

PID LOOP TUNING & ADVANCED PROCESS CONTROL STRATEGY TRAINING

Practical and fundamental training to help you:

- Identify and solve process control problems
- Tighten process control
- Improve product quality
- Reduce energy usage
- Increase profitability

Seattle, WA - March 1-2, 2017
Philadelphia, PA - March 22-23, 2017

Designed for engineers and technicians, classes will cover basic terminology and building blocks of process control as well as fundamentals and advanced process control techniques using our fully automated, award-winning control solutions.

This is universal PID loop tuning and advanced strategy training. The skills you learn will benefit you regardless of your control system. Software is used for simulation exercises during class, but this is NOT product training.

ControlSoft Inc. was founded in 1985 by distinguished professors and graduate students from Case Western Reserve University, whose systems and control engineering program is consistently ranked among the best in the world. This strong relationship with one of the nation's most outstanding research institutions has provided ControlSoft with some of the best national and international experts in the field of process control automation.

LEARN FROM THE EXPERTS IN PROCESS CONTROL

CONTROLSOFT
ADVANCED PROCESS CONTROL MADE EASY

Who Should Attend?

Engineers, technicians, and operators who have the responsibility for building or maintaining a process and/or need to set up, use, evaluate, or tune PID loops, complex control strategies, or advanced controls.

ControlSoft holds seminars throughout the country and also does onsite training for groups. We would be delighted to reserve space for you in any of these locations or offer your group an onsite quote.

Fill out the application form to register for training. Class runs from 8:30 a.m. to 5:30 p.m. each day.

ControlSoft uses software to simulate loop tuning and advanced process control; each student does hands-on exercises to practice the techniques in real-time situations.

- Instructor uses both PowerPoint presentations and real process simulation during these training classes.
- This is not product training; the skills you learn will benefit you regardless of your control system.

Please call 440-443-3900 to discuss your training needs.

Thank you!

ControlSoft Training Coordinator
training@controlsoftinc.com

Special Bonus

Each student will have the opportunity to work with the same software tool that the instructor will be using to develop, test, and simulate the applications.

Cost: \$2,250 per student

SESSION DETAILS

Professional Hours: Attendees who successfully complete the training will receive a certificate equal to 15 PDHs for the 2-day training class. These can be put toward any qualifying certification, including PE status. Please confirm your own state's requirements for classes.

To register, please fill out the information below and send registration form and payment information by fax to 440-443-0249 or email to training@controlsoftinc.com.

Name: _____

Title: _____

Company: _____

Address: _____

City, State & Zip: _____

Phone No.: _____ Fax No.: _____ Email: _____

Training: ☐ Seattle, WA - March 1-2, 2017 | ☐ Philadelphia, PA - March 22-23, 2017

Amount: \$2,250 **Payment By (check box):** ☐ Check ☐ P.O. ☐ Credit Card* Check or P.O. No.: _____

* If paying by credit card, please call our training coordinator at 440-443-3900 or provide the best phone number and time for a return call to process your payment (ph: _____ time: _____).

ControlSoft: *Highest Rated in*
Exceptional Service by Control Magazine Readers

FREE PID Loop Tuning Tips Pocket Guide
available at www.controlsoftinc.com

Summary

You'll 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.

- Students learn an easy-to-use 3-step approach for tuning PID loops and how to recognize when tuning is not the root cause issue.
- PID loops will be simulated and demonstrated using software-based process simulations.
- Hands-on exercises allow attendees to practice these techniques in real-time simulation.

Applications Reviewed	Standard Applications	Difficult Applications
Using the provided software, which students install in advance on their PCs, students can simulate, tune, and build control strategies for standard and difficult applications. The results can be seen and evaluated instantly.	<ul style="list-style-type: none"> • Temperature • Pressure • Flow • Level 	<ul style="list-style-type: none"> • Inline Blending • Cascade PID Loops • Long Deadtime

Agenda

1	Understanding Process Control: Recognize the differences of each process loop. Learn the different process types, effect of noise, and the pros and cons of open loop tests and closed loop tests – all elements critical to tuning success.
2	Fundamentals of PID Control: What are the P, I, D parameters? How do they work? The units of each term and different structures of PID formulas.
3	Control and Tuning Objectives: Discussion of different control objectives, such as setpoint tracking or disturbance rejection, ramp and soak. How to adjust tuning strategy depending on your objectives.
4	Tuning Techniques: Discussion of various tuning techniques such as Ziegler-Nichols Tuning, Cohen-Coon Method, and IMC based tuning.
5	Tuning Practice: Tuning step by step, using trial and error and open methods. Simulation of tuning results and comparison of the results of different tuning parameters.
6	Adaptive Tuning and Advanced Topics: The benefits of adaptive tuning and non-intrusive loop diagnostics for different process loops.

Advanced Process Control Strategy

DAY 2

Summary

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

- Each strategy will be simulated and demonstrated using software-based process simulation in class.
- Hands-on exercises allow attendees to practice these techniques in real-time simulation.

Applications Reviewed	Standard Applications	Difficult Applications
Using the provided software, which students install in advance on their PCs, students can simulate, tune, and build control strategies for standard and difficult applications. The results can be seen and evaluated instantly.	<ul style="list-style-type: none"> • Standard PID • Model-Based Control • Cascade Control • Long Deadtime • Gain Scheduling • Feedforward Control • Heat/Cool Split Range 	<ul style="list-style-type: none"> • Interacting PID Loops • Long Deadtime Processes • Multi-Output Control • Extruder Control

Agenda

1	PID Control: Review of PID control and common mistakes; brief discussion of proper tuning from day 1 instruction.
2	Cascade Control: Benefits of cascade control; processes that benefit from cascade control and common implementation issues.
3	Feedforward Control: Benefits of feedforward control; when to use and how to implement. Design and demonstration of how feedforward control can reduce a process disturbance.
4	Gain Scheduling and Multiple PID: Discussion of process nonlinearity and how it can affect your process. Benefits and implementation of gain scheduling.
5	Override Control: Discussion and implementation of override control for process safety. Importance of controller tracking.
6	Long Deadtime Processes: Discussion of other common control issues and their solutions.
7	Robust Model Predictive Control: 3x1 model-based control, modeling, tuning, and applications.

ControlSoft Process Control Training

PID LOOP TUNING & ADVANCED PROCESS CONTROL STRATEGY TRAINING

Learn PID loop tuning & process control strategy from the experts in process control.

Practical & Fundamental Training For Your Technical Staff

- Identify and Solve Process Control Problems
- Tighten Process Control
- Improve Product Quality
- Reduce Energy Usage
- Increase Profitability

Please pass along this information to other engineers in your company as applicable. Or send us the contact info for anyone who might benefit from attending these classes and we'll be happy to contact them directly.
Thank you!

Our trainees say it best:

"Simulation and tuning exercises very good and realistic; very good class. Instructor was fantastic."

-- Sr. I&C Engineer

"The first-day training really hit home on PIDs in general. The instructor's knowledge of loops and ability to relate it back to a real-time application was helpful. I left feeling more confident in my tuning ability. I would definitely recommend this class to others."

-- I&E Technician

"The instructor really knows his subject. One of the best classes I've ever attended."

-- Maintenance Chief

"The class covers a lot of material, in a short period of time, overall a tremendous eye-opener!"

-- Manager, Performance Engineering

Register early. Classes fill up fast.

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An Exceptional Opportunity to Learn

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Highland Heights OH 44143
Phone: 440-443-3900
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