# Workforce Development Catalog 2019

## Creating a Plan to Fill Workforce Skill Gaps

Click here to begin.

Rockwell Automation

# Table of Contents

# Why Rockwell Automation Training?

The cost of unscheduled downtime, safety compliance, and new technology integration can significantly impact productivity. However, many of these issues can be minimized with proper workforce training and development.

The demands of your business are increasing and the supply of skilled employees is decreasing. Do you have a plan to address these issues and bring together all the necessary steps to create a comprehensive workforce development solution?

With well-thought out plans and a strategy, you can not only reap the benefits of a more satisfied and more productive workforce, but you will be able to measure it with key metrics to show your return on investment.

Rockwell Automation developed a lifecycle to show how the process of creating a highly-skilled workforce is a disciplined process, rather than just a one-time event. There are four key steps to the process that our team of experts will walk you through when deciding how to execute on your plan.

## Training Services Fast Facts

Explore the Global Footprint of Rockwell Automation Training Services:

- Over 100 Active Courses
- Delivery Locations throughout the U.S. and Canada
- 80 Dedicated Training Resources
- 10 Training Development Experts

See what Training Services can do for you. Explore our Training Lifecycle Steps and Offerings below.

# Training Lifecycle Steps

Click on the icons below to view more information.

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## Assess

This step enables you to gauge the current abilities of your employees and better create individualized development plans.

Click to view Assess Offerings.

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### Train

Using data from your assessment, you can leverage specific, flexible and customizable approaches to not only fit your employees' learning needs, but also fit your business' production goals.

Click to view Train Offerings.

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# Training Lifecycle Steps

Click on the icons below to view more information.

Assess | Train | Apply | Measure

## Apply

After your training is completed, Rockwell Automation has developed job aids and refresher tools so employees can improve their skills and practice in an offline environment.

Click to view Apply Offerings.

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Assess | Train | Apply | Measure

## Measure

Using essential manufacturing metrics, you can leverage assessment data both pre and post training to ensure the effectiveness of your training plan.

Click to view Measure Offerings.

# Assess Offerings

## The First Step to Developing Your Workforce

Explore our Training Services Assess Offerings:

**Training Advisor**

Training Advisor can help you determine a tailored training path for your workforce to obtain the knowledge required to successfully improve on-the-job performance. This tool can help you identify skill and knowledge gaps hindering production performance and helps develop a training strategy that maximizes job performance and effectiveness.

With Training Advisor, you can customize online assessments in the following areas based on job tasks that are performed specifically by your workforce:

- Controllers
- Networks
- Motion Control
- Drives Control
- Safety
- Visualization
- Process Control
- OEM
- System Integrators
- Craft Skills (mechanical and electrical)

Training Advisor compiles the assessment results, identifies areas for potential training, and creates a strategic training plan with a recommended list of specific courses to meet each employee's particular needs.

Training Advisor is included with Standard and Enterprise Tech Connect contracts and is valid through the life of your Tech Connect contract. If you do not have a Tech Connect contract, contact your local Allen-Bradley Distributor or Rockwell Automation Sales Office for monthly and annual subscription options.

**Custom Workforce Assessments**

Assessments offer a comprehensive analysis of employees' job skills and knowledge levels of automation and control equipment for specific jobs and tasks. These assessments include recommendations to improve your employees' performance.

For more information on either of these offerings, contact your local Allen-Bradley Distributor or Rockwell Automation Sales Office.

# Train Offerings

## Taking Action to Fill Your Workforce Knowledge Gaps

Explore our Training Services Train Offerings:

**Open Enrollment**

With over 100 standard Open Enrollment courses at your disposal, your employees will be equipped to realize the full capabilities of Rockwell Automation technologies. Courses are designed to align with specific job functions and focus on relevant job tasks. Courses are open to all students and conducted at Rockwell Automation and partner locations.

**Virtual Classroom**

Rockwell Automation Virtual Classrooms are live, instructor-led courses designed using web-delivered, interactive training through WebEx technology to provide students with all the benefits of classroom instruction, straight from your desktop. This is ideal for students who cannot leave for training for an extended period of time, those with limited training budgets, and those who want to refresh previous training.

Courses can include various learning activities and feature polls/surveys, group and private chat, white board, desktop sharing, passing control to students, break out rooms for small group discussion, and knowledge checks through testing.

To enroll in Open Enrollment courses, including Virtual Classroom courses, contact your local Allen-Bradley Distributor, Rockwell Automation Sales Office, or enroll online now (available in select regions).

**Global Workforce Solutions**

Global Workforce Solutions designs and implements future-proof, sustainable, flexible solutions that result in retained performance, while continuously measuring the value of each solution through ongoing alignment and investment analysis. Whether at a single plant site or enterprise wide, Rockwell Automation is focused on creating training programs that provide foundational, intermediate, and mastery-level skills to your newest employees and most skilled experts. Our comprehensive training solutions can help increase the consistency, experience, and competency of your employees to improve enterprise-wide productivity and profitability.

Elements of a successful workforce solution can include skills and knowledge assessments, embedded instructors, application-specific or custom curriculums, on-going refresher training, train-the-trainer programs, custom electronic learning and workstations, and craft skills, mechanical concepts and precision maintenance courses.

# Train Offerings

## Taking Action to Fill Your Workforce Knowledge Gaps (Cont'd)

### Private Delivery

Rockwell Automation provides private on-site training courses to meet your industry, application, and system-level training needs. This offering is available for companies who want to ensure their employees are highly skilled in certain applications or systems, or within certain industries. These classes include craft skills and mechanical concepts courses to develop core competencies, fundamentals, advanced fundamentals, and equipment specific skills.

### Personal Trainer

Our Rockwell Automation instructor can help you create automation expertise with one-on-one training. The Personal Trainer is an experienced instructor and technical expert who develops and implements an individualized training plan for one to two individuals on-site at your facility. The Personal Trainer can provide in-depth technical experience or help mentor newly hired employees.

### Tailored Training

If what your employees need to maximize performance is a unique training curriculum that meets your specific requirements, Tailored Training is the solution. Rockwell Automation Tailored Training lets you build a training curriculum that meets your specific requirements. You make the decisions based on your needs for training that's tailored to your manufacturing technologies, employees' skill and knowledge requirements, timetable, and budget. Choose from over 1200 lessons in the Tailored Training database to create multiple technology training, introductory or prerequisite courses, refresher courses, software proficiency classes, or focused learning.

### Computer-Based Training

Self-paced, self-directed, computer-based training courses will help you acquire and retain new skills at an accelerated rate, giving you more time on the plant floor and less time in the classroom. Rockwell Automation's computer-based training courses provide engaging, interactive features that enhance your learning experience including interactive and integrated exercises, animated and descriptive technical explanations, interactive software simulations, knowledge post-tests, and online help.

### Web-Based Training

Self-paced, self-directed, web-delivered training courses are available when and where you need them most. Taking advantage of the flexibility of the internet, Rockwell Automation University Online Training is host to a variety of fundamental and product specific training. We incorporate these essential courses into a powerful Learning Management System to deliver a world-class online training solution directly to your plant floor or wherever you need it most.

For more information on any of these offerings, contact your local Allen-Bradley Distributor or Rockwell Automation Sales Office.

# Apply Offerings

## Begin to see Results and Application of Knowledge from Learning Engagements

Explore our Training Services Apply Offerings:

**Workstations**

Training workstations are the ideal tool to reinforce and practice maintenance, troubleshooting and programming skills, train new employees on your technologies, and ease the transition from one technology to another.

**Job Aids**

Job Aids provide your employees with essential job task information, thereby minimizing errors that can occur at the most inopportune moments. Our job aids are written at a level of detail to ensure that you are consistently using the best practices.

For more information on these offerings, contact your local Allen-Bradley Distributor or Rockwell Automation Sales Office.

# Measure Offerings

## Understand the Value of Your Workforce Development Investment

Explore our Training Services Measure Offerings:

**Pre and Post Testing**

We can offer pre and post testing as stand alone offerings after private classes are executed to see if your employees filled their knowledge gaps or if there are additional opportunities needed for full development.

**ROI Tool**

The ROI Forecasting tool includes common manufacturing metrics related to production, quality, and service that are impacted by employee training. The Pre-Training ROI Forecasting Model presents the methodology used to create our ROI Forecasting Tool.

**Rockwell Automation Certificate Programs**

Certificate programs offer professional recognition and help your employees develop and apply technical skills and knowledge to your plant systems to improve quality, efficiency, and productivity.

**Functional Safety (TÜV Rheinland) Certifications**

The standards regarding functional safety and relevant laws and directives demand that employees and organizations performing responsible tasks during all relevant life cycle phases of a machine must achieve and prove the required competencies. Rockwell Automation provides Functional Safety TUV Rheinland certifications with Engineer and Technician paths.

**Cisco Certifications**

OT and IT convergence is raising questions within manufacturing and industrial organizations of who will develop and oversee new and complex network infrastructures. Rockwell Automation, in collaboration with Strategic Alliance partner Cisco®, now offers Industrial Networking Specialist and Cisco Certified Network Associate (CCNA) Industrial training and certification.

The Managing Industrial Networks with Cisco Networking Technologies (IMINS) and Managing Industrial Networks for Manufacturing with Cisco Technologies (IMINS2) classes are designed for IT and operations technology professionals who are responsible for the implementation, administration and support of networked industrial infrastructure.

Learn More about The Connected Enterprise and our popular Industrial Internet of Things Curriculum.

For more information on any of these offerings, contact your local Allen-Bradley Distributor or Rockwell Automation Sales Office.

# The Connected Enterprise

## The Connected Enterprise Puts the Industrial Internet of Things to Work for You

Information is power. Helping customers harness it to bring our Connected Enterprise vision to life has been a priority for decades.

Accelerated by the emergence of the Industrial Internet of Things and advances in enabling technologies – including data analytics, remote monitoring and mobility – The Connected Enterprise opens new worlds of opportunity through greater connectivity and information sharing.

Guided by our industrial expertise and complemented by government and industry initiatives, including the Smart Manufacturing Leadership Coalition, Industry 4.0 and Smart Factories, it drives better decision making, exposes inefficiencies and sparks collaboration.

The Connected Enterprise helps operations managers profitably manage and improve manufacturing and industrial processes. It helps IT executives reduce network complexities and exposure to information security risks. It shares productivity-improving information to workers across the organization in a context that is meaningful for each role.

The information-enabled Connected Enterprise is a more competitive enterprise. It creates tremendous opportunities for those taking advantage and great risks for those not preparing a strategic response. Explore how Rockwell Automation is evolving its own global operations and helping its customers harness the Industrial Internet of Things by leveraging real-time decision making to drive profitability.

**Learn More about The Connected Enterprise**

**Learn More about the Industrial Internet of Things Curriculum**

# Industrial Internet of Things Curriculum

## Increasing Demand for Network Convergence Skills

As organizations recognize the value of converging the industrial plant floor with their IT infrastructure, the gap in the skills that are required to manage such a convergence is becoming apparent. Before organizations can realize the significant benefits to be achieved in quality, safety, timeliness and customer satisfaction, their Information Technology (IT) and Operational Technology (OT) professionals need to understand the significant complexities of the converged environment.

Together Rockwell Automation and Cisco have developed a training and certificate portfolio that is optimized for each side of the equation, IT and OT, providing the skills that are required to securely converge the network architecture with maximum efficiency and return on investment, enabling organizations to transform their business and gain a competitive edge. The Industrial Networking Certification program provides practical, relevant and job-ready certification curricula that are aligned closely with the specific tasks expected of these in demand professionals. We provide a roadmap of training and certificates that complement, enable and increase your skills as your career progresses.

For more information on courses, see the Industrial Internet of Things Training Guide listed in the Training Guides section.

Rockwell Automation

# The Right Training Makes All the Difference

TOP 20
Rockwell Automation Courses

| | Course Number | Course Title |
|---|---|---|
| 1 | CCP299 | Studio 5000™ Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting |
| 2 | CCP146 | Studio 5000™ Logix Designer Level 1: ControlLogix System Fundamentals |
| 3 | CCP151 | Studio 5000™ Logix Designer Level 2: Basic Ladder Logic Programming |
| 4 | CCP143 | Studio 5000™ Logix Designer Level 3: Project Development |
| 5 | CCV204-A | FactoryTalk® View ME and PanelView™ Plus Programming |
| 6 | CCP153 | Studio 5000™ Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting |
| 7 | CCA183 | PowerFlex® 750-Series Maintenance and Troubleshooting |
| 8 | CCV207 | FactoryTalk® View SE Programming |
| 9 | CCA182 | PowerFlex® 750-Series Configuration and Startup |
| 10 | SAF-SFT10618 | NFPA 70E® 2018 – Electrical Safety and Arc Flash Awareness |
| 11 | CCN130 | Motion Control Fundamentals |
| 12 | IMINS | Managing Industrial Networks with Cisco Networking Technologies |
| 13 | CCPS43 | SLC™ 500 and RSLogix™ 500 Maintenance and Troubleshooting |
| 14 | SAF-SFT11218 | NFPA 70E® 2018 – Electrical Safety and Arc Flash Compliance |
| 15 | CCCL21 | Studio 5000™ Logix Designer Level 3: Basic Ladder Logic Interpretation |
| 16 | SAF-LOG101 | GuardLogix® Application Development |
| 17 | SAF-TUV0T | Functional Safety for Machinery Technician Certification (TÜV Rheinland) |
| 18 | CCP152 | Studio 5000™ Logix Designer Level 4: Function Block Programming |
| 19 | CCN144 | Studio 5000™ Logix Designer Level 4: Kinetix 6500 (CIP) Programming |
| 20 | FTVP | FactoryTalk® VantagePoint Configuration and Reporting |

# Training Details

- Training Schedules and Pricing
  Refer to the Training Services website for current schedules and course tuition.
  www.rockwellautomation.com/go/training
- Enrollment Policy
  Rockwell Automation Training Services class registration will close exactly seven (7) calendar days prior to the class start time and date. No exceptions will be granted.
- Cancellation Policy
  If registration in a Rockwell Automation Training Services course is cancelled more than 14 days before the scheduled start of the event, 100% of the tuition will be refunded. If cancelled 14 days or less before the scheduled start of the event, 50% of the full tuition amount will be billed for standard enrollments. If a student fails to appear for a scheduled course, full tuition will be charged.Rockwell Automation strongly suggests that students only make refundable travel and lodging arrangements. Rockwell Automation reserves the right to alter course schedules, content, limit class size, reschedule, discontinue, or cancel courses.
- IACET Continuing Education Units (CEUs)
  Rockwell Automation Training Services is accredited by the International Association for Continuing Education and Training (IACET). Rockwell Automation Training Services complies with the ANSI/IACET Standard, which is recognized internationally as a standard of excellence in instructional practices. As a result of this accreditation, Rockwell Automation Training Services is authorized to issue the IACET CEU. As an IACET Accredited Provider, Rockwell Automation Training Services offers CEUs for its programs that qualify under the ANSI/IACET Standard. To verify our IACET accreditation, go to www.iacet.org/ap/108685.

  Rockwell Automation awards IACET Continuing Education Units (CEUs) for attendance in its courses. It demonstrates our commitment to quality standards and practices. IACET CEUs are only offered for courses delivered in the United States and Canada. Refer to the course description, which can be found in the training catalog or training schedule: www.rockwellautomation.com/go/training
- Terms and Conditions
  Printed materials provided in Rockwell Automation training courses are copyrighted and may not be reproduced. No audio or visual recording of Rockwell Automation training courses, or Rockwell Automation personnel teaching such courses, may be taken or reproduced electronically.

*Scan this code to access the Training Services website and online enrollment*

## Rockwell Automation Training Offices

Rockwell Automation training is conducted in several cities across the United States and in Canada. Call 440-646-3434 (option 7) to be routed to the nearest Rockwell Automation Enrollment Specialist in one of these locations:

| United States | | Canada |
|---|---|---|
| Atlanta | Little Rock | Brampton |
| Boston | Los Angeles | Calgary |
| Charlotte | Milwaukee | Cambridge |
| Chicago | Minneapolis | Dartmouth |
| Cincinnati | Nashville | Edmonton |
| Cleveland | New York City | Montreal |
| Dallas | Philadelphia | Vancouver |
| Davenport | Richmond | |
| Denver | Rochester | |
| Detroit | San Francisco | |
| Houston | Seattle | |
| Indianapolis | St. Louis | |
| Kalamazoo | Tampa | |

Phone: Call your local Allen-Bradley distributor or 440-646-3434 (option 7)

Web: www.rockwellautomation.com/go/training

Email: Send your questions to trainingservices@ra.rockwell.com

# Training Guide Details

Training Guides show a recommended path based on your job responsibilities within a technology area. For example, the courses in the maintenance section are designed for and instruct students on maintenance-related responsibilities.

1. Locate the start icon 

. This is the beginning of the "Understand" section. Courses with a "START" icon are required prerequisites. If there is no start icon, identify the recommended courses in the "Understand" section. Courses in the "Understand" section apply to all students and provide the prerequisite knowledge required to successfully complete courses in both the "Maintain or Troubleshoot" and "Program or Design" sections. It is highly recommended you complete the courses in the "Understand" track before progressing to the other tracks in the guide.
2. Select the course that best fits your job responsibilities in either the "Maintain or Troubleshoot" and "Program or Design." Note that some Training Guides offer additional sections and courses related to "Safety Standards," "Integrate or Design section," and "Application-Specific Courses." Courses with an arrow represent a progression in the content covered. Be sure to consult the course descriptions because some courses may require additional prerequisites.
   Note: When presented with a choice of two courses, select the most appropriate one by reviewing the course description.
3. Review related products that are available for prerequisite, refresher, or supplemental courses in the "e-LEARNING" section of the Training Guide. e-Learning options include computer-based training, mobile app, and iBooks.
4. Use the legend in each map to identify and locate additional information.


Course is taught virtually with a live-instructor. Refer to the Virtual Classroom section of the catalog for more information.


Core Requirement for Certificate Program for the specific technology. Refer to the Certificate Program section of the catalog for more information.

Optional exam can be completed to receive certification.

Course is delivered on-site at the customer's facility.


Combination Understand and Maintain or Troubleshoot Level Course.


Combination Program or Design and Maintain or Troubleshoot Level Course.


Hardware is included with the purchase of the course.


Offered as Open Enrollment Course in US


Offered as Open Enrollment Course in Canada

# Training Guides Menu

Please click on any of the Training Guides listed to view more information.



Note: Consult course description for prerequisites.

# ControlLogix/Studio 5000 Logix Designer Training Guide

Rockwell Automation

## UNDERSTAND

Introduction to the Integrated Architecture System
CIA101 • 2 Days

START

Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals
CCP146 • 2 Days

Ladder Logic Basics with CompactLogix Hardware
VC-LLB-B • (5) 120-Min. Sessions

Ladder Logic Basics without CompactLogix Hardware
VC-LLBWO-A (5) 120-Min. Sessions

## PROGRAM OR DESIGN

SI: Logix 5000 Project Development and Basic Ladder Logic Programming
SI100 • 4 Days

Application Code Manager and Library Object Development
CCP157 • 3 Days
Private Delivery Only

Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming
CCN144 • 4 Days

Accelerated Logix5000 Maintainer Certificate Level 1
CCP300 • 5 Days

Advanced Logix5000 Programmer Certificate
CCP251 • 4 Days

PowerFlex 750-Series Configuration for an Integrated Architecture System
CCA184 • 1 Day
Private Delivery Only

Studio 5000 Logix Designer Level 4: Structured Text/ Sequential Function Chart Programming
CCP154 • 2 Days
Private Delivery Only

Studio 5000 Logix Designer Level 4: Function Block Programming
CCP152 • 2 Days

POINT I/O Implementation
VC-PIO-A • 120-Min. Session

Machine-Level Design Optimization:
VC-MLDO-A • (2) 120-Min. Sessions

Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming
CCP151 • 2 Days

Studio 5000 Logix Designer Level 3: Project Development
CCP143 • 4 Days

Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming
CCN145 • 4

Studio 5000 Logix Designer Level 5: Advanced Motion Programming
CCN190-LD • 2 Days

Accelerated Logix5000 Programmer Certificate Level 1
CCP250 • 5 Days

## MAINTAIN OR TROUBLESHOOT

Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting
CCP153 • 4 Days

Studio 5000 Logix Designer Level 3: Basic Ladder Logic Interpretation
CCCL21 • 2 Days

Kinetix 6000 Troubleshooting and Project Interpretation
CCN200 • 2 Days

Kinetix 6500 Troubleshooting and Project Interpretation
CCN201 • 3 Days

Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting
CCP299 • 4.5 Days
Combination of CCP146 and CCP153 Courses

Studio 5000 Logix Designer Level 1: CompactLogix Fundamentals and Troubleshooting
CCP298 • 4.5 Days
Combination of CCP146 and CCP153 Courses

OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000 and PowerFlex 40 Fundamentals and Troubleshooting
OEM100 • 5 Days

## e-LEARNING

ControlLogix Fundamentals
RSTrainer Computer-Based Training

RSLogix 5000 Software-Online Monitoring
RSTrainer Computer-Based Training

RSLogix 5000 Software-Motion
RSTrainer Computer-Based Training

RSLogix 5000 Software-Offline Programming
RSTrainer Computer-Based Training

Introduction to Automation iBook Available on iTunes

RSLogix 5000 Software-Project Configuration
RSTrainer Computer-Based Training

RSLogix 5000 Software-Bundle
Online Monitoring
Offline Programming
Project Configuration

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# PowerFlex 750-SeriesConfiguration For an Integrated Architecture System

(Private Delivery Only)

## CCA184

1 Day CEUs 0.7

**Course Purpose**

Upon completion of this course, given a PowerFlex 750-Series drive (PowerFlex 753 or PowerFlex 755) that has been successfully started up, students will be able to integrate their drive into a system that includes Logix5000 controllers and PanelView™ Plus terminals running FactoryTalk View ME software. Throughout the course, students will have the chance to use a variety of hardware and software tools, including the A6 LCD HIM, Logix Designer software, and FactoryTalk® View ME software. After each demonstration, students will be given exercises that offer extensive hands-on practice using a PowerFlex 753 or PowerFlex 755 drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Add a PowerFlex 750-Series drive to a Logix Designer project
- Locate and modify PowerFlex 750-Series data using Logix Designer software
- Integrate a PowerFlex 750-Series drive with a Logix5000 controller
- Add PowerFlex 750-Series faceplates to a FactoryTalk View ME application
- Operate a PowerFlex 750-Series drive in an Integrated Architecture system

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Individuals who need to add PowerFlex 750-Series drives to an Integrated Architecture system

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and knowledge of electrical/industrial safety (including PPE requirements and safe practices)
- Completion of the PowerFlex 750-Series Startup & Configuration course (CCA182)
- Knowledge of Logix5000 system fundamentals and basic programming skills through one or more of the following methods:
  - Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146)
  - Logix 5000 software computer-based training
  - Equivalent experience programming Logix5000 control systems
- Previous experience with FactoryTalk View ME software is suggested, but not required

# Studio 5000 Logix Designer Level 3: Basic Ladder Logic Interpretation

**CCCL21**

2 Days | CEUs 1.4

**Course Purpose**

This course is a skill-building course that provides maintainers with a more detailed understanding of Studio 5000 Logix Designer ladder logic instructions and terminology. It also provides the resources and hands-on practice required to interpret ladder logic instructions for any Logix5000 controller. Students will have the opportunity to use the Logix Designer application to perform basic software tasks to meet the requirements of a given functional specification. In addition to using ladder logic, students will be introduced to ladder logic techniques, established standards, and common rules for interpretating ladder logic.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Review basic ladder logic
- Document and search ladder logic
- Interpret timer and counter instructions
- Interpret program control instructions
- Interpret compare instructions
- Interpret move instructions
- Interpret math instructions
- Interpret expression handling instructions
- Interpret copy and file fill instructions

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Top 20

Maintainers who need to interpret ladder logic using the Logix Designer application

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience
- Completion of the Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting course (CCP153) or equivalent experience

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCP151.*

# Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming

## CCN144

4 Days | CEUs 2.8

**Course Purpose**

After completing this course, students should be able to configure, test, tune, and program CIP motion axes in the Studio 5000 Logix Designer programming environment. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development course (CCP143), students will learn how to apply the Logix5000 architecture to a multi-axis CIP motion control system. Students will practice project planning and efficient programming skills necessary for translating a machine specification into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, students will be able to apply the configuring and programming motion control skills they learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project for a CIP motion application
- Add drives and configure CIP motion axes
- Test CIP motion hardware
- Autotune CIP motion axes
- Plan a motion project
- Create user-defined data types, axis-level program shell, and axis-level tags
- Program the:
  - Axis-level dispatch and power up routines
  - Axis-level command routine
  - Axis-level waiting routine
  - Aborting, clearing, stopping, resetting, and starting routine
- Replicate the axis program
- Replicate an application-level program and the execute routines
- Add a virtual axis
- Program electronic gearing and camming

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |


## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent knowledge of general motion control, drives, feedback devices, and servo motion systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience

# Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming

## CCN145

4 Days CEUs 2.8

**Course Purpose**

After completing this course, students should be able to configure, test, tune, and program SERCOS motion axes in the Studio 5000 Logix Designer programming environment. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development course (CCP143), students will learn how to apply the Logix5000 architecture to a multi-axis SERCOS motion control system. Students will also practice project planning and efficient programming skills necessary for translating a machine specification into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, students will be able to apply the configuring and programming motion control skills they learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project for a SERCOS motion application
- Add drives and configure SERCOS axes
- Test SERCOS hardware
- Autotune SERCOS axes
- Plan a motion project
- Create user-defined data types, an axis-level program shell, and axis-level tags
- Program the:
  - Axis-level dispatch and power up routines
  - Axis-level command routine
  - Axis-level waiting routine
  - Aborting, clearing, stopping, resetting, and starting routine
- Replicate the axis program
- Replicate an application-level program and the execute routines
- Add a virtual axis
- Program electronic gearing and camming
- Replicate the axis program and application-level program
- Add a virtual axis

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent knowledge of general motion control, drives, feedback devices, and servo motion systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience

# Studio 5000 Logix Designer Level 5: Advanced Motion Programming

## CCN190-LD

2 Days

**Course Purpose**

This course is intended to provide students with the skills to configure and program Logix5000 applications specifically for integrated motion control functionality using ladder logic including SERCOS motion control technology. Students will learn how to apply advanced programming skills including tuning with motion analyzer software, advanced camming techniques, coordinated motion, and add-on instructions for motion applications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Tune a servo axis with motion analyzer software
- Program event driven tasks
- Program output cam instructions
- Calculate a cam profile
- Program coordinate and motion add-on instructions
- Develop a motion control project using the power programming state model
- Program coordinated move transform instructions in a pick and place application

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience with basic ladder logic programming
- Completion of the Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming course (CCN145) or equivalent experience

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |

# Kinetix 6000 Troubleshooting and Project Interpretation

## CCN200

2 Days CEUs 1.4

**Course Purpose**

This course provides students with skills required to diagnose common problems on a Kinetix 6000 system. Students will practice operating and troubleshooting the system through hands-on exercises using the Studio 5000 Logix Designer application. Students will learn how to maintain and troubleshoot a multi-axis motion control system. Students will practice identifying faults related to hardware and software by employing methods such as fault code tables, system LEDs, and other status indicators. Upon completion of this course, students will be able to apply maintenance and troubleshooting techniques to diagnose and correct common problems on a Kinetix 6000 system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate Kinetix 6000 system components
- Check Kinetix 6000 connections
- Interpret Kinetix 6000 indicators
- Analyze fault codes in a Kinetix 6000 system
- Interpret motion state and move instructions in a Logix Designer project
- Test and tune axes in a Logix Designer project
- Replace a Kinetix 6000 drive

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide ABT-1756-TSJ52

## Who Should Attend?

Individuals who need to maintain and troubleshoot Kinetix 6000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience with the ControlLogix platform and basic ladder logic

# Kinetix 6500 Troubleshooting and Project Interpretation

## CCN201

3 Days CEUs 2.1

**Course Purpose**

This course is intended to provide students with the skills required to diagnose common problems on a Kinetix 6500 servo drive system. During class, students will practice operating and troubleshooting the system through hands-on exercises using the Studio 5000 Logix Designer application. Building upon the skills developed in the Fundamentals of Motion Control course (CCN130), students will learn how to maintain and troubleshoot a multi-axis motion control system. Students will practice identifying faults related to hardware, software, and motion networks by leveraging tools such as web pages, system LEDs, and Logix Designer status indicators. Upon completion of this course, students will be able to apply maintenance and troubleshooting techniques to diagnose and correct common problems on a Kinetix 6500 servo drive system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the physical components and wiring of a Kinetix 6500 servo drive
- Interpret Kinetix 6500 servo drive status indicators
- Using the Studio 5000 Logix Designer application:
  - Determine the status of a drive and its associated axis
  - Test wiring and signals for a Kinetix 6500 servo drive axis
  - Trend status information for a Kinetix 6500 servo drive axis
  - Tune a Kinetix 6500 servo drive axis
- In a Studio 5000 Logix Designer project:
  - Verify a Kinetix 6500 servo drive and drive axis configuration
  - Interpret motion state instructions for a Kinetix 6500 servo drive axis
  - Interpret motion move instructions for a Kinetix 6500 servo drive axis
  - Troubleshoot ladder logic for a Kinetix 6500 servo drive axis
- Troubleshoot failed communications for a Kinetix 6500 servo drive control module
- Access a Kinetix 6500 servo drive web page
- Remove and replace a Kinetix 6500 servo drive

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to maintain and troubleshoot Kinetix 6500 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience with the ControlLogix platform and basic ladder logic

# Studio 5000 Logix Designer Level 3: Project Development

## CCP143

4 Days CEUs 2.8

**Course Purpose**

Given a functional specification for a Logix5000 application, students will be able to develop a project during the course to meet the specification requirements. This course covers tasks common to all controllers that use the Logix5000 control engine or operating system, including ControlLogix, CompactLogix, and SoftLogix™ controllers. This course presents a deeper understanding of project development tasks, such as organizing tasks and routines, organizing controller data, configuring modules, and sharing data. Students will use Producer/Consumer technology to multicast input and output devices, share data between controllers, and control remote I/O.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create and organize a project
- Create periodic and event tasks
- Develop an add-on instruction in ladder diagram
- Organize arrays
- Create a user-defined data type
- Import components
- Enter, edit, and verify ladder logic
- Configure a controller to produce and consume data
- Configure controllers to share data over EtherNet/IP™
- Communicate with a local 1756-I/O module and over an EtherNet/IP network
- Configure a message
- Allocate connections
- Retrieve and set controller status values with GSV/SSV instructions
- Program a BTD instruction
- Handle a major fault
- Manage project files
- Update firmware

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50


## Who Should Attend?

Individuals who need to develop Studio 5000 Logix Designer® projects for any Logix5000 controller

## Prerequisites

- Ability to perform basic Microsoft Windows tasks
- Knowledge of common controller terms and operation through experience or one of the following courses:
  - Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course No. CCP146)
  - RSTrainer for ControlLogix Fundamentals computer-based training (9393-RSTCLX)
- Ability to write basic ladder logic with common instructions, such as bit, timer, counter, move, and comparison instructions through experience or this course:
  - Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming (Course No. CCP151)

# Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals

## CCP146

2 Days | CEUs 1.4

**Course Purpose**

This course will assist students in developing and building a solid foundation with a fundamental knowledge of Logix5000 systems. Students will be introduced to Logix5000 system components and functionality and will have an opportunity to use Studio 5000 Logix Designer application to perform basic system configuration tasks.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understand ControlLogix system components
- Select and connect to industrial networks in a Logix5000 system
- Download and go online to a Logix5000 controller
- Operate the Logix Designer application
- Configure local 1756-I/O modules
- Create tags and monitor data in a Logix Designer project
- Draft basic ladder logic for a Logix Designer routine
- Select basic ladder logic instructions for a Logix Designer routine
- Enter ladder logic components in a Logix Designer routine
- Locate ControlLogix system components, I/O Tags, and devices in a Logix5000 system

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

Top 20

### Who Should Attend?

Individuals who have little or no working experience with Logix5000 systems or other programmable controllers

### Prerequisites

- Experience operating a computer within a Microsoft Windows environment

*This course is intended for maintainers or programmers. Some topics may be similar to topics covered in course CCP299.*

# Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming

## CCP151

2 Days CEUs 1.4

**Course Purpose**

This is a skill-building course that provides programmers with the resources and hands-on practice required to program basic ladder logic instructions for a Logix5000 controller. Students will use the Logix Designer Application to perform basic software tasks to meet the requirements of a given functional specification. In addition, students will set up a sequencer to run equipment through a predefined procedure and separate production procedure from equipment control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Start and test a ladder diagram
- Program timer and counter instructions
- Program compare, move, and math instructions
- Document and search and handle expressions
- Program and separate the procedure from equipment control
- Copy and fill an array

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Top 20

Individuals who:

- Have little controller experience
- Are responsible for programming Logix5000 controllers using the Logix Designer Application
- Need to learn how to draft ladder logic for any application

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience

# Studio 5000 Logix Designer Level 4: Function Block Programming

## CCP152

2 Days CEUs 1.4

**Course Purpose**

This course provides students with an understanding of Logix Designer function block diagrams and terminology. Resources and hands-on practice are provided to program a Logix5000 controller using function block diagrams. Students will perform parameter modifications to individual function block instructions and create and develop function block diagram programs and routines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a function block diagram
- Program logical function block instructions
- Program timer and counter function block instructions
- Program analog function block instructions
- Program device driver function block instructions
- Select timing modes in a function block instruction
- Program a totalizer function block instruction
- Program and monitor an RMPS (ramp/soak) function block instruction
- Control program flow using function block instructions
- Program a PID loop using a function block diagram
- Tune a PID loop using ActiveX controls
- Develop an add-on instruction in function block diagram

**Job Aid Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

Top 20

## Who Should Attend?

Individuals who:

- Are responsible for developing, debugging, and programming Logix5000 controllers using Logix Designer application with function block diagrams
- Use ActiveX controls in an operator interface such as FactoryTalk View ME software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Understanding of basic measurement and control theory, including basic loop control
- Completion of the Studio 5000 Logix Designer Level 3: Project Developing course (CCP143) or equivalent experience

# Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting

## CCP153

4 Days | CEUs 1.4

**Course Purpose**

This course provides students with the necessary resources and hands-on practice to efficiently troubleshoot a previously operational ControlLogix system and restore normal operation. This course adds to students' skill sets by introducing new tasks, such as connecting to a network, interpreting project execution, and editing ladder logic online. After practicing such skills, students will be presented with a systematic strategy for diagnosing and troubleshooting a variety of system errors, such as controller, I/O, and other hardware problems, noise-related problems, and software configuration problems.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- *Optional*: Locate ControlLogix system components
- Interpret project organization and execution, frequently used instructions, arrays, and tags of user-defined data types
- Locate and edit tag values
- Force I/O and toggle bits
- Troubleshoot digital, analog, and remote I/O
- Update Logix5000 firmware
- Troubleshoot controller, power supply, noise related, and digital I/O module problems
- Analyze and troubleshoot a system using trend chart
- Edit ladder logic online
- *Optional:* Edit FDB's online
- Document, print, and search project components

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |


## Who Should Attend?

Individuals who need to maintain and troubleshoot a ControlLogix or other Logix 5000 system

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience
- Knowledge of basic ladder logic instructions

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCP299.*

# Studio 5000 Logix Designer Level 4: Structured Text/Sequential Function Chart Programming

(Private Delivery Only)

CCP154

2 Days CEUs 1.4

**Course Purpose**

This course provides students with the skills and knowledge to program using the structured text and sequential function chart programming languages. Students will learn how to select instructions, expressions, and constructs, and then enter these elements and more into a routine. Students will also learn how to test sequential function chart logic using forces and step throughs.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Program assignments, expressions, and instructions in structured text
- Program constructs and comments in structured text
- Design a sequential function chart
- Program and test a sequential function chart
- Store, pause, and reset sequential function chart data

**Job Aid Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Individuals who need to program structured text and sequential function chart routines in Logix Designer projects for any Logix5000 controller

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or experience with basic Logix Designer projects (navigating the software, creating tags, creating routines, etc.)

# Application Code Manager and Library Object Development

(Private Delivery Only)

## CCP157

3 Days CEUs 2.1

**Course Purpose**

Project engineers and programmers who need to use existing code libraries, rapidly deploy applications, and improve engineering quality and efficiency by automatically generating Studio 5000 solutions with tested standards. Project librarians and programmers who need to be able to create new standardized code libraries and manage/edit existing code libraries for use in the Application Code Manager.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and register pre-configured Application Code Manager (ACM) library objects
- Create and decorate Studio 5000 Library Objects
- Create Application Code Manager (ACM) Library Objects from Studio 5000 Library Objects
- Add FactoryTalk® Alarms and Events, FactoryTalk® View and Historian SE content to the Library Object

## Who Should Attend?

Individuals who need to program structured text and sequential function chart routines in Logix Designer projects for any Logix5000 controller

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (Course No. CCP143), or experience creating Studio 5000 Logix Designer® content
- Completion of the Studio 5000 Logix Designer Level 4: Function Block Programming (CCP152) or function block experience

# Studio 5000 Logix Designer Level 1: CompactLogix Fundamentals and Troubleshooting

**CCP298**

4.5 Days | CEUs 3.2

**Course Purpose**

Upon completion of this course, students should be able to troubleshoot a previously operational CompactLogix™ system and restore normal operation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate CompactLogix system components
- Navigate through the Logix Designer application
- Connect a computer to a communications network
- Download and go online
- Locate I/O tags and devices
- Interpret Logix Designer project organization and execution
- Interpret ladder logic structure
- Locate and edit tag values
- Interpret bit and frequently used instructions
- Interpret arrays
- Interpret tags of user defined data types
- Search for project components
- Force I/O and toggle bits
- Troubleshoot digital I/O, analog I/O, banked local I/O, distributed I/O, controller, power supply, and noise related problems
- Update Logix5000 firmware
- Analyze and troubleshoot a system using a trend chart
- Edit ladder logic online
- Manage Logix Designer project files
- Document and print components

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Individuals who need to maintain and troubleshoot a CompactLogix system – but have no or little current working experience with CompactLogix systems.

## Prerequisites

- Ability to perform basic Microsoft Windows® tasks
- Previous experience with common industrial control system concepts

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCP146, CCP153, and CCP299.*

# Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting

**CCP299**

4.5 Days | CEUs 3.2

**Course Purpose**

Upon completion of this course, students should be able to troubleshoot a previously operational ControlLogix system and restore normal operation. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology, practicing a systematic strategy for diagnosing and troubleshooting problems, and performing hands-on exercises.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate CompactLogix system components
- Navigate through the Logix Designer application
- Connect a computer to a communications network
- Download and go online
- Locate I/O tags and devices
- Interpret Logix Designer project organization and execution
- Interpret ladder logic structure
- Locate and edit tag values
- Interpret bit and frequently used instructions
- Interpret arrays
- Interpret tags of user defined data types
- Search for project components
- Force I/O and toggle bits
- Troubleshoot digital I/O, analog I/O, remote I/O, controller, power supply, and noise related problems
- Update Logix5000 firmware
- Analyze and troubleshoot a system using a trend chart
- Edit ladder logic online
- Manage Logix Designer project files
- Document and print components

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

Top 20

## Who Should Attend?

This course is intended for individuals who need to maintain and troubleshoot a ControlLogix system – but have no current working experience with ControlLogix systems.

## Prerequisites

- Ability to perform basic Microsoft Windows® tasks
- Knowledge of basic ladder logic instructions (bit, timer, counter, etc.) through previous training and/or personal experience

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCP146, CCP153, and CCP298.*

# Introduction to the Integrated Architecture™ System

(Private Delivery Only)

CIA101

2 Days CEUs 1.4

**Course Purpose**

This course will assist students in developing and building a solid foundation of Integrated Architecture and automation system knowledge. Students will learn about and interact with a variety of automation hardware. They will also have an opportunity to use Rockwell Automation software to perform basic system configuration tasks. While performing these tasks, students will gain an understanding of how controllers, drives, motors, networks, and human-machine interface (HMI) products function together within Integrated Architecture.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify components of the integrated architecture system
- Establish communications in an integrated system
- Program a basic Logix Designer project for an integrated system
- Program with tag-based addressing in an integrated system
- Identify programming languages in an integrated system
- Understand Logix5000 multi-discipline control
- Understand NetLinx-enabled networks
- Understand the visualization development environment of an integrated system
- Understand HMI direct tag referencing in an integrated system

## Who Should Attend?

Individuals who:

- Have little or no working experience with automation systems
- Are interested in gaining a broad understanding of automation and the Integrated Architecture System

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

# OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000, and PowerFlex 40 Fundamentals and Troubleshooting

## OEM100

5 Days CEUs 3.5

**Course Purpose**

This course provides students with the skills necessary to maintain and troubleshoot: Studio 5000 applications that operate on a ControlLogix-based machine; FactoryTalk View Machine Edition (ME) applications that run on PanelView Plus terminals; Kinetix 6000 motion systems; and PowerFlex 40 drives. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology used with: ControlLogix hardware, PanelView Plus terminal, Kinetix 6000 systems, and PowerFlex 40 drives; Studio 5000 Logix Designer application; and FactoryTalk View ME application. Students will also learn to diagnose and troubleshoot problems with controller, I/O or other hardware issues.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Connect a computer to a network
- Configure EtherNet/IP addresses
- Download and go online
- Update firmware
- Locate I/O tags and devices
- Locate and edit tag values
- Create and modify projects
- Draft basic ladder logic
- Select ladder logic instructions
- Edit ladder logic online
- Program timer, counter, math, compare, and move instructions
- Search for project components
- Force I/O and toggle bits
- Configure produced/consumed data
- Tune a PID loop
- Manage project files
- Configure a trend chart
- Test a ladder diagram
- Troubleshoot digital and analog I/O modules
- Modify application communications
- Download runtime files
- Configure display security, graphic displays, and interactive controls
- Troubleshoot workstation problems
- Interpret motion instructions and indicators
- Modify drive parameters

## Who Should Attend?

OEMs who need to maintain and troubleshoot a ControlLogix-based machine, but have little to no working experience with ControlLogix systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Perform basic voltage and current checks
- Read wiring diagrams

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide | ABT-2711P-TSJ50 |
| EtherNet/IP™ Procedures Guide | ABT-N300-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

# SI: Logix 5000 Project Development and Basic Ladder Logic Programming

## SI100

4 Days | CEUs 2.8

**Course Purpose**

This course is a skill-building course that provides students with the resources and hands-on practice required to develop a project and program basic ladder logic instructions for any Logix5000 controller. Students will have an opportunity to use the Studio 5000 Logix Designer application to perform basic software tasks to meet the requirements of a given functional specification. In addition, students will be introduced to basic Logix5000 concepts and terminology.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate control system components
- Create and modify a project
- Organize project and arrays
- Connect a computer to a communication network
- Download and go online
- Communicate with local and remote I/O modules
- Update Logix5000 firmware
- Start a ladder diagram
- Create tags and monitor data
- Enter ladder logic components
- Create UDTs
- Select basic ladder logic instructions
- Program timer, counter, move, math, and compare instructions
- Document and search ladder logic
- Configure produce/consume messaging and message instructions
- Configure controllers to share data over an EtherNet/IP network
- Create a periodic and event task
- Develop an add-on instruction
- Test a ladder diagram
- Handle a major fault
- Import Logix Designer components
- *Optional:*
  - Understand control systems
  - Manage Logix Designer project files

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

System integrator programmers who have little or no working experience with Logix5000 controllers, and are responsible for programming Logix5000 controllers using the Studio 5000 Logix Designer application.

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Read wiring diagrams

*This course contains many of the lessons in courses CCP143, CCP146, and CCP151 in a consolidated format. Do not take all 4 courses.*

# Ladder Logic Basics With CompactLogix Starter Workstation

## VC-LLB-B

(5) 120-Min. Sessions

**Course Purpose**

This course will teach students how to write and test basic ladder logic code and how to employ common programming strategies and best practices. Students will learn how to select and program bit, timer, counter, compare, and move instructions. Examples and labs will use Studio 5000 Logix Designer and a CompactLogix controller; however, the general ladder logic concepts covered in this course are applicable to most common programmable controllers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Review basic logic flow
- Convert scenarios to if – then statements
- Convert if – then statements to simple rungs
- Enter ladder logic into software
- Download a project
- Monitor the ladder logic
- Tie the alias to an existing address
- Apply bit instructions and common ladder logic strategies
- Select a class of instruction categories
- Select and integrate timers and counters
- Select and integrate compare and move instructions
- Combine compare with move instructions

## Who Should Attend?

Beginning programmers or individuals who are required to edit ladder logic

## Prerequisites

A general knowledge of automation, including the general purpose of a controller, data, and I/O; and the purpose of common devices like push buttons, pilot lights, limit switches, relays, contractors, and solenoids is required

## Technical Requirements

- A computer and phone
- Studio 5000 Logix Designer (version 28) must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.
- CompactLogix starter workstation (shipped prior to class)

# Machine-Level Design Optimization: Drive and Motor Selection

## VC-MLDO-A

(2) 120 Min.

**Course Purpose**

This course covers best practices for architecting control solutions for machines. The instructor will show students how to size and select drives and motors and then they will practice these tasks with an example application. The design tools and best practices covered in the course aim to optimize and reduce build time with machine-level design.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure a motion profile, a mechanism, and transmissions
- Select a motor and drive

## Who Should Attend?

Control engineers and OEMs who design machine-level control applications

## Prerequisites

There are no prerequisites for this course; however, experience with designing machine-level control applications is helpful

## Technical Requirements

- A computer and phone
- Motion Analyzer software, version 6.1, must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.

# Point I/O Implementation

## VC-PIO-A

120 Min. CEUs 0.2

**Course Purpose**

This course will teach students how to implement a POINT I/O system from determining the quantity and type of I/O needed to testing your system. This course will also show students how to calculate power requirements and decide whether an expansion power supply will be needed. Students will also add and configure an Ethernet adapter and I/O modules in a Studio 5000 Logix Designer project.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Size a POINT I/O control system
- Set the EtherNet/IP address of an Ethernet adapter
- Configure POINT I/O control system components in a Studio 5000 Logix Designer project
- Test POINT I/O control system components

## Who Should Attend?

Control engineers who design and develop control applications and who will be working with POINT I/O system components over an EtherNet/IP™ network

## Prerequisites

- Studio 5000 Logix Designer experience or one of the following courses:
  - Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting (CCP299)
  - Studio 5000 Logix Designer Level 1: CompactLogix Fundamentals and Troubleshooting (CCP298)
- Knowledge of Ethernet fundamentals
- Knowledge of safe electrical practices
- Knowledge of electrical principles such as voltage, current, and power

## Technical Requirements

- A computer and phone
- The Studio 5000 Logix Designer application (version 21) must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.

# Ladder Logic Basics without CompactLogix Hardware VC-LLBWO-A

120 Min

**Course Purpose**

This course will teach you how to write and test basic ladder logic code and how to employ common programming strategies and best practices. You will also learn how to select and program bit, timer, counter, compare, and move instructions. Examples and labs will use the Studio 5000 Logix Designer® application and RSLogix™ Emulate 5000 simulation software. Note: There is no hardware provided for this course; however, the general ladder logic concepts covered in this course are applicable to most common programmable controllers and will be simulated using RSLogix Emulate 5000 simulation software.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Ladder Logic Basics: If-Then Statements
- Ladder Logic Basics: Ladder Logic Verification
- Ladder Logic Basics: Common Strategies and Best Practices
- Ladder Logic Basics: Timers and Counters
- Ladder Logic Basics: Compare and Move Instructions

| Characteristic | Minimum | Recommended |
|---|---|---|
| Processor | Pentium 4 | Intel Core i5 |
| Speed | 2.8 GHz | 2.8GHz |
| RAM Memmory | 2 GB | 8 GB |
| Hard Disk Space - Free | 16 GB | 20 GB |
| Graphic Device | DirectX 9, with WDDM 1.0 or higher drive | DirectX 9, with WDDM 1.0 or higher drive |

*Note: The Logix Designer application is currently not supported on Windows® 8 operating systems.*

## Who Should Attend?

Beginning programmers or individuals who are required to edit ladder logic should attend this course

## Prerequisites

- A general knowledge of automation, including the general purpose of a controller, data, and I/O; and the purpose of common devices like pushbuttons, pilot lights, limit switches, relays, contactors, and solenoids is required.

## Technical Requirements

- A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html
- RSLogix Emulate 5000 software, version 21.
- Studio 5000 Logix Designer software, version 21, must be installed and activated.
  - If you don't have the software, your virtual classroom invitation will provide details on how to obtain a temporary installation.

