



Consulting and Training | Reach New Heights

Course Name

Industrial Communication & Smart Instrumentation

Sector Name

Instrumentation & Controls

Document Type

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Industrial Communication & Smart Instrumentation

Course Introduction

Industrial instrumentation is no longer limited to transmitting a single measurement value from the field to the control system. Smart instruments can provide device status, configuration information, diagnostic data, and additional process variables alongside the primary measurement. To use these capabilities effectively, instrumentation and control professionals need to understand how field devices communicate, how information moves across industrial networks, and how communication problems can affect measurement and control performance.

Boost Consulting & Training offers this course to develop practical capability in industrial communication and smart instrumentation. Participants explore communication principles, HART-enabled devices, field communication technologies, industrial Ethernet concepts, device configuration, digital diagnostics, network behavior, and communication troubleshooting. Practical activities focus on interpreting device information and tracing communication problems between smart field instruments and control systems.

The **main concept of this course** is to move beyond treating instruments as isolated measurement devices and use their communication and diagnostic capabilities as connected sources of process and equipment intelligence.

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Industrial Communication & Smart Instrumentation

Target Audience

- ✓ Instrumentation and control engineers
- ✓ Automation and control system engineers
- ✓ Instrument and communication specialists
- ✓ Engineers responsible for smart field devices and industrial control connectivity

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Industrial Communication & Smart Instrumentation

Learning Objectives

- ✓ Explain the role of industrial communication within modern instrumentation systems.
- ✓ Distinguish conventional instrument signals from digital and smart-device communication.
- ✓ Interpret essential communication concepts used in industrial environments.
- ✓ Explain the application of HART and common field communication technologies.
- ✓ Configure and interpret information available from smart field instruments.
- ✓ Use device diagnostics to support instrumentation monitoring and troubleshooting.
- ✓ Diagnoses common communication, configuration, and connectivity problems.
- ✓ Evaluate the effective integration of smart instruments with industrial control systems.

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Industrial Communication & Smart Instrumentation

Course Outline

✓ DAY 01

Moving from Conventional to Smart Instrumentation

Understanding Instrument Communication

- ✓ Compare traditional analog signal transmission with digital communication capabilities.
- ✓ Identify the additional information available from intelligent field devices.
- ✓ Trace measurement, status, configuration, and diagnostic information from field instruments to control system.

Understanding Smart Instrument Architecture

- ✓ Examine sensing, processing, communication, configuration, and diagnostic functions within smart devices.
- ✓ Distinguish primary process values from secondary variables and device information.
- ✓ Complete a Smart Instrument Information Mapping Exercise for an industrial measurement application.

Industrial Communication & Smart Instrumentation

Course Outline

✓ DAY 02

Understanding Industrial Communication

Reading Communication Fundamentals

- ✓ Understand addressing, data transmission, communication speed, update rates, and network relationships.
- ✓ Distinguish point-to-point, multidrop, and networked communication arrangements.
- ✓ Recognize factors influencing communication reliability and availability.

Exploring Field Communication Technologies

- ✓ Examine the role of HART and other commonly applied industrial field communication approaches.
- ✓ Compare how different technologies carry process and device information.
- ✓ Complete a Communication Technology Selection Exercise for contrasting field applications.

Industrial Communication & Smart Instrumentation

Course Outline

✓ DAY 03

Working with Smart Field Devices

Configuring Intelligent Instruments

- ✓ Access device range, engineering units, damping, identification, and application parameters.
- ✓ Verify that device configuration matches process and control-system requirements.
- ✓ Recognize configuration errors that can produce apparently valid but incorrect measurements.

Using Device Diagnostics

- ✓ Interpret device status, health information, warnings, and diagnostic indicators.
- ✓ Distinguish process-related conditions from internal device and communication problems.
- ✓ Conduct a Smart Device Diagnostic Challenge using measurement and device-health information.

Industrial Communication & Smart Instrumentation

Course Outline

✓ DAY 04

Connecting Field Information with Control Systems

Integrating Smart Instrument Data

- ✓ Map process variables, device status, and diagnostic information into control and monitoring environments.
- ✓ Maintain consistency between field-device configuration and control-system data.
- ✓ Identify where information can be lost or incorrectly interpreted across the interface.

Understanding Industrial Ethernet Connectivity

- ✓ Examine essential Ethernet concepts relevant to industrial control environments.
- ✓ Recognize the role of switches, network segments, addressing, and communication paths.
- ✓ Build a Field-to-Control Connectivity Map showing how instrument information reaches operational systems.

Industrial Communication & Smart Instrumentation

Course Outline

✓ DAY 05

Diagnosing Communication and Device Problems

Troubleshooting Field Communication

- ✓ Investigate missing devices, intermittent communication, incorrect values, and unavailable diagnostic information.
- ✓ Trace faults through device configuration, wiring, communication interfaces, addressing, and control-system settings.
- ✓ Distinguish communication failures from actual instrument or process problems.

Using Connected Instrumentation Effectively

- ✓ Combine measurement values, device health, diagnostics, and communication status when assessing instrument performance.
- ✓ Identify how smart-device information can support faster troubleshooting and better maintenance decisions.
- ✓ Complete an Industrial Communication & Smart Instrumentation Case from device configuration and connectivity through diagnostic interpretation, fault isolation, and final communication verification.

Industrial Communication & Smart Instrumentation

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Oct. 11, 2027	Oct. 15, 2027	5 days	4250.00 \$	UAE , Abu Dhabi
May 2, 2027	May 6, 2027	5 days	4250.00 \$	KSA , Riyadh
July 5, 2027	July 9, 2027	5 days	4250.00 \$	UAE , Dubai
Jan. 25, 2027	Jan. 29, 2027	5 days	4950.00 \$	Hungary , Budapest

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