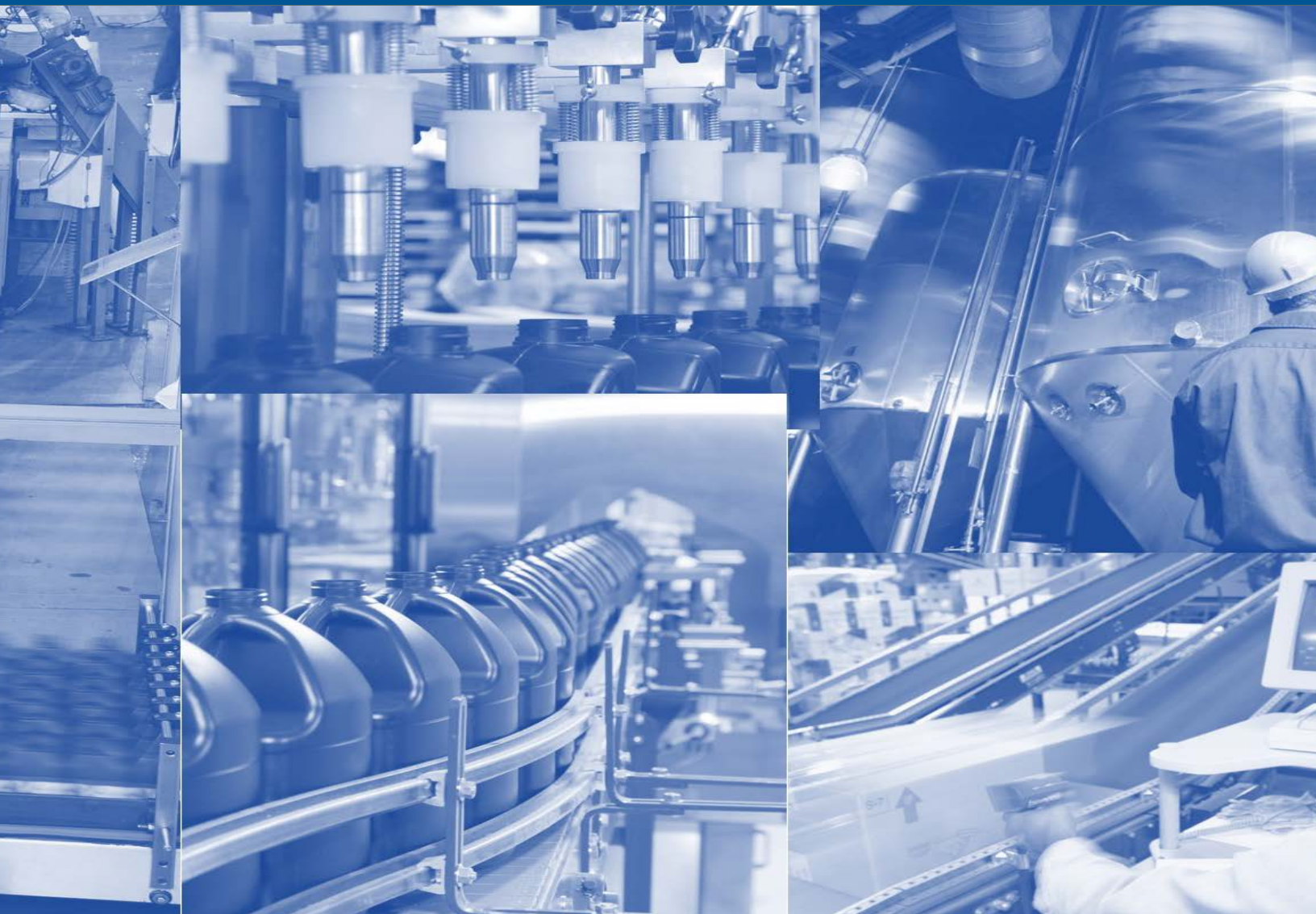




INTEGRATING AND ENGINEERING INNOVATIVE MANUFACTURING SOLUTIONS





OPERATIONAL EXCELLENCE WITH MINIMAL RISK

Polytron, a CSIA-Certified leader in engineering consulting and systems integration, 2015 and 2019 System Integrator of the Year and Digital System Integrator (Cisco). Applying more than 33 years of engineering expertise, we deliver Full Manufacturing System Services and Solutions from process to material handling, packaging, and warehouse - *anything inside the four walls*.

