PID Fuzzy Logic Control

**NI LabVIEW PID and Fuzzy Logic Toolkit** NEW!

- Graphical development of control algorithms
- P, PI, PD, and PID control algorithms
- Autotuning to improve performance of PID control
- Fuzzy logic tools for complex systems

**PID Control Tools**
- Error-squared PID
- Lead-lag compensation
- Setpoint ramp generation
- Gain scheduling
- Multiloop cascade control
- Feedforward control
- Ratio/bias control
- Integrator antiwindup
- Bumpless transfer

**Fuzzy Logic Control Tools**
- Fuzzy Logic designer included
- Cascade multiple controllers for complex control
- Membership functions including triangular, trapezoidal, Z-shaped, S-shaped, Singleton
- Defuzzification methods including center of area, center of maximum, mean of maximum

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**Overview**
The NI LabVIEW PID and Fuzzy Logic Toolkit adds sophisticated control algorithms to your instrumentation software development system. By combining the control functions in this toolkit with the math and logic functions in the LabVIEW development environment, you can quickly develop programs for automated control. Integrate these control tools with NI data acquisition hardware to easily create control systems. You can download these tools, included with the LabVIEW Real-Time Module, to a real-time controller for deterministic control applications.

**PID Control Tools**
The PID functions implement a set of PID algorithms including error-squared and external-reset feedback. The PID algorithms feature bumpless transfer, integrator anti-windup, direct/inverse action, manual output adjustment, and a run/hold switch. The PID tools feature gain scheduling, so you can improve performance by defining several regions of operation for your controller. The autotuning tools automatically test the control system to determine new PID parameters that improve controller performance. This method maintains closed-loop control during the tuning process.

**Fuzzy Logic Control Tools**
Use fuzzy logic to accelerate the development and implementation of control for nonlinear or highly complex systems. The control strategy is implemented with simple, intuitive linguistic rules. You can also use the fuzzy logic software for expert decision making, such as pattern recognition or fault diagnosis. You can implement fuzzy controllers for control with rules that are easy to understand. Linguistic terms for rules are defined with membership functions, and then a set of rules is generated automatically using the interactive fuzzy logic software. The output of each rule is manually selected, and you can assign weight values to control tuning.

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**Ordering Information**
**LabVIEW PID and Fuzzy Logic Toolkit**
Windows XP/2000/NT .......................................................... 777874-03

**BUY NOW**
For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to ni.com/toolkits.
PID Fuzzy Logic Control

Function List

**PID**
- PID Advanced
- PID Autotuning
- PID Lead Lag
- PID Setpoint Profile
- PID Input Control Filter
- PID Gain Schedule
- PID Output Rate Limiter
- PID EGU to Percentage
- PID Percentage to EGU

**Fuzzy Logic**
- FL Fuzzy Controller
- FL Save Fuzzy System
- FL Load Fuzzy System
- FL New Fuzzy System

**Fuzzy Logic – Variables**
- FL Create Variable
- FL Get Variable
- FL Set Variable
- FL Get Number of Variables
- FL Get Variable Names

**Fuzzy Logic – Memberships**
- FL Create Membership Function
- FL Get Membership Function
- FL Set Membership Function
- FL Number of Membership Functions
- FL Get Membership Function Names

**Fuzzy Logic – Rules**
- FL Create Rule
- FL Get Rule
- FL Set Rule
- FL Get Number of Rules
- FL Get Rules as Text
- FL Create Antecedent
- FL Create Consequent
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