Entivity Testing Success Story #702

Wenger Reduces Programming by 50% using Entivity Live!

Customer Profile

Wenger is a global leader in supplying extrusion solutions for food and feed processing industries.

Application
- Process simulation and testing

Industry
- Extrusion processing systems

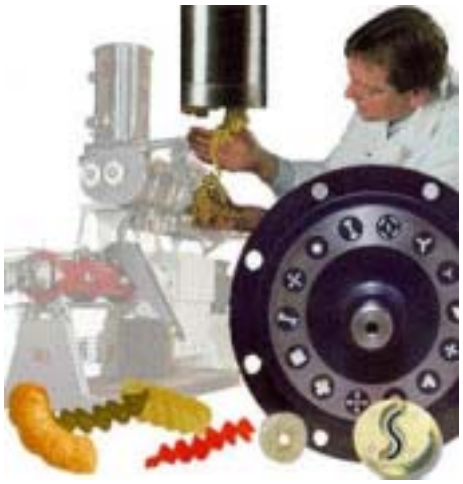
Location and Web Site
- Sabetha, Kansas
- www.wenger.com

Key Benefits
- 50% less programming time required than original estimate
- Easy-to-use flowcharting
- Built-in OPC drivers
- Easy I/O configuration

Mission-Critical Capability
- Process control PID accuracy improved

"In less than two hours of self-training with Live! flowcharting tools, I had a good handle on how to write our programs."

Brian Plattner
Process Engineer
Wenger Laboratory



Wenger Manufacturing, Inc. selected Entivity Live!™ as the PC-based control solution for their new laboratory instrument that simulates an extrusion environment. Brian Plattner, a Process Engineer at Wenger's Laboratory explained, "We wanted something sophisticated, flexible, usable and cost effective. We liked what we saw and went with Live!."

Manufacturing Challenge

Wenger manufactures extruders and continuous cooking devices. The product is cooked until it exits the extruder's die in a particular shape. The extrusion process has three main control points that directly effect end product results:

1. Moisture content – the percent water content
2. Thermal energy – heating the mixture to a setpoint
3. Mechanical energy – stirring and mixing the ingredients.

By knowing the raw material's characteristics in advance, a process engineer can tune the extrusion system to achieve a consistent product quality. Variations in the incoming raw material can therefore greatly affect the extrusion process. Today, many test instruments are able to determine characteristics of simple mixtures. However, these instruments have been unable to test complex mixtures, which are typically in breakfast cereals, pet food, and livestock feed product recipes.

Manufacturing Solution Taking Shape...

This manufacturing challenge required developing an innovative means for determining the characteristics of complex mixtures of raw materials before entering the extrusion process. Then, manufacturing personnel could more appropriately tune parameters of the process, resulting in less waste during extrusion. Existing test instruments lost moisture and were unable to accurately determine key data characteristics for complex biopolymers. Wenger sought to solve that problem by designing the Phase Transition Analyzer which simulates the extrusion process using Live! as the control system. The Phase Transition Analyzer is the first test system that accurately determines complex biopolymer phase transition temperatures under simulated extrusion process conditions.

Phase transition temperatures are critical data points indicating when raw materials change state from solid crystalline form to pliable material. Knowing the occurrence of when such a change takes place is a great aid in determining when the desired consistency level for raw materials are likely to be achieved.

entivity™ Automation Software
935 Technology Drive
Ann Arbor, MI 48108
1-800-722-6875
www.entivity.com

Customer Satisfaction

"Hardware system setup and debugging was easy. I/O View instantly scans the network and identifies installed modules without additional programming... we were very satisfied with the technical support and service provided by the Entivity support team. They were extremely helpful in answering our questions about PID setup and communication with Visual Basic programs."

Brian Plattner
Process Engineer
Wenger Laboratory

DL205 I/O system in prototype machine (top). The Rheometer Runtime screen gives the lab technicians dynamic test status.

The Phase Transition Analyzer test equipment reliably simulates the extrusion process environment by controlling moisture, pressure and temperature. The main distinction between Wenger's Phase Transition Analyzer and its predecessors is that Wenger's applies a constant pressure to the sample instead of maintaining a constant volume in the sample chamber. By maintaining a constant pressure on the sample, this test equipment is able to more accurately determine temperatures for a given material than other test equipment.

Design of the Solution

Wenger's Phase Transition Analyzer is functional test equipment that uses Live! and an Ethernet I/O system to simulate the extrusion environment. I/O points consist of discrete outputs, analog inputs, analog outputs and a temperature input using an Automationdirect.com DL205 I/O base and an Ethernet Base Controller.

The Phase Transition Analyzer has seven graphical HMI Screens to set up tests, calibrate equipment, view Phase Transition Analyzer Runtime Status, and utilize Trending and PID Tuning screens. These seven screens were designed using Live!'s Screen- View graphical editor.Screen- View accesses the same list of application data items as the flowchart tools. This saves time by eliminating retyping of data items. Compared to competitive control solutions, where the HMI package is separate, the designer would have to setup the HMI package and possibly retype or recreate another database for the HMI to use.

The control application also interfaces with Visual Basic® using the OPC protocol. Visual Basic programs allow users to save data files and initiate computer shutdown in a quick and efficient manner.

Project Implementation and Results

Plattner was more familiar with process flowcharts than PLC relay ladder programming. So, the use of Live! leveraged that flowchart knowledge. "The Phase Transition Analyzer's control system application development took 50% less time than the original project time estimate," stated Plattner. He also noted, "In less than two hours of self-training with Live!'s flowcharting tools, I had a good handle on how to write our program." He was able to think through the required application logic and then intuitively program the system.

Plattner attributed additional project timesavings to Live!'s ease of use. Specifically, PID blocks, programming examples, and Thinklets. The PID loop control blocks were simple to set up by just filling in tagnames of process variables and gains. Thinklets are portable, reusable pieces of logic (subcharts) that can be added to a project and allow programmers to easily include those frequently used functions into their specific application. Since subcharts are called by parameters in the software (instead of global data items), Thinklets fit seamlessly into applications.

