Self-paced, online training
ANYtime
ANYwhere

January – December 2019
ISA Online Training

Setting the Standard for Automation™
ISA Distance Learning
Classroom-quality technical training—without the classroom.

If self-paced distance education is a better fit for your schedule, ISA has a wealth of distance learning options from which to choose. We have hundreds of self-directed courses to choose from in a format that meets your needs. We now offer ISA-developed on-demand modules as well. These courses are sure to become a critical part of your technical training program!

ISA online, instructor-assisted training is designed for today's busy automation and control technicians and engineers who need expert ISA technical training, but have difficulty finding time to attend a classroom event.

ISA Online Formats

ISA On-Demand Modules and Courses

Modular delivery fits the way you want to learn!

Our responsive on-demand modular delivery format allows you to access the course anywhere, anytime from any mobile device you choose.

• Learn when and where you want
• Pause and resume training at your own schedule and pace
• Cost effective — No travel or hotel expense
• On demand purchasing——select as few or as many modules offered within the course
• Interactive learning

Learn more about other ISA distance learning options. See page 23.

ISA™

The International Society of Automation (www.isa.org) is a nonprofit professional association that sets the standard for those who apply engineering and technology to improve the management, safety, and cybersecurity of modern automation and control systems used across industry and critical infrastructure. Founded in 1945, ISA develops widely used global standards; certifies industry professionals; provides education and training; publishes books and technical articles; hosts conferences and exhibits; and provides networking and career development programs for its 40,000 members and 400,000 customers around the world.

ISA owns Automation.com, a leading online publisher of automation-related content, and is the founding sponsor of The Automation Federation (www.automationfederation.org), an association of non-profit organizations serving as “The Voice of Automation.” Through a wholly owned subsidiary, ISA bridges the gap between standards and their implementation with the ISA Security Compliance Institute (www.isasecure.org) and the ISA Wireless Compliance Institute (www.isa100wci.org).
Online, Instructor-Assisted Courses
ISA online, instructor-assisted training courses are flexible, multi-week courses of study that allow you, the busy automation professional, to complete an ISA course any time, any place. You will acquire skills and expertise that are in high demand in today’s marketplace as you learn from ISA experts and network with professional classmates who share similar technical issues.

Virtual Instructor-Led Training
Virtual Instructor-Led Training saves you time and money with no travel or hotel expenses needed. You get the same great ISA content delivered conveniently to you via a live interactive webinar, led by our expert ISA instructors!

Third Party On-Demand Curriculum
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Fundamentals of Industrial Process Measurement & Control (FG05E)

Dates:
• 11 February – 3 May
• 13 May – 13 July
• 12 August – 1 November
• 30 September – 27 December

This self-paced, online course provides an overview of industrial measurement and control for technicians, engineers, and managers, and lays a foundation for improved communication with control systems professionals.

You will be able to:
• Communicate the latest trends in measurement and control
• Recognize the role of measurement and control in industrial processes
• Compare continuous, batch, and discrete control and how they are used in industry
• Interpret measurement and control terminology
• Compare the methods and devices used in temperature, pressure, level, and flow measurement
• And more…

You will cover:
• Week 1: Pre-Exam/Module 1: Concepts of Process Control
• Week 2: Module 2: Documentation
• Week 3: Module 3 & 4: Industrial Measurement Systems (Parts I & II)
• Week 4: Module 5: Temperature Measurement (Part I)
• Week 5: Module 6: Temperature Measurement (Part II)
  Module 7: Pressure Measurement
• Week 6: Module 8 & 9: Level Measurement (Parts I & II)
• Week 7: Module 10 & 11: Flow Measurement (Parts I & II)
• Week 8: Module 12 & 13: Control Valves (Parts I & II)
• Week 9: Module 14 & 15: Feedback Control Strategies (Parts I & II)
• Week 10: Module 16: Advanced Control Strategies
• Week 11: Module 17: Smart Field Devices
  Module 18: Control System Hardware
• Week 12: Final Examination

Course details:
Course Number: FG05E
Length: 12 weeks
CEUs: 2.1 (21 PDHs)
Price: 1,680 USD ISA Member
1,890 USD Affiliate Member
2,105 USD Community Member/List
Fundamentals of Industrial Process Measurement & Control (FG05M)

On-demand modular training you can register for anytime.
You can buy the entire course or choose only the modules that meet your individualized needs, budget, and time constraints.

Choose from among 12 highly-informative modules.
Those who purchase all 12 modules will receive a 10% discount.* You have one year from date of purchase to complete the module(s).

All Modules: FG05M Full Course
Module 1: Concepts of Process Control
Module 2: Documentation
Module 3: Industrial Measurement Systems (Parts I & II)
Module 4: Temperature Measurement (Parts I & II)
Module 5: Pressure Measurement
Module 6: Level Measurement (Parts I & II)
Module 7: Flow Measurement (Parts I & II)
Module 8: Control Valves (Parts I & II)
Module 9: Feedback Control Strategies (Parts I & II)
Module 10: Advanced Control Strategies
Module 11: Smart Field Devices
Module 12: Control System Hardware

With ISA’s modular approach to online training, you’ll:
• Create your own learning experience, one relevant to your professional and personal needs
• Be able to purchase-on demand-as few or as many modules offered within a course
• Receive ISA training without the expense or time commitment of attending out-of-town classes
• Enjoy advanced, highly interactive instruction with built-in content reviews and knowledge checks
• Pause and resume training at your own schedule and pace. All instructional progress is automatically tracked and saved
• Have one year from date of purchase to complete the module(s)
• Earn CEU and PDH credits

A new flexible way to learn the fundamentals of industrial measurement and control
The new modular delivery of the (FG05M) course—is ideally suited for those looking for introductory learning in the field of automation and control. As overview instruction for technicians, engineers, and managers, the course provides the fundamental knowledge understanding and a foundation for communicating with other control systems professionals.

Course details:
Course Number: FG05M
Length: On demand
CEUs: Varies depending on the number of modules taken
Price: Varies per full course
Module: 1,080 USD ISA Member
1,350 USD Community Member/List

*10% Discount is already calculated in the full course price.
Developing & Applying Standard Instrumentation and Control Documentation (FG15E)

Dates:
- 27 March – 17 May
- 3 June – 26 July
- 9 September – 8 November
- 12 December – 24 January 2020

This course will present the methodology for designing and developing control systems documentation. The development of piping and instrument diagrams (P&IDs) and related ISA drawings are emphasized. This course covers both the development and the reading/interpreting of these documents, making it beneficial to engineers, designers, software programmers, system integrators, and technicians.

