Ultra Violet (UV), Infra Red (IR) and UV/IR
  - Installing – Where to locate and aim the detector.
  - Causes of False alarms from Flame Detection and ideas to minimize the alarms
  - Preventive Maintenance
- Gas Detection - Flammable and Toxic Gas:
  - Introduction to Gas detection principals
  - Gas Detector Transmitters - Millennium Transmitters – M2B and 21
  - Types of Gas detectors available in the market and its Operating principals: Cat Bead, Electrochemical and Metal Oxide Semiconductor
  - Installing – Where to site and locate the gas detectors
  - Preventive Maintenance
- Smoke/Oil Mist Detector (EExd model):
  - Introduction to the Airborne
  - Particle Monitor (APM)
  - Applications using APM
  - Installing the APM – Where to site and locate the detector
  - Causes of false alarms and how to minimize it
  - Preventive Maintenance
- Ultrasonic Gas Leak Detector:
  - Introduction to Ultrasonic Gas Leak Detector (UGLD)
  - Applications using UGLD
  - Site Mapping of Background Noise
  - Installing the UGLD – Where to site and locate the detector
  - Causes of false alarms and how to minimize it
  - Preventive Maintenance

### Tank Gauging Tank Gauging Technical Product Training

#### Course RTG101

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

##### 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

##### Prerequisites

Knowledge of basic pressure fundamentals and pressure instrumentation.

##### 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

### Tank Gauging Tank Master Training

#### Course RTG102

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

##### Overview

This 4-day TankMaster Training covers more detailed information about TankMaster functions. This course is suitable for anyone who works with TankMaster as well as for customers who use WinOpi as the operators' interface. Among other useful functions in TankMaster, the training covers batchhandling, Custom Views, and Redundancy. Students who complete this course will:

- correctly perform System
- Configuration
- properly configure Host
- Communication
- properly use Redundancy
- perform basic troubleshooting

##### Prerequisites

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

##### Topics

- System Configuration
- WinOpi Tools
- Host Communication and OPC
- TankMaster Batch
- Custom Views and Translation
- TankMaster to Enraf
- Network Basics
- Redundancy
- TankMaster.net
- Administrator Program, Backup & Restore
- Troubleshooting

### Temperature Measurement Rosemount 3144P Fieldbus Temperature Transmitters

#### Course 2324

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 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 Model 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 and 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

##### Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

##### 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.

### Temperature Measurement Rosemount 3144P Temperature Transmitters

#### Course 2321

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

##### 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 the 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

##### Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

##### 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

**Note:** This product is also included in courses 2326 and 2329.

### Temperature Measurement Rosemount 848 Fieldbus Temperature Transmitters

#### Course 2328

This course is designed for those individuals responsible for the installation and maintenance of the Rosemount Model 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 Model 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

##### Prerequisites

Knowledge of basic temperature fundamentals and temperature instrumentation.

##### 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.

## Wireless Self Organizing Network

### Course 2375

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.

#### 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

#### Prerequisites

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

#### 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 AMS Device Manager with the 1420 Wireless Gateway
- Operation of AMS Wireless SNAP-ON
- Modbus Serial Integration
- Modbus TCP Integration
- OPC Integration

## Wireless Self Organizing Network

### Course 2376

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 all their components.

#### 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, 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

#### Prerequisites

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

#### 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 AMS Device Manager with the 1420 Wireless Gateway



## Asset Reliability Advanced AMSTM Suite: Machinery Health Manager

### Course 2070/V



#### 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 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.

#### Prerequisites

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

#### 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

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. Infrared Analysis, Motorview, CSI Online Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

## Asset Reliability AMS Device Manager

### Course 7020

#### 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. The training exercises focus on skills required by engineers and technicians, and are based on real-world tasks that most users will encounter on the job.

- 7020-1 Configuring and Using AMS Device Manager
  - Viewing and Modifying Devices
  - Creating a Plant Database
  - Hierarchy and Adding Devices
  - Field Communicator - AMS Device Manager
  - AMS Device Manager Browser Functions
  - Audit Trail
  - Calibrating Device - Calibration Assistant
  - Configuring and Monitoring System Alerts
- 7020-2 System Administration
  - AMS Device Manager System Overview
  - 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
- 7020-3 SNAP-ON™ Applications
  - AMS ValveLink® SNAP-ON Application-Basics
  - MV Engineering Assistant SNAP-ON Application - Basics
  - Rosemount Engineering Assistant™ 3051SMV SNAP-ON
  - AMS Wireless SNAP-ON Application
  - QuickCheck™ SNAP-ON Application
  - Using AMS Device Manager OPC Server and the Matrikon OPC Explorer
  - AMS Device Manager Web Services
  - AlertTrack SNAP-ON Application

This instructor assisted course is operated in a hands-on, self-paced environment, which allows the student to work at their individual pace. Training can also be delivered at your plant with the help of our certified instructors. AMS Device Manager modules may be purchased for self-study for \$200 each or \$510 for all three paper/bound modules.

Asset Reliability  
AMS Device Manager with DeltaV

Course 7039

**Overview**

This 4-1/2 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. 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, start ups, and for project work
- improves process availability and reduces operations and maintenance costs

The hands-on workshops with AMS Device Manager 13.5 along with DeltaV v13.3.1 will address areas relating to the instrument technician's daily tasks.

**Prerequisites**

Microsoft windows experience. Prospective attendees should first complete the eLearning e7020 AMS Device Manager Suite Primer. The purchase of this course includes access to the e7020 course at no extra charge. Upon confirmed enrollment, the student will receive access to the e7020 online course (via email) to take as a prerequisite prior to attending the instructor led course.

**Topics**

- DeltaV and PlantWeb Overview
- AMS Device Manager Overview
- Foundation fieldbus Overview
- ValveLink SNAP-ON Introduction
- ValveLink DVC Setup
- HART Overview
- PROCONEX QuickCheck SNAP-ON
- PROFIBUS Overview
- Wireless SNAP-ON Introduction
- PlantWeb AlertsAMS Device Manager
- User Interface
- AMS Device Manager Help

- AMS Device Manager Plant Location Hierarchy
- AMS Device Manager Browser
- Monitoring System Alerts with AMS Device Manager
- PROCONEX AlertTrack SNAP-ON
- Device Replacement for HART, Fieldbus, and PROFIBUS Devices
- AMS Device Manager Audit Trail
- ValveLink SNAP-ON Tests and Diagnostics
- AMS Device Manager Calibration Assistant

Asset Reliability  
AMS Suite Intelligent Device Manager Primer (eLearning)

Course e7020

**Overview**

Audience This course is for maintenance personnel and managers responsible for understanding the benefits of using the AMS Suite Intelligent Device Manager. This is a 2-hour (average) on-line course with AMS Device Manager screens including interactive practice sessions, workshops, demonstrations, audio presentations and quizzes.

**Topics**

- Identify Areas that AMS Device Manager could be applied:
  - Speed-Up Start-Ups and Commissioning
  - Improve Quality and Uptime
  - Reduce Costs – Both Fixed and Operating
  - Simplify Safety System Use and Compliance Including Start-Ups
- Identify and Navigate the AMS Device Manager's Screens

**Note:** Course access is 12 months

Asset Reliability  
AutosStat for AMSTM S uite: Machinery Health Manager

Course 2070A or Course 2070CV



AustoStat is included in the standard curriculum of the 4-day Advanced AMS Machinery Manager, course 2070. This 2-day session only covers AutoStat in the AMS Machinery Manager software.

