

Application Story:

PROFINET Helps GE Make Appliance Manufacturing Leaner



GE Appliance Park: Louisville, Kentucky

"I needed to reduce implementation time. PROFINET does that."

—Robert Frank, Senior Advanced Manufacturing Engineer

Moving at the speed demanded in today's business environment, where stiff competition means new products must be made and introduced faster than ever before, requires technologies that simplify production start-ups. For GE Appliances, those technologies include the Profinet industrial Ethernet network.

Profinet provides the backbone for a new lean manufacturing system that is producing GE's latest home laundry appliance, a high-efficiency (HE) top-loading washer. By dramatically reducing the time and cost to install new production lines at GE's 900-acre Appliance Park in Louisville, KY, the Profinet network helped GE bring its innovative washer to market in time for the 2012 holiday buying season.

Shortening cycle time

"We needed to shorten the cycle time for building and installing new manufacturing equipment," said Robert Frank, senior advanced manufacturing engineer, explaining why Profinet was chosen for the new HE washer production lines at Building 1, Home Laundry, a

1.3 million square foot facility with approximately 1,300 employees.

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"The machine that fabricates the washer apron (the front and sides of the new topload washer) has approximately 500 input/output points," said Frank, pointing to one example of the efficiencies gained with Profinet. "With traditional wiring practices, 1,500 individual wires would have had to be cut, stripped, numbered and terminated. We also would have had to disconnect and reconnect 500 of those wires when the equipment was shipped from the machine builder to our facility. All of that wiring was replaced with 15 Profinet and 15 DC power cables."

Profinet also made it simple to connect valves from the compressed air system used in washer assembly. "The valves need to be located near the devices they are powering--bringing compressed air to a cylinder, for example," said Frank. "Profinet eliminated the wiring

and conduit needed for traditional hard-wired valves. The valve packs also have the capability for inputs, so the sensors used to verify that the cylinder has moved can be plugged into the valve pack, which eliminated the wiring for those devices as well.”

Profinet’s ability to provide the same capabilities in less time and at lower cost was a deciding factor. “We were looking for less time to implement new products and we wanted Profinet to take less time to build our equipment,” explained Frank. “But we also wanted the performance to be no different than what we had been getting with our previous method of wiring equipment. Profinet saves us time and, in the end, the result is invisible—it just gets there faster.”

“Profinet lets us use multiple suppliers, so we can standardize on how we’re doing things.”

Staff familiarity with Ethernet technology assures reliable network support, added Frank. “One of the factors in choosing Profinet was that it is Ethernet technology, which is very widely used. There’s a much better understanding of it than there is of some small proprietary network that might only be around for a few years. We expect Profinet to be around for a long time.”

Lean transforms manufacturing

The transformation at the Home Laundry facility is part of a \$1 billion investment GE is making, most of it at Appliance Park, to revitalize its global appliance manufacturing operations. By introducing lean manufacturing principles and technologies such as Profinet to reduce costs and improve competitiveness, GE expects to launch 11 revitalized product lines over the next few years, and in the process create more than 1,400 new jobs in the U.S.

“Lean has changed production processes through simplification,” said Frank. “Instead of bigger and more complex, the process has taken the facility back to basics. De-complication is one of the biggest gains through lean production.” Lean has also fostered greater teamwork between sourcing, technology and manufacturing, as well as stronger partnerships with suppliers.

Widely accepted standard

GE sources manufacturing equipment from machine builders in many countries, so their comfort with Profinet was a major consideration. “It seemed like all the suppliers we looked at were offering Profinet

solutions, which was important since it is the preferred Ethernet network for GE Intelligent Platforms automation solutions,” Frank said. “The suppliers that build the equipment, they’ve been pleased with it also. They like the ease of starting it up and the reduction in the man hours required to install equipment and get it up and running.”

Frank pointed to Profinet’s open standard as a corporate-wide advantage for GE. “We have plants around the country, not just in Louisville. Different plants will use different equipment because they have a different supplier base that’s local to them. Profinet lets us use multiple suppliers, so we can standardize on how we’re doing things but have enough flexibility that plants at different sites can still utilize their local base of suppliers and get the support they’ve always had.”

Flexibility, now and in the future

Frank sees the flexibility of Profinet as a key benefit. “It is a scalable solution. It will work well on a long production line, where everything is spread out. It will also work on a more compact piece of equipment where there is a lot of I/O concentrated. In fact, the greater the number of I/O, the greater our savings,” he said.

“In addition, as we start up a new factory, there are always things that end up changing; you want to try something or add something or change things. What’s nice is that Profinet allows us to add things easily. We can install a Profinet block and add some I/O or an additional valve pack. It really helps as we’re getting up and running. It saves us a lot of time when we have to make an alteration like that.”

Frank expects Profinet to benefit GE appliance manufacturing far into the future. “Profinet contributes in several ways. By reducing the cost of equipment, it frees up investment dollars to be spent on new products and features. And by reducing implementation time, products reach the consumer faster. The ease of adding or changing a machine allows new features to be implemented faster and for less cost. The result is that we can come out with more new products, so the consumer is the big beneficiary in all of this.”