You will be able to:
- Design, develop, and interpret the documents used to define instruments and control systems for a typical project, including P&IDs, loop diagrams, specification forms, instrument lists, logic diagrams, installation details, and location plans
- Explain the information included on each document
- Plan document development as it relates to project management
- Apply ISA standards for symbols and terminology to documentation
- Describe the relationship of ISO 9000, OSHA process safety management (PSM), and API 750 to control systems documentation

You will cover:
- **P&IDs**: Definition and Use | ISA Standard Symbols and Identification | Contents and Piping Information | Design and Construction | Developing from Flow Diagrams | Scheduling Considerations | Hazardous Area Considerations
- **Instrument Lists**: Definition and Use
- **Control System Software**: PLC/DCS Functional Requirement Documentation Development
- **Logic Diagrams**: Definition and Use | Symbology | Interpretation | ISA Standards
- **Installation Details**: Use | Development | Materials of Construction | Valves | Scheduling
- **Location Plans**: Purpose and Development | Structural Considerations | Electrical and Other Trays | Panel Location
- **Instrument List**: Specification Forms | An ISA20 Specification Form
- **Loop Diagrams**: Purpose | Interpretation | Development | ISA Standards | Scheduling Considerations
- **Control Methods**: Feedback | Feedforward | Ratio | Cascade | Control Valves
- **Standards and Documentation**: ISAS.1 - ISAS.6 | ISO 9000 | OSHA | Process Safety System Management | API 750

Course details:
- **Course Number**: FG15E
- **Length**: 8 weeks
- **CEUs**: 1.4 (14 PDHs)
- **Price**: 1,440 USD ISA Member
- **Price**: 1,620 USD Affiliate Member
- **Price**: 1,800 USD Community Member/List
Using the ISA/IEC 62443 Standards to Secure Your Industrial Control System (IC32E)

Dates:
- 28 January – 22 March
- 25 March – 18 May
- 8 April – 3 June
- 15 July – 6 September
- 23 September – 15 November
- 18 November 2019 – 19 January 2020

This online, instructor-assisted course provides a detailed look at how the ANSI/ISA-62443 (formerly ANSI/ISA99) standards can be used to protect your critical control systems. It also explores the procedural and technical differences between the security for traditional IT environments and those solutions appropriate for SCADA or plant floor environments. The course also explores the move to using open standards such as Ethernet, TCP/IP, and web technologies in SCADA and process control networks and how this has begun to expose these systems to the same cyberattacks that have wreaked so much havoc on corporate information systems.

You will be able to:
- Discuss the need and importance for control system security
- Learn about current principles and best practices
- Understand the structure and content of the ANSI/ISA-62443 series of documents
- Discuss the principles behind creating an effective long-term security program
- Learn the basics of risk analysis, industrial networking, and network security
- Define the concepts of defense in depth and zones and conduits
- Learn how to apply key risk mitigation techniques such as anti-virus, patch management, firewalls, and virtual private networks

You will cover:
- Week 1: Pre-Exam/Introduction to Control Systems Security and the ANSI/ISA-62443 Standards
- Week 2: Terminology, Concepts, Models, and Metrics
- Week 3: Networking Basics
- Week 4: Network Security Basics
- Week 5: Industrial Protocols
- Week 6: Creating an ICS Security Management Program
- Week 7: Designing/Validating Secure Systems
- Week 8: Developing Secure Products and Systems/Final Course Evaluation

Course materials:
- Course Noteset and Syllabus
- ISA Text: Industrial Network Security by David J. Teumin
- ISA Standards and Technical Reports:
  - ANSI/ISA-62443-3-3 (99.03.03)-2013, Security for Industrial Automation and Control Systems Part 3-3: System Security Requirements and Security Levels

Course details:
- Course Number: IC32E
- Length: 8 weeks
- CEUs: 1.4 (14 PDHs)
- Price:
  - 1,640 USD ISA Member
  - 1,820 USD Affiliate Member
  - 2,000 USD Community Subscriber/List

Certificate Program Price:
Your course registration includes your registration for the exam (see next page)
This VILT course provides a detailed look at how the ANSI/ISA99 standards can be used to protect your critical control systems. It also explores the procedural and technical differences between the security for traditional IT environments and those solutions appropriate for SCADA or plant floor environments.

**Course details:**
- **Course Number:** IC32V
- **Length:** 4 half-days
- **Course Hours:** 1:00 p.m. – 5:00 p.m. Eastern Daylight Time (EDT)

**Dates:**
- 18 – 21 February
- 1 – 4 December
Assessing the Cybersecurity of New or Existing IACS Systems (IC33M)

Our popular cybersecurity assessment course (IC33M) is now available on-demand! Learn the skills you need to assess the cybersecurity of any Industrial Automation and Control System (IACS) anytime, anywhere!

Based on our ISA/IEC 62443, the world’s only consensus-based series of IACS Standards, our popular Assessing the Cybersecurity of New or Existing IACS Systems (IC33M) course is vitally important training in ensuring security for both new and existing IACS systems.

Comprised of six (6) instructional modules that take about 30-40 minutes to complete, course learning elements include interactive review and video lab demonstrations. You can pause and resume course training at your own schedule and pace; and you have a year from date of purchase to complete the modules.

You’ll learn the skills and knowledge necessary to:
• Organize and perform cybersecurity vulnerability and risk assessments
• Develop a cybersecurity requirements specification (CRS) document for outlining crucial cybersecurity requirements

Plus! This course starts you on the learning path to earn your certificate as an ISA Cybersecurity Risk Assessment Specialist and you can ultimately earn your Cybersecurity Expert certificate.

The IC33M Full Course Bundle includes:
Six (6) on-demand modules (Approx. 30 minutes each)
• Module 1: Preparing for an Assessment
• Module 2: Cybersecurity Vulnerability Assessment
• Module 3: Conducting Vulnerability Assessments
• Module 4: Cyber Risk Assessments
• Module 5: Conducting Cyber Risk Assessments
• Module 6: Documentation

A viewable version of ISA standards for course reference
• ISA/IEC 62443-1-1
• ISA/IEC 62443-2-1
• ISA/IEC 62443-3-3
• ISA/IEC 62443-2 (draft version)

Course details:
Course Number: IC33M
Length: Approximately 7 hours total
CEUs: .7
Price: 960 USD ISA Member
1,820 USD Non member

Exam fee ($200) for ISA/IEC 62443 Cybersecurity Risk Assessment Specialist is included with bundle
The second phase in the IACS Cybersecurity Lifecycle (defined in ISA 62443-1-1) focuses on the activities associated with the design and implementation of IACS cybersecurity countermeasures.

