

Process Control

PID Loop Development and Tuning Course Description

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 in Ladder Diagram
- Autotuning a PID Loop



COURSE NUMBER: PRS010

Course Purpose

This 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.

Who Should Attend

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

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

LISTEN.
THINK.
SOLVE.®

Prerequisites

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

- *RSLogix 5000 Level 1: ControlLogix Systems Fundamentals* (Course No. CCP146) or equivalent experience

The following skills and knowledge are helpful but not required:

- Experience using function block diagram programming language or attending training (Course No. CCP152)
- Knowledge of automation systems
- ISA Process Control Fundamentals training, or equivalent experience

Technology Requirements

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

Student Materials

To enhance and facilitate your learning experience, the following materials are provided as part of the course package:

- *Lab Book*, which includes the hands-on exercises.
- *Presentation Book*, which contains the key concepts, definitions, and examples presented in the course. You will use this manual to follow presentations and take notes.
- *RSLogix 5000 and Logix5000 Procedures Guide*, which 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

Hands-on practice is a necessary part of learning. This course offers hands-on opportunities to perform fundamental process control methods.

Using a hardware workstation, you will practice programming and configuring function block diagram using RSLogix™ 5000.

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Hands-On Practice (continued)

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. Some examples of these process courses are:

- *FactoryTalk Batch Server and Configuration Tools* (Course No. RS-BATRG) which provides you with the FactoryTalk® Batch system architecture, operation, and configuration.
- *Foundation Fieldbus Basic* (Course No. CCPC02-LD) which introduces the fundamentals of basic measurement technology used in process control.

Course Length

This is a one-day course.

Course Number

The course number is PRS010.



IACET CEUs

CEUs Awarded: 0.7

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>

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