Polytron is uniquely positioned and fully qualified with certified best-in-class systems integration talent and industry expertise. This enables us to provide you with solutions that help you meet your project objectives while reducing risk and improving overall performance in:

- Process Systems and Utilities
- Manufacturing Intelligence / MES
- Smart Manufacturing
- Machinery Safety
- Automation and Controls
- Industrial Network and Security Solutions (INSS)
- Material Handling and Packaging Systems
- Workforce Development and Training

Grounded in a Partnership and Trusted Advisor Approach, our project delivery methodology provides your company with the value of a strong partnership based on trust – open and honest communications, collaboration, a focus on success for all parties, and a commitment to develop the most appropriate solutions. It is this approach that has established long-term relationships with the majority of our global clients.

Our **Process** of developing and deploying performance-based manufacturing solutions while ensuring your **People** fully understand your systems lowers your risk to achieve your business objectives - making certain your business realizes a **continuity of Performance**.

Our complete services portfolio and wide-ranging expertise combine with our focus on the delivery of your business objectives at a lower risk to make Polytron your one-stop provider of strategy, systems, equipment, processes, and training for manufacturing.

Clients: Fortune 500 companies - majority retained over 25 years.

Our Employees: 56 Certified: Project Managers, Electrical and Mechanical and Process Engineers, IT Professionals, Training professionals and support staff.

LOWER YOUR RISK WITH OUR PROJECT MANAGEMENT EXPERTISE

Polytron's engineering and technology expertise is positioned to lower your risk. Our certified Project Management Professionals apply expert knowledge in best-practices and standards to ensure the highest degree of project delivery in all areas of project management.

Our projects address a wide array of businesses, so rigid project management guidelines alone aren't flexible enough for practical use. Over time, we have customized and tailored PMBOK principles and practices to create our own proven project management methodology. Our project management methodology is the glue that holds everything on the project together.



PMP Certification

Our Project Managers are Project Management Professionals certified by the Project Management Institute (PMI).



Areas of Expertise

Process Systems and Utilities
Packaging and Material Handling
Manufacturing Intelligence
Smart Manufacturing
Industrial Network & Security
Automation and Controls
Workforce Development & Training
Machinery Safety
Project Management

Industries Served

Food
Beverage
Consumer Packaged Goods
Chemical
Automotive / Tire
Life Sciences

HOW POLYTRON HELPS YOU

Manufacturing Intelligence and MES: We develop, deploy and integrate MI/MES solutions to help you not just understand what's going on at the plant floor level, but also optimize your operation and utilize your resources effectively to improve profitability.

Industrial Network and Security Solutions (INSS): From Network Audit to definition and design, through Implementation and Validation, our roadmap ensures secure, standardized, and consistent network integration to enable plant wide information sharing. *Polytron was chosen to be one of the first Digital System Integrators by Cisco's Digital Transformation Group.*

Workforce Development and Training: As the plant floor evolves to a Smart Manufacturing environment, current workforce skills will also need evolve to efficiently respond to a data-driven work environment. Ensuring a continuity of performance, our certified training group deliver adult learning programs to close the skill gaps through internal and external training for long-term sustainability across your company.

Automation and Controls: The technical depth and understanding of the entire manufacturing process allows Polytron to provide you with single-point accountability to deliver a fully engineered, installed and commissioned system.