This involves the selection of appropriate countermeasures based upon their security level capability and the nature of the threats and vulnerabilities identified in the Assess phase. This phase also includes cybersecurity acceptance testing of the integrated solution, in order to validate countermeasures are properly implemented and that the IACS has achieved the target security level.

This course will provide students with the information and skills to select and implement cybersecurity countermeasures for a new or existing IACS in order to achieve the target security level assigned to each IACS zone or conduit.

Additionally, students will learn how to develop and execute test plans to verify that the cybersecurity of an IACS solution has properly satisfied the objectives in the cybersecurity requirements specification.

Certificate Program:
Part of the ISA/IEC 62443 Cybersecurity Certificate Program.

After successfully completing all eight modules, students may take the exam for ISA/IEC 62443 Cybersecurity Design Specialist.

The exam is included in the Full Course Bundle but must be purchased separately if modules are purchased separately.

- 10% Discount!
- Module 1: Assessment Overview
- Module 2: Conceptual Design
- Module 3: Detailed Design
- Module 4: Firewalls
- Module 5: Intrusion Detection Systems
- Module 6: System Hardening
- Module 7: Access Control
- Module 8: Cybersecurity Acceptance Testing

Course details:
Course Number: IC34M
Length: Eight modules (20-90 minutes each)
CEUs: Full Course .7
Price:
- 960 USD ISA Member
- 1,200 USD Non member
- Modules Price:
  - 150 USD ISA Member
  - 135 USD Non member

Recommended Pre-Requisite:
Previous entries in the ISA IC-Series of Cybersecurity Courses:
ISA Course IC32 and IC33/IC33M or equivalent knowledge/experience.
ISA has developed several certificate programs designed to increase knowledge and awareness of ISAs industry-vital safety and cybersecurity standards. Certificate program applicants must successfully complete the required ISA training course prior to taking the certificate exam. Those candidates who successfully pass the certificate exam will be issued an ISA digital badge and certificate specifying that they have earned that specific designation.

**ISA/IEC 62443 Cybersecurity Certificate Program**

**Certificate 1:**
ISA/IEC 62443 Cybersecurity Fundamentals Specialist
Required Course: Using the ISA/IEC 62443 Standards to Secure Your Control System (IC32) or its online equivalents (IC32E) or (IC32V).

**Certificate 2:**
ISA/IEC 62443 Cybersecurity Risk Assessment Specialist
Required Course: Assessing the Cybersecurity of New or Existing IACS Systems (IC33) or its online equivalent IC33M.
ISA/IEC 62443 Cybersecurity Fundamentals Specialist Certificate is a prerequisite.

**Certificate 3:**
ISA/IEC 62443 Cybersecurity Design Specialist
Required Course: IACS Cybersecurity Design & Implementation (IC34 or its online equivalent IC34M).
ISA/IEC 62443 Cybersecurity Fundamentals Specialist Certificate is a prerequisite.

**Certificate 4:**
ISA/IEC 62443 Cybersecurity Maintenance Specialist
Required Course: IACS Cybersecurity Operations and Maintenance (IC37).
ISA/IEC 62443 Cybersecurity Fundamentals Specialist Certificate is a prerequisite.

ISA/IEC 62443 Cybersecurity Expert
Individuals who achieve all four ISA/IEC 62443 certificates are designated as ISA/IEC 62443 Cybersecurity Experts.

Learn more about these certificate programs, eligibility criteria, renewal, and upcoming courses at www.isa.org/ISACertificatePrograms.
Industrial Data Communications Systems (TS06M)

This online, modular, interactive, computer-based training is available anytime on-demand.

Starting from the basics, this course gives you the tools to design and maintain industrial communications systems on your plant floor. You’ll learn the underlying principles behind today’s industrial communications systems, including Modbus, Data Highway Plus, Ethernet, and TCP/IP. Real-life examples and case histories provide insight into the facts behind control networks and how to apply and maintain them effectively in your plant.

You will be able to:
- Apply traditional and current serial standards, such as EIA-232, 422, 423, and 485, in industrial plant floor settings
- Explain the inner working of proprietary PLC networks
- Identify Local Area Network (LAN) topologies and protocols
- Compare media access techniques such as CSMA/CD, token passing, and master/slave
- Describe design methods for Industrial LANs using Ethernet
- Define the different Ethernet varieties and which are best for industry
- List options for Ethernet hardware to avoid instant obsolescence and being locked in the past
- Select and apply fiber optic technology
- Differentiate between different wireless and Industrial Ethernet alternatives

You will cover:
- What is Data Communications?: ISO/OSI Reference Model | Terminology Basics
- Serial Communications: Modem Principles | The EIA-232E Standard | Beyond 232: EIA-422/423/485/530 Standards
- The Analog TelCo system including circuit types and Modems
- The Digital TelCo system T1/T3 circuits, ISDN, xDSL, Frame Relay, X.25 networks, ATM and SONET
- Data Link Layer Basics: Data Encoding | Error Detection/Correction Schemes
- Industrial Protocols: Modbus and Modbus/IP, DNP3.0 and DF-1
- LAN Technologies: Overview of Ethernet Technology | Ethernet Cabling and Configuration Rules | Repeaters, Bridges, Routers, and Gateways
- TCP/IP basics | Is Ethernet Ready for the Plant Floor? | Industrial Ethernet Design Techniques
- Fiber optics: standards, cables, applications, limitations
- Wireless Industrial Communications: SP100, Wireless HART, Wireless Fieldbus, Wireless Profibus
- Inside the Proprietary PLC Networks: MB+ and DH+ LAN design
- Data Exchange using OPC for inter-system data exchanges
- Troubleshooting Industrial Networks and Fieldbuses: Five Rules for Troubleshooting | Troubleshooting with Statistics | Troubleshooting Tools

*NOTE: Once you access the course, you will have one year to access and complete the course and final exam.

