

## Solution Note

### Accurately Identify and Tune any Process with Accutune III



#### Accurate tuning reduces waste and downtime

Industry surveys indicate that nearly half of all processes are not accurately tuned. A poorly tuned process can result in bad readings, downtime and wasted materials.

#### Solution: Controller Accutune III

ACCUTUNE III with Fuzzy Logic enables easy system tuning for the Honeywell UDC 2500, UDC 3200, UDC 3500 and HC900 Controllers. Accutune:

- Accurately identifies and tunes any process
- Speeds up and simplifies start-ups, saves energy and improves throughput

This is a plug-and-play tuning algorithm which will, at the touch of a button or through a digital input, accurately identify and tune any process, including integrating processes and those with dead-time. This speeds up and simplifies startup.

It also includes the original Accutune adaptive tuning algorithm that can automatically and continuously retune whenever a setpoint step change is implemented or whenever a process variable disturbance occurs.

Fuzzy logic is used to suppress process variable overshoot due to setpoint changes or externally induced process disturbances. It does not change PID constants, but temporarily modifies the internal controller response to suppress overshoot to allow more aggressive tuning to co-exist with smooth process variable responses.

Accutune III provides for two types of tuning: SP Tuning and PV Adaptive Tuning.

#### 1. SP Tuning Algorithm

The SP Tuning algorithm provides on-demand tuning through the selection of two different methods of tuning using the setpoint value. The selections include: DISABLE (default selection),



CYCLE TUNING and SP TUNING. Both tuning methods calculate new tuning parameter values, on demand, as a result of different types of tuning procedures.

**Cycle Tuning** - With Cycle Tuning, tuning parameter values are derived from the process response to causing the PV to oscillate about a SP value. This tuning method uses the measured ultimate gain and period to produce tuning parameter values using the relationship developed by the Ziegler-Nichols equations. It does not require an initial stable process and the process may be moving. Cycle Tuning is applicable to Three Position Step control and can be used for integrating processes (level control).

**SP Tuning** - SP Tuning is based on the process response to a SP change. When initiated, a target SP value is calculated and used during the tuning period. The tuning algorithm uses the target SP value to initially estimate the final output value needed to get the PV to the target SP value. That output value is held until the process is identified. When identification is complete, new tuning parameter values are calculated, control is returned to automatic, and the process resumes control action to the pre-tuning SP value.

#### 2. PV Adaptive Tuning

The PV Adaptive Tuning method adapts a tuned process to changing system characteristics over time. It operates by observing a previously tuned process for changes in the system such as changes in deadtime or other process characteristics that can make a tuned process become unstable, unresponsive or over-responsive.

## Applications

Accutune III is ideal for tuning furnaces, ovens and boilers, including combustion fired as well as electrically heated processes. Accutune III can also be used to tune flow and level loops such as those found in the food & beverage, pharmaceutical and chemical industries.

In all these applications, Accutune III will not only save start-up time by automatically tuning the process, it will also provide higher quality output and save energy.

## The Honeywell Advantage

Using Honeywell's Accutune leads to significant benefits:

- Accurately identifies and tunes any process including those with deadtime and integrating processes
- Speeds up and simplifies start-ups, and allows return to any setpoint
- Saves energy via tighter control
- Improves throughput



**It Matters.** [Learn more](#) how Honeywell solutions help solve what matters.

### For More Information

To learn more about Honeywell's Accutune III visit our website [www.honeywellprocess.com](http://www.honeywellprocess.com) or call your local HPS Account Manager.

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