# Accelerated Logix5000 Programmer Certificate Level 1

## CCP250

5 Days | CEUs 3.5

**Course Purpose**

This accelerated course is for individuals who can quickly learn and apply Logix5000™ concepts, terminology, hardware, and the Studio 5000 Logix Designer® programming environment. You will quickly move from these early concepts to using producer/consumer technology and messages to multicast input and output devices, share data between controllers and control remote I/O.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project
- Program an application
- Add advance functionality to an application (data arrays, add-on instructions, produce/consume data and messages)

## Who Should Attend?

Individuals responsible for programming Logix5000 controllers using the Studio 5000 Logix Designer application. Also, those who need to learn how to draft ladder logic for any application.

## Prerequisites

- Completion of at least one Rockwell Automation Logix5000 course in the last two years (course completed on or after 3/31/2016)
- Pursuing a Logix5000 Certificate for Programmers

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide — ABT-1756-TSJ50

**Curriculum Note:**

*Along with new material and labs, this course contains lessons from courses CCP146, CCP151, and CCP143 – in an accelerated five-day format. Do not take all three courses in addition to this course. This course is bundled with the certificate assessment.*

# Advanced Logix5000 Programmer Certificate

# CCP251

4 Days CEUs 2.8

**Course Purpose**

This course is for individuals who can quickly learn and apply Logix 5000™ concepts, terminology, hardware, and the Studio 5000 Logix Designer® programming environment. You will learn about more advanced programming methods and instructions, project execution and optimization, controller project security and event logging, and tools available in the Studio 5000 Automation Engineering & Design Environment®.

**Objectives**

After completing this course, you should be able to perform advanced ControlLogix® and Studio 5000 Logix Designer® tasks, such as:

- Programming advanced instructions
- Optimizing tags/parameters, program execution, and controller performance
- Utilizing Studio 5000 Logix Designer tools
- Managing controller information and security

Additionally, you will be introduced to Integrated Architecture Builder® and Studio 5000 Architect® software.

## Who Should Attend?

Individuals responsible for programming Logix5000 controllers using the Studio 5000 Logix Designer application. Also, those who need to learn how to draft ladder logic for any application.

## Prerequisites

- Completion of either of the following courses:
  - Accelerated Logix 5000 Programmer Certificate Course Level 1 (Course Number CCP250)
  - Studio 5000 Logix Designer Level 3: Project Development
- Pursuit of a Logix 5000 Certificate for Programmers.

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

# Accelerated Logix5000 Maintainer Certificate Level 1

## CCP300

5 Days CEUs 3.5

**Course Purpose**

This accelerated course is for individuals who can quickly learn and apply Logix5000™ concepts, terminology, hardware troubleshooting skills, and interpretation of ladder logic in a Studio 5000 Logix Designer® project. This course prepares you for the Logix5000 Maintainer Certificate Course Level 1 certificate exam, which is included in the course price.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understanding Control Systems
- Locating Logix5000 System Components
- Connecting a Computer to a Communication Network
- Assigning IP Addresses for an EtherNet/IP Network using RSLinx Classic Software and Rotary Switches
- Navigating Through the Studio 5000 Logix Designer Application
- Downloading, Uploading, and Going Online
- Locating I/O Tags and Devices
- Interpreting, Monitoring, and Editing Tag Values
- Isolating Problems in a Logix5000 System
- Troubleshooting Electrical, Digital I/O Module, Analog I/O Module, Logix5000 System EtherNet/IP Network and Distributed I/O Module Problems
- Interpreting Simple Ladder Logic Structure
- Documenting and Searching Ladder Logic

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

This course is intended for individuals who need to maintain and troubleshoot a Logix5000 system and have current working experience with Logix5000 systems.

## Prerequisites

- Experience reading wiring diagrams
- Completion of at least one Rockwell Automation Logix5000 course in the last two years (course completed on or after 3/31/2016)
- Pursuing a Logix5000 Certificate for Maintainers

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

**Curriculum Note:**

*This course contains many of the lessons in courses CCP153, CCP299, and CCCL21 – in an accelerated five-day format. Do not take all three courses.*

# Motion Control Training Guide

Rockwell Automation

## UNDERSTAND

START

**Motion Control Fundamentals**
CCN130 • 2 Days

Private Delivery Only

**Introduction to the Integrated Architecture System**
CIA101 • 2 Days

## PROGRAM OR DESIGN

**Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming**
CCN144 • 4 Days

**Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming**
CCN145 • 4 Days

**Studio 5000 Logix Designer Level 5: Advanced Motion Programming**
CCN190-LD • 2 Days

**Implementing an EtherNet/IP Network of Motion and Standard Drive Axes Using Premiere Integration**
VC-CCN300-C • (3) 120-Min. Session

**Studio 5000 Logix Designer Level 4: Kinetix 5700 (CIP) Programming**
CCN144-A • 4 Days

**Advanced Logix5000 Programmer Certificate**
CCP251 • 4 Days

## MAINTAIN OR TROUBLESHOOT

**Kinetix 6000 Troubleshooting and Project Interpretation**
CCN200 • 1 Day

**OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000 and PowerFlex 40 Fundamentals and Troubleshooting**
OEM100 • 4 Days

**Kinetix 6500 Troubleshooting and Project Interpretation**
CCN201 • 3 Days

**Kinetix 5700 Troubleshooting and Project Interpretation**
CCN202 • 3 Days

## e-LEARNING

Introduction to Automation iBook Available on iTunes

**RSLogix 5000 Software-Motion**
**RSTrainer Computer-Based Training**

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# Implementing an EtherNet/IP Network of Motion and Standard Drive Axes Using Premiere Integration

## VC-CCN300-C

(3) 120 MIN CEUs 0.6

**Course Purpose**

This course will teach you how to choose an EtherNet/IP network topology and relevant components, configure controllers and axes, and add Kinetix® 6500 and PowerFlex® 755 drives for control over an EtherNet/IP network (also known as CIP™ motion). This course will also show you how to start up the network, run hookup tests, autotune axes, and test axes with motion direct commands.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Choose a network topology
- Choose network components
- Configure a network
- Add the motion group and axes
- Add drives
- Configure axes
- Start up an EtherNet/IP network
- Test hardware
- Autotune axes
- Test axis performance

## Who Should Attend?

Control engineers who design and develop motion control applications and who will be working with drives controlled over an EtherNet/IP network should attend this course.

## Prerequisites

Experience developing motion control applications and working in the Studio 5000® environment.

## Technology Requirements

A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html

# Motion Control Fundamentals

## CCN130

2 Days CEUs 1.4

**Course Purpose**

This course provides students with an overview of motion control concepts, terminology, functionality, and applications. In addition, students will learn how motion control applications function using the concepts and principles discussed in each lesson. This course allows students to establish the strong essential foundation needed to maintain and program motion control systems.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify:
  - Servo motion elements
  - Motion drive elements
  - Motor types and components
  - Feedback devices
- Trace the power supply circuit
- Create a motion profile
- Identify and apply a reference
- Trace signal flow through the drive control module
- Identify and scale loads

## Who Should Attend?

Top 20

Individuals who:

- Need to learn basic motion control concepts for their job
- Need a prerequisite for attending other motion control courses

## Prerequisites

Background in basic electricity, electronics, controllers operation, and computer concepts is helpful

**Job Aids Included**

| | |
|---|---|
| Motion Control Fundamentals Procedures Guide | ABT-M100-TSJ50 |

# Introduction to the Integrated Architecture™ System

(Private Delivery Only)

CIA101

2 Days CEUs 1.4

**Course Purpose**

This course will assist students in developing and building a solid foundation of Integrated Architecture and automation system knowledge. Students will learn about and interact with a variety of automation hardware. They will also have an opportunity to use Rockwell Automation software to perform basic system configuration tasks. While performing these tasks, students will gain an understanding of how controllers, drives, motors, networks, and human-machine interface (HMI) products function together within Integrated Architecture.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify components of the integrated architecture system
- Establish communications in an integrated system
- Program a basic Logix Designer project for an integrated system
- Program with tag-based addressing in an integrated system
- Identify programming languages in an integrated system
- Understand Logix5000 multi-discipline control
- Understand NetLinx-enabled networks
- Understand the visualization development environment of an integrated system
- Understand HMI direct tag referencing in an integrated system

## Who Should Attend?

Individuals who:

- Have little or no working experience with automation systems
- Are interested in gaining a broad understanding of automation and the Integrated Architecture System

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

# OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000, and PowerFlex 40 Fundamentals and Troubleshooting

## OEM100

5 Days CEUs 3.5

**Course Purpose**

This course provides students with the skills necessary to maintain and troubleshoot: Studio 5000 applications that operate on a ControlLogix-based machine; FactoryTalk View Machine Edition (ME) applications that run on PanelView Plus terminals; Kinetix 6000 motion systems; and PowerFlex 40 drives. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology used with: ControlLogix hardware, PanelView Plus terminal, Kinetix 6000 systems, and PowerFlex 40 drives; Studio 5000 Logix Designer application; and FactoryTalk View ME application. Students will also learn to diagnose and troubleshoot problems with controller, I/O or other hardware issues.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Connect a computer to a network
- Configure EtherNet/IP addresses
- Download and go online
- Update firmware
- Locate I/O tags and devices
- Locate and edit tag values
- Create and modify projects
- Draft basic ladder logic
- Select ladder logic instructions
- Edit ladder logic online
- Program timer, counter, math, compare, and move instructions
- Search for project components
- Force I/O and toggle bits
- Configure produced/consumed data
- Tune a PID loop
- Manage project files
- Configure a trend chart
- Test a ladder diagram
- Troubleshoot digital and analog I/O modules
- Modify application communications
- Download runtime files
- Configure display security, graphic displays, and interactive controls
- Troubleshoot workstation problems
- Interpret motion instructions and indicators
- Modify drive parameters

## Who Should Attend?

OEMs who need to maintain and troubleshoot a ControlLogix-based machine, but have little to no working experience with ControlLogix systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Perform basic voltage and current checks
- Read wiring diagrams

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide | ABT-2711P-TSJ50 |
| EtherNet/IP™ Procedures Guide | ABT-N300-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

# Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming

## CCN144

4 Days CEUs 2.8

**Course Purpose**

After completing this course, students should be able to configure, test, tune, and program CIP motion axes in the Studio 5000 Logix Designer programming environment. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development course (CCP143), students will learn how to apply the Logix5000 architecture to a multi-axis CIP motion control system. Students will practice project planning and efficient programming skills necessary for translating a machine specification into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, students will be able to apply the configuring and programming motion control skills they learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project for a CIP motion application
- Add drives and configure CIP motion axes
- Test CIP motion hardware
- Autotune CIP motion axes
- Plan a motion project
- Create user-defined data types, axis-level program shell, and axis-level tags
- Program the:
  - Axis-level dispatch and power up routines
  - Axis-level command routine
  - Axis-level waiting routine
  - Aborting, clearing, stopping, resetting, and starting routine
- Replicate the axis program
- Replicate an application-level program and the execute routines
- Add a virtual axis
- Program electronic gearing and camming

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent knowledge of general motion control, drives, feedback devices, and servo motion systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience

# Studio 5000 Logix Designer Level 5: Advanced Motion Programming

## CCN190-LD

2 Days

**Course Purpose**

This course is intended to provide students with the skills to configure and program Logix5000 applications specifically for integrated motion control functionality using ladder logic including SERCOS motion control technology. Students will learn how to apply advanced programming skills including tuning with motion analyzer software, advanced camming techniques, coordinated motion, and add-on instructions for motion applications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Tune a servo axis with motion analyzer software
- Program event driven tasks
- Program output cam instructions
- Calculate a cam profile
- Program coordinate and motion add-on instructions
- Develop a motion control project using the power programming state model
- Program coordinated move transform instructions in a pick and place application

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience with basic ladder logic programming
- Completion of the Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming course (CCN145) or equivalent experience

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |

# Kinetix 6500 Troubleshooting and Project Interpretation

## CCN201

3 Days CEUs 2.1

**Course Purpose**

This course is intended to provide students with the skills required to diagnose common problems on a Kinetix 6500 servo drive system. During class, students will practice operating and troubleshooting the system through hands-on exercises using the Studio 5000 Logix Designer application. Building upon the skills developed in the Fundamentals of Motion Control course (CCN130), students will learn how to maintain and troubleshoot a multi-axis motion control system. Students will practice identifying faults related to hardware, software, and motion networks by leveraging tools such as web pages, system LEDs, and Logix Designer status indicators. Upon completion of this course, students will be able to apply maintenance and troubleshooting techniques to diagnose and correct common problems on a Kinetix 6500 servo drive system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the physical components and wiring of a Kinetix 6500 servo drive
- Interpret Kinetix 6500 servo drive status indicators
- Using the Studio 5000 Logix Designer application:
  - Determine the status of a drive and its associated axis
  - Test wiring and signals for a Kinetix 6500 servo drive axis
  - Trend status information for a Kinetix 6500 servo drive axis
  - Tune a Kinetix 6500 servo drive axis
- In a Studio 5000 Logix Designer project:
  - Verify a Kinetix 6500 servo drive and drive axis configuration
  - Interpret motion state instructions for a Kinetix 6500 servo drive axis
  - Interpret motion move instructions for a Kinetix 6500 servo drive axis
  - Troubleshoot ladder logic for a Kinetix 6500 servo drive axis
- Troubleshoot failed communications for a Kinetix 6500 servo drive control module
- Access a Kinetix 6500 servo drive web page
- Remove and replace a Kinetix 6500 servo drive

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to maintain and troubleshoot Kinetix 6500 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience with the ControlLogix platform and basic ladder logic

# Kinetix 6000 Troubleshooting and Project Interpretation

## CCN200

2 Days CEUs 1.4

**Course Purpose**

This course provides students with skills required to diagnose common problems on a Kinetix 6000 system. Students will practice operating and troubleshooting the system through hands-on exercises using the Studio 5000 Logix Designer application. Students will learn how to maintain and troubleshoot a multi-axis motion control system. Students will practice identifying faults related to hardware and software by employing methods such as fault code tables, system LEDs, and other status indicators. Upon completion of this course, students will be able to apply maintenance and troubleshooting techniques to diagnose and correct common problems on a Kinetix 6000 system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate Kinetix 6000 system components
- Check Kinetix 6000 connections
- Interpret Kinetix 6000 indicators
- Analyze fault codes in a Kinetix 6000 system
- Interpret motion state and move instructions in a Logix Designer project
- Test and tune axes in a Logix Designer project
- Replace a Kinetix 6000 drive

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide ABT-1756-TSJ52

Top 20

## Who Should Attend?

Individuals who need to maintain and troubleshoot Kinetix 6000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience with the ControlLogix platform and basic ladder logic

# Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming

## CCN145

4 Days CEUs 2.8

**Course Purpose**

After completing this course, students should be able to configure, test, tune, and program SERCOS motion axes in the Studio 5000 Logix Designer programming environment. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development course (CCP143), students will learn how to apply the Logix5000 architecture to a multi-axis SERCOS motion control system. Students will also practice project planning and efficient programming skills necessary for translating a machine specification into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, students will be able to apply the configuring and programming motion control skills they learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project for a SERCOS motion application
- Add drives and configure SERCOS axes
- Test SERCOS hardware
- Autotune SERCOS axes
- Plan a motion project
- Create user-defined data types, an axis-level program shell, and axis-level tags
- Program the:
  - Axis-level dispatch and power up routines
  - Axis-level command routine
  - Axis-level waiting routine
  - Aborting, clearing, stopping, resetting, and starting routine
- Replicate the axis program
- Replicate an application-level program and the execute routines
- Add a virtual axis
- Program electronic gearing and camming
- Replicate the axis program and application-level program
- Add a virtual axis

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent knowledge of general motion control, drives, feedback devices, and servo motion systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience

# Kinetix 5700 Troubleshooting and Project Interpretation

## CCN202

3 Days CEUs 2.1

**Course Purpose**

Upon completion of this course, you will be able to apply maintenance and troubleshooting techniques to diagnose and correct common problems which may occur with a Kinetix® 5700 servo drive system. You will practice operating and troubleshooting the system through handson exercises using the Studio 5000 Logix Designer® application. Building upon the skills you developed in the Fundamentals of Motion Control (Course No. CCN130) course, you will learn to maintain and troubleshoot a multi-axis motion control system. You will practice identifying faults related to hardware, software, and motion networks by leveraging tools such as web pages, system LEDs, and Studio 5000 Logix Designer status indicators.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate Kinetix 5700 system components
- Retrieving System Status Information using Kinetix 5700 Servo Drive Hardware
- Retrieving System Status Information using a Studio 5000 Logix Designer project
- Troubleshooting Failed Communications for a Kinetix 5700 Servo Drive System
- Testing Wiring and Signals for a Kinetix 5700 Servo Drive System
- Trending Status Information for a Kinetix 5700 Servo Drive System using a Studio 5000 Logix Designer project
- Accessing a Kinetix 5700 Servo Drive Web Page
- Interpreting Motion State and Motion Move Instructions in a Studio 5000 Logix Designer project
- Troubleshooting Integrated Motion Application Code using a Studio 5000 Logix Designer project
- Removing and Replacing a Kinetix 5700 Servo Drive

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to maintain and troubleshoot Kinetix 5700 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience with the ControlLogix platform and basic ladder logic

# Studio 5000 Logix Designer Level 4: Kinetix 5700 (CIP) Programming

## CCN144-A

4 Days CEUs 2.8

**Course Purpose**

Upon completion of this course, you should be able to configure, test, tune, and program CIP Motion™ axes using the Studio 5000 Logix Designer® application. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development (CCP143) course, you will learn how to apply the Logix5000™ architecture to a multi-axis CIP™ motion control system. You will also practice efficient programming skills necessary for translating a machine specification document into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, you will be able to apply the motion control configuring and programming skills you learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configuring a Studio 5000 Logix Designer Project for Integrated Motion over an EtherNet/IP Network
- Adding and Configuring EtherNet/IP Drives and Configuring CIP Servo Axes
- Testing Hardware for Integrated Motion over an EtherNet/IP Network
- Tuning Axes over an EtherNet/IP Network
- Programming Instructions to Turn on and Turn off Servo Control
- Programming Instructions to Home and Stop Axes
- Programming Shutdown and Recovery Instructions
- Programming Group Motion Instructions
- Dynamically Altering Move Parameters and Adding a Virtual Axis
- Programming Gearing Instructions
- Programming Position Camming and Time Camming Instructions

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide | ABT-1756-TSJ52 |

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems should attend this course. In addition, only students who are already familiar with Logix5000 systems and general motion control should attend this course.

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent experience with drives, feedback devices, and velocity and position loop systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (Course No. CCP143) or equivalent experience

# Advanced Logix5000 Programmer Certificate

## CCP251

4 Days CEUs 2.8

**Course Purpose**

This course is for individuals who can quickly learn and apply Logix 5000™ concepts, terminology, hardware, and the Studio 5000 Logix Designer® programming environment. You will learn about more advanced programming methods and instructions, project execution and optimization, controller project security and event logging, and tools available in the Studio 5000 Automation Engineering & Design Environment®.

**Objectives**

After completing this course, you should be able to perform advanced ControlLogix® and Studio 5000 Logix Designer® tasks, such as:

- Programming advanced instructions
- Optimizing tags/parameters, program execution, and controller performance
- Utilizing Studio 5000 Logix Designer tools
- Managing controller information and security

Additionally, you will be introduced to Integrated Architecture Builder® and Studio 5000 Architect® software.

## Who Should Attend?

Individuals responsible for programming Logix5000 controllers using the Studio 5000 Logix Designer application. Also, those who need to learn how to draft ladder logic for any application.

## Prerequisites

- Completion of either of the following courses:
  - Accelerated Logix 5000 Programmer Certificate Course Level 1 (Course Number CCP250)
  - Studio 5000 Logix Designer Level 3: Project Development
- Pursuit of a Logix 5000 Certificate for Programmers.

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## UNDERSTAND

Introduction to the Integrated Architecture System
CIA101 • 2 Days
Private Delivery Only

## PROGRAM OR DESIGN

Managing Industrial Networks with Cisco Networking Technologies
IMINS • 5 Days

CENTERLINE MCC with IntelliCENTER Software Commissioning on an EtherNet/IP Network
CCI108 • 3 Days

Segmenting an Industrial Ethernet Network
VC-SEGNET-A • 120-Min. Session

DeviceNet and RSNetWorx Configuration and Troubleshooting
CCP164 • 3 Days

ControlNet and RSNetworx Configuration and Troubleshooting
CCP173 • 3 Days
Private Delivery Only

Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming
CCN144 • 4 Days

Managing Industrial Networks for Manufacturing with Cisco Technologies
IMINS2 • 5 Days

## MAINTAIN OR TROUBLESHOOT

EtherNet/IP Configuration and Troubleshooting
CCP183 • 3 Days

NetLinx System Maintenance and Troubleshooting
CCP177 • 4 Days
Private Delivery Only

Combination of DeviceNet, ControlNet and EtherNet/IP Maintenance Topics

Configuring and Troubleshooting a Device-Level Ring Network
VC-DLR • 2 Hours

## e-LEARNING

Introduction to Automation iBook Available on iTunes

RSLinx Software
RSTrainer Computer-Based Training

EtherNet/IP - Hardware and IP Addressing
RSTrainer Computer-Based Training

EtherNet/IP- Communications and Diagnostics
RSTrainer Computer-Based Training

EtherNet/IP Bundle
Hardware and IP Addressing Communications and Diagnostics

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# CenterLine MCC With IntelliCenter® Software Commissioning on an EtherNet/IP Network

**CCI108**

3 Days | CEUs 2.1

**Course Purpose**

After completing this course, given a newly installed CENTERLINE MCC with IntelliCENTER software, students should be able to produce an operational motor control system over an EtherNet/IP network. Throughout the course, students will work with a number of hardware and software products, including IntelliCENTER software; E300™ and E3 Plus™ electronic overload relays; PowerFlex 525 and PowerFlex 40 variable speed drives; Stratix 5700 industrial Ethernet switches; Logix5000 controllers and the Studio 5000 Logix Designer application; and FactoryTalk View software. Students will be introduced to a variety of tools they can use to ensure proper functioning of a motor control system. This course also shows how CENTERLINE MCCs interact with other parts of a control system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Verify connections between CENTERLINE MCC sections
- Implement an EtherNet/IP network topology for an MCC
- Configure:
  - Stratix 5700 EtherNet/IP switch settings
  - IntelliCENTER software preferences
  - E300 and E3 Plus electronic overload relays
  - PowerFlex 525 and PowerFlex 40 drive parameters
- Install IntelliCENTER software and data disks
- Modify CENTERLINE MCC lineup properties using IntelliCENTER software
- Add MCC components to a Studio 5000 Logix Designer application
- Enable automatic device configuration for a PowerFlex 525 drive in a CENTERLINE MCC
- Add IntelliCENTER ActiveX controls to a FactoryTalk View application
- Configure and view IntelliCENTER energy software data
- Add documentation to an IntelliCENTER software database
- Modify MCC component spare parts lists in IntelliCENTER software
- Manage IntelliCENTER software databases

## Who Should Attend?

System engineers and/or other individuals responsible for starting the operation of a CENTERLINE motor control center

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience

**Job Aids Included**

IntelliCENTER Software Procedures Guide ABT-MCC-TSJ50

# Segmenting an Industrial Ethernet Network

## VC-SEGNET-A

3 Hours CEUs 0.3

**Course Purpose**

This course will teach you how to start the transition from industrial Ethernet network designs that use a flat and open infrastructure to ones that are structured, hardened, modular, and future-ready. You will be introduced to the concept of organizing a network as smaller, modular, building blocks that:

- Minimize network sprawl
- Give you a scalable, robust, and future-ready network infrastructure

Once you have defined the building blocks of a network, you will then look at options to segment and manage the required traffic flows of the network. Segmentation techniques will include physical segmentation, VLANs, and Network Address Translation (NAT). Finally, you will make decisions around organizing the IP subnets for the network.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define cell/area zones
- Identify level 3 site operations
- Identify switch requirements
- Decide whether to use NAT
- Decide between physical or VLAN segmentation
- Assign VLANs and subnets to each cell/area zone

## Who Should Attend?

Control or network engineers who have to design industrial Ethernet networks should attend this course.

## Prerequisites

- To attend this course, you should already have these prerequisite skills and knowledge:
  - Familiarity with the concepts of IP addresses and subnets
  - Working knowledge of common components of an industrial automation system: controllers, drives, I/O, &HMI

# DeviceNet and RSNetworx Configuration and Troubleshooting

## CCP164

3 Days | CEUs 2.1

**Course Purpose**

This course prepares students to successfully design and configure an efficient DeviceNet network using components for the ControlLogix platform. To meet this objective, students begin by designing a cable system, and then configure a driver, a 1756-DNB scanner module, and network devices. This course prepares students to troubleshoot a malfunctioning DeviceNet network and return it to normal operation with minimum downtime. Students will verify proper network installation and perform both hardware and software-based tasks used to isolate DeviceNet problems, as well as practice the tasks necessary to add and replace network devices.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify DeviceNet network components and design a DeviceNet cable system
- Create a DeviceNet network configuration
- Commission nodes on a DeviceNet network
- Configure a 1756-DNB DeviceNet scanner module
- Map inputs and outputs on a DeviceNet network
- Manage DeviceNet EDS files
- Configure Automatic Device Recovery (ADR) on a DeviceNet network
- Communicate on a DeviceNet network using explicit messaging
- Troubleshoot a DeviceNet network using:
  - RSNetWorx for DeviceNet software
  - RSLogix 5000 software
  - DeviceNet and ControlLogix hardware indicators
- Troubleshoot duplicate node addresses on a DeviceNet network
- Restore a malfunctioning DeviceNet network to normal operation

## Who Should Attend?

Individuals who are:

- Responsible for designing and configuring a new DeviceNet network
- Responsible for isolating and correcting problems or performing basic maintenance on a DeviceNet network

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the RSLogix 5000 Level 1: ControlLogix System Fundamentals course (CCP146)

  OR
- Knowledge of common ControlLogix terminology and the ability to program and interpret basic ladder logic instructions in RSLogix 5000 software

**Job Aids Included**

| | |
|---|---|
| DeviceNet and RSNetWorx Troubleshooting Guide | ABT-N100-TSJ20 |
| DeviceNet and RSNetWorx Procedures Guide | ABT-N100-TSJ50 |

# ControlNet and RSNetworx Configuration and Troubleshooting

(Private Delivery Only)

CCP173

3 Days

**Course Purpose**

This course provides students with the skills necessary to efficiently design and configure a ControlNet network. Students will gain these skills from the ground up, practicing each step in the design and configure process from choosing the correct cable to configuring the connections that will transmit data from ControlLogix (Logix5000) controllers and other devices across that cable. This course provides students with the skills needed to safely and efficiently return a malfunctioning network to normal operation. The instructor will introduce a logical process for troubleshooting ControlNet and RSNetWorx components and demonstrate how to identify problems with communications cards, cabling, and other network hardware.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Design and troubleshoot a ControlNet media system
- Go online to a ControlNet network
- Enter scheduled ControlNet I/O data connections for Logix5000 controllers
- Enter ControlNet messages for Logix5000 controllers
- Isolate faulty ControlNet and RSNetWorx media using signal measurement equipment
- Isolate ControlNet and RSNetWorx network malfunctions using LEDs and mnemonic displays
- Identify a ControlNet and RSNetWorx network malfunction using RSLinx software
- Troubleshoot a ControlNet and RSNetWorx network using RSNetWorx for ControlNet software

## Who Should Attend?

Individuals who are:

- Responsible for designing/configuring a new ControlNet & RSNetWorx network
- Managing/modifying an existing ControlNet & RSNetWorx network

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Experience with Windows-based programming software (Studio 5000 Logix Designer)

**Job Aids Included**

| | |
|---|---|
| ControlNet and RSNetWorx Procedures Guide | ABT-N200-TSJ50 |
| ControlNet and RSNetWorx Troubleshooting Guide | ABT-N200-TSJ20 |

# Introduction to the Integrated Architecture™ System

(Private Delivery Only)

CIA101

2 Days CEUs 1.4

**Course Purpose**

This course will assist students in developing and building a solid foundation of Integrated Architecture and automation system knowledge. Students will learn about and interact with a variety of automation hardware. They will also have an opportunity to use Rockwell Automation software to perform basic system configuration tasks. While performing these tasks, students will gain an understanding of how controllers, drives, motors, networks, and human-machine interface (HMI) products function together within Integrated Architecture.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify components of the integrated architecture system
- Establish communications in an integrated system
- Program a basic Logix Designer project for an integrated system
- Program with tag-based addressing in an integrated system
- Identify programming languages in an integrated system
- Understand Logix5000 multi-discipline control
- Understand NetLinx-enabled networks
- Understand the visualization development environment of an integrated system
- Understand HMI direct tag referencing in an integrated system

## Who Should Attend?

Individuals who:

- Have little or no working experience with automation systems
- Are interested in gaining a broad understanding of automation and the Integrated Architecture System

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

# Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming

## CCN144

4 Days CEUs 2.8

**Course Purpose**

After completing this course, students should be able to configure, test, tune, and program CIP motion axes in the Studio 5000 Logix Designer programming environment. Building upon the skills gained in the Studio 5000 Logix Designer Level 3: Project Development course (CCP143), students will learn how to apply the Logix5000 architecture to a multi-axis CIP motion control system. Students will practice project planning and efficient programming skills necessary for translating a machine specification into reliable ladder logic code. Because all Logix5000 products share common features and a common operating system, students will be able to apply the configuring and programming motion control skills they learn in this course to any of the Logix5000 controllers that are capable of motion control.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a Studio 5000 Logix Designer project for a CIP motion application
- Add drives and configure CIP motion axes
- Test CIP motion hardware
- Autotune CIP motion axes
- Plan a motion project
- Create user-defined data types, axis-level program shell, and axis-level tags
- Program the:
  - Axis-level dispatch and power up routines
  - Axis-level command routine
  - Axis-level waiting routine
  - Aborting, clearing, stopping, resetting, and starting routine
- Replicate the axis program
- Replicate an application-level program and the execute routines
- Add a virtual axis
- Program electronic gearing and camming

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Motion Procedures Guide ABT-1756-TSJ52

## Who Should Attend?

Individuals who need to configure and program Logix5000 motion control systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Motion Control Fundamentals course (CCN130) or equivalent knowledge of general motion control, drives, feedback devices, and servo motion systems
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or equivalent experience

# EtherNet/IP Configuration and Troubleshooting

## CCP183

3 Days CEUs 2.1

**Course Purpose**

This course will assist students in developing fundamental knowledge of industrial communications over an EtherNet/IP network. Students will learn basic concepts and learn how to use various tools to assign IP addresses to EtherNet/IP devices. This course prepares students to effectively resolve issues with communications between a controller and the devices it is controlling. Students will troubleshoot EtherNet/IP network media and components, including a Stratix 5700, 8000 and/or 8300 switch. Students will have an opportunity to monitor diagnostic information using web-based technologies and modify web server module data views and tag values.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Assign IP addresses using:
  - RSLinx classic software and rotary switches
  - BOOTP-DHCP server software
- Isolate an EtherNet/IP network problem
- Diagnose problems with EtherNet/IP modules and network components
- Monitor an EtherNet/IP network using web-enabled technologies

**Job Aids Included**

Ethernet/IP Procedures Guide ABT-N300-TSJ50

### Who Should Attend?

Individuals who are responsible for maintaining Industrial Automation and Control Systems (IACS) networks

### Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix Systems

### Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

# Managing Industrial Networks with CISCO Networking Technologies

## IMINS

5 Days

**Course Purpose**

Managing Industrial Networks with Cisco® Networking Technologies (IMINS) Version 1.0 is a hands-on lab-based course, which helps students with the foundational skills needed for the management and administration of networked industrial control systems. The IMINS course, developed in conjunction with Rockwell Automation, helps plant administrators, control system engineers, and traditional network engineers understand networking technologies that are needed in today's connected plants and enterprises. This course also helps students prepare for the Cisco Industrial Networking Specialist Certification exam (exam ID 600-601) and qualify for the Cisco Industrial Networking Specialist certification. The goal of this course is to enable students to achieve competency and skills to install, configure, maintain, and troubleshoot industrial network systems while helping to ensure network availability, reliability, and Internet security throughout your company.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe Cisco Industrial Ethernet (IE) switches, Cisco Connected Grid™ switches and routers, and Rockwell Automation Stratix™ switches
- Interpret designs and drawings, recognize industrial topologies, and access reference materials
- Install industrial network components
- Deploy industrial network components
- Perform basic maintenance tasks
- Troubleshoot network and control issues

TOP 20

## Who Should Attend?

IT and operations technology (OT) professionals and control engineers who will be involved with the implementation, operation, and support of networked industrial products and solutions for the manufacturing, process control, and oil and gas industries

## Prerequisites

The knowledge and skills that you must have before attending this course include a college degree or non-degreed qualified technician with 2-3 years experience. Also, it is recommended you take the following Cisco Electronic Learning and Training (ELT) courses to achieve a basic understanding of networking and industrial protocols:

- Networking Fundamentals for Industrial Control Systems (INICS)
- Industrial Control Systems Fundamentals for Network Engineers (ICINS)

# Managing Industrial Networks for Manufacturing with Cisco Technologies (IMINS2)

IMINS2

5 Days

**Course Purpose**

Gain the skills you need to successfully implement and troubleshoot the most common industry standard protocols. Our lab-intensive course, Managing Industrial Networks for Manufacturing with Cisco® Technologies (IMINS2), builds on the Managing Industrial Networks with Cisco Networking Technologies (IMINS) course. It teaches students how to deploy best practices used in security and wireless technologies for today's industrial networks. The IMINS2 course caters to plant administrators, control system engineers, and traditional network engineers in the oil and gas, process control, and manufacturing industries who are involved with the convergence of IT and industrial networks. It prepares students for the exam, Managing Industrial Networks for Manufacturing with Cisco Technologies Certification (200-601 IMINS2) and the Cisco Certified Network Associate Industrial (CCNA Industrial) certification. This course is job and role-specific, enabling students to achieve competency and skills to configure, maintain, and troubleshoot industry standard network protocols as well as wireless and security technologies. Learn how to make full use of current infrastructures while developing a converged platform for flexibility to support future business outcomes. IMINS2 exposes students to multiple industrial network technologies in addition to products from Cisco and other industrial suppliers, including Rockwell Automation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize the difference between enterprise and industrial networks
- Understand the functions of the OSI layers and TCP/IP model
- Troubleshoot common issues found in Layers 1, 2, and 3 of the OSI model
- Describe the functions and components of Ethernet and IP protocols
- Configure CIP on Cisco and Stratix managed switches
- Troubleshoot common Ethernet and IP issues
- Describe the functions and components of the PROFINET protocol
- Configure PROFINET protocols on Cisco Industrial Ethernet devices
- Troubleshoot common PROFINET issues
- Identify common network threats and resolutions
- Configure basic security components (access lists and AAA features)
- Configure a wireless network within an industrial environment

## Who Should Attend?

This course is designed for IT and operations technology (OT) professionals as well as control engineers involved with the installation, configuration, and troubleshooting of networked industrial products and solutions for the following industries: Manufacturing, Process control, Oil and gas, Other industries as applicable

## Prerequisites

Knowledge and skills required:

- College degree, or non-degreed qualified technician with two– three years' experience in industrial networks
- Familiarity with command-line and web-based interfaces
- Solid understanding of networking and industrial protocols

# NetLinx System Maintenance and Troubleshooting

(Private Delivery Only)

**CCP177**

4 Days | CEUs 2.8

**Course Purpose**

This course is designed to provide students with the necessary skills to effectively maintain and troubleshoot DeviceNet™, ControlNet™, and EtherNet/IP™ hardware and software. Students will build their skills by using troubleshooting best practices and network troubleshooting tools; gain experience troubleshooting DeviceNet, ControlNet, and EtherNet/IP networks by maintaining connectivity to the networks; and learn a variety of software packages and hardware indicators to ensure that the Logix5000 controllers and devices on the networks maintain communications to sustain optimal performance.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify NetLinx networks and hardware components of an EtherNet/IP system
- Connect a computer to a Logix5000 system over an EtherNet/IP network
- Troubleshoot EtherNet/IP network media components
- Monitor/troubleshoot EtherNet/IP media components
- Identify ControlNet media components/ signal measuring equipment
- Connect to a ControlNet network using RSLinx classic software
- Troubleshoot a scheduled ControlNet data connection for a ControlLogix controller
- Troubleshoot a ControlNet network using RSNetWorx™ for ControlNet software
- Identify DeviceNet network components
- Commission nodes on, and troubleshoot, a DeviceNet network
- Troubleshoot a DeviceNet network using RSNetWorx for DeviceNet software

## Who Should Attend?

Individuals who are responsible for maintaining and troubleshooting existing DeviceNet, ControlNet, and EtherNet/IP networks

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience

***Curriculum Note:***

*This course is intended for maintainers. Some topics may be similar to topics covered in courses CCP164, and CCP173.*

**Job Aids Included**

| | | | |
|---|---|---|---|
| ControlNet and RSNetWorx Troubleshooting Guide | ABT-N200-TSJ20 | DeviceNet and RSNetWorx Procedures Guide | ABT-N100-TSJ50 |
| ControlNet and RSNetWorx Procedures Guide | ABT-N200-TSJ50 | EtherNet/IP Procedures Guide | ABT-N300-TSJ50 |
| DeviceNet and RSNetWorx Troubleshooting Guide | ABT-N100-TSJ20 | Studio 5000 Logix Designer and Logix 5000 Procedures Guide | ABT-1756-TSJ50 |

# Configuring and Troubleshooting a Device-Level Ring Network

## VC-DLR

2 Hours CEUs .2

**Course Purpose**

This course will teach you the process of configuring a device-level ring (DLR) network including determining node counts, supervisor, back up and ring nodes. You will be provided with an understanding of normal operation of a DLR network and how to configure a supervisor node for managing traffic. This course will also show you the troubleshooting tools for diagnosing issues on the network along with resolutions to return a faulted DLR network back to normal operation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define Supervisor Nodes
- Add an EtherNet/IP Device
- Connect Devices to the Network
- Configure Supervisor Nodes in a Logix Designer Project
- Complete the Physical Connections of the Network
- Verify the Network

## Who Should Attend?

Control and automation engineers who are responsible for configuring a DLR network and returning a faulted network back to normal operation.

## Prerequisites

- Experience configuring embedded switch technology devices in a Studio 5000 Logix Designer® project.

# PLC-5/RSLogix 5 Training Guide

Rockwell Automation

## UNDERSTAND

START

**PLC-5/SLC 500 and RSLogix Fundamentals**
CCP122 • 2 Days
Private Delivery Only

## PROGRAM OR DESIGN

**PLC-5 and RSLogix 5 Programming**
CCP410 • 4 Days
Private Delivery Only

**PLC-5 to ControlLogix Conversions**
VC-PLC5-CLX • 120 minutes

## MAINTAIN OR TROUBLESHOOT

**PLC-5 and RSLogix 5 Maintenance and Troubleshooting**
CCP412 • 4 Days

## e-LEARNING

**RSLogix 5 Software**
**RSTrainer Computer-Based Training**

**RSLinx Software**
**RSTrainer Computer-Based Training**

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# PLC-5/SLC 500 and RSLogix Fundamentals

(Private Delivery Only)

## CCP122

2 Days

**Course Purpose**

This course is an introduction to programmable controller systems. Students will identify the main components of programmable controller systems and describe their functions and describe the flow of information through a programmable controller system. They will receive a thorough introduction to RSLogix 5 or RSLogix 500 software, and will learn how to transfer, monitor, and run projects on a PLC-5 or SLC 500 processor and how to interpret simple ladder logic.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understand programmable controller systems
- Identify common hardware components of processors
- Identify hardware components of I/O systems
- Identify I/O configurations
- Get started with programming systems
- Change the radix (base) of a number
- Set up communications between a programming system and a processor
- Identify PLC-5 and SLC 500 system addresses
- Interpret ladder logic
- Interpret Timer On-Delay (TON) and Count Up (CTU) instructions

## Who Should Attend?

Individuals who:

- Have little or no working experience with programmable controller systems
- Are preparing for the following courses: PLC-5 and RSLogix 5 Programming (CCP410), SLC 500 and RSLogix 500 Programming (CCPS41), PLC-5 and RSLogix 5 Maintenance and Troubleshooting (CCP412), and SLC 500 and RSLogix 500 Maintenance and Troubleshooting (CCPS43)

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

# PLC-5 and RSLogix 5 Programming

(Private Delivery Only)

## CCP410

4 Days

**Course Purpose**

This course introduces students to programming techniques and instructions to configure and program a 1785 PLC-5 system. The instructor will demonstrate how to use programming instructions and techniques to create a ladder logic project. Students will be given exercises that provide them with hands-on practice using RSLogix 5 software to program a PLC-5 processor.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Establish communications
- Configure channels
- Identify addresses and organize the data table
- Draft ladder logic
- Program bit instructions
- Enter, edit, and verify ladder logic
- Select and program timer and counter instructions
- Control program flow
- Enter documentation
- Search ladder logic
- Convert integer values to and from binary coded decimal values
- Select and program mathematical, compare, and manipulation instructions
- Configure and preview a project printout

## Who Should Attend?

Individuals who have to write ladder logic projects for 1785 PLC-5 processors

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the PLC-5/SLC 500 and RSLogix Fundamentals course (CCP122) or equivalent experience

**Job Aids Included**

| | |
|---|---|
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |

# PLC-5 and RSLogix 5 Maintenance and Troubleshooting

## CCP412

4 Days

**Course Purpose**

This skill-building course provides students with the knowledge and the practice needed to interpret, isolate, and diagnose common hardware problems related to noise, power, and discrete and analog I/O. In troubleshooting scenarios, students are introduced to basic ladder logic interpretation, which is applied to diagnostic tasks. Students practice these diagnostic skills by tracing through ladder logic instructions in an RSLogix 5 project.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Communicate with a PLC-5 processor
- Monitor and enter data
- Interpret bit instructions
- Edit and search ladder logic
- Document a project
- Force inputs and outputs
- Configure and preview a project report
- Create a histogram and trend chart
- Troubleshoot noise, discrete and analog I/O, I/O channel and chassis, and processor/power supply problems
- Interpret and edit counter and timer instructions
- Search and interpret basic ladder logic
- Interpret and edit compare, data manipulation, and program control instructions
- Maintain and troubleshoot a PLC-5 system

## Who Should Attend?

Individuals who are responsible for troubleshooting and maintaining PLC-5 systems using RSLogix 5 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Experience maintaining electrically controlled systems
- Working knowledge of programmable controllers or completion of the PLC-5/SLC 500 and RSLogix Fundamentals course (CCP122)

**Job Aids Included**

| | |
|---|---|
| PLC-5 and RSLogix 5 Troubleshooting Guide | ABT-1785-TSJ22 |
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |

# PLC-5 to ControlLogix Conversions

## VC-PLC5-CLX

120 Minutes CEUs 0.2

**Course Purpose**

This course will teach you how to convert your PLC-5® program to a project for a ControlLogix® controller as part of a system migration. You will learn to start a phased migration where you leave your existing I/O system in place and connect to it via a ControlLogix Remote I/O communication module.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Preparing and Exporting the PLC-5 Project for Translation
- Converting Text Files to a ControlLogix Project
- Resolving Program Conversion Errors
- Configuring the 1756-RIO Module
- Mapping I/O Data between the 1756-RIO Module and Logic
- Verifying Project Flow Control

## Who Should Attend?

Control engineers who have to migrate existing PLC-5 control systems to ControlLogix control systems should attend this course.

## Prerequisites

- Draft ladder logic in the Studio 5000 Logix Designer® application
- Configure common Logix5000™ instructions, such as bit-level, timer, and copy instructions
- Configure an I/O module
- Locate data in an array
- Download a project to a ControlLogix controller

# Power Control (Drives and Motor Control Centers) Training Guide

Rockwell Automation

## APPLICATION-SPECIFIC COURSES

**PowerFlex 400 AC Drive Field Startup for HVAC Applications** (Private Delivery Only)
CCA171-LD • 1 Day

## PROGRAM OR DESIGN

**PowerFlex 700 Vector Control Configuration and Startup** (Private Delivery Only)
CCA161 • 1 Day

**PowerFlex 750-Series Configuration and Startup**
CCA182 • 2 Days

**PowerFlex 750-Series Configuration for an Integrated Architecture System** (Private Delivery Only)
CCA184 • 1 Day

**IntelliCENTER and DeviceNet Configuration** (Private Delivery Only)
CCI106-LD • 2 Days

**CENTERLINE MCC with IntelliCENTER Software Commissioning on an EtherNet/IP Network**
CCI108 • 3 Days

**PowerFlex 700 Vector Control Communications over EtherNet/IP** (Private Delivery Only)
CCA165 • 1 Day

**PowerFlex 523/525 Drives with PowerFlex 525 Drive Kit: Communications and Programming**
VC-PF523P-A • 120-Min. Session

## MAINTAIN OR TROUBLESHOOT

**PowerFlex 70 Maintenance and Troubleshooting** (Private Delivery Only)
CCA159-LD • 1 Day

**AutoMax Maintenance and Troubleshooting** (Private Delivery Only)
RE0520 • 4 Days

**PowerFlex 700S Phase II Maintenance and Troubleshooting** (Private Delivery Only)
PFX700S2-LD • 3 Days

**PowerFlex DC Drive Troubleshooting** (Private Delivery Only)
CDD163 • 2 Days

**Motor Control**
EM-204 • 5 Days

**PowerFlex 7000 Medium Voltage Drive Operation and Maintenance**
CAN7000 • 3.5 Days

**PowerFlex 7000 Medium Voltage Drive Operation and Maintenance Lite**
CAN7000-L • 3 Days

**PowerFlex 700 Vector Control Maintenance and Troubleshooting** (Private Delivery Only)
CCA163 • 1 Day

**PowerFlex 750-Series Maintenance and Troubleshooting**
CCA183 • 2 Days

**PowerFlex 755 Floor-Mounted Drives: Pre-Installation Planning**
VC-PF755H-A • 120-Min. Session

**OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000 and PowerFlex 40 Fundamentals and Troubleshooting**
OEM100 • 5 Days

**PowerFlex 7000 Liquid Cooled Medium Voltage Drive Operation and Maintenance**
CAN7000C • 4 Days

**PowerFlex 7000 Liquid Cooled Medium Voltage Drive Operation and Maintenance Lite**
CAN7000C-L • 3.5 Days

AC and DC Drives
iBook Available on iTunes

Introduction to Automation
iBook Available on iTunes

# OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000, AND PowerFlex 40 Fundamentals and Troubleshooting

**OEM100**

5 Days | CEUs 3.5

**Course Purpose**

This course provides students with the skills necessary to maintain and troubleshoot: Studio 5000 applications that operate on a ControlLogix-based machine; FactoryTalk View Machine Edition (ME) applications that run on PanelView Plus terminals; Kinetix 6000 motion systems; and PowerFlex 40 drives. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology used with: ControlLogix hardware, PanelView Plus terminal, Kinetix 6000 systems, and PowerFlex 40 drives; Studio 5000 Logix Designer application; and FactoryTalk View ME application. Students will also learn to diagnose and troubleshoot problems with controller, I/O or other hardware issues.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Connect a computer to a network
- Configure EtherNet/IP addresses
- Download and go online
- Update firmware
- Locate I/O tags and devices
- Locate and edit tag values
- Create and modify project
- Draft basic ladder logic
- Select ladder logic instructions
- Edit ladder logic online
- Program timer, counter, math, compare, and move instructions
- Search for project components
- Force I/O and toggle bits
- Configure produced/consumed data
- Tune a PID loop
- Manage project files
- Configure a trend chart
- Test a ladder diagram
- Troubleshoot digital and analog I/O modules
- Modify application communications
- Download runtime files
- Configure display security, graphic displays, and interactive controls
- Troubleshoot workstation problems
- Interpret motion instructions and indicators
- Modify drive parameters

## Who Should Attend?

OEMs who need to maintain and troubleshoot a ControlLogix-based machine, but have little to no working experience with ControlLogix systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Perform basic voltage and current checks
- Read wiring diagrams

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide | ABT-2711P-TSJ50 |
| EtherNet/IP™ Procedures Guide | ABT-N300-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

# PowerFlex 523/525 Drives with PowerFlex 525 Drive Kit: Communications and Programming

## VC-PF523P-A

(2) 90-Min Sessions CEUs 0.3

**Course Purpose**

After completing this course, students should be able to program drive parameters for a drive application. This course will teach students how to create a custom parameter group based upon drive applications. Throughout this course, the instructor will cover a range of topics from establishing communications with a PowerFlex 523/525 drive via a USB connection and EtherNet/IP network to testing parameters of a PowerFlex 523/525 drive using the HIM.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Establish communications with a PowerFlex 523/525 drive via a USB connection
- Establish communications with a PowerFlex 525 drive via an EtherNet/IP network
- Configure a PowerFlex 523/525 drive using the Startup Wizard in Connected Components Workbench™ software
- Create a CustomView parameter group
- Edit and test parameters using the HIM

## Who Should Attend?

Individuals who have drive programming experience but are new to PowerFlex component-class drives

## Prerequisites

- Knowledge of AC/DC drive fundamentals and drives programming experience
- Basic working knowledge of safe electrical practices including, but not limited to:
  - Understanding electricity, how it works, and the dangers involved in working with electricity
  - Identifying hazardous conditions
  - Adhering to all safety regulations

## Technical Requirements

- PowerFlex 525 drive kit (shipped prior to class)
- A computer and phone
- Connected Components Workbench software must be installed and activated. The virtual classroom invitation will provide details on this software.