TS06M Full Course Bundle includes:
- All 32 modules
- 10% Discount
- Additional Prologue module
- One Year to access modules

BEST VALUE!
Individual Modules:
Module 1: Basic Electrical Communications: Data Communications Defined
Module 2: Basic Electrical Communications: Data Communications History
Module 3: Basic Electrical Communications: OSI Model
Module 4: Basic Electrical Communications: Defining Industrial Communications
Module 5: Basic Serial Data Signaling: Electrical Signaling
Module 6: Basic Serial Data Signaling: EIA/TIA 232
Module 7: Basic Serial Data Signaling: Clocking Asynchronous Data
Module 8: Contemporary Data Communication Methods: Digital Representations of Data
Module 9: Contemporary Data Communication Methods: Error Detection and Correction
Module 10: Contemporary Data Communication Methods: Beyond EIA 232
Module 11: Wireline and Fiber-Optic Communications: Wireline Communications
Module 12: Wireline and Fiber-Optic Communications: Fiber-Optic Communication
Module 13: Industrial Protocols: ModBus RT
Module 14: Industrial Protocols: DeviceNET
Module 15: Industrial Protocols: DNP 3.0
Module 16: Local Area Networks
Module 17: Media Access Control
Module 18: Ethernet
Module 19: Ethernet Variations
Module 20: Wireless Principles
Module 21: 802.15
Module 22: Wireless WAN Technologies
Module 23: WAN Technologies
Module 24: Wide-Area Network Technologies
Module 25: Network Connections
Module 26: Ethernet LAN Components
Module 27: TCP/IP
Module 28: IPV6
Module 29: IPV6 Implementation
Module 30: Application Layer Protocols
Module 31: Industrial Network Considerations Part 1
Module 32: Network Considerations Part 2

Course details:
Course Number: TS06M
Length: 32 Modules
Full Course Bundle Price: 1,070 USD ISA Member
1,337 USD Community Member/List
Applying Instrumentation in Hazardous (Classified) Locations (ES10E)

Dates:
• 28 January – 22 March
• 13 May – 12 July
• 5 August – 27 September
• 9 September – 6 December

This self-paced, online course provides a systematic approach to specifying and implementing instrumentation in hazardous locations. Related standards from National Fire Protection Association (NFPA), National Electrical Manufacturers Association (NEMA), International Electrotechnical Commission (IEC), American Petroleum Institute (API), and ISA are discussed.

You will be able to:
• Identify process and environmental factors that determine classification
• Describe and use procedures for electrical classification
• Use applicable standards to develop classification drawings for gases, dusts, and fibers
• Describe the basic principles of protection
• And more…

You will cover:
• Week 1: Pre-Exam
  Module 1: Introduction
  Location Classification Standards
• Week 2: Module 2: Class I Division
  Zone Classification
• Week 3: Module 3: Class I Zone (Alternative)
  Class II Division Classifications
• Week 4: Module 4: Class III Division
  Zone Classification for Dusts
  Module 5: Protection Technique Standards
  Enclosure Types
• Week 5: Module 6: Explosion Proof Enclosures
  Module 7: Intrinsic Safety
• Week 6: Module 8: Non-incendive Systems
  Module 9: Pressurization & Purging
• Week 7: Module 10: Other Types of Protection
  Module 11: Maintenance Considerations
• Week 8: Final Examination

Course materials:
• Course notestet with slides from course modules and course syllabus
• ISA Standards: ANSI/ISARP12.06.01-2003, Intrinsic Safety; ANSI/ISATR12.24.01-1998 (IEC 60079-10 Mod), Class I, Zones 0, 1, and 2; ANSI/ISA12.01.01-1999, Definitions and ANSI/ISA12.12.01-2000, Non-incendive

Course details:
Course Number: ES10E
Length: 8 weeks
CEUs: 1.4 (14 PDHs)
Price: 1,440 USD ISA Member
1,620 USD Affiliate Member
1,800 USD Community Member/List
SAFETY

Safety Instrumented Systems—Design, Analysis, and Justification (EC50E)

Dates:
- 28 January – 22 March
- 25 March – 17 May
- 20 May – 19 July
- 22 July – 13 September
- 16 September – 15 November
- 20 November 2018 – 10 January 2020

This course focuses on the engineering requirements for the specification, design, analysis, and justification of safety instrumented systems (SIS) for the process industries. Students will learn how to determine safety integrity levels (SILs) and evaluate whether proposed or existing systems meet the performance requirements.

You will be able to:
- Differentiate between process control and safety control
- Implement the ISA84 standard (IEC61511)
- Evaluate process risk levels
- And more...

You will cover:
- Week 1: Pre-Exam/Intro and Background
- Week 2: Hazard, Risk Assessment, and Determining SIL
- Week 3: Layer of Protection Analysis—LOPA
- And more...

Course details:
Course Number: EC50E
Length: 8 weeks
CEUs: 3.5 (35 PDHs)
Course Price: 3,100 USD ISA Member
3,465 USD Affiliate Member
3,830 USD Community Subscriber/List

Certificate Program Price:
Your course registration includes your registration for the exam (see page 12)

4½
Four-and-a-half day, instructor-led course also available.
Visit www.isa.org/EC50
This online, on demand course is a pre-recorded video format taught by a subject matter expert that explains the changes in safety systems standard IEC 61511.

The course discusses what the changes in the standard are and how they will impact SIS design and implementation work practices moving forward. It will bring an SIS practitioner that is familiar with the 2003 version of the standard up-to-date with the current standard in the most efficient way possible.

A variety of online learning activities including flashcards, knowledge checks, pre- and post- quizzes, and a workbook/study guide are in the course.

**Key Benefits include:**
- Rapid and efficient ramp up to the current version of a standard that many people are already working with.
- Quick reference for changes between the new version of the standard and the older version.

**You will cover:**
- Overview, Scope and References
- Terms, Definitions, and Abbreviations
- Management of Functional Safety
- Safety Lifecycle and Verification
- And much more…

**Who Should Attend:**
- Participants in EC50 prior to August of 2018
- SIS Engineers
- Instrumentation and Control Engineers
- Instrumentation and Control Maintenance
- Engineering Management
- Maintenance Management

**Course Prerequisites:**
- Understanding and Experience with SIS design using the 2003 version of IEC 61511 or the 2004 version of ISA 84.00.01.
- Classroom/Laboratory Exercises:
- Pre-Instructional Survey
- Quizzes at the end of all eleven sections
- Interactive Activity
- Post-Instructional Survey

**Course details:**
**Course Number:** ESS1VID
**Length:** 6 hours
**CEUs:** .6
**Price:**
- 650 USD ISA Member
- 815 USD Non Member
**Course Hours:** On demand Video Course
ISA has developed several certificate programs designed to increase knowledge and awareness of ISAs industry-vital safety and cybersecurity standards. Certificate program applicants must successfully complete the required ISA training course prior to taking the certificate exam. Those candidates who successfully pass the certificate exam will be issued an ISA certificate specifying that they have earned that specific designation.

