

Process Control

PID Loop Development and Tuning



Course Number

PRSO10

Course Purpose

This basic-level course will help provide you with the skills needed to obtain a tuned process control loop for typical applications. You will create and develop a process model; calculate proportional, integral, and derivative gains; verify gains using ladder diagram; practice PID programming in function block diagram and learn how to autotune typical PID loops.

This course enables you to develop an understanding of process control by allowing you to practice PID control methods for the majority of systems encountered on the job. Although it does not provide you with all skills needed for every situation, it does prepare you for further process control classes with more specialized applications and design involvement.

COURSE AGENDA

DAY 1

- Creating a Process Reaction Curve
- Developing a Process Model
- Determining the Control Action
- Configuring Program Timing
- Programming a Simple PID Loop Using Function Block Diagram
- Calculating and Verifying PID Gains
- Autotuning a PID Loop

WHO SHOULD ATTEND

Individuals who need to learn the following should attend this course:

- How to make basic PID design decisions
- How to program and configure PIDE instructions using function block diagram
- How to tune basic PID loops using manual methods and ladder diagram
- How to autotune

PREREQUISITES

To successfully complete this course, the following prerequisites are required:

- *RSLogix 5000 Level 1: ControlLogix Systems Fundamentals* (Course Number CCP146) or equivalent experience

The following skills and knowledge are helpful:

- Experience using function block diagram programming language or attending training (Course Number CCP152)
- Knowledge of automation systems
- ISA Process Control Fundamentals training, or equivalent experience

STUDENT MATERIALS

To enhance and facilitate the students' learning experiences, the following materials are provided as part of the course package:

- Student Manual
 - Includes the key concepts, definitions, examples, and activities presented in this course
- Lab Book
 - Provides learning activities and hands-on practice. Solutions are included after each exercise for immediate feedback.
- RSLogix 5000 and Logix5000 Procedures Guide
 - Provides all of the steps required to complete basic RSLogix 5000® software tasks that are common to all Logix5000™ hardware platforms. By following the procedures in this job aid, you can immediately apply what is learned in the course to their own jobs.

HANDS-ON PRACTICE

Throughout this course, you will have the opportunity to practice the skills you have learned through a variety of hands-on exercises.

You will practice programming and configuring function block diagram using RSLogix 5000. Ladder diagram will be used to verify manually calculated gains. Ladder will also be used to adjust gains in order to develop an understanding of how proportional, integral, and derivative gains impact process control loops. Using a simulated ControlLogix panel and RSLogix™ Emulate 5000 software, you will test your program and autotune. You will also use RSLogix 5000 faceplates in Microsoft Excel to control and monitor your process loop.

NEXT LEARNING LEVEL

Once you have mastered the skills covered in this course, you can expand your process knowledge by attending additional process related courses:

- *PlantPax Process System Configuration* (Course Number PRS013) which provides you with an introduction to the core PlantPax system.
- *FactoryTalk Batch Server and Configuration Tools* (Course Number RS-BATR) which introduces you to the FactoryTalk® Batch system.

COURSE LENGTH

This is a one-day course.

IACET CEUS

Rockwell Automation is authorized by IACET to offer 0.7 CEUs for this program.







TO REGISTER

To register for this or any other Rockwell Automation training course, contact your local authorized Allen-Bradley® Distributor or your local Sales/Support office for a complete listing of courses, descriptions, prices, and schedules.

You can also access course information via the Web at <http://www.rockwellautomation.com/training>

Rockwell Automation is accredited by the International Association for Continuing Education and Training (IACET) and is authorized to issue the IACET CEU. [Click here](#) to view the Rockwell Automation Certificate of Accreditation.

To be respectful of the environment, Rockwell Automation is transitioning some of its training courses to a paperless format. Students are asked to complete downloads and bring personal devices to these classes. A full list of digital/paperless courses is currently available through your local distributor.

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