

# THE CHALLENGE



## Meeting Customer Needs at Risk

Downtime, reduced productivity, and poor product quality raised the risk that a food and consumer goods packaging manufacturer could not meet customer needs and demand.



## Obsolete and Unsupported Equipment

End-of-life drives, unsupported controllers, and obsolete variable frequency drives (VFDs) were causing hours of downtime per week on the winder equipment creating poor product quality.



# Updating Aging Assets to Meet Market Demand

## Solution: Update, Optimize, and Restore

The extruder, webbing, and winding section of production was updated and optimized to resolve the obsolete components on the process side of the line. To abide by the manufacturer's budgetary planning requirements, Polytron plotted a strategy that prioritized the most problematic components for replacement and captured those that could be postponed. Control system errors were eliminated, new technology is supported by many vendors, and line capacity increased resulting in the ability to meet customer demand.



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# EXECUTIVE SUMMARY

## ► Packaging Manufacturer Takes on Aging Assets to Meet Market Demand

**Client:** Food and Consumer Good Packaging Manufacturer

### **Challenge:**

Obsolete equipment and related systems caused downtime that risked the company's ability to serve customers.

### **Solution:**

Update and optimize extruder, webbing, and winding section of production line and resolve obsolete components on the process side of the line. The work was done in two phases to minimize the problem quickly while also accommodating budgetary constraints.

### **Results:**

- Control system errors entirely eliminated
- Capacity available to reliably serve customers in the short and long term
- Widely used technology is implemented that can be supported by many vendors

### **Excessive Downtime Increasing Risk of Losing Customers to Competitors**

For a food and consumer goods packaging manufacturer running lean in a commoditized industry, downtime and reduced productivity increasingly raised the risk that the company would be unable to meet its customers' needs.

Its end-of-life drives and controllers often caused hours of downtime per week. Old proprietary PLC controllers were no longer supported by the OEM and spare parts were no longer available on the market. With the controllers reaching end-of-life, support resources had diminished until only one person knew how to keep the production lines running.

The manufacturer's variable frequency drives (VFDs) were also obsolete and no longer supported.

Poor product quality and frustration across the plant floor compounded the stress. Though it would be a substantial undertaking, the company's director of engineering knew the situation had to be addressed.

### **Select a Partner with Expertise in Deploying Smart Manufacturing Technology**

After identifying goals, the engineering director brought Polytron on as a consultative partner to support the technology, process and organizational changes required for success.

Working with other contractors, Polytron supported restoration of the facility by executing a number of engineering projects, including:

- Reverse engineered the plant's process operating system
- Created a new processor control system using simulation and conducted a software FAT, fine tuning the programming within 95% accuracy before going onsite
- Created the industrial network system architecture drawings and installation information for the Ethernet switches and PLC IP addresses
- Conducted an ARC flash audit and lock-out/tag-out (LOTO) equipment assessment to prepare a safe working environment; also established standardized LOTO processes for each machine and hazardous energy point
- Monitored energy usage throughout the plant and HMI visibility for control of the process system
- Supported startup and post-startup on an as-needed basis

The team determined that a complete update of the line would exceed the manufacturer's budgetary planning requirements. Polytron plotted a strategy that prioritized the most problematic components for replacement Phase 1 and captured those that could be postponed to Phase 2:

**Phase 1:** Update and optimize the extruder, webbing, and winding section of the production line which controls pressure and blending.

**Phase 2:** Resolve the process side of the line which manages winder and die temperatures.

### **Phase 1: Extruder, Webbing and Winding**

This section of the production line included multiple proprietary programming and several variations of drives with different vendor protocols. To ensure the work satisfied project goals and delays were avoided, Polytron conducted a thorough audit to ensure all details were addressed for the scope of work.

Unforeseen issues arose during the project, including:

- Obsolete PLC controllers required high level expertise, which Polytron engaged for the project. This extended the project schedule by two weeks but over the long term resulted in a tightly engineered and more reliable line.
- A loss of key manufacturer experts due to a voluntary buyout just days short of startup impacted tribal knowledge.

In the end, total execution time for Phase 1 was only six to eight weeks. Polytron executed shutdown and startup over the Christmas holiday, allowing the manufacturer to minimize production impact.

### **Phase 2: Process Side of the Line**

Preparing to execute Phase 2, the engineering team conducted a field audit to verify wiring and I/O as the drawings provided were not up-to-date. Collecting current info was critical to creating accurate design.

- The old PLCs were ripped out and new controllers were installed.
- Two obsolete extruder drives were upgraded to new drives.
- The process area was converted to Ethernet for consistent communication with the whole line.
- Production line HMIs were upgraded to process objects for standardized visualization across the total line.
- New schematics were created and the backplane of the control panel was updated.
- From shutdown to I/O checkout, the whole system was up and running product on day 22.



**“The Polytron engineering team goes above and beyond, sometimes troubleshooting issues not in the current scope and staffing a startup during the holidays – and even when the project funding had run out.”**

- Project Group Engineering Director

## Results

- Downtime due to control system errors is completely eliminated
- Less downtime means more line capacity, giving the engineering director confidence the manufacturer can serve their customers, even as demand grows annually
- New technology is standardized and sustainable by a variety of vendors
- Old PLCs from both Phase 1 and 2 were sent to a centralized asset inventory to be redeployed to other plants in the manufacturer's network.
- The entire production line was upgraded and able to communicate across new Ethernet.
- Operators have consistent HMI visibility across the entire line.



## About Polytron, Inc.

Since 1983, Polytron has been an industry leading system integration and engineering consulting firm delivering a broad spectrum of innovative manufacturing solutions. Polytron serves manufacturers in the food, beverage, consumer packaged goods, chemical, and life sciences industries across North America.

To learn more about Polytron, visit us online ([www.polytron.com](http://www.polytron.com)) or contact us ([www.polytron.com/contact-us](http://www.polytron.com/contact-us)) to talk to a specialist today.