**ISA84 Safety Instrumented Systems Certificate Program**

**Certificate 1:**  
**ISA84 SIS Fundamentals Specialist**  
This certificate program requires the completion of the 4.5 day, instructor-led ISA training course, EC50 (or the online, instructor-assisted version, EC50E), and exam. See page 11 for EC50E course details.

**Certificate 2:**  
**ISA84 SIL Selection Specialist**  
This certificate requires the completion of the two-day, instructor-led ISA training course, EC52 and exam. ISA84 SIS Fundamentals Specialist certificate is a prerequisite.

**Certificate 3:**  
**ISA84 SIL Verification Specialist**  
This certificate requires the completion of the two-day, instructor-led ISA training course, EC54 and exam. ISA84 SIS Fundamentals Specialist certificate is a prerequisite.

**ISA84 SIS Expert**  
Individuals who earn all three ISA84 certificates are designated as ISA84 Safety Instrumented Systems (SIS) Experts.

Learn more about these certificate programs, eligibility criteria, renewal, and upcoming courses at [www.isa.org/ISACertificatePrograms](http://www.isa.org/ISACertificatePrograms).
Batch Control Systems: Using the ANSI/ISA88 Standards (IC40E)

Dates:
• 4 February – 3 May
• 6 May – 14 June
• 5 August – 20 September
• 14 November – 20 December

This course presents an approach to developing functional requirements/specifications using the models and terminology defined in the ANSI/ISA88 batch control standards. A review of the characteristics of batch manufacturing systems is included. Participants will explore the ANSI/ISA88 concept that separates the recipe from the equipment. This course includes a methodology that defines an object approach based on ANSI/ISA88 that promotes the reuse of these objects from one project to the next.

You will be able to:
• Specify the requirements for a batch control system
• Effectively structure and subdivide equipment entities
• Define procedural elements that can be effectively used with the above equipment entities
• Describe modes and states and how they are applied at the equipment level
• Develop phase logic that executes in equipment and that can deal with both normal and abnormal operations
• Recognize the various control languages that are available
• Identify the alternative architectures for programmable logic controllers (PLCs), distributed control systems (DCSs), and PC-based control systems
• Describe the interfaces that are needed between batch control and other systems within an enterprise

Course details:
Course Number: IC40E
Length: 7 Weeks
CEUs: 2.1 (21 PDHs)
Price: 1,560 USD ISA Member
        1,755 USD Affiliate Member
        1,955 USD Community Member/List
Implementing Business to MES Integration Using the ANSI/ISA95 Standards – Online (IC55E)

**Dates:**
- 4 February – 22 March
- 6 May – 21 June
- 5 August – 27 September
- 14 November – 20 December

This course introduces the fundamental concepts of the ANSI/ISA95 standards so that students can apply them to implementing an integration between plant manufacturing systems and business systems.

By understanding the object models and information flows defined in the ANSI/ISA95 standards, you will have the tools you need to specify, design, and execute a successful business to manufacturing integration project.

This course is ideal for Integration Project Managers; Manufacturing Information Systems Analysts; Information Design Engineers and IT Professionals

**You will be able to:**
- Specify the requirements for an enterprise/control integration solution
- Identify the issues involved in the integration of logistics to manufacturing control
- Identify the business processes that need information from manufacturing systems
- Identify the manufacturing control processes that need information from business systems
- Explain the business drivers involved in integration
- Identify the detailed information associated with enterprise/control integration
- Discuss the roles of UML, XML, and B2MML in vertical integration
- Apply the ISA95 object models

**You will cover:**
- **Standards and Models**
  - ANSI/ISA95 Standards | MESA International Model | WBF B2MML XML Schemas
- **Business Processes**
  - Procurement | Product Cost Accounting | Product Inventory Control | Maintenance | Production Planning and Scheduling
- **Production Processes**
  - Detailed Production Scheduling | Production Tracking | Production Resource Management | Product Definition Management
- **Information Model**
  - Production Resources | Process Segments | Product Definition and Capability | Production Schedules | Production Performance

**Lab and Classroom Exercises:**
- Identify key business drivers for integration
- Identify key business processes and objects
- Identify process segment definitions
- Develop shared product definition information

(continued)
Course Schedule/Outline:
Pre-Exam  Students are asked to take the pre-exam, which includes questions related to the subject matter areas. Answers will be provided for students to assess their knowledge, prior to beginning the course material.

- Week 1: **Module 1:** Overview and Introduction
- Week 2: **Module 2:** Domain Model
  - **Module 3:** Functions, Activities and Data Flow
- Week 3: **Module 4:** Major Object Definitions
  - **Module 5:** Operations Definitions Model
- Week 4: **Module 6:** Overview and Review
  - **Module 7:** UML and XML
- Week 5: **Module 8:** Modeling the Objects
- Week 6: **Module 9:** Models of Exchanged Information
  - **Module 10:** Implementing ISA95
- Week 7: Final Examination

Course materials:
- **Course notestet** with slides from course modules and course syllabus
- **Standards**
  - ANSI/ISA-95.00.01-2010
  - ANSI/ISA-95.00.02-2010
  - ANSI/ISA-95.00.03-2013
  - ANSI/ISA-95.00.04-2012
  - ANSI/ISA-95.00.05-2013
  - ANSI/ISA-95.00.06-2014
- **Books**
  - The Road to Integration: A Guide to Applying the ISA-95 Standard in Manufacturing, Bianca Scholten
  - Design Patterns for Flexible Manufacturing, Dennis Brandl

Course details:
- **Course Number:** IC55E
- **Length:** 7 weeks
- **CEUs:** 1.4 (14 PDHs)
- **Price:**
  - 1,440 USD ISA Member
  - 1,620 USD Affiliate Member
  - 1,800 USD Community Member/List
Certified Control Systems Technician® (CCST®) Level I Online Exam Review Course (TS00E)

Dates:  
• 18 February – 3 May  
• 20 May – 9 August  
• 12 August – 1 November

This course is a fast-paced review of the knowledge and practical skills necessary to install and maintain standard measurement and control instrumentation. It is intended for practicing technicians preparing for the ISA Certified Control Systems Technician® (CCST®) Level I exam. Practice certification-type exams and an explanation of the examination process are provided.