Process: For complete process system design and recipe control, we are your trusted partner for custom and standard solutions. Polytron helps you achieve a more Vertical Startup for your process system by validating, testing processes virtually and delivering flexibility.

Machine Safety: Through support of your Risk Assessment and the development of your Safety Functional Requirements Specification, we design and implement a remediation plan to help you lower your hazard and risk levels using industry-leading solutions. *Polytron is the first Rockwell Automation Machinery Safety Solution Partner in North America.*

HOW POLYTRON HELPS YOU

Smart Manufacturing Solutions: We develop solutions to use real-time data and technology when, where and in the forms needed by your people and machines to create fully-integrated, collaborative manufacturing systems that respond in real time to meet the changing demands and conditions of your plant. We provide solutions to connect your supply chain to operations and connect SAP with the plant floor.

Emulation: PolySimSM enables us to test and debug programming in the PLC and HMI prior to implementation on your plant floor, **reducing your risks.** Running a real-time computer model of the system is actually more effective than running the system itself in the field. Because emulation has the capacity to address variables and yield more useful data in a shorter period of time, your engineering team can run and test various "what if" scenarios without impacting production.

Manufacturing Consolidation: In an environment of creating efficiency and streamlining production, consolidation of manufacturing facilities is sometimes the most strategic business decision. From Master Planning to startup, Polytron provides full turnkey project management and execution services for your consolidation project.

Turnkey Operations Solutions: Polytron provides a single point of contact for your projects with a comprehensive solution offering. Our full set of engineering and project management capabilities start-to-finish, includes: front-end engineering discovery efforts; detailed design; construction installation packages; network integration; operator interface design; and total system training.

Industrial Network Upgrade

Challenge: Network performance communication issues between factory floor assets causing unplanned production losses.

Objective: Implement an industrial network architecture focused at increasing efficiency, enhanced reliability and planned expandability. Use updated standard networking technologies and methodologies. Better tool sets for network health diagnostics

Results: Architecture that focuses on improving operational efficiency through ease-of-use tools that improve productivity and to maximize the benefits of plant-to-business network convergence. Updated switching technology and high performance copper & fiber systems that meet and exceed enterprise and industrial networking standards. New network diagnostic tools readily available for plant resource use. Updated network documentation for new system.

The updated network provided the desired performance results and delivered a system that is secure, sustainable and scalable eliminating network-related production downtime and increasing availability to diagnostics.

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Blending Control System

Challenge: Fluctuating commodity oil prices created cost issues for client. Ingredient profile allowed use of multiple oils and created the opportunity for blending control system.

Objective: Modify oil-blending methods in nearly 30 plants to reduce shipping and manufacturing costs - maintaining product quality and consistency.

Results: Reduced ingredient and shipping costs; added flexibility; no unplanned interruptions and maintained product quality. Conducted over 14 months with three teams leapfrogging through sites often on successive weekends.

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Upgrading Obsolete Control System

Challenge: High speed beverage line had 93 obsolete Variable Frequency Drives (VFDs) that were no longer supported by the VFD manufacturer.

Objective: Replace all 93 VFD drives within specified downtime available.

Results: Line was evaluated and plan developed to meet the project requirements within the allowable downtime (3 days over 2 weekends). Coordinated pre-manufacture replacements for fast swap of drives. Line was up and running efficiently with all new drives in required timeframe.

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Global Consumer Goods Manufacturer Standardizes Entire Plant Code

Challenge: Inefficiency and manual labor resulted directly from programming and automation design deficiencies. Aging equipment and years of program changes by various groups caused excessive downtime.

Objective: Create new PLC program standards. Rewrite code for PLC controlling hundreds of motors, merges and switches. Validate code before installing.

Results: Created full PolySimSM emulation model to test new control system in real time. Full production ramped up as scheduled: three lines started up over 3-day period with a nearly vertical startup. Downtime cut in half and reduced partials by 85% - well exceeding the manufacturer's goals. Standardized code now makes it easier to spot equipment issues and make corrections quickly to reduce downtime.

