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How Food Manufacturer Integrated 5 Lines During Building Construction, Aggressive Timeline

During construction for a 1-million-sq.ft. plant, a system integrator helped set up automation systems quickly for robust canning and palletizing.



From [Polytron, Inc.](#)

After being acquired by an international brand, a food manufacturer faced the challenge of consolidating and upgrading six lines from three different factories into a single facility.

That newly constructed plant spanned nearly 1 million sq. ft. and represented a major investment in North American growth by the parent company. Converting the enormous shell into a plant capable of reliable, efficient production was a huge task that fell to plant engineering staff. They were accomplished individuals and worthy of the charge, but also recognized it would be an arduous and risky endeavor – a once-in-a-career kind of project.

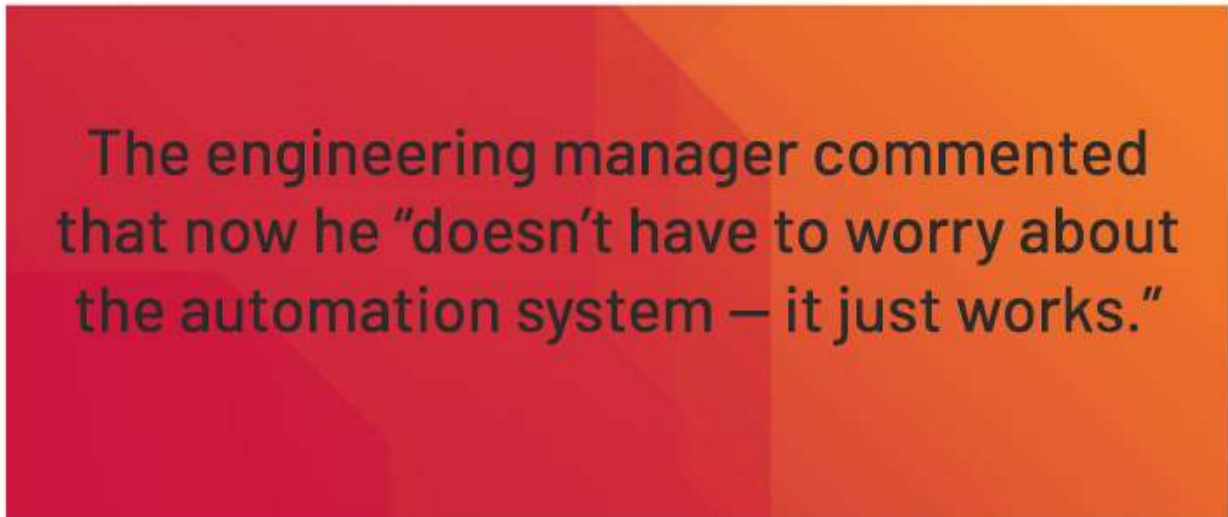
The project to consolidate the lines and transform the new building into a productive plant faced the additional pressure to be as time efficient as possible to maintain delivery of product to customers. The team also faced time pressure from the parent company, which was eager to see its funds going to good use sooner, rather than later.

Steps to Integrating Line 1

On top of the many challenges of a new building and new automated canning lines, the plant automation engineer was concerned that the automation system should be professionally designed, usable and reliable. He needed to be able to focus on any equipment that might malfunction and to have confidence that problems weren't with the automation system itself.

Rockwell Automation Solution Provider [Polytron](#) was engaged to write the software supporting packaging automation of both canning and palletizing systems for Line 1. The firm designed automation to control the line, so it would work correctly and perform repeatably, as follows:

1. Created equipment naming standards. Polytron devised naming standards using Rockwell Automation [PlantPax](#)[®] distributed control system (DCS) libraries, based on a Polytron template, that verifies future ease of location equipment and alarm conditions. This included standards for sensors, valves, motors and other automation hardware, applied across multiple systems in the facility.



The engineering manager commented that now he “doesn’t have to worry about the automation system – it just works.”