You will be able to:
• Cite principles and theory that explain measurement and control instrument functions
• Describe procedures required to properly maintain the function of measurement and control instrumentation
• Identify the procedures and safety requirements for loop checking and its purpose
• Perform calculations and other analyses of information related to the calibration and troubleshooting of measurement and control instruments and systems
• Describe procedures required to safely start-up and shut-down a new or existing process
• Define the education, experience, and examination requirements for becoming a CCST
• Identify important knowledge and skill requirements of a practicing CCST
• Describe the procedures involved in taking the CCST Level I exam
• Identify any need for further study or training in specific knowledge areas
• Complete simulated CCST Level I practice exams

You will cover:
• Week/Module 1: Overview of CCST certification/concepts of process control
• Week/Module 2: Domain 1—Calibration, maintenance, repair and troubleshooting
• Week/Module 3: Domain 1—Calibration, maintenance, repair and troubleshooting (cont’d)
• Week/Module 4: Domain 1—Calibration, maintenance, repair and troubleshooting (cont’d)
• Week/Module 5: Domain 2—Project start-up, commissioning, loop-checking, project organization and planning
• Week/Module 6: Domain 2—Project start-up, commissioning, loop-checking, project organization and planning (cont’d)
• Week/Module 7: Domain 2—Project start-up, commissioning, loop-checking, project organization and planning (cont’d)
• Week/Module 8: Domain 3—Documentation
• Week/Module 9: Domain 3—Documentation (cont’d)
• Week/Module 10: Domain 3—Documentation (cont’d)
• Week/Module 11: Final Examination

Course materials (included with registration):
• Course Noteset and Syllabus
• ISA Text: CCST® Study Guide Level I—A $39 Value!

Course details:
Course Number: TS00E
Length: 11 weeks
CEUs: 2.1 (21 PDHs)
Price:  
• 2,380 USD ISA Member
• 2,680 USD Affiliate Member
• 2,980 USD Community Member/List

Four-day, instructor-led course also available. Visit www.isa.org/TS00course.

Learn more about ISA CCST® certification at www.isa.org/CCST

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Certified Control Systems Technician® (CCST®) Level II Online Exam Review Course (TS02E)

Dates:
• 4 February – 3 May
• 1 April – 28 June
• 8 July – 20 September
• 23 September – 20 December

This is a fast-paced review of the knowledge and skills necessary for technicians with 7+ years of practical experience who are preparing to sit for the CCST® Level II exam. An explanation of the requirements, examination process and practice certification-type exams are provided.

You will be able to:
• Explain multi-step troubleshooting methodology
• Evaluate control systems tuning and system response to changes in control parameters
• Describe the isolation of a process component from an operational system to perform proper testing, maintenance, or troubleshooting
• Evaluate installed industrial network data and performance using network diagnostic tools
• Explain the process to identify and correct problems that may arise during the commissioning of control systems
• Verify final control element functionality through manipulated variables using controller mode and output functions
• Define system documentation and symbology to effectively troubleshoot instrumentation, control loops, and electrical and pneumatic installations
• Identify electrical or hazard area classifications and determine appropriate procedures to be followed for safe and effective operation
• Identify any need for further study or training in specific knowledge areas

You will cover:
• Concepts of Process Control | Instrument Air
• Piping & Instrumentation Diagrams (P&ID) | Basic Measuring Units
• Fundamentals of Instrumentation
• Temperature | Pressure | Flow | Level
• Analyzers | Final Control Elements
• Safety | Electricity
• Advancing Technologies | Numbering Systems
• PLC Basics | Basic Requirements for Protocol
• Fieldbus | Communications Protocol
• Fiber Optics | SCADA
• Process Dynamics | Control Action
• PID | Tuning | Advanced Control Strategy
• Calibration | Instrument Performance
• Pressure Test & Calibration Equipment | Instrument Maintenance
• Best Procedures for LANs | Troubleshooting with Statistics | Tools
• DCS Troubleshooting | Hazardous Locations
• Installation | Start-Up | Loop Checking

Classroom/Laboratory Exercises:
• ISA CCST Level II practice exams
• ISA Text: CCST® Study Guide Level II—A $39 Value!

Course details:
Course Number:  TS02E
Length:  13 weeks
CEUs:  2.8 (28 PDHs)
Price:  2,380 USD ISA Member
        2,680 USD Affiliate Member
        2,980 USD Community Member/List
CERTIFICATION

Certified Control System Technician® (CCST®) Level III Online Exam Review Course (TS03E)

Dates:
• 4 March – 14 June
• 17 June – 27 September
• 16 September – 20 December
• 2 December 2018 – 31 March 2020

This online course reviews the knowledge and skills areas included on the Certified Control Systems Technician® (CCST®) Level III certification examination. The intent is to prepare an automation professional who meets the exam criteria to take the exam. The content is based on the latest Job Analysis Domains, Tasks, Knowledge Areas, and Skill Areas developed, and regularly reviewed and updated, as the basis for the CCST certification exams.

You will be able to:
• Define the scope and format of the CCST Level III exam
• Compare process variable measurements and control valve selections
• Discuss how the various types of control technologies are used in industrial automation, including process control from basic to advanced control and discrete, batch, motor, and motion control
• Determine the requirement for tuning and discuss tuning procedures
• Identify the range of digital communications used in automation and how these are used in system integration
• Explain when safety instrumented systems (SISs) are needed and how they are specified
• Apply the critical areas of regulatory procedures and project documentation
• Interpret the best practice methodology for troubleshooting automation projects

You will cover:
• Week 1: Pre-Exam/Review of Process Control Concepts
• Week 2: Documentation—Part 1
• Week 3: Documentation—Part 2
• Week 4: Industrial Measurement and Instrument Performance
• Week 5: Calibration Principles and Procedures
• Week 6: Fundamentals of Instruments—Part 1
• Week 7: Fundamentals of Instruments—Part 2 | Final Control Elements
• Week 8: Troubleshooting | Common Loop Checking Problems
• Week 9: Feedback and Advanced Control Strategies | Loop Check Concepts
• Week 10: Programmable Electronic Systems | Fieldbus | Start-up Concerns
• Week 11: Installation in Hazardous Areas | Tuning Methods
• Week 12: Instrument Maintenance
• Week 13: Installation Practices
• Week 14: Project Management | Safety Standards | Cybersecurity
• Week 15: Final Course Examination

Course materials:
• Course notset with slides from course modules and course syllabus
• ISA Text: CCST® Level III Study Guide—A $39 Value!