# PowerFlex 7000 Medium Voltage Drive Operation and Maintenance

## CAN7000

3.5 Days

**Course Purpose**

This course will provide students with techniques needed to facilitate operation and maintenance of the medium voltage (MV) PowerFlex 7000 Drive. Emphasis is on hardware familiarity, programming procedures, and troubleshooting. Upon completion of this course, students should be able to adopt proper safety measures while working on MV equipment, recognize proper drive and motor operation, understand the significance of all the key parameters, and troubleshoot drive malfunctions. Students should also be able to remove and replace power components of the PowerFlex 7000 adjustable frequency AC drive.

**Objectives**

After completing this course, students should be knowledgeable about the following topics:

- MV products overview
- PF7000 drive topology
- Power components
- Safety training (LOTO)
- Power supplies (classic and ForGe)
- PF7000 classic and ForGe control boards
- Voltage and current monitoring (classic and ForGe)
- Drive cooling system and operation
- Maintenance and troubleshooting
- Labs:
  - Device replacement
  - Resistance checks
  - Control voltage checks
  - Classic and ForGe control board checks
  - Review classic and ForGe drawings
  - HMI PV550 / PV1000
  - Uploading drive setup and control data
  - Downloading firmware

## Who Should Attend?

Engineers, technicians, and electrical maintenance persons engaged in the operation and maintenance of PowerFlex 7000 drives (frames A and B).

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Comprehensive knowledge of electrical principles and circuits
- Practical experience using a multimeter, ammeter and oscilloscope

**Curriculum Note:**

*This course covers PowerFlex 7000 drives frame A and B. For PowerFlex 7000C drives, take course CAN7000C which covers everything in this course plus liquid-cooled drives (frame C).*

# PowerFlex 7000 Medium Voltage Drive Operation and Maintenance Lite

## CAN7000-L

3 Days

**Course Purpose**

This course will provide students with techniques needed to facilitate operation and maintenance of the medium voltage (MV) PowerFlex 7000 Drive. Emphasis is on hardware familiarity, programming procedures, and troubleshooting. Upon completion of this course, students should be able to adopt proper safety measures while working on MV equipment, recognize proper drive and motor operation, understand the significance of all the key parameters, and troubleshoot drive malfunctions. Students should also be able to remove and replace power components of the PowerFlex 7000 adjustable frequency AC drive.
Note: This course is delivered at the MV Center of Excellence. This course does NOT include commisioned drive.

**Objectives**

After completing this course, students should be knowledgeable about the following topics:

- MV products overview
- PF7000 drive topology
- Power components
- Safety training (LOTO)
- Power supplies (classic and ForGe)
- PF7000 classic and ForGe control boards
- Voltage and current monitoring (classic and ForGe)
- Drive cooling system and operation
- Maintenance and troubleshooting
- Labs:
  - Device replacement
  - Resistance checks
  - Control voltage checks
  - Classic and ForGe control board checks
  - Review classic and ForGe drawings
  - HMI PV550 / PV1000
  - Uploading drive setup and control data
  - Downloading firmware

## Who Should Attend?

Engineers, technicians, and electrical maintenance persons engaged in the operation and maintenance of PowerFlex 7000 drives (frames A and B).

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Comprehensive knowledge of electrical principles and circuits
- Practical experience using a multimeter, ammeter and oscilloscope

**Curriculum Note:**

*This course covers PowerFlex 7000 drives frame A and B. For PowerFlex 7000C drives, take course CAN7000C which covers everything in this course plus liquid-cooled drives (frame C).*

# PowerFlex 7000 Liquid-Cooled Medium Voltage Drive Operation and Maintenance

## CAN7000C

4 Days

**Course Purpose**

This course provides students with techniques needed to facilitate operation and maintenance of the medium voltage (MV) PowerFlex 7000C drive. Emphasis is on hardware familiarity, programming procedures, and troubleshooting. Upon completion of this course, students should be able to adopt proper safety measures while working on MV equipment, recognize proper drive and motor operation, understand the significance of all the key parameters, and troubleshoot drive malfunctions. Students should also be able to remove and replace power components of the PowerFlex 7000C adjustable frequency AC drive.

**Objectives**

After completing this course, students should be knowledgeable about the following topics:

- MV products and liquid-cooled system overview
- PF7000 drive topology
- Power components
- Safety training (LOTO)
- Power supplies (classic and ForGe)
- PF7000 classic and ForGe control boards
- Voltage and current monitoring (classic and ForGe)
- Drive cooling system and operation
- Maintenance and troubleshooting
- PF7000C features and parameters
- Heat exchangers
- Chill block and thermostatic valve replacement
- Labs:
  - Device replacement
  - Resistance checks
  - Control voltage checks
  - Classic and ForGe control board checks
  - Review classic and ForGe drawings
  - HMI PV550 / PV1000
  - Uploading drive setup and control data
  - Downloading firmware

## Who Should Attend?

Engineers, technicians, and electrical maintenance persons engaged in the operation and maintenance of PowerFlex 7000C drives.

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Comprehensive knowledge of electrical principles and circuits
- Practical experience using a multimeter, ammeter and oscilloscope

**Curriculum Note:**

*Do not take this course and course CAN7000. The first 3.5 days are the same.*

# PowerFlex 7000C Liquid-Cooled Medium Voltage Drive Operation and Maintenance Lite

## CAN7000C-L

3.5 Days

**Course Purpose**

This course provides students with techniques needed to facilitate operation and maintenance of the medium voltage (MV) PowerFlex 7000C drive. Emphasis is on hardware familiarity, programming procedures, and troubleshooting. Upon completion of this course, students should be able to adopt proper safety measures while working on MV equipment, recognize proper drive and motor operation, understand the significance of all the key parameters, and troubleshoot drive malfunctions. Students should also be able to remove and replace power components of the PowerFlex 7000C adjustable frequency AC drive.
Note: This course is delivered at the MV Center of Excellence. This course does NOT include commisioned drive.

**Objectives**

After completing this course, students should be knowledgeable about the following topics:

- MV products and liquid-cooled system overview
- PF7000 drive topology
- Power components
- Safety training (LOTO)
- Power supplies (classic and ForGe)
- PF7000 classic and ForGe control boards
- Voltage and current monitoring (classic and ForGe)
- Drive cooling system and operation
- Maintenance and troubleshooting
- PF7000C features and parameters
- Heat exchangers
- Chill block and thermostatic valve replacement
- Labs:
  - Device replacement
  - Resistance checks
  - Control voltage checks
  - Classic and ForGe control board checks
  - Review classic and ForGe drawings
  - HMI PV550 / PV1000
  - Uploading drive setup and control data
  - Downloading firmware

## Who Should Attend?

Engineers, technicians, and electrical maintenance persons engaged in the operation and maintenance of PowerFlex 7000C drives.

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Comprehensive knowledge of electrical principles and circuits
- Practical experience using a multimeter, ammeter and oscilloscope

**Curriculum Note:**

*Do not take this course and course CAN7000. The first 3.5 days are the same.*

# PowerFlex 70 Maintenance and Troubleshooting

(Private Delivery Only)

## CCA159-LD

1 Day

**Course Purpose**

This skill-building course introduces concepts and techniques that will assist students in successfully maintaining and troubleshooting a PowerFlex 70 AC drive. Students will learn how to recognize PowerFlex 70 drive hardware and properly wire the drive. Students will learn to diagnose specific load-related, environmental, and equipment faults. Throughout the course, students will use the LCD HIM, DriveExplorer software, and DriveExecutive software to clear faults and alarms. After each demonstration, students will be given an application-based exercise that offers extensive hands-on practice using a PowerFlex 70 drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Replace and rewire drive hardware
- Configure drive parameters using the LCD HIM, DriveExplorer & DriveExecutive software
- Upload and download drive data
- Troubleshoot and clear drive alarms
- Clear drive faults
- Troubleshoot drive load and environmental faults
- Troubleshoot drive equipment malfunctions
- Maintain and troubleshooting a PowerFlex 70 drive

## Who Should Attend?

Individuals responsible for maintaining and troubleshooting PowerFlex 70 drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and knowledge of electrical/ industrial safety
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# PowerFlex 700 Vector Control Configuration and Startup

(Private Delivery Only)

## CCA161

1 Day

**Course Purpose**

This skill-building course introduces techniques and instructions that will assist students in successfully configuring and starting up a PowerFlex 700 vector control drive. Throughout the course, the instructor will demonstrate how to configure PowerFlex 700 drive parameters. The instructor will demonstrate how to install and commission one or more of the following communications adapters: remote I/O, DeviceNet, EtherNet/IP, and ControlNet. Then, students will practice these tasks during hands-on exercises using the LCD HIM, DriveExplorer software, and DriveExecutive software. This course is designed as a stand-alone course, or it can be taken in conjunction with other PowerFlex 700 courses for further skill development.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure drive parameters using DriveExplorer and DriveExecutive software
- Configure drive parameters using an LCD HIM
- Startup a drive, upload and download drive data
- Control drive operation
- Install and configure a EtherNet/IP communications adapter
- *Optional:* Install and configure a DeviceNet, ControlNet, and remote I/O communications adapter

**Job Aids Included**

| | |
|---|---|
| PowerFlex 700 Standard and Vector Control Procedures Guide | ABT-20B-TSJ50 |
| PowerFlex 700 Standard and Vector Control Quick Reference Guide | ABT-20AB-TQR90 |

## Who Should Attend?

Individuals responsible for configuring parameters and starting up PowerFlex 700 vector control drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and safety practices
- Completion of the AC/DC Motor and Drive Fundamentals course (CCA101) or equivalent experience

# PowerFlex 700 Vector Control Maintenance and Troubleshooting

(Private Delivery Only)

## CCA163

1 Day

**Course Purpose**

This skill-building course introduces concepts and techniques that will assist students in successfully maintaining and troubleshooting a PowerFlex 700 vector control drive. Students will learn how to recognize PowerFlex 700 drive hardware and properly wire the drive. Students will learn to diagnose specific load-related, environmental, and equipment faults. Throughout the course, students will use the LCD HIM, DriveExplorer, and DriveExecutive software to clear faults and alarms.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Replace and rewire drive hardware
- Configure drive parameters using LCD HIM, DriveExplorer, and DriveExecutive software
- Upload and download drive data
- Troubleshoot and clear drive alarms
- Clear drive faults
- Troubleshoot drive load and environmental faults
- Troubleshoot drive equipment malfunctions

## Who Should Attend?

Individuals responsible for maintaining and troubleshooting PowerFlex 700 vector control drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and electrical/industrial safety
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

**Job Aids Included**

| | |
|---|---|
| PowerFlex 700 Standard and Vector Control Troubleshooting Guide | ABT-20B-TSJ20 |
| PowerFlex 700 Standard and Vector Control Procedures Guide | ABT-20B-TSJ50 |
| PowerFlex 700 Standard and Vector Control Quick Reference Guide | ABT-20AB-TQR90 |

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCA161.*

# PowerFlex 400 AC Drive Field Startup For HVAC Applications

(Private Delivery Only)

CCA171-LD

1 Day

**Course Purpose**

This course provides fundamental concepts of AC/DC drive and motor operation to enable effective startup of PowerFlex 400 drives within the HVAC market. This course provides students with information related to applications, proper drive selection, and sizing as well as various installation considerations. Students will learn how to recognize PowerFlex 400 drive hardware and properly program and troubleshoot the drive as part of a typical startup service. Throughout this course, students will use the LCD HIM and DriveExplorer software to program and monitor various drive parameters. After each demonstration, students will be given an application-based exercise that offers extensive hands-on practice using the PowerFlex 400 drive.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Basic drive and motor technology
- PowerFlex 400 and configured product overview
- General programming and bypass lab
- Application specific features overview and labs
- Installation and application considerations
- DriveExplorer software overview
- Network communications overview
- Start up registration procedure
- Relate product features to application needs
- Verify proper installation of the drive
- Effectively program the drive

## Who Should Attend?

Individuals who will be conducting startup of PowerFlex 400 drives for HVAC applications

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Previous experience working with AC Drive technology
- Working knowledge of electricity, and knowledge of electrical/ industrial safety
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# PowerFlex 750-Series Configuration and Startup

## CCA182

2 Days CEUs 1.4

**Course Purpose**

Upon completion of this course, given a wired PowerFlex 750-Series drive (PowerFlex 753 or PowerFlex 755) and AC motor, students will be able to startup the drive and configure drive parameters to meet application needs. Throughout the course, students will have the chance to use a variety of hardware and software tools, including the A6 LCD HIM, DriveExecutive software, and DriveExplorer software. After each demonstration, students will be given exercises that offer extensive hands-on practice using a PowerFlex 753 or PowerFlex 755 drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Verify PowerFlex 750-Series drive installation
- Locate and modify PowerFlex 750-Series drive data using the A6 HIM and drive software Configure EtherNet/IP communications adapter for a PowerFlex 750-Series drive
- Startup a PowerFlex 750-Series drive
- Interpret PowerFlex 750-Series control block diagrams
- Control PowerFlex 750-Series drive operation
- Create a DeviceLogix program in a PowerFlex 750-Series drive

Top 20

### Who Should Attend?

Individuals who need to configure and startup PowerFlex 750-Series drives

### Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and safety practices
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

*This course is intended for programmers. Some topics may be similar to topics covered in course CCA183.*

# PowerFlex 750-SERIES Maintenance and Troubleshooting

## CCA183

2 Days CEUs 1.4

**Course Purpose**

This skill-building course introduces concepts and techniques that will assist students in successfully maintaining and troubleshooting a PowerFlex 750-Series (PowerFlex 753 or PowerFlex 755) drive. Students will learn how to recognize PowerFlex 750-Series drive hardware and properly wire the drive. Students will learn to diagnose specific faults. Throughout the course, students will have the chance to use a variety of maintenance and troubleshooting tools, including the A6 LCD HIM, DriveExplorer software, and DriveExecutive software. After each demonstration, students will be given exercises that offer extensive hands-on practice using a PowerFlex 753 or PowerFlex 755 drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate PowerFlex 750-Series drive hardware
- Locate and modify PowerFlex 750-Series drive data using the A6 HIM and drive software
- Clear PowerFlex 750-Series drive alarms and faults
- Perform predictive maintenance using PowerFlex 750-Series parameters
- Troubleshoot PowerFlex 750-Series load/environmental faults and equipment malfunctions

Top 20

## Who Should Attend?

Individuals responsible for maintaining and troubleshooting PowerFlex 750-Series drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and safety practices
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# Intellicenter and DeviceNet™ Configuration

(Private Delivery Only)

## CCI106-LD

2 Days

**Course Purpose**

This course provides the concepts, knowledge, and tools necessary to design, specify, install, troubleshoot, and use an IntelliCENTER MCC or DeviceNet MCC. During the course, students will employ control and communication architectures by solving sample architecture problems presented in class. Students will learn to use various software tools associated with DeviceNet MCCs, such as RSLinx and RSNetWorx for DeviceNet software in addition to MCC start-up, maintenance, and replacement. The last day focuses on network configuration, mapping of scanners, and PLC programming in a DeviceNet MCC system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understand basics of DeviceNet and NetLinx
- RSLinx and RSNetWorx for DeviceNet, EDS files
- Search for EDS files
- DeviceNet media in CENTERLINE MCCs
- Add MCC units and sections to IntelliCENTER software
- Replace a device/auto-device and node recovery options
- IntelliCENTER support services
- Set up a ControlLogix chassis with DeviceNet and Ethernet
- Map devices to a DeviceNet scanner
- PLC Programs for IntelliCENTER

## Who Should Attend?

Control engineers, electrical technicians, and system integrators who will be involved in designing, installing, and using IntelliCENTER/DeviceNet MCCs

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Familiarity with PLC programming software
- Working knowledge of electricity and knowledge of electrical/industrial safety

# PowerFlex DC Drive Troubleshooting

(Private Delivery Only)

CDD163

2 Days CEUs 1.4

**Course Purpose**

This skill-building course is delivered at your facility and requires 230V, 3-phase power to operate the workstations. This course introduces concepts and techniques that will assist students in successfully troubleshooting a PowerFlex DC drive. Students will learn how to recognize PowerFlex DC drive hardware and properly rewire the drive. Students will learn to diagnose and correct specific faults. Throughout this course, students will have the chance to use a variety of troubleshooting tools, including: LCD HIM, DriveExplorer software, and DriveExecutive software. After each demonstration, students will be given exercises that offer extensive hands-on practice using the PowerFlex DC drive. This course can be taken as a stand-alone course, or it can be taken in conjunction with other courses in the PowerFlex AC and DC drives curriculum for further skills development.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify PowerFlex DC drive hardware
- Locate and modify PowerFlex DC drive parameters using the A3 LCD HIM, the A6 LCD HIM (optional), and DriveExplorer software
- Clear PowerFlex DC drive alarms and faults
- Troubleshoot PowerFlex DC load, environmental faults, and drive equipment malfunctions
- Troubleshoot a PowerFlex DC drive
- Apply DC drive and motor fundamentals (optional review)
- Prepare for PowerFlex DC drive troubleshooting

## Who Should Attend?

Individuals responsible for troubleshooting PowerFlex DC drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of basic DC motor and drive fundamentals through the completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# Motor Control

## EM-204

5 Days CEUs 3.5

**Course Purpose**

This course provides students with information on the concepts associated with AC and DC motor fundamentals, motor control fundamentals, control of motor starting, and motors and motor controllers. The lessons cover a wide range of topics such as motor enclosures, nameplate data, AC motors, DC motors, magnetic contactors, control circuits, Wye-Delta starters, speed controllers, AC/DC machine maintenance, and motor control circuit maintenance.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Explain AC motor theory
- Describe contacts
- Distinguish relays, contactors, and motor starters
- Identify pilot devices
- Interpret motor control device symbols
- Construct basic, reversing, and advanced motor control circuits
- Troubleshoot acceleration circuits and basic, reversing, time delay, soft-start, and advanced motor control circuits
- Accelerate motors using motor controllers
- Perform maintenance inspections
- Use time delays in motor control circuits

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

Understanding of electrical theory and electrical systems

**Curriculum Note:**

*Many of the lessons in this course are consolidated in course EM-206 in a condensed format. Do not take both courses.*

# PowerFlex 700S Phase II Maintenance and Troubleshooting

(Private Delivery Only)

PFX700S2-LD

3 Days

**Course Purpose**

This skill-building course introduces concepts and techniques that will assist students in successfully maintaining and troubleshooting a PowerFlex 700S Phase II AC drive. Students will learn how to recognize PowerFlex 700S Phase II drive hardware and properly wire the drive. Students will learn to diagnose specific load-related, environmental, and equipment faults. Throughout the course, students will use the LCD HIM, DriveExplorer software, and DriveExecutive software to clear faults and alarms. After each demonstration, students will be given an application-based exercise that offers extensive hands-on practice using the PowerFlex 700S drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understand PowerFlex 700S Phase II high-performance AC drive hardware
- Configure parameters using the LCD HIM
- Configure drive parameters using DriveExecutive and DriveExplorer software
- Configure motor control options
- Select speed feedback options
- Upgrade communications module firmware
- Configure a gear-in application
- Configure Synchlink™ communications
- Troubleshoot a PowerFlex 700S Phase II high-performance AC drive
- Install and configure a ControlNet communications adapter
- Install and configure an EtherNet communications adapter

## Who Should Attend?

Individuals responsible for starting up, configuring, maintaining, and troubleshooting PowerFlex 700S Phase II drives

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and knowledge of electrical/industrial safety
- Completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# AutoMax Maintenance and Troubleshooting

(Private Delivery Only)

RE0520

4 Days

**Course Purpose**

This course is designed to provide students with a general understanding of AutoMax hardware and to acquire the necessary skills to interrogate the AutoMax processors for information needed to troubleshoot the system. Students will be provided an opportunity to monitor and load an AutoMax processor and to locate the necessary points for voltage measurements. After completing this course, students will understand AutoMax hardware in order to perform basic troubleshooting.

**Objectives**

After completing this course, students should understand the following topics:

- AutoMax concepts
- Hardware discussion
- AutoMax executive
- Configuration
- PC task
- Basic language
- Control block language

## Who Should Attend?

Individuals who are responsible for the installation, maintenance, and repair of AutoMax systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Familiarity with test equipment and drive systems
- Working knowledge of electricity and knowledge of electrical/industrial safety (including PPE requirements and safe practices)
- Knowledge of basic DC motor and drive fundamentals through the completion of the AC/DC Motors and Drives Fundamentals course (CCA101) or equivalent experience

# PowerFlex 755 Floor-Mounted Drives: Pre-Installation Planning

## VC-PF755H-A

120 Min. CEUs 0.2

**Course Purpose**

This course will help students plan for the successful installation of PowerFlex 755 floor-mounted, frame 8 and larger (300 Hp (200 kW) and above) drives. Students will explore common drive pre-installation topics including specific wiring, mounting, fusing, and option card installation considerations for floor-mounted PowerFlex 755 units. During this course, students will use a variety of available technical documents and tools to help them prepare for installation situations unique to these drives.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Interpret and verify floor-mounted drive catalog numbers
- Prepare for frame 8 and larger drive mounting
- Verify drive option card locations
- Plan for floor-mounted drive
- Fusing and wiring
- Plan floor-mounted drive integration with a motor control center

## Who Should Attend?

Individuals responsible for installing Frame 8 and larger PowerFlex 755 drives

## Prerequisites

- Knowledge of safe electrical practices
- Prior experience working with AC drives
- Experience with wall-mounted (frame 1…7) PowerFlex 750-series drives is helpful, but not required

## Technical Requirements

A computer and phone

# PowerFlex 750-SeriesConfiguration for an Integrated Architecture System

## (Private Delivery Only)

**CCA184**

1 Day | CEUs 0.7

**Course Purpose**

Upon completion of this course, given a PowerFlex 750-Series drive (PowerFlex 753 or PowerFlex 755) that has been successfully started up, students will be able to integrate their drive into a system that includes Logix5000 controllers and PanelView™ Plus terminals running FactoryTalk View ME software. Throughout the course, students will have the chance to use a variety of hardware and software tools, including the A6 LCD HIM, Logix Designer software, and FactoryTalk® View ME software. After each demonstration, students will be given exercises that offer extensive hands-on practice using a PowerFlex 753 or PowerFlex 755 drive.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Add a PowerFlex 750-Series drive to a Logix Designer project
- Locate and modify PowerFlex 750-Series data using Logix Designer software
- Integrate a PowerFlex 750-Series drive with a Logix5000 controller
- Add PowerFlex 750-Series faceplates to a FactoryTalk View ME application
- Operate a PowerFlex 750-Series drive in an Integrated Architecture system

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Individuals who need to add PowerFlex 750-Series drives to an Integrated Architecture system

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of electricity and knowledge of electrical/industrial safety (including PPE requirements and safe practices)
- Completion of the PowerFlex 750-Series Startup & Configuration course (CCA182)
- Knowledge of Logix5000 system fundamentals and basic programming skills through one or more of the following methods:
  - Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146)
  - Logix 5000 software computer-based training
  - Equivalent experience programming Logix5000 control systems
- Previous experience with FactoryTalk View ME software is suggested, but not required

# CenterLine MCC with Intellicenter® Software Commissioning on an EtherNet/IP Network

**CCI108**

3 Days | CEUs 2.1

**Course Purpose**

After completing this course, given a newly installed CENTERLINE MCC with IntelliCENTER software, students should be able to produce an operational motor control system over an EtherNet/IP network. Throughout the course, students will work with a number of hardware and software products, including IntelliCENTER software; E300™ and E3 Plus™ electronic overload relays; PowerFlex 525 and PowerFlex 40 variable speed drives; Stratix 5700 industrial Ethernet switches; Logix5000 controllers and the Studio 5000 Logix Designer application; and FactoryTalk View software. Students will be introduced to a variety of tools they can use to ensure proper functioning of a motor control system. This course also shows how CENTERLINE MCCs interact with other parts of a control system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Verify connections between CENTERLINE MCC sections
- Implement an EtherNet/IP network topology for an MCC
- Configure:
  - Stratix 5700 EtherNet/IP switch settings
  - IntelliCENTER software preferences
  - E300 and E3 Plus electronic overload relays
  - PowerFlex 525 and PowerFlex 40 drive parameters
- Install IntelliCENTER software and data disks
- Modify CENTERLINE MCC lineup properties using IntelliCENTER software
- Add MCC components to a Studio 5000 Logix Designer application
- Enable automatic device configuration for a PowerFlex 525 drive in a CENTERLINE MCC
- Add IntelliCENTER ActiveX controls to a FactoryTalk View application
- Configure and view IntelliCENTER energy software data
- Add documentation to an IntelliCENTER software database
- Modify MCC component spare parts lists in IntelliCENTER software
- Manage IntelliCENTER software databases

## Who Should Attend?

System engineers and/or other individuals responsible for starting the operation of a CENTERLINE motor control center

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical and industrial safety (including PPE requirements and safe practices)
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience

**Job Aids Included**

IntelliCENTER Software Procedures Guide ABT-MCC-TSJ50

# PowerFlex 700 Vector Control Communications Over EtherNet/IP

## (Private Delivery Only)

**CCA165**

1 Day | CEUs 0.7

**Course Purpose**

After completing this course, given a PowerFlex 700 vector control drive that has been successfully started up and configured, students should be able to add their drive to an EtherNet/IP network that includes Logix5000 controllers or PanelView Plus terminals running FactoryTalk View ME software. Throughout the course, students will have the chance to use a variety of hardware and software tools, including: A3 LCD HIM; Studio 5000 Logix Designer application; and drive configuration software (DriveExecutive, Connected Components Workbench). After each demonstration, students will be given exercises that offer extensive hands-on practice using a PowerFlex 700 vector control drive in tandem with a CompactLogix controller and/or PanelView Plus terminal.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Add a PowerFlex 700 vector control drive to a Studio 5000 Logix Designer project
- Import PowerFlex 700 vector control drive control code into a Studio 5000 Logix Designer project
- Create new PowerFlex 700 vector control drive control code in a Studio 5000 Logix Designer project
- Synchronize data and test PowerFlex 700 vector control drive operating modes
- Configure PowerFlex 700 vector control drive peer-to-peer communications

**Job Aids Included**

| | |
|---|---|
| PowerFlex 700 Standard and Vector Control Procedures Guide | ABT-20B-TSJ50 |
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Individuals responsible for commissioning PowerFlex 700 vector control drives on an EtherNet/IP network

## Prerequisites

- Working knowledge of electricity, and knowledge of electrical/industrial safety
- Completion of the PowerFlex 700 Vector Control Configuration and Startup course (CCA161) or equivalent experience
- Knowledge of Logix5000 system fundamentals and basic programming skills through one of the following methods:
  - Completion of the Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming course (CCP151)
  - Completion of available RSLogix 5000/Studio 5000 software computer-based training
- Equivalent on-the-job experience

# SLC 500/RSLogix 500 Training Guide

Rockwell Automation

## UNDERSTAND

START

**PLC-5/SLC 500 and RSLogix Fundamentals**
CCP122 • 2 Days
Private Delivery Only

## PROGRAM OR DESIGN

**SLC 500 and RSLogix 500 Programming**
CCPS41 • 4 Days

## MAINTAIN OR TROUBLESHOOT

**SLC 500 and RSLogix 500 Maintenance and Troubleshooting**
CCPS43 • 4 Days

**SLC 500 and RSLogix 500Advanced Maintenance and Troubleshooting**
CCPS45 • 4 Days
Private Delivery Only

**OEM: SLC 500 and RSLogix 500 Fundamentals and Troubleshooting**
OEM101 • 2 Days

## e-LEARNING

Available in Spanish

**RSLogix 500 Software-Offline Programming**
RSTrainer Computer-Based Training

**RSLinx Software**
RSTrainer Computer-Based Training

**RSLogix 500 Software-Online Monitoring**
RSTrainer Computer-Based Training

**SLC 500-Hardware Fundamentals**
RSTrainer Computer-Based Training

**RSLogix 500 Software-Documenting and Searching**
RSTrainer Computer-Based Training

**SLC 500-Programming Fundamentals**
RSTrainer Computer-Based Training

**RSLogix 500- Software Bundle**
Online Monitoring
Offline Programming
Documenting and Searching

**SLC 500-Fundamentals Bundle**
Hardware Fundamentals
Programming Fundamentals

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# PLC-5/SLC 500 and RSLogix Fundamentals

(Private Delivery Only)

## CCP122

2 Days

**Course Purpose**

This course is an introduction to programmable controller systems. Students will identify the main components of programmable controller systems and describe their functions and describe the flow of information through a programmable controller system. They will receive a thorough introduction to RSLogix 5 or RSLogix 500 software, and will learn how to transfer, monitor, and run projects on a PLC-5 or SLC 500 processor and how to interpret simple ladder logic.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understand programmable controller systems
- Identify common hardware components of processors
- Identify hardware components of I/O systems
- Identify I/O configurations
- Get started with programming systems
- Change the radix (base) of a number
- Set up communications between a programming system and a processor
- Identify PLC-5 and SLC 500 system addresses
- Interpret ladder logic
- Interpret Timer On-Delay (TON) and Count Up (CTU) instructions

## Who Should Attend?

Individuals who:

- Have little or no working experience with programmable controller systems
- Are preparing for the following courses: PLC-5 and RSLogix 5 Programming (CCP410), SLC 500 and RSLogix 500 Programming (CCPS41), PLC-5 and RSLogix 5 Maintenance and Troubleshooting (CCP412), and SLC 500 and RSLogix 500 Maintenance and Troubleshooting (CCPS43)

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

# SLC 500 and RSLogix 500 Programming

## CCPS41

4 Days

**Course Purpose**

This course provides students with the resources and hands-on practice to program an SLC 500 processor. Students will create a step-by-step program to meet the requirements of a given functional specification. As each section of the program is built, students will gain experience that can be applied to more advanced RSLogix 500 projects.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Communicate with a SLC 500 processor
- Create a new project and draft ladder logic
- Determine addresses and assign symbols
- Determine program flow and create subroutines
- Select and program timer, counter, math, data handling, and comparison instructions
- Enter and search for documentation
- Organize the data table
- Enter, edit, and verify ladder logic
- Test a project
- Configure and preview a project report

## Who Should Attend?

Individuals who are responsible for programming SLC 500 applications using RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Experience with basic control and electrical principles
- Working knowledge of programmable controllers

OR

- Completion of the PLC-5/SLC 500 and RSLogix Fundamentals course (CCP122)

**Job Aids Included**

| | |
|---|---|
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |

# SLC 500 and RSLogix 500 Maintenance and Troubleshooting

## CCPS43

4 Days

**Course Purpose**

This skill-building course provides the necessary practice needed to interpret, isolate, and diagnose common hardware problems related to noise, power, and discrete and analog I/O. In troubleshooting scenarios, students will be introduced to basic ladder logic interpretation, which is applied to diagnostic tasks. Students practice these diagnostic skills by tracing through ladder logic instructions in an RSLogix 500 project.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Communicate with a SLC 500 processor
- Identify memory layout and SLC 500 system addresses
- Monitor and enter data
- Search, document, and edit ladder logic
- Interpret various ladder logic instructions
- Configure and preview a project report
- Troubleshoot processor, power supply, and noise-related problems
- Troubleshoot discrete and analog I/O problems
- Create a histogram
- Force inputs and outputs
- Maintain and troubleshoot a SLC 500 system

Top 20

## Who Should Attend?

Individuals who need to troubleshoot and maintain SLC 500 systems using RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Experience maintaining electrically controlled systems
- Working knowledge of programmable controllers or completion of the PLC-5/SLC 500 and RSLogix Fundamentals course (CCP122)

**Job Aids Included**

| | |
|---|---|
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |
| SLC 500 and RSLogix 500 Troubleshooting Guide | ABT-1747-TSJ22 |

# SLC 500 and RSLogix 500 Advanced Maintenance and Troubleshooting

## (Private Delivery Only)

CCPS45

4 Days CEUs 2.8

**Course Purpose**

This course provides the practice needed to interpret, isolate, and diagnose problems found in advanced SLC 500 applications. In troubleshooting scenarios, students will interpret and modify advanced ladder logic instructions by operating a variety of simulation devices and software HMI applications, such as PanelView terminals, and RSView®32 software applications. Students will practice these diagnostic skills by tracing through ladder logic instructions and troubleshooting communication problems with DH+ and remote I/O networks.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Setup a SLC 500 system on a DH+ network
- Troubleshoot RSLogix 500 projects containing the following:
  - STI, DII, program flow/interrupt, and fault routines
  - Immediate I/O update, shift register, sequencer, and PID instructions
  - Indexed and indirect addressing
  - Message instructions for DH+ communications
  - Remote I/O addressing
  - Discrete data transfers on a remote I/O link
  - Block transfers on a remote I/O link
- Apply preventative maintenance and troubleshooting strategies

## Who Should Attend?

Individuals who are responsible for maintaining and troubleshooting advanced SLC 500 applications using RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Experience maintaining electrically controlled systems
- Completion of the SLC 500 and RSLogix 500 Maintenance and Troubleshooting course (CCPS43)

**Job Aids Included**

| | |
|---|---|
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |
| SLC 500 and RSLogix 500 Troubleshooting Guide | ABT-1747-TSJ22 |

# OEM: SLC 500 and RSLogix 500 Fundamentals and Troubleshooting

## OEM101

2 Days CEUs 1.4

**Course Purpose**

This course provides students with the resources and hands-on practice required to maintain and troubleshoot an RSLogix 500 application on a SLC 500-based machine. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology used with SLC 500 hardware and RSLogix 500 software. Students will also practice diagnosing and troubleshooting problems with Controller, I/O, or other hardware issues.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Communicate with a processor
- Determine addresses
- Draft basic ladder logic
- Program bit, timer, counter, math, and compare instructions
- Search ladder logic
- Force I/O and toggle bits
- Configure a histogram

### Who Should Attend?

OEMs who need to maintain and troubleshoot SLC 500 applications using RSLogix 500 software

### Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Perform basic voltage and current checks
- Read wiring diagrams

***Curriculum Note:***

*This course contains many of the lessons in courses CCP122 and CCPS43 in an accelerated format. Do not take this course with the other two courses.*

**Job Aids Included**

| | |
|---|---|
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |
| SLC 500 and RSLogix 500 Troubleshooting Guide | ABT-1747-TSJ22 |

## UNDERSTAND

## CERTIFICATIONS

Private Delivery Only

**Vibration Analysis: Level I**

EK-ICM201 • 3.5 Days

Optional Exam Last Half Day of Class

Private Delivery Only

**Vibration Analysis Fundamentals**

EK-ICM101 • 3 Days

# Vibration Analysis Fundamentals

(Private Delivery Only)

## EK-ICM101

3 Days

**Course Purpose**

This course is designed for the new user of vibration analysis or predictive maintenance instrumentation or for the individual that desires to become more familiar with the basics of vibration. The relationship between the mechanical condition of machinery and vibration is presented. This background helps show how vibration detection and analysis can be used in a cost-effective program to identify machinery problems and schedule repairs to avoid costly machine downtime.

**Objectives**

After completing this course, students should understand the following topics and tasks:

- Introduction to vibration technology, vibration analysis, and dynamic balancing
- Characteristics of vibration
- Relate vibration frequency, amplitude, and phase to machine condition
- Review of severity charts
- Differences between displacement, velocity, and acceleration
- Instruments for vibration detection and analysis
- Transducer selection and mounting methods
- Calculate trial and correction weights
- Identify the most common machinery problems
- Implement a predictive maintenance program

## Who Should Attend?

Maintenance supervisors, mechanics, technicians, engineers or analysts involved in the maintenance or operation of plant machinery

## Prerequisites

There are no prerequisites for this course

# Vibration Analysis: Level I

(Private Delivery Only)

## EK-ICM201

3.5 Days

**Course Purpose**

The fundamental information necessary to implement and operate a successful predictive maintenance program is presented in this seminar. Vibration basics and the relationship between vibration and machinery condition are reviewed. Proven techniques for specifying meaningful overall and spectrum band alarm limits for a wide variety of machinery are presented. The material in this course is applicable to all vendors' vibration data collection or analysis equipment. Case histories are used extensively throughout the course to emphasize the practical application of the material. An optional certification test is administered during the last half day of this course.

**Objectives**

After completing this course, students should understand the following topics:

- Characteristics of vibration and review of severity charts
- Relate time waveform and vibration frequency
- Digital vs. analog overall vibration measurement
- Vibration transducer overview and selection criteria
- Role of spike energy, HFD, and shock pulse and alarm levels
- Vibration signature analysis to diagnose machine problems
- How to track rolling element bearing health
- Methods for specifying spectral alarm band levels and frequencies
- Common pitfalls in vibration measurements

### Who Should Attend?

- Mechanics, technicians, engineers, or analysts involved in the maintenance or operation of plant machinery

### Prerequisites

- 6 months or more of field experience
- Completion of the Vibration Analysis Fundamentals (EK-ICM101), or similar, course

## UNDERSTAND

**PID Loop Development and Tuning**
PRS010 • 1 Day
Private Delivery Only

## PROGRAM OR DESIGN

**Studio 5000 Logix Designer Level 4: Function Block Programming**
CCP152 • 2 Days

**AADvance Comprehensive System Training**
PRST9063LD • 3 Days
Private Delivery Only

**FactoryTalk View SE Programming**
CCV207 • 4.5 Days

**FactoryTalk Historian Site Edition Configuration and Data Collection**
RS-FTHSEC • 3.5 Days

**FactoryTalk VantagePoint Configuration and Reporting**
FTVP • 3 Days

**Advanced Logix5000 Programmer Certificate**
CCP251 • 4 Days

**PlantPAx System Design and Configuration**
PRS019 • 4.5 Days
Private Delivery Only

**Studio 5000 Logix Designer Level 3: Project Development**
CCP143 • 4 Days

**Studio 5000 Logix Designer Level 4: Structured Text/ Sequential Function Chart Programming**
CCP154 • 2 Days
Private Delivery Only

**FactoryTalk Batch Project Design and Implementation**
PRS101-LD • 5 Days

**PlantPAx System Configuration Fundamentals**
PRS013 • 5 Days

**Pulp and Paper Application Suite Configuration**
PRS017 • 2 Days
Private Delivery Only

## MAINTAIN OR TROUBLESHOOT

**Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting**
CCP299 • 4.5 Days

**AADvance Operation, Maintenance, and Troubleshooting**
PRST9064LD • 2 Days
Private Delivery Only

**EtherNet/IP Configuration and Troubleshooting**
CCP183 • 3 Day

**NetLinx System Maintenance and Troubleshooting**
CCP177 • 4 Days
Private Delivery Only

Combination of DeviceNet, ControlNet and EtherNet/IP Maintenance Topics

# PlantPAx System Configuration Fundamentals

PRS013

4.5 Days CEUs 3.2

**Course Purpose**

This course is intended for control engineers who have a background in process control – but are new to Rockwell Automation. This course introduces new students to the core components of a PlantPAx process control system, including controllers, HMI, networks, and instrumentation devices. Students will look at the individual components and see their relationships to the complete system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify a PlantPAx system
- Locate ControlLogix components and organize ControlLogix data
- Create and organize a new project
- Configure device-level ring
- Program a function block diagram
- Configure PlantPAx AOI and devices using HART
- Use tag placeholders
- Configure global objects and PlantPAx faceplates
- Create a graphic display, tag database, alarm, data log model, and trend
- Set up reporting
- Configure security
- Program and tune a PID loop
- Program considerations for applications and structured text
- Design an SFC
- Determine workstation layout
- Configure redundancy

## Who Should Attend?

Individuals who have a background in process control applications who are new to Rockwell Automation

## Prerequisites

- Basic knowledge of process control

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| FactoryTalk View SE Procedures Guide | ABT-9701SE-TSJ50 |

# Pulp and Paper Application Suite Configuration

(Private Delivery Only)

PRS017

2 Days CEUs 1.4

**Course Purpose**

Upon completion of this course, students will be able to use a Rockwell Automation application suite to develop effective control applications for a PlantPAx process automation system. The focus of this course will be on the pulp and paper industry and applications. In this course, students will have the opportunity to create, configure, and develop working code to address a variety of application scenarios. Students will realize the benefits of using a Rockwell Automation application suite through a combination of instruction and hands-on experience, which emphasize concepts, common features, and functions.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate components of the application suite
- Recognize common functions and configuration options in the application suite
- Program and configure Logix Designer and FactoryTalk View SE systems
- Recognize industry-specific functions
- Select functions through configuration
- Operate and troubleshoot
- Locate reference material and access ongoing support
- Analyze and interpret application requirements
- Identify the repeatable portions of an application
- Determine the optimum use of the application suite for control applications
- Modifying an application
- Coordinate, sequence, and manage equipment

## Who Should Attend?

Individuals who need to maintain and/or troubleshoot a system which utilizes a Rockwell Automation application suite

## Prerequisites

- Completion of the PlantPAx Process System Configuration course (PRS013) or
- Personal experience with process applications, ControlLogix systems and programming, including basic ladder logic instructions, and FactoryTalk View SE applications

# Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting

## CCP299

4.5 Days CEUs 3.2

**Course Purpose**

Upon completion of this course, students should be able to troubleshoot a previously operational ControlLogix system and restore normal operation. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology, practicing a systematic strategy for diagnosing and troubleshooting problems, and performing hands-on exercises.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Locate CompactLogix system components
- Navigate through the Logix Designer application
- Connect a computer to a communications network
- Download and go online
- Locate I/O tags and devices
- Interpret Logix Designer project organization and execution
- Interpret ladder logic structure
- Locate and edit tag values
- Interpret bit and frequently used instructions
- Interpret arrays
- Interpret tags of user defined data types
- Search for project components
- Force I/O and toggle bits
- Troubleshoot digital I/O, analog I/O, remote I/O, controller, power supply, and noise related problems
- Update Logix5000 firmware
- Analyze and troubleshoot a system using a trend chart
- Edit ladder logic online
- Manage Logix Designer project files
- Document and print components

**Job Aids Included**

| | |
|---|---|
| RSLogix 5000 and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

TOP 20

## Who Should Attend?

This course is intended for individuals who need to maintain and troubleshoot a ControlLogix system – but have no current working experience with ControlLogix systems.

## Prerequisites

- Ability to perform basic Microsoft Windows® tasks
- Knowledge of basic ladder logic instructions (bit, timer, counter, etc.) through previous training and/or personal experience

*This course is intended for maintainers. Some topics may be similar to topics covered in course CCP146, CCP153, and CCP298.*

# Advanced Logix5000 Programmer Certificate

CCP251

4 Days CEUs 2.8

**Course Purpose**

This course is for individuals who can quickly learn and apply Logix 5000™ concepts, terminology, hardware, and the Studio 5000 Logix Designer® programming environment. You will learn about more advanced programming methods and instructions, project execution and optimization, controller project security and event logging, and tools available in the Studio 5000 Automation Engineering & Design Environment®.

**Objectives**

After completing this course, you should be able to perform advanced ControlLogix® and Studio 5000 Logix Designer® tasks, such as:

- Programming advanced instructions
- Optimizing tags/parameters, program execution, and controller performance
- Utilizing Studio 5000 Logix Designer tools
- Managing controller information and security

Additionally, you will be introduced to Integrated Architecture Builder® and Studio 5000 Architect® software.

## Who Should Attend?

Individuals responsible for programming Logix5000 controllers using the Studio 5000 Logix Designer application. Also, those who need to learn how to draft ladder logic for any application.

## Prerequisites

- Completion of either of the following courses:
  - Accelerated Logix 5000 Programmer Certificate Course Level 1 (Course Number CCP250)
  - Studio 5000 Logix Designer Level 3: Project Development
- Pursuit of a Logix 5000 Certificate for Programmers.

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

# FactoryTalk View SE Programming

## CCV207

4.5 Days CEUs 3.2

**Course Purpose**

This course will aid students in developing FactoryTalk View Site Edition (SE) applications. All aspects of the FactoryTalk View SE software are presented, followed by interactive hands-on lab assignments emphasizing application of the concepts in an industrial setting. Students will have the opportunity to create an application and build graphic displays. Students will work with RSLinx Enterprise communications software and the FactoryTalk diagnostics system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure RSLinx enterprise communications
- Configure OPC communications
- Create a network FactoryTalk View SE application
- Create graphic displays
- Build and animate an interactive graphic display
- Configure global objects
- Configure HMI tag-based alarms and FactoryTalk alarms/events
- Create and configure a trend
- Create macros, symbols, and keys
- Create an HMI tag database
- Use tag placeholders and create a FactoryTalk View SE client
- Create and view a data log model
- Create a derived tag tile and an event file
- *Optional:* Add VBA display code

**Job Aid Included**

FactoryTalk View SE Procedures Guide ABT-9701SE-TSJ50

Top 20

## Who Should Attend?

Individuals who need to develop FactoryTalk View SE local (stand-alone) or network (distributed) applications

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

# Studio 5000 Logix Designer Level 4: Function Block Programming

## CCP152

2 Days CEUs 1.4

**Course Purpose**

This course provides students with an understanding of Logix Designer function block diagrams and terminology. Resources and hands-on practice are provided to program a Logix5000 controller using function block diagrams. Students will perform parameter modifications to individual function block instructions and create and develop function block diagram programs and routines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a function block diagram
- Program logical function block instructions
- Program timer and counter function block instructions
- Program analog function block instructions
- Program device driver function block instructions
- Select timing modes in a function block instruction
- Program a totalizer function block instruction
- Program and monitor an RMPS (ramp/soak) function block instruction
- Control program flow using function block instructions
- Program a PID loop using a function block diagram
- Tune a PID loop using ActiveX controls
- Develop an add-on instruction in function block diagram

**Job Aid Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Top 20

Individuals who:

- Are responsible for developing, debugging, and programming Logix5000 controllers using Logix Designer application with function block diagrams
- Use ActiveX controls in an operator interface such as FactoryTalk View ME software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Understanding of basic measurement and control theory, including basic loop control
- Completion of the Studio 5000 Logix Designer Level 3: Project Developing course (CCP143) or equivalent experience

# Studio 5000 Logix Designer Level 4: Structured Text/Sequential Function Chart Programming

(Private Delivery Only)

CCP154

2 Days CEUs 1.4

**Course Purpose**

This course provides students with the skills and knowledge to program using the structured text and sequential function chart programming languages. Students will learn how to select instructions, expressions, and constructs, and then enter these elements and more into a routine. Students will also learn how to test sequential function chart logic using forces and step throughs.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Program assignments, expressions, and instructions in structured text
- Program constructs and comments in structured text
- Design a sequential function chart
- Program and test a sequential function chart
- Store, pause, and reset sequential function chart data

**Job Aid Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Individuals who need to program structured text and sequential function chart routines in Logix Designer projects for any Logix5000 controller

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) or experience with basic Logix Designer projects (navigating the software, creating tags, creating routines, etc.)

