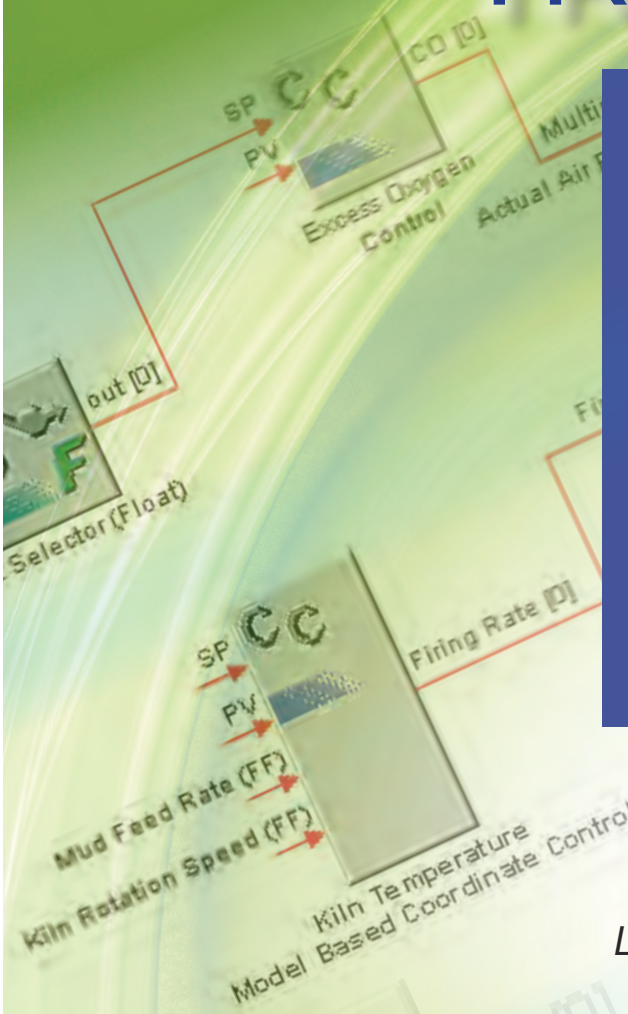
PID LOOP TUNING & ADVANCED PROCESS CONTROL STRATEGY TRAINING



Practical & Fundamental Training To Help Your Technical Staff:

- Identify and Solve Process Problems Before They Occur
- Tighten Process Control
- Improve Product Quality
- Reduce Chemical Usage
- Increase Profitability

REGISTER NOW FOR TRAINING SESSIONS

Los Angeles CA March 28-29, 2012 (Wed.-Thurs.)
Chicago IL April 18-19, 2012 (Wed.-Thurs.)
Phoenix AZ May 2-3, 2012 (Wed.-Thurs.)
Baton Rouge LA May 23-24, 2012 (Wed.-Thurs.)
Omaha NE June 13-14, 2012 (Wed.-Thurs.)
Atlanta GA July 18-19, 2012 (Wed.-Thurs.)
St. Louis MO August 15-16, 2012 (Wed.-Thurs.)

See inside for details

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 does onsite training for groups and also holds seminars throughout the country. I 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 both days of training for $1,900/person or $950/person to attend the first day only (PID loop tuning training). Classes run from 8:30 a.m. to 5:30 p.m. each day.

ControlSoft uses software to simulate loop tuning; each student does hands-on exercises to practice the technique he is learning 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.*

Special Bonus

Each student will receive a **free 30-day evaluation copy** of the same software tool that the instructor will be using to develop, test, and simulate the applications.

Cost: $1,900 per student for the two days.

Cost: $950 per student for PID class only.

This may be taken as a 1-day Seminar or in conjunction with the APC Strategy training.

*Please call me at **440-443-3900 ext. 103** to discuss your training needs. I look forward to your valued response.*

Thank you.

Karen Ledasil
kledasil@controlsoftinc.com

SESSION DETAILS INSIDE

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.

Please send registration form and payment information by
fax to 440-443-0249 or email to **sales@controlsoftinc.com. *LAPTOP REQUIRED.***
If any questions, call Karen Ledasil at ControlSoft, 440-443-3900.

Name & Title _____

Company _____

Address _____

City, State & Zip _____

Phone # _____ Fax # _____

Email _____

Training ☐ Los Angeles ☐ Chicago ☐ Phoenix ☐ Baton Rouge ☐ Omaha ☐ Atlanta ☐ St. Louis

PAYMENT for (check box): ☐ $950 PID 1-day class or ☐ $1,900 APC 2-day class

CREDIT CARD (check box): ☐ Visa ☐ MasterCard ☐ American Express

Acct. No. _____ Expiration Date (month) _____ (year) _____

Name & billing address: _____

P.O. # or CHECK # _____

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

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

Day 1: PID Loop Tuning Training Class

Purpose of this Class

This session will train engineers, technicians, and operators to set up, maintain, and tune a PI or PID controller, thus gaining the benefits of better control, improved product quality, and reduced scrap, with better and easier maintenance work.

The class will cover the fundamentals of PID control, its variations, things that are important to know in evaluating the health and tuning of PID loops, and the practical ways to tune a PID controller.

- The class culminates in an easy-to-use 3-step approach for tuning any PID loop and the ability to understand when tuning is not the root cause issue.
- PID loops will be simulated and demonstrated using software-based process simulation in class.
- Hands-on exercises will allow attendees to practice these techniques in real-time simulation.

Required: Laptop computer with CD drive. Windows XP or later version.

Applications Reviewed

During the course of the class, standard applications such as Temperature, Pressure, Flow, and Level control are reviewed. Also discussed are applications that are more complex and difficult to tune, such as Cascade PID loops and Long Deadtime applications.

Using the provided software, students can simulate and tune; the results can be seen and evaluated right away.

PID Loop Tuning & Optimization
Company Profile
Understanding Process Control
Fundamentals of PID Control
Control & Tuning Objectives
Tuning Techniques
Tuning & Simulation Practice
Manual Tuning Using INTUNE Tuning Software
Adaptive Tuning & Advanced Topics

Applications Reviewed
Standard Applications
Temperature
Pressure
Flow
Level
Difficult Applications
Inline Blending
Cascade PID Loops
Long Deadtime

Class Agenda

- 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.
- 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.
- 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.
- Tuning Techniques: Discussion of various tuning techniques such as Ziegler-Nichols Tuning, Cohen-Coon Method, and IMC based tuning.
- Tuning and Simulation Practice: This section is the focus of the class. Instructor will go over tuning step by step, using trial and error method and open loop method. Simulation of tuning results and comparison of the results of different tuning parameters.
- Adaptive Tuning and Advanced Topics: The benefits of adaptive tuning and non-intrusive loop diagnostics for different process loops.

Day 2: Advanced Process Control Strategy Training Class

Purpose of this Class

This session will demonstrate the best practices techniques for commonly used process control strategies beyond PID control, such as multi-layer cascades, override control, gain scheduling, feedforward compensation, design, and tuning.

We will discuss when each strategy is appropriate along with the common implementation pitfalls that often produce less than desirable results.

- Each strategy will be simulated and demonstrated using software-based process simulation in class.
- Instructor will use both a PowerPoint presentation and real process simulation during these training classes.
- As on Day 1, hands-on exercises will allow attendees to practice these techniques in real-time simulation.

Required: Laptop computer with CD drive. Windows XP or later version and MS PowerPoint.

Applications Reviewed

Students will receive copies of all the simulations used in class. These will include simple Temperature, Pressure, Flow, and Level loops along with complex applications such as Chlorine Control, Chemical Reactor, In-line Blending, Extrusion, and Ramp and Soak Furnace Control.

Using the provided software, students can simulate, change, and build a control strategy on the fly. The results can be seen and evaluated right away.

Understanding Process Control
Advanced PID Control
Model-Based Control
Cascade Control
Feedforward Control
Gain Scheduling
Split Range
Override Control

Applications Simulated
Standard PID
Model-Based Control
Cascade Control
Long Deadtime
Gain Scheduling
Feedforward Control
Heat/Cool Split Range

Difficult Control Problems
Interacting PID Loops
Long Deadtime Processes
Multi-Output Control
Extruder Control

Class Agenda

- PID Control: Review and overview of PID control; Common mistakes; Brief discussion of proper tuning from previous day's instruction.
- Cascade Control: Benefits of cascade control; Processes that benefit from cascade; Common implementation issues; Demonstration.
- Feedforward Control: Benefits of feedforward; Discussion of when to use feedforward; Implementation of feed-forward; Design and demonstration of how feedforward control can reduce a process disturbance.
- Gain Scheduling and Multiple PID: Discussion of process nonlinearity; How nonlinearity can affect your process; Implementation of gain scheduling; Demonstration of the benefits of gain scheduling.
- Override Control: Discussion of override control for process safety; Implementation of override control; Discussion of the importance of controller tracking; Simulation.
- Long Deadtime Processes: Discussion of other common control issues and their solutions.
- Robust Model Predictive Control: 3x1 model-based control, modeling, tuning, and applications.

The PID class may be taken as a 1-day Seminar or in conjunction with the APC Strategy training.

CONTROLSOFT
ADVANCED PROCESS CONTROL MADE EASY

Phone: 440-443-3900

TRAINING BY CONTROLSOFT INC.
PID Loop Tuning & Advanced Process Control Strategy

ControlSoft, the award-winning, innovative leader in advanced process controls, announces training classes in your area. 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 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.

As plants reorganize, many people are taking on new tasks. Training overall will become the most important aspect that could improve operational efficiency in 2012 and beyond. Consider the crucial role of skills and training in gaining a business advantage.

Our classes are taught by instructors with years of experience who are exceptionally knowledgeable in the subject matter and more than willing to explain things as they pertain to the real world environment.

REGISTER EARLY.
CLASSES FILL UP FAST.

Our trainees say it best:

"The instructor really knows his subject . . . very high level class, outstanding . . . one on the best classes I've ever attended."
-- Maintenance Chief, 2011 Seattle Attendee

"The training was great. We can now tune an application in about 4 hours that used to take us a week or more to tune properly."
-- Engineering Technician, 2007

"The trainer was very knowledgeable and covered everything well. The training and simulation exercises helped to get a grasp on our tuning issues."
-- I&C Technician, 2008

"The instructor's presentation was very thorough and precise. He really made an introduction to PID a pleasant experience. The teachings are well thought out and take advantage of every minute available."
-- Engineer, 2009

"The class covers a lot of material in a short period of time. Overall, a tremendous eye-opener!"
-- Performance Engineering Manager, 2010

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

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ADVANCED PROCESS CONTROL MADE EASY

www.controlsoftinc.com

BATON ROUGE
May 23-24, 2012

AND

ATLANTA
July 18-19, 2012

PID Loop Tuning & Advanced Process Control Strategy Training

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

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