Course details:
Course Number: TS03E
Length: 15 weeks
CEUs: 2.1 (21 PDHs)
Price:
• 2,380 USD ISA Member
• 2,680 USD Affiliate Member
• 2,980 USD Community Member/List

Learn more about ISA CCST® certification at www.isa.org/CCST

Four-day, instructor-led course also available. Visit www.isa.org/TS03course.
Certified Automation Professional® (CAP®) Online Exam Review Course (EC00E)

Dates:  
- 4 February – 3 May
- 6 May – 2 August
- 5 August – 1 November
- 30 September – 27 December
- 11 November 2018 – 7 February 2020

This online course reviews the knowledge and skill areas included on the CAP® certification examination. The intent is to prepare an automation professional who meets the exam criteria to take the exam. The content is based on the Job Analysis Domains, Tasks, Knowledge Areas, and Skill Areas developed as the basis for the CAP® certification exam.

You will be able to:
- Define the scope and format of the CAP® exam
- Compare process variable measurements and control valve selections
- Discuss how the various types of control technologies are used in industrial automation, including process control from basic to advanced, discrete, batch, motor, and motion control
- Identify the range of digital communications used in automation and how these are used in system integration
- Explain when safety instrumented systems (SIS) are needed and how they are specified
- Recognize the importance of electrical issues that relate to grounding and noise
- Apply the critical areas of automation opportunity identification and project justification
- Interpret the best practice methodology for automation project execution

You will cover:
- Week 1: Pre-Exam | Introduction | CAP Basics
- Week 2: Process Instrumentation | Analytical Instrumentation
- Week 3: Continuous Control | Control Valves and Analog Communications
- Week 4: Control System Documentation and Equipment
- Week 5: Discrete I/O Devices and General Manufacturing Measurements | Motor & Drive Control
- Week 6: Motion Control | Process Modeling and Advanced Process Control
- Week 7: Batch Control | Alarm Management and Reliability
- Week 8: Safety Instrumented Systems | Electrical Installations
- Week 9: Digital Communications | Industrial Networks
- Week 10: MES Integration and Network Security | Operator Interface | Data Management
- Week 11: Software | Operator Training | Checkout, System Testing, and Startup
- Week 12: Troubleshooting | Project Management | Interpersonal Skills
- Week 13: Final Course Examination

Course materials:
- Course noteset with slides from course modules and course syllabus

Course details:
- Course Number: EC00E
- Length: 13 weeks
- CEUs: 2.1 (21 PDHs)
- Price: 1,680 USD ISA Member
  1,890 USD Affiliate Member
  2,105 USD Community Member/List

Learn more about ISA CAP® certification at www.isa.org/CAP

Three-day, instructor-led course also available. Visit www.isa.org/EC00course.
Certified Automation Professional® (CAP®) Exam Review Course (EC00V)

Dates:  • 16, 17, 18 & 23, 24, 25 July

This Virtual Instructor-Led Training (VILT) course reviews the knowledge and skills areas included on the CAP examination. The content is based on the Job Analysis Domains, Tasks, Knowledge Areas, and Skill Areas developed as the basis for the CAP certification exam.

New VILT Delivery!
This VILT course is taught remotely via live interactive webinar by our experienced instructors in short sessions over several days.

Take the CAP Exam for free!
Take this review course and schedule an electronic CAP exam on the date and at the location of your choosing—at no additional fee! The exam fee will be waived ONLY if you attend the review course AND you meet the CAP qualifications.

You will cover:
- **Field Devices**
  - Pressure, Level, Temperature, and Flow Measurement | Analytical Measurement | Discrete Field Devices | Control Valves | Communication Concepts
- **Control and Simulation**
  - Response and Loop Characteristics | PID Control | Advanced Regulatory Control | Multi-variable Control | Distributed Control System | Control Strategy Design Steps | Documentation | Batch Control | Discrete Control | Drive Control | Motion Control
- **Operator Interface and Alarm Management**
  - Human Machine Interface (HMI) | Historical Data
- **Integration**
  - Communications | Manufacturing Execution System (MES) | Network Security
- **Safety, Reliability, and Electrical**
  - Safety Instrumented Systems (SIS) | Hazardous Area Classification | Protection Techniques | Intrinsic Safety | Pressurized Enclosures | Grounding, Shielding, and Interference
- **Maintenance Management**
  - General Maintenance Activities | Maintenance Repair and Improvement | Computerized Maintenance Management | Maintenance Execution Responsibilities
- **Workflow and Project Leadership**
  - Opportunity Identification and Project Justification | Communications and Team Processes

Course Resources (included with registration):

Recommended Resource:

Course details:
Course Number:  EC00V
Length:  6 half-days (Tuesday, Wednesday, and Thursday) over a two-week time period
Course Hours:  1:00 p.m. – 5:00 p.m. Eastern Daylight Time (EDT)
Price:  1,680 USD ISA Member
        1,890 USD Affiliate Member
        2,105 USD Community Member/List
Control Systems Engineer (CSE) PE Online Exam Review Course (EN00E)

Dates:  
• 1 April – 21 June  
• 24 June – 14 September

This online course reviews the knowledge and skills areas that are included on the Control Systems Engineer (CSE) Professional Engineer (PE) examination produced by the National Council of Examiners for Engineering and Surveying (NCEES) and administered by US state professional license boards each October. The intent of the class is to prepare an engineer with four or more years of experience to take the exam by providing instruction in the broad range of technical areas that will be tested.

You will be able to:  
• Follow the guidelines for taking the CSE exam  
• Identify the breadth of the knowledge and skills areas covered  
• Apply recognized standards for symbols and documents  
• Recognize the basic calculation techniques for measurement devices  
• Apply process variable measurements and sensor selection  
• Compare the various final control elements/valves  
• Explain basic process control loops: their configuration, operation, and performance  
• Follow discrete logic in motor and interlock control  
• Describe various signal conversion and wiring arrangements  
• Compare various installation methods and techniques  
• Determine material requirements from physical parameters  
• Use safety instrumented basics  
• Interpret system scope statements and apply to design needs

You will cover:  
• Week 1: Pre-Exam | CSE Professional Engineer Overview | Control Systems Concepts  
• Week 2: Sensor Characteristics | Pressure Measurement  
• Week 3: Level Measurement | Temperature Measurement  
• Week 4: Flow Measurement  
• Week 5: Signals and Transmission | Smart Transmitters | Wiring Considerations  
• Week 6: Control Valves: Types, Characteristics, Sizing, Calculations, Selection, and Installation  
• Week 7: Pressure Relief Devices | Variable Speed Drives | System Documentation  
• Week 8: Control Types and Characteristics  
• Week 9: Sample Loop Problems | Control Loop Tuning  
• Week 10: Control Room: Ergonomics, System Architecture, Configuration, and Programming  
• Week 11: Safety Instrumented Systems | Code Application (ISA, ANSI, NEC, NFPA)  
• Week 12: Final Course Examination

