

## It's All About Profitability!

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Let's face it, the electronics assembly industry is a low-value-added business. This does not mean that assemblers cannot be highly profitable. After squeezing material and equipment suppliers for lower prices and trimming the work force to run leaner, or moving production to low cost areas, what's left? The short answer: run your production more efficiently. New technologies now offer leaps in operational productivity.

### Uptime and cycle-time

Cost savings start with optimizing individual processes. One key to improvement comes from GE's six-sigma program: "If you can measure it, you can improve it." Measuring and defining a specific process facilitates finding the optimal solution. If the process in question is a bottleneck, minimizing the cycle-time may be the answer. When a tight process window is the issue, as in the case of lead-free reflow, operating in the center of that window becomes critical. If uptime is the issue, reducing changeover time may add efficiency.

Today's computing speeds enable software to search 100 percent of potential machine setups, rank them according to user-defined criteria, and select the optimal setup, all in a matter of a few moments. Optimization and equipment setup also can be performed offline from a host computer to minimize downtime.

Individual processes do not operate in a vacuum and will need to be networked for maximum efficiency. This allows continuous real-time process data from every stage of the line to be fed automatically to a host computer. With networking, line-balancing systems can help manufacturers tune their individual processes to secure maximum line efficiency. When running 24/7, preventive maintenance becomes critical. Monitoring the equipment and process allows for more efficient PM scheduling to maximize uptime. When technology exists to run your processes at the optimal level, why settle for just adequate?

### Quality and yield

Maximizing yield is important not only from a quality standpoint, but also because rework and production interruptions are expensive. AOI and other process monitoring systems enable cost-effective automatic real-time SPC charting. A real-time, automated calculation for each processed board, for example, will immediately signal when a process is no longer in control, thus allowing the process engineer to take corrective action prior to an out-of-spec situation. Immediately identifying the cause and feeding the information back to the line for corrective action saves valuable production time.

Technology transfer is another key to cost savings. A new application perfected on the pilot line is of little value if it cannot be transferred effectively to the volume factory. A "copy exact" policy for new product introduction is one solution, albeit an expensive one. An improvement on this policy is to standardize processes by quantifying and controlling how well production performs relative to its process window.

The maximum acceptable process window index is defined, and each processed PCB's corresponding index is tracked. Automated equipment setup software will facilitate exact and painless transfer of production from pilot line to high-volume assembly. Real-time monitoring data can be shared via Internet or Intranet with sister facilities and clients. A company can rest assured that the production quality in any of its worldwide factories will meet corporate standards when the process is automatically and continuously measured and monitored.

### Reduced labor costs

In recent years, assemblers have reduced labor costs by running lean. One consequence of this is that process engineers have been spread thin. Better assembly equipment and software now allow process engineers to define process parameters and delegate daily tasks to the line operators, much like an architect designs a building and lets the construction crew build it.

Another labor issue is high employee turnover. A constant influx of new and inexperienced personnel means increased training costs. Again, new technologies and software offer a solution. Modern software platforms can enable a novice to run a world-class process with two hours' training! Software to manage individual pieces of equipment or the entire process now includes operational intelligence to facilitate better staff allocation and reduced training costs.

After more than a decade of perfecting the production equipment, it's time to focus on running it more efficiently!

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