# FactoryTalk VantagePoint Configuration and Reporting FTVP

3 Days

**Course Purpose**

In this course, students will learn various tools to analyze and display data using FactoryTalk VantagePoint and/or VantagePoint EMI. The course covers how to use the analysis and reporting tools to create trends, Excel reports, and dashboards. Students will have an opportunity to use the Portal and configure it to display content in various ways. The course also focuses on extending the model in the product and configuring security. Upon completion of the course, students will be able to utilize many tools and techniques for the display, analysis and reporting of data using FactoryTalk VantagePoint EMI.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Introduction to FactoryTalk VantagePoint
- Configuring FactoryTalk Data Sources in FactoryTalk VantagePoint Software
- Creating and Publishing Trend and Excell Reports in FactoryTalk VantagePoint Software
- Creating and Configuring Incuity Tags in FactoryTalk VantagePoint Software
- Working with Calculated Tags in FactoryTalk VantagePoint Software
- Creating and Using a Microsoft SQL Server Database Connector in FactoryTalk VantagePoint Software
- Creating and Using Types and Type Reports in FactoryTalk VantagePoint Software
- Importing Logix Controller Structures in FactoryTalk VantagePoint Software
- Creating Cascading Excel Reports in FactoryTalk VantagePoint Software
- Creating Composite and Dashboard Reports in FactoryTalk VantagePoint Software
- Customizing the FactoryTalk VantagePoint Portal
- Creating Status Indicators in FactoryTalk VantagePoint Software
- Configuring Security in FactoryTalk VantagePoint Software
- Using Mobility Features in FactoryTalk VantagePoint Software


## Who Should Attend?

- Developers or engineers who will work with FactoryTalk VantagePoint EMI applications and need to view, analyze, and create reports

## Prerequisites

Experience with:

- Microsoft SQL Server 2008
- Microsoft Office Excel 2010
- ControlLogix and FactoryTalk products and terminology

# PID Loop Development and Tuning

(Private Delivery Only)

**PRS010**

1 Day CEUs 0.7

**Course Purpose**

This course enables students to develop an understanding of process control by allowing them to practice PID control methods. This course prepares students for further process control classes with more specialized applications and design involvement. This course provides students with the skills needed to obtain a tuned process control loop for typical applications. Students will create and develop a process model; calculate proportional, integral, and derivative gains; verify gains using ladder diagram; practice PID programming in function block diagram and learn how to autotune typical PID loops.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a process reaction curve
- Develop a process model
- Determine the control action
- Configure program timing
- Program a simple PID loop using function block diagram
- Calculate and verify PID gains
- Autotune a PID loop

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Individuals who need to learn:

- How to make basic PID design decisions
- How to program and configure PIDE instructions using function block diagram
- How to tune basic PID loops using manual methods and ladder diagram
- How to autotune

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience
- ISA Process Control Fundamentals training or equivalent experience is recommended but not required
- Knowledge of automation systems and experience using function block diagram programming language or attending training (CCP152) is helpful but not required

# PlantPAx System Design and Configuration

(Private Delivery Only)

PRS019

4.5 Day CEUs 3.2

**Course Purpose**

This course enables students to develop an understanding of process control by allowing them to practice PID control methods. This course prepares students for further process control classes with more specialized applications and design involvement. This course provides students with the skills needed to obtain a tuned process control loop for typical applications. Students will create and develop a process model; calculate proportional, integral, and derivative gains; verify gains using ladder diagram; practice PID programming in function block diagram and learn how to autotune typical PID loops.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Architecting a PlantPAx Distributed Control System
- Verifying a PlantPAx Distributed Control System Architecture Using the PlantPAx System Estimator
- Configuring a PlantPAx Distributed Control System Using Studio 5000 Architect™ Software
- Configuring a Studio 5000 Logix Designer® Project for a PlantPAx Application
- Developing PlantPAx Application Code Using the Rockwell Automation Library of Process Objects
- Developing a PlantPAx HMI Application Using the Rockwell Automation Library of Process Objects
- Configuring a Sequencer in a PlantPAx Application
- Configuring Alarms for a PlantPAx Application
- Configuring Basic FactoryTalk® Security for Use in a PlantPAx Distributed Control System
- Configuring Software Product Security in a PlantPAx Distributed Control System

## Who Should Attend?

System Integrators who have a background in automated process control and Rockwell Automation products should attend this course. This course covers concepts related to PlantPAx components. For details on the topics covered, please see the Course Agenda.

## Prerequisites

- PlantPAx System Configuration Fundamentals (Course No. PRS013) or
- Practical work experience with process applications, ControlLogix® systems and programming, and FactoryTalk® View SE applications

# FactoryTalk Batch Project Design and Implementation

## PRS101-LD

5 Days

**Course Purpose**

This course is designed to provide students with a complete overview of the design and implementation of a batch project using FactoryTalk Batch software. This includes an introduction to batch processing and to the ANSI/ISA S88.01 Standard. FactoryTalk Batch system architecture, system operation, and system configuration are covered in detail.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define batching and the S88 Standard
- Work in FactoryTalk Batch and FactoryTalk View
- Define an area model from a P&ID
- Use FactoryTalk Equipment Editor
- Translate a product definition into a recipe
- Configure the FactoryTalk Recipe Editor including the basic mechanics, divergent flow, class-based recipes, and enhanced unit binding
- Configure Batch Archiver and enhanced batch reporting
- Interface with the FactoryTalk Batch API and ActiveX controls
- Perform system administration tasks related to file structure, project folder, and security
- Equipment Phase–FactoryTalk Batch Communications (phase design and equipment phase instructions)
- Integrate manual phases and FactoryTalk Batch eProcedure
- Integrate material-based phases and the FactoryTalk Batch Material Manager

## Who Should Attend?

Supervisors, operators, formulators, and engineers who will be involved with the installation, setup, and operation of a FactoryTalk Batch system

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Familiarity with S88 Batch Standard is helpful

# FactoryTalk Historian Site Edition Configuration and Data Collection

## RS-FTHSEC

3.5 Days

**Course Purpose**

This course will provide students with an overview of the various FactoryTalk Historian tools for collecting data. Students will learn how to configure a FactoryTalk Historian Site Edition system and how to use Microsoft Excel to create and modify FactoryTalk Historian tags. During the course, students will learn how to apply exception and compression to filter data to be archived. Students will be given an opportunity to compare the use of Polled versus Advised data collection modes and learn about data buffering, layers/methods of redundancy, archive management and backup. Upon completion of the course, students will have gained exposure to the many aspects of the FactoryTalk Historian system and be able to install and configure FactoryTalk Historian to collect data.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- FactoryTalk Historian (SE and ME)
- Understanding Tags and Using Excel Tag Configurator
- Using FactoryTalk Vantage Point
- Understanding and Using Exception and Compression
- FactoryTalk Historian Tag Types
- Using Performance Equation and Totalizers
- Working with Digital States
- Using Asset Framework and Event Frames
- Using Health Points and Performance
- Monitor Tags
- Using and Displaying Audit Information Using Archive Management Tools
- Scheduling Backups of FactoryTalk
- Historian Data
- Using FactoryTalk View SE Trend to Display
- FactoryTalk Historian Data
- Backfilling Data into a FactoryTalk
- Historian Server
- FactoryTalk Historian SE High Availability

## Who Should Attend?

Field engineers, MPS, pre-sales consultants, and support individuals who need to install and configure FactoryTalk Historian Site Edition for data collection

## Prerequisites

- Working familiarity with the Microsoft Windows® environment
- Completion of Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course Number CCP146) or knowledge of common ControlLogix terminology and the ability to program and interpret basic ladder logic instructions in Studio 5000 software

# Studio 5000 Logix Designer Level 3: Project Development

## CCP143

4 Days CEUs 2.8

**Course Purpose**

Given a functional specification for a Logix5000 application, students will be able to develop a project during the course to meet the specification requirements. This course covers tasks common to all controllers that use the Logix5000 control engine or operating system, including ControlLogix, CompactLogix, and SoftLogix™ controllers. This course presents a deeper understanding of project development tasks, such as organizing tasks and routines, organizing controller data, configuring modules, and sharing data. Students will use Producer/Consumer technology to multicast input and output devices, share data between controllers, and control remote I/O.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create and organize a project
- Create periodic and event tasks
- Develop an add-on instruction in ladder diagram
- Organize arrays
- Create a user-defined data type
- Import components
- Enter, edit, and verify ladder logic
- Configure a controller to produce and consume data
- Configure controllers to share data over EtherNet/IP™
- Communicate with a local 1756-I/O module and over an EtherNet/IP network
- Configure a message
- Allocate connections
- Retrieve and set controller status values with GSV/SSV instructions
- Program a BTD instruction
- Handle a major fault
- Manage project files
- Update firmware

**Job Aids Included**

Studio 5000 Logix Designer and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Top 20

Individuals who need to develop Studio 5000 Logix Designer® projects for any Logix5000 controller

## Prerequisites

- Ability to perform basic Microsoft Windows tasks
- Knowledge of common controller terms and operation through experience or one of the following courses:
  - Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course No. CCP146)
  - RSTrainer for ControlLogix Fundamentals computer-based training (9393-RSTCLX)
- Ability to write basic ladder logic with common instructions, such as bit, timer, counter, move, and comparison instructions through experience or this course:
  - Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming (Course No. CCP151)

# AAdvance Comprehensive System Training

(Private Delivery Only)

## PRST9063LD

3 Days

**Course Purpose**

This course provides a comprehensive overview of AADvance hardware, software, and troubleshooting. Upon successful completion of this course, students should be able to understand how AADvance operates as a fail-safe or fault tolerant controller; understand the configuration limits of the system; examine process I/O requirements and select the appropriate hardware; design and assemble a complete system; use the Workbench to configure and program the system, including communication with external devices; develop functions, function blocks and programs using standard IEC 61131 programming languages; make hardware expansions to an existing system; and isolate faults to the module level by interpreting automatic fault indications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize system architectures
- Identify components
- Install and wire a system
- Develop a program
- Simulate and test a project
- Download and monitor a project
- Create and use functions and function blocks
- Update a running project
- Map a binding between controllers
- Manage version source control
- Protect a project
- Import and export elements
- Archive and restore a project
- Configure OPC communication
- Troubleshoot a system
- Develop a project

## Who Should Attend?

Individuals who are responsible for designing, building, programming, and troubleshooting an AADvance system

## Prerequisites

- General knowledge of programmable logic controllers (PLCs)
- Background in industrial electronic control principles and practices

***Curriculum Note:***

*Do not take both PRST9063LD and PRST9064LD because they share similar content. If your responsibilities are limited to maintaining and troubleshooting the AADvance system, take this course instead: AADvance Operation, Maintenance, & Troubleshooting (PRST9064LD)*

# AAdvanced Operation, Maintenance, and Troubleshooting

(Private Delivery Only)

## PRST9064LD

2 Days

**Course Purpose**

This course provides an overview of AADvance hardware, software, and troubleshooting. The course consists of a mixture of lecture and hands-on lessons. Upon successful completion of this course, students should be able to understand how AADvance operates as a fail-safe or fault tolerant controller; understand the configuration limits of the system; navigate the workbench; monitor programs; lock/force I/O points; isolate faults to the module level by interpreting automatic fault indications; and hot-replace failed modules without disrupting the systems or process.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize system architectures
- Identify components
- Install and wire a system
- Develop a program
- Download and monitor a project
- Update a running project
- Manage version source control
- Troubleshoot a system

***Curriculum Note:***

*Do not take both PRST9063LD and PRST9064LD because they share similar content. If you are responsible for designing, building, or programming an AADvance system take this course instead: AADvance Comprehensive System Training (PRST9063LD)*

## Who Should Attend?

Individuals responsible for maintaining and troubleshooting the AADvance system

## Prerequisites

- General knowledge of programmable logic controllers (PLCs)
- Background in industrial electronic control principles and practices

# Netlinx System Maintenance and Troubleshooting

(Private Delivery Only)

**CCP177**

4 Days | CEUs 2.8

### Course Purpose

This course is designed to provide students with the necessary skills to effectively maintain and troubleshoot DeviceNet™, ControlNet™, and EtherNet/IP™ hardware and software. Students will build their skills by using troubleshooting best practices and network troubleshooting tools; gain experience troubleshooting DeviceNet, ControlNet, and EtherNet/IP networks by maintaining connectivity to the networks; and learn a variety of software packages and hardware indicators to ensure that the Logix5000 controllers and devices on the networks maintain communications to sustain optimal performance.

### Objectives

After completing this course, students should be able to perform the following tasks:

- Identify NetLinx networks and hardware components of an EtherNet/IP system
- Connect a computer to a Logix5000 system over an EtherNet/IP network
- Troubleshoot EtherNet/IP network media components
- Monitor/troubleshoot EtherNet/IP media components
- Identify ControlNet media components/ signal measuring equipment
- Connect to a ControlNet network using RSLinx classic software
- Troubleshoot a scheduled ControlNet data connection for a ControlLogix controller
- Troubleshoot a ControlNet network using RSNetWorx™ for ControlNet software
- Identify DeviceNet network components
- Commission nodes on, and troubleshoot, a DeviceNet network
- Troubleshoot a DeviceNet network using RSNetWorx for DeviceNet software

## Who Should Attend?

Individuals who are responsible for maintaining and troubleshooting existing DeviceNet, ControlNet, and EtherNet/IP networks

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or equivalent experience

***Curriculum Note:***

*This course is intended for maintainers. Some topics may be similar to topics covered in courses CCP164 and CCP173.*

### Job Aids Included

| | | | |
|---|---|---|---|
| ControlNet and RSNetWorx Troubleshooting Guide | ABT-N200-TSJ20 | DeviceNet and RSNetWorx Procedures Guide | ABT-N100-TSJ50 |
| ControlNet and RSNetWorx Procedures Guide | ABT-N200-TSJ50 | EtherNet/IP Procedures Guide | ABT-N300-TSJ50 |
| DeviceNet and RSNetWorx Troubleshooting Guide | ABT-N100-TSJ20 | Studio 5000 Logix Designer and Logix 5000 Procedures Guide | ABT-1756-TSJ50 |

# EtherNet/IP Configuration and Troubleshooting

## CCP183

3 Day CEUs 2.1

**Course Purpose**

This course will assist students in developing fundamental knowledge of industrial communications over an EtherNet/IP network. Students will learn basic concepts and learn how to use various tools to assign IP addresses to EtherNet/IP devices. This course prepares students to effectively resolve issues with communications between a controller and the devices it is controlling. Students will troubleshoot EtherNet/IP network media and components, including a Stratix 5700, 8000 and/or 8300 switch. Students will have an opportunity to monitor diagnostic information using web-based technologies and modify web server module data views and tag values.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Ping a module IP address
- Assign IP addresses using:
  - RSLinx classic software and rotary switches
  - BOOTP-DHCP server software
- Isolate an EtherNet/IP network problem
- Diagnose problems with EtherNet/IP modules and network components
- Monitor an EtherNet/IP network using web-enabled technologies

**Job Aids Included**

Ethernet/IP Procedures Guide ABT-N300-TSJ50

## Who Should Attend?

Individuals who are responsible for maintaining Industrial Automation and Control Systems (IACS) networks

## Prerequisites

Completion of the Studio 5000 Logix Designer Level 1: ControlLogix Systems

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

# Visualization/HMI Training Guide

Rockwell Automation

## UNDERSTAND

Private Delivery Only

**Introduction to the Integrated Architecture System**
CIA101 • 2 Days

## PROGRAM OR DESIGN

**FactoryTalk View ME and PanelView Plus Programming**
CCV204-A • 4 Days

**FactoryTalk View SE Programming**
CCV207 • 4.5 Days

**FactoryTalk ViewPoint Implementation**
VC-FTVIEW-A • 90-Min. Session

**SI: FactoryTalk View SE Configuration**
SI101 • 3 Days

**Studio 5000 View Designer and PanelView 5500 Programming**
CCV210 • 3 Days

## MAINTAIN OR TROUBLESHOOT

**FactoryTalk View ME and PanelView Plus Maintenance and Troubleshooting**
CCV209-A • 2 Days

**OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000 and PowerFlex 40 Fundamentals and Troubleshooting**
OEM100 • 4 Days

**ThinManager Configuration and Maintenance**
SPE201-LD • 2 Days

## e-LEARNING

**FactoryTalk View Machine Edition- Applications and Displays**
RSTrainer Computer-Based Training

**FactoryTalk View Machine Edition- Drawing Objects**
RSTrainer Computer-Based Training

**FactoryTalk View Machine Edition- Interactive Objects**
RSTrainer Computer-Based Training

**FactoryTalk View Machine Edition- Bundle**
Applications and Displays
Drawing Objects
Interactive Objects

Introduction to Automation iBook Available on iTunes

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

# FactoryTalk View ME and PanelView Plus Programming

## CCV204-A

4 Days CEUs 2.8

**Course Purpose**

This course is a skill-building course that provides students with the skills necessary to develop FactoryTalk View Machine Edition (ME) applications that run on the next-generation PanelView Plus terminals. During class, students will gain hands-on skills, like preparing a PanelView Plus terminal for operation, creating a new application and run it on a terminal, creating/configuring/animating graphic objects on graphic displays, configuring security for granting/restricting access to certain graphic displays or for rights to perform certain actions, and creating/configuring messages and alarms for alerting operators to changes in a process.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure a PanelView Plus terminal, RSLinx enterprise communications, FactoryTalk security, and display security
- Create and customize a FactoryTalk View ME application
- Create and modify tags and graphic objects
- Add and configure graphic display
- Create and manipulate graphic objects
- Create and configure interactive controls, information messages, alarms, and macros
- Create and manage FactoryTalk View ME runtime files
- Configure basic animation for FactoryTalk View ME objects, recipes with the RecipePlus system, and language switching
- Create data logs and trends, tag placeholders, and parameter files
- Add global objects
- Insert faceplates

**Job Aid Included**

FactoryTalk ME and PanelView Plus Procedures Guide ABT-2711P-TSJ50

Top 20

### Who Should Attend?

Individuals who need to create FactoryTalk View ME applications for use on a PanelView Plus terminal

### Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) OR
- Basic experience with ControlLogix tags and architecture

# FactoryTalk View SE Programming

## CCV207

4.5 Days CEUs 3.2

**Course Purpose**

This course will aid students in developing FactoryTalk View Site Edition (SE) applications. All aspects of the FactoryTalk View SE software are presented, followed by interactive hands-on lab assignments emphasizing application of the concepts in an industrial setting. Students will have the opportunity to create an application and build graphic displays. Students will work with RSLinx Enterprise communications software and the FactoryTalk diagnostics system.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure RSLinx enterprise communications
- Configure OPC communications
- Create a network FactoryTalk View SE application
- Create graphic displays
- Build and animate an interactive graphic display
- Configure global objects
- Configure HMI tag-based alarms and FactoryTalk alarms/events
- Create and configure a trend
- Create macros, symbols, and keys
- Create an HMI tag database
- Use tag placeholders and create a FactoryTalk View SE client
- Create and view a data log model
- Create a derived tag tile and an event file
- *Optional:* Add VBA display code

**Job Aid Included**

FactoryTalk View SE Procedures Guide ABT-9701SE-TSJ50

Top 20

## Who Should Attend?

Individuals who need to develop FactoryTalk View SE local (stand-alone) or network (distributed) applications

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

# FactoryTalk View ME and PanelView Plus Maintenance and Troubleshooting

## CCV209-A

2 Days CEUs 1.4

**Course Purpose**

This course provides students with the skills necessary to maintain and troubleshoot FactoryTalk View Machine Edition (ME) applications that run on PanelView Plus terminals. This course provides opportunities to work with both the hardware and software. Students will gain the hands-on skills required to prepare a PanelView Plus terminal for operation. Students will work with FactoryTalk View ME software and RSLinx Enterprise software and will practice downloading FactoryTalk View ME applications to a PanelView Plus terminal.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Replace components on a PanelView Plus terminal
- Set options on a PanelView Plus terminal
- Manage runtime files on a PanelView Plus terminal
- Manage development files using the application manager
- Modify RSLinx Enterprise communications in a FactoryTalk View ME application
- Download and upload FactoryTalk View ME runtime files
- Troubleshoot a PanelView Plus terminal
- Create tags and test data in a FactoryTalk View ME application
- Modify graphic displays in a FactoryTalk View ME application
- View and print FactoryTalk View ME components using the application documenter

## Who Should Attend?

Individuals who need to maintain FactoryTalk ME applications and troubleshoot PanelView Plus terminals

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course (CCP146) or basic experience with ControlLogix tags and architecture

**Job Aid Included**

FactoryTalk View ME and PanelView Plus Procedures Guide ABT-2711P-TSJ50

**Curriculum Note:**

*This course contains many of the lessons in course CCV207 in a consolidated format. Do not take both courses.*

# SI: FactoryTalk View SE Configuration

## SI101

3 Days CEUs 2.1

**Course Purpose**

Upon completion of this course, students should be able to organize and develop FactoryTalk View Site Edition (SE) applications. This course provides opportunities for students to organize and develop FactoryTalk View SE applications. During class, students will have the opportunity to practice the skills used to create/build graphic displays. Students will learn how to configure alarms and security, trend data, and test their application using FactoryTalk View SE Client. Students will also work with RSLinx Enterprise communications software.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Get started with FactoryTalk View SE
- Configure:
  - RSLinx Enterprise communications in a new FactoryTalk View SE application
  - Global objects
  - HMI tag-based alarms
  - FactoryTalk alarms and events
- Create a graphic display and an HMI tag database
- Build an interactive graphic display
- Animate a graphic display
- Use tag placeholders and create a FactoryTalk View SE client
- Create and configure a trend
- Create a derived tag file and an event file
- Configure security

**Job Aids Included**

| | |
|---|---|
| FactoryTalk View SE Procedures Guide | ABT-9701SE-TSJ50 |

## Who Should Attend?

System Integrator Programmers who have little or no working experience with developing FactoryTalk View SE local (stand-alone) or network (distributed) applications

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Read wiring diagrams

**Curriculum Note:**

*This course contains many of the lessons in course CCV207 in a consolidated format. Do not take both courses.*

# Introduction to the Integrated Architecture™ System

(Private Delivery Only)

CIA101

2 Days CEUs 1.4

**Course Purpose**

This course will assist students in developing and building a solid foundation of Integrated Architecture and automation system knowledge. Students will learn about and interact with a variety of automation hardware. They will also have an opportunity to use Rockwell Automation software to perform basic system configuration tasks. While performing these tasks, students will gain an understanding of how controllers, drives, motors, networks, and human-machine interface (HMI) products function together within Integrated Architecture.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify components of the integrated architecture system
- Establish communications in an integrated system
- Program a basic Logix Designer project for an integrated system
- Program with tag-based addressing in an integrated system
- Identify programming languages in an integrated system
- Understand Logix5000 multi-discipline control
- Understand NetLinx-enabled networks
- Understand the visualization development environment of an integrated system
- Understand HMI direct tag referencing in an integrated system

## Who Should Attend?

Individuals who:

- Have little or no working experience with automation systems
- Are interested in gaining a broad understanding of automation and the Integrated Architecture System

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

# FactoryTalk® ViewPoint Implementation

## VC-FTVIEW-A

3.5 Days

**Course Purpose**

This course will teach you how to monitor your FactoryTalk View ME projects in a web browser. This course will also show you how to create a new FactoryTalk View ME web application and connect to an existing FactoryTalk View ME web application via Ethernet from a PanelView Plus.

**Objectives**

After completing this course, students should understand the following topics:

- Verifying client requirements
- Verifying server requirements
- Creating a new ME web application
- Connecting to an existing ME web application
- Troubleshooting common integration problems

## Who Should Attend?

Individuals who need to monitor installations from any remote location with Internet access, but without FactoryTalk View ME software, should attend this course.

## Prerequisites

- Experience using FactoryTalk View ME software and PanelView Plus programming is required. Specifically, students must know how to create .apa files and download files to PanelView Plus terminals.

# OEM: ControlLogix, FactoryTalk View ME, Kinetix 6000, and PowerFlex 40 Fundamentals and Troubleshooting

**OEM100**

5 Days | CEUs 3.5

**Course Purpose**

This course provides students with the skills necessary to maintain and troubleshoot: Studio 5000 applications that operate on a ControlLogix-based machine; FactoryTalk View Machine Edition (ME) applications that run on PanelView Plus terminals; Kinetix 6000 motion systems; and PowerFlex 40 drives. Students will have the opportunity to develop and practice these skills by learning basic concepts and terminology used with: ControlLogix hardware, PanelView Plus terminal, Kinetix 6000 systems, and PowerFlex 40 drives; Studio 5000 Logix Designer application; and FactoryTalk View ME application. Students will also learn to diagnose and troubleshoot problems with controller, I/O or other hardware issues.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Connect a computer to a network
- Configure EtherNet/IP addresses
- Download and go online
- Update firmware
- Locate I/O tags and devices
- Locate and edit tag values
- Create and modify project
- Draft basic ladder logic
- Select ladder logic instructions
- Edit ladder logic online
- Program timer, counter, math, compare, and move instructions
- Search for project components
- Force I/O and toggle bits
- Configure produced/consumed data
- Tune a PID loop
- Manage project files
- Configure a trend chart
- Test a ladder diagram
- Troubleshoot digital and analog I/O modules
- Modify application communications
- Download runtime files
- Configure display security, graphic displays, and interactive controls
- Troubleshoot workstation problems
- Interpret motion instructions and indicators
- Modify drive parameters

## Who Should Attend?

OEMs who need to maintain and troubleshoot a ControlLogix-based machine, but have little to no working experience with ControlLogix systems

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Perform basic voltage and current checks
- Read wiring diagrams

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide | ABT-2711P-TSJ50 |
| EtherNet/IP™ Procedures Guide | ABT-N300-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

# Studio 5000 View Designer and PanelView 5500 Programming

## CCV210

3 Days CEUs 2.1

**Course Purpose**

This course will teach you, given a computer with Studio 5000 View Designer and a PanelView 5000 terminal, to produce an operational project running on the terminal

**Objectives**

After completing this course, students should understand the following:

- Configuring and Maintaining a PanelView 5000 Terminal
- Creating and Configuring a Studio 5000 View Designer Project
- Creating and Configuring Screens in a Studio 5000 View Designer Project
- Creating and Configuring Graphic Elements in a Studio 5000 View Designer Project
- Configuring Events in a Studio 5000 View Designer Project
- Creating and Configuring Trends, Graphs, and Gauges in a Studio 5000 View Designer Project
- Creating Interactive Elements in a Studio 5000 View Designer Project
- Configuring Animation for Graphic Elements in a Studio 5000 View Designer Project
- Configuring Alarm Screens in a Studio 5000 View Designer Project
- Creating Reusable Screens in a Studio 5000 View Designer Project
- Creating Add-On Graphics in a Studio 5000 View Designer Project
- Configuring Language Switching in a Studio 5000 View Designer Project
- Configuring Security for a Studio 5000 View Designer Project
- Enhancing an Interactive Studio 5000 View Designer Project

**Job Aid Included**

| | |
|---|---|
| Studio 5000 View Designer and PanelView 5500 Procedures Guide | ABT-2715-TSJ50 |

## Who Should Attend?

Individuals who need to create Studio 5000 View Designer project for use on a PanelView 5000 terminal.

## Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals course. (Course No CCP146) or basic experience with Logix 5000 tags and architecture.

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

# ThinManager Configuration and Maintenance

SPE201-LD

2 Days

**Course Purpose**

ThinManager® is a thin client platform with an architecture that allows for deployment of less-expensive hardware. This gives users familiar applications and tools in a format that reduces management and maintenance costs while increasing security. This course is designed to teach you how to set up and use the hardware in the demonstration kit to provide effective ThinManager integration with existing systems. While the focus is system configuration, some of the topics covered will introduce system maintenance. Along the way, you will have an opportunity to explore a number of ThinManager features. In this course, you will learn how to run Windows-based applications for Rockwell Automation software via Microsoft's Remote Desktop Services, as well as other content sources including VNC servers, IP cameras and terminal-toterminal shadowing.ThinManager's wizard-based configuration also allows administrators to set up advanced functionality and to customize the content delivered to the terminal based on who is logged in and what role they play in your work environment.

**Objectives**

After completing this course, students should understand the following:

- Value Proposition
- Installation of the Remote Desktop Services Role
- Installation of an HMI (FactoryTalk View SE)
- Installation of ThinManager
- Defining and Configuring Remote Desktop Servers, Display Clients, and Terminals
- AppLink for Single Applications
- MultiSession and Tiling
- MultiMonitor and Virtual Screens
- Terminal Replacement
- ThinManager Server Versus Remote Desktop Server
- ThinManager in a Rockwell Automation System
- Licensing
- Troubleshooting
- Relevance User Services
- Relevance Location Services
- Relevance and Geo-Fencing
- Advanced ThinManager Lab
- DHCP Server, Firewalls, and Ports
- Firmware Packages and Modules

## Who Should Attend?

Individuals who are responsible for system configuration or are interested in learning more about the ThinManager architecture should attend this course.

## Prerequisites

- There are no prerequisites for this course.

## Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

Rockwell Automation

## Electrical Maintenance Skills

**Basic Electrical Concepts**
EMS-100 • 5 Days

**Motor Theory**
EMS-105 • 3 Days

**Generator Theory**
EMS-110 • 2 Days

**Electrical Test Equipment**
EMS-115 • 2 Days

**Conduit Bending and Wiring**
EMS-125 • 5 Days

**Power Transformers**
EMS-200 • 3 Days

**Low Voltage Switchgear**
EMS-205 • 5 Days

**Medium Voltage Switchgear**
EMS-210 • 5 Days

**High Voltage Switchgear**
EMS-215 • 5 Days

**Protective Relays**
EMS-220 • 4 Days

Private Delivery Only

**Batteries and Uninterruptable Power Supplies**
EMS-225 • 1 Day

**Motor Control and Troubleshooting**
EMS-230 • 5 Days

Rockwell Automation

## Mechanical Maintenance Skills

- **Heat Exchanger Fundamentals** — MMS-100 • 1 Day (Private Delivery Only)
- **Valve Fundamentals** — MMS-105 • 2 Days
- **Seals and Packing Fundamentals** — MMS-110 • 1 Day (Private Delivery Only)
- **Bearing Fundamentals** — MMS-115 • 2 Days
- **Boiler Fundamentals** — MMS-120 • 1 Day (Private Delivery Only)
- **Hydraulics and Pneumatics Fundamentals** — MMS-125 • 3 Days
- **Diesel Engines Fundamentals** — MMS-135 • 3 Days
- **Reciprocating Compressors Fundamentals** — MMS-140 • 3 Days
- **Axial Flow Compressors Fundamentals** — MMS-145 • 3 Days
- **Radial Flow Compressors Fundamentals** — MMS-150 • 3 Days
- **Centrifugal Pumps** — MMS-200 • 3 Days
- **Positive Displacement Pumps** — MMS-205 • 2 Days
- **Valve Repair** — MMS-210 • 5 Days
- **Belt Drives** — MMS-225 • 1 Day (Private Delivery Only)
- **Chain Drives** — MMS-230 • 1 Day (Private Delivery Only)
- **Gears** — MMS-235 • 1 Day (Private Delivery Only)
- **Shaft and Coupling Alignment** — MMS-245 • 5 Days
- **Pipefitting** — MMS-250 • 5 Days

Rockwell Automation

## Instrumentation & Controls Skills

**Industrial Electronics**
ICS-100 • 3 Days

**Digital Circuits**
ICS-105 • 3 Days

Private Delivery Only
**Instrumentation Overview**
ICS-110 • 1 Day

Private Delivery Only
**Introduction to HART Communications**
ICS-115 • 1 Day

**Combustion Basics**
ICS-120 • 2 Days

Private Delivery Only
**Introduction to Distributed Control Systems**
ICS-125 • 1 Day

Private Delivery Only
**Process Controls Fundamentals**
ICS-200 • 1 Day

Private Delivery Only
**Differential Pressure Cells**
ICS-300 • 1 Day

Private Delivery Only
**Level Detection**
ICS-305 • 1 Day

Private Delivery Only
**Flow Detection**
ICS-310 • 1 Day

Private Delivery Only
**Temperature Detection**
ICS-315 • 1 Day

# Craft Skills and Mechanical Concepts

Rockwell Automation

## Foundational Skills

- **Mechanical Print Reading**
  FND-015 • 3 Days
- **Mechanical Safety and Lockout Tagout** (Private Delivery Only)
  FND-020 • 1 Day
- **Electrical Print Reading**
  FND-030 • 2 Days
- **Electrical Safety for Qualified Personnel**
  FND-035 • 2 Days

## Multi-Craft Skills

- **Bolts and Fasteners**
  MUS-100 • 1 Day
- **Precision Measuring Instruments**
  MUS-105 • 2 Days
- **Lubrication Fundamentals** (Private Delivery Only)
  MUS-110 • 1 Day
- **Lubricant Application and Analysis**
  MUS-115 • 2 Days
- **Introduction to Steam Turbines**
  MUS-125 • 3 Days
- **Introduction to Gas Turbines**
  MUS-130 • 3 Days
- **Scaffolding**
  MUS-200 • 2 Days
- **Rigging**
  MUS-205 • 2 Days
- **Electric Overhead Traveling (EOT) Crane Inspection**
  MUS-300 • 2 Days
- **Direct Current (DC) Crane Controls**
  MUS-305 • 3 Days

# Basic Electrical Concepts

## EMS-100

5 Days

**Course Purpose**

This course provides information on the basic concepts of direct current (DC) electricity and magnetism, including electrostatics, basic circuit concepts, and measurement of electrical quantities and associated numerical concepts, Ohm's Law, practical circuits, electromagnetism, and electrical measurements. There are hands-on exercises for device operation and simple circuit construction and analysis.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the types of electrical energy
- Discuss the composition of the atom and its relation to electrical charge
- Explain the characteristics of current, voltage, and resistance
- Explain Kirchhoff's Current Law and Kirchhoff's Voltage Law
- Calculate equivalent resistance of series and parallel resistive circuits
- Calculate DC circuit parameters using Ohm's Law, Kirchhoff's Current Law, and Kirchhoff's Voltage Law
- Describe the characteristics of capacitors and capacitance
- Describe the characteristics of inductors and inductance
- Describe the construction and operation of a simple AC generator
- Define inductive reactance
- Calculate the inductive reactance of a simple AC circuit
- Define capacitive reactance
- Calculate the capacitive reactance of a simple AC circuit
- Define impedance
- Describe the relationship between apparent, true, and reactive power
- Define power factor as it relates to true power and apparent power

### Who Should Attend?

I&C technicians, electricians, and electrical technicians

### Prerequisites

There are no prerequisites for this course

# Motor Theory

## EMS-105

3 Days

**Course Purpose**

This course provides information on the principles of operation associated with motors and motor components, and the AC/DC theory of operation, including torque, pullout torque, and slip.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the general characteristics of electric motors
- Describe the construction and operation of DC motors
- Identify the types of DC motors
- Describe how DC motors are controlled
- Describe the construction and operation of AC motors
- Identify the types of AC motors
- Describe how AC motors are controlled
- Identify the information on a motor nameplate
- Describe DC and AC motor maintenance activities
- Describe the National Electric Testing Association guidelines for testing motors

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Generator Theory

EMS-110

2 Days

**Course Purpose**

This course provides information on the concepts associated with generators, generator function, generator design, three-phase voltage, and load sharing.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the terminology associated with AC and DC power generation
- List and describe the major components of an AC generator
- Describe AC power generation theory
- Explain the operation of AC generators
- List and describe the major components of a DC generator
- Describe DC power generation theory
- Explain the operation of DC generators

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Electrical Test Equipment

EMS-115

2 Days

**Course Purpose**

This course provides information on electrical testing, safety precautions associated with electrical testing, and the use and care of electrical test equipment.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the operation of an analog meter
- Describe the operation of a clamp-on ammeter
- Describe the operation of a digital meter
- Describe the operation of a voltage detector
- Describe the operation of the basic oscilloscope
- Calculate amplitude, frequency, period, phase difference, and duty cycle
- Describe the operation of a megohmmeter (megger)
- Explain the purpose of thermography

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Conduit Bending and Wiring

## EMS-125

5 Days

**Course Purpose**

This course provides information on calculating and making conduit bends, wiring requirements, material identification, and the installation and splicing of wiring in accordance with NFPA 70 standards.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and describe the purpose for the various types of conduit used for electrical runs
- Interpret rigid metal conduit data
- Explain conduit fill and spacing requirements
- Explain and demonstrate proper methods to cutting, reaming, bending, and installing conduit
- Identify between conductors, insulators, and semiconductors and describe the key characteristics of each
- Describe cable construction and characteristics of the different components used in construction of cables
- Discuss the operating characteristics of electrical cables
- Describe the different methods of cable installation and their advantages and disadvantages over other methods of installation
- Demonstrate the proper techniques to pull wire or cable
- Describe the precautions that must be observed when splicing wires and demonstrate how wire and cable is spliced
- Discuss the differences between low and medium voltage splicing

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Power Transformers

EMS-200

3 Days

**Course Purpose**

This course provides information on the concepts associated with transformers, transformer function, transformer design, transformer maintenance, transformer faults, and transformer inspecting and testing in accordance with NFPA NEC 70 standards.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and discuss safety issues relating to transformers
- Explain the theory of transformer operations
- List and describe the types of transformers
- Describe the construction and nameplate information of a transformer
- Demonstrate different types of transformer tap connections
- Demonstrate proper inspection techniques for transformers
- Demonstrate proper maintenance techniques for transformers

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Low Voltage Switchgear

## EMS-205

5 Days

**Course Purpose**

This course provides information on the construction, operation, maintenance, and inspection of low voltage switchgear and circuit breakers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain the voltage level conventions used in electrical equipment
- List and describe the components that make up electrical switchgear
- Identify and explain the four general classifications of circuit breakers
- List and explain the major ratings of circuit breakers
- Discuss the major components associated with a power system
- Demonstrate inspection methods of low voltage circuit breakers

## Who Should Attend?

Electricians (Work on less than 600 Volts)
Electrical Technicians (Work on less than 600 Volts)

## Prerequisites

There are no prerequisites for this course

# Medium Voltage Switchgear

## EMS-210

5 Days

**Course Purpose**

This course provides information on the construction, operation, maintenance, and inspection of medium voltage switchgear and circuit breakers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain the voltage level conventions used in electrical equipment
- List and describe the components that make up electrical switchgear
- Identify and explain the four general classifications of circuit breakers
- List and explain the major ratings of circuit breakers
- Discuss the major components associated with a power system
- Demonstrate inspection methods of medium voltage circuit breakers

## Who Should Attend?

Electricians and Electrical Technicians who work on greater than 600 volts and less than 13,000 volts

## Prerequisites

There are no prerequisites for this course

# High Voltage Switchgear

## EMS-215

5 Days

**Course Purpose**

This course provides information on the construction, operation, maintenance, and inspection of high voltage switchgear and circuit breakers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain the voltage level conventions used in electrical equipment
- List and describe the components that make up electrical switchgear
- Identify and explain the four general classifications of circuit breakers
- List and explain the major ratings of circuit breakers
- Discuss the major components associated with a power system
- Demonstrate inspection methods of high voltage circuit breakers

## Who Should Attend?

Electricians and Electrical Technicians who work on greater than 13,000 volts

## Prerequisites

There are no prerequisites for this course

# Protective Relays

EMS-220

4 Days

**Course Purpose**

This course provides information on the concepts, function, maintenance, and testing of protective relays.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the purpose and types of protective relays
- List and describe the components found in protective relays
- Describe the functions of protective relays
- Discuss the methods for protective relay testing
- List and demonstrate protective relay function tests
- Identify and demonstrate common maintenance tasks associated with protective relays

## Who Should Attend?

Electricians, Electrical technicians

## Prerequisites

There are no prerequisites for this course

# Batteries and Uninterruptable Power Supplies

(Private Delivery Only)

EMS-225

1 Day

**Course Purpose**

This course provides information on the concepts associated with industrial batteries, Uninterruptable Power Supplies (UPS) and transfer switches.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the types of batteries
- Describe the construction and operation of various batteries
- Identify industry and government standards for maintenance, testing, replacement, sizing, and installation of lead-acid batteries
- Identify federal regulations governing lead-acid battery disposal
- Describe the construction and operation of a UPS
- Describe the function and operation of a transfer switch
- Inspect a UPS system
- Analyze battery charge and discharge rate to determine if replacement is needed

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Motor Control and Troubleshooting

## EMS-230

5 Days

**Course Purpose**

This course provides information on the concepts associated with systematic troubleshooting of instrumentation systems. Participants use practical application of troubleshooting techniques in exercise scenarios.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain a systematic approach to troubleshooting electrical circuits
- List and describe the purpose and application of various motor control components
- Explain methods for inspecting electrical contacts
- Describe the basic methods of starting a three-phase AC motor using full or reduced voltage
- Describe the basic operation of a three-phase AC motor
- Describe methods for troubleshooting AC motors
- Apply a systematic approach to troubleshooting motor control circuits
- Design and construct motor control circuits
- Implement proper motor control troubleshooting techniques
- Analyze and evaluate faults to determine failed motor control components

## Who Should Attend?

Electrical maintenance technicians

## Prerequisites

Understanding of electrical theory and electrical systems

# Heat Exchanger Fundamentals

(Private Delivery Only)

MMS-100

1 Day

**Course Purpose**

This course provides information on methods of heat transfer methods; safety, types and major components of heat exchangers; and basic maintenance and inspection techniques associated with heat exchangers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and explain heat transfer within heat exchangers
- Discuss safety precautions associated with heat exchangers
- List and identify different types of heat exchangers and their major components
- Identify maintenance and inspection activities associated with heat exchangers

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Valve Fundamentals

MMS-105

2 Days

**Course Purpose**

This course provides information on the types of valves and actuator used as control elements, valve components, and valve applications. There are hands-on exercises for equipment setup and evaluation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe various types of valve actuators
- Discuss possible problems with valve actuators and positioners
- Describe the troubleshooting steps to repair faulty valve actuators
- State the purpose of bench set information of a pneumatic actuator
- Explain the function of a valve positioner
- State when a valve positioner should and should not be used
- Explain how to set up a valve positioner
- Explain the importance of valve position indication and feedback
- Discuss how valve position information impacts control of a process or system

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

Understanding of mechanical systems and applications

# Seals and Packing Fundamentals

(Private Delivery Only)

## MMS-110

1 Day

**Course Purpose**

This course provides information on identification and installation of packing and mechanical seals and their applications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the different types of compression packing, and explain when each is used
- Identify the different types of molded packing, and explain when each is used
- List the advantages and disadvantages of pump mechanical seals

## Who Should Attend?

Mechanical technicians

## Prerequisites

Understanding of mechanical theory and mechanical systems

# Bearing Fundamentals

MMS-115

2 Days

**Course Purpose**

This course provides information on identification, maintenance, and installation of bearings and their applications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and explain the purpose for bearings
- Discuss the basic terms associated with bearing design and construction
- Identify and recognize the major components of various bearings
- Demonstrate proper bearing maintenance and lubrication techniques
- Demonstrate the proper installation and removal of bearings
- Examine a bearing and analyze to determine cause of failure

## Who Should Attend?

Mechanical technicians

## Prerequisites

Understanding of mechanical theory and mechanical systems

# Boiler Fundamentals

(Private Delivery Only)

MMS-120

1 Day

**Course Purpose**

This course provides information on the fundamentals of boiler construction and operation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Explain the fundamentals of steam production
- List and describe the major components in a boiler
- Explain the basic operation of a boiler system

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Hydraulics and Pneumatics Fundamentals

MMS-125

3 Days

**Course Purpose**

This course provides information on the concepts associated with hydraulics, hydraulic systems and components, fluid principles, hydraulic system design, and hydraulic schematic symbology

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**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the basic principle of fluid dynamics
- State the relationship between force, pressure, and area
- List and describe the major components of a hydraulic system
- Identify the symbols used to identify hydraulic components in a schematic
- List and describe the major components of a pneumatic system
- Identify the symbols used to identify pneumatic components in a schematic

## Who Should Attend?

Mechanical technicians

## Prerequisites

Understanding of mechanical theory and mechanical systems

# Diesel Engines Fundamentals

## MMS-135

3 Days

**Course Purpose**

Upon completion of this course, the participants will be able to identify the major components and describe the operation of a diesel engine.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the function of a diesel engine
- List and describe the major components of a diesel engine
- Describe the basic operation of a diesel engine
- Discuss factors that affect engine operation
- Discuss maintenance activities associated with a diesel engine
- Troubleshoot common engine problems

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Reciprocating Compressors Fundamentals

## MMS-140

3 Days

**Course Purpose**
This course provides information on the concepts associated with reciprocating compressors.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- Describe the function of a reciprocating compressor
- List and describe the major components of a reciprocating compressor
- Describe the basic operation of a reciprocating compressor
- Discuss factors that affect compressor operation
- Discuss maintenance activities associated with a reciprocating compressor
- Troubleshoot common compressor problems

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Axial Flow Compressors Fundamentals

MMS-145

3 Days

**Course Purpose**

This course provides information on the concepts associated with axial flow compressors.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the function of a axial flow compressor
- List and describe the major components of a axial flow compressor.
- Describe the basic operation of a axial flow compressor
- Discuss factors that affect compressor operation
- Discuss maintenance activities associated with a axial flow compressor
- Troubleshoot common compressor problems

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Radial Flow Compressors Fundamentals

MMS-150

3 Days

**Course Purpose**

This course provides information on the concepts associated with Radial Flow compressors

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the function of a Radial Flow compressor
- List and describe the major components of a Radial Flow compressor
- Describe the basic operation of a Radial Flow compressor
- Discuss factors that affect compressor operation
- Discuss maintenance activities associated with a Radial Flow compressor
- Troubleshoot common compressor problems

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Centrifugal Pumps

## MMS-200

3 Days

**Course Purpose**

This course provides information on the concepts associated with centrifugal pump application, operation, hazards, troubleshooting and repair common problems. It also explains how to draw and label simple pump curves. There are hands-on exercises for inspection and repair of pumps and its associated equipment.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the major components of a centrifugal pump and describe its function
  - Explain the operation of a centrifugal pump
  - Identify and state the function of the various centrifugal pump components
  - Classify centrifugal pumps as to position, impeller design, number of stages, and direction of flow
- Discuss factors affecting pump performance
  - Explain how slip effects the operation of a centrifugal pump
  - Draw and label simple pump curves
  - Define net positive suction head and cavitation
- And more

## Who Should Attend?

Mechanical technicians

## Prerequisites

Understanding of mechanical theory and mechanical systems

# Positive Displacement Pumps

## MMS-205

2 Days

**Course Purpose**

This course provides information on the concepts associated with positive displacement pump application, operation, hazards, troubleshooting and repair common problems.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the major components of a positive displacement pump and describe its function
  - Reciprocating pumps
  - Piston pumps
  - Rotary pumps
  - Special purpose pumps
- Demonstrate proper techniques for disassembly, maintenance, and assembly of a positive displacement pump
  - Factors affecting pump performance
  - Wear areas and inspection points

## Who Should Attend?

Mechanical technicians

## Prerequisites

Understanding of mechanical theory and mechanical systems

# Valve Repair

## MMS-210

5 Days

**Course Purpose**

This course provides information on valve maintenance and repair activities associated with common valves used in industrial applications. This course assumes that the student is familiar with valve fundaments.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and replace worn valve components
  - Identify high wear components of valves
  - Explain preventative maintenance
  - List indications that a valve requires corrective maintenance
  - Discuss tag out procedures for valve isolations
- Demonstrate how to properly repack a valve
  - Describe various types of packing and their applications
  - Describe various types of gaskets and their applications
  - Explain precautions associated with working with packing and insulation

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

Understanding of mechanical systems and applications

# Belt Drives

(Private Delivery Only)

MMS-225

1 Day

**Course Purpose**

This course provides information on the concepts associated with belt drives, belt drive function, belt drive design, belt drive maintenance, installation and removal and belt drive faults.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and describe the principals of operation of belt drives
- Identify the types of belts and their uses
- Demonstrate the proper installation, alignment and tensioning of belt drives
- Discuss common drive failures

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Chain Drives
(Private Delivery Only)

MMS-230

1 Day

**Course Purpose**
This course provides information on the concepts associated with chain drives, chain drive function; chain drive design, chain drive maintenance, installation, and removal; and chain drive faults.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- List and describe the principals of operation of chain drives
- Identify the types of chains and their uses
- Demonstrate the proper installation, alignment and tensioning of chain drives
- Discuss common drive failures

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Gears

(Private Delivery Only)

MMS-235

1 Day

**Course Purpose**

This course provides information on the concepts associated with gears, gear function, gear backlash, gear lubrication, and gear ratios.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- State the purpose of gears
- Define the terminology associated with gears
- Identify the following types of gear arrangements: spur gear, helical gear, herringbone gear, bevel gear, worm gear, and planetary gear
- Demonstrate how to measure backlash in a gearing arrangement

## Who Should Attend?

Maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Shaft and Coupling Alignment

## MMS-245

5 Days

**Course Purpose**

This course provides information on the importance of proper alignment and alignment methods, cause of misalignment and how to correct for error such as soft foot and thermal growth using dial indicators, and coupling alignment using dial indicators and lasers where applicable. There are hands-on exercises for shaft and equipment alignments.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the fundamental principles of shaft alignment
- List and identify the tools used in the alignment process
- Discuss the importance of using a pre-alignment checklist
- Identify soft foot and discuss methods to correct it
- Identify the phases of the alignment process
- Demonstrate proper alignment methods
- Discuss the factors that may affect alignment
- Discuss the importance of alignment tolerances
- Discuss methods used for non-standard alignments
- Identify the couplings used to connect shafts

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Pipefitting

## MMS-250

5 Days

**Course Purpose**
This course provides information on the codes and standards, types of piping and associated components, specifications, and fitting and supporting techniques.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- List and discuss codes and standards associated with pipe and tubing
- Identify and discuss types of metal piping and their uses
- Identify and discuss types of non-metallic piping and their uses
- Identify and discuss types of tubing, including their installation and use
- Describe the methods used for connecting pipes
- Describe the components found in a piping system
- Identify and discuss the types of pipe hangers and their applications

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

**Curriculum Note:**
*Many of the lessons contained in this course are also contained in course MM-500 in a condensed format.*

# Industrial Electronics

ICS-100

3 Days

**Course Purpose**

This course provides information on the function and circuit analysis of power supplies, amplifiers, integrators, comparators, and oscillators.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Discuss the characteristics and uses of semiconductor devices
- Discuss the characteristics and uses of bipolar transistors
- Describe the operation of diodes
- Describe the operation of transistors
- Describe the operation of operational amplifiers
- And much more

## Who Should Attend?

Electrical maintenance technicians, electronic technicians and I.C technicians

## Prerequisites

There are no prerequisites for this course

# Digital Circuits

## ICS-105

3 Days

**Course Purpose**

This course provides information on the basic digital electronics concepts, gates, circuits, flip-flop based circuits, and troubleshooting techniques. There are hands-on exercises for circuit construction.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Convert a number between binary and decimal
- Describe the difference between analog and digital circuits
- Describe the gates found in digital logic
- Simplify expressions using Boolean algebra
- Describe how to combine logic gates
- Describe the circuits found in sequential logic

## Who Should Attend?

Electrical maintenance technicians, electronic technicians or I&C technicians

## Prerequisites

Understanding of electrical theory and electrical systems

# Instrumentation Overview

(Private Delivery Only)

ICS-110

1 Day

**Course Purpose**

This course provides information on the components, function and design of instrumentation loops.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the different types of instruments used in an instrumentation loop
- Describe and explain the function of components that are used for an instrumentation loop
- Demonstrate how to build a basic instrumentation loop

## Who Should Attend?

Instrumentation Technicians, I&C Technicians

## Prerequisites

Knowledge of basic electrical concepts

# Introduction to HART Communications

(Private Delivery Only)

ICS-115

1 Day

**Course Purpose**

This course provides information on the components, function and design of instrumentation loops.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and discuss the components of a HART communicator
- Demonstrate connection methods to field devices
- Demonstrate how to properly setup and calibrate field devices

## Who Should Attend?

Instrumentation Technicians, I&C Technicians

## Prerequisites

Knowledge of basic electrical concepts

# Combustion Basics

## ICS-120

2 Days

**Course Purpose**

Upon completion of this course, the participants will be able to explain the theory, function, and design of combustion equipment, methods of heat transfer and safety issues when working on or maintaining combustion equipment.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Explain the flame triangle
- Describe the relationship between heat, temperature, and specific heat
- List and discuss the different methods of heat transfer
- Identify and discuss the by-products of combustion
- Identify and describe the importance of stoichiometric conditions
- Describe the construction of basic combustion systems
- Describe the safety equipment associated with a combustion system
- Design a basic fuel train for a combustion system given components

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Introduction to Distributed Control Systems

(Private Delivery Only)

ICS-125

1 Day

**Course Purpose**

This course provides information on the components, infrastructure, networking and communication protocols, and functions of Distributed Control Systems (DCS).