Course materials:  
• Course noteshet with slides from course modules and course syllabus  

Course details:  
Course Number: EN00E  
Length: 12 weeks  
CEUs: 2.1 (21 PDHs)  
Price:  
• 1,680 USD ISA Member  
• 1,890 USD Affiliate Member  
• 2,105 USD Community Member/List

Three-day, instructor-led course also available. Visit www.isa.org/EN00course.
Control Systems Engineering (CSE) PE Exam Review Course (EN00V)

Dates: 23, 25, 27 & 30 September & 2, 4 October

This Virtual Instructor-led Training (VILT) course reviews the knowledge and skills areas that are included on the Control Systems Engineer (CSE) Professional Engineer (PE) examination produced by the National Council of Examiners for Engineering and Surveying (NCEES) and administered by US state professional license boards each October. The content is based on the CSE Exam Specification that went into effect in October 2011.

New VILT Delivery!
This VILT course is taught remotely via live interactive webinar by our experienced instructors in short sessions over several days.

You will cover:
- **Sensors Technologies Applicable to Various Measurements (Process Variables)**
  - Sensor Types | Calibration Ranges | Linearity | Hysteresis | Repeatability | Elevated and Suppressed Zero Ranges
- **Calculations Involved In Process Measurements**
  - Flow | Pressure | Level | Temperature
- **Final Control Elements**
  - Valve Types and Styles | Flow Characteristics | Applications | Sizing | Safety Relief Valves
- **Fluid Properties**
  - Specific Gravity | Pressure and Temperature Conversion | Reynolds Number
- **Signal Types and Transmission Methods**
  - Electronic | Pneumatic | Signal Circuit Design (Type, Grounding, Shielding, and Installation)
- **Control Systems**
  - Loop Tuning Methods | Distributed Control Systems | Ergonomics | Human Machine Interface (HMI) and Graphics | Programming (Ladder Logic, Sequential, Function Block)
- **Safety Systems**
  - Reliability of Devices | Risk Reduction Factors | Probability of Failure on Demand
- **Codes, Standards, and Regulations**
  - Applications and Use | Intrinsic Safety | Hazardous Area Classification

Recommended Prerequisites:
- Basic experience and background in control systems engineering
- Successful completion of the Fundamentals of Engineering Exam

Course Resources (included with registration):

Course details:
- **Course Number:** EN00V
- **Length:** 6 half-days (Tuesday, Wednesday, and Thursday) over a two-week time period
- **Course Hours:** 1:00 p.m. – 5:00 p.m. Eastern Daylight Time (EDT)
- **Price:**
  - 1,680 USD ISA Member
  - 1,890 USD Affiliate Member
  - 2,105 USD Community Member/List
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101 Tips for a Successful Automation Career  
Greg McMillan and Hunter Vegas

Advanced Control Foundation: Tools, Techniques, and Applications  
Terrence Blevins, Willy K. Wojsznis, and Mark Nixon

Advanced Temperature Measurement and Control, Second Edition  
Gregory K. McMillian

Applying S88: Batch Control from a User’s Perspective  
Jim Parshall and Larry Lamb

Automation Made Easy: Everything You Wanted to Know about Automation—And Need to Ask  
Peter G. Martin, PhD, and Gregory Hale

Dick Caro

Basic Electricity and Electronics for Control: Fundamentals and Applications, Third Edition  
Lawrence (Larry) M. Thompson

Boiler Control Systems Engineering, Second Edition  
G. F. (Jerry) Gilman

Bottom-Line Automation, Second Edition  
Peter G. Martin, PhD

Calibration: A Technician’s Guide  
Mike Cable

Collaborative Process Automation Systems  
Martin Hollender

Condensed Handbook of Measurement and Control, Third Edition  
N. E. Battikha

Control Loop Foundation—Batch and Continuous Processes  
Terrence Blevins and Mark Nixon  
(A Chinese translation of this book is available in ePub or Mobi format.)

ISA

Bryon Lewis, PE, CMfgE, CNNA

Control Valve Primer, Fourth Edition  
Hans D. Baumann

Foundation Fieldbus, Fourth Edition  
Ian Verhappen and Augusto Pereira

Fundamentals of Process Control Theory, Third Edition  
P. W. Murrill

Future Energy: Opportunities and Challenges  
Thomas W. Kerlin, PhD

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Charlie Gifford, Editor and Contributing Author

How to File Your Own U.S. Patent Application
Hans D. Baumann

Human-Machine Interface Design for Process Control Applications
Jean-Yves Fiset

IEC 61499 Function Blocks for Embedded and Distributed Control Systems Design, Third Edition
Valeriy Vyatkin

Industrial Automation and Control Systems Security Principles
Ronald Krutz, PhD

Industrial Data Communications, Fifth Edition
Lawrence (Larry) M. Thompson and Tim Shaw

Industrial Network Security, Second Edition
David Teumim

ISA Handbook of Measurement, Equations and Tables, Second Edition
Jim Strothman

Measurement and Control Basics, Fifth Edition
Thomas A. Hughes

MES Guide for Executives: Why and How to Select, Implement, and Maintain a Manufacturing Execution System
Bianca Scholten

Practical Project Management: Learning to Manage the Professional, Second Edition
Gerald W. Cockrell

Preventive Maintenance, Third Edition
J. D. Patton

Safety Instrumented Systems Verification—Practical Probabilistic Calculations
William M. Goble and Harry Cheddle

SCADA: Supervisory and Control Data Acquisition, Fourth Edition
Stuart Boyer

Sell More Through Effective Technical Presentations, Second Edition
Paul Gruhn

Michael D. Whitt

The MOM Chronicles: ISA-95 Best Practices Book 3.0
Charlie Gifford, Editor and Contributing Author

The Tao of Measurement: A Philosophical View of Flow and Sensors
Jesse Yoder and Dick Morley

The Road to Integration: A Guide to Applying the ISA-95 Standard in Manufacturing
Bianca Scholten

William L. Mostia Jr., PE

When World’s Collide in Manufacturing Operation: ISA Best Practices Book 2.0
Charlie Gifford, Editor and Contributing Author

Wireless Control Foundation: Continuous and Discrete for the Process Industry
Terrence Blevins, Deji Chen, Mark Nixon, and Willy Wojsznis

Wireless Networks for Industrial Automation, Fourth Edition
Dick Caro
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