

Coca-Cola®/ Dasani® Water

Opto 22 SNAP Ultimate I/O® System Maximizes Flow for Plant's Bottling Processes

When the Coca-Cola Company purchased a plant in southern Missouri to bottle its Dasani brand of drinking water, it knew that this facility would draw water from the nearby Roubidoux Formation, which is the source of some of the purest water in North America. What Coca-Cola officials didn't know was that the plant was not equipped to pump the roughly 1,000 gallons of water per minute needed to meet

demand for Dasani water. It was determined that, at best, the plant would be able to pump only half that amount.

Now, however, the plant is pumping more than 1,500 gallons of water per minute, thanks to a new control and data acquisition system from Opto 22 of Temecula, California. In addition to satisfying Coca-Cola's production requirements, this system has helped save floor space in the plant, reduced its overall energy use, and ensured that all water being pumped into Dasani bottles is 100 percent pure. "We used Opto 22 hardware and software to build this system primarily for the sake of simplicity," says Barrett

Davis, owner of The Automate Company, LLC, the Pacific, Missouri control systems integrator that designed and installed the system for Coca-Cola. "We typically build the panels for our control systems from scratch, and the Opto 22 hardware and software makes it easy to do that."

Flexible Programming

Davis finds the programming methodology of the Opto 22 equipment especially appealing. "Because the Opto 22 software [ioControl™] doesn't rely on ladder logic or numeric addressing schemes,