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain the concepts of computer networking and communications
- Describe the components of a Distributed Control System and their functions
- Describe communications in a Distributed Control System

## Who Should Attend?

I&C technicians

## Prerequisites

There are no prerequisites for this course

# Process Controls Fundamentals

(Private Delivery Only)

## ICS-200

1 Day

**Course Purpose**

This course provides information on the fundamentals of process control and PID loop tuning. Lessons include characteristics of process, criteria for loop response, and controller tuning methods. This course also i ntroduces advancedcontrol methods including cascade and feed forward control methods. Thereare extensive hands-on exercises for process measurements, controller setup, and process tuning.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain process control terms
- Describe how a single or multiple capacity process responds to change
- Demonstrate proper two position control loop installation
- Demonstrate basic proportional control loop installation

## Who Should Attend?

Electrical maintenance technicians, electronic technicians or IC technicians

## Prerequisites

Understanding of electrical theory and electrical systems

# Differential Pressure Cells

(Private Delivery Only)

ICS-300

1 Day

**Course Purpose**

This course provides information on how differential pressure cells function and their uses in a process control environment.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and describe the components of a differential pressure cell
- Describe how a differential pressure cell operates
- Demonstrate different connection methods and uses of a differential pressure cell
- Demonstrate proper setup and calibration of a differential pressure cell
- Explain consistency measurement methods

## Who Should Attend?

Electrical maintenance technicians, electronic technicians or I&C technicians

## Prerequisites

Understanding of electrical theory and electrical systems

# Level Detection
(Private Delivery Only)

## ICS-305
1 Day

**Course Purpose**
This course provides information on how different level detectors function and their uses in a process control environment.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- Identify and describe the components of different level detection devices
- Describe how level detection devices operate
- Demonstrate different connection methods and uses of level detection devices
- Demonstrate proper setup and calibration of level detection devices

## Who Should Attend?
Electrical maintenance technicians, electronic technicians or I&C technicians

## Prerequisites
Understanding of electrical theory and electrical systems

# Flow Detection
(Private Delivery Only)

## ICS-310
1 Day

**Course Purpose**
This course provides information on how different flow detectors function and their uses in a process control environment.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- Identify and describe the components of different flow detection devices
- Describe how flow detection devices operate
- Demonstrate different connection methods and uses of flow detection devices
- Demonstrate proper setup and calibration of flow detection devices

## Who Should Attend?
Electrical maintenance technicians, electronic technicians or I&C technicians

## Prerequisites
Understanding of electrical theory and electrical systems

# Temperature Detection
(Private Delivery Only)

## ICS-315
1 Day

**Course Purpose**
This course provides information on how different temperature detectors function and their uses in a process control environment.

**Objectives**
After completing this course, students should be able to perform the following tasks:

- Identify and describe the components of different temperature detection devices
- Describe how temperature detection devices operate
- Demonstrate different connection methods and uses of temperaturedetection devices
- Demonstrate proper setup and calibration of temperature detection devices

## Who Should Attend?
Electrical maintenance technicians, electronic technicians or I&C technicians

## Prerequisites
Understanding of electrical theory and electrical systems

# Mechanical Print Reading

FND-015

3 Days

**Course Purpose**

This course provides an understanding of information found on mechanical drawings and prints, and provides the participant with the ability to understand and identify components and how to identify dimensions of tapered and machined surfaces.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- List and explain the types of mechanical drawings
- Explain and describe the purpose of the title block, legend, revisions, and material list in terms of location and content
- Describe and identify the meaning of each of the six types of lines used in drawings
- Identify and define the types of views used in drawings
- Given a drawing, identify its construction, size, and location dimensions
- Locate and identify tolerances on machine drawings
- Measure and identify screw threads
- Identify and discuss the different types of dimensions found in drawings
- Identify and discuss the different elements of a P&ID
- Draw schematics of simple mechanical systems

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Mechanical Safety and Lockout Tagout

(Private Delivery Only)

FND-020

1 Day

**Course Purpose**

This course provides information on potential safety hazards, safety precautions, personal protective equipment, and lockout/tagout in accordance with OSHA part 1910 regulations.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and discuss electrical safety hazards
- Discuss the hazards of stored-energy in hydraulic and pneumatic systems
- Given a scenario, discuss the proper use of personal protective equipment
- Given a scenario, discuss the hazards particular to mechanical work and the precautions/ countermeasures for each hazard
- Describe mechanical system lockout/tagout requirements

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Electrical Print Reading

## FND-030

2 Days

**Course Purpose**

This course provides the participant with the basic understanding of electrical prints and components associated with electrical print reading; it also provides the participant with the ability to interpret simple ladder logic diagrams.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the organization of an electrical print
- Identify common electrical schematic symbols
- Interpret an electrical block diagram and a one-line diagram
- Interpret an electrical three-line diagram
- Interpret a piping and instrumentation diagram (P&ID)
- Analyze a basic logic circuit
- Interpret basic ladder logic

## Who Should Attend?

Electrical maintenance technicians, but is also used for cross-training of mechanical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Electrical Safety for Qualified Personnel

FND-035

2 Days

**Course Purpose**

This is an in depth electrical safety course that covers electrical safety including LOTO and arc flash that meets the training requirements specified in OSHA 1910 and NFPA 70E.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe general safety hazards and precautions associated with electrical systems
- Describe electrical tool and equipment safety
- Define voltage level conventions for electrical systems
- Describe electrical system lockout/tagout requirements
- Identify the requirements for working on energized equipment
- Given a scenario, describe the requirements associated with arc flash protection
- Describe the proper use of electrical protective rubber goods
- Explain the requirements for protective grounding
- Describe the electrical safety requirements associated with fuses
- Describe the electrical safety requirements associated with switchgear and circuit breakers
- Describe the electrical safety requirements for batteries and DC systems

## Who Should Attend?

Qualified electrical personnel and appropriate for non-technical students requiring safety awareness

## Prerequisites

There are no prerequisites for this course

# Bolts and Fasteners

MUS-100

1 Day

**Course Purpose**

This course provides information on the concepts associated with threaded and bolted fasteners, retaining rings, clamps, pins, keys, and locking devices, the specifications for fasteners and the assembly of equipment using fasteners.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the standards associated with bolts and fasteners
- Describe the different types of basic fasteners and their applications
- Discuss the appropriate specifications and selection criteria for fasteners
- Describe the various types of locking devices in common use
- Select the proper fastener for a given application
- Demonstrate the proper torqueing techniques for various mechanical fasteners

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Precision Measuring Instruments

MUS-105

2 Days

**Course Purpose**

This course provides information on the proper use of measuring tools to make basic linear and angular measurements.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Explain the purpose of precision measurement
- List and discuss the terminology as it applies to precision measurement
- Discuss the factors that affect measurement
- Identify and demonstrate the proper use and application of precision measuring instruments
- Apply and measure torque to fasteners

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Lubrication Fundamentals

(Private Delivery Only)

MUS-110

1 Day

**Course Purpose**

This course provides information on the concepts associated with lubrication, lubrication properties, and lubrication selection.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and explain lubrication maintenance strategies
- Discuss the fundamentals and theory of lubrication
- Describe the selection criteria for lubrication

## Who Should Attend?

Mechanical and electrical technicians

## Prerequisites

There are no prerequisites for this course

# Lubricant Application and Analysis

MUS-115

2 Days

**Course Purpose**

This course provides information on the application types, storage and handling, filtering, determining health, and wear of lubricants.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Discuss proper lubricant application and maintenance on lubricating systems
- Explain the requirements for proper lubrication storage and management
- Describe lubrication system filtering methods
- List and explain lube oil sampling requirements
- Identify and explain the factors affecting lubrication health
- Describe common wear mechanisms associated with machines

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Introduction to Steam Turbines

MUS-125

3 Days

**Course Purpose**

This course provides information on the concepts associated with steam turbines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the function of a steam turbine
- List and describe the major components of a steam turbine
- Describe the basic operation of a steam turbine
- Discuss factors that affect turbine operation
- Discuss maintenance activities associated with a steam turbine
- Troubleshoot common turbine problems

## Who Should Attend?

Mechanical and electrical technicians

## Prerequisites

There are no prerequisites for this course

# Introduction to Gas Turbines

MUS-130

3 Days

**Course Purpose**

This course provides information on the concepts associated with gas turbines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe the function of a gas turbine.
- List and describe the major components of a gas turbine.
- Describe the basic operation of a gas turbine.
- Discuss factors that affect turbine operation.
- Discuss maintenance activities associated with a gas turbine.
- Troubleshoot common turbine problems.

## Who Should Attend?

Mechanical and electrical technicians

## Prerequisites

There are no prerequisites for this course

# Scaffolding

## MUS-200

2 Days

**Course Purpose**

This course provides information on the concepts associated with procedures, precautions, and limitations for safely erecting and dismantling fabricated frame scaffolding in accordance with OSHA part 1910 or part 1926 regulations as they apply.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Explain the requirements set forth by OSHA part 1910 or part 1926 regulations
- Identify safety hazards associated with scaffolding
- Identify the types and uses of scaffolding
- Discuss procedures, precautions, limitations, and practices surrounding the aspects of erecting, using, and dismantling fabricated frame scaffolding to include:
  - Base section
  - Support structure
  - Access
  - Fall protection
  - Platform
  - Falling objects
  - Keeping upright
  - Electrical hazards
- And more

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

There are no prerequisites for this course

# Rigging

## MUS-205

2 Days

**Course Purpose**

This course provides information on the concepts and principles associated with rigging equipment, its use, inspection, planning, and proper selection of rigging equipment in accordance with OSHA part 1910.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify the safety hazards associated with rigging
- Identify and describe rigging gear to include:
  - Wire rope
  - Slings
  - Hardware
  - Hoists
  - Beams trolleys
  - Jacks
  - Rollers and skids
  - Winches
  - Cribbing
- Discuss the fundamentals of rigging
- Discuss methods used to determine the weight of a load
- Demonstrate methods used for moving and manipulating loads

## Who Should Attend?

Mechanical technicians

## Prerequisites

There are no prerequisites for this course

# Electric Overhead Traveling (EOT) Crane Inspection

## MUS-300

2 Days

**Course Purpose**

This course provides information on the mechanical inspection of Electrical Overhead Traveling (EOT) cranes in accordance with OSHA part 1910.179 regulations.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and discuss the major assemblies of EOT cranes
- List the inspection points on an EOT crane
- Locate the inspection points on an EOT crane
- Discuss the criteria for the inspection points

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

Knowledge of Electrical Overhead Travel (EOT) crane operations

# Direct Current (DC) Crane Controls

## MUS-305

3 Days

**Course Purpose**

Upon completion of this course, the participants will be able to explain the function, design, and construction of DC cranes and the control equipment; interpret crane control prints; and troubleshoot crane control faults.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identify and explain component layout of a crane
- Describe the function and operation of electrical components associated with DC cranes
- List and describe the purpose of components located in a DC power control system
- Describe the operation of DC motors
- Analyze a DC schematic to determine failed component
- Demonstrate proper troubleshooting techniques
- Demonstrate proper maintenance associated with cranes

## Who Should Attend?

Mechanical maintenance technicians

## Prerequisites

Understanding of electrical theory and electrical systems

# Industrial Internet of Things

Rockwell Automation

## UNDERSTAND

**Essentials of Industrial Automation for the IT Professional**
CCP810 • 2 Days

**Essentials of Industrial Ethernet Networks for the OT Professional**
CCP182 • 2 Days

## PROGRAM OR DESIGN

**Managing Industrial Networks with Cisco Networking Technologies**
IMINS • 5 Days

**Managing Industrial Networks for Manufacturing with Cisco Technologies**
IMINS2 • 5 Days

**Segmenting an Industrial Ethernet Network**
VC-SEGNET-A • (4) 120-Min. Sessions

## MAINTAIN OR TROUBLESHOOT

**EtherNet/IP Configuration and Troubleshooting**
CCP183 • 3 Day

## e-LEARNING

Introduction to Automation iBook Available on iTunes

**Industrial IP Advantage Network Design**

**Industrial IP Advantage e-Learning 12 hours**

# Essentials of Industrial Automation for an IT Professional

## CCP810

2 Days CEUs 1.4

**Course Purpose**

This course will assist you in building a solid foundation of Industrial Automation and Control Systems (IACS) knowledge. You will learn about and interact with a variety of automation hardware. You will also have an opportunity to use Rockwell Automation software to perform basic system and network tasks. While performing these tasks, you will gain an understanding of how controllers, I/O and HMI products function together on an EtherNet/IP network. This introductory level course will give you a broad understanding of how an IACS leverages the high performance, convenience, and widespread usage of Ethernet networks. After completing this course, you should be able to assess the general network requirements for an IACS communicating on an EtherNet/IP network.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Identifying automation devices impacting an EtherNet/IP™ network
- Creating an Ethernet driver using RSLinx® Classic software
- Verifying Ethernet communications using RSLinx Classic software
- Accessing a controller online using Studio 5000 Logix Designer™ software
- Uploading and downloading Studio 5000 Logix Designer projects
- Downloading a FactoryTalk® View Machine Edition (ME) runtime application to a PanelView™ Plus terminal
- Determining the status of an EtherNet/IP device using hardware indicators
- Determining the status of an EtherNet/IP device using Studio 5000 Logix Designer software
- Determining a device confi guration in a Studio 5000 Logix Designer project
- Retrieving configuration and performance data using an EtherNet/IP device webpage
- Identifying Industrial Automation and Control System (IACS) traffic on an EtherNet/IP network using a network protocol analyzer

**Job Aids Included**

Ethernet/IP Procedures Guide ABT-N300-TSJ50

## Who Should Attend?

Individuals who have little or no working experience with automation systems and are interested in gaining a broad understanding of industrial automation and control on an EtherNet/IP network should attend this course.

## Prerequisites

To successfully complete this course, the following prerequisite is required:

– Ability to perform basic Windows® operating system tasks

# EtherNet/IP Configuration and Troubleshooting

## CCP183

3 Day CEUs 2.1

**Course Purpose**

This course will assist students in developing fundamental knowledge of industrial communications over an EtherNet/IP network. Students will learn basic concepts and learn how to use various tools to assign IP addresses to EtherNet/IP devices. This course prepares students to effectively resolve issues with communications between a controller and the devices it is controlling. Students will troubleshoot EtherNet/IP network media and components, including a Stratix 5700, 8000 and/or 8300 switch. Students will have an opportunity to monitor diagnostic information using web-based technologies and modify web server module data views and tag values.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Assign an IP address to a computer
- Ping a module IP address
- Assign IP addresses using:
  - RSLinx classic software and rotary switches
  - BOOTP-DHCP server software
- Isolate an EtherNet/IP network problem
- Diagnose problems with EtherNet/IP modules and network components
- Monitor an EtherNet/IP network using web-enabled technologies

**Job Aids Included**

Ethernet/IP Procedures Guide ABT-N300-TSJ50

### Who Should Attend?

Individuals who are responsible for maintaining Industrial Automation and Control Systems (IACS) networks

### Prerequisites

- Completion of the Studio 5000 Logix Designer Level 1: ControlLogix Systems

### Technical Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

# Managing Industrial Networks with CISCO Networking Technologies

## IMINS

5 Days

**Course Purpose**

Managing Industrial Networks with Cisco® Networking Technologies (IMINS) Version 1.0 is a hands-on lab-based course, which helps students with the foundational skills needed for the management and administration of networked industrial control systems. The IMINS course, developed in conjunction with Rockwell Automation, helps plant administrators, control system engineers, and traditional network engineers understand networking technologies that are needed in today's connected plants and enterprises. This course also helps students prepare for the Cisco Industrial Networking Specialist Certification exam (exam ID 600-601) and qualify for the Cisco Industrial Networking Specialist certification. The goal of this course is to enable students to achieve competency and skills to install, configure, maintain, and troubleshoot industrial network systems while helping to ensure network availability, reliability, and Internet security throughout your company.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Describe Cisco Industrial Ethernet (IE) switches, Cisco Connected Grid™ switches and routers, and Rockwell Automation Stratix™ switches
- Interpret designs and drawings, recognize industrial topologies, and access reference materials
- Install industrial network components
- Deploy industrial network components
- Perform basic maintenance tasks
- Troubleshoot network and control issues

TOP 20

## Who Should Attend?

IT and operations technology (OT) professionals and control engineers who will be involved with the implementation, operation, and support of networked industrial products and solutions for the manufacturing, process control, and oil and gas industries

## Prerequisites

The knowledge and skills that you must have before attending this course include a college degree or non-degreed qualified technician with 2-3 years experience. Also, it is recommended you take the following Cisco Electronic Learning and Training (ELT) courses to achieve a basic understanding of networking and industrial protocols:

- Networking Fundamentals for Industrial Control Systems (INICS)
- Industrial Control Systems Fundamentals for Network Engineers (ICINS)

# Essentials of Industrial Ethernet Networks for an OT Professional

CCP182

2 Days CEUs 1.4

**Course Purpose**

After completing this course, you should be able to: Demonstrate understanding of basic Ethernet networking skills, terminology and concepts; Apply these skills when performing advanced network specification, configuration and troubleshooting tasks. In this course, you will learn how to verify communications between devices, recognize data transmission types and differentiate between OSI Model Layer 2 and Layer 3 switching functions. You will also identify the routing process, monitor a switch using Device Manager and CLI commands and work with IOS confi guration files. This course prepares you to more clearly understand key IT terms and concepts for communicating with other professionals on projects in support of The Connected Enterprise.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Interpreting an Ethernet network hardware layout
- Verifying communications between two Ethernet devices
- Interpreting basic data flow of host-to-host Ethernet communications
- Recognizing Ethernet data transmission types
- Recognizing Layer 2 switching functions on an Ethernet network
- Recognizing Ethernet network loop avoidance protocols
- Interpreting the Network Address Translation (NAT) scheme for an Ethernet network
- Accessing Ethernet switch information using CLI commands
- Recognizing Layer 3 switching functions on an Ethernet network
- Copying and removing IOS configuration files on an Ethernet switch

## Who Should Attend?

Operations Technology (OT) professionals (such as control engineers) and others responsible for installing, configuring and/or maintaining industrial devices on an Ethernet network should attend this course.

## Prerequisites

To successfully complete this course, the following prerequisite is required:

– Ability to perform basic Windows® operating system tasks

**Job Aids Included**

Ethernet/IP Procedures Guide ABT-N300-TSJ50

# Managing Industrial Networks for Manufacturing with Cisco Technologies (IMINS2)

**IMINS2**

5 Days

**Course Purpose**

Gain the skills you need to successfully implement and troubleshoot the most common industry standard protocols. Our lab-intensive course, Managing Industrial Networks for Manufacturing with Cisco® Technologies (IMINS2), builds on the Managing Industrial Networks with Cisco Networking Technologies (IMINS) course. It teaches students how to deploy best practices used in security and wireless technologies for today's industrial networks. The IMINS2 course caters to plant administrators, control system engineers, and traditional network engineers in the oil and gas, process control, and manufacturing industries who are involved with the convergence of IT and industrial networks. It prepares students for the exam, Managing Industrial Networks for Manufacturing with Cisco Technologies Certification (200-601 IMINS2) and the Cisco Certified Network Associate Industrial (CCNA Industrial) certification. This course is job and role-specific, enabling students to achieve competency and skills to configure, maintain, and troubleshoot industry standard network protocols as well as wireless and security technologies. Learn how to make full use of current infrastructures while developing a converged platform for flexibility to support future business outcomes. IMINS2 exposes students to multiple industrial network technologies in addition to products from Cisco and other industrial suppliers, including Rockwell Automation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize the difference between enterprise and industrial networks
- Understand the functions of the OSI layers and TCP/IP model
- Troubleshoot common issues found in Layers 1, 2, and 3 of the OSI model
- Describe the functions and components of Ethernet and IP protocols
- Configure CIP on Cisco and Stratix managed switches
- Troubleshoot common Ethernet and IP issues
- Describe the functions and components of the PROFINET protocol
- Configure PROFINET protocols on Cisco Industrial Ethernet devices
- Troubleshoot common PROFINET issues
- Identify common network threats and resolutions
- Configure basic security components (access lists and AAA features)
- Configure a wireless network within an industrial environment

## Who Should Attend?

This course is designed for IT and operations technology (OT) professionals as well as control engineers involved with the installation, configuration, and troubleshooting of networked industrial products and solutions for the following industries: Manufacturing, Process control, Oil and gas, Other industries as applicable

## Prerequisites

Knowledge and skills required:

- College degree, or non-degreed qualified technician with two– three years' experience in industrial networks
- Familiarity with command-line and web-based interfaces
- Solid understanding of networking and industrial protocols

# Segmenting an Industrial Ethernet Network

## VC-SEGNET-A

3 Hours CEUs 0.3

**Course Purpose**

This course will teach you how to start the transition from industrial Ethernet network designs that use a flat and open infrastructure to ones that are structured, hardened, modular, and future-ready. You will be introduced to the concept of organizing a network as smaller, modular, building blocks that:

- Minimize network sprawl
- Give you a scalable, robust, and future-ready network infrastructure

Once you have defined the building blocks of a network, you will then look at options to segment and manage the required traffic flows of the network. Segmentation techniques will include physical segmentation, VLANs, and Network Address Translation (NAT). Finally, you will make decisions around organizing the IP subnets for the network.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define cell/area zones
- Identify level 3 site operations
- Identify switch requirements
- Decide whether to use NAT
- Decide between physical or VLAN segmentation
- Assign VLANs and subnets to each cell/area zone

## Who Should Attend?

Control or network engineers who have to design industrial Ethernet networks should attend this course.

## Prerequisites

- To attend this course, you should already have these prerequisite skills and knowledge:
  - Familiarity with the concepts of IP addresses and subnets
  - Working knowledge of common components of an industrial automation system: controllers, drives, I/O, &HMI

## SAFETY STANDARDS

**Functional Safety for Machinery Introduction**
SAF-TUV1 • 3 Days

**Functional Safety for Machinery Engineer Certification (TÜV Rheinland)**
SAF-TUV2T • 4.5 Days

**Functional Safety for Machinery Technician Certification (TÜV Rheinland)**
SAF-TUV0T • 2 Days

**NFPA 70E® 2018-Electrical Safety and Arc Flash Compliance**
SAF-SFT11218 • 2 Days
US Standard

**Machine Functional Safety and ISO 13849 System Design: Risk Assessment**
VC-MFSISO-A • 120-Min. Session

Private Delivery Only

**NFPA 70E® 2018 – Electrical Safety and Arc Flash Awareness**
SAF-SFT10618 • 1 Day
US Standard

**Lockout Tagout**
VC-LOTO-A • 3 Hour Session

**NFPA 70E® 2018 – Electrical Safety and Arc Flash Awareness**
VC-SFT10618 • (4) 90-Min. Sessions
US Standard

## PROGRAM OR DESIGN

**Studio 5000 Logix Designer Level 3: Project Development**
CCP143 • 4 Days

**GuardLogix Application Development**
SAF-LOG101 • 2 Days

Private Delivery Only

**AADvance Comprehensive System Training**
PRST9063LD • 3 Days

## MAINTAIN OR TROUBLESHOOT

**GuardLogix Fundamentals and Troubleshooting**
SAF-LOG103 • 1 Day

Private Delivery Only

**AADvance Operation, Maintenance, and Troubleshooting**
PRST9064LD • 2 Days

**Safety Relays and Devices Maintenance and Troubleshooting**
SAF-COM101 • 2 Days

# Studio 5000 Logix Designer Level 3: Project Development

## CCP143

4 Days CEUs 2.8

**Course Purpose**

Given a functional specification for a Logix5000 application, students will be able to develop a project during the course to meet the specification requirements. This course covers tasks common to all controllers that use the Logix5000 control engine or operating system, including ControlLogix, CompactLogix, and SoftLogix™ controllers. This course presents a deeper understanding of project development tasks, such as organizing tasks and routines, organizing controller data, configuring modules, and sharing data. Students will use Producer/Consumer technology to multicast input and output devices, share data between controllers, and control remote I/O.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create and organize a project
- Create periodic and event tasks
- Develop an add-on instruction in ladder diagram
- Organize arrays
- Create a user-defined data type
- Import components
- Enter, edit, and verify ladder logic
- Configure a controller to produce and consume data
- Configure controllers to share data over EtherNet/IP™
- Communicate with a local 1756-I/O module and over an EtherNet/IP network
- Configure a message
- Allocate connections
- Retrieve and set controller status values with GSV/SSV instructions
- Program a BTD instruction
- Handle a major fault
- Manage project files
- Update firmware

**Job Aids Included**

| | |
|---|---|
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Top 20

Individuals who need to develop Studio 5000 Logix Designer® projects for any Logix5000 controller

## Prerequisites

- Ability to perform basic Microsoft Windows tasks
- Knowledge of common controller terms and operation through experience or one of the following courses:
  - Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course No. CCP146)
  - RSTrainer for ControlLogix Fundamentals computer-based training (9393-RSTCLX)
- Ability to write basic ladder logic with common instructions, such as bit, timer, counter, move, and comparison instructions through experience or this course:
  - Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming (Course No. CCP151)

# Machine Functional Safety and ISO 13849 System Design: Risk Assessment

VC-MFSISO-A

120 Min. CEUs 0.2

**Course Purpose**

This course teaches students to use a structured risk assessment process based on ISO 13849. Students will learn how to identify the hazards of a machine, estimate the level of risk, and choose risk reduction techniques. During the exercises, students will make their decisions using the terms and rating system from ISO 13849. As students work through the process, they will build documentation that they can use throughout the lifecycle of their machines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define the scope of the risk assessment
- Identify the hazards
- Determine the risk level of each hazard
- Identify potential risk reduction techniques
- Choose risk reduction techniques
- Write a risk assessment report

## Who Should Attend?

Design engineers, maintenance managers, or people in health and safety roles

## Prerequisites

Experience with the design, development, maintenance, or supervision of industrial automation systems is required

## Technology Requirements

A computer and phone

# AAdvance Comprehensive System Training

(Private Delivery Only)

## PRST9063LD

3 Days

**Course Purpose**

This course provides a comprehensive overview of AADvance hardware, software, and troubleshooting. Upon successful completion of this course, students should be able to understand how AADvance operates as a fail-safe or fault tolerant controller; understand the configuration limits of the system; examine process I/O requirements and select the appropriate hardware; design and assemble a complete system; use the Workbench to configure and program the system, including communication with external devices; develop functions, function blocks and programs using standard IEC 61131 programming languages; make hardware expansions to an existing system; and isolate faults to the module level by interpreting automatic fault indications.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize system architectures
- Identify components
- Install and wire a system
- Develop a program
- Simulate and test a project
- Download and monitor a project
- Create and use functions and function blocks
- Update a running project
- Map a binding between controllers
- Manage version source control
- Protect a project
- Import and export elements
- Archive and restore a project
- Configure OPC communication
- Troubleshoot a system
- Develop a project

## Who Should Attend?

Individuals who are responsible for designing, building, programming, and troubleshooting an AADvance system

## Prerequisites

- General knowledge of programmable logic controllers (PLCs)
- Background in industrial electronic control principles and practices

***Curriculum Note:***

*Do not take both PRST9063LD and PRST9064LD because they share similar content. If your responsibilities are limited to maintaining and troubleshooting the AADvance system, take this course instead: AADvance Operation, Maintenance, & Troubleshooting (PRST9064LD)*

# AAdvance Operation, Maintenance and Troubleshooting

(Private Delivery Only)

PRST9064LD

2 Days

**Course Purpose**

This course provides an overview of AADvance hardware, software, and troubleshooting. The course consists of a mixture of lecture and hands-on lessons. Upon successful completion of this course, students should be able to understand how AADvance operates as a fail-safe or fault tolerant controller; understand the configuration limits of the system; navigate the workbench; monitor programs; lock/force I/O points; isolate faults to the module level by interpreting automatic fault indications; and hot-replace failed modules without disrupting the systems or process.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Recognize system architectures
- Identify components
- Install and wire a system
- Develop a program
- Download and monitor a project
- Update a running project
- Manage version source control
- Troubleshoot a system

***Curriculum Note:***

*Do not take both PRST9063LD and PRST9064LD because they share similar content. If you are responsible for designing, building, or programming an AADvance system take this course instead: AADvance Comprehensive System Training (PRST9063LD)*

## Who Should Attend?

Individuals responsible for maintaining and troubleshooting the AADvance system

## Prerequisites

- General knowledge of programmable logic controllers (PLCs)
- Background in industrial electronic control principles and practices

# Safety Relays and Devices Maintenance and Troubleshooting

## SAF-COM101

2 Days CEUs 1.4

**Course Purpose**

This course will assist students in maintaining and troubleshooting safety relays and devices in relay-based machine functional safety systems. Students will be introduced to safety relays and input and output devices used to configure safety systems according to industry standards for functional safety of machinery. Students will have the opportunity for hands-on experience with Rockwell Automation safety products, including safety relays; opto-electronic presence sensing devices (light curtains and sensors); pressure sensing devices (safety mats); operator interface devices (grip enabling switches and E-stop pushbuttons); electromechanical switches (interlock); and electronic switches (non-contact RFID).

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Maintain relay-based machine functional safety systems
- Interpret and clear faults:
  - At the safety relay
  - For E-stop pushbuttons and grip enabling switches
  - For interlock and non-contact switches
  - For light curtains and safety sensors
  - For safety mats
  - For safety outputs
  - For wiring in safety systems

## Who Should Attend?

Individuals who maintain and troubleshoot electric circuits or machine systems and need to learn more about how to apply their skills to relay-based machine functional safety systems

## Prerequisites

Experience

- Interpreting industrial electrical circuit schematics
- Maintaining industrial electrical circuits or machine systems

# GuardLogix® Application Development

## SAF-LOG101

2 Days CEUs 1.4

**Course Purpose**

Upon completion of this course, students will be able to create a Logix Designer project for a GuardLogix system and maintain the system. Students will have the opportunity to develop and practice these skills by: adding and configuring CompactBlock Guard I/O safety modules; creating and configuring a GuardLogix project; generating safety signatures and lock/unlock a GuardLogix controller; and programming safety instructions.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Create a new GuardLogix project using the Logix Designer application
- Configure CompactBlock Guard I/O safety modules for a GuardLogix project using the Logix Designer application
- Get CompactBlock Guard I/O point status information via explicit messaging using the Logix Designer application
- Configure a GuardLogix controller to produce and consume safety data over EtherNet/IP
- Configure GuardLogix controller safety option
- Program a dual-channel input stop instruction and dual-channel input stop with test and mute instruction
- Program a configurable redundant output instruction
- Program a five position mode selector instruction
- Program a safety mat instruction


## Who Should Attend?

Individuals who need to develop Logix Designer projects for GuardLogix controllers

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the Studio 5000 Logix Designer Level 3: Project Development course (CCP143) and GuardLogix Fundamentals and Troubleshooting course (SAF -LOG103)
- General experience with industrial controls

# GuardLogix® Fundamentals and Troubleshooting

## SAF-LOG103

1 Day CEUs 0.7

**Course Purpose**

This course will assist students in developing and building a solid foundation with a fundamental knowledge of a GuardLogix system. Upon completion of this course, students should be able to efficiently troubleshoot a previously operational GuardLogix system. Students will have the opportunity to develop and practice these skills by learning basic GuardLogix concepts and terminology and troubleshooting a GuardLogix project.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Understanding GuardLogix Controller Safety Operation
- Identifying GuardLogix System Hardware Components
- Identifying GuardLogix Project Components
- Downloading and Uploading a GuardLogix Project
- Troubleshooting GuardLogix Controller Components
- Troubleshooting and Replacing GuardLogix CompactBlock Guard I/O Safety Modules

## Who Should Attend?

Individuals who need to monitor and troubleshoot Logix Designer projects and hardware for GuardLogix controllers

## Prerequisites

- Ability to perform basic Microsoft Windows tasks
- Completion of the following courses or equivalent experience with Studio 5000 Logix Designer:
  - Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course Number CCP146)
  - Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting (Course Number CCP153)
- General experience with industrial controls

# NFPA 70E® 2018–Electrical Safety and Arc Flash Awareness (Private Delivery Only)

**SAF-SFT10618**

1 Day

**Course Purpose**

The purpose of this course is to provide the student with an overall understanding of the current requirements of NFPA 70E. A complete review of the standard will be provided, along with a review of the tables used to determine the Limited and Restricted Approach Boundaries and tables and calculation methods used to determine the Arc Flash Boundary and for determining proper personal protective equipment (PPE).

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Review of Work Practices required by NFPA 70E Standard for Electrical Safety in the Workplace
- Determining Limited and Restricted Approach Boundaries
- Determining/Calculating the Arc Flash Boundary
- Selection of Personal Protective Equipment

## Who Should Attend?

Individuals that require access to or will be exposed to the work area designated by the arc flash or limited approach boundaries

## Prerequisites

- Familiarity with basic electricity
- Proficiency in student's respective classification

OR

- Enrolled in an up-grader or apprentice program

**Job Aid Included**

NFPA 70E: Standard for Electrical Safety in the Workplace®, 2015 Edition

# NFPA 70E® 2018–Electrical Safety and Arc Flash Compliance

**SAF-SFT11218**

2 Days

**Course Purpose**

The purpose of this course is to provide the student with an in-depth understanding of the current requirements of NFPA 70E® 2018. A complete presentation of the standard will be provided, along with the examples and exercises covering the tables and calculation methods used in the standard for determining Approach Boundaries and selecting proper Personal Protective Equipment (PPE).

**Objectives**

After completing this course, students should be able to perform the following tasks:

- NFPA 70E 2018 Standard for Electrical Safety in the Workplace
- Safe Electrical Work Practices
- Calculating Arc Flash Boundary (Bolted Fault)
- Selecting Appropriate Personnel Protective Equipment
- Calculations based on Bolted Fault Current – Short-circuit Current, Power in the Arc, Arc Flash Boundary, Determining Clearing Time, Incident Energy (Arc in Open Air & Arc in a Cubic Box), Calculation Limitations
- Calculations based on Arcing Current (IEEE 1584) – Arcing Current, Incident Energy (Normalized and Actual), IEEE 1584 Arc Flash Boundary Calculation

Top 20

## Who Should Attend?

Individuals who:

- Are responsible for ensuring compliance with, developing training on, or supervising employees who are required to work in accordance with NFPA 70E 2015
- Will be exposed to work areas designated by the approach boundaries

## Prerequisites

- Familiarity with basic electricity
- Proficiency in student's respective classification

  OR
- Enrolled in an up-grader or apprentice program

**Job Aid Included**

NFPA 70E: Standard for Electrical Safety in the Workplace®, 2015 Edition

# Functional Safety for Machinery Technician Certification (TÜV Rheinland)

SAF-TUV0T

2 Days

**Course Purpose**

The standards regarding functional safety and relevant laws and directives demand that people and organizations performing responsible (accountable) tasks during relevant life cycle phases of a machine must achieve and prove required competencies. In this training, students will learn how the current standards dictate the selection, assembly, installation, validation, and maintenance of safety devices and components to reduce hazards from machinery and ensure the safety of people and the environment. Practical examples will demonstrate possibilities regarding machine protection. This training will also cover safety topics, such as: redundancy, testing, distance calculations, assigning required level of risk reduction as PL, monitoring moveable guard positions, and fault avoidance for relevant life cycle phases. After completing this course, students should understand and be able to use ISO 12100, IEC 60204-1 and other relevant machine functional safety standards. Students who want Functional Safety for Machinery Technician Certification (TÜV Rheinland) must meet all eligibility requirements and pass the exam scheduled at the end of the second day.

**Objectives**

After completing this course, students should be able to identify

- Understanding the Functional Safety for Machinery Technician Certification (TÜV Rheinland)
- Defining Legal Guidelines and Standards
- Defining Risk Analysis and Processes (ISO 12100:2010)
- Defining Basic Electrical Safety Principles (IEC 60204-1)
- Defining Basic Safety Principles
- Defining Machine Guarding Principles
- Identifying Safety Functions
- Identifying Safety Devices
- Identifying Circuits, Schematics, and Examples
- Defining New Standards Regarding Safety of Machinery
- Evaluating Machine Safety Using a Practical Example


## Who Should Attend?

Machine technicians, application engineers, safety specialists and those responsible for repairing and maintaining machine safety should attend this course.

## Prerequisites

Required:

- Minimum of 1 year experience working on industrial machinery
- A completed and approved eligibility form to receive certification (see details in the next section)

**Recommended**: Basic working knowledge of electrical and electronic control functions for machinery
**Recommended**: Awareness of basic safety principles

# Functional Safety For Machinery Introduction

## SAF-TUV1

3 Days

**Course Purpose**

This is an introduction to the Rockwell Automation/TÜV Rheinland certification course in functional safety for machinery. This course will define the design and proof requirements for functional safety of machines, according to current standards and guidelines. Practical examples will demonstrate possible techniques for machine guarding and protection. This course will introduce organizational measures that can be instituted to protect employees and equipment. The organizational measures include quality assurance techniques and documentation for life-cycle design and validation. After completing this course, students should understand how safety devices and components are assembled and applied to reduce hazards from machinery so the necessary safety for people and the environment is achieved.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Understand the Functional Safety for Machinery Certification (TÜV Rheinland)
- Define:
  - European and OSHA guidelines and requirements
  - Risk analysis and processes (ISO 12100:2010)
  - ISO 13894-1, ISO 13849-1/2, and IEC 62061
  - New standards regarding safety of machinery
  - Basic electrical safety principles (IEC 60204-1)
- Identify:
  - Safety devices
  - Safety functions of machines
  - Circuits, schematics, and examples
- Perform ISO 13849/IEC 62061 calculations

## Who Should Attend?

Application engineers, system integrators, developers, safety specialists, and authorized experts in machinery

## Prerequisites

It is highly recommended that training participants have professional experience in the field of Functional Safety or have attended another introduction course on Functional Safety

# Functional Safety For Machinery Engineer Certification (TÜV RHEINLAND)

## SAF-TUV2

4 Days*

**Course Purpose**

In this course, students will learn how current standards dictate the design and proof of functional safety for machines. The participant will learn how safety devices and components are assembled and applied to reduce hazards from machinery so the necessary safety for people and environment is achieved. Practical examples will demonstrate possibilities regarding machine protection. In addition to the technical requirements, students will learn about organizational measures, quality assurance techniques, and documentation for lifecycle design and validation. After completing this course, students should understand and be able to use IEC 60204-1, IEC 62061, ISO 12100, ISO 13849-1, -2, and other relevant machine functional safety standards. The exam is optional for students who would like to attend the training, but do not want certification, are assembled and applied to reduce hazards from machinery so the necessary safety for people and the environment is achieved.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Understand the Functional Safety for Machinery Engineer Certification (TÜV Rheinland)
- Define:
  - Legal guidelines and standards
  - Risk analysis and processes (ISO 12100:2010)
  - Basic electrical safety principles (IEC 60204-1)
  - New standards regarding safety of machinery
  - ISO 13849-1, ISO 13849-2, and IEC 62061
- Identify:
  - Safety devices
  - Safety functions of machines
  - Circuits, schematics, and examples
- Perform ISO 13849/IEC 62061 calculations

** additional 0.5 days for exam*

## Who Should Attend?

Application engineers, system integrators, developers, safety specialists, and authorized experts in machinery

## Prerequisites

Recommended completion of the Functional Safety for Machinery Introduction course (SAF-TUV1), but not mandatory

A completed and approved Functional Safety Technician eligibility form from TÜV Rheinland is required for admittance to the exam

**Exam And Eligibility Requirements for Tüv Functional Safety Engineer**

The following requirements must be met in order to receive the TÜV Functional Safety Engineer certificate:

- A completed and approved eligibility form from TÜV Rheinland proving::
  - Minimum of 3-5 years experience in the field of Functional Safety
  - University engineering degree (master's or bachelor's) or equivalent engineer
- Completion of eligibility form from Rockwell Automation/TÜV Rheinland
- A passing grade of 70% or higher on Functional Safety for Machinery Engineer Certification (TÜV Rheinland) exam

# Lockout Tagout

## VC-LOTO-A

180 Min

**Course Purpose**

This training expose students to the lockout-tagout processes and procedures. Students will also become familiar with the regulation's intent, the company's policy on lockout, and how each applies to them and their job function is customized with pictures of the actual equipment in the facility and includes specific tasks that the authorized employees will encounter on a routine basis including a hands-on lockout demonstration guided by our lockout expert.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Explain the goals and benefits of lockout-tagout procedures
- Instruction on how to use the lockout-tagout procedures that have been implemented as part of the client's program

## Who Should Attend?

This course is recommended for all employees when a new system is put in place, as an annual training requirement, or for newly hired.

## Prerequisites

Experience with the design, development, maintenance, or supervision of industrial automation systems is required

## Technology Requirements

A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html

# NFPA 70E® 2018–Electrical Safety and Arc Flash Awareness

VC-SFT10618

(4) 90-Min. Sessions

**Course Purpose**

This course will teach you to assess arc flash hazards and act to mitigate them by selecting appropriate PPE and determining shock protection and arc flash boundaries. You will also learn how to use NFPA 70E® 2018 and approach boundary calculation methods to approach boundaries. This course also provides some of the key requirements necessary to become a "qualified" person as defined in OSHA 1910.269, 332, 333, and NFPA 70E.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Determining approach distances
- Being capable of using special precautionary techniques, PPE, insulating and shielding materials, and insulated tools
- Receiving safety training to recognize and avoid hazards

## Who Should Attend?

Individuals required to work in accordance with NFPA 70E or who will be exposed to work areas designated by an arc flash boundary

## Prerequisites

- Experience distinguishing exposed live parts from other parts of electrical equipment
- Determining nominal system voltage of exposed live parts
- Skills and knowledge related to the construction and operation of electrical

## Technical Requirements

- A computer and phone
- A calculator must be available for Session 2
- A scientific calculator must be available for Session 3 and Session 4

Students can use the calculator found in Microsoft Windows>Programs>Accessories for all sessions.

## UNDERSTAND

### SAFETY STANDARDS

**Machine Functional Safety and ISO 13849 System Design: Risk Assessment**
VC-MFSISO-A • 120-Min. Session

**NFPA 70E® 2018 – Electrical Safety and Arc Flash Awareness**
VC-SFT10618 • (4) 90-Min. Sessions

**Lockout Tagout**
VC-LOTO-A • 3 Hour Session

### PROGRAM OR DESIGN

**Ladder Logic Basics with CompactLogix Starter Workstation**
VC-LLB-B • (5) 120-Min. Sessions

**Ladder Logic Basics without CompactLogix Hardware**
VC-LLBWO-A • (5) 120-Min. Sessions

**FactoryTalk ViewPoint Implementation**
VC-FTVIEW-A • 90-Min. Session

**Machine-Level Design Optimization**
VC-MLDO-A • (2) 120-Min. Sessions

**POINT I/O Implementation**
VC-PIO-A • 120-Min. Session

**PowerFlex 523/525 Drives with PowerFlex 525 Drive Kit: Communications and Programming**
VC-PF523P-A • (2) 90-Min. Sessions

**Segmenting an Industrial Ethernet Network**
VC-SEGNET-A • (4) 120-Min. Sessions

**Implementing an EtherNet/IP Network of Motion and Standard Drive Axes Using Premiere Integration**
VC-CCN300-C • (3) 120-Min. Sessions

**PLC-5 to ControlLogix Conversions**
VC-PLC5-CLX • 120-Min. Session

### MAINTAIN OR TROUBLESHOOT

**PowerFlex 755 Floor-Mounted Drives: Pre-Installation Planning**
VC-PF755H-A • 120-Min. Session

**Configuring and Troubleshooting a Device-Level Ring Network**
VC-DLR • 2 Hours

# FactoryTalk ViewPoint Implementation

## VC-FTVIEW-A

3.5 Days

**Course Purpose**

This course will teach you how to monitor your FactoryTalk® View ME projects in a web browser. This course will also show you how to create a new FactoryTalk View ME web application and connect to an existing FactoryTalk View ME web application via Ethernet from a PanelView™ Plus.

**Objectives**

After completing this course, students should understand the following topics:

- Characteristics of vibration and review of severity charts
- Relate time waveform and vibration frequency
- Digital vs. analog overall vibration measurement
- Vibration transducer overview and selection criteria
- Role of spike energy, HFD, and shock pulse and alarm levels
- Vibration signature analysis to diagnose machine problems
- How to track rolling element bearing health
- Methods for specifying spectral alarm band levels and frequencies
- Common pitfalls in vibration measurements

## Who Should Attend?

- Mechanics, technicians, engineers, or analysts involved in the maintenance or operation of plant machinery

## Prerequisites

- 6 months or more of field experience
- Completion of the Vibration Analysis Fundamentals (EK-ICM101), or similar, course

# Machine Functional Safety and ISO 13849 System Design: Risk Assessment

VC-MFSISO-A

120 Min. CEUs 0.2

**Course Purpose**

This course teaches students to use a structured risk assessment process based on ISO 13849. Students will learn how to identify the hazards of a machine, estimate the level of risk, and choose risk reduction techniques. During the exercises, students will make their decisions using the terms and rating system from ISO 13849. As students work through the process, they will build documentation that they can use throughout the lifecycle of their machines.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define the scope of the risk assessment
- Identify the hazards
- Determine the risk level of each hazard
- Identify potential risk reduction techniques
- Choose risk reduction techniques
- Write a risk assessment report

## Who Should Attend?

Design engineers, maintenance managers, or people in health and safety roles

## Prerequisites

Experience with the design, development, maintenance, or supervision of industrial automation systems is required

## Technology Requirements

A computer and phone

# NFPA 70E® 2015–Electrical Safety and Arc Flash Awareness

VC-SFT10618

(4) 90-Min. Sessions

**Course Purpose**

This course will teach students to assess arc flash hazards and act to mitigate them by selecting appropriate PPE and determining shock protection and arc flash boundaries. Students will learn how to use NFPA 70E 2015 and approach boundary calculation methods to determine approach boundaries. This course provides some of the key requirements necessary to become a "qualified" person as defined in OSHA 1910.269, 332, 333, and NFPA 70E, such as: determining approach distances; being capable of using special precautionary techniques, PPE, insulating and shielding materials, and insulated tools; receiving safety training to recognize and avoid hazards.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Determine appropriate PPE
- Determine thermal and shock boundaries
- Perform bolted fault arc flash calculations
- Perform arc fault calculations

## Who Should Attend?

Individuals required to work in accordance with NFPA 70E or who will be exposed to work areas designated by an arc flash boundary

## Prerequisites

- Experience distinguishing exposed live parts from other parts of electrical equipment
- Determining nominal system voltage of exposed live parts
- Skills and knowledge related to the construction and operation of electrical

## Technical Requirements

- A computer and phone
- A calculator must be available for Session 2
- A scientific calculator must be available for Session 3 and Session 4

Students can use the calculator found in Microsoft Windows>Programs>Accessories for all sessions.

