

Siemens Solution Partner gets automation project on track.

PROFINET and SIMATIC RFID critical tools to the project.

Plant managers were looking forward to celebrating upon the completion of a new control system, but the machine builder hired to automate their manufacturing process was struggling with the complex installation. Deadlines were slipping. The facility upgrade and the big investments funding it were in jeopardy.

With profits on the line, the tobacco products manufacturer knew it needed help — and fast. The company turned to Siemens, which recommended Mobile, AL based systems integrator Prism Systems, a certified member of Siemens Solution Provider program.

“Faced with a costly project failure, the company didn’t have time to research potential controls integrators. They hired us based on our Siemens Solution Provider certification and the fact that Siemens stood up and said these guys can make it work,” says Keith Jones, president of Prism Systems.

“We tend to gravitate toward the more complicated and challenging systems. There are a lot of firms capable of competing on simple controls projects, but a customer that requires a highly integrated solution needs a highly qualified provider,” explains Jones, who prefers to work upfront with customers in developing well-planned, well engineered installations. “Siemens and its partnership program helped us get there.” To help the tobacco plant effectively streamline operations, Prism Systems and its Siemens support team pulled the wraps off two brand new technologies from Siemens, PROFINET, and SIMATIC RFID.

Complexities Simplified: Component-Based Automation

The automation project Prism implemented is composed of a vast network of equipment, including dozens of machines that turn raw materials into an assortment of finished tobacco products. Historically, it’s been a heavily manual job with workers carting work in progress (WIP) bins of supplies to and from the devices producing, packaging, and preparing merchandise for the market.



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This would be one of the first testing grounds in the United States for Siemens new Component-Based Automationsolution which enables engineers to treat machines, processors — regardless of manufacturer, major sections of a factory, or even code as objects, thereby saving hours of integration time. In this case, the once difficult process of establishing communications between plant conveyors, hundreds of WIP trays carrying materials throughout the process, and production machinery was greatly simplified via Ethernet and the component-based approach.

“The facility’s system is so big, that one PLC (programmable logic controller) can’t control everything. There’s a tremendous amount of processor to processor communication configured over an Ethernet network,” says Alan Stabler, Prism Systems lead engineer on the project. “We put more than 20 controllers in the plant, and they all have to act as one integrated, intelligent system. The combination of the PROFINET component-based approach to automation and the SIMATIC iMap software package made the overall install much easier.”

PROFINET is a deterministic, industrialgrade communication solution, complete with built-in error checks, which virtually ensures the reliability of critical data transfers over a standard Ethernet network. “When you’re using a PROFINET deterministic network, you know when the system delivers a message it’s going to make it through,” explains Stabler. “It alleviates a lot of the headaches, including having to write PLC code

to handle message delivery failures we would have with other types of communication platforms.” PROFINET not only simplifies the engineering, it enables the customer to establish a flexible and scalable, future-ready platform architecture. That’s good news for the tobacco products maker, who plans to add new machines and bolster production to meet consumer demand. “If the plant ever wants to ramp-up its manufacturing capacity or replace old equipment, it’s going to be very easy now to add equipment on the production line,” says Jones. “We’re sold on PROFINET. There’s no question we’ll be using the system platform every chance we get, because it saves us and our customers money.”

Recycled Code Saves Time, Money

Jones and his Prism Systems team weren’t so convinced at the outset of the project. “I must admit we were not sure what to expect. We’ve been in this business a long time, and we often run into problems when we’re using brand new products or software releases,” Jones explains. “We were pleasantly surprised. The PROFINET installation and iMap configuration went extremely well.” Jones says the more object-oriented codinghis engineers can do, the more reusable the code becomes. That’s especially important when there’s a lot of equipment duplication involved across a large plant floor and complex network. When you’re a systems integrator facing a four month deadline on a project that’s already months behind schedule, every hour saved is important.

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"We were able to put ten good engineers on the project, get the project back on schedule, and then ease back down to a team of three to complete the job," recalls Stabler. "Typically, it would be very tough to have ten engineers working on the same platform, but Siemens approach to an integrated project, unlike most of its competitors, enabled our Prism Systems team to layout the object-oriented system without walking on top of each other."

"The investment of time and energy you put into coding the first machines are not required again when you start rolling it out to all the other similar pieces of equipment in the system," Jones added.

Graphically Configured versus Engineered System Communication

The graphical configuration of PROFINET and iMap delivers other big dividends over traditional, hard-coded engineered environments. You can actually see how the communications between systems and objects is working, and, as a result, diagnostics are a cinch for installation engineers, system mechanics, and even maintenance teams down the road. "If there's a problem with communications, it is immediately evident in iMap. Communications links that are not working properly show up red," describes Stabler. "I know in seconds where I need to focus my energies, and I do not have to rely on an operator interface to get system-wide information such as this."

Prism Systems was able to take full advantage of the graphical configuration and the function-based programming from Siemens to shorten the project development cycle. In the S7 development environment, you can write code as function blocks and deploy identical instances of this code, which eliminates the need for debugging code. Engineers write code for one machine, then, in the case of this customer, run the exact same code on 75 identical production machines. If a portion of the system isn't working, odds are it's a mechanical or electrical problem. Using function blocks or software objects makes the process of duplicating software from one machine to another less error prone.

Tagged For Success

Smarter production on the assembly line leads to better, fresher tobacco goods. "Before, it wasn't uncommon for trays of mid-production merchandise to sit around losing flavor and freshness by the minute," says Stabler. "By enabling the plant to intelligently track work in progress and automatically route materials to the right machine at exactly the right time, manufacturing capacity and product flavor has been maximized."

With the component-based architecture in place, Prism Systems enlisted Siemens read/write SIMATIC RFID tags to ensure the timely and efficient handling and tracking of materials throughout the plant. "In a large manufacturing facility, many different SKUs or product types are running simultaneously.

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RFID enables us to easily monitor products through every phase of assembly," explains Jones. "When an assembly machine requests more raw materials, the order is passed to multiple PLCs and the requested supplies are routed to the right machine and fed automatically into the hopper. RFID tags allow the conveyor system to query material as it moves from point A to point B and effectively track production stages as they're completed."

With as many as 3,500 bins of materials being delivered simultaneously through-out the tobacco production facility, RFID tags provide plant managers with real-time product status and, ultimately, better control of WIP inventories and manufacturing schedules. At any time, plant operators know how much product is ready for shipping, what time each lot was produced and packaged, and whether or not there were any manufacturing delays along the way that may have sacrificed freshness or flavor.

"We could have handled the application with barcodes, but the RFID tags simplified everything and offered up a level of reliability and quality of data the customer wouldn't have realized using other technologies," explains Stabler.

Bottom-line on the Assembly Line

While the tobacco manufacturer's initial misstep — hiring a machine maker to orchestrate extremely complex software and communications system installations — dealt financial and schedule setbacks, Prism Systems stepped in and rescued the controls portion of the project by delivering an effective automation solution on deadline. The object-oriented coding simplified a complex installation, saving time and money, and contributed significantly to Prism Systems' ability to deliver a quick system start up.

"It's proof positive that Siemens customers can put their trust in the Siemens Solution Provider program, which ensures the system integrator being considered for a project has the proper experience, training, and tools to do the job right," explains Jones, whose Prism Systems team has put improved production times and better materials handling capabilities well within reach of a customer focused on stream lining operations. "All phases of our client's project are not yet complete, but we have installed and commissioned all of the controls. As this project nears completion, our customer is poised to reduce manufacturing costs, improve product freshness, and begin to see payback on a great investment. They are definitely back on track for success."



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