THE CHALLENGE

Better Decisions - Better Project Outcomes

Best-in-class manufacturers use emulation and simulation to make better project decisions. Lowering risk with solution and design confirmation delivers cost-savings and faster production startup.

What if... Exploring the Options

What if - you could speed up/slow down equipment or lines without losing product.

What if - you and your team could "test drive"programming before it was installed.

What if - you and your team could run saleable product on Day 1 of startup.

Emulation: Lower Risk with a Digital Twin

Solution: Proven Results With Emulation

While there is no crystal ball to predict the outcome of a project, there is proven technology that delivers valuable insight into programming, line design, equipment and overall line performance. Emulation removes the guesswork, trial and error and delivers an efficient real time approach to confident outcomes.

POLYTRON

▶ Emulation: Lower Project Risk and Increase Certainty Outcome

Challenge:
Best-in-class manufacturers use emulation and simulation to make better project decisions.

Lowering risk with solution and design confirmation delivers cost-savings and faster production startup.

Solution:
What if - you could speed-up / slow-down equipment or lines without losing product.

What if - you and your team could "test drive" programming before it was installed.

What if - you and your team could run salesable product on Day 1 of startup.

Results:
- Lowers overall investment risks
- Reduces on-site testing time and costs for shorter startup time
- Increases control system quality
- Allows controls testing earlier in the project cycle
- Allows 95% debugging and verification before installation

Emulation: Lower Project Risk

Manufacturers face significant risk when it's time to update and upgrade operations. Issues like:

- Excessive production losses
- Inferior financials
- Low yield
- Poor quality
- High investment risk
- Unplanned downtime
- Growing market demand

…plus a host of other unmet KPIs and challenges push factories to embark on big changes.

But these changes have plenty of other challenges. Project managers and procurement professionals need strategies to lower the risk and shorten startup time required to:

- Design a new production facility
- Introduce new lines
- Expand production capacity
- Consolidate facilities and operations

PolySim℠ Creates a "Digital Twin"

PolySim℠ Emulation software allows operators and maintenance technicians to interact with a new PLC program and virtually control the line. The PLC reads the input from this dynamic model and directs the outputs in the model according to the logic. You and your team can verify the logic and confirm that the line will, in fact, operate as you intend.

Emulation vs. Simulation - What's the Difference?

An emulation model is a virtual clone or "digital twin" of your process, batch production system, or packaging line. It directs your PLC to handle real-time scenarios as if they are happening on the factory floor.

The emulation software lets you test control systems at various speeds and production levels, without moving physical product through the actual production line. Emulation is the only way to dynamically check the code in advance of implementation.

Simulation, on the other hand, is typically limited to code checking within the PLC—additional code telling the "real code" that it is working.

Unlike emulation, simulation cannot validate that the PLC code has the capacity to handle the dynamics and nuances of a real operating system using every possible running scenario.

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.

Versatility and Value: Control System Factory Acceptance Test

With PolySim℠ you can program, test and tweak all system components before you ever lift a screwdriver to begin your new installation or make changes. The PLC appears to be running the line, but it's just a perfect "emulation" of the line.

The possibilities are vast—from testing a ten year production forecast on your finished goods handling system today, to testing a new package size or format with no wasted time or product.

As you watch scenario unfold, you can identify and resolve problems before they occur. Typical issues that are adressed involve:

- Line layout
- Controls Programming
- HMI functionality
- Verification of operation of controls
- Alarms and enunciators
- Packaging changes
- Batch recipe management upgrades
- Troubleshoot line / production issues

The result is the ability to achieve 95% of the debugging and verification process before a single item is installed on site. That contributes to benefits like competitive advantage, peace of mind, and a significant amount of time and money saved.

Major Benefits of Emulation

1. Lowers overall investment risks
2. Reduces on-site testing time and costs for shorter startup time
3. Removes logic controls testing from the project's critical path
4. Allows controls testing earlier in the project cycle
5. Tests multiple scenarios without wasting materials
6. Increases control system quality
7. Improves working conditions for controls engineer by safer testing
8. Improves operator training and minimizes disruption to existing production
9. Makes overall project duration simpler to forecast and budget
10. Allows 95% debugging and verification before installation

Training with Emulation

PolySim℠ serves as an effective tool for training staff to run and maintain the working system because it looks and responds like the actual production line.

Not all employees who interact with the line have the time to experience the changes prior to the implementation of the project.

Consider a beverage manufacturing operation—using emulation on the HMI, the trainer can communicate the critical importance of bottle population, for example, by demonstrating the impact of too few or too many bottles on overall line operation and system throughput or changes to the process system.

> **"I recommend using emulation every time. It helped operators visualize how the line was designed to run and allowed them to challenge the line with various "what if" scenarios."**
>
> **-** Project Manager, Global Beverage Manufacturer

PolySim℠ Eliminates the "Fear Factor" for Employees

Operators and Technology Leads can learn to make changes to PLC code or troubleshoot the system without the anxiety of making an expensive mistake.

Examining scenarios in this way doesn't create waste or impact production, but it delivers meaningful lessons that stay with the trainee long after typical classroom instruction.

These are the desired descriptors of a successful training event integrated with up-to-date and modern emulation technology.

Unleash the Power of Emulation

For 20 years, Polytron has been successfully using simulation and emulation technologies to help diverse manufacturers expand and make major changes and decisions – without the stress and risk that comes with guesswork.

In manufacturing, the key to success is to manage risk and eliminate the unknown to the highest degree possible. Emulation is a strategic tool that lets you troubleshoot and perfect engineering solutions in a safe digital environment.

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)** or contact us **(www.polytron.com/contact-us)** to talk to a specialist today.

POLYTRON