# Ladder Logic Basics with CompactLogix Starter Workstation

## VC-LLB-B

(5) 120-Min. Sessions

**Course Purpose**

This course will teach students how to write and test basic ladder logic code and how to employ common programming strategies and best practices. Students will learn how to select and program bit, timer, counter, compare, and move instructions. Examples and labs will use Studio 5000 Logix Designer and a CompactLogix controller; however, the general ladder logic concepts covered in this course are applicable to most common programmable controllers.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Review basic logic flow
- Convert scenarios to if – then statements
- Convert if – then statements to simple rungs
- Enter ladder logic into software
- Download a project
- Monitor the ladder logic
- Tie the alias to an existing address
- Apply bit instructions and common ladder logic strategies
- Select a class of instruction categories
- Select and integrate timers and counters
- Select and integrate compare and move instructions
- Combine compare with move instructions

## Who Should Attend?

Beginning programmers or individuals who are required to edit ladder logic

## Prerequisites

A general knowledge of automation, including the general purpose of a controller, data, and I/O; and the purpose of common devices like push buttons, pilot lights, limit switches, relays, contractors, and solenoids is required

## Technical Requirements

- A computer and phone
- Studio 5000 Logix Designer (version 28) must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.
- CompactLogix starter workstation (shipped prior to class)

# Machine-Level Design Optimization: Drive and Motor Selection

## VC-MLDO-A

(2) 120 min.

**Course Purpose**

This course covers best practices for architecting control solutions for machines. The instructor will show students how to size and select drives and motors and then they will practice these tasks with an example application. The design tools and best practices covered in the course aim to optimize and reduce build time with machine-level design.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Configure a motion profile, a mechanism, and transmissions
- Select a motor and drive

## Who Should Attend?

Control engineers and OEMs who design machine-level control applications

## Prerequisites

There are no prerequisites for this course; however, experience with designing machine-level control applications is helpful

## Technical Requirements

- A computer and phone
- Motion Analyzer software, version 6.1, must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.

# Point I/O Implementation

## VC-PIO-A

120 Min. CEUs 0.2

**Course Purpose**

This course will teach students how to implement a POINT I/O system from determining the quantity and type of I/O needed to testing your system. This course will also show students how to calculate power requirements and decide whether an expansion power supply will be needed. Students will also add and configure an Ethernet adapter and I/O modules in a Studio 5000 Logix Designer project.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Size a POINT I/O control system
- Set the EtherNet/IP address of an Ethernet adapter
- Configure POINT I/O control system components in a Studio 5000 Logix Designer project
- Test POINT I/O control system components

## Who Should Attend?

Control engineers who design and develop control applications and who will be working with POINT I/O system components over an EtherNet/IP™ network

## Prerequisites

- Studio 5000 Logix Designer experience or one of the following courses:
  - Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting (CCP299)
  - Studio 5000 Logix Designer Level 1: CompactLogix Fundamentals and Troubleshooting (CCP298)
- Knowledge of Ethernet fundamentals
- Knowledge of safe electrical practices
- Knowledge of electrical principles such as voltage, current, and power

## Technical Requirements

- A computer and phone
- The Studio 5000 Logix Designer application (version 21) must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.

# PowerFlex 523/525 Drives with PowerFlex 525 Drive Kit: Communications and Programming

## VC-PF523P-A

(2) 90-Min Sessions CEUs 0.3

**Course Purpose**

After completing this course, students should be able to program drive parameters for a drive application. This course will teach students how to create a custom parameter group based upon drive applications. Throughout this course, the instructor will cover a range of topics from establishing communications with a PowerFlex 523/525 drive via a USB connection and EtherNet/IP network to testing parameters of a PowerFlex 523/525 drive using the HIM.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Establish communications with a PowerFlex 523/525 drive via a USB connection
- Establish communications with a PowerFlex 525 drive via an EtherNet/IP network
- Configure a PowerFlex 523/525 drive using the Startup Wizard in Connected
- Components Workbench™ software
- Create a CustomView parameter group
- Edit and test parameters using the HIM

## Who Should Attend?

Individuals who have drive programming experience but are new to PowerFlex component-class drives

## Prerequisites

- Knowledge of AC/DC drive fundamentals and drives programming experience
- Basic working knowledge of safe electrical practices including, but not limited to:
  - Understanding electricity, how it works, and the dangers involved in working with electricity
  - Identifying hazardous conditions
  - Adhering to all safety regulations

## Technical Requirements

- PowerFlex 525 drive kit (shipped prior to class)
- A computer and phone
- Connected Components Workbench software must be installed and activated. The virtual classroom invitation will provide details on how to obtain a temporary installation of the software if students do not have it.

# PowerFlex 755 Floor-Mounted Drives: Pre-Installation Planning

VC-PF755H-A

120 Min. CEUs 0.2

**Course Purpose**

This course will help students plan for the successful installation of PowerFlex 755 floor-mounted, frame 8 and larger (300 Hp (200 kW) and above) drives. Students will explore common drive pre-installation topics including specific wiring, mounting, fusing, and option card installation considerations for floor-mounted PowerFlex 755 units. During this course, students will use a variety of available technical documents and tools to help them prepare for installation situations unique to these drives.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Interpret and verify floor-mounted drive catalog numbers
- Prepare for frame 8 and larger drive mounting
- Verify drive option card locations
- Plan for floor-mounted drive
- Fusing and wiring
- Plan floor-mounted drive integration with a motor control center

## Who Should Attend?

Individuals responsible for installing Frame 8 and larger PowerFlex 755 drives

## Prerequisites

- Knowledge of safe electrical practices
- Prior experience working with AC drives
- Experience with wall-mounted (frame 1…7) PowerFlex 750-series drives is helpful, but not required

## Technical Requirements

A computer and phone

# Ladder Logic Basics without CompactLogix Hardware VC-LLBWO-A

120 Min

**Course Purpose**

This course will teach you how to write and test basic ladder logic code and how to employ common programming strategies and best practices. You will also learn how to select and program bit, timer, counter, compare, and move instructions. Examples and labs will use the Studio 5000 Logix Designer® application and RSLogix™ Emulate 5000 simulation software. Note: There is no hardware provided for this course; however, the general ladder logic concepts covered in this course are applicable to most common programmable controllers and will be simulated using RSLogix Emulate 5000 simulation software.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Ladder Logic Basics: If-Then Statements
- Ladder Logic Basics: Ladder Logic Verification
- Ladder Logic Basics: Common Strategies and Best Practices
- Ladder Logic Basics: Timers and Counters
- Ladder Logic Basics: Compare and Move Instructions

| Characteristic | Minimum | Recommended |
|---|---|---|
| Processor | Pentium 4 | Intel Core i5 |
| Speed | 2.8 GHz | 2.8GHz |
| RAM Memmory | 2 GB | 8 GB |
| Hard Disk Space - Free | 16 GB | 20 GB |
| Graphic Device | DirectX 9, with WDDM 1.0 or higher drive | DirectX 9, with WDDM 1.0 or higher drive |

*Note: The Logix Designer application is currently not supported on Windows® 8 operating systems.*

## Who Should Attend?

Beginning programmers or individuals who are required to edit ladder logic should attend this course

## Prerequisites

- A general knowledge of automation, including the general purpose of a controller, data, and I/O; and the purpose of common devices like pushbuttons, pilot lights, limit switches, relays, contactors, and solenoids is required.

## Technical Requirements

- A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html
- RSLogix Emulate 5000 software, version 21.
- Studio 5000 Logix Designer software, version 21, must be installed and activated.
  - If you don't have the software, your virtual classroom invitation will provide details on how to obtain a temporary installation.

# Segmenting an Industrial Ethernet Network

## VC-SEGNET-A

3 Hours CEUs 0.3

**Course Purpose**

This course will teach you how to start the transition from industrial Ethernet network designs that use a flat and open infrastructure to ones that are structured, hardened, modular, and future-ready. You will be introduced to the concept of organizing a network as smaller, modular, building blocks that:

- Minimize network sprawl
- Give you a scalable, robust, and future-ready network infrastructure

Once you have defined the building blocks of a network, you will then look at options to segment and manage the required traffic flows of the network. Segmentation techniques will include physical segmentation, VLANs, and Network Address Translation (NAT). Finally, you will make decisions around organizing the IP subnets for the network.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define cell/area zones
- Identify level 3 site operations
- Identify switch requirements
- Decide whether to use NAT
- Decide between physical or VLAN segmentation
- Assign VLANs and subnets to each cell/area zone

## Who Should Attend?

Control or network engineers who have to design industrial Ethernet networks should attend this course.

## Prerequisites

- To attend this course, you should already have these prerequisite skills and knowledge:
  - Familiarity with the concepts of IP addresses and subnets
  - Working knowledge of common components of an industrial automation system: controllers, drives, I/O, &HMI

# Implementing an EtherNet/IP Network of Motion and Standard Drive Axes Using Premiere Integration

## VC-CCN300-C

(3) 120 MIN CEUs 0.6

**Course Purpose**

This course will teach you how to choose an EtherNet/IP network topology and relevant components, configure controllers and axes, and add Kinetix® 6500 and PowerFlex® 755 drives for control over an EtherNet/IP network (also known as CIP™ motion). This course will also show you how to start up the network, run hookup tests, autotune axes, and test axes with motion direct commands.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Choose a network topology
- Choose network components
- Configure a network
- Add the motion group and axes
- Add drives
- Configure axes
- Start up an EtherNet/IP network
- Test hardware
- Autotune axes
- Test axis performance

## Who Should Attend?

Control engineers who design and develop motion control applications and who will be working with drives controlled over an EtherNet/IP network should attend this course.

## Prerequisites

Experience developing motion control applications and working in the Studio 5000® environment.

## Technology Requirements

A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html

# Lockout Tagout

## VC-LOTO-A

180 Min

**Course Purpose**

This training expose students to the lockout-tagout processes and procedures. Students will also become familiar with the regulation's intent, the company's policy on lockout, and how each applies to them and their job function is customized with pictures of the actual equipment in the facility and includes specific tasks that the authorized employees will encounter on a routine basis including a hands-on lockout demonstration guided by our lockout expert.

**Objectives**

After completing this course, students should be knowledgeable about the following topics and tasks:

- Explain the goals and benefits of lockout-tagout procedures
- Instruction on how to use the lockout-tagout procedures that have been implemented as part of the client's program

## Who Should Attend?

This course is recommended for all employees when a new system is put in place, as an annual training requirement, or for newly hired.

## Prerequisites

Experience with the design, development, maintenance, or supervision of industrial automation systems is required

## Technology Requirements

A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requirements.html

# Configuring and Troubleshooting a Device-Level Ring Network

## VC-DLR

2 Hours CEUs .2

**Course Purpose**

This course will teach you the process of configuring a device-level ring (DLR) network including determining node counts, supervisor, back up and ring nodes. You will be provided with an understanding of normal operation of a DLR network and how to configure a supervisor node for managing traffic. This course will also show you the troubleshooting tools for diagnosing issues on the network along with resolutions to return a faulted DLR network back to normal operation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Define Supervisor Nodes
- Add an EtherNet/IP Device
- Connect Devices to the Network
- Configure Supervisor Nodes in a Logix Designer Project
- Complete the Physical Connections of the Network
- Verify the Network

## Who Should Attend?

Control and automation engineers who are responsible for configuring a DLR network and returning a faulted network back to normal operation.

## Prerequisites

- Experience configuring embedded switch technology devices in a Studio 5000 Logix Designer® project.

# PLC-5 to ControlLogix Conversions

## VC-PLC5-CLX

120 Minutes CEUs .2

**Course Purpose**

This course will teach you how to convert your PLC-5® program to a project for a ControlLogix® controller as part of a system migration. You will learn to start a phased migration where you leave your existing I/O system in place and connect to it via a ControlLogix Remote I/O communication module

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Prepare and export the PLC-5 for translation
- Convert text files to a ControlLogix Project
- Resolve program conversion errors
- Configure the 1756-RIO Module
- Map I/O data between the 1756-RIO Module and Logic
- Verify project flow control

## Who Should Attend?

Control engineers who have to migrate existing PLC-5 control systems to ControlLogix control systems.

## Prerequisites

- Draft ladder logic in the Studio 5000 Logix Designer® application
- Configure common Logix5000™ instructions, such as bit-level, timer, and copy instructions
- Configure an I/O module
- Locate data in an array
- Download a project to a ControlLogix controller

## Technical Requirements

A computer and phone are required. For minimum computer requirements for the virtual classroom tool, please visit: http://support.webex.com/support/system-requriements.html

# Computer-Based Training Guide

Rockwell Automation

## CONTROLLOGIX/RSLOGIX 5000

RSTrainer for RSLogix 5000 Software- Project Configuration
9393-RSTLX5KPRJ
9393-RSTLX5KPRJM
Enterprise Edition
9393-RSTLKPRJENF
9393-RSTLKPRJENFM

RSTrainer for RSLogix 5000 Software- Offline Programming
9393-RSTLX5KOFF
9393-RSTLX5KOFFM
Enterprise Edition
9393-RSTLKOFFENF
9393-RSTLKOFFENFM

RSTrainer for RSLogix 5000 Software- Online Monitoring
9393-RSTLX5KON
9393-RSTLX5KONM
Enterprise Edition
9393-RSTLKONENF
9393-RSTLKONENFM

RSTrainer for RSLogix 5000 Software - Software - Bundle
9393-RSTL5KENE
9393-RSTL5KENM
Enterprise Edition
9393-RSTL5KENF
9393-RSTL5KENFM

RSTrainer for RSLogix 5000 Software - Motion
9393-RSTLX5KMOT
9393-RSTLX5KMOTM
Enterprise Edition
9393-RSTLKMOTENF
9393-RSTLKMOTENFM

RSTrainer for RSLogix 5000 Software - ControlLogix Fundamentals
9393-RSTCLX
9393-RSTCLXM
Enterprise Edition
9393-RSTCLXENF
9393-RSTCLXENFM

## SLC/RSLOGIX 500

RSTrainer for SLC 500 - Hardware Fundamentals
9393-RSTSLCHENE
9393-RSTSLCHENM
Enterprise Edition
9393-RSTSLCHENF
9393-RSTSLCHENFM

RSTrainer for SLC 500 - Programming Fundamentals
9393-RSTSLCPENE
9393-RSTSLCPENM
Enterprise Edition
9393-RSTSLCPENF
9393-RSTSLCPENFM

RSTrainer for SLC 500 Fundamentals Bundle
9393-RSTSLCALENE
9393-RSTSLCALENM
Enterprise Edition
9393-RSTSLCALENF
9393-RSTSLCALENFM

Available in Spanish

RSTrainer for RSLogix 500 Software - Offline Programming
9393-RST500OFENE
9393-RST500OFENM
Enterprise Edition
9393-RST500OFENF
9393-RST500OFENFM

RSTrainer for RSLogix 500 Software - Online Monitoring
9393-RST500ONENE
9393-RST500ONENM
Enterprise Edition
9393-RST500ONENF
9393-RST500ONENFM

RSTrainer for RSLogix 500 Software - Documenting and Searching
9393-RST500DSENE
9393-RST500DSENM
Enterprise Edition
9393-RST500DSENF
9393-RST500DSENFM

RSTrainer for RSLogix 500 Software - Bundle
9393-RST500ALENE
9393-RST500ALENM
Enterprise Edition
9393-RST500ALENF
9393-RST500ALENFM

## NETWORKS

RSTrainer for RSLogix 5000 Software - EtherNet/IP - Hardware and IP Addressing
9393-RSTENET1ENE
9393-RSTENMT1ENM
Enterprise Edition
9393-RSTENET1ENF
9393-RSTENMT1ENFM

RSTrainer for RSLogix 5000 Software Communications and Diagnostics
9393-RSTENET2ENE
9393-RSTENMT2ENM
Enterprise Edition
9393-RSTENET2ENF
9393-RSTENMT2ENFM

RSTrainer for RSLogix 5000 Software - Software - EtherNet/IP Bundle
9393-RSTENETAENE
9393-RSTENMTAENM
Enterprise Edition
9393-RSTENETAENF
9393-RSTENMTAENFM

RSTrainer for RSLinx Software
9393-RSTLINX
9393-RSTLINXM
Enterprise Edition
9393-RSTLINXENF
9393-RSTLINXENFM

## PLC/RSLOGIX 5

RSTrainer for RSLogix 5 Software
9393-RSTLX5
9393-RSTLX5M
Enterprise Edition
9393-RSTLX5ENF
9393-RSTLX5ENFM

## HYDRAULICS

RSTrainer for Hydraulics
9393-RSTHYD
9393-RSTHYDM
Enterprise Edition
9393-RSTHYDENF
9393-RSTHYDENFM

## VISUALIZATION

RSTrainer for FactoryTalk View Machine Edition - Applications and Displays
9393-RSTVMEPT1
9393-RSTVMEPT1M
Enterprise Edition
9393-RSTMEPT1ENF
9393-RSTMEPT1ENFM

RSTrainer for FactoryTalk View Machine Edition - Drawing Objects
9393-RSTVMEPT2
9393-RSTVMEPT2M
Enterprise Edition
9393-RSTMEPT2ENF
9393-RSTMEPT2ENFM

RSTrainer for FactoryTalk View Machine Edition - Interactive Objects
9393-RSTVMEPT3
9393-RSTVMEPT3M
Enterprise Edition
9393-RSTMEPT3ENF
9393-RSTMEPT3ENFM

RSTrainer for FactoryTalk View Machine Edition - Bundle
9393-RSTVMEALL
9393-RSTVMEALLM
Enterprise Edition
9393-RSTMEALLENF
9393-RSTMEALLENFM

## ADDITIONAL PRODUCTS

RSTrainer Enterprise Edition for Student Manager
9393-RSTSMGRENF
9393-RSTSMGRENFM

Modular Programming for Machine Applications
Self-Study Training Kit
9393-MODPROG
9393-MODPROGM

RSTrainer licensing options:
- Single license (node-locked)
- 5 concurrent licenses (Enterprise Edition)

Note:
- Catalog numbers that end in M : Physical Delivery Catalog Number.

# RSTrainer For RSLogix 500 Software– Documenting And Searching

Node-Locked Edition

9393-RST500DSENE 9393-RST500DSENM

Enterprise Edition

9393-RST500DSENF 9393-RST500DSENFM

5 Hours

**Course Purpose**

This interactive, computer-based training course teaches the core tasks required for documenting and searching an RSLogix 500 project. Students will learn to enter a variety of project documentation, such as rung comments and page titles, that students can use to improve their own RSLogix 500 projects. Students will learn how to import and export RSLogix 500 databases and how to backup their RSLogix 500 projects. Helpful animations, background information, and links to other reference materials provide students with a variety of knowledge and learning tools. Students will have the opportunity to practice performing software tasks through interactive simulations.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Use RSLogix 500 backup utilities
- Add symbols, address descriptions, instruction, rung comments, and page titles
- Use database tools and import/export a database
- Reporting
- Search an RSLogix 500 project

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 500 Software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Are interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

**Related Job Aids Available For Purchase**

RSLogix 500 and SLC 500 Procedures Guide ABT-1747-TSJ52

# RSTrainer For RSLogix 500 Software–Online Monitoring

Node-Locked Edition

9393-RST500ONENE 9393-RST500ONENM

Enterprise Edition

9393-RST500ONENF 9393-RST500ONENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches students the core tasks required for communicating with and monitoring an online RSLogix 500 project. Students will learn how to configure communication drivers and upload, download, and go online with an RSLogix 500 project. Students will learn how to go online and use RSLogix Emulator 500 software, which will allow students to test their project in a non-production environment. This course covers how to enter ladder logic online and use a variety of data monitoring tools, such as histograms and trends. Helpful animations, background information, and links to other reference materials provide students with a variety of knowledge and learning tools. Students will have the opportunity to practice performing software tasks through interactive simulations.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Configure communications software
- Transfer an RSLogix 500 project file between a computer and a processor
- Use RSLogix Emulator 500 software
- Edit ladder logic while online with an RSLogix 500 project
- Create and interpret data table monitors
- Create and configure trends and histograms
- Use workspace manager
- Force inputs and outputs

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 500 Software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Are interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

**Related Job Aids Available For Purchase**

RSLogix 500 and SLC 500 Procedures Guide ABT-1747-TSJ52

# RSTrainer For RSLogix 500 Software–Offline Programming

(ALSO AVAILABLE IN SPANISH)

| Node-Locked Edition | |
|---|---|
| 9393-RST500OFENE | 9393-RST500OFENM |
| **Enterprise Edition** | |
| 9393-RST500OFENF | 9393-RST500OFENFM |

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches students the core tasks required for programming an RSLogix 500 project offline. Students will learn how to create and navigate through an RSLogix 500 project, configure I/O modules, and create program and data files. Students will learn how to enter ladder logic using a variety of methods and verify a project so it will be ready to download. Helpful animations, background information, and links to other reference materials provide students with a variety of knowledge and learning tools. Students will have the opportunity to practice performing software tasks through interactive simulations.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Configure the display
- Navigate through the menus, ladder view, and project view
- Create a new project
- Configure I/O modules in a project
- Create program and data files
- Enter ladder logic
- Assign addresses to ladder logic
- Verify a project
- Copy, paste, and move rungs
- Edit with .SLC library files

**Related Job Aids Available For Purchase**

| | |
|---|---|
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 500 Software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Are interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

# RSTrainer For EtherNet/IP– Communications and Diagnostics

Node-Locked Edition

9393-RSTENET2ENE 9393-RSTENMT2ENM

Enterprise Edition

9393-RSTENET2ENF 9393-RSTENMT2ENFM

5 Hours

**Course Purpose**

This computer-based training course explains the concepts of Ethernet Industrial Protocol (EtherNet/IP) communications and diagnostics. During this course, students will learn how to establish EtherNet/IP connections, send messages, and perform basic networking diagnostics. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Configure an Ethernet/IP module in a local and remote chassis
- Configure digital and analog I/O modules in a chassis
- Modify module parameters
- Add a controller to an I/O configuration
- Produce and consume data over an Ethernet/IP network
- Communicate between multiple controllers on an Ethernet/IP network using an MSG instruction
- Configure the 9300-8EDM Ethernet diagnostic module
- Obtain computer IP addresses
- Access diagnostic information using a web browser

## Who Should Attend?

Individuals who:

- Are responsible for setting up communications over an EtherNet/IP network
- Are interested in understanding how to send messages over an EtherNet/IP network, and perform basic networking diagnostics

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aids Available For Purchase**

EtherNet/IP Procedures Guide ABT-N300-TSJ50

# RSTrainer For EtherNet/IP–Hardware and IP Addressing

Node-Locked Edition

9393-RSTENET1ENE 9393-RSTENMT1ENM

Enterprise Edition

9393-RSTENET1ENF 9393-RSTENMT1ENFM

5 Hours

**Course Purpose**

This computer-based training course covers the fundamentals of Ethernet Industrial Protocol (EtherNet/IP) hardware and IP addressing. During this course, students will learn how to design and optimize an EtherNet/IP network and configure an EtherNet/IP driver and IP addresses for EtherNet/IP devices. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Design EtherNet/IP networks
- Configure an EtherNet/IP communications driver using RSLinx
- Ping an IP address
- Configure and modify EtherNet/IP addresses using BOOTP-DHCP server and RSLinx software
- Configure and modify EtherNet/IP addresses using RSLogix 5000 software

## Who Should Attend?

Individuals who:

- Are responsible for designing EtherNet/IP networks
- Are interested in optimizing EtherNet/IP networks, configuring communications, and configuring EtherNet/IP addresses

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aids Available For Purchase**

EtherNet/IP Procedures Guide ABT-N300-TSJ50

# RSTrainer For ControlLogix Fundamentals

Node-Locked Edition

9393-RSTCLX 9393-RSTCLXM

Enterprise Edition

9393-RSTCLXENF 9393-RSTCLXENFM

20 Hours

**Course Purpose**

This interactive computer-based training course teaches students the core tasks required when working with a ControlLogix control system. This course provides an overview of the Logix5550®, Logix5555®, and Logix5563® controllers, I/O modules, communications modules, and motion modules. Students will learn how to navigate through RSLogix 5000 software and learn about the four RSLogix 5000 programming languages. Through demonstrations, students will learn about the various settings and options in the software and see how to perform the required tasks for example control applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- ControlLogix overview
- RSLogix 5000 software overview
- Chassis and power supplies
- Controllers
- I/O, communications, and motion modules
- Module configuration (connections, module configuration)
- Tag structures (digital, analog, DeviceNet, DH/RIO)
- Programming (languages, project file, numbering systems)

## Who Should Attend?

Individuals who:

- Are users of the Rockwell Automation ControlLogix family of programmable controllers who need refresher training
- Are interested in the features and capabilities of the Rockwell Automation ControlLogix family of programmable controllers and RSLogix 5000 software

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

# RSTrainer For Hydraulics

Node-Locked Edition

9393-RSTHYD 9393-RSTHYDM

Enterprise Edition

9393-RSTHYDENF 9393-RSTHYDENFM

20 Hours

**Course Purpose**

This computer-based training course is designed to teach students the fundamental concepts, principles, and equipment used in hydraulic systems. Students gain knowledge about pumps, valves, actuators, and fluids that comprise hydraulic systems through example hydraulic simulations. Problem-solving simulations and troubleshooting situations help students learn about the operation and characteristics of various types of hydraulic equipment.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Basic functions and principles of hydraulic systems
- Pumps (gear, vane, piston)
- Valves (pressure control, flow control, check, directional control)
- Actuators (linear, rotary, hydraulic motors)
- Fluids (hydraulic fluid oil additives, auxiliary equipment, contaminants and filtration, conductors and fittings)

## Who Should Attend?

Individuals who:

- Are users of hydraulic systems who need refresher training
- Need to know components, functions, and basic operation of hydraulic systems that include pumping, conducting, filtering, controlling, and actuating

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

**Related Job Aids Available For Purchase**

| | |
|---|---|
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |
| PLC-5 and RSLogix 5 Troubleshooting Guide | ABT-1785-TSJ22 |

# RSTrainer For RSLinx Software

Node-Locked Edition

9393-RSTLINX 9393-RSTLINXM

Enterprise Edition

9393-RSTLINXENF 9393-RSTLINXENFM

20 Hours

**Course Purpose**

This interactive, self-paced training course provides students with a basic understanding of the powerful monitoring, configuration, communication, and diagnostic capabilities of RSLinx software. The skills students will learn will enable them to use RSLinx software for the acquisition of PLC data and to integrate the display, archiving, and management of critical data. Students will learn to use RSLinx software to exchange data between Rockwell Automation hardware and software and commercial software applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Driver configuration
- Diagnostic tools and utilities (network monitoring tools, configuration tools and security, utilities: backup, restore, EDS hardware installation tools, etc.)
- Client application communications (DDE/OPC topics, Alias topics, DDE/OPC diagnostics)

## Who Should Attend?

Individuals who:

- Are users of RSLinx software who need refresher training
- Are interested in RSLinx software
- Have a fundamental knowledge of programmable controller

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Working knowledge of programmable controllers

**Related Job Aids Available For Purchase**

| | |
|---|---|
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |
| PLC-5 and RSLogix 5 Troubleshooting Guide | ABT-1785-TSJ22 |

# RSTrainer For RSLogix 5 Software

Node-Locked Edition

9393-RSTLX5 9393-RSTLX5M

Enterprise Edition

9393-RSTLX5ENF 9393-RSTLX5ENFM

20 Hours

**Course Purpose**

This interactive, self-paced training course teaches the core tasks required for programming an RSLogix 5 project. This course provides information on how to install, configure, and navigate through RSLogix 5 software. Students will learn how to transfer an RSLogix 5 project from a computer to the processor, document ladder logic, and monitor data. Students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Work with RSTrainer software
- Install RSLogix 5 software
- Screen layout, navigation, and help
- Offline programming (new project, ladder logic editing, database documentation, reports, backup utilities)
- Online programming (communications, diagnostics: searching and data table monitoring)
- Upload/download and go online

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 5 Software who need refresher training
- Are interested in the features and capabilities of RSLogix 5 software

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aids Available For Purchase**

| | |
|---|---|
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |
| PLC-5 and RSLogix 5 Troubleshooting Guide | ABT-1785-TSJ22 |

# RSTrainer For RSLogix 5000 Software–Motion

Node-Locked Edition

9393-RSTLX5KMOT 9393-RSTLX5KMOTM

Enterprise Edition

9393-RSTLKMOTENF 9393-RSTLKMOTENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches the core tasks required to effectively program motion control applications. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to configure servo modules, program motion instructions, and test and tune axes through step-by-step demonstrations. Students will learn about the various settings and options in the software and see how to perform the required tasks for example motion applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Define a typical RSLogix 5000 motion control system
- Compare axis control modules
- Configure the servo modules
- Configure the controller
- Add and configure a SERCOS servo drive axis
- Add and configure an analog servo drive axis
- Understand the motion instruction tag structure
- Compare immediate and synchronous instructions
- Test and tune an axis
- Use motion direct commands

**Related Job Aids Available For Purchase**

Studio 5000 and Logix5000 Procedures Guide ABT-1756-TSJ50

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 5000 control systems who need refresher training
- Are interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the following e-Learning training courses or equivalent experience with RSLogix 5000 software is recommended:
  - RSTrainer for RSLogix 5000 Software – Project Configuration (9393-RSTLX5KPRJ/9393-RSTLKPRJENF)
  - RSTrainer for RSLogix 5000 Software – Offline Programming (9393-RSTLX5KOFF/9393-RSTLKOFFENF)
  - RSTrainer for RSLogix 5000 Software – Online Monitoring (9393-RSTLX5KON/9393-RSTLKONENF)

# RSTrainer For RSLogix 5000 Software–Offline Programming

Node-Locked Edition

9393-RSTLX5KOFF 9393-RSTLX5KOFFM

Enterprise Edition

9393-RSTLKOFFENF 9393-RSTLKOFFENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches the core tasks required to effectively create and configure automation control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to install and navigate through the software, create and configure a new project, and produce and consume tags through step-by-step demonstrations. Through the demonstrations, students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Enter and edit ladder logic elements
- Configure ladder logic display options
- Enter and edit function block diagrams
- Configure function block diagram display options
- Enter and edit structured text
- Configure the structured text display
- Create, deploy, and manage an add-on instruction
- Verify project components
- Search and replace text
- Create a cross reference list

**Related Job Aids Available For Purchase**

| | |
|---|---|
| Studio 5000 and Logix5000 Procedures Guide | ABT-1756-TSJ50 |

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 5000 control systems who need refresher training
- Are interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the RSTrainer for RSLogix 5000 Software–Project Configuration (9393-RSTLX5KPRJ/9393-RSTLKPRJENF) e-Learning training course or equivalent experience with RSLogix 5000 software is recommended

# RSTrainer For RSLogix 5000 Software–Online Monitoring

Node-Locked Edition

9393-RSTLX5KON 9393-RSTLX5KONM

Enterprise Edition

9393-RSTLKONENF 9393-RSTLKONENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches the core tasks required to effectively monitor and edit industrial control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to establish communications, monitor the status of a project, program ladder logic online, and identify and correct faults through step-by-step demonstrations. Students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Establish communications
- Monitor status
- Identify and correct faults
- Program ladder logic online

**Related Job Aids Available For Purchase**

| | |
|---|---|
| Studio 5000 and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 5000 control systems who need refresher training
- Are interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the following e-Learning training courses or equivalent experience with RSLogix 5000 software is recommended:
  - RSTrainer for RSLogix 5000 Software – Project Configuration (9393-RSTLX5KPRJ/9393-RSTLKPRJENF)
  - RSTrainer for RSLogix 5000 Software – Offline Programming (9393-RSTLX5KOFF/9393-RSTLKOFFENF)

# RSTrainer For RSLogix 5000 Software–Project Configuration

Node-Locked Edition

9393-RSTLX5KPRJ 9393-RSTLX5KPRJM

Enterprise Edition

9393-RSTLKPRJENF 9393-RSTLKPRJENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches the core tasks required to effectively create and configure automation control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to install and navigate through the software, create and configure a new project, and produce and consume tags through step-by-step demonstrations. Students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Identify main window components
- Configure the display
- Navigate through the software
- Create and manage project files
- Configure a controller
- Organize tasks, programs, and routines
- Configure a local I/O module
- Produce and consume tags
- Export and import tags

## Who Should Attend?

Individuals who:

- Are users of Rockwell Automation RSLogix 5000 control systems who need refresher training
- Are interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aids Available For Purchase**

Studio 5000 and Logix5000 Procedures Guide ABT-1756-TSJ50

# RSTrainer Enterprise Edition For Student Manager

Enterprise Edition

9393-RSTSMGRENF 9393-RSTSMGRENFM

**Course Purpose**

This software is a student tracking and reporting utility for use with the RSTrainer series of computer-based training courses. It provides similar functionality to a learning management system by maintaining, recording, and managing student information for the RSTrainer computer-based training courses. This advanced system maintains every student's progress, scores, and personal information in an easy-to-use interface and database system that eliminates the burden of manually documenting employee training information.

**Objectives**

This software will allow the following information to be tracked for each student completing the RSTrainer computer-based training courses:

- Passwords and log-on information
- Account and program access
- Progress
- Scores

## Who Should Attend?

Training professionals, managers, or supervisors who maintain several students' records and progress in a training program

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Products**

All RSTrainer series of computer-based training courses

# RSTrainer For FactoryTalk View Machine Edition (ME)–Applications and Displays

Node-Locked Edition

9393-RSTVMEPT1 9393-RSTVMEPT1M

Enterprise Edition

9393-RSTMEPT1ENF 9393-RSTMEPT1ENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course provides information about creating FactoryTalk View Machine Edition applications and displays. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME. Students will learn how to work with default graphic displays, configure application-wide settings, configure RSLinx Enterprise, and work with tags in an application. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Work with applications
- Identify main window components
- Use the application explorer and default graphic displays
- Create a new display
- Use the startup editor
- Define project settings
- Configure security and language options
- Use direct-reference tags in an application
- Create new HMI tags
- Use HMI tags

## Who Should Attend?

Individuals who:

- Are responsible for designing FactoryTalk View ME applications
- Are interested in configuring application-wide settings, configuring RSLinx Enterprise software, and working with tags in an application

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aid Available For Purchase**

FactoryTalk View ME and PanelView Plus Procedures Guide ABT-2711P-TSJ50

# RSTrainer For FactoryTalk View Machine Edition (ME)–Drawing Objects

Node-Locked Edition

9393-RSTVMEPT2 9393-RSTVMEPT2M

Enterprise Edition

9393-RSTMEPT2ENF 9393-RSTMEPT2ENFM

5 Hours

**Course Purpose**

This interactive, self-paced training course provides information about creating FactoryTalk View Machine Edition drawing objects in graphic displays. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME. Students will be introduced to a variety of basic graphic objects and learn how to modify their properties, animate them, and arrange them on the displays. Students will learn how to use objects from the Graphic Library. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Understand drawing objects
- Understand object properties
- Arrange objects
- Add objects from the graphic library
- Use the object explorer
- Animate drawing objects

## Who Should Attend?

Individuals who:

- Are responsible for designing FactoryTalk View ME applications
- Are interested in learning about basic drawing objects

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aid Available For Purchase**

FactoryTalk View ME and PanelView Plus Procedures Guide ABT-2711P-TSJ50

# RSTainer For FactoryTalk View Machine Edition (ME)–Interactive Objects

Node-Locked Edition

9393-RSTVMEPT3 9393-RSTVMEPT3M

Enterprise Edition

9393-RSTMEPT3ENF 9393-RSTMEPT3ENFM

5 Hours

**Course Purpose**

This interactive training course provides information about creating FactoryTalk View Machine Edition interactive objects. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME. Students will learn how to work interactive and advanced objects in graphic displays as well as create and configure data logs, trends, and alarms. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Create and configure:
  - Push buttons
  - Indicators
  - Display objects
  - Control list selectors, gauges, and graph objects
  - Display navigation objects
  - Local message displays
  - Data logs
  - Trends
  - Alarms
- Add advanced features to interactive objects
- Create parameter files and tag placeholders
- Test displays and applications
- Use faceplates in an application

## Who Should Attend?

Individuals who:

- Are responsible for designing FactoryTalk View ME applications
- Are interested in learning about interactive objects

## Prerequisites

Experience operating a computer within a Microsoft Windows environment

**Related Job Aid Available For Purchase**

FactoryTalk View ME and PanelView Plus Procedures Guide ABT-2711P-TSJ50

# Modular Programming For Machine Applications

Self-Study Training Kit
9393-MODPROG 9393-MODPROGM

**Course Purpose**

This computer-based training course provides students with the skills and knowledge to produce a software design specification for a machine or line of machines. The modular programming concepts in this course are derived from the ISA-88.01 industry standard and include the OMAC PackML state and data models as defined in the ISA-TR88.00.02 technical report. The specification will follow modular programming guidelines and describe: equipment and control modules for controlling the machine's I/O devices, procedures for supervising and coordinating the modules, data structures for interfacing procedures with modules, state model for machine's overall operation, and naming conventions for software components. By using a modular approach to software design, software becomes much easier to reuse from project to project. As the base of modular code increases, development time decreases. Additionally, the quality of the code increases because students will be able to refine it each time they reuse it.

**Objectives**

After completing this computer-based training course, students should be knowledgeable about the following tasks:

- Introduce modular programming
- Select modes and states
- Break down states and equipment modules into steps
- Identify equipment and control modules
- Organize unit procedures
- Define interfaces for procedures and modules
- Implement modular programming tools and modular programming into RSLogix 5000 software

## Who Should Attend?

- Control engineers who want to improve the efficiency of their software development process
- Plant engineers who need to integrate and maintain lines of machines
- Technicians and other maintenance individuals who need to interpret and maintain modular software programs

## Prerequisites

- First-hand knowledge of how your machines operate
- Able to organize data into programs and routines and create user-defined data types in RSLogix 5000 software
- Able to write and program ladder diagrams in RSLogix 5000 software
- Students can use these courses to get the prerequisite RSLogix 5000 skills:
  - RSLogix 5000 Level 2: Basic Ladder Logic Programming (CCP151)
  - RSLogix 5000 Level 3: Project Development (CCP143)

# Software

Rockwell Automation software courses address today's diverse plant information needs, such as:

- Production management—real-time coordination across plant-wide production processes
- Data management—tools and methods used for collecting, transforming, and integrating production information
- Asset management—optimizing maintenance and plant operations to improve resource availability
- Performance and visibility—offering a window into the process so plant personnel can make better decisions

Real-time exchange of information between manufacturing and the rest of your company is critical for making business decisions that improve responsiveness, increase productivity, and reduce costs. With Rockwell Automation software courses, you can learn how to integrate your factory floor.

| Course Number | Course Title | Course Length |
|---|---|---|
| FTAC | FactoryTalk AssetCentre System Design and Implementation | 3 Days |
| FTM | FactoryTalk Metrics Configuration | 3 Days |
| RS-FTHSEC | FactoryTalk Historian Site Edition Configuration and DataCollection | 3.5 Days |
| FTVP | FactoryTalk VantagePoint Configuration and Reporting | 3 Days |
| FTEM | FactoryTalk EnergyMetrix Software Configuration in an Energy Monitoring System | 2 Days |

# FactoryTalk AssetCentre System Design and Implementation

(Private Delivery Only)

FTAC

3 Days | CEUs 2.1

### Course Purpose

This course provides students with the skills required to use FactoryTalk AssetCentre software to maximize their control system investment and manage assets effectively. Throughout the course, students will learn how to design a FactoryTalk AssetCentre system, install and configure the software, secure access to the control system, track users' actions, manage asset configuration files, provide backup and recovery of operating asset configurations, and troubleshoot their system using FactoryTalk AssetCentre. The instructor will demonstrate how to perform all of the tasks covered in this course. Students will then be given an opportunity to practice these tasks using a procedures guide and a VMware® image designed to imitate a real production facility.

### Objectives

After completing this course, students should be able to perform the following tasks:

- Establish a FactoryTalk AssetCentre system architecture
- Identify:
  - Assets, files, and an organization scheme for a FactoryTalk AssetCentre system
  - Basic additional software requirements for a FactoryTalk AssetCentre system
- Install the required software for a FactoryTalk AssetCentre system
- Configure asset tree organization in FactoryTalk AssetCentre software
- Add and configure assets
- Backup and restore critical files
- Archive files and manage archive files
- Configure disaster recovery
- Find a system event using FactoryTalk AssetCentre software
- Plan security for a FactoryTalk AssetCentre system
- Configure basic FactoryTalk security in the FactoryTalk directory
- Configure system and product policy security in the FactoryTalk directory
- Configure security within FactoryTalk AssetCentre software
- Troubleshoot a system using FactoryTalk AssetCentre software

## Who Should Attend?

Individuals who need to securely and centrally manage automation production environments using FactoryTalk AssetCentre software.

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of your production environment

# FactoryTalk Metrics Configuration

FTM

3 Days

**Course Purpose**

FactoryTalk Metrics is a complete, windows-based solution for the analysis of time-series process and production data. FactoryTalk Metrics provides a set of tools to analyze the performance of production assets. FactoryTalk Metrics provides a performance rating, based on the widely used Overall Equipment Effectiveness (OEE) model, for every production asset. The OEE metric provides a simple way to quickly determine if a production asset is performing adequately. In this course, students will learn to use the reporting, graphing, and querying functionality that make FactoryTalk a complete and very easy-to-use solution for data collection and analysis.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Introduction to MSSQL for FactoryTalk Metrics
- Create a FactoryTalk Metrics database and user
- Configure a system DSN
- Install FactoryTalk Metrics software
- Administrate FactoryTalk Metrics
- Create FactoryTalk Metrics plant model
- Configure FactoryTalk Metrics
  - Workcell
  - Workcell schedules
  - Reports
  - Performance parameter events
  - Fault metrics
- Create FactoryTalk Metrics reports and filters
- Use FactoryTalk Metrics import/export
- Using report expert

## Who Should Attend?

- Engineers and plant managers who need to collect, analyze, and report PLC data

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Basic understanding of Allen-Bradley PLC processors
- Knowledge of basic client/server database concepts is recommended, but not required
- Familiarity with basic networking concepts is strongly recommended, but not required
- Knowledge or experience with Microsoft SQL server is helpful

# FactoryTalk Historian Site Edition Configuration and Data Collection

## RS-FTHSEC

3.5 Days

**Course Purpose**

This course will provide students with an overview of the various FactoryTalk Historian tools for collecting data. Students will learn how to configure a FactoryTalk Historian Site Edition system and how to use Microsoft Excel to create and modify FactoryTalk Historian tags. During the course, students will learn how to apply exception and compression to filter data to be archived. Students will be given an opportunity to compare the use of Polled versus Advised data collection modes and learn about data buffering, layers/methods of redundancy, archive management and backup. Upon completion of the course, students will have gained exposure to the many aspects of the FactoryTalk Historian system and be able to install and configure FactoryTalk Historian to collect data.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- FactoryTalk Historian (SE and ME)
- Understanding Tags and Using Excel Tag Configurator
- Using FactoryTalk Vantage Point
- Understanding and Using Exception and Compression
- FactoryTalk Historian Tag Types
- Using Performance Equations and Totalizers
- Working with Digital States
- Using Asset Framework and Event Frames
- Using Health Points and Performance Monitor Tags
- Using and Displaying Audit Information
- Using Archive Management Tools
- Scheduling Backups of FactoryTalk Historian Data
- Using FactoryTalk View SE Trend to Display FactoryTalk Historian Data
- Backfilling Data into a FactoryTalk Historian Server
- FactoryTalk Historian SE High Availability

## Who Should Attend?

- Field engineers, MPS, pre-sales consultants, and support individuals who need to install and configure FactoryTalk Historian Site Edition for data collection

## Prerequisites

- Working familiarity with the Microsoft Windows® environment
- Completion of Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals (Course Number CCP146) or knowledge of common ControlLogix terminology and the ability to program and interpret basic ladder logic instructions in Studio 5000 software

# FactoryTalk VanatagePoint Configuration and Reporting

FTVP

3 Days

**Course Purpose**

In this course, students will learn various tools to analyze and display data using FactoryTalk VantagePoint and/or VantagePoint EMI. The course covers how to use the analysis and reporting tools to create trends, Excel reports, and dashboards. Students will have an opportunity to use the Portal and configure it to display content in various ways. The course also focuses on extending the model in the product and configuring security. Upon completion of the course, students will be able to utilize many tools and techniques for the display, analysis and reporting of data using FactoryTalk VantagePoint EMI.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Introduction to FactoryTalk VantagePoint
- Configuring FactoryTalk Data Sources in FactoryTalk VantagePoint Software
- Creating and Publishing Trend and Excell Reports in FactoryTalk VantagePoint Software
- Creating and Configuring Incuity Tags in FactoryTalk VantagePoint Software
- Working with Calculated Tags in FactoryTalk VantagePoint Software
- Creating and Using a Microsoft SQL Server Database Connector in FactoryTalk VantagePoint Software
- Creating and Using Types and Type Reports in FactoryTalk VantagePoint Software
- Importing Logix Controller Structures in FactoryTalk VantagePoint Software
- Creating Cascading Excel Reports in FactoryTalk VantagePoint Software
- Creating Composite and Dashboard Reports in FactoryTalk VantagePoint Software
- Customizing the FactoryTalk VantagePoint Portal
- Creating Status Indicators in FactoryTalk VantagePoint Software
- Configuring Security in FactoryTalk VantagePoint Software
- Using Mobility Features in FactoryTalk VantagePoint Software


## Who Should Attend?

- Developers or engineers who will work with FactoryTalk VantagePoint EMI applications and need to view, analyze, and create reports

## Prerequisites

- Experience with:
  - Microsoft SQL Server 2008
  - Microsoft Office Excel 2010
  - ControlLogix and FactoryTalk products and terminology

# FactoryTalk EnergyMetrix™ Software Configuration in an Energy Monitoring System

FTEM

2 Days

## (Private Delivery Only)

**Course Purpose**

With FactoryTalk EnergyMetrix, students can capture, analyze, store, and share energy data across their entire enterprise using a simple Web browser. This makes it easy to distribute the knowledge they need to optimize energy consumption, which can help improve productivity while lowering energy costs. This course provides students with an understanding of FactoryTalk EnergyMetrix. This course also shows students how to navigate the FactoryTalk EnergyMetrix Web interface and understand the information it contains; use FactoryTalk EnergyMetrix software to provide standard and customized reports of energy usage and costs; and configure all the components of an EnergyMetrix software installation.

**Objectives**

After completing this course, students should be able to perform the following tasks:

- Log in
- Load profiles
- View standard reports
- Generate billing reports
- Configure an application and a derived tag
- Create a new domain and group
- Set up a:
  - Device
  - Meter and meter tags
  - Simple rate schedule
  - Role and privileges
  - Maual meter
  - Alarm
  - Custom page
  - Personalized start page
- Create:
  - A multi-purpose report using grid & charts
  - Reports
  - Billing Reports
  - A system configuration
- Use ChartsPlus and ReportsPlus
- Back up EnergyMetrix database
- Shrink a transaction log
- Run reports automatically
- Copy devices and meters

## Who Should Attend?

- Managers, engineers, and technical specialists who need to configure FactoryTalk EnergyMetrix software in order to solve on-going, energy-related challenges

## Prerequisites

- Basic understanding of three-phase electric power
- Basic understanding of Rockwell Automation Integrated Architecture products, networks, and software
- Basic understanding of PowerMonitor products
- Basic understanding of internet server applications, Microsoft SQL Server and .NET scripting

# Industrial Leadership Skills

Effective leaders consistently seek to learn, change and grow by enhancing their leadership skills.