Alarms are an important part of any analysis program. Properly setting alarms allows the user to quickly identify an abnormal machine condition and reduces time spent analyzing machines that are running in acceptable or "normal" condition.

AMS Machinery Health Manager provides the user the ability to create up to 12 parameter bands with alarms in addition to the Overall value. Calculating ideal alarm values for these parameters can be very complicated. Autostat uses statistical analysis to provide limit values for the individual parameter bands by analyzing the data associated with similar pieces of equipment.

**Overview**

This 2-day session is designed for students have a basic understanding of AMS Machinery Health Manager and will guide these user's through the process of using Autostat for the generation of both Analysis Parameter sets and Statistical narrowband Envelope generation.

**Topics**

- Analysis Parameter Alarms vs/ Narrowband Alarms – What's the Difference?
- Database Setup Requirements and Reports
- Creating and Editing Analysis Groups
- Modifying and Creating New Parameter Alarms
- Creating and Editing Statistical Envelopes
- Using these Alarms within the Vibration Analysis Plotting Application

Asset Reliability  
Intermediate AMSTM S uite: Machinery Health Manager

Course 2074 /V



**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 and full version of RBMview.

**Prerequisites**

Introduction to AMS Machinery Health Manager, course 2068, Basic Vibration Analysis course or 6 months vibration analysis experience are recommended.

**Topics**

- PeakVue™
- Vibration Analysis module
- Reporting Module
- Exception Analysis
- Nspectr
- BMview

**Note:** 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. Infrared Analysis, Motorview, CSI Online Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Asset Reliability  
Introduction to AMSTM S uite: Machinery Health Manager

Course 2068/V



**Overview**

This 4-day course was designed for the new users of AMS Machinery Manager. 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.

**Prerequisites**

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

**Topics**

- Navigation
- Database Creation
- Data Collection
- Basic Analysis and Reporting
- Link to RBMview

**Note:** 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. Advanced Vibration Analysis module, Infrared Analysis, Motorview, CSI Online Machinery Health Monitor and Oilview modules are covered in other course offerings and are not part of this course.

Asset Reliability  
ISO 18436-2 Compliant Vibration Certification Exams

Course 2021EX



**Overview**

Category I exam, available at the end of course 2031. Test Format: Written exam Duration: 2 hours Passing Grade: 75%

**Eligibility for Examination:**

- Recommended Minimum Duration of Cumulated Training (hours): 32
- Recommended Minimum Duration of Cumulated Experience (months): 6

Asset Reliability  
Course 2022EX



**Overview**

Category II exam, available at the end of course 2032. Test Format: Written exam Duration: 3 hours Passing Grade: 75%

**Eligibility for Examination:**

- Recommended Minimum Duration of Cumulated Training (hours): 70
- Recommended Minimum Duration of Cumulated Experience (months): 18
- Passing Category I exam is NOT a prerequisite for taking Category II exam.

Asset Reliability  
Course 2023EX



**Overview**

Category III exam, available at the end of course 2033. Test Format: Written exam Duration: 4 hours Passing Grade: 75%

**Eligibility for Examination:**

- Recommended Minimum Duration of Cumulated Training (hours): 110
- Recommended Minimum Duration of Cumulated Experience (months): 36
- Has taken and passed the Category II exam.

Asset Reliability  
**Vibration Analysis Module AMS Machinery Manager (V5.2 or Higher) (eLearning)**

Course e2074V



**Overview**  
 This eLearning course provides thorough introduction on the Vibration Analysis module in the V5.2 or higher AMS Machinery Manager software. The interface of the Vibration Analysis module is much more user intuitive. With the V5.2/V5.3 version of the Vibration Analysis module, powerful tools for the analysis and comparison of multiple types of data are right at your fingertips.

**Prerequisites**  
 Familiar with the AMS Machinery Manager Software

- Topics**
- Introduction of the New Vibration Analysis Module (V5.2/V5.3)
  - Learn to Display Spectra, Waveform, and Trends
  - Use the Toolbar for Data Manipulation

Operations Management Software  
**Advanced Ovation Graphics**

Ov310-WIN

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.

**Prerequisites**  
 OV210 \*OV310- UNX Offered Upon Request

Operations Management Software  
**Advanced Vibration Analysis/Category III Compliant**

Course 2033

**Overview**  
 This 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™ Suite:

Machinery Health Manager Software to set up the advanced analyzer features and the powerful downloadable 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.

**Prerequisites**  
 Intermediate Vibration Analysis course and a cumulative three years of field experience.

- 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
  - Establish Specifications for Vibration Levels and Acceptance Criteria for New Machinery
  - Measure and Analyze Basic Operational Deflection Shapes (ODS)
  - Measure and Analyze PeakVue® Measurements
  - Slow Speed Technology (SST®)
  - Zoom Analysis / Transient Techniques
  - Dual Channel Machinery Analyzer Features
  - Triggered Data Capture/Resonance Detection

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

Operations Management Software  
**Basic Vibration Analysis/Category I Compliant**

Course 2031

**Overview**  
 This course complies with Category I Vibration Analyst per ISO standard 18436-2: Vibration condition monitoring and diagnostics.

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. Although this training course is not product specific, students will use Emerson's CSI technologies for demonstration purposes. The class shows the student how to use the vibration analyzer in conjunction with Emerson Machinery Health supported software to analyze basic vibration defects.

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

- Topics**
- Principles of Vibration
  - Data acquisition & Signal Processing
  - Condition monitoring & Corrective Action
  - Equipment Knowledge
  - Acceptance Testing
  - Basic Analyzer Functions
  - The Class Shows Students How to Recognize Machine Defects such as:
    - Unbalance
    - Shaft Misalignment
    - Looseness
    - Rolling Element Bearing Defects
    - Gear Problems
    - Resonance Introduction to
    - Electrical Defects
    - Introduction to Electrical Defects

Participants will receive a complimentary copy of the Pocket Vibration Analysis Trouble-Shooter Guide.

Operations Management Software  
**Building & Maintaining Ovation Control**

OV200-WIN



**Overview**  
 This internet-based course is ideal for those who have never used Emerson's onsite oil analysis technologies as well as experienced users who wish to learn more about advanced OilView® features in AMS Suite: Machinery Health Manager. The course demonstrates how to set up and configure the OilView® software module, discusses calibration and use of OilView® instruments (including the CSI 5200 Machinery Health Oil Analyzer) for analyzing oil samples onsite, and explains data interpretation and basic reporting. Also covered is database creation and modification, Analysis Parameter and Alarm Limit Sets.

- Topics**
- Reference Oil Database Management
  - Database Construction and Modification
  - Analysis Parameter Sets
  - Alarm Limit Sets
  - Best Practices -Onsite Analysis Using OilView®
  - Importing Laboratory Data
  - Basic Wear Debris Analysis
  - Data Analysis and Reporting

Operations Management Software  
**Building Ovation Graphics**

OV210-WIN

Covers building Ovation system graphic diagrams and using the Ovation Graphics Builder. Course topics include layout and implementation of static and dynamic objects, linking to control, and creating perspective-type diagrams.

**Required Prerequisite:** OV100, OV200

Operations Management Software  
**Config S600+ Pro FloBoss S600+ Advanced - Config600**

Course RA901

The 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.

**Overview**  
 The 2-1/2 day advanced course provides an insight into the generation of application configurations for the FloBoss S600+.

