



Corn Syrup Producer Enjoys Sweet Rewards

CIMPLICITY HMI/SCADA Provides Plant-Wide Visualization, Diagnostics, and Analysis



They do things big in Texas.

This Lone Star State producer of corn syrup is no exception. After enjoying more than 15 years of reliable PLC performance, the company decided to take a big next step and implement a modern manufacturing solution, upgrading its automation systems—including new PLCs and a high performance SCADA—in order to reduce labor and downtime costs, reduce troubleshooting, and improve performance.

With the help of integration firm Brandon & Clark, the company implemented a plant-wide SCADA system and upgraded its network to speed up communications—without interrupting production. As a result, the company has cut equipment downtime and control-room labor costs.



The Ears Have It

While most of us think of corn syrup as the staple sweetener in our soft drinks and other sugary goodies, the experts know it can be one sticky business.

Today, the plant's process begins in the millhouse, where the corn is separated into starch and other lesser components. After soaking or steeping the corn to remove the soluble

“In the areas we’ve upgraded so far, we’ve virtually eliminated troubleshooting. If a piece of equipment shuts down, a quick glance at one of our CIMPLICITY screens tells us exactly where to go to get things moving again.”

— **Maintenance and Engineering Manager**
Major Corn Syrup Manufacturer

portion, the corn is processed through a series of mills, screens, separators, and dryers to remove any remaining by-products that are generally used for cattle feed. Once separated, the corn starch portion is pumped into two refineries for 42% and 55% high fructose syrup production.

The 42 Refinery treats the starch slurry with enzymes that reduce the starch to dextrose, a bland sugar. The dextrose is then converted into the sweeter fructose, which is comparable in taste to the sugar produced from beets or cane. Using the 42% syrup, the 55 Refinery increases the

concentration using ion-exclusion technology. Finally, both products are pumped into rail cars and shipped for use by soft-drink, fruit-drink, and soup companies, as well as bakeries and creameries.



The Results:

- Decreased labor and downtime costs
- Greater productivity
- Less maintenance with faster troubleshooting
- Easy upgrade program for substantially reduced costs
- Centralized control room plus mobility for plant-wide system management



Pouring on the Power

Before the current upgrade, the plant controlled three of its four processing areas from separate control rooms, which placed an ever-increasing burden on personnel with regard to troubleshooting, information sharing, and communication in general.

While the plant could have upgraded its PLCs without consolidating their control rooms, plant operators would have continued to struggle with communications.

Currently monitoring approximately 6,100 I/O points, the CIMPLICITY HMI/SCADA software extends the functionality of the new PLCs and I/O blocks by providing a graphical interface with real-time monitoring and control capabilities, including database tools that log information and compile reports for all of the plant's process equipment, such as boilers, furnaces, storage tanks, and air compressors. The software's manufacturing control features also allow operators to make equipment adjustments like starting and stopping motors and conveyors and opening and closing valves. And, because of the software's object-oriented

approach, the team can create screens to handle any number of operating parameters, ranging in complexity from simple status screens and alarm reports to more complex screens displaying diagnostics and analysis of the starch as it progresses through the conversion process.

Operators can also use the software interface to visually track capacity and temperature in tanks and rail cars, promptly handle any irregularities in distribution, and equalize load levels. For example, when the syrup is pumped from storage tanks into rail cars, the I/O reports all information regarding the load-out process to the PLCs, which send the data to CIMPLICITY. To date, the plant has built 25 graphical interface screens into the system with plans to add about 25 more.

The plant's new centrally located control room comprises five CIMPLICITY work-stations. Two more will be added as

the project progresses, with one dedicated to the 42 Refinery and one dedicated to the load-out area. Once complete, the team anticipates the control room will reduce labor costs by consolidating supervisory tasks. Whereas, the previous multiple control room layout required ten operators per shift, one control room will only require eight, which will allow the plant to focus the additional personnel on other productivity-boosting functions.

In addition to process monitor and control functions, the team has also begun implementing the CIMPLICITY software's trending tool, which will further enhance maintenance and troubleshooting by analyzing the historical data of equipment and predicting maintenance needs and performance issues. A new Quality Control room will be built next to the new control room, providing convenient data entry and access to the information.



“Adding GE Digital CIMPLICITY automation software was a perfect fit for our data-collection and analysis needs. With all the power the upgraded PLCs offer in terms of speed and I/O communications, it was only natural for us to take that power and apply it to a broader control and networking solution. We also knew the network would give us the speed and reliability we sought, as well as the option to expand into higher level systems in the future.”

— Plant's maintenance and engineering manager.



Troubleshooting down, productivity up

As the plant continues to upgrade its systems, early results are promising. *“In the areas we’ve upgraded so far, we’ve virtually eliminated troubleshooting,”* explains the maintenance and engineering manager. *“If a piece of equipment shuts down, a quick glance at one of our CIMPLICITY screens tells us exactly where to go to get things moving again.”*

“Each component of the new system is incredibly easy to program,” adds the electrical maintenance supervisor. *“Our programmers were able to handle the system—the PLC, I/O blocks, and CIMPLICITY software—after only three days of training. It’s just that easy.”*

What’s more, upgrading and implementing the new SCADA system positions the plant for another ten years of productivity gains and labor and downtime cost savings, while providing a technology platform for easier upgrades and enhancements for plant expansions in the future.





About GE

GE (NYSE: GE) is the world's Digital Industrial Company, transforming industry with software-defined machines and solutions that are connected, responsive and predictive. GE is organized around a global exchange of knowledge, the "GE Store," through which each business shares and accesses the same technology, markets, structure and intellect. Each invention further fuels innovation and application across our industrial sectors. With people, services, technology and scale, GE delivers better outcomes for customers by speaking the language of industry.

Contact Information

www.ge.com/digital