Industrial Leadership courses are for supervisors and managers working in a plant environment.

There are no prerequisites for these courses.

| Course Number | Course Title | Course Length |
|---|---|---|
| ILEAD-001 | Accountability & Delegation | 1 Day |
| ILEAD-003 | Communicate with Clarity | 1 Day |
| ILEAD-004 | Feedback: Giving and Receiving | 1 Day |
| ILEAD-005 | Coaching for Performance | 1 Day |
| ILEAD-006 | Problem Solving and Decision Making | 1 Day |
| ILEAD-007 | Conflict Management | 1 Day |
| ILEAD-008 | Leading T.E.A.M. work | 1 Day |
| ILEAD-009 | Hiring: Right Person Right Job | 1 Day |
| ILEAD-010 | Mentoring | 0.5 Day |
| ILEAD-011 | Project Management | 1 Day |
| ILEAD-012 | Foundational Leadership Skills | 4 Days |
| ILEAD-013 | Enhanced Leadership Skills | 4 Days |

# Accountablity & Delegation

(Private Delivery Only)

ILEAD-001

1 Day CEUs 0.7

**Course Purpose**

This course teaches the skills and explains the attitude that is necessary for creating an accountable organization while also providing managers with the skills to effectively delegate work to others. In today's business climate, it is more important than ever for team members to hold themselves accountable; organizations depend on individuals and teams to implement actions that align with the values, competencies, and strategies of the organization. These values, competencies, and strategies must be demonstrated by every member on a daily basis. While the term "accountability" is commonly heard, there is often a great deal of confusion about what this word means and to whom it applies. Delegation is an overlooked and undervalued tool that managers can use to complete an ever-increasing list of work responsibilities. There is often confusion about the true meaning and nature of delegation. In discussing the definition, students begin to realize that delegation is about assigning meaningful tasks that can challenge employees and provide them with opportunities to build their skills. They recognize many benefits to delegation; However, there are many barriers as well. Certain patterns in thoughts and beliefs may hinder managers from delegating as often as they should.

**Objectives**

After completing the Accountability portion of this course, students will be able to:

- Define accountability, responsibility, and empowerment
- Rate yourself and your team on the Power Meter
- Discuss the Account-Able Choice
- Identify obstacles to being accountable
- Apply a three-step model to ask self-accountability questions
- Speak the language of empowerment and accountability
- Apply a five-step model to create accountability in others

After completing the Delegation portion of this course, students will be able to:

- Define delegation
- Break your personal barriers to delegation
- Apply situational leadership to delegation
- Decide the tasks to delegate and the tasks to keep
- Determine the right person to whom to delegate the task
- Plan and conduct a four-step delegation meeting
- Follow up on a delegated task
- Obtain the results you expect from a delegated

# Communicate with Clarity

(Private Delivery Only)

ILEAD-003

1 Day CEUs 0.7

**Course Purpose**

Every function and activity that takes place in an organization involves some form of direct or indirect communication. The success of these functions and activities directly depends on the ability of the people in the organization to communicate effectively. This course focuses on the process of creating open communication that increases rapport and productivity. Most people in organizations take steps to work toward "being a better communicator." In this course, students will identify concrete steps and processes that will truly help them improve their communications skills. Once these concepts are identified, they will then practice these skills during several role-play and group activities, which will add more depth and solidify their learning. The course begins with an activity where participants work in groups to identify both effective and ineffective communication elements. They will also consider and discuss the impacts of both. It is during this activity that students gain a better understanding of the need to communicate effectively during every interaction. They then are introduced to a five-step process for creating open and effective communication. This process is the foundation for the course, as students will be working through each of the five steps for the rest of the session. Students begin by working in small groups to identify barriers in the workplace that prevent the communication process from flowing smoothly. At the end of the session, students will revisit these barriers with solutions gained through the course content and learning. Next, they will each take a communication assessment that will help pinpoint both areas of strength and improvement in their personal communication skills. After taking a personal look at skills, students will then examine their communication as a group by working through a difficult challenge as a large group. Effective communication is required for success in this challenge. Students gain experiential insight as to where the gaps in skills hurt their opportunity for success and where their strengths in communication as a group helped to move them forward. In the second half of the course, students explore concepts to improve their communication skills, and then immediately apply those concepts through small-group activities and role plays. Through these activities, students learn to identify the goal of a message, create assertive statements, ask for and receive feedback, and utilize strong questioning and listening skills. They will apply their newly acquired skills and concepts to an actual message they need to deliver. Writing effective e-mail messages and delivering messages upwards to leadership is included.

**Objectives**

After completing this course, students will be able to:

- Describe the five steps to creating open communication
- Assess communication skills and identify areas of strength and development
- Determine the most appropriate method for sharing messages
- Demonstrate the appropriate nonverbal skills to enhance communication with others
- Create assertive statements
- Apply open-ended questioning techniques to increase two-way communication
- Use active listening skills to improve rapport and productivity in the working environment
- Respond effectively when receiving feedback

# Feedback: Giving and Receiving

(Private Delivery Only)

## ILEAD-004

1 Day CEUs 0.7

**Course Purpose**

This course teaches the skills that are necessary to both give and receive constructive and positive feedback in a way that maintains relationships and increases performance. Feedback opens the door to discussion and problem solving, and it is essential to personal growth and development. When feedback is given constructively, the receiver of the feedback is more likely to listen non-defensively and take appropriate action. It is important for learners to discover that the receiver of feedback has equal responsibility in creating a comfortable interaction between the giver and receiver. Students begin the course by defining feedback and identifying why it is so hard to give. The answer identified in class will be a surprise and will begin to develop the learners' awareness of how to provide feedback. Next, students become involved in a role play using a realistic scenario. During this scenario, students are assigned roles and will then provide feedback as either supervisor to employee, or peer to peer. The objective is to explore how to approach individuals when giving feedback; it is a fun but significant learning exercise about what style of feedback people most want from others. An important influence technique in giving feedback of any kind is the ability to speak from the standpoint of observation versus judgment, and use effective language that reflects the appropriate standpoint. Students will learn this important technique using lecture, video, and practice. Two models are provided in the material for students to use as they begin to learn and practice the skills. One model provides a four-step process for giving constructive feedback; a three-step model is also demonstrated and used for providing positive feedback. After these models are taught, students engage in a robust skills practice activity. One of the most challenging aspects of giving constructive feedback is anticipating and responding to the reaction of the receiver. In this activity, students learn methods and techniques for handling situations when the receiver gives a negative response. Students conclude the session by learning the equally important, but sometimes forgotten, skill of effectively receiving feedback. During the What Would You Say? activity, students explore appropriate responses to a variety of feedback scenarios.

**Objectives**

After completing this course, students will be able to:

- Define feedback
- Identify guidelines for giving feedback
- Demonstrate the ability to use observation versus judgment
- Apply steps to giving constructive feedback
- Apply steps to giving positive feedback
- Apply guidelines for receiving feedback

# Coaching for Performance

(Private Delivery Only)

ILEAD-005

1 Day CEUs 0.7

**Course Purpose**

Have you ever wondered how to increase the effectiveness of your team? How to attract and retain the best talent? How to fully engage your employees? Successful organizations create environments in which people can achieve their potential through guidance, assistance, and support. Coaching is a skill that can be utilized to create that environment and to support team members in ways that allow them to contribute to their fullest. When coaching becomes an integral part of doing business, employees are engaged; this results in greater productivity and the retention of top talent. This course provides students with the tools to coach effectively, and it enables the performance improvement of all team members. Coaching is often confused with teaching or giving feedback. Students start the course by exploring the true definition of coaching and how it differs from other forms of communication. Coaching is an investment of time and effort; students discuss the many benefits that can be achieved from using this skill in the workplace. They also identify several opportunities to coach in their work environment. Questioning and listening skills are central to effective coaching, so time will be spent learning and practicing these skills. This course allows for several practice opportunities. Students engage in mini-coaching sessions, using actual coaching opportunities that they have identified. They learn and use a four-step process to help them plan and structure their coaching sessions for maximum benefit. Some coaching opportunities are difficult, so students discuss and practice effective techniques to overcome difficult situations that may arise. Students end the session by developing a strategy for personal continuous coaching development, which they then share with a partner. This strategy will help ensure that their coaching skills continue to grow, thereby increasing the skills and productivity of their team members.

**Objectives**

After completing this course, students will be able to:

- Identify the benefits of coaching
- Follow a three-stage Leader as Coach Model
- Identify coaching opportunities with direct reports and peers
- Solicit the ideas of others using effective questioning skills
- Apply active listening skills
- Apply the four-step GROW Model to coach direct reports and peers
- Respond effectively to difficult situations using one of five techniques
- Implement an action plan for formal and informal follow-up
- Provide reinforcement and developmental feedback to direct reports and peers on a day-to-day basis

# Problem Solving and Decision Making

(Private Delivery Only)

ILEAD-006

1 Day CEUs 0.7

**Course Purpose**

Employees in any organization find themselves solving problems on a daily basis. The ability to identify the problem, pinpoint the true cause and identify a workable solution is essential for personal, professional, and organizational success. In this course, students will learn to identify problems proactively, correctly state identified problems, identify the most likely cause, and determine innovative solutions. They are also asked to bring a current work problem to class and to be prepared to have fun with problem solving! Students begin the course by working in small groups to solve a problem. During the debrief, they discuss challenges and successes in the process they used to resolve the problem. In this discussion, they identify a problem as being the gap between the current state and the desired state. They also discuss and identify barriers to effective problem solving and their role in overcoming those barriers. Similar small problems are introduced periodically during the day to challenge students' thinking and keep it fresh. In the next segment of the course, students are introduced to a six-step problem-solving process. Using a case study based on an actual problem, they will work step-by step in small groups and apply the process to the case study. While working through these steps, they will learn multiple tools that they can use to identify causes and solutions in an efficient and effective manner back in the workplace. Once they have had an opportunity to use the tools and the six-step process, students will then apply their learning and the tools to an actual problem that they need to solve. Engaging in this activity allows them to see how powerful and practical the process and tools can be in helping them resolve real issues. Students conclude the session by engaging in individual action planning.

**Objectives**

After completing this course, students will be able to:

- Define their role in problem solving
- Identify barriers to effective problem solving
- Apply a six-step problem-solving process
- Select appropriate tools to effectively problem-solve
- Coach mistakes without commanding or criticizing

# Conflict Management

(Private Delivery Only)

## ILEAD-007

1 Day CEUs 0.7

**Course Purpose**

Conflict is an inevitable dynamic in the work environment. Unfortunately, it usually carries a negative connotation. Conflict, in and of itself, is neither "good" nor "bad". What makes a conflict situation productive or destructive is the way in which issues and information are analyzed, approached, and communicated. Successful teams and managers have the ability to not only address but utilize differences in a way that increases the overall strength of the team. This course teaches the skills and perspectives that are necessary to effectively manage conflict. Most people view conflict as being highly personal in nature. In this course, students will explore the true definition of conflict, and how this definition can help them better analyze and understand a challenging situation or person. They will also examine the role of personal power and how it influences the level and outcome of a conflict. Next, students complete the Thomas-Kilmann Conflict Mode Instrument. Through this instrument, they will gain insight into their preferred mode of conflict management. They will also gain exposure to, and a better understanding of, the preferred approaches of others in a conflict situation. Working in small groups, they will then explore the best approaches to different types of conflicts, and discuss how their preferred approach can be adapted to best manage the situation. Next, students will be introduced to the Stop, Yield Go Model for conflict resolution. This is a three-step process that they can use to keep their approach and communication focused and on track so that the conflict is resolved in a productive manner. Students will identify a conflict situation that they are currently experiencing or anticipate experiencing in the near future. They will then work through the conflict using the three steps. In each step, students will be engaging in activities and discussions regarding the following topics: assertive language techniques, the power of inquiry and advocacy, and how to effectively manage difficult responses. Students will view a video that demonstrates assertive language techniques. Working with a partner, students will obtain additional feedback and insight into the management of their conflict situation. This will provide students with a detailed and complete action plan that they can implement immediately.

**Objectives**

After completing this course, students will be able to:

- Define conflict
- Recognize the five styles of conflict resolution and how to best adapt their style and approach to a conflict situation
- Understand their preferred style of conflict resolution
- Apply the Stop, Yield, Go Model to collaborative conflict resolution
- Apply techniques to managing emotions during conflict
- Explain assumptions and their effect on conflict
- Use active-listening skills to improve the working environment
- Apply assertive language techniques to express their needs and respect the needs of others

# Leading T.E.A.M.work
(Private Delivery Only)

ILEAD-008

1 Day CEUs 0.7

**Course Purpose**

Most of the time when you hear the term team, it's about a group of people who get together to complete a special project. This course is about creating a team environment with the people with whom you work with each day. The team environment that you create can and will contribute to a positive and productive work group. In this course, participants will learn techniques for translating team goals into individual goals, empowering all team members to participate, encouraging collaboration amongst team members, and monitoring the team's progress using structured tools and processes.

**Objectives**

After completing this course, students will be able to:

- Identify telltale signs that the T.E.A.M.work within their team needs attention
- Apply techniques to translate goals to individual team members
- Apply techniques to empower all team members to participate
- Apply techniques to encourage collaboration amongst all team members
- Discuss techniques to monitor the team's environment and to make adjustments
- Describe how stereotyping team members affects the team environment

# Hiring: Right Person Right Job

(Private Delivery Only)

ILEAD-009

1 Day CEUs 0.7

**Course Purpose**

Given today's business realities, it is more important than ever for organizations to utilize their resources wisely. In any organization, selecting the right person for the right job is a challenge. When the challenge is met, turnover is low, morale and productivity are high, and great customer service is provided. This course is designed to provide information and skills to assess, build, and conduct high-quality selection interviews in order to decide on the right person for the right job. Participants begin the course by discussing the impact of poor hiring decisions, including the cost of turnover. They then are introduced to a four-step interviewing process that consists of assessing the job requirements, building the interview questions, conducting the interview, and deciding on the right candidate. Throughout this process, participants will utilize their own organization's hiring practices, competencies, and value behaviors, which will allow for greater transfer of the skills when the participant needs to apply them in their work environment. The building of questions is a key skill that participants gain from this course. They explore different types of questions, from traditional to behavior-based, and learn which questions elicit specific responses. Participants then learn to create behavior-based questions that are directly relevant to the job requirements. They also learn and practice how to ask important follow-up questions. Participants will be able to witness these skills and behaviors demonstrated in the video, "More Than a Gut Feeling." Participants then discuss what needs to happen during the actual interview, including the need to maintain a legal line of questioning. They also examine common interview errors and ways to avoid them. Finally, participants have a chance to practice their new skills by preparing and conducting a mock interview for a position that they may actually need to fill.

**Objectives**

After completing this course, students will be able to:

- Recognize the importance of selecting the right candidate
- Calculate the cost of turnover
- Explain the organization's hiring process
- Apply a four-step interviewing process
- Identify job competencies and value behaviors for an open position
- Create behavior-based interview questions
- Conduct an effective selection interview
- Decide on the best candidate

# Mentoring
(Private Delivery Only)

ILEAD-010

0.5 Day CEUs 0.4

**Course Purpose**

Mentoring is one way in which to transfer expertise and knowledge to new workers. Mentoring has been proven to reduce turnover and increase employee satisfaction. This course provides an opportunity for a mentor and their protégé to work together, and learn about each other and how to work effectively together. Worksheets are provided to allow mentors and protégés to learn about one another, identify interaction guidelines, and set mentoring goals. Participants will discuss and practice the components of being an effective mentor and protégé.

**Objectives**

After completing this course, students will be able to:

- Define the role and responsibilities as a mentor or protégé in the mentoring process
- Understand the phases of mentoring and the activities in each phase
- Understand the mentor's or protégé's interaction style
- Set and manage expectations for the mentoring relationship
- Listen with openness and understanding
- Provide supportive feedback
- Coach mistakes without commanding or criticizing

# Project Management
(Private Delivery Only)

ILEAD-011

1 Day CEUs 0.7

**Course Purpose**

Effective management of projects is essential in today's ever-changing business environment. This one-day program will help participants gain a broad understanding of the basic core concepts of the project management process. Each stage of the project life cycle will be explored. Approaches that aid the project manager to complete the project on time and within budget will be identified and discussed. All the elements of project management, as prescribed by the Project Management Institute®, will be reviewed using interactive lecture and class exercise.

**Objectives**

After completing this course, students will be able to:

- Describe the definition of a project
- Explain the difference between Program Management and Project Management
- Apply project selection and portfolio management techniques to align projects
- With an organization's business strategy
- Define the quadruple constraints of Project Management
- Manage customer requirements, develop project boundaries and define project success criteria
- Understand all aspects of project planning including scope development and planning, scheduling, staffing, budgeting, communication management, risk management, quality management and vendor/procurement management
- Apply interpersonal and communication skills that are critical to project execution and stakeholder/team management including conflict management, team motivation and techniques to effectively lead a cross-functional; cross-organizational team
- Monitor and control projects including managing integrated change control and obtaining project status
- Implement a formal project closing process including project reports and lessons learned

# Foundational Leadership Skills

ILEAD-012

4 Days CEUs 2.8

**Course Purpose**

Sound leadership skills are the foundation for success in industrial manufacturing environments. The exercise of effective leadership practices has been found to enhance work environments that contribute to engaged employees and high performance. This course offers five foundational leadership skills that new supervisors must develop in order to successfully build and maintain strong relationships with employees, which in turn increases employee productivity. The course combines the concepts of communication, feedback, coaching, accountability and delegation to create a 4-day foundational leadership skills course for new and emerging supervisors and managers. The first element of the course, communication, focuses on the process of creating open communication that increases rapport and productivity. Most people in organizations take steps to work toward "being a better communicator." In this course, participants will identify concrete steps and processes that will truly help them improve their communications skills. Once these concepts are identified, they will then practice these skills during several role-play and group activities, which will add more depth and solidify their learning.

This course element, feedback, teaches the skills that are necessary to both give and receive constructive and positive feedback in a way that maintains relationships and increases performance. Feedback opens the door to discussion and problem solving, and it is essential to personal growth and development. When feedback is given constructively, the receiver of the feedback is more likely to listen non-defensively and take appropriate action. Coaching is a skill that can be used to create an environment in which people can achieve their potential through guidance, assistance, and support and to support team members in ways that allow them to contribute to their fullest. When coaching becomes an integral part of doing business, employees are engaged; this results in greater productivity and the retention of top talent. This course provides participants with the tools to coach effectively, and it enables the performance improvement of all team members.

The accountability portion of the course teaches the skills and explains the attitude that is necessary for creating an accountable organization. In today's business climate, it is more important than ever for team members to hold themselves accountable; organizations depend on individuals and teams to implement actions that align with the values, competencies, and strategies of the organization. These values, competencies, and strategies must be demonstrated by every member on a daily basis. Delegation is an overlooked and undervalued tool that managers can use to complete an ever-increasing list of work responsibilities. This course provides managers with the skills to effectively delegate work to others. There is often confusion about the true meaning and nature of delegation. In discussing the definition, participants begin to realize that delegation is about assigning meaningful tasks that can challenge employees and provide them with opportunities to build their skills. They recognize many benefits to delegation.

Click next to view Objectives for this course.

# Foundational Leadership Skills (Cont'd)

ILEAD-012

4 Days CEUs 2.8

**Objectives**

After completing the Communication portion of this course, students will be able to:

- Describe the five steps to creating open communication
- Assess communication skills and identify areas of strength and development
- Determine the most appropriate method for sharing messages
- Demonstrate the appropriate nonverbal skills to enhance communication with others
- Create assertive statements
- Apply open-ended questioning techniques to increase two-way communication
- Use active listening skills to improve rapport and productivity in the working environment
- Respond effectively when receiving feedback

**Objectives**

After completing the Feedback portion of the course, students will be able to:

- Define feedback
- Identify guidelines for giving feedback
- Demonstrate the ability to use observation versus judgment
- Apply steps to giving constructive and positive feedback
- Apply guidelines for receiving feedback

**Objectives**

After completing the Coaching portion of the course, students will be able to:

- Identify the benefits of coaching
- Follow a three-stage Leader as Coach Model
- Identify coaching opportunities with direct reports and peers
- Solicit the ideas of others during a coaching session using effective questioning skills
- Apply active listening skills during a coaching session
- Apply the four-step GROW Model to coach direct reports and peers
- Respond effectively to difficult situations using one of five techniques
- Implement an action plan for formal and informal follow-up
- Provide reinforcement and developmental feedback to direct reports and peers on a day-to-day basis

Click next to view Objectives for this course.

# Foundational Leadership Skills (Cont'd)

ILEAD-012

4 Days CEUs 2.8

**Objectives**

After completing the Accountability portion of this course, students will be able to:

- Define accountability, responsibility, and empowerment
- Rate yourself and your team on the Power Meter
- Discuss the Account-Able Choice
- Identify obstacles to being accountable
- Apply a three-step model to ask self-accountability questions
- Speak the language of empowerment and accountability
- Apply a five-step model to create accountability in others

**Objectives**

After completing the Delegation portion of this course, students will be able to:

- Define delegation
- Break your personal barriers to delegation
- Apply situational leadership to delegation
- Decide the tasks to delegate and the tasks to keep
- Determine the right person to whom to delegate the task
- Plan and conduct a four-step delegation meeting
- Follow up on a delegated task
- Obtain the results you expect from a delegated

# Enhanced Leadership Skills

ILEAD-013

4 Days CEUs 2.8

**Course Purpose**

Effective leaders consistently seek to learn, change and grow by enhancing their leadership skills. In fact, leading in organizations requires learning, changing and the ability to adapt to and address the dynamic trends that often affect our internal and external environments. Strong leadership requires the ability to enhance their leadership skills and work environments in order to engage employees and produce high performance. This course offers five enhanced leadership skills that new supervisors must develop to successfully build and maintain strong relationships with employees generating synergy between employees. This, in turn, increases employee productivity. The course combines the concepts of hiring, teamwork, conflict management, and problem solving & decision making to create a 4-day enhanced leadership skills course for new and emerging supervisors and managers.

Given today's business realities, it is more important than ever for organizations to utilize their resources wisely. In any organization, selecting the right person for the right job is a challenge. When the challenge is met, turnover is low, morale and productivity are high, and great customer service is provided. This course is designed to provide information and skills to assess, build, and conduct high-quality selection interviews in order to decide on the right person for the right job. Most of the time when you hear the term team, it's about a group of people who get together to complete a special project. This course is about creating a team environment with the people with whom you work with each day. The team environment that you create can and will contribute to a positive and productive work group. In this course, participants will learn techniques for translating team goals into individual goals, empowering all team members to participate, encouraging collaboration amongst team members, and monitoring the team's progress using structured tools and processes.

Conflict is an inevitable dynamic in the work environment. Unfortunately, it usually carries a negative connotation. Conflict, in and of itself, is neither "good" nor "bad". What makes a conflict situation productive or destructive is the way in which issues and information are analyzed, approached, and communicated. Successful teams and managers have the ability to not only address but utilize differences in a way that increases the overall strength of the team. This course teaches the skills and perspectives that are necessary to effectively manage conflict. Most people view conflict as being highly personal in nature. In this course, participants will explore the true definition of conflict, and how this definition can help them better analyze and understand a challenging situation or person. They will also examine the role of personal power and how it influences the level and outcome of a conflict.

Employees in any organization find themselves solving problems on a daily basis. The ability to identify the problem, pinpoint the true cause and identify a workable solution is essential for personal, professional, and organizational success. In this course, participants will learn to identify problems proactively, correctly state identified problems, identify the most likely cause, and determine innovative solutions. They are also asked to bring a current work problem to class and to be prepared to have fun with problem solving!

Click next to view Objectives for this course.

# Enhanced Leadership Skills
(Cont'd)

## ILEAD-013

4 Days CEUs 2.8

**Objectives**

After completing Hiring portion of this course, students should be able to:

- Recognize the importance of selecting the right candidate
- Calculate the cost of turnover
- Explain the organization's hiring process
- Apply a four-step interviewing process
- Identify job competencies and value behaviors for an open position
- Create behavior-based interview questions
- Conduct an effective selection interview
- Decide on the best candidate

**Objectives**

After completing the Teamwork portion of the course, students should be able to:

- Identify telltale signs that the TEAMwork within your team needs attention
- Apply techniques to translate goals to individual team members
- Apply techniques to empower all team members to participate
- Apply techniques to encourage collaboration amongst all team members
- Discuss techniques to monitor the team's environment and to make adjustments
- Describe how stereotyping of team members affects the team environment.

Click next to view Objectives for this course.

# Enhanced Leadership Skills (Cont'd)

## ILEAD-013

4 Days | CEUs 2.8

**Objectives**

After completing the Conflict Management portion of the course, students should be able to:

- Define conflict
- Recognize the five styles of conflict resolution and how to best adapt their style and approach to a conflict situation
- Understand their preferred style of conflict resolution
- Apply the Stop, Yield, Go Model to collaborative conflict resolution
- Apply techniques to managing emotions during conflict
- Explain assumptions and their effect on conflict
- Use active-listening skills to improve the working environment
- Apply assertive language techniques to express their needs and respect the needs of others

**Objectives**

After completing the Problem Solving and Decision Making portion of this course, students should be able to:

- Define their role in problem solving
- Identify barriers to effective problem solving
- Apply a six-step problem-solving process
- Select appropriate tools to effectively problem-solve
- Coach mistakes without commanding or criticizing

# Web-Based Training Guide

Rockwell Automation

## AUTOMATION FUNDAMENTALS

- Fundamentals of AC/DC Motors and Drives
- PLC Fundamentals

## SLC/RSLOGIX 500

- SLC 500 - Hardware Fundamentals
- SLC 500 - Programming Fundamentals
- RSLogix 500 Software - Offline Programming (Available in Spanish)
- RSLogix 500 Software - Online Monitoring
- RSLogix 500 Software - Documenting and Searching

## VISUALIZATION

- FactoryTalk View Machine Edition - Applications and Displays
- FactoryTalk View Machine Edition - Drawing Objects
- FactoryTalk View Machine Edition - Interactive Objects

## GENERAL INDUSTRIAL

- Electrical Theory
- Industrial Electrical
- Industrial Safety
- Industrial Mechanical
- Industrial Hydraulics
- Industrial Pneumatics
- Mobile Hydraulics (Available in Spanish)
- Mobile Electrical (Available in Spanish)

## CONTROLLOGIX/RSLOGIX 5000

- RSLogix 5000 Software - Project Configuration
- RSLogix 5000 Software - Offline Programming
- RSLogix 5000 Software - Online Monitoring
- RSLogix 5000 Software - Motion

## NETWORKS

- EtherNet/IP - Hardware and IP Addressing
- EtherNet/IP - Communications and Diagnostics

**Web-Based courses** are delivered via the Internet and are activated using ePasses. One ePass is needed to activate a single course and permits unlimited usage for a single user for one year. An Internet connection is required.

| Catalog# | Description |
|---|---|
| EL-WBT1 | Web-Based Training 1 Pack |
| EL-WBT5 | Web-Based Training 5 Pack |
| EL-WBT20 | Web-Based Training 20 Pack |
| EL-WBT50 | Web-Based Training 50 Pack |
| EL-WBT100 | Web-Based Training 100 Pack |

# Fundamentals Of AC/DC Motors And Drives

Click Here for Catalog Numbers and Purchasing Options

20 Hours

**Course Purpose**

This interactive, self-paced, training course is a knowledge-building course that provides students with a basic understanding of AC and DC motor and drive concepts and terminology. Through animated simulations, students will learn the various components and functions of drives and motors. Students will learn to recognize AC and DC drive and motor hardware and functions through example drive applications.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Recognize AC and DC motor hardware and operation
- Select a replacement motor
- Recognize line protection and filtering device hardware and functions
- Prevent electrostatic damage to drive components
- Recognize AC and DC drive hardware and functions
- Recognize AC and DC motor braking methods
- Test a drive using electrical measuring tools
- Preform pre-power and power-on checks
- Monitor and control a drive using a HIM
- Select a drive for basic applications

## Who Should Attend?

- Are users of Rockwell Automation AC and DC drives or drive software who need refresher training
- Are interested in the capabilities of AC and DC drive hardware and software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Understanding of basic electrical and electronic concepts Designer software

## Related Job Aids Available For Purchase

- RSLogix 5 and PLC-5 Procedures Guide: ABT-1785-TSJ53

# PLC Fundamentals

Click Here for Catalog Numbers and Purchasing Options

20 Hours

**Course Purpose**

This interactive, self-paced, training course delivers a broad-based understanding of important PLC principles and concepts. Students will understand how to connect to PLC hardware and how they function in various control systems. Students will study the various programming conventions, as well as practical issues about automation controls and components.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- What is a PLC?
- PLC hardware
- PLC numbering systems
- How is a PLC structured
- How to program a PLC
- Devices connected to a PLC
- How to use timers
- How to use counters
- Data handling instructions
- Comparison instructions
- Math instructions
- Sequencing instructions
- Specialty instructions
- Practical issues
- Product support

## Who Should Attend?

- Individuals who need to understand the basics of programmable logic controllers

## Prerequisites

- There are no prerequisites for this web-based training course

## Related Job Aids Available For Purchase

- RSLogix 5 and PLC-5 Procedures Guide: ABT-1785-TSJ53

# EtherNet/IP – Hardware and IP Addressing

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced training course covers the fundamentals of Ethernet Industrial Protocol (EtherNet/IP) hardware and IP addressing. During this course, students will learn how to design and optimize an EtherNet/IP network and configure an EtherNet/IP driver and IP addresses for EtherNet/IP devices. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Design and optimize EtherNet/IP networks
- Configure an EtherNet/IP communications driver using RSLinx
- Ping an IP address
- Configure and modify EtherNet/IP addresses using:
  - BOOTP-DHCP server software
  - RSLinx software
  - RSLogix 5000 software

## Who Should Attend?

- Are responsible for designing EtherNet/IP networks
- Are interested in optimizing EtherNet/IP networks, configuring communications, and configuring EtherNet/IP addresses

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- EtherNet/IP Procedures Guide: ABT-N300-TSJ50

# EtherNet/IP – Communications and Diagnostics

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced training course teaches the concepts of Ethernet Industrial Protocol (EtherNet/IP) communications and diagnostics. During this course, students will learn how to establish EtherNet/IP connections, send messages, and perform basic networking diagnostics. Helpful animations, background information, answers to frequently asked questions, and links to other reference materials provide students with a variety of knowledge and learning tools.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Configure an Ethernet/IP module in a local and remote chassis
- Configure a digital and analog I/O module in a chassis
- Modify EtherNet/IP module parameters
- Add a controller to an I/O configuration
- Produce and consume data over an EtherNet/IP network
- Communicate between multiple controllers on an EtherNet/IP network using an MSG instruction
- Configure the 9300-8EDM Ethernet diagnostic module
- Obtain computer IP addresses
- Access diagnostic information using a web browser

## Who Should Attend?

- Are responsible for setting up communications over an EtherNet/IP network
- Are interested in understanding how to send messages over an EtherNet/IP network, and perform basic networking diagnostics

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- EtherNet/IP Procedures Guide: ABT-N300-TSJ50

# FactoryTalk View Machine Edition – Applications and Displays

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced training course provides information about creating FactoryTalk View Machine Edition (ME) applications and displays. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME software. During this course, students will learn how to work with default graphic displays, configure application-wide settings, configure RSLinx Enterprise, and work with tags in an application.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Use the application explorer
- Use default graphic displays
- Create a new display
- Use the startup editor
- Define project settings
- Configure security and language options
- Use direct-reference tags in an application
- Create and use new HMI tags

## Who Should Attend?

- Are responsible for designing FactoryTalk View ME applications
- Are interested in configuring application-wide settings, configuring RSLinx Enterprise software, and working with tags in an application

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- FactoryTalk View ME & PanelView Plus Procedures Guide: ABT-2711P-TSJ50

# FactoryTalk View Machine Edition – Drawing Objects

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced training course provides information about creating FactoryTalk View Machine Edition (ME) drawing objects in graphic displays. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME software. During this course, students will be introduced to a variety of basic graphic objects and learn how to modify their properties, animate them, and arrange them on the displays. Students will learn how to use objects from the graphic library.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Understand drawing objects
- Understand object properties
- Arrange objects
- Add objects from the graphic library
- Use the object explorer
- Animate drawing objects

## Who Should Attend?

- Are responsible for designing FactoryTalk View ME displays
- Are interested in learning about basic drawing objects

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- FactoryTalk View ME & PanelView Plus Procedures Guide: ABT-2711P-TSJ50

# FactoryTalk View Machine Edition – Interactive Objects

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course provides information about creating FactoryTalk View Machine Edition (ME) interactive objects. This course is part of a series of e-Learning courses designed to teach FactoryTalk View ME software. During this course, students will learn how to work interactive and advanced objects in graphic displays as well as create and configure data logs, trends, and alarms.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Create and configure:
  - Push buttons
  - Indicators
  - Display objects
  - Control list selectors
  - Gauges
  - Graph objects
  - Display navigation objects
  - Local message displays
  - Data logs
  - Trends
  - Alarms
- Add advanced features to interactive objects
- Create parameter files and tag placeholders

## Who Should Attend?

- Are responsible for designing FactoryTalk View ME displays
- Are interested in learning about interactive objects

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- FactoryTalk View ME & PanelView Plus Procedures Guide: ABT-2711P-TSJ50

# SLC 500 – Hardware Fundamentals

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This web-based training course teaches students the core hardware of SLC 500 control systems. This course provides an overview of the SLC 5/01, SLC 5/02, SLC 5/03, and SLC 5/04 programmable controllers, concepts, and terminology. During this course, students will learn about chassis, power supplies, and processors. This course present information about the SLC 500 communication options, discrete and analog I/O modules, and hardware configuration.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- SLC 500 family
- Chassis
- Power supplies
- Processors (status indicators, keyswitch, channel 1, channel 0, battery, and memory module)
- Communication options
- Discrete and analog I/O modules
- Hardware configuration

## Who Should Attend?

- Users of Rockwell Automation SLC 500 processors who need refresher training
- Those interested in the features and capabilities of the SLC family of processors and RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

# SLC 500 – Programming Fundamentals

Click Here for Catalog Numbers and Purchasing Options

7 Hours

**Course Purpose**

This web-based training course teaches students the core programming concepts of SLC 500 control systems. During this course, students will learn about memory organization, addressing, ladder logic concepts, and the SLC 500 operating cycle. Students will be provided with an overview of RSLogix 500 software.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Memory organization
- Addressing (address types, indexed and indirect addressing)
- RSLogix 500 software overview
- Numbering systems
- Ladder programs
- Operating cycle
- Status file

## Who Should Attend?

- Users of Rockwell Automation SLC 500 processors who need refresher training
- Those interested in the features and capabilities of the SLC family of processors and RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- RSLogix 500 and SLC 500 Procedures Guide: ABT-1747-TSJ52

# RSLogix 500 Software – Offline Programming

## (Also Available In Spanish)

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required for programming an RSLogix 500 project. During this course, students will learn how to create and navigate through an RSLogix 500 project, configure I/O modules, and create program and data files. Students will learn how to enter ladder logic using a variety of methods and verify a project so it will be ready to download. Helpful animations, background information, and links to other reference materials provide students with a variety of knowledge and learning tools. Students will have the opportunity to practice performing software tasks through interactive simulations.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Navigate through the RSLogix 500 software
- Configure the display
- Create a new project
- Configure I/O modules in a project
- Create program and data files
- Enter ladder logic
- Assign addresses to ladder logic
- Verify a project
- Copy, paste, and move rungs
- Edit with .SLC library files

## Who Should Attend?

- Users of Rockwell Automation RSLogix 500 software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Those interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

## Related Job Aids Available For Purchase

- RSLogix 500 and SLC 500 Procedures Guide: ABT-1747-TSJ52

# RSLogix 500 Software – Online Monitoring

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required for communicating with and monitoring an RSLogix 500 project online. During this course, students will learn how to configure communication drivers and upload, download, and go online with an RSLogix 500 project. Students will learn how to go online and use RSLogix Emulator 500 software, which will allow students to test their project in a non-production environment. This course covers how to enter ladder logic online and use a variety of data monitoring tools, such as histograms and trends

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Configure communications
- Transfer an RSLogix 500 project file
- Edit ladder logic online
- Monitor data
- Force inputs and outputs

## Who Should Attend?

- Users of Rockwell Automation RSLogix 500 software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Those interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

## Related Job Aids Available For Purchase

- RSLogix 500 and SLC 500 Procedures Guide: ABT-1747-TSJ52

# RSLogix 500 Software – Documenting and Searching

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required for documenting and searching an RSLogix 500 project. Students will learn to enter a variety of project documentation, such as rung comments and page titles, that students can use to improve their own RSLogix 500 projects. Students will learn how to import and export RSLogix 500 databases and how to backup their RSLogix 500 projects.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Use RSLogix 500 backup utilities
- Add symbols and address descriptions
- Add instruction comments, rung comments, and page titles
- Use database tools
- Import and export a database
- Print reports
- Search an RSLogix 500 project

## Who Should Attend?

- Users of Rockwell Automation RSLogix 500 software who need refresher training
- Need to configure and navigate through RSLogix 500 software
- Those interested in the features and capabilities of RSLogix 500 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Knowledge of common processor and ladder logic terms and operation is suggested

## Related Job Aids Available For Purchase

- RSLogix 500 and SLC 500 Procedures Guide: ABT-1747-TSJ52

# RSLogix 5000 Software – Project Configuration

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required to effectively create and configure automation control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to install and navigate through the software, create and configure a new project, and produce and consume tags through step-by-step demonstrations. Students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Install RSLogix 5000 software
- Identify main window components
- Configure the display
- Navigate through the software
- Create and manage project files
- Configure a controller
- Organize tasks, programs, and routines
- Configure a local I/O module
- Organize data
- Produce and consume tags
- Export and import tags

## Who Should Attend?

- Users of RSLogix 5000 control systems who need refresher training
- Those interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment

## Related Job Aids Available For Purchase

- Studio 5000 Logix Designer and Logix5000 Procedures Guide: ABT-1756-TSJ50

# RSLogix 5000 Software – Offline Programming

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required to effectively create and configure automation control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to install and navigate through the software, create and configure a new project, and produce and consume tags through step-by-step demonstrations. Through the demonstrations, students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Enter and edit ladder logic elements
- Configure ladder logic display options
- Print a ladder logic routine
- Enter and edit function block diagrams
- Configure function block diagram display options
- Print a function block diagram
- Enter and edit structured text
- Configure the structured text display
- Print a structured text routine
- Verify project components
- Search and replace text
- Create a cross reference list

## Who Should Attend?

- Users of RSLogix 5000 control systems who need refresher training
- Those interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the RSLogix 5000 Software – Project Configuration web-based training course (ePass/WBT1PACK) or equivalent experience with RSLogix 5000 software is recommended

## Related Job Aids Available For Purchase

- Studio 5000 Logix Designer and Logix5000 Procedures Guide: ABT-1756-TSJ50

# RSLogix 5000 Software – Online Monitoring

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required to effectively monitor and edit industrial control projects. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to establish communications, monitor the status of a project, program ladder logic online, and identify and correct faults through step-by-step demonstrations. Students will learn about the various settings and options in the software and see how to perform the required tasks for example automation control applications.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Establish communications
- Monitor status
- Print a ladder logic routine
- Identify and correct faults
- Program ladder logic online
- Print a function block diagram

## Who Should Attend?

- Users of RSLogix 5000 control systems who need refresher training
- Those interested in the features and capabilities of RSLogix 5000 software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the following web-based training courses or equivalent experience with RSLogix 5000 software is recommended:
  - RSLogix 5000 Software – Project Configuration
  - RSLogix 5000 Software – Offline Programming

## Related Job Aids Available For Purchase

- Studio 5000 Logix Designer and Logix5000 Procedures Guide: ABT-1756-TSJ50
- ControlLogix Troubleshooting Guide: ABT-1756-TSJ20

# RSLogix 5000 Software – Motion

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course teaches the core tasks required to effectively program motion control applications. This course is part of a series of e-Learning courses designed to teach RSLogix 5000 software. Students will learn how to configure servo modules, program motion instructions, and test and tune axes through step-by-step demonstrations. Students will learn the various settings and options in the software and see how to perform the required tasks for example motion applications.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Define a typical RSLogix 5000 motion control system
- Compare axis control modules
- Configure the servo modules
- Configure the controller
- Add and configure a SERCOS servo drive axis
- Add and configure an analog servo drive axis
- Understand the motion instruction tag structure
- Compare immediate and synchronous instructions
- Test and tune an axis
- Use motion direct commands

## Who Should Attend?

- Users of RSLogix 5000 motion control systems who need refresher training
- Those interested in the features and capabilities of RSLogix 5000 motion control software

## Prerequisites

- Experience operating a computer within a Microsoft Windows environment
- Completion of the following web-based training courses or equivalent experience with RSLogix 5000 software is recommended:
  - RSLogix 5000 Software – Project Configuration
  - RSLogix 5000 Software – Offline Programming
  - RSLogix 5000 Software – Online Monitoring

## Related Job Aids Available For Purchase

- Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide: ABT-1756-TSJ52

# Electrical Theory

Click Here for Catalog Numbers
and Purchasing Options

15 Hours

**Course Purpose**

This interactive, self-paced, training course begins with the basics — the atom, electrical charge, voltage, current, and more. The basics are followed by an in-depth, theoretical approach to circuit analysis, basic magnetism, magnetic induction, and single- and poly-phase AC circuits.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Electrical fundamentals
- Basic physics
- Circuit fundamentals
- Circuit analysis
- Basic magnetism
- Magnetic circuits
- Single-pass AC circuits
- Magnetic induction
- Poly-phase AC circuits

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Industrial Electrical

Click Here for Catalog Numbers
and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course delivers a broad-based understanding of the most important electrical concepts. Students will understand basic physics laws as they apply to electricity and basic electrical circuits. Students will study the various components of electrical systems and how they function and interact with each other.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Electrical fundamentals
- Circuit fundamentals
- Circuit analysis
- Basic magnetism
- Circuit components
- Electrical testers
- Schematics

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Industrial Safety

Click Here for Catalog Numbers
and Purchasing Options

15 Hours

**Course Purpose**

This interactive, self-paced, training course covers the ten common safety concerns in industrial, manufacturing, and construction environments. It delivers an interactive training experience focused on safety from an employee perspective.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Introduction to safety
- Walking and working surfaces
- Prevention and protection plans
- Personal protective equipment
- Electrical safety
- Machine guarding
- Chemical safety
- Powered industrial trucks
- Industrial hygiene
- Ergonomics

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Industrial Mechanical

Click Here for Catalog Numbers
and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course delivers a broad-based understanding of the most important mechanical concepts. Students will understand basic physics laws as they apply to mechanical power and the systems in which they can be used. Students will study the various components of mechanical systems and how they function and interact with each other.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Basic physics
- Linear actuators
- Clutches
- Brakes
- Clutch/brake combinations
- Bearings
- Gears
- Drives
- Couplings

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Industrial Hydraulics

Click Here for Catalog Numbers
and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course delivers a broad-based understanding of the most important hydraulic concepts. Students will understand basic physics laws as they apply to hydraulic power and the systems in which they can be used. Students will study the various components of hydraulic systems and how they function and interact with each other.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Basic hydraulic physics
- Pumps
- Actuators
- Pressure control
- Directional control
- Flow control valves
- Modular control valves
- Fluid conditioning
- Check valves
- Accessory components
- Fluid conductors
- Schematics
- Basic system design

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Industrial Pneumatics

Click Here for Catalog Numbers
and Purchasing Options

5 Hours

**Course Purpose**

This interactive, self-paced, training course delivers a broad-based understanding of the most important pneumatic concepts. Students will understand basic physics laws as they apply to pneumatics, as well as understand schematics and system design. Students will study the various components of pneumatic systems and how they function and interact with each other.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Electrical physics
- Compressors
- Air dryers
- Air preparation
- Air distribution
- Actuators
- Directional control valves
- Accessories
- Air line conductors
- Vacuum
- Schematics

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Mobile Hydraulics

(Also Available In Spanish)

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This course delivers an interactive training experience covering the concepts needed to understand and work with the hydraulic systems of mobile equipment. Students will learn various physics laws related to hydraulic power, as well as the hydraulic components and circuits associated with these systems. Students will study the basics of hydrostatic transmissions, as well as valves and maintenance systems common to almost all combustion engine vehicles. Students will study the symbols and language of hydraulic schematics, helping them better understand their systems.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Fluid power physics
- Pumps
- Actuators
- Hydraulic transmissions
- Pressure control
- Directional control valves
- Flow control valves
- Modular control valves
- Fluid conditioning
- Check valves
- Accessory components
- Fluid conductors
- Schematics

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Mobile Electrical

(Also Available In Spanish)

Click Here for Catalog Numbers and Purchasing Options

5 Hours

**Course Purpose**

This course delivers an interactive training experience to assist students in working with electrical systems of mobile equipment. Students will learn the various physics laws related to electric power, as well as the electric components and circuits associated with these systems.

**Objectives**

After completing this web-based training course, students should be knowledgeable about the following tasks:

- Electrical fundamentals
- Circuit fundamentals
- Circuit analysis
- Basic magnetism
- Circuit components
- Electrical testers
- Charging and starting systems

## Who Should Attend?

- Individuals who need to understand electrical theory systems

## Prerequisites

- There are no prerequisites for this web-based training course

# Rockwell Automation Interactive iBooks

Not just a textbook but a new and exciting way to read and learn about industrial automation concepts straight from your iPad®.

**Rockwell Automation iBooks are highly engaging and include diverse learning activities:**

- Videos/Animations—a wide variety of videos and animations to enhance concepts and provide realworld examples
- Podcasts—listen to interviews with automation workers that offer unique perspectives of various jobs and industries
- Web links—access to supplemental information instantly
- Check Knowledge—relevant questions will test your understanding of concepts

**Availability**

To purchase Rockwell Automation iBooks, visit the iTunes® Store.

**Introduction to Automation iBook®**

The Introduction to Automation iBook will provide you with a broad and fundamental understanding of industrial automation. Topics range from an overview of common automation industries to an introduction of basic automated system components, such as controllers, I/O, drives, and HMI (Human Machine Interface). In addition, you will learn common automation terminology, what tools are used with industrial automation, and what careers may be available to them within this field. The variety of learning resources integrated in this iBook will give you a solid foundation with automated systems and prepare you for more advanced automation-related topics.

**Introduction to Automation Chapters:**

- Identifying Common Industries and Applications in Industrial Automation
- Understanding Industrial Automation Careers
- Identifying Industrial Automation Standards and Regulations
- Understanding Basic Mechanical Components
- Understanding Automation Control Systems
- Understanding Controllers
- Identifying I/O Devices and Modules
- Understanding Networks
- Recognizing Logic
- Recognizing Basic Programming Concepts
- Identifying System Documentation
- Identifying Human Machine Interfaces
- Identifying AC and DC Motors and Drives
- Understanding Safety in Automation
- Understanding Process Control Audience

This book is intended for individuals who have little or no experience with automation systems.

Click next to learn about the AC and DC Drives iBook.

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# AC and DC Drives iBook

The AC and DC Drives iBook will provide you with an understanding of AC and DC drives, including basic configuring, operating, maintaining, and troubleshooting using a HIM or HMI. You will identify basic components common to industrial drive applications. You will also learn the characteristics of AC and DC drives in various examples of real-world applications. This book includes key concepts, definitions, links to multimedia examples and more to give you an interactive learning experience.

**AC and DC Drives Chapters:**

- Identifying Drive System Components and Concepts
- Identifying Line Protection and Filtering Methods for AC and DC Drive Systems
- Recognizing DC Motor Functions Controlled by DC Drives
- Identifying DC Drive Hardware and Functions
- Recognizing AC Motor Functions Controlled by AC Drives
- Identifying AC Drive Hardware and Functions
- Identifying Braking Methods for AC and DC Drive Systems
- Comparing AC and DC Drive Systems for Basic Applications
- Preventing Electrostatic Damage to Drive Components
- Identifying Electrical Measuring Tools and Functions
- Identifying Basic Startup Procedures for AC and DC Drives
- Using a HIM to Configure, Control, and Monitor a Drive
- Performing Preventative Maintenance and Basic Troubleshooting for Drives

**Audience**

This book is intended for individuals who have some experience with electric motors and are interested in understanding AC and DC drives.

Click next to learn about ControlLogix's Mobile App.