2. Defined a common human-machine interface (HMI) visualization for operator control of packaging equipment. A standard “look and feel” using PlantPax code objects was designed and applied across all the packaging lines so operators recognize the interface regardless of what position on which line, facilitating a more flexible workforce. ControlLogix[®], CompactLogix[™] and SLC 500[™] were implemented for the programmable automation controllers (PACs).

Polytron’s graphics library was tapped for controls. The system integrator also designed custom 3D graphics to mimic the installed equipment and use Rockwell Automation PlantPax libraries for standard controls for sensors, valves and motors.

Plant-wide, the thin client-based HMI system implemented across multiple lines for packaging and processing automation systems provided server stability in the hardware infrastructure.

The [FactoryTalk[®] View SE](#) distributed solution via multiple servers included:

- FactoryTalk HMI Server.
- FactoryTalk RSLinx[®] Data Server.
- FactoryTalk Directory Server.
- FactoryTalk Alarms and Events Server.
- FactoryTalk Studio 5000.
- RSLogix[™] 500.

3. Implemented programmable logic controller (PLC) code standards. To make troubleshooting, maintenance and reliability easier, Polytron modified its own standard PLC code objects for advanced control of equipment for zoning, recipe integration, alarming and system diagnostics. Rockwell Automation PlantPax code objects for basic controls for sensors, valves, and motors were also used.

4. Organized the multitude of Ethernet connected devices on the OT network.

The system integrator created a plant-wide addressing scheme for the operations technology (OT) network.

5. Defined security standards for HMI control using [FactoryTalk Security](#). The defined security standards for FactoryTalk Security span multiple lines with different security roles.

Performing the work in a new facility created challenges and frustrations, because much of the infrastructure usually taken for granted in established plants was also being installed as the team worked. The network, bathrooms, lighting, climate control systems and other basic amenities sometimes weren't functioning correctly because they, too, were under construction.

Benefits from Additional Engineering Horsepower

As work went on, the plant automation engineer came to invest more trust in the Polytron project lead, and he relied on the system integrator for additional responsibilities, including:

- I/O system design.
- Device and equipment naming standards.
- Machine to machine communications standards.
- Standards for PLC code.
- HMI graphics visualization standards.
- Security standards for plant controls.
- Managing line control standards with manufacturer's machine vendor contractors.

With the success of the Line 1 and palletizing systems, the plant automation engineer asked Polytron to stay on to provide design, programming and start-up for integration of Lines 2, 3, and 4.

Additionally, as the system integrator completed the packaging system, it also assisted with initial process systems implementation and start-up, helping the plant automation engineer bring it online in time for a visit by the investors.

Focus on Equipment Troubleshooting

As the lines went live and logged days and then weeks of production, the engineer commented that he "doesn't have to worry about the automation system – it just works."

The system was designed so that once the software is installed, problems with the automation system are rare. If there's any problem on the line, the engineer can focus on troubleshooting equipment, with confidence that the automation system is operating correctly.

Performance in the Hands of Operators

An important tenet of effective software design is consistent standards. Polytron's team further aided the plant automation engineer by following the same best practices when establishing each line. This means operators who understand the Line 1's automation system also can operate Line 2, Line 3, etc.

Also, consistency of user interfaces and documentation establishes a road map the manufacturer's personnel can follow in the case of maintenance, troubleshooting and even minor changes to the system – without needing to call the system integrator back in.

Benefits and Results of Polytron Partnership

The plant automation engineer has successfully commissioned 5 lines with Polytron, and he continues to serve as key and lead person responsible for the automation systems. The systems are dependable and deliver consistent, quality product 24 hours per day. The lines in the facility and the automation systems that control them are productive, robust and reliable.

Based in Duluth, Georgia, [Polytron, Inc.](#), is a Solution Partner in the Rockwell Automation [PartnerNetwork™](#) program. The firm is a CSIA CERTIFIED Systems Integrator, Cisco® Digital Systems Integrator, and 2015 and 2019 System Integrator of the Year, and brings almost 40 years of engineering experience to deliver full manufacturing systems and solutions.

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