ControlSoft
ADVANCED PROCESS CONTROL MADE EASY

Open Enrollment Training

PID Loop Tuning & Advanced Process Control Techniques

Overview

Designed for engineers and technicians, courses cover fundamentals of process control as well as advanced process control techniques using our award-winning control solutions. Learn how to:

- Increase operational efficiency with existing assets
- Maintain safe regulatory control environments
- Mitigate risk of unscheduled downtime
- Reduce operational costs and Increase profitability
- Extend hardware asset lifespans
- Improve product consistency

This is universal PID loop tuning and process control training. The skills you learn will benefit you regardless of your control system. Our software is used for hands-on exercises in class, but this is not product training.

Course Options

Our modular courses enable you to acquire new skills or deepen specific skills while providing the flexibility to meet your specific needs. We offer the following modules:

- PID Controller Tuning
- Advanced Process Control Techniques
- Model-based Control Techniques «Add-on»
- Power Gen & Boiler Tuning «Add-on»

You can register for the course as follows:

- PID
- PID and APC
- PID and APC plus MBC or Power Gen & Boiler Tuning

Virtual Interactive  OR  In-person Interactive

See **controlsoftinc.com/training/** for our current schedule.

ControlSoft

- 38 years in business (since 1985)
- Expert team of PhDs and advanced degree engineers, with 20-30 years field experience in plants worldwide
- Numerous patents and multiple industry awards for technology, service and growth over the past three decades

ControlSoft 38 YEARS OF EXCELLENCE 1985-2023

Private Training

Private training is the perfect option for organizations that need a cost-effective way to train eight or more employees all at once. Help your team become more productive by scheduling ControlSoft to train your team. Courses are delivered to your employees, on location or virtually, at your convenience. Each course is designed to meet your needs, and can be customized to include application-specific content if desired.

(440) 443-3900 | training@controlsoftinc.com

Course Content

PID Controller Tuning (Length: 7.5 hours)

Prerequisite: None

Learn the fundamentals of PID control, its variations, and things that are important to know in evaluating the health and tuning of PID loops, as well as how to tune a PID controller.

Topics

1. Understanding Process Modeling and Control
2. Fundamentals of PID Control
3. Control and Tuning Objectives
4. Tuning Techniques and Practices
5. Industrial PID Equation Types
6. Adaptive Tuning and Advanced Topics

Applications

- Temperature
- Pressure
- Flow
- Level
- Speed
- Position
- Composition
- High-order Process

Advanced Process Control Techniques (Length: 7.5 hours)

Prerequisite: PID Controller Tuning

Learn the best practices and techniques for process control strategies beyond PID control, as well as design, tuning, and common implementation pitfalls.

Topics

1. Enhanced PID Control: Anti-reset Windup, Tracking mode, Bumpless transfer
2. Cascade Control
3. Feedforward Control
4. Split Range Control
5. Gain Scheduling and Multiple PID
6. Override Control

Applications

- Controlling Non-linear Process
- Reducing Impact of Disturbances
- Speed
- Position
- Composition
- High-order Process

Model-based Control Techniques (Length: 7.5 hours)

Prerequisite: PID Controller Tuning & APC Techniques

Learn about model-based control theory and practice, including the design, tuning, and evaluation of applications best suited for model-based control.

Topics

1. Model Based Control Overview
2. Smith Predictor
3. Internal Model Control (IMC)
4. Coordinated Control (CC)
5. Modular Multivariable Control (MMC)
6. Predictive Control

Applications

- Long Deadtime Processes
- Multi-Output Control
- Control of Interacting Processes

Power Gen & Boiler Tuning (Length: 15 hours)

Prerequisite: PID Controller Tuning & APC Techniques

Learn about critical boiler control loops and control methods, as well as design, tuning, and common implementation pitfalls that often make proper boiler tuning so challenging.

Topics

1. Boiler Control
2. Load Demand Control
3. Boiler-Following Mode
4. Turbine-Following Mode
5. Coordinated Control
6. Main Boiler Control Loops
7. Trim Control Principles and Uses
8. Function Generators Characterization
9. SH/RH Steam Temperature Control
10. Feedwater Flow Control
11. Drum Level Control
12. Pollution Controls (NOx, SOx, Opacity)
13. SCR Ammonia Injection / NOx Emission Control Tuning
14. Combustion Control
15. Fuel Flow Control
16. Air Flow Control
17. Excess O2 Control
18. Furnace Pressure Control
19. Unit Master (MW and Throttle Pressure) Control Processes

www.controlsoftinc.com
(440) 443-3900 | info@controlsoftinc.com

SOFTWARE **CUSTOM SOLUTIONS** **TRAINING**

PUBLICATION **TRN126C-EN**

COPYRIGHT © 2023 CONTROLSOFT INC. ALL RIGHTS RESERVED.