- Prerequisites**
- Participants should be familiar with metering techniques and standards
  - Participants should bring their own personal computer to the course and should and should have administrative privileges
  - Participants must be PC literate
  - Participants must have attended the RA900 fundamentals course

- Topics**
- Loading Config600 Pro Software
  - License
  - Firmware Versions
  - Using System Editor Object
  - Types
  - Logical cEditor
  - Registering Tickets - Do's and Don'ts

Operations Management Software  
**ControlWave® Designer Fundamentals**

Course RA441

Personnel responsible for programming and debugging in ControlWave Designer programming software.

**Overview**  
 This 4-1/2 day hands-on course for 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.

- Prerequisites**
- Participants must have a strong working knowledge of personal computers and Windows XP or later versions
  - Participants should have a strong working knowledge of their application/process

- Topics**
- Ladder Logic
  - Structured Text
  - Function Block Diagram
  - Creating User Function Blocks

Operations Management Software  
**Fieldbus and Profibus Applications**

**Course OV241-WIN**

This course will provide students with a thorough knowledge of Fieldbus applications & Profibus applications as applied to an Ovation System. Ovation Fieldbus & Profibus module, segment design, device commissioning, FF algorithms, and basic troubleshooting are covered. Students will be provided with hands on experience implementing Fieldbus architecture. This course is intended for technicians who install and maintain Ovation Fieldbus & Profibus devices.

**Overview**  
 Students must have a good understanding of the Ovation system architecture. Experience working in a Windows environment is helpful but not necessary. Prior completion of OV100-WIN, OV210-WIN and either OV200-WIN is highly recommended but not required.

**Duration**  
 5 Days

- Objective**
- Upon successful completion of this course, using the reference material provided, the student will be able to:
  - Explain what fieldbus is as well as its purpose.
  - Differentiate between Foundation Fieldbus and Profibus Fieldbus from device purpose and hardware design.
  - Download firmware to the FF module and Profibus Module.
  - Configure FF & Profibus driver and protocol on Ovation controller.
  - Utilize configure tools insert modules define ports, and insert devices.
  - Utilize tools commission devices on FF.
  - Build FF control sheet to get process device value.
  - Read FF & Profibus status from live bus diagnostics tools.

Operations Management Software  
**Fieldbus and Profibus Applications FloBoss S600+ Combined - Config600**

**Course RA902**

The FloBoss S600+ Combined Course is a combination of both the fundamentals course and advanced course in one.

**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.

- Prerequisites**
- Participants should be familiar with metering techniques and standards
  - Participants should bring their own personal computer to the course and should have administrative privileges
  - Participants must be PC literate

- 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 cEditor
  - Registering Tickets - Do's and Don'ts

Operations Management Software  
**FloBoss S600+ Operator**

**Course RA900**

The FloBoss S600+ Fundamentals course provides an overview into the hardware and operational aspects of the FloBoss S600+ flow computer.

**Overview**  
 The 2-day FloBoss S600+ Fundamentals course will have participants become familiar with the FloBoss S600+ hardware, the start up 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.

- 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

- Topics**
- Introduction to S600+
  - Standard Application Overview
  - S600+ Hardware Overview
  - Navigating Displays
  - Editing Display Items
  - Editing Configurations with Config600
  - Using Config600 Transfer

Operations Management Software  
**Fundamentals of CSI 2140**

**Course 2072**

**Overview**  
 This 2-day hands-on course focuses on the basic operation of the CSI 2140 Machinery Health Analyzer. Students collect data on lab machines. This course is designed for personnel with little or no experience with CSI analyzers, but who are experienced in the field of vibration data collection and analysis.

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

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

**Note:** You may take with Fundamentals of Vibration as a four day course.

Operations Management Software  
**Fundamentals of CSI 2140 Machinery Health Analyzer (eLearning)**

**Course e2140**



Emerson's Machinery Health training now includes the Fundamentals of the CSI 2140 eLearning course, designed to provide you with the tools you need to perform data collection using the CSI 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 CSI 2140 Analysis Expert Functions

Operations Management Software  
**Fundamentals of CSI 2130 Machinery Health Analyzer (eLearning)**

**Course e2130**



Emerson's Machinery Health training now includes a 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.

**Overview**  
 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 predefined 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



Operations Management Software  
**Fundamentals of CSI 2140**

**Course 2076**

**Overview**

This 2-day hands-on course focuses on the basic operation of the CSI 2140 Machinery Health Analyzer. Students collect data on lab machines. This course is designed for personnel with little or no experience with CSI analyzers, but who are experienced in the field of vibration data collection and analysis.

**Prerequisites**

Understanding of vibration analysis. Familiar with basic vibration collection principles

**Topics**

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

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

Operations Management Software  
**Intermediate Vibration Analysis/ Category II Compliant**

**Course 2032**

This 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 CSI 2130 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.

**Prerequisites**

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

**Topics**

- Equipment Testing and Diagnostics
- Reference Standards
- Reporting and Documentation
- Fault Severity Determination
- Analyzer Averaging Techniques
- Sensor Selection Guidelines
- Introduction to Demodulation and PeakVue®
- Advanced Waveform Analysis
- Sideband Analysis
- Rolling Element Bearing Failure Modes
- Advanced Electrical Analysis Techniques
- Pump/fan Vibration
- Phase Analysis using Single and Dual Channel
- Perform Basic Single-Plane Field Balancing

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

Operations Management Software  
**Level I Lubrication with Certification**

**Course 2082A**

**Overview**

This 1.5-day course is designed for individuals who have limited or no oil analysis experience. Guidelines and instruction for starting an oil analysis program will be provided. 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.

**Prerequisites**

None

**Topics**

- Starting a 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

Optional Level I Lubrication Certification is available at no charge.

**Note:** May be taken with *Level II Lubrication* as a 3-day course.

Operations Management Software  
**Ovation Hardware Project**

**Course OV216-WIN**

The course is designed for personnel whose primary interest and/or job assignment is maintaining the Ovation Hardware. Selected topics from several courses are incorporated and expanded upon to cover hardware features of the Ovation controller, it's power supplies and the most commonly applied I/O modules (including HART). Hands-on exercises will require building control sheets and linking inputs and outputs to selected modules.

**Required Prerequisites:** OV100, OV200 or OV215

Operations Management Software  
**Ovation Operator**

**Course OV010-WIN**

Provides the user with the ability to use the Ovation system to perform trends, understand alarming, point (tag) details and searches as well process graphics. Concise overview of the controller, network and workstations are presented.

**Note:** Offered Upon Request

Operations Management Software  
**Ovation Troubleshooting**

**Course OV300-WIN**

Provides the skills and methods to troubleshoot and repair faults in the data acquisition and control functions of the Ovation system. Requires students to isolate faults anywhere in the signal path, from the field terminations to the I/O modules, through the controller, across the network and into the graphic display. Students will evaluate single- and multiple problem scenarios.

**Required Prerequisites:** OV100, OV200, OV210 or OV215, OV216

Operations Management Software  
**ROC800 Series Configuration and Operations**

**Course RA1240/V**

This Remote Automation Solutions course is for engineers, technicians, and others involved with the operation and maintenance of the ROC800 Series products.

**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 operate the ROC800 series products. Each participant will be provided (ROCLINK800 preinstalled), a Remote Automation Solutions RTU, a communication cable, and a workbook for the duration of the course. However, partici- laptop to class.

