

## **The Emulation Equation**

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Duluth, Feb 07, 2012 -- Has your company ever needed to add a new line, bring outsourcing in house, gear up for a new product launch, or rearrange your geographical footprint to lower distribution costs? By using the latest virtual technology along with a basic process, your business can be much more efficient and effective and get to market quicker. After all, every day without that new line is another day of lost revenue. So what do you do?

Technology has certainly evolved over the years, and this holds true in the manufacturing industry as well as most others.

For example, simulation programs are currently very popular because of their predictive power and general usefulness, but emulation is slowly beginning to demonstrate how to derive more benefit from system modeling. The tools involved in emulation are much richer -- and therefore more accurate -- than typical simulation utilities.

What kind of a difference can emulation make? Manufacturers can add a new line to the production facility in half the time, for half the costs and effort. This can even work with highly complex installations!

For example, a global leader in the consumer products industry recently wanted to add another input to the system at one of its large southeastern plants. This line would lead to a new high-speed palletizer. At first glance, the task sounded pretty straightforward: just add a new line. But there was a major problem - the manufacturer was under pressure to get the line up to capacity as soon as possible. The company's customer demand already exceeded the plant's capacity and the company was missing vital revenue on a daily basis. They needed someone to master this maze of conveyors, and they needed it done yesterday.

The options to address such a situation are: Traditional field testing, simulation, and emulation.

Traditional field testing requires that you have a system installed and powered up before you can even begin the debug process. This means that the controls engineers are waiting for construction before checking the first line of code.

On the other hand, simulation is basically "code checking code." This is merely more code in the Programming Logic Controller (PLC) that is used to tell the real code that

it is working. This doesn't validate that the PLC code is ready to handle the dynamics and nuances of a live operating system – and it doesn't include every possible running scenario. Controls engineers still have to spend a lot of time onsite getting the code working – and the line producing.

In this case, the best approach is emulation: a Programming Logic Controller (PLC) connected to and controlling a model of the real system. This is the only way to dynamically check the code beforehand with real-world scenarios and circumstances. In many cases, this approach can debug up to 95% of the code by time to go onsite. And, an added benefit is that the same emulation model is then used to train plant staff to run and maintain the system after to going live.

Using emulation to complete 95% of code debugging and verification off site, the company can get to market twice as fast. This is called, "The Emulation Equation." In practice, it means a simple, cost-saving, four-step process:

1. Create the emulation model and connect it to the PLC running the new code
2. Test the code in-house on an emulation model
3. Make any necessary adjustments
4. Conduct a final Factory Acceptance Test (FAT) using the emulation model

Putting "The Emulation Equation" into practice can help company and customer alike by lowering the cost of new system build and increasing the speed to market with finished goods.

**Contact Information:**

Name: Brent Stromwall

Company: Polytron

Telephone: (678) 328-2955

Email: [bstromwall@polytron.com](mailto:bstromwall@polytron.com)