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CONNECTING PROCESS, PEOPLE AND PERFORMANCE

Polytron's Workforce Development and Training Group provides your company with a broad spectrum of technical services from system analysis and planning to installation and certification. Our proprietary program delivers the development and management tools to strengthen your multi-generational workforce with effective knowledge transfer processes ensuring a continuity of performance across the organization.

As the plant floor evolves to a Smart Manufacturing environment, current workforce skills will also need evolve to efficiently respond to a data-driven work environment. While many discussions in the industry have centered around the challenge of finding new outside talent, the emphasis should shift toward a focus on workforce development for existing plant talent and closing the skill gaps through internal and external training.

Focused on delivering successful training strategies to your key production employees. Polytron, uses proven adult learning methodologies, to create and execute targeted training plans, develop effective materials, create easy-to-use learning aids, and facilitate hands-on blended learning events to ensure that your workforce is equipped to deliver stated business goals. The training program's goal is to close knowledge gaps and ultimately increase your Overall Equipment Effectiveness (OEE) by utilizing *your greatest resource – your people.*

Training Program Engages Staff to Meet Target Goals

Challenge: At a major consumer products company, training tools had become outdated and workforce productivity was slipping by almost 15% from the 60,000 cases per shift target goal.

Objective: Develop an updated training program that would deliver training in the areas of safety, start-up, shutdown, specific fault recovery and effective troubleshooting all in less than 16 weeks. The training program would engage employees and enhance training and knowledge retention.

Results: A client-branded site specific web-based program management tool organized and delivered everything needed to plan, train, assess, certify, track and report in-house training activities. Employees enjoyed the web-based program. Fingertip ready standardized training courses with the daily training plans, presentations, handouts, activities, checklists and assessments enhanced new employee training and established just-in-time training. Given the ability to track trainee progress and evaluate over the course of 30, 60, 90-days resulted in operation engagement and interaction providing almost 10% improvement in shift target goals.

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“The Wonderful Halos plant has been considered one of the best in class within our sister companies due to the focus we have on developing our workforce and continuously improve.

The team (both hourly and salary) has demonstrated great adherence to what we were taught during Polytron (Job Aid Development, ICP, and M.E.N.T.O.R) Workshops, keeping our training materials up to date, increasing training efficiency due to the development of subject matter experts and documentation of best practices and one point lessons shared across the plant. I truly recommend Polytron's expertise to make this happen.”

Sr. Production Manager, Wonderful Halos

MANUFACTURING INTELLIGENCE AND MANUFACTURING EXECUTION SYSTEMS

We develop, deploy and integrate MES/MI solutions to help you not just understand what's going on at the plant floor level, but also optimize your operation and utilize your resources effectively to improve profitability. Based on over 30 years of experience, we develop the most appropriate solutions using platforms from Parsec, Rockwell Automation, Wonderware, GE, among others.

These solutions include:

- Performance tracking and reporting
- Downloading work orders
- Confirming system changeovers
- Ingredient and product tracking
- Quality data collection and analysis
- Advance RFID systems
- SAP Connector from plant floor to Enterprise

Based on your requirements, we are experienced in integrating your MES/MI solution with your ERP and WMS systems.

Data Driven Decisions

Technological advances in automation, instrumentation and networking over the past several decades has resulted in a tremendous amount of diagnostic data being available for consumption. A typical manufacturing system easily can contain millions of data points. Sorting through this data to determine how to best use it creates unique challenges. A few of these challenges include:

- Data overload
- Untimely data
- Lack of User-based data
- Lack of context-based data
- Inaccurate data



Using Real-time Data Visibility to Improve Operations

Challenge: Global Beverage company needed to automate data management of full production process from supply chain to warehouse including batch system, ERP inventory system and FDA regulations and tracking

Objective: Create real-time data access and higher production visibility for improved quality control and reduced waste.