**Prerequisites**

Participants should have a working knowledge of their application/process and should be thoroughly familiar with Microsoft Windows operating systems (XP or later versions)

**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 of MVS Products
- Setup of Multi-dropping of MVS
- Configuring AGA Flow
- Calculations
- Configuring ROC History
- Modbus Tables
- PID Configuration
- Building ROC Displays
- FST Workshop

Operations Management Software  
**Simulator Instructor Station**

**Course Sim-001**

**Overview**

Teaches instructors how to use the principal features of the simulator instructor station. Hands-on exercises include snapping and resetting the simulator conditions; backtracking; plotting parameter trends; applying equipment malfunctions and other types of actions; using event triggers and automated plant procedures; and reviewing trainee performance. Course is limited to four instructors. Conducted at the customer's site using the customer's simulator. Course applies only to simulators having JADE™ JStation™ instructor station software by GSE Power Systems, Inc.

**Prerequisites**

None

**Duration**

3 Days

Operations Management Software  
**Simulator Instructor Training**

**Course Sim-011**

**Overview**

Teaches instructors the process of planning, preparing, validating, executing, and evaluating simulator training sessions for plant operators. Hands-on exercises apply the process to plan, prepare, and validate simulator training sessions for unit startup, unit shutdown, unit abnormal operations, and DCS graphics familiarization. Course is limited to four instructors. Conducted at the customer's site using the customer's simulator. Course applies only to simulators having JADE™ JStation™ instructor station software by GSE Power Systems, Inc.

**Prerequisites**

Sim-001 is a recommended prerequisite.

**Duration**

5 Days

Operations Management Software  
**Simulator Training for Experienced Operators**

**Course Sim-031**

**Overview**

Applies the customer's simulator to exercise, refresh and test the operating skills of experienced plant operators. Trainee operates the simulator as the real unit, in accordance with the customer's procedures. Customer's instructor controls the conduct and content of the training. Emerson trainer helps the customer's instructor use the course materials, manipulate the simulator instructor station, and generally conduct the training, without telling the customer how to operate their plant. Course is patterned after one operational cycle of the real plant—unit startup, power generation, and shutdown. Trainee encounters a variety of abnormal conditions that require responsive action. Course is flexible to accommodate the customer's specific unit, simulator, and operating procedures. Course is limited to four operators and three instructors. Conducted at the customer's site using the customer's simulator. Course applies only to simulators having JADE™ JStation™ instructor station software by GSE Power Systems, Inc.

**Prerequisites**

Sim-001 and Sim-011 are recommended prerequisites for instructors.

**Required Prerequisites for Operators**

Sufficient knowledge of plant systems, controls, principles, and procedures to understand and perform the operations with little or no instructor assistance.

**Duration**

10 Days

Operations Management Software  
**Simulator Training for New Operators**

**Course Sim-021**

**Overview**

Applies the customer's simulator to develop the operating skills of new plant operators. Trainee operates the simulator as the real unit, in accordance with the customer's procedures. Customer's instructor controls the conduct and content of the training. Emerson trainer helps the customer's instructor use the course materials, manipulate the simulator instructor station, and generally conduct the training, without telling the customer how to operate their plant. The course is divided into ten discrete simulator training sessions that focus on essential Ovation graphics operations, unit startup, unit shutdown, and unit operations in response to selected abnormal conditions. Course is flexible to accommodate the customer's specific unit, simulator, and operating procedures. Course is limited to four operators and three instructors. Conducted at the customer's site using the customer's simulator. Course applies only to simulators having JADE™ JStation™ instructor station software by GSE Power Systems, Inc.

**Prerequisites**

Sim-001 and Sim-011 are recommended prerequisites for instructors.

**Required Prerequisites for Operators**

Sufficient knowledge of plant systems, controls, principles, and procedures to understand and perform the operations with some instructor assistance.

**Duration**

10 Days

Operations Management Software  
**Solaris to Windows Upgrade**

**Course OV115-WIN**

The OV115-WIN course is designed to teach the Ovation™ Windows® 3.5 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 of discussion include: basic network, architecture and components, Operator functions, Developer Studio features, Control and Graphics building and Basic system configuration.

**Prerequisites**

The course is intended but not limited to students with a knowledgeable Solaris background and should have attended the UNIX (core) courses namely the OV100-UNIX, OV200-UNIX and OV210-UNIX prior to attending the OV115-WIN.

**Duration**

5 Days

**Objective**

Upon successful completion of this course, 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 3.5 control builder
- Demonstrate a basic level of proficiency using the graphics builder
- Understand and implement some basic Ovation Windows configuration changes

Operations Management Software  
**Starting with Data Acquisition**

**Course OV100-WIN**

**Overview**

OV100-WIN provides experience using an Ovation™ Data Acquisition System (DAS). Ovation terminology and proper use of Ovation documentation are discussed. Students are introduced to the major components of the system and practice using Ovation tools that are designed to make data acquisition easy. Exercises include modifying and building database point records for analog and digital points. Students physically connect various field devices to the I/O and test the signals. Basic techniques for troubleshooting data acquisition hardware and software are also included in the course. This course is intended for anyone who will need to work with the DAS of the Ovation system in a Windows environment.

**Prerequisites**

There are no prerequisites for this course.

**Duration**

5 Days

**Objective**

Upon successful completion of this course, using the reference material provided, the student will be able to:

- Recognize Ovation terminology and identify the types of drops used for data acquisition in an Ovation system
- Demonstrate the ability to effectively use Ovation documentation
- Describe the functions of the Ovation network and its components
- Describe the general architecture of an Ovation system
- Describe the database point record movement between various drops as the points are monitored, modified and built
- Monitor plant processes using data acquisition tools
- Recognize, modify and build the various types of database point records in an Ovation system
- Select and configure I/O modules for typical field devices
- Wire and test complete signal paths between various field devices and appropriate database point records
- Analyze problem situations and implement appropriate corrective solutions/proficiency using the graphics builder

- Understand and implement some basic Ovation Windows configuration changes

**Note:** We will be offering separate OV100-WIN courses for Ovation 3.x and Ovation 2.x users. As the courses are scheduled simultaneously, please be sure that you enroll in the proper system-level class

Operations Management Software  
**Syncade™ Document Control and Archiving**

**Course 7081/V**



**Overview**  
 This 3-day class provides the user with the necessary skills to set up, configure and maintain the DCA module in Syncade. Students will be taught repository setup and administration settings, how to add documents to a user configured repository structure using manual or automated techniques, manually move documents through the promotion model as well as editing existing documents and making them available to the production cycle. Users will configure and use the Change Request feature within DCA to move documents through the promotion model. Change request types and workflows will be created and users assigned to the roles in the steps to automate the document promotion process. Document packages will also be taught in this class. Users will create package classes that will be used to create a print package for a production run.

**Prerequisites**  
 None

**Duration**  
 5 Days

- Topics**
- DCA Overview
    - DCA User Interface
    - Repository Creation, Configuration and Use
  - Document Types
  - Configured Properties
  - Creating Document Properties
  - Adding Documents – Manual / Autoloader
  - Document Life Cycle
  - Document Change Control
  - Change Request User Interface
  - Change Request Life Cycle
  - Change Request Types
  - Change Request Workflows
  - Creating Change Requests
  - Review and Approval Processes
  - Document Packages Overview
  - Packages User Interface
    - Package Classes

**Note:** Virtual Training Available, Call to Schedule.

Operations Management Software  
**Syncade™ Equipment Tracking**

**Course 7083/V**



**Overview**  
 This 2-day class 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 up on 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.