# Training Workstations

Practice and Reinforce Your Job Skills

Superior tools and technology are the most obvious building blocks of success in today's manufacturing operations. Those with the best tools coupled with strategic innovation tend to get the best results. But this isn't the whole equation because even automated tools are essentially "enablers"… extensions of a machine user whose knowledge, skill, and productivity are the ultimate drivers of your success. Rockwell Automation understands this, which is why we build training workstations to optimize the productivity of both your manufacturing and human assets.

Built from the same proven Rockwell Automation technologies you use every day, our training workstations precisely mirror your manufacturing processes for the most realistic experience possible. Whether you're introducing new skills, bringing skills up-to-date or conducting pre-deployment testing on a new process before going "live," our training workstations effectively get employees up-to-speed, while supporting manufacturing's human dimension for the best results.

**Hands-on Training**

Workstations provide ideal practice for:

- New hires
- New technologies
- System upgrades
- New production processes
- Transitioning employees
- Competency assessments

# Lab Books

For practice exercises related to training workstations, these self-paced lab books are available with a workstation purchase. Note: Lab books must be purchased in conjunction with a workstation. Previously purchased workstations apply.

| Lab Book | Lab Book Descriptions | Corresponding Workstations |
|---|---|---|
| ABT-CCA161TLB | PowerFlex 700 Configuration Lab Book | |
| ABT-CCA162TLB | PowerFlex 700 DeviceNet Lab Book | DeviceNet Workstation (ABT-TDDNET2-A) |
| ABT-CCA163TLB | PowerFlex 700 Maintenance Lab Book | |
| ABT-CCA164TLB | PowerFlex 700 ControlNet Lab Book | ControlNet Workstation (ABT-CNET1) |
| ABT-CCA182TLB | PowerFlex 750 Config Lab Book | |
| ABT-CCA183TLB | PowerFlex 750-Series AC Drive Maintenance and Troubleshooting Lab Book | |
| ABT-CCN130TLB | Motion Control Fundamentals Lab Book | Kinetix 6000 Servo Drive Workstation (ABT-TD20941)<br>And one of the following:<br>ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B)<br>ControlLogix Workstation (10-Slot Chassis with Ultra 3000) (ABT-TDCLX3K-A) |
| ABT-CCN145TLB | Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Lab Book | Kinetix 6000 Servo Drive Workstation (ABT-TD20941)<br>And one of the following:<br>ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B)<br>ControlLogix Workstation (10-Slot Chassis with Ultra 3000) (ABT-TDCLX3K-A) |
| ABT-CCN201TLB | Kinetix 6500 Troubleshooting and Project Interpretation Lab Book | Kinetix 6500 Workstation with EN2TR (ABT-TDK6500EN2TR)<br>And one of the following:<br>ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B)<br>ControlLogix Workstation (10-Slot Chassis with Ultra 3000) (ABT-TDCLX3K-A) |
| ABT-CCP146TLB | ControlLogix Fundamentals Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP151TLB | Ladder Logix Programming Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP153TLB | ControlLogix Maintenance Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP164TLB | DeviceNet,RSNetWorx Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |

# Lab Books

| Lab Book | Lab Book Descriptions | Corresponding Workstations |
|---|---|---|
| ABT-CCP164TLB-B | DeviceNet and RSNetWorx Configuration and Troubleshooting Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP182TLB | Essentials of Industrial Ethernet Networks for an OT Professional Lab Book | EtherNet/IP Workstation (ABT-TDENET5700) and Stratix 8300 switch<br>*To preform the Network Address Translation (NAT) lesson in this lab book, two ABT-TDENET5700 workstations are required.* |
| ABT-CCP298TLB | CompactLogix Lab Book | CompactLogix Workstation (ABT-TDIALITE-A) |
| ABT-CCP299TLB | ControlLogix Fundamentals Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP711TLB | PhaseManager Project Design Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B) |
| ABT-CCP800TLB | Automation Ferris Wheel Lab Book | Automation Ferris Wheel Workstation |
| ABT-CCP810TLB | Essentials of Industrial Automation for an IT Professional Lab Book | EtherNet/IP Workstation (ABT-TDENET5700) |
| ABT-CCPS43TLB | SLC 500 Maintenance Lab Book | SLC 500 Workstation – SLC 5/04 Processor (10-slot chassis) and Universal I/O Simulator Workstation – 120V AC Operation |
| ABT-CCV204TLB | FactoryTalk ViewME,PanelView Plus Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B)<br>And one of the following:<br>PanelView Plus Workstation (ABT-TDPVPLUSTC01)<br>PanelView Plus 6 Workstation (ABT-TDPVPLUSTC02) |
| ABT-CCV209TLB | FactoryTalk View ME and PanelView Plus Maintenance and Troubleshooting Lab Book | ControlLogix Workstation — No Motion (10-slot chassis) (ABT-TDCLX3-B)<br>And one of the following:<br>PanelView Plus Workstation (ABT-TDPVPLUSTC01)<br>PanelView Plus 6 Workstation (ABT-TDPVPLUSTC02) |
| ABT-CIA101TLB | Introduction To IA Lab Book | |
| ABT-SAFLOG101TLB | GuardLogix Application Lab Book | GuardLogix Controller Workstation (ABT-TDGRDLX1-B) |
| ABT-SAFLOG103TLB | GuardLogix Fundamentals Lab Book | GuardLogix Controller Workstation (ABT-TDGRDLX1-B) |

# Automation Ferris Wheel Workstation

## Catalog Number:

ABT-TDFW100
ABT-TDFW100C (UNIT+CASE)*

**Major Components**:

- Control hardware:
  - 1 24V power supply
  - 1 1769-PA2 power supply
  - 1 CompactLogix™ controller
  - 1 1769-IQ16 DC input module
  - 1 1769 OB16 DC output module
  - 1 PowerFlex® 40P AC drive with remote HIM
- Network hardware:
  - 1 1783-US8T 8-port unmanaged Ethernet switch
  - 5 Ethernet cables
- Operator interface panel:
  - 1 illuminated E-stop
  - 7 pushbuttons
  - 5 pilot lights
  - 1 dual pushbutton / pilot light
  - 1 3-position switch
  - 2 2-position switches (1 with key)
  - PanelView™ Plus 600 color terminal
- Ferris wheel assembly:
  - 1 plastic Ferris wheel with 6 seats
  - 1 230V motor
  - 1 encoder
  - 1 photo-eye
  - 1 2-color stack light
  - 1 plastic safety cube to cover the Ferris wheel assembly

**Dimensions**:

*Automation Workstation*
- Width: 25 in (64 cm)
- Height: 28 in (71 cm)
- Depth: 18 in (46 cm)
- Estimated Weight: 90 lbs. (41 kg.)

*Ferris Wheel Assembly*
- Width: 20 in (51 cm)
- Height: 9.5 in (24 cm)
- Depth: 8 in (20 cm)
- Estimated Weight: 20 lbs. (9 kg)

For the size with an optional shipping case, add 3 in. (8 cm.) to the width and depth, and 8 in. (20 cm.) to the height.

Lead Time = 9 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Centerline® MCC on EtherNet/IP™ Workstation

## Catalog Number:

ABT-TDMCCENET

**Major Components:**

- Network hardware:
  - Stratix 5700 10-port Ethernet switch
  - 2100-ENET Ethernet adapter
- Control hardware:
  - PowerFlex 525 AC drive
  - (2) E300™ electronic overload relays
  - (1) E3 Plus™ overload relay
- Flywheel with manual brake
- 871TM proximity sensor
- Operator panel:
  - E-stop
  - 6 illuminated push buttons
  - 7 selector switches

**Dimensions:**

- Box 1
  - Width: 29 in. (74 cm)
  - Height: 21 in. (54 cm)
  - Depth: 13 in. (33 cm)
  - Weight: 83 lb. (38 kg)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

**Note:**

- For the approximate dimensions with an optional shipping case, add 5 in. (13 cm) to the width, 6 in. (15 cm) to the height, 3 in. (8 cm) to the depth, and 50 lbs. (23 kg) to the weight.

# 5380 CompactLogix and PanelView 5500 Workstation

**Major Components:**

- Network hardware:
  - CompactLogix™ 5380 Controller: 5069-L310ERM
  - PanelView™ 5500 graphic terminal with touchscreen operation
  - DC power supply
  - Ethernet cable
  - Hard-shell enclosure

**Dimensions:**

- Box 1
  - Height: 10 in (25 cm)
  - Width: 16 in (40.5 cm)
  - Depth: 5.5 in (14.5 cm)

## Catalog Number:

ABT-TDCMPX-PV5500

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# CompactLogix and PanelView Plus 7 Workstation

## Catalog Number:

ABT-TDCMPX-PVP7

**Major Components:**

- CompactLogix™ L18ERM processor
- PanelView™ Plus 7 Performance terminal with touchscreen operation
- DC power supply
- Ethernet cable
- Hard-shell enclosure

**Dimensions:**

- Height: 9 in (23 cm)
- Width: 15.5 in (39 cm)
- Depth: 4.5 in (11.5 cm)

**Related Products:**

- FactoryTalk View ME and PanelView Plus Procedures Guide (ABT-2711P-TSJ50)
- FactoryTalk View ME & PanelView Plus Programming Lab Book (ABT-CCV204-TLB)
- FactoryTalk View ME & PanelView Plus Maintenance and Troubleshooting LabBook (ABT-CCV209-TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# CompactLogix Workstation

## Catalog Number:

ABT-TDIALITE-A

**Major Components**:

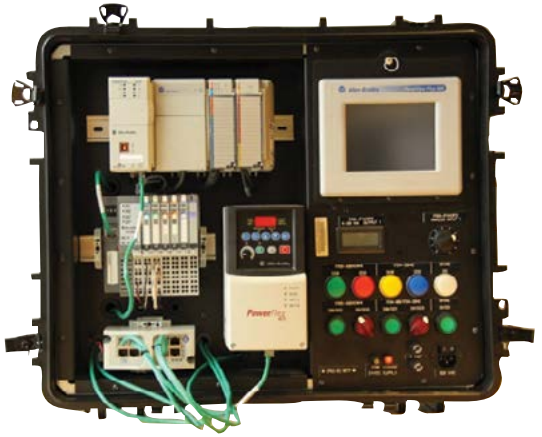
- 0.5 Hp PowerFlex 40 AC Drive
- Operator interface panel
  - 2 dual input and output push buttons
  - 4 digital output pilot lights
  - 1 analog input
  - 1 analog meter
- CompactLogix hardware
  - 1 DIN Rail
  - 1 system power supply
  - 1 CompactLogix controller
  - 1 digital output module
  - 1 analog output module
- Point I/O hardware
  - 1 Ethernet adapter
  - 1 digital input/output module
  - 2 dual input and output push buttons
- PanelView Plus 600 terminal
- Stratix 8-port switch

**Dimensions:**

- Box 1
  - Height 24 in. (61 cm)
  - Width 20 in. (51 cm)
  - Depth 13in. (33cm)
  - Weight 40 lb. (18kg)

**Related Products**

CompactLogix System Fundamentals & Troubleshooting Lab Book (ABT-CCP298TLB)



Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# CompactLogix Lite Workstation

## Catalog Number:

ABT-TDCMPXLITE

**Major Components**:

- 1 CompactLogix™ L30ER processor
- 1 CompactLogix AC power supply
- 1 Digital combo, 6 digital in/4 digital out
- 4 Momentary pushbuttons
- 2 Selector switches
- 1 Compactbus end cap

**Dimensions:**

- Height: 14 in (36 cm)
- Width: 10 in (25 cm)
- Depth: 6 in (15 cm)
- Weight: 15 lbs (7 kg)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Connected Components Workstation

## Catalog Number:

ABT-TDCONNCOMP

**Major Components**:

- 1 MicroLogix 1400
- 1 PowerFlex 4M AC drive
- 1 PanelView C600 terminal
- 1 Stratix Ethernet switch
- Dual discrete inputs/outputs
- 3 selector switches
- 4 push buttons
- 1 analog output meter
- 2 photo eyes
- Ethernet cables

**Dimensions:**

- Box 1
  - Width: 20 in. (51 cm)
  - Height: 29 in. (74 cm)

**Related Products**

- CompactLogix System Fundamentals & Troubleshooting Lab Book (ABT-CCP298TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix Workstation – No Motion (7-Slot Chassis)

## Catalog Number:

ABT-TDCLX2-B

**Major Components**:

- Network hardware:
  - 1 ControlNet™ bridge module
  - 2 ControlNet taps
  - 2 terminators
- Control hardware:
  - (1) 7-slot I/O chassis
  - (1) 1756 system power supply
  - 1 ControlLogix controller
  - 1 DC input module
  - 1 DC output module
  - 1 analog input module
  - 1 analog output module
- Operator interface panel:
  - 12 illuminated push buttons
  - 2 potentiometers
  - 2 analog voltmeters

**Dimensions:**

- Box 1
  - Width: 20 in. (51 cm)
  - Height: 16 in. (41 cm)
  - Depth: 9 in. (23 cm)
  - Weight: 90 lb. (41 kg)

**Related Products:**

- All Studio 5000 Logix Designer software procedures guides
- ControlLogix Troubleshooting Guide (ABT-1756-TSJ20)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix Workstation – No Motion (10-Slot Chassis)

## Catalog Number:

ABT-TDCLX3-C

**Major Components**:

- Network hardware:
  - 1 EtherNet module
  - 1 ControlNet bridge module
  - 2 ControlNet taps
  - 2 terminators
- Control hardware:
  - (1) 10-slot I/O chassis
  - (1) 1756 system power supply
  - 1 ControlLogix controller
  - 1 DC input module
  - 2 DC output module
  - 1 analog input module
  - 1 analog output module
- Operator interface panel:
  - 12 illuminated push buttons
  - 2 potentiometers
  - 2 analog voltmeters

**Dimensions:**

- Box 1
  - Width: 20 in. (51 cm)
  - Height: 16 in. (41 cm)
  - Depth: 9 in. (23 cm)
  - Weight: 70 lb. (33 kg)

**Related Products:**

- All Studio 5000 Logix Designer software procedures guides
- ControlLogix Troubleshooting Guide (ABT-1756-TSJ20)
- Lab books associated with the ControlLogix/Studio 5000 curriculum

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix Workstation – No Motion and No Controller (7-Slot Chassis)

**Major Components**:

- Network hardware:
  - 1 ControlNet™ bridge module
  - 2 ControlNet taps
  - 2 terminators
- Control hardware:
  - (1) 7-slot I/O chassis
  - (1) 1756 system power supply
  - 1 ControlLogix controller
  - 1 DC input module
  - 1 DC output module
  - 1 analog input module
  - 1 analog output module
- Programming Cable
- Operator interface panel:
  - 12 illuminated push buttons
  - 2 potentiometers
  - 2 analog voltmeters

**Dimensions:**

- Box 1
  - Width: 20 in. (51 cm)
  - Height: 16 in. (41 cm)
  - Depth: 9 in. (23 cm)
  - Weight: 90 lb. (41 kg)

**Related Products:**

- All Studio 5000 Logix Designer software procedures guides
- ControlLogix Troubleshooting Guide (ABT-1756-TSJ20)

## Catalog Number:

ABT-TDCLX2NP-A

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix Workstation – No Motion and No Controller (10-Slot Chassis)

## Catalog Number:

ABT-TDCLX3NP-A

**Major Components**:

- Network hardware:
  - 1 EtherNet module
  - 1 ControlNet bridge module
  - 2 ControlNet taps
  - 2 terminators
- Control hardware:
  - (1) 10-slot I/O chassis
  - (1) 1756 system power supply
  - 1 DC input module
  - 2 DC output module
  - 1 analog input module
  - 1 analog output module
- Programming Cable
- Operator interface panel:
  - 12 illuminated push buttons
  - 2 potentiometers
  - 2 analog voltmeters

**Dimensions:**

- Box 1
  - Width: 20 in. (51 cm)
  - Height: 16 in. (41 cm)
  - Depth: 9 in. (23 cm)
  - Weight: 70 lb. (33 kg)

**Related Products:**

- All Studio 5000 Logix Designer software procedures guides
- ControlLogix Troubleshooting Guide (ABT-1756-TSJ20)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix Integrated Architecture Workstation

## Catalog Number:

ABT-TDIA-B

**Major Components**:

- 0.5-HP PowerFlex® 40 AC drive
- Network hardware:
  - ControlNet-to-DeviceNet linking device
  - ControlNet FLEX™ I/O adapter
  - NETGEAR 5-port Ethernet switch
  - RightSight™ photoeye
  - Tower light
- ControlLogix® hardware:
  - 10-slot I/O chassis
  - 1756 system power supply
  - ControlLogix controller
  - DC input module
  - DC output module
  - Analog input module
  - Analog output module
  - ControlNet bridge module
  - EtherNet/IP bridge module
  - DeviceNet scanner module
- FLEX I/O hardware:
  - DC input/output combo module
  - Analog input/output combo module
- Motion control hardware:
  - M08SE SERCOS interface module
  - Kinetix® Integrated IAM Drive
- PanelView™ Plus 600 terminal

**Dimensions**:

- Box 1
  - Width: 31 in (79 cm)
  - Height: 22 in (56 cm)
  - Depth: 12 in (30 cm)
  - Weight: 70 lb. (32 kg)
- Box 2
  - Width: 29 in (74 cm)
  - Height: 21 in (53 cm)
  - Depth: 12 in (30 cm)
  - Weight: 35 lb. (16 kg)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# ControlLogix with 5069 Compact I/O Workstation (4-Slot Chassis)

## Catalog Number:

ABT-TDCLX4

**Major Components**:

- Network hardware:
  - 1756-EN2T EtherNet/IP module
  - Stratix® 2000 unmanaged switch
  - 5069-AEN2TR EtherNet/IP adapter
- Control hardware:
  - 4-slot chassis
  - 5583E ControlLogix® controller
  - 1756-IB16D DC input module
  - 1756-OB16D DC output module
  - 5069-IY4 analog input module
  - 5069-OF4 analog output module
- Operator interface panel:
  - 12 illuminated pushbuttons
  - 4 maintained 2-position selector switches
  - 2 potentiometers
  - 2 analog voltmeters

**Dimensions:**

- Box 1
  - Width: 21.5 in. (54.5 cm)
  - Height: 12 in. (30.5 cm)
  - Depth: 6 in. (15.5 cm)
  - Weight: 20 lb. (9 kg)

**Related Products:**

- All Studio 5000 Logix Designer® Software Procedures Guides
- ControlLogix Troubleshooting Guide (ABT-1756-TSJ20)
- Many labs books in the ControlLogix/Studio 5000® curriculum. Please call for availability or check the Workstations section of our Training Catalog: Workforce Development Catalog.

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Stratix 5700 EtherNet/IP™ Workstation

## Catalog Number:

ABT-TDENET5700**

**Major Components**:

- 7-slot ControlLogix chassis with the following modules:
  - ControlLogix Controller
  - EtherNet/IP bridge module
  - EtherNet/IP web server module
  - Digital input module
  - Digital output module
- ControlLogix power supply
- CompactLogix chassis with the following modules:
  - CompactLogix controller
  - 1769 digital input module
  - 1769 digital output module
- 1794-AENT EtherNet/IP adapter module with a four channel non-isolated analog output module
- PanelView Plus 600 terminal
- Stratix switch (select 6000 or 5700)
- 18 dual discrete inputs/outputs
- 6 selector switches
- 1 analog output meter
- 1 photoeye

**Dimensions:**

- Box 1
  - Width: 30 in. (76 cm)
  - Height: 21 in. (53 cm)
  - Depth: 13 in. (33 cm)
  - Weight: 45 lb. (20 kg)

**Related Products:**

- EtherNet/IP Procedures Guide (ABT-N300-TSJ50)
- EtherNet/IP Design and Troubleshooting Lab Book (ABT-CCP179TLB)

**** IMPORTANT ORDERING INFORMATION**

- This unit is available with different switches:
  - For a unit with a Stratix 5700 switch, order ABT-TDENET5700

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# GuardLogix Controller Workstation

## Catalog Number:

ABT-TDGRDLX1-B

**Major Components**:

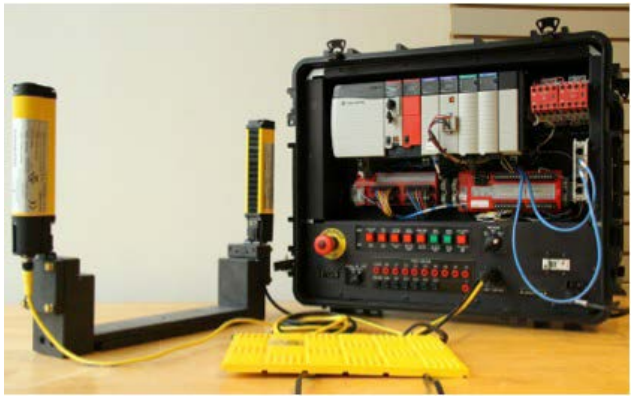
- GuardLogix primary controller
- GuardLogix safety partner
- 7-slot ControlLogix chassis
- ControlLogix power supply
- 8 dual discrete inputs/outputs
- 1 selector switch
- CompactBlock I/O safety modules:
  - 1791ES-IB16 EtherNet/IP module with 16 safety inputs and 16 pulse test outputs
  - 1791DS-IB8XOB8 DeviceNet module with 8 safety inputs, 8 safety solid-state outputs
- Communication modules:
  - EtherNet/IP bridge module
  - DeviceNet bridge module
- Light curtain
- E-stop push button
- Patch connectors
- Stratix 2000™ 5-port Ethernet switch
- MatGuard™ safety mat

**Dimensions:**

- Box 1
  - Width: 24 in. (61 cm)
  - Height: 20 in. (51 cm)
  - Depth: 12 in. (30 cm)
  - Weight: 58 lb. (27 kg)

**Related Products:**

- GuardLogix Fundamentals and Maintenance Lab Book (ABT-SAF-LOG101TLB)
- GuardLogix Application Development Lab Book (ABT-SAF-LOG103TLB)



Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# GuardPLC Workstation

## Catalog Number:

ABT-TDGRDPLC1

**Major Components**:

- GuardPLC 1600 controller
- Distributed I/O expansion module
- Power switch
- 120V / 220V plug receptacle
- E-stop push button
- 6 dual discrete inputs/outputs
- Patch connectors

**Dimensions:**

- Box 1
  - Width: 19 in. (48 cm)
  - Height: 15 in. (38 cm)
  - Depth: 8 in. (20 cm)
  - Weight: 20 lb. (9 kg)

**Related Products:**

- RSLogix Guard PLUS and GuardPLC Procedures Guide (ABT-1753-TSJ50)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# HART Process Workstation

## Catalog Number:

ABT-TDHART

**Major Components**:

- 4-slot ControlLogix® chassis:
  - ControlLogix controller
  - EtherNet/IP bridge module
  - HART module
  - ControlNet redundant module
- Endress & Hauser temperature transmitter
- Stratix® Ethernet switch, 5-port
- Flex™ I/O
  - Flex I/O adapter
  - Flex I/O digital combo module
  - Flex I/O analog combo module

**Dimensions:**

- Box 1
  - Width: 32 in (81 cm)
  - Height: 26 in (66 cm)
  - Depth: 16 in (41 cm)
  - Weight: 35 lbs (156 kg)

**Related Products**

Studio 5000 Logix Designer and Logix5000 Procedures Guide (ABT-1756-TSJ50)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Integrated Architecture Basic Workstation

## Catalog Number:

ABT-TDCMPX

**Major Components**:

- 0.5 Hp PowerFlex 40 AC drive
- CompactLogix hardware:
  - 1 DIN Rail
  - 1 system power supply
  - 1 CompactLogix controller
- 1 PanelView Plus 6,600 terminal
- 1 Stratix 8-port switch

**Dimensions:**

- Box 1
  - Width: 15 in. (38 cm)
  - Height: 18 in. (46 cm)
  - Depth: 12 in. (31 cm)

**Related Products**

CompactLogix System Fundamentals & Troubleshooting Lab Book (ABT-CCP298TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Kinetix 6000 Servo Drive Workstation

## Catalog Number:

ABT-TD20941 (120V AC)
ABT-TD20942 (230V AC, 20 A)

**Major Components**:

- 2-axis power rail
- 120V AC operation
- Integrated axis module
- MP-series motors
- SERCOS communication card
- Illuminated mushroom E-stop push button
- Integral surge suppression
- Auxiliary encoder
- Cable package:
  - Universal feedback cable
  - Universal motor power cable
  - Lo-profile I/O connector kit
  - Lo-profile feedback connector kit
  - Lo-profile auxiliary feedback connector kit

**Dimensions:**

- Box 1
  - Width: 25 in. (64 cm)
  - Height: 19 in. (48 cm)
  - Depth: 10 in. (25 cm)
  - Weight: 70 lb. (32 kg)

**Related Products:**

- Studio 5000™ Logix Designer and Logix5000 Motion Control Procedures Guide (ABT-1756-TSJ52)
- Motion Programming Using Ladder Logic Lab Book (ABT-CCN145TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Kinetix 6500 Workstation

## Catalog Number:

ABT-TDK6500**
ABT-TDK6500EN2TR (with EN2TR) **

**Major Components**:

- Kinetix 6500 integrated axis module (460V AC)
- Kinetix 6500 axis module (460V AC)
- 2 Ethernet safe speed monitoring control modules
- 2 MPL motors
- 5-port Stratix Ethernet switch
- 1783- ETAP
- TLS-3-GD2 guard locking switch
- Power supply 24V, 5 A
- Safe-off button
- 2-position selector switch
- 2 photo switches

**Important:**

– This unit requires a controller and connecting modules. Please see the Important Ordering Information.

**Dimensions:**

- Box 1
  - – Width: 28 in. (71 cm)
  - – Height: 20 in. (51 cm)
  - – Depth: 17 in. (43 cm)
  - – Weight: 113 lb. (51 kg)

****Important Ordering Information:**

- This unit must have the following additional equipment to operate:
  - – A 10/100 Mbps Ethernet bridge:
    - – Order ABT-TDK6500EN2TR for a unit with a bridge
    - – Order ABT-TDK6500 for a unit without a bridge (provide your own)
  - – A ControlLogix controller to
    - – Order ABT-TDCLX3-C (complete ControlLogix workstation)
    - – If you chose to buy the Kinetix unit without the ControlLogix workstation, you will need your own controller, I/O, and interface.

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Kinetix 5700 Workstation

## Catalog Number:

ABT-TDK5700

**Major Components**:

- Kinetix® 5700 DC bus power supply
- Kinetix 5700 dual-axis inverter module (460 V AC)
- 1769-L18ERM-BB1B CompactLogix™ Controller
- 2 VPL motors
- Power supply (24V, 5A)
- Safe-off button
- 2 photoswitches
- Operator interface panel:
  - 9 illuminated pushbuttons
  - 3 illuminated selector switches
  - 1 three-position selector switch

**Dimensions:**

- Box 1
  - Width: 24.80 in. (62.99 cm)
  - Height: 20.87 in. (53.07 cm)
  - Depth: 15.23 in. (38.68 cm)
  - Weight: 75 lb. (34.47 kg)

**Related Products**

- Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide (ABT-1756-TSJ52)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# PanelView Plus 6 Workstation

## Catalog Number:

ABT-TDPV61000 (1000 terminal)
ABT-TDPV6700 (700 terminal)

**Major Components (Control Workstation):**

- PanelView Plus 6 terminal with touch screen operation
- Ethernet cable
- Swing stand
- Hard-shell enclosure

**Compatibility:**

– The PanelView Plus 6 workstation can be used with the ControLogix Workstation – No Motion (ABT-TDCLX3-C)

**Dimensions:**

- Box 1
  - – Width: 22 in. (55 cm)
  - – Height: 22 in. (56 cm)
  - – Depth: 14 in. (36 cm)
  - – Weight: 124 lb. (56 kg)

**Related Products:**

- FactoryTalk View ME and PanelView Plus Procedures Guide (ABT-2711P-TSJ50)
- FactoryTalk View ME & PanelView Plus Programming Lab Book (ABT-CCV204TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# PanelView Plus 1000 Workstation

## Catalog Number:

ABT-TDPVPLUSTC02

**Major Components:**

- PanelView Plus terminal keypad and touch operation
- DH+™, DH-485
- Serial Interface cable
- Hard-shell enclosure

**Dimensions:**

- Box 1
  - Width: 13 in. (33 cm)
  - Height: 10 in. (25 cm)
  - Depth: 3 in. (6 cm)
  - Weight: 6 lb. (3 kg)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# PlantPAx™ Process System Workstation

## Catalog Number:

ABT-TDPAX

**Major Components (Control Workstation):**

- Redundant controller chassis
- Redundant Stratix 8000 switches
- 15 in. VersaView with touch screen

**Major Components (I/O Workstation):**

- Remote ControlLogix digital and HART I/O modules
- 3 simulated valves with open and closed feedback
- 7 hand switches
- 2 HART potentiometers
- 4…20 mA potentiometer
- 4…20 mA digital ammeter
- 24V DC motor with HOA switch
- 3-color stack light
- Fluke 87 multimeter

**Major Components (MCC Workstation):**

- PowerFlex 40 drive
- E1 Plus overload relay with EtherNet/IP module
- Stratix 6000 switch
- 220V AC motor with hand brake
- 115V AC motor with hand brake and Hand/Off/Auto switch

**Dimensions (HART Workstation):**

- Box 1
  - Width: 39 in. (97 cm)
  - Height: 22 in. (56 cm)
  - Depth: 14 in. (36 cm)
  - Weight: 177 lb. (80 kg)

**Dimensions (FieldBus Workstation):**

- Box 2

Width: 29 in. (73 cm)
  - Height: 22 in. (56 cm)
  - Depth: 14 in. (36 cm)
  - Weight: 139 lb. (63 kg)

**Dimensions (MCC Workstation):**

- Box 3
  - Width: 22 in. (55 cm)
  - Height: 22 in. (56 cm)
  - Depth: 14 in. (36 cm)
  - Weight: 124 lb. (56 kg)

Lead Time = 9 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

*** Related Products:**

- PlantPAx Process System Troubleshooting Guide (ABT-P100-TSJ20)

# PowerFlex 700 AC Drive Workstation Description

## Catalog Number:

ABT-TDPF700-A

**Major Components**:

- 1 HP PowerFlex® 700 AC drive
- Ethernet communications
- 120V AC operation
- Drive operator panel that includes:
  - Programmable digital output
  - User-configurable digital inputs
  - 0-10V speed reference
  - 0-10V analog output
- Human interface module
- Embedded 25W AC motor with encoder feedback
- Fault simulation switches
- User-accessible wiring terminals

**Dimensions:**

- Box 1
  - Width: 25 in. (64 cm)
  - Height: 20 in. (51 cm)
  - Depth: 17 in. (43 cm)
  - Weight: 57 lb. (26 kg)

**Related Products:**

- PowerFlex 700 Standard and Vector Control Troubleshooting Guide (Catalog No. ABT-20B-TSJ20)
- PowerFlex 700 Standard and Vector Control Procedures Guide (Catalog No. ABT-20B-TSJ50)
- PowerFlex 700 Vector Control Configuration & Startup Lab Book (Catalog No. ABT-CCA161-TLB)
- PowerFlex 700 Vector Control Maintenance & Troubleshooting Lab Book (Catalog No. ABT-CCA163-TLB)

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# PowerFlex 755 Workstation

## Catalog Number:

ABT-TDPF755-A

**Major Components**:

- 1 HP PowerFlex® 755 AC drive
  - Embedded EtherNet/IP communications
- 120V AC operation
- 1/30 HP 230V induction motor with optical incremental encoder
- Human interface module
- Drive operator panel that includes:
  - Programmable digital outputs
  - Programmable digital inputs
  - 0-10V speed reference
  - 0-10V analog output
  - User-configurable analog input
  - User-configurable analog output
  - Safe-speed relay with switch
  - Safe-Off 24V LED module

**Dimensions:**

- Box 1
  - Width: 25 in. (61 cm)
  - Height: 20 in. (51 cm)
  - Depth: 13 in. (41 cm)
  - Weight: 70 lb. (32 kg)

This unit comes with a case. For the size with shipping case, add 3 in (8 cm) to width and depth and 8 in (20 cm) to height.


Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Safety Components Workstation

## Catalog Number:

ABT-TDSAFCOMP

**Major Components:**

- Guardmaster safety relay with one dual-channel input
- 2 Guardmaster safety relays with two dual-channel inputs
- Guardmaster EMD safety relay expansion module with time delay
- Safety-wired 4-port distribution box
- 4 safety-wired shorting plugs
- GuardShield™ safety light curtain
- Guardmaster safety sensor
- MatGuard safety mat
- Guardmaster grip enabling switch
- Guardmaster guard locking switch
- Guardmaster safety limit switch
- Cadet™ tongue interlock switch
- 3 SensaGuard™ non-contact safety switches
- Allen-Bradley E-stop push button
- Allen-Bradley power supply
- Stackable banana jacks
- Patchcord connectors

**Dimensions:**

- Box 1
  - Width: 24.5 in. (62 cm)
  - Height: 20.5 in. (52 cm)
  - Depth: 13 in. (33 cm)
  - Weight: 65 lb. (30 kg) without shipping case
    111 lb (51 kg) with shipping case

Lead Time = 7 Weeks*

* Contact your local Rockwell Automation sales office or Allen-Bradley distributor to check availability for immediate shipment.

# Job Aids

Rockwell Automation recognizes that one of the keys to superior performance on-the-job is the ability to become efficient and highly effective using support resources. Rockwell Automation's award-winning job aids provide essential job task information, thereby minimizing errors that can occur at the most inopportune moments. Job aids provide immediate hardware and software information when it is needed so production is not impacted. Our job aids are written at a level of detail to ensure that you are consistently using best practices. The right job aid can make the difference between productive time and downtime and between maximum performance and minimum operation.

### Standard Guides

Standard job aids are designed to assist individuals with software and hardware job tasks. While these tools are very good at covering tasks associated with Rockwell Automation hardware components, they are not designed to take into consideration every possible custom system configuration or state.

### Custom Guides

Custom guides are designed and developed to work with plant-specific systems and applications. Common operator-related hardware and software errors can be eliminated by using custom designed procedures and guides. Rockwell Automation can assist you with the design and creation of the guides you need to achieve maximum efficiency and minimize operator-related errors. Contact your local Rockwell Automation sales office or Allen-Bradley distributor to discuss creating custom guides for your needs.

### Quick Reference Guides

Quick reference guides provide hardware and software-specific information that users can quickly reference when configuring Rockwell Automation equipment. Parameter-specific information can typically be found in a quick reference guide.

| Job Aid | Catalog Number |
|---|---|
| 1336 IMPACT Quick Reference Guide | ABT-1336E-TQR90 |
| 1336 PLUS and PLUS II AC Drive Parameters Quick Reference Guide | ABT-1336SF-TQR90 |
| PowerFlex 700 Standard and Vector Control Quick Reference Guide | ABT-20AB-TQR90 |

Click next to learn about Procedure Guides

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# Procedure Guides

Procedure guides provide detailed step-by-step instructions on the most common software and hardware-related job tasks that help users to program, configure, troubleshoot, and test Rockwell Automation control equipment.

| Job Aid | Catalog Number |
|---|---|
| 1395 Drive Installation Guide | ABT-1395-TSH50 |
| ControlNet™ and RSNetWorx Procedures Guide | ABT-N200-TSJ50 |
| ControlNet and RSNetWorx Procedures Guide - Spanish | ABT-N200-TSJ50ES |
| DeviceNet™ and RSNetWorx Procedures Guide | ABT-N100-TSJ50 |
| DriveExplorer Software Procedures Guide | ABT-D500-TSJ51 |
| DriveTools32 Software Procedures Guide | ABT-D500-TSJ50 |
| EtherNet/IP Procedures Guide | ABT-N300-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide | ABT-2711P-TSJ50 |
| FactoryTalk View ME and PanelView Plus Procedures Guide - Spanish | ABT-2711P-TSJ50ES |
| FactoryTalk View SE Procedures Guide | ABT-9701SE-TSJ50 |
| FactoryTalk View SE Procedures Guide - Spanish | ABT-9701SE-TSJ50ES |
| CENTERLINE® MCC and IntelliCENTER Software Procedures Guide | ABT-MCC-TSJ50 |
| Motion Control Fundamentals Procedures Guide | ABT-M100-TSJ50 |
| PanelView 300/550/600/900/1000/1400 and PanelBuilder32 Procedures Guide | ABT-2711-TSJ50 |

| Job Aid | Catalog Number |
|---|---|
| PanelView 1000e/1200e/1400e and PanelBuilder 1400e Configuration Procedures Guide | ABT-2711E-TSJ50 |
| PowerFlex 700 Standard and Vector Control Procedures Guide | ABT-20B-TSJ50 |
| RSLogix 5 and PLC-5 Procedures Guide | ABT-1785-TSJ53 |
| RSLogix 5 and PLC-5 Procedures Guide - Spanish | ABT-1785-TSJ53ES |
| RSLogix 500 and SLC 500 Procedures Guide | ABT-1747-TSJ52 |
| RSLogix 500 and SLC 500 Procedures Guide - Spanish | ABT-1747-TSJ52ES |
| Studio 5000 Procedures Guide for use with V30 | ABT-1756-TSJ60 |
| Studio 5000 Logix Designer and Logix5000 Motion Control Procedures Guide | ABT-1756-TSJ52 |
| Studio 5000 Logix Designer and Logix5000 Procedures Guide | ABT-1756-TSJ50 |
| Studio 5000 Logix Designer and Logix5000 Procedures Guide - Spanish | ABT-1756-TSJ50ES |
| Studio 5000 View Designer and PanelView 5500 Procedure Guide | ABT-2715-7SJ50 |
| RSLogix Guard PLUS and GuardPLC Procedures Guide | ABT-1753-TSJ50 |
| RSView32 Procedures Guide | ABT-9301-TSJ50 |

Click next to learn about Troubleshooting Guides

# Troubleshooting Guides

Rockwell Automation troubleshooting guides contain flowcharts that walk you through faults that can occur on a system. These guides are specifically designed for use on the plant floor and their pocket-size design allows for easy portability. Troubleshooting guides are filled with procedures, error code information, and status indicator listings with recommended actions, reference charts, and hardware/software diagrams.

**Features**

- Detailed illustrations with pertinent troubleshooting information
- Location indicators where action is needed or where possible problems exist
- Consistent starting point from which to logically begin troubleshooting
- Logical progression of questions, causes, and actions to determine the problem
- Important safety considerations, precautions, and general warnings

| Job Aid | Catalog Number |
|---|---|
| 1336 PLUS™ II AC Drive Troubleshooting Guide | ABT-1336F-TSJ20 |
| ControlLogix Troubleshooting Guide | ABT-1756-TSJ20 |
| ControlLogix Troubleshooting Guide - Spanish | ABT-1756-TSJ20ES |
| ControlNet and RSNetWorx Troubleshooting Guide | ABT-N200-TSJ20 |
| ControlNet and RSNetWorx Troubleshooting Guide - Spanish | ABT-N200-TSJ20ES |

| Job Aid | Catalog Number |
|---|---|
| DeviceNet and RSNetWorx Troubleshooting Guide | ABT-N100-TSJ20 |
| PlantPAx Process System Troubleshooting Guide | ABT-P100-TSJ20 |
| PLC-5 and RSLogix 5 Troubleshooting Guide | ABT-1785-TSJ22 |
| PowerFlex 700 Standard and Vector Control Troubleshooting Guide | ABT-20B-TSJ20 |
| SLC 500 and RSLogix 500 Troubleshooting Guide | ABT-1747-TSJ22 |
| SLC 500 and RSLogix 500 Troubleshooting Guide - Spanish | ABT-1747-TSJ22ES |

# Logix, Drives, and Motion Certificate Programs

Apply Logix, Drives, and Motion technology to help improve the quality, efficiency, and productivity of your plant systems.

The Logix, Drives, and Motion Certificate Programs are intended for maintenance and programming professionals who want to develop their knowledge and skills using the latest technology. This program combines a number of up-to-date training courses.

You can choose to complete one or both of the Certificate Programs. As a certificate candidate, you will follow a series of Rockwell Automation training courses offering practical, hands-on exercises and take a final assessment. Participants will be trained on Logix, Drives, or Motion skills and competencies. They will understand theoretical concepts, and learn to maintain and/or program Logix, Drives, or Motion equipment. Depending on the combination of training courses followed, it will lead you to the desired level and type of certificate.

Upon completion of the program requirements, please contact your local Rockwell Automation Enrollment Specialist to review your training record.

Once approved, you can enroll for the assessment through your local Allen-Bradley distributor or Rockwell Automation Enrollment Specialist. You will be given access to the online, web-based assessment (fee requirement), the final step leading to your Certificate of Achievement. A passing score on the assessment will entitle you to the rewards and benefits of the Certificate Program you completed.

**Program Rewards**

- Recognition Award - Certificate of Achievement
- Custom Rockwell Automation polo shirt with certificate logo

**Program Value-Add**

- Job aids
- Continuing education units
- Tools to maintain skills and knowledge:
  - CompactLogix starter workstation (available with specific ControlLogix courses)

**Benefits**

- Competency
- Recognition
- Knowledge assessment
- Competitive edge
- Education credits
- Improved on-the-job skills

Click next to view the Certificate Curriculums

# Certificate Programs Menu

Please click on any of the links listed to view more information.

# Logix Programmer Certificate Curriculum

Rockwell Automation

## Traditional Path

Standard Pace of Learning, Typical Hands-on Learning Time

**Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals**
CCP146 • 2 Days
1.4 CEUs

→ **Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming**
CCP151 • 2 Days
1.4 CEUs

→ **Studio 5000 Logix Designer Level 3: Project Development**
CCP143 • 4 Days • 2.8 CEUs

→ **Choose 1 Elective Course**

→ **Logix Programmer Assessment**
T-CLXPT

**Elective Courses** (Choose 1 Course)

- **Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting**
  CCP299 • 4.5 Days • 3.2 CEUs
- **Motion Control Fundamentals**
  CCN130 • 2 Days
  1.4 CEUs
- **Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming**
  CCN145 • 4 Days
  2.8 CEUs
- **Studio 5000 Logix Designer Level 5: Advanced Motion Programming**
  CCN190-LD • 2 Days
- **Introduction to the Integrated Architecture System** (Private Delivery Only)
  CIA101 • 2 Days
  1.4 CEUs
- **GuardLogix Application Development**
  SAF-LOG101 • 2 Days
  1.4 CEUs
- **Studio 5000 Logix Designer Level 4: Function Block Programming**
  CCP152 • 2 Days
  1.4 CEUs
- **Studio 5000 Logix Designer Level 4: Structured Text/Sequential Function Chart Programming** (Private Delivery Only)
  CCP154 • 2 Days • 1.4 CEUs
- **Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming**
  CCN144 • 4 Days
  2.8 CEUs
- **FactoryTalk View ME and PanelView Plus Programming**
  CCV204-A • 4 Days
  2.8 CEUs
- **Essentials of Industrial Ethernet Networks for the OT Professional**
  CCP182 • 2 Days
  1.4 CEUs
- **EtherNet/IP Configuration and Troubleshooting**
  CCP183 • 3 Days
  2.1 CEUs

## Expedited Paths

Expedited Pace of Learning, Limited Hands-on Learning Time

### I. Accelerated

**Any CLX Course as Prerequisite**

→ **Accelerated Logix5000 Programmer Certificate Level 1** CCP250 •
5 Days • 3.5 CEUs

→ **Accelerated Logix5000 Programmer Assessment**
*Included with CCP250*

### II. Advanced

**Logix Programmer Certificate (Traditional Path)**

OR

**Accelerated Logix5000 Programmer Certificate (Accelerated Path)**

OR

**Studio 5000 Logix Designer Level 3: Project Development**
**CCP143 • 4 Days • 2.8 CEUs**

→ **Advanced Logix5000 Programmer Certificate**
**CCP251 • 4 Days • 2.8 CEUs**

→ **Advanced Logix5000 Programmer Certificate Assessment**
*Included with CCP251*

# Logix Maintainer Certificate Curriculum

Rockwell Automation

## Traditional Path

Standard Pace of Learning, Typical Hands-on Learning Time

**Studio 5000 Logix Designer Level 1: ControlLogix SystemFundamentals**
CCP146 • 2 Days
1.4 CEUs

**Studio 5000 Logix Designer Level 1: ControlLogix Fundamentals and Troubleshooting**
CCP299 • 4.5 Days
3.2 CEUs

OR

**Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting**
CCP153 • 4 Days
2.8 CEUs

**Studio 5000 Logix Designer Level 3: Basic Ladder Logic Interpretation**
CCCL21 • 2 Days
1.4 CEUs

**Choose 1 Elective Course**

**Logix Maintainer Assessment**
T-CLXMT

**Elective Courses** (Choose 1 Course)

- **Motion Control Fundamentals**
  CCN130 • 3 Days • 1.4 CEUs
- **Kinetix 6000 Troubleshooting and Project Interpretation**
  CCN200 • 2 Days • 1.4 CEUs
- **Kinetix® 6500 Troubleshooting and Project Interpretation**
  CCN201 • 3 Days
- **FactoryTalk® View ME and PanelView™ Plus Maintenance and Troubleshooting**
  CCV209-A • 2 Days
- **Essentials of Industrial Automation for the IT Professional**
  CCP810 • 2 Days
- **Essentials of Industrial Ethernet Networks for the OT Professional**
  CCP182 • 2 Days
- **EtherNet/IP Configuration and Troubleshooting**
  CCP183 • 3 Days

## Accelerated Path

Expedited Pace of Learning, Limited Hands-on Learning Time

**Any CLX Course as Prerequisite**

**Accelerated Logix5000 Maintenance Certificate Level 1**
CCP300 • 5 Days • 3.5 CEUs

**Accelerated Logix5000 Maintainer Assessment**
*Included with CCP300*

# Motion Control Kinetix 5700/6000/6500 Programmer Certificate Curriculum

Rockwell Automation

**Core Courses**

**Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals**
CCP146 • 2 Days • 1.4 CEUs

**Studio 5000 Logix Designer Level 2: Basic Ladder Logic Programming**
CCP151 • 2 Days • 1.4 CEUs

**Studio 5000 Logix Designer Level 3: Project Development**
CCP143 • 4 Days • 2.8 CEUs

**Motion Control Fundamentals**
CCN130 • 2 Days • 1.4 CEUs

**Studio 5000 Logix Designer Level 4: Kinetix 5700 (CIP) Programming**
**CCN144-A • 4 Days • 2.8 CEUs**

OR

**Studio 5000 Logix Designer Level 4: Kinetix 6500 (CIP) Programming**
CCN144 • 4 Days • 2.8 CEUs

OR

**Studio 5000 Logix Designer Level 4: Kinetix 6000 (SERCOS) Programming**
CCN145 • 4 Days • 2.8 CEUs

**Motion Programmer Assessment**
T-K5700P/T-MC-6000P/T-MC-6500P

# Motion Control Kinetix 5700/6000/6500 Maintainer Certificate Curriculum

Rockwell Automation

**Core Courses**

**Studio 5000 Logix Designer Level 1: ControlLogix System Fundamentals**
CCP146 • 2 Days • 1.4 CEUs

**Motion Control Fundamentals**
CCN130 • 2 Days • 1.4 CEUs

**Kinetix 5700 Troubleshooting and Project Interpretation**
CCN202 • 3 Days • 2.1 CEUs

OR

**Kinetix 6000 Troubleshooting and Project Interpretation**
CCN200 • 2 Days • 1.4 CEUs

OR

**Kinetix 6500 Troubleshooting and Ladder Logic Interpretation**
CCN201 • 3 Days • 2.1 CEUs

**Choose 1 Elective Course**

**Studio 5000 Logix Designer Level 2: ControlLogix Maintenance and Troubleshooting**
CCP153 • 4 Days • 2.8 CEUs

**Studio 5000 Logix Designer Level 3: Basic Ladder Logic Interpretation**
CCCL21 • 2 Days • 1.4 CEUs

**Motion Maintainer Assessment**
T-K5700M/T-MC-6000M/T-MC-6500M

# PowerFlex 750 Certificate Curriculum

**PowerFlex 750-Series Configuration and Startup**
CCA182 • 2 Days • 1.4 CEUs

**PowerFlex 750-Series Maintenance and Troubleshooting**
CCA183 • 2 Days • 1.4 CEUs

**Choose any 2 Drives, Medium Voltage, or Motion Courses as Elective Courses**

**PowerFlex 750 Assessment**
T-PF750

Rockwell Automation, Inc. (NYSE:ROK), the world's largest company dedicated to industrial automation, makes its customers more productive and the world more sustainable. Throughout the world, our flagship Allen-Bradley® and Rockwell Software® product brands are recognized for innovation and excellence.




**www.rockwellautomation.com**

**Power, Control and Information Solutions Headquarters**

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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