Result: Leading technology solution was programmed to match client's existing dashboards to provide visibility throughout the plant. Automated transfer of material usage, created exception reports reducing one full-time position. RFID and barcode system enabled tracking of all material lot information and pre-blending of ingredients. Provided reports for track & trace, scheduling, WIP, and batch reports for expiration date management to ensure product safety and quality and FDA reporting.

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Manufacturers' success over the coming years will be comprised of connected, data-driven processes that combine innovative automation, interactive connectivity, sensing and control, with a transformed workforce.

Rande Allen, Vice President, Polytron, Inc.

SMART MANUFACTURING

Polytron's Smart Manufacturing Roadmap helps you get started with small steps which can lead to major improvements in efficiency and help create a realistic plan to get your plant ready for the future.

The Smart Manufacturing-ready plant is fully-integrated, collaborative manufacturing systems that respond in real-time to meet changing demand and conditions. Production data is available on smartphones and tablets to view and control operations from anywhere, so you can have a bird's eye view of your entire operation, from procurement through finished inventory. Melding your manufacturing infrastructure with real-time data generated by your equipment will give your operations team the ability to make informed decisions at any given instant.

To achieve the benefits of Smart Manufacturing, manufacturers will need a clear set of architectural guidelines and products that tie together factory automation systems, enterprise applications, and the wider ecosystem of supplier and partner solutions.

Key components include:

- Upgraded industrial network to allow for operational upgrades.
- Open and scalable architectures for robust Industrial Ethernet and enterprise networks.
- Standards-based Industrial IP Ethernet switching and security services.
- New higher speed drives, controllers, sensors, etc. delivered on an industrial platform with scalable, secure, real-time performance.
- Access to video, cameras, smarter controllers, data, and real-time feeds from HMIs, wireless handheld devices, and scoreboards.
- Digital control systems with embedded, automated process controls, operator tools, and information systems, that are optimizing your plant operations and adding safety.
- Asset management with predictive maintenance tools, statistical evaluation, and measurement to maximize plant reliability.
- Smart sensors to detect anomalies and help avoid abnormal or devastating events.
- Smart systems integrated within the industrial energy management system and externally to a smart grid for real-time energy optimization.

Where to Start

Some of these upgrades are direct and more easily accomplished, others more complex and risky to operational performance. A thoughtful look at each of these items will help to develop a strategic plan. In most cases, interdependencies must be addressed before diving into an upgrade.

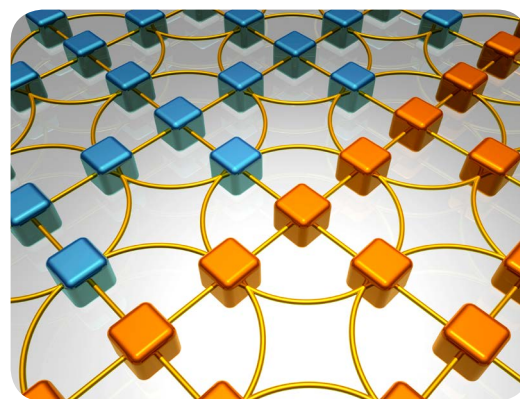
Regardless of whether you call it Smart Manufacturing, Converged Plantwide Ethernet (CPwE), Industrial Internet of Things (IIoT), or Industry 4.0, preparing for change at the plant floor level calls for a holistic view of the plant with a 3D top down view of the whole plant. The plant environment is not unlike an ecosystem where everything is connected and interdependent – that environment exists now.

A plan for future readiness goes far beyond parts and pieces, and anything less creates silos of technology which fragment this holistic approach.

Are you ready?

- Does end-of-life hardware and software run your plant floor decisions?
- Are you experiencing unscheduled downtime and productivity losses?
- Is your current network able to handle today's new smart technology?
- Do you have a plan for effectively using a higher volume of production data?
- How do you plan to increase production under the state of your current operation?
- What is the "view" of your plant for future readiness?