**Prerequisites**  
 None

**Duration**  
 5 Days

- Topics**
- ET Overview
  - Create Equipment Classes
  - Define Calibration Targets
  - Add Custom Properties
  - Create Events and Event State Matrix
  - Create Rules and Groups
  - Material and Labor with Events
  - Event Scheduling
  - Create Equipment
  - Integrating Documents and Skills
  - Performing Events
  - Work Orders

**Note:** Virtual Training Available, Call to Schedule.

Operations Management Software  
**Syncade™ Materials, Inventory and Order Management**

**Course 7084/V**



**Overview**  
 This 3-day 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.

**Prerequisites**  
 None

**Duration**  
 5 Days

- Topics**
- Material/Inventory Management Overview
  - OM Overview
  - Material Masters
  - Material Properties
  - Quality Statuses
  - Order Creation and Execution
  - Material Allocations
  - Weigh and Dispense
  - Trusted Dispensing
  - Sampling
  - Purchasing and Receiving
  - Lot and Container Actions
  - Physical Inventory
  - Genealogy
  - Inventory Adjustments

**Note:** Virtual Training Available, Call to Schedule.

Operations Management Software  
**Syncade™ Overview**

**Course 7080/V**



**Overview**  
 This 2-day class provides an overview of the Syncade applications and their use within a Manufacturing Execution System (MES) environment. The Syncade applications handle tasks that fit between the process control system environment, such as DeltaV™, and corporate Enterprise Resource Planning (ERP) systems, such as SAP. Each module in Syncade will be covered briefly to provide the user with a basic understanding of the module, its functionality and how it fits into the overall MES functional layer. Integration methods and implementation techniques are not part of this class.

**Prerequisites**  
 None

- Topics**
- Manufacturing Execution Systems (MES)
  - Document Control and Authoring
  - Security Basics
  - Portal
  - Training and Development
  - Equipment Tracking
  - Materials Management
  - Inventory Management
  - Recipe Authoring
  - Order Management
  - Weigh and Dispense

**Note:** Virtual Training Available, Call to Schedule.

Operations Management Software  
**Syncade™ Recipe Authoring**

**Course 7095/V**



**Overview**  
 This 3-day class will provide the user with the necessary skills to configure version 4 recipes for Syncade execution. Users will learn to configure manual recipes, DeltaV recipes and recipes that integrate the Syncade and DeltaV into a complete cohesive batch record.

**Prerequisites**  
 None

- Topics**
- Recipe Authoring (RA) Overview
  - RA Application
  - Manual and Automation Recipe Hierarchy
  - Work Instructions and Parameter Types
  - Operations, Unit Procedures and Procedure Creation
  - RA Simulator
  - Process Segments
  - Master Recipes
  - Order Execution
  - Parameter Referral and Deferral
  - Reference Groups
  - Formula Creation/Selection
  - Behaviors
  - DeltaV Recipes
  - Integrated Type 2 and 3 Recipes

**Note:** Detailed application classes available to customers that have purchased Syncade.

Virtual Training Available, Call to Schedule.

Operations Management Software  
**Syncade™ Training and Development**

**Course Course 7082/V**



**Overview**  
 This 1-day class will provide the user with the necessary skills to configure the Training and Development module to successfully ensure the workforce is up to date with job related skill sets. Users will configure the tasks and skill sets necessary for an individual to complete a job function as well as maintain those skills over time. Users will configure an organizational structure that will be used to define departments and positions and assign skills to those positions that will set the requirements for a person holding that position. Courses will be created that will teach the tasks required to fill a position in the organization. Users will also schedule classes and learn how to enroll themselves and others using the training and requirement planners in the TD module. Users will also be taught how to set up the notification processes within the Syncade administration menus.

**Prerequisites**  
 None

- Topics**
- TD Overview
  - Defining the Organizational Structure
  - Creating Tasks
  - Creating Skills and Assigning Tasks
  - Certification Methods
  - Setting Up Training Classes
  - Creating Job Requirements
  - Integrating TD with Other Syncade Modules
  - Maintaining Necessary Job Related Skills
  - Administration Notification Processes

**Note:** Virtual Training Available, Call to Schedule.

Operations Management Software  
**System Administration**

**Course OV230-WIN**

**Overview**

This course is designed for Chemometricians, Process Engineers, Quality Engineers, and Process Control Engineers. This 8-hour (average duration) on-line course provides an orientation of Batch Analytics Model Builder. The course includes audio presentations, demonstrations, hands-on practices, hands-on workshops, and quizzes. Upon completion of this course, the student will be able to:

**Prerequisites**  
None

**Topics**

- Manufacturing Execution Systems (MES)
- Document Control and Authoring
- Security Basics
- Portal
- Training and Development
- Equipment Tracking
- Materials Management
- Inventory Management
- Recipe Authoring
- Order Management
- Weigh and Dispense

**Note:** OV230-UNX Offered Upon Request

Process Control & Automation Software  
**Batch Analytics Model Building (eLearning)**

**Course e7046**



**Overview**

This course is designed for Chemometricians, Process Engineers, Quality Engineers, and Process Control Engineers. This 8-hour (average duration) on-line course provides an orientation of Batch Analytics Model Builder. The course includes audio presentations, demonstrations, hands-on practices, hands-on workshops, and quizzes. Upon completion of this course, the student will be able to:

- define basic principles of Batch Data Analytics and their use in fault detection and quality parameter prediction
- use the Batch Data Analytics Model Builder application to build and deploy a project for fault detection and quality parameter prediction
- users will be able to recognize and navigate the screens needed to build a model in Batch Analytics
- users need to define batch logic, stage logic, and initial condition logic needed for model development
- users will be able to interpret analytic data of the Model Builder application using a saline example
- users will be able to build a Batch Data Analytics model

**Prerequisites**

DeltaV Batch experience and Microsoft Windows experience is required. Statistical/Quality background would be beneficial.

**Topics**

- Batch Analytics Overview
- Batch Analytics Model Builder
- Overview
- Batch Analytics Viewer Overview
- Batch Saline Simulation
- Benefits of Using Batch Analytics
- Batch Analytics Manager
- Administration
- Batch Logic, Stage Logic, and Initial Logic Required to Build a Model
- Batch Analytics Model Builder - Equipment
- Batch Analytics Model Builder - Product
- Batch Analytics Model Builder – Model

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**Batch Analytics Operator (eLearning)**

**Course e7044**



**Overview**

This course is designed for operators, process engineers, and management. This 6-hour (average duration) on-line course provides an orientation of Batch Analytics and how it is used in a production environment. The course includes audio presentations, demonstrations, hands-on practices, hands-on workshops, and quizzes. Upon completion of this course, the student will be able to:

- define basic principles of Batch Analytics
- identify how Batch Analytics is used in fault detection and quality parameter prediction
- identify the Batch List, Quality Prediction, and Fault Detection screens
- monitor a fault
- interpret analytic data of a saline example
- identify the root cause of a detected fault

**Prerequisites**

DeltaV Batch experience and Microsoft Windows experience is required

**Topics**

- Batch Analytics Overview
- Batch Analytics Model Builder Overview
- Batch Analytics Viewer Overview
- Batch Saline Simulation
- Benefits of Using Batch Analytics
- Batch Analytics Viewer – Batch List Tab
- Batch Analytics Viewer – Fault Detection Tab • Batch Analytics Viewer – Quality Prediction

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**Control Loop Foundation**

**Course 9025**



**Overview**

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.

