



Improving Control Can Be So Sweet!

Chocolate is a nearly \$100 Billion global business. As may be expected the process of transforming raw cacao beans into its many tasty confectionary forms is complex. In particular, the tempering process takes chocolate through a precisely controlled temperature curve that involves the raising followed by the lowering of the product's temperature. It is through tempering that the cocoa butter crystals within chocolate are realigned in such a way that a smooth and snappy texture results. Without tight control during the tempering process the end-product will either be too soft or excessively hard.

When a global leader in chocolate struggled to control the tempering process at its facility in Ireland the company's automation and engineering staff turned to Control Station's LOOP-PRO™ Tuner technology. Unable to reduce variability within their temperer process after repeated manual tuning attempts, staff capitalized on LOOP-PRO's unique ability to accurately model oscillatory and noisy process data. With access to historical step test data the software accurately modeled the process dynamics and generated ideal tuning parameters. A 90% reduction in variability proved that optimization can be oh so sweet.

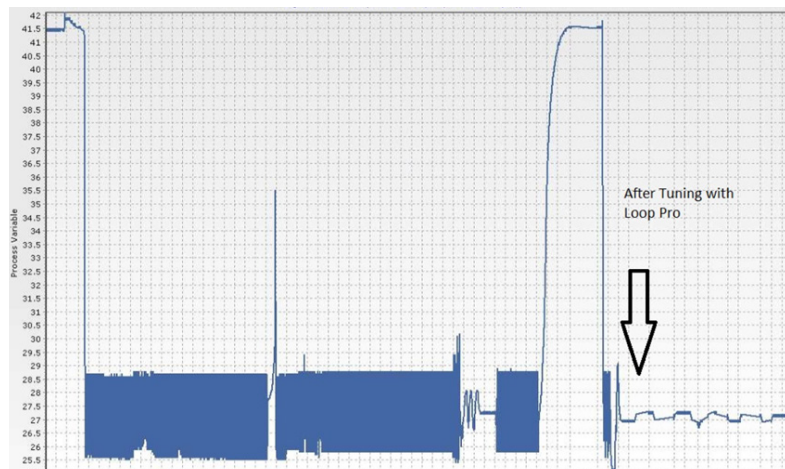


"We are now seeing much improved control on this loop. While temperature variation had originally been 3° Celsius around Set Point, the variation in temperature has been reduced to 0.3 Celsius."

P. Gough, Automation Engineer

When a Picture Tells a Thousand Words

Chocolate has been refined over four millennia as it transitioned from a bitter beverage into today's edible delight. While the key production input remains the cacao bean the process by which cacao is transformed from bean into bar has changed dramatically. Processes such as tempering assure that the end-product is smooth, breaks with a 'snap', and has an attractive sheen. In order to achieve the desired end-result, however, the process of tempering chocolate must be tightly controlled.



Shown above is a trend provided by plant staff of their temperer process both before and after tuning with LOOP-PRO™. Clearly evident on the left is the control loop's highly variable performance as the loop oscillates between 25.50° and 28.75° Celsius. Once tuned with LOOP-PRO™ variability is held within 0.30° Celsius — a 90% reduction.

Variability in the plant's temperer process exceeded 3° Celsius and jeopardized product quality. Numerous attempts to manually tune the PID had failed to produce the necessary improvement in control. The difficulty arose from a combination of noise in the data signal and oscillatory dynamics. Automation staff struggled to limit the noise and hold the process steady prior to initiating each manual bump tests. After multiple attempts the team chose to engage Control Station and to put LOOP-PRO™ to the test.

LOOP-PRO™ is the only tuning software that accurately models oscillatory and noisy data associated with the full range of industrial control loops – not just level loops. Using the software the plant's automation team was able to quickly model and tune the PID responsible for regulating temperer Temperature. While LOOP-PRO™ can connect live to the process, the software also supports the use of existing historical data. In this case the team's previous manual bump tests provided more than adequate data for use by LOOP-PRO™. The software's graphic tools empowered the engineers to tailor loops easily for appropriate responsiveness and optimal control. Once the new tuning parameters were uploaded the automation team saw immediate improvement in control. The loop's variability dropped to less than 0.3° Celsius — a 90% improvement.

Finally – tune your facility's most complex PID control loops for optimal performance.

Learn why LOOP-PRO™ is the only product that accurately models oscillatory, noisy process data. Contact us today at +1 (860) 872-2920 or sales@controlstation.com.