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Streamlined Workflow

Challenge: Global food manufacturer wanted to leverage power of automated workflow to increase visibility and access to its critical downtime, quality and other operational data.

Objective: Using existing software to create paperless workflow to automate standard operating practices to include every part of the plant, including quality, operations, plant management, IT and others.

Results: A system was designed based on User Requirements Specifications (URS) and implemented which: Automatically notified personnel of an event; Required standard step-by-step procedures; Checked to see if an incident is repeating; Provided search capability for centralized information; Allowed centralized storage of documentation and photos; Allowed centralized listing of events and current status; Provided automated emails to appropriate personnel; Provided traceability for all actions taken. Now provides company-wide visibility of all manufacturing sites across the company.

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Manufacturing Consolidation

Challenge: A global beverage company needed to merge two companies into one manufacturing organization. This required the most cost effective state of the new organization by consolidating production capabilities from seven (7) facilities into three (3) locations without disrupting the company's operational capabilities.

Objective: The project included: a major building expansion at one location; product filtering and blending; new chilling and blending, and throughout the system; a total of seventeen (17) production lines modified and/or installed; utilizing mostly used, relocated equipment; and one (1) line that incorporated the use of new equipment.

The execution of the project took approximately fifteen (15) months to complete, and the total amount of capital managed was \$40MM. Polytron provided complete responsibility for Batch process automation of the new batch/blending operation. Included full responsibility for electrical design, installation design, controls hardware supply, Batch, PLC and HMI programming and operator and technician training and documentation for all 17 production lines.

Results: Provided definition and execution services for the consolidation of multiple manufacturing capabilities and production volumes of liquid product from seven (7) locations to three (3), without disrupting the plants' operational capabilities. Provided project management, design, integration, installation management and system verification. Delivered the project UNDER budget and ON schedule.

CERTIFICATIONS AND ASSOCIATIONS



One of the first Digital System Integrators



MACHINERY SAFETY

Applying years of machinery safety engineering expertise in manufacturing, we help your company reach its safety program goals by meeting you where you are. Polytron offers you complete safety project delivery – including risk assessment through functional specification to remediation; validation and start-up; with training for operators and maintenance, to ensure that your workforce is ready to safely operate your equipment.

In March 2014, Polytron, Inc. became Rockwell Automation's first North American Machinery Safety Solution Partner. This Machinery Safety designation is reserved for an elite group of systems integrators that pass a thorough assessment of their safety application expertise, experience and capabilities, and shows a commitment to maintaining excellence in machinery safety applications over the long term.

Your company's manufacturing safety program will most likely require the modification of existing machines to reduce the hazard and risk levels identified by your risk assessment. It is important to choose a system integrator who is experienced in machine safety projects. This expertise allows you to realize benefits such as:

- Understanding of standards and how to effectively apply technology.
- Minimize machine downtime and impacted systems with a well-developed plan.
- Cost-effective changes that reduce the risk level of the equipment within the company allowable limits.
- Increase equipment efficiency (in majority of cases).

Risk mitigation creates necessary change for everyone's protection and in many cases provides operational improvement. For operators, a machine that has been upgraded with new safety features should be approached as new equipment.

Polytron offers you complete machine safety project delivery from functional specification to remediation to validation and start-up through to training for operators and maintenance to ensure that your workforce is able to safely operate the newly upgraded machine. ***Polytron is the first ever Rockwell Automation Machinery Safety Solution Partner in North America.***

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About Our Machinery Safety Team

Since earning the Machinery Safety elite status in North America, Polytron has consistently invested in the TÜV certification of select engineers to meet the growing machinery safety needs of its clients and ensure the highest level of safety solutions. TÜV machinery safety certifications are provided by various technology providers across the industry and Polytron has chosen to select technology vendor certifications to deliver a broader depth of expertise.

The team currently holds the following TÜV certifications.

