PID Control Applications Firmware

The PID Control Applications Firmware provides Proportional, Integral, and Derivative (PID) gain control for a Remote Operations Controller (ROC) or FloBoss™ 407 Flow Manager. The firmware enables the stable operation of feedback control loops that employ a regulating device, such as a control valve. The firmware, which is standard in the ROC, is configured using ROCLINK™ Configuration Software.

The firmware can accommodate as many as four independent PID algorithms (loops) in the FloBoss 407 unit, one in the ROC306, six loops in the ROC312 unit, and sixteen loops in the ROC364 unit. Each loop has its own user-defined input, output, and override capability.

The typical use for PID control is to maintain the process variable at a setpoint. If PID override control is configured, the primary loop is normally in control of the regulating device. When a designated process variable crosses a user-defined switchover setpoint, a secondary (override) loop takes control of the regulating device. When the switchover conditions are no longer met, the primary loop regains control of the device.

PID Control Applications Firmware Specifications

COMMON VARIABLES

Common variables are configured for both loops and consist of:

Point Tag ID: The 10-character name for the control loops.

Control Type: Selects the "modes" in which the PID loop operates: auto/manual, primary/override, Discrete Output (DO) control/Analog Output (AO) control, stop on reset, manual tracking.

PRIMARY/OVERRIDE LOOP VARIABLES

Primary/override loop variables are configured for each loop and consist of:

Input Definition: The input (process variable) assigned to the PID loop.

Output Definition: The output assigned to the PID loop.

Setpoint: Value to which the process variable is controlled.

Setpoint EU/Min: The maximum rate at which the setpoint is allowed to ramp to a new value.

Loop Period: The amount of time between PID calculations.

PID Gains: Proportional, integral, and derivative gains used by the loop for desired response and stability.

PRIMARY/OVERRIDE LOOP VARIABLES

Scale Factor: Ratio of output span to input (process variable) span. The scale factor determines direct or reverse action for the loop.

Deadband: Integral action is disabled when the process variable is within this "window" around the setpoint.

SWITCHOVER VARIABLES

Switchover variables are configured for each loop when override mode is used and consist of:

Switch Setpoint: The setpoint at which control is passed to the other configured loop.

Switch PV Definition: Designates the input to be assigned as the switch process variable. Its value is compared with the switch setpoint to determine switchover.

Switch Mode: Defines the comparison (greater than or less than) for switchover from one loop to the other.

Minimum Control Time: The amount of time that the active loop must maintain control before switchover to the other loop can occur.

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PID Control Applications Firmware Specifications

MONITORED VARIABLES

In addition to the configured variables, the following variables are displayed for each loop:

Loop Status: The current state of the PID loops: primary/override loops disabled, primary loop running, override loop running.

Scan Time: The time elapsed between executions of the PID algorithm.

Primary/Override Process Variable: The current value of the process variable.

MONITORED VARIABLES (CONTINUED)

Primary/Override Output EU: The current value of the controlled output.

Primary/Override Switch Process Variable: The current value of the switch process variable.

DEFAULT VALUES

Default values are provided for most user-entered variables.

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