IC 102

● ● ○ Intermediate 45 hours 3 modules · 21 lessons

Signals, Final Control Elements & Process Control

Wiring and signal integrity, valves and drives that act on the process, and the PID control that ties it together.

45	3	21	3,000	105	9
HOURS OF TRAINING	MODULES	LESSONS	STUDY CARDS	SCENARIOS	3D SIMULATORS

COURSE OBJECTIVES

By the end of this course you will be able to:

1. Wire analog and discrete signals correctly and find the fault in a failed 4–20 mA loop.
2. Apply separation, twisting, shielding and single-point grounding to keep noise out.
3. Recognize ground-loop errors and use isolators appropriately.
4. Set up and troubleshoot control valves, positioners and VFDs as final control elements.
5. Explain proportional, integral and derivative action and tune loops with step tests.
6. Implement flow-paced chemical feed with residual trim and cascade/ratio schemes.
7. Document and verify loop performance.

WHAT YOU WILL LEARN

Signal integrity
Wiring, shielding, grounding and isolation.

Loop checks
Finding opens, shorts, leaks and low-supply faults with a meter.

Control valves
Positioners, characteristics, sizing and fail position.

Drives as final elements
VFD speed reference, feedback and limits.

PID control
Tuning methods, windup, interactions and disturbance response.

Advanced schemes
Ratio, cascade and feed-forward for chemical dosing.

MAJOR TOPICS COVERED

Module 5	Signals, Wiring, Grounding & Loop Integrity	7 lessons
Module 6	Final Control Elements	7 lessons
Module 7	Process Control & PID Tuning	7 lessons

COURSE HIGHLIGHTS

- **45 hours** of structured, self-paced instruction with active-time tracking.
- **9 interactive 3D simulators** — rotate, explode and cut away real equipment, then change the controls and watch the numbers respond.
- **105 field scenarios** with background, decision points and worked answers.
- **3,000 study cards**, 21 printable checklists and hands-on calculators.
- **Module quizzes** and a completion certificate with a verification code.

WHO IT'S FOR

I&C technicians and electricians who wire, calibrate and tune control loops.

BEFORE YOU START

IC 101 recommended; ELEC 101 helpful for safety.

WHERE TO NEXT

IC 103 — PLCs, SCADA, OT Cybersecurity & Commissioning

Start learning Create a free account at tryetech.com, open **Instrumentation & Controls** and begin with Module 5.