**Prerequisites**

Windows experience.

**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

Process Control & Automation Software  
**DeltaV Advanced Control**

**Course 7201/V**



**Overview**

This 4-1/2 day course introduces students to the advanced control tools available within DeltaV and how they may be used to improve plant operations. The principal technology that is utilized in each product will be discussed. The areas of improvement that may be achieved will be detailed. Also, each student will gain hands on experience with these tools in class exercises based on realistic process simulations.

**Prerequisites**

Courses 7101, PlantWeb/DeltaV Intro. or 7009, DeltaV Implementation I or equivalent field experience.

**Topics**

- The Control Foundation in DeltaV
  - Traditional Tools e.g. Override, Cascade, Ratio
  - Improvements Provided by Advanced Control
- DeltaV Inspect with InSight
  - Detection of Abnormal Conditions
  - Performance Indices
  - Performance Reports
- DeltaV Tune with InSight
  - Tuning Response
  - Process Learning
  - Adaptive Tuning
  - Adaptive Control
- DeltaV Fuzzy
  - Principles of Logic Control
  - FLC Function Block, Tuning
- DeltaV Predict
  - MPC for Multi-Variable Control
  - Model Identification, Data
  - Screening
  - Simulation of Response, Tuning
- DeltaV Neural
  - Creation of Virtual Sensor
  - Data Screening, Training
- DeltaV Simulate Suite
  - Process Simulation
  - Simulate Pro

**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Advanced Graphics**

**Course 7025/V**



**Overview**

This 4-1/2 day course is for process control engineers responsible for configuring advanced functionality in the DeltaV user interface. This course expands on graphic topics covered in both the DeltaV Implementation course 7009 and DeltaV Implementation II course 7017.

**Prerequisites**

Course 7009, DeltaV Implementation I

**Topics**

- Visual Basic Primer
- Forms
- Modules
- Schedules
- User Preferences
- Picture Sizing
- Environment Customization
- Custom Faceplates
- Function Block Faceplates
- FRS Functions
- Pop Up Menus
- Color Threshold Tables
- Custom Dynamos
- Tag Groups
- Key Macro Editor
- Theme Dynamos

Process Control & Automation Software  
**DeltaV Hardware & Troubleshooting**

**Course 7018**

**Overview**

This course is recommended for instrumentation and maintenance technicians, managers, and configuration engineers who need to know about DeltaV hardware. It provides an overview of the DeltaV Control Network, Mand S-series hardware, and software applications. Upon completion, you will be familiar with the hardware 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 hardware-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 prerequisite requirement for these bus course (except 7032).

**Prerequisites**

Windows experience.

**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 and AMS Suite Intelligent
- Device Manager
- Redundant I/O

Process Control & Automation Software  
**DeltaV Implementation I**

**Course 7009**

**Overview**

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

**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, Course 7101, or DeltaV Hardware & Troubleshooting, Course 7018

**Topics**

- System Overview
- DeltaV Explorer
- DeltaV Diagnostics
- Control Modules
- Control Studio
- 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)

**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Implementation II**

**Course 7017/V**



**Overview**

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

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, configure modules using State-Driven & Command-Driven algorithms, configure modules with Analog Control Palette Blocks and create simulation for testing purposes.

**Prerequisites**

Course 7009, DeltaV Implementation I

**Topics**

- Function Block Structures & Status
- Values
- Analog Control Palette Blocks – Bias/Gain, Deadtime, Limit, Ratio, Signal Characterizer, Splitter
- HART Inputs and Outputs
- HART Device Alarms
- AMS Intelligent Device Manager
- Unit Alarms
- DeltaV Tune with InSight
- Device Control Options
- Class Based Control Modules

Process Control & Automation Software  
**DeltaV Model Predictive Control**

**Course 7202/V**



**Overview**

This 3-day course is designed for process and control engineers who are applying DeltaV Model Predictive Controls capabilities. 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.

**Prerequisites**

DeltaV Advanced Control, Course 7201.

**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
- Insuring Disturbance Inputs are Independent of other Process Inputs
- 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 Deadtime 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

**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Operator Interface for Batch**

**Course 7014/V**



**Overview**

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

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

**Prerequisites**

DeltaV Advanced Control, Course 7201.

**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

**Price/Location/Start Date:** Call to Discuss  
**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Operator Interface for Continuous Control**

**Course 7012/V**



**Overview**

This course is for operators, supervisors and managers responsible for the operation of continuous processes using DeltaV system. This 2-day course uses lectures and hands-on workshops to provide an in-depth overview on operating the DeltaV System. Students who complete this course will:

- access operator displays
- manipulate various control module operating parameters to operate the process
- respond to process alarms
- monitor process performance
- view real-time and historical trend data

**Prerequisites**

DeltaV Advanced Control, Course 7201.

**Topics**

- System Overview
- Accessing DeltaV Operate Window, Menus Displays and Directories
- Discrete and Analog Control Module Operation
- Accessing Alarm Displays/Alarm Handling
- Motor Control Module Operation
- Regulatory/Cascade Control Module Operation
- Accessing Real-time/Historical Trend Data
- Unit Alarms
- Sequential Function Chart Operation
- Phase Logic Modules

**Price/Location/Start Date:** Call to Discuss  
**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Operator Interface for Continuous Control (eLearning)**

Course e7012



**Audience**  
 Operators, supervisors and managers responsible for the operation of continuous processes with a DeltaV System. Ideal students for this course are new to the DeltaV System but already have process control/plant experience. This interactive on-line course includes audio presentations, demonstrations, practice sessions, workshops, quizzes, and a final examination. The average time to complete the course is 12 hours.

- Topics**
- System Overview; Accessing DeltaV Operate
  - Navigating in DeltaV Operate
  - Discrete, Analog, Regulatory, and Cascade Control Module Operation
  - Motor Control Module Operation
  - Accessing: Alarm Displays; Real-Time/ Historical Trend Data; Process History View
  - Using DeltaV Operate Themes

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**DeltaV Operator Interface for Batch Control (eLearning)**

Course e7014



**Audience**  
 Operators, supervisors, and managers responsible for the operation of a batch process using the DeltaV system. This is an interactive 16-hour on-line course with DeltaV screens including audio presentations, demonstrations, practice sessions, workshops, quizzes and a final examination.

- Topics**
- System Overview
  - Accessing DeltaV Operate
  - Navigation in DeltaV Operate
  - Discrete, Analog, Regulatory, and Cascade Control Module Operation
  - Motor Control Module Operation
  - Accessing Alarm Displays
  - Accessing Real-Time/Historical Trend Data
  - Accessing Process History View
  - Phase and Recipe Controls
  - Batch Operator Interface
  - How to Add/Run Batches

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**DeltaV Safety Instrumented System with SLS 1508 Maintenance**

Course 7303

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

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

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

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**DeltaV Systems Administration - Windows 7/Server 2008**

Course 7027

**Overview**  
 This 4-1/2 day course is designed for control system administrators, process control engineers and IT specialist responsible for managing, installing, and commissioning a DeltaV system running on the Windows 7 operating system and Windows Server 2008.

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

The purchase of this course includes access to the eDVS23 course at no extra charge. Upon confirmed enrollment, the student will receive access to the eDVS23 online course (via email) to take at any time.