- TÜV Rheinland Functional Safety Engineer (FSE) certified by Rockwell Automation
- TÜV SUD Siemens Functional Safety Professional (SFSP) certified by Siemens
- TÜV NORD Certified Safety Machinery Experts (CSME) certified by Pilz

Safety First - Putting Up Your Guard

Challenge: Global consumer goods manufacturer initiated a company-wide Environmental Health Safety (EHS) program. Risk assessments conducted by the manufacturer identified high risk areas requiring immediate hazard and risk mitigation.

Objective: Modify and apply safety solutions to lower the risk level to the company's stated range of tolerance. The goal – modify the machine without inhibiting the operation of the equipment.

Results: Equipment risk levels in the identified areas were reduced to an acceptable level. This required applying guarding, new software, safety-rated components and technology and creating isolated safety zones for efficient operation and maintenance. Training was conducted on the new machine operations. As a result, the workforce has integrated the new safety procedures and functionality into the regular maintenance and operation of the system.

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POLYSIMSM EMULATION

Polytron's PolySimSM helps you know what your system capabilities are before you buy, build or modify. Our process provides the tools needed to identify the existing capabilities of your system and the current or future constraints.

Through analysis, simulation, emulation and diagnostic tools, complicated systems and design problems are dissected into relatively simple representations that capture the essence of the relevant issues and ultimately, uncover verifiable solutions.

You can trust in our ability to replicate, investigate and verify – in real-time and under real-world, plant floor conditions – the validity and robust nature of all concepts and scenarios.

Our process has helped manufacturing companies save millions of dollars and hundreds of thousands of hours.

Risk Reduction and Management

Innovation and creativity are what drive your business to excel in the marketplace. Historically, these have come with the high price-tag of increased risk. Our use of PolySimSM to virtually build a system for the purposes of fully testing the automation and information systems reduces your risks – answering many questions before they are even asked.

*"I recommend using emulation every time. It helped our operators visualize how the line was designed to run and allowed them to challenge the line with various **what if** scenarios."*

To duplicate this on the production line would have been far more time consuming and costly."

Project Manager, Global Beverage Manufacturer



Instant Startup

Challenge: Global beverage maker decided to introduce a new package design involving a PET bottle that would need to filled in an Extended Shelf Life (ESL) environment. The new packaging line included nine brand new major unit operations, plus two existing operations.

Objective: The various subsystems came from a variety of vendors and suppliers, and the whole system needed to be integrated and get the system working together as a whole from Day One.

Results: An emulation set up of the new factory line using the customer's PLCs controlling a computer model of the line, tested, debugged and adjusted everything virtually. The operations staff conducted Factory Acceptance Testing (FAT) before the new equipment was installed. Accurate SOPs were written and training was conducted **before** the real line was installed. When the new line was in place, a water run was conducted on the entire line Day One with no control changes made for secondary packaging.

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SMART MANUFACTURING

DEFINITIONS

Industrial Internet of Things (IIoT) - network of physical objects or things embedded with electronics, software, sensors and network connectivity to enable these objects to collect and exchange data - from supply to consumer.

Converged Plantwide Ethernet (CPwE) - underlying architecture that provides the standard network services for control and information disciplines, devices and equipment found in Industrial Automation and Control System (IACS) applications.

SMART MANUFACTURING (Industry 4.0 / Manufacturing 4.0) - the use of real-time data and technology when, where and in the forms that are needed by people and machines. It is **fully-integrated, collaborative manufacturing systems that respond in real time to meet changing demands and conditions in the plant.**

Digital Transformation - the profound and accelerating transformation of business activities, processes, competencies and models to **fully leverage the changes and opportunities of digital technologies and their impact** across society in a strategic and prioritized way with present and future shifts in mind.



Innovative Manufacturing Solutions

Call today to learn how we might help you create innovative solutions for your manufacturing challenges.

1.855.794.7659 (Toll-free)

3300 Breckinridge Boulevard
Ste 100
Duluth, GA 30096

