

## I&C Advanced

This ten-day course begins with a review of process measurement fundamentals followed by a review of the measurement means: pressure, temperature, flow, and level. Next, process control systems are explained. The final portion of the course instructs the fundamentals of calibration and programmable logic controllers.

### I. Process Measurement Fundamentals

- Fundamentals of Measurement for PID Loops

### II. Pressure Measurement

- Pressure
- Basic Troubleshooting
- Pressure Measurement Devices
- Troubleshooting Help for Pressure Transmitters
- Common Conversions

### III. Temperature Measurement

- The Basics of Temperature Measurement
- Temperature Measurement Devices
- Troubleshooting Help for Temperature Transmitters

### IV. Flow Measurement

- Units of Flow
- Physical Properties of Fluids
- Basic Flow Measurement Devices
- Primary Elements
- Secondary Elements
- Troubleshooting Help for Flow Transmitters
- Example IE Problem

### V. Level Measurement

- Methods of Level Measurement
- Troubleshooting Help for Level Transmitters

### VI. Process Control Systems

- Process Control Systems
- Modes of Control
- Control Loop Tuning
- Cabling
- Pneumatic Instruments
- Pneumatic Controllers

### VII. Calibration Techniques

- Review of Instrument Loops
- Smart Transmitter Overview
- Rosemount Smart Transmitter
- Rosemount Pressure Transmitter
- Rosemount 3144 Temperature Transmitter

### VIII. Programmable Logic Controllers

- PLC Construction
- Special Considerations for Power SCR's & Triacs
- Heat Sinking of Power SCR's and Triacs
- Special Considerations for Water Cooled SCR's and Triacs
- Testing, Troubleshooting, and Repair of SCR and Triac Circuits
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