- Topics**
- Overview/Review of System
  - Components and Topologies
  - DeltaV Licenses
  - Database Administration
  - User Administration
  - Network Node Diagnostics
  - Auto Update Service
  - Cybersecurity Tools – Smart Firewall, Controller Firewall, Smart Switches
  - Installation Checklist of the Windows 7 and Windows Server 2008
  - Operating Systems
  - Installation of the DeltaV Software and AMS Device Manager
  - Components
  - DeltaV Control Networks and Remote Access
  - DeltaV Domains and Workgroups
  - Network Security
  - Upgrading Hardware and Software
  - Backup and Restore Procedures
  - Importing/Exporting
  - DeltaV Zones

**Note:** Virtual Training Available, Call to Schedule.

Process Control & Automation Software  
**DeltaV Systems Batch Implementation**

Course 7016

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

**Prerequisites**  
 Course 7009, DeltaV Implementation I.

- 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

Process Control & Automation Software  
**eLearning: Features Training on DeltaV Analyze 2.0 (eLearning)**

Course e7045



**Overview**  
 This course is for personnel who will be using DeltaV Analyze in their alarm management program. This on-line course includes audio presentations, quizzes, and up to a four hour access to DeltaV Analyze. To obtain hands on experience, e7045 students will have four hour access to DeltaV Analyze over a two week timeframe.

**Prerequisites**  
 Course 7009, DeltaV Implementation I.

- Topics**
- DeltaV Analyze Overview
  - DeltaV Analyze Administration Features
  - How to Create a Bookmark
  - How to Create an Alarm Statistics Report

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**Fieldbus Systems and Devices**

**Course 7032**

**Audience**

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.

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

**Prerequisites**

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

**Topics**

- FOUNDATION™ fieldbus Overview
- Macro Cycle Execution
- Fieldbus Function Blocks
- Control Anywhere
- Fieldbus Wiring and Installation
- Segment Checkout Procedures
- Commissioning and Configuring Devices
- Control Strategy Configuration
- PlantWeb Alerts
- Configuring an Operator Display

Process Control & Automation Software  
**eLearning: Installing DeltaV Virtual Studio 2.3 (eLearning)**

**Course eDVS 23**



**Overview**

This course is designed for control system administrators, IT administrators, or any other personnel installing DeltaV Virtual Studio 2.3.

This 1 hour (average duration) on-line course shows the process of installing a DeltaV Virtualization (DeltaV Virtual Studio 2.3) solution. This video is not intended to be a video installation manual, but does attempt to show important installation details to the viewer. Viewers are encouraged to have a copy of the DeltaV Virtualization Planning and Installation guide when watching the video to better follow and understand the methods and procedures in completing a DeltaV Virtualization installation. The latest DeltaV Virtualization system planning and installation documentation should be available through the Emerson Guardian and Foundation Support website.

**Prerequisites**

Control System/IT administration experience.

**Topics**

- Upon completion of this course, the student will be able to identify the various installation steps including:
- Installing Windows Server 2012
  - Installing Microsoft Hyper-V Server 2012
  - Creating a Domain in Server 2012
  - Installing the Required Software Components
  - Using the Automated Configuration Tools to Configure the Storage Area Network Device, or SAN Device, and Create a Failover Cluster
  - Creating a virtualized ProfessionalPLUS
  - Using a USB to Network device for the DeltaV Dongle
  - Creating a DeltaV Operator Station

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Note:** Course access is 12 months

Process Control & Automation Software  
**PlantWeb/DeltaV Introduction**

**Course 7101**

**Audience**

This course is for plant managers, process and process control engineers, and maintenance personnel needing an introduction to how the PlantWeb technology is utilized in basic process control systems and safety systems. Students will perform basic workstation operations including accessing displays, accessing faceplates, accessing modules to make process changes, responding to alarms and observing/changing tunable configuration parameters. Students who complete this 3-day course will be able to:

- use and apply PlantWeb terminology and acronyms
- identify DeltaV Explorer components
- define the different types of downloads
- commission and download a controller
- identify DeltaV Operate functionality
- operate a process using faceplates, detail displays, and primary control displays using DeltaV Operate
- define the Foundation™ Fieldbus technology terminology
- view device alerts using AMS Suite: Intelligent Device Manager
- define the DeltaV SIS architecture

**Prerequisites**

None

**Topics**

- DeltaV System Description
- DeltaV Hardware
- Engineering Application
- Operation & Maintenance
- Alarm Management
- Security
- Bus Architecture
- Safety Life Cycle
- DeltaV SIS Overview
- Data Integration
- Batch

Safety Instrumented System  
**DeltaV Safety Instrumented System with Electronic Marshalling Maintenance**

**Course 7304**

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

**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 be able to configure Partial Stroke Test using DeltaV SIS with Electronic Marshalling. Students will practice troubleshooting and maintenance techniques with DeltaV SIS simulators throughout the course.

**Prerequisites**

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

**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
- Partial Stroke Test using DeltaV SIS with Electronic Marshalling
- Local Safety Network Bridges

Safety Instrumented System  
**DeltaV SIS Implementation**

**Course 7305/V**



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

**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 Security
- AMS Device Manager relating to DeltaV SIS
- DeltaV SIS Fisher SIS Digital Valve Controllers
- SISNet Repeaters
- DeltaV SIS Security
- DeltaV Version Control
- Local Safety Network Bridges



**Control Valve Engineering I****Course 1300**

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

**Overview**

This 4-1/2 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 valve assemblies. Students will solve several demonstration sizing and selection problems using Fisher Specification Manager 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

**Prerequisites**

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

**Topics**

- Control Valve Selection: Rotary/Sliding Stem
- Actuator Selection and Sizing
- Corrosion Resistant Valves
- Liquid Valve Sizing
- Gas Valve Sizing
- Positioners and Transducers
- Valve Application Guidelines
- Valve Characteristics
- Valve Packing Considerations
- Cavitation
- Valve Noise

**Fisher Actuator Basics (eLearning)****Course e1503****Overview**

This 1/2-hour (average duration) course introduces the basic definition of an actuator, lists the types of actuators for sliding stem and rotary control valves, states the general components of an actuator and lists the general actuator selection guidelines.

**Note:** Course access is 3 months

**Prerequisites**

None. However, a basic familiarity with Industrial Process Control is beneficial.

**Topics**

- Function of an Actuator
- Pneumatic Spring-and-Diaphragm Actuators
- Pneumatic Piston Actuators
- Electric Actuators
- Electro-Hydraulic Actuators
- Actuator General Selection Guidelines

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Fisher Rotary Control Valve Basics (eLearning)****Course e1502****Overview**

This 1/2-hour (average duration) course introduces the basic definition of rotary control valves, defines the body types and styles of rotary valves, as well as their common components, flow characteristics and considerations, and finally the general sizing capacity and selection guidelines.

**Note:** Course access is 3 months

**Prerequisites**

None.

**Topics**

- Butterfly Control Valves
- Disc designs
- Rotary Ball Valves
- Ball Styles
- Eccentric Plug Valves
- End Connections
- Packing Options
- General Sizing and Selection

[www.emersonprocess.com/education](http://www.emersonprocess.com/education)

**Fisher Sliding Stem Control Valve Basics (eLearning)****Course e1501****Overview**

This 1/2-hour (average duration) course introduces the basic definition of sliding stem control valves, types of sliding stem valves, their common components, guiding methods, typical uses, flow characteristics, the general sizing capacity and selection guidelines.

