

Sized Right

New technologies boost appeal of retrofitting size-control systems.

With U.S. manufacturing on the rebound, many companies are investing in new equipment. Manufacturers seeking to maximize their return on investment (ROI) would be well-advised to consider a retrofit instead. A good retrofit can restore like-new performance to an older machine.

The need for a retrofit can be especially acute for a manufacturer working with an older size-control system.

SCSs typically consist of measuring devices, controllers, tool positioners and software that collects and analyzes data about parts being machined. They often are used in automotive, aerospace and other industries that require extremely precise dimensional control.

By taking advantage of proven retrofitting and refurbishing techniques, a manufacturer can dramatically improve the performance of an older SCS for a fraction of the cost of new equipment.

Problems with Old Systems

Many manufacturers operate SCSs that are 10 or more years old. Often, they fail to realize that these older systems lower their operational efficiency and part quality, thereby raising their production costs.

Many automotive parts manufacturers use SCSs to produce alternator housings. A setup might include fixed tool positioners with a microcontroller down-line; three gage heads, to monitor finished-part IDs and ODs; a pneumatic gage with its own controller; and two electronic gage heads multiplexed into another control unit. Using four controllers for a single machine tool may seem excessive, but it was the norm 15 years ago.

Not surprisingly, the finished parts from these types of manufacturing lines often don't meet specifications. In some cases, certain system components may not even be working, and the machine operator may bypass these nonfunctioning components entirely.

Moreover, older size-control equipment is often associated with an unacceptable scrap rate, which wastes both time and money. And as system components age and machine precision decreases, replacement parts can be difficult to find.

Older SCSs do not incorporate statistical-process-control or networking capabilities. They require the operator to make incremental adjustments to the machine to compensate for errors. This trial-and-error approach lacks accuracy and leads to constant process oscillation.



The older size-control system shown here incorporates four pneumatic controllers—one each for the two tool positioners and one each for the two pneumatic gage heads. Newer SCS controllers, such as Samsomatic's Model SC3, save floor space. A single SC3 can perform the work formerly done by four pneumatic controllers.

Using outdated equipment also complicates—and increases the costs associated with—troubleshooting, maintenance and training new operators.

To Retrofit or Not

How does a company know whether to retrofit its SCS or buy a new system? A good rule of thumb is that the retrofit should cost no more than 60 percent of the cost of new equipment. If this is the case, a retrofit is likely to deliver a greater ROI than buying new.

Here are some common indicators that a retrofit is in order:

Unacceptable scrap rate. Every company will have its own definition of what unacceptable means. Cost is the bottom line. If a large percentage of parts that come off the line have to be tested, a retrofit might be in order.

New customer requirements. A customer may tighten its tolerance requirements