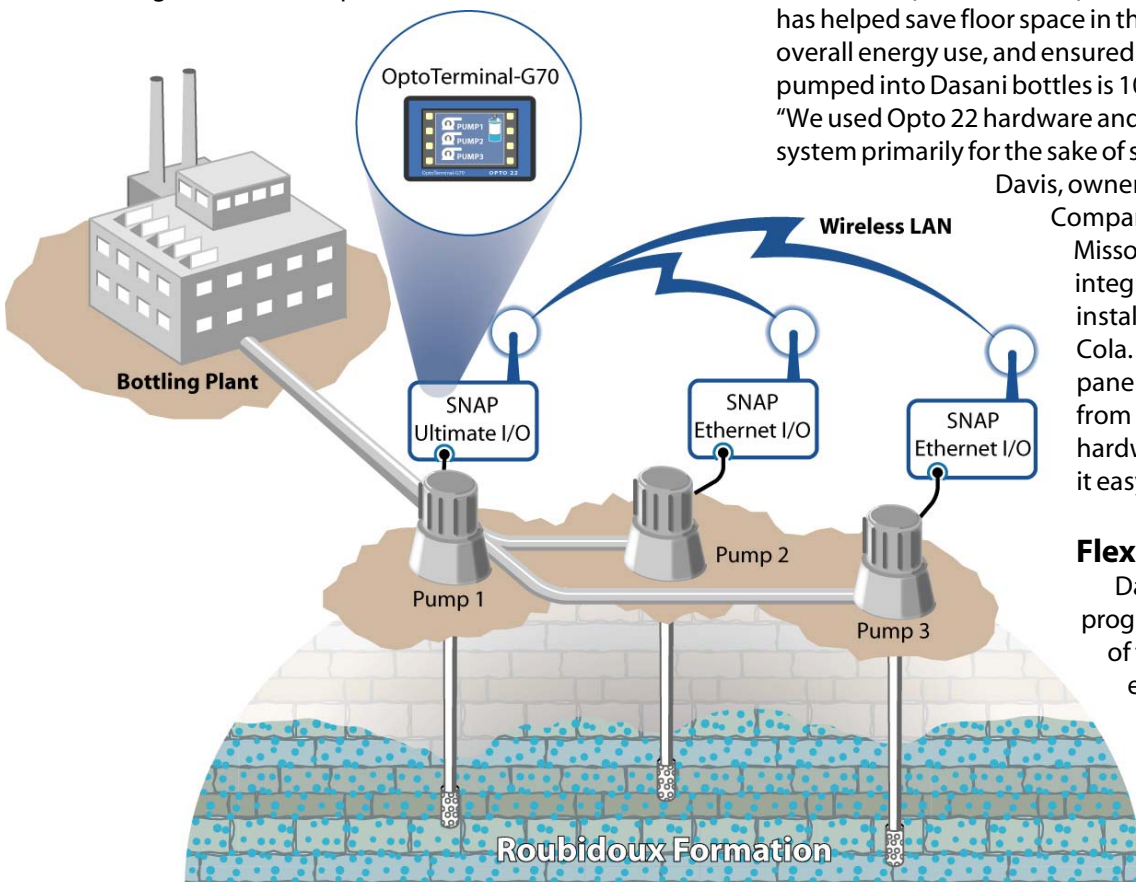


Figure 1: Coca-Cola/Dasani System Architecture

I can create a graphical representation of the system I want to build before I do any actual programming," he says. "In essence, the software lets me generate ideas on the fly, which is basically what I did for the Dasani project. With ladder logic, you have to define all of your I/O points and variables before you start working with the software, simply because it's just too difficult to make changes."

In contrast, Davis says that with the Opto 22 programming software he can lay out the points and variables he envisions being part of the control system on his computer screen. He then labels each one and defines the way they will interact once the system is up and running. After reviewing this flowchart, he starts to create the actual program code. But best of all, Davis says, he can go back at any time and add or modify any points or variables he wishes.

"With the Opto 22 tools, I was able to create my program in a week or two. If I had done it a different way, it would have taken at least twice that long," Davis declares.

Variable Control

The control system that Davis ultimately designed for the Dasani plant begins with the OptoTerminal-G70, an Ethernet network-enabled touchscreen that serves as the primary interface for plant workers who monitor the control system. The terminal is linked to an Opto 22 SNAP Ultimate I/O controller, which is the central control device for the entire system.

Communicating via a wireless Ethernet network, the SNAP Ultimate I/O controller sends information back and forth between the OptoTerminal-G70 and all the various devices (including other Opto 22 SNAP I/O systems) that control equipment throughout the plant. Together, this equipment controls three wells that pump water from the nearby Roubidoux Formation into the plant, where it is later bottled.

A pump attached to each well is equipped with a variable frequency drive (VFD), a device that controls the speed at which the pump operates. When these VFDs work in concert, as they are designed to do, it ensures that the three wells are constantly pumping the exact amount of water—no more and no less—that Coca-Cola needs to meet the current demand for Dasani water.

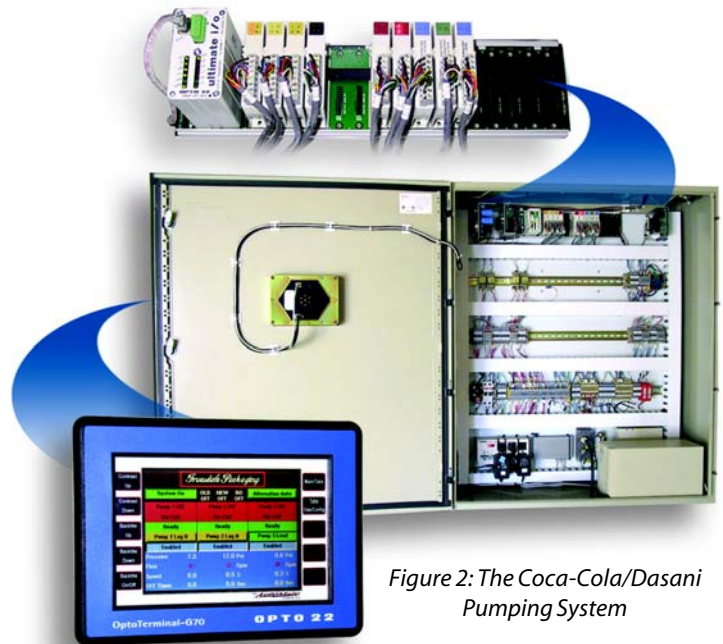


Figure 2: The Coca-Cola/Dasani Pumping System

"Any of the well pumps can be designated as the lead," Davis explains. "That pump will have a set point for moving water at a certain level of pressure, say 60 psi. Once that point is set, the pump will work to provide that level of pressure to the plant at all times. The VFD works to speed the pump up or down, as necessary, to keep the pressure at that level."

Quick Response

Meanwhile, the Opto 22 control system continually monitors this activity. The system detects when a VFD is operating at maximum speed and can no longer make the lead pump push enough water to keep up the required level of pressure. When that happens, an additional pump is called into action. This new "lag" pump begins moving water at a preset minimum speed. If that isn't enough to keep up the required level of pressure, the lag pump speeds up until water flow reaches the designated flow rate.