**Note :** Course access is 3 months

**Prerequisites**

A basic familiarity with Industrial Process Control is beneficial.

**Topics**

- Sliding Stem Valves
- Types of Globe Valves
- Plug Design, Gaskets and Trim Bonnet
- Packing Assembly
- End Connections
- Pressure and Temperature
- Flow Direction
- Shutoff
- General Sizing and Selection Guidelines

**Fundamentals of HART Based FIELDVUE Digital Valve Controller using the 475 Field Communicator****Course 1751**

This course is for technicians, engineers and others responsible for installing, calibrating and basic troubleshooting FIELDVUE instruments using the 475 Field Communicator.

**Overview**

This 2-day course provides the skills necessary to:

- install and mount FIELDVUETM digital valve controller onto Sliding Stem Actuator/ Valve and Rotary Actuator/ Valve Assemblies
- configure and calibrate FIELDVUE Instruments with the Field Communicator

**Prerequisites**

Control valve experience and/or course 1400, 1300, 1710, or 1451.

**Topics**

- FIELDVUE Digital Valve Controller Theory of Operation
- FIELDVUE Instrument Installation
- Field Communicator for Instrument Configuration, Calibration and Troubleshooting
- ValveLinkTM Mobile Overview

**Introduction to Fisher Control Valves (eLearning)****Course e1500****Overview**

This 1-hour (average duration) elearning course introduces anyone with no prior experience to industrial process control valves. Students are led on a self-paced discussion on how control valve designs vary, basic theory of operation, and how control valves function in a process control loop. Student interaction in the form of "Check your knowledge" and quiz assessments are used throughout to confirm student understanding.

**Note:** Course access is 3 months

**Prerequisites**

A basic familiarity with Industrial Process Control is beneficial.

**Topics**

- Basic Terminology of Control Valve Types
- Uses of Control Valves
- Role of the Control Valve in Industrial Process
- Inherent Flow Characteristics
- Entities that Define Codes and Standards for Final Control Devices

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## Control Valves

### Control Valves Valve Technician I

#### Course 1400

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.

##### Overview

This 4-1/2 day course 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, positioners and digital valve controllers. Those who complete this course will be able to:

- correctly perform installation procedures
- perform basic troubleshooting
- properly apply and calibrate, positioners and FIELDVUETM digital valve controllers
- change valve trim, gaskets and packing

##### Prerequisites

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

##### Topics

- Control Valve Terminology
- Globe Valves
- Packing
- Actuators, Positioners and Digital Valve Controllers
- Bench Set
- Seat Leak Testing
- Ball Valves
- Butterfly Valves
- Eccentric Disc Valves
- Valve Characteristics

### Control Valves ValveLink™ Software for Diagnostics of FIELDVUE™ Digital Valve Controller

#### Course 1759

This course teaches the techniques necessary to collect and interpret valve diagnostic tests performed using ValveLink™ software.

##### Overview

This 2-1/2 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 valves/actuators containing assembly or operating flaws and use the data for troubleshooting purposes.

##### Prerequisites

Completion of courses: 1750, 1752 or 7036 prior to attending.

##### Topics

- Pneumatic Control Valve Terminology
- Features of the Digital Valve Controller and ValveLink™ Software
- ValveLink™ Diagnostic Tests
- Data Interpretation
- Troubleshooting Techniques
- Comparison Testing Techniques
- Performance Diagnostics

### Control Valves ValveLink™ Software for Configuration and Calibration of FIELDVUE™ Digital Valve Controllers

#### Course 1752

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.

##### Overview

This lecture/lab style 2-1/2 day course provides hands-on experience working with FIELDVUE digital valve controller and ValveLink™ software. Students will be able to execute ValveLink™ calibration and diagnostic routines, and create an instrument database.

##### Prerequisites

Control valve experience and/or course 1400, 1300, 1710, or 1451.

##### Topics

- Introduction to ValveLink™ Software
- ValveLink™ Tag and Database Management
- Configuration with ValveLink™
- Calibration with ValveLink™
- ValveLink™ Advanced and Performance Tier Diagnostics
- Troubleshooting
- Introduction to Diagnostic Data Interpretation

# Educational Services

Maximize Your Investment with Well-Trained Personnel



## Maximize Your Investment!

### Control System Engineer Curriculum Path

#### Self-Guided Primers

e9025, Control Loop Foundation

#### Core Competencies

7009, DeltaV Implementation I  
7016, DeltaV Batch Implementation

#### Additional Competencies

- 7076, DeltaV PMO Configuration Standard
- 7201, DeltaV Advanced
- 7202, DeltaV Model Predictive Control
- 7017, DeltaV Implementations II
- 7025, DeltaV Advanced Graphics
- 7018, DeltaV Hardware & Troubleshooting
- 7037, Communication Interfaces with the DeltaV System
- 7027, DeltaV Systems Administration Window 7/Server 2008
- 7305, DeltaV SIS Implementation
- 7020, AMS Device manager or 7039, AMS Device Manager with DeltaV
- 7032, FieldBus System and Devices

#### Job Competencies

- Support DeltaV Automation Control
- System performance
- Maintain, troubleshoot, and enhance configuration, application and operation of Basic Process Control System and Safety Instrumented System (SIS)
- Identify, plan, and implement process control Improvement projects
- Productivity of Operations Personnel
- Alarm Rationalization and Management
- Construct and support external communication links
- Overall Risk Management of DeltaV
- Automation Control System

Your control system engineers' process and technical knowledge and skills can directly impact your facility's bottom line. Emerson Educational Services can dramatically boost your personnel skills and performance and reinforce job competencies.

Emerson Process Control System Engineers' Curriculum Path provides focused, in-depth, objective-based training on product-specific procedures for proper configuration and maintenance of your DeltaV distributed control system. Your control systems engineers' get practical application skills through dedicated classroom facilities and hardware.

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# Educational Services

Maximize Your Investment with Well-Trained Personnel



## Maximize Your Investment!

### Continuous Control Operators Curriculum Path

#### Self-Guided Primers

- e9025, Control Loop Foundation
- e7012, DeltaV Operator Interface for Continuous Control

#### 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

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.

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## Maximize Your Investment!

### I&E Maintenance Technical Curriculum Path

#### Self-Guided Primers

- e9025, Control Loop Foundation
- e7020, AM Suite: Intelligent Device Manager Primer

#### Core Competencies

- 7018, DeltaV Hardware & Troubleshooting
- 7020, AMS Device Manager or 7039, AMS Device Manager 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, trouble shoot, and make configuration changes to Basic Process Control System and Safety Instrumented Systems (SIS)
- Connect to HART® & Fieldbus devices
- Calibrate and commission devices, instruments and valves
- Proactively monitor devices for alerts, troubleshoot device problems & faulty assets
- Effectiveness of Maintenance Reliability Program

Your maintenance technicians' process knowledge and skills can affect your facility's performance, up-time, and maintenance cost-and ultimately your bottom line.

Emerson Educational 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.

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# Educational Services

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## Maximize Your Investment!

### Batch Operators Curriculum Path

#### Self-Guided Primers

- e9025, Control Loop Foundation
- e7014, DeltaV Operator Interface for Batch

#### 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.

Your batch operators' process knowledge and skills levels affect how your process is run, which can directly impact your facility's bottom line.

Emerson Educational 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.

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