

TO: PROCESS CONTROL PROFESSIONALS

ANNOUNCING: PID LOOP TUNING TRAINING CLASS

PRESENTED BY: CONTROL SOFT, INC.

WHEN: 8:30 AM – 5:30 PM

LOCATION: INDIANAPOLIS, IN – WED, DEC 9, 2009
HOUSTON, TX – WED, FEB 3, 2010
LOUISVILLE, KY – WED, MARCH 10, 2010
PHOENIX, AZ – WED, APRIL 14, 2010

PURPOSE: This class is designed for engineers, technicians and operators who need to set up, maintain, and tune PI and PID controllers, thus gaining the benefits of better control. Loops will be simulated and demonstrated using software based process simulation in class, hands on exercises allow attendees to practice technique in real-time simulation. Instructor will use both a PowerPoint presentation and real process simulation during this training class.

SPECIAL BONUS: EACH STUDENT WILL RECEIVE A FREE 60-DAY EVALUATION COPY of the same software tool that the instructor will be using to develop, test, and simulate the applications listed below.

COST: \$800 PER STUDENT – THIS MAY BE TAKEN AS A 1-DAY SEMINAR OR IN CONJUNCTION WITH THE APC STRATEGY TRAINING.

PID LOOP TUNING & OPTIMIZATION:

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

APPLICATIONS REVIEWED:

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

Please send registration form along with payment information by fax to 440-443-0249 or e-mail to sales@controlsoftinc.com. Call ControlSoft at 440-443-3900 with any questions.

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|--|--|---------------------------|--------------------|
| Name | Title | | |
| Company | | | |
| Address | | | |
| City | State | Zip | |
| Phone # | Fax # | | |
| Email | Training (circle one): Baton Rouge Philly Indy Houston | | |
| \$800 Payment: | CREDIT CARD (circle one) | Visa | MasterCard AmerExp |
| | Acct. No. | Expiration date (mo) (yr) | |
| Acct. Name and billing address if different: | | | |
| P.O. # | | CHECK # | |

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PID 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 for each attendee: Laptop computer with CD drive. Windows 2000 or XP; NO Vista.

CLASS AGENDA

- **Understanding of 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 that are 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 Zeigler-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 nonintrusive loop diagnostics of all your process loops.

APPLICATIONS

Students will receive copies of all the simulations used in class. These will include simple temperature, pressure, flow and level loops along with advanced applications such as long deadtime issues. Using the provided software, students can simulate, change, and tune a control strategy on the fly. The results can be seen and evaluated right away.

WHO SHOULD ATTEND

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

CUSTOMER TESTIMONIES

"All topics were covered very well and will be useful back at the plant. I would recommend the training to anyone wanting to truly understand the control loop tuning process."

-- I&C Technician, TVA, 2006 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, Allegheny Energy, 2007 Attendee

"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, Garland Power and Light, 2008 Attendee