Astoundingly, all of these changes and reactions to water flow take place in a fraction of a second. "Having an Ethernet-based system and running it over a wireless network means that all of the communication takes place very quickly and efficiently," Davis says. "When the SNAP Ultimate unit sends out a

request for information, the response arrives within 3 milliseconds, as opposed to 5 to 10 seconds with traditional radio telemetry equipment."

Ultimately, this fast response time means that the plant is always operating at maximum efficiency and never pumping too much or too little water. Davis also credits the system for boosting the plant's efficiency by allowing it to eliminate a 30,000 gallon tank that was used to store water before it was bottled.

"When Coca-Cola took over the plant, it had only two wells," Davis explains. "The third one was built to accommodate an increased demand for Dasani water. We realized and informed Coke that adding the third well was going to cause an overflow in that storage tank. So now, with the VFDs and the Opto 22 system, we can pump more precise amounts of water from these wells without having to put any of it in a storage tank."

Removing the storage tank has freed up 3,000 square feet of floor space in the plant and also eliminated the need for a 100-horsepower pump that moved water from the tank to the bottling process. Eliminating the storage tank also removes the possibility of bacteria forming in the water sitting idly in the tank.

In short, the Opto 22 control and data acquisition system has given Coca-Cola/Dasani a reliable, cost-effective means of producing the highest quality product in the shortest time possible. What more could a manufacturer ask for?

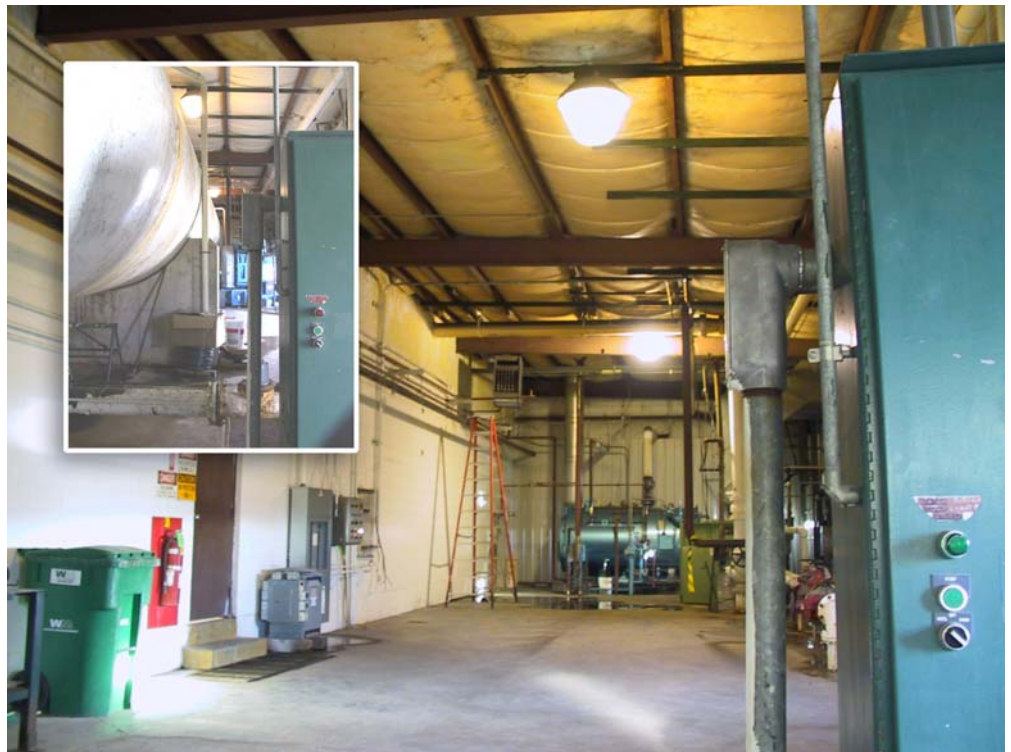


Figure 3:

The Opto 22-based control system enabled Coca-Cola to eliminate a 30,000 gallon overflow tank (inset) and free up 3,000 square feet of floor space.

About Opto 22

Opto 22 manufactures and develops hardware and software products for applications in industrial automation, remote monitoring, and enterprise data acquisition. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's SNAP systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, or electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel. Founded in 1974 and with over 80 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability. Opto 22 products are sold through a worldwide network of distributors, partners, and system integrators. For more information, contact Opto 22 headquarters at 800-321-OPTO or visit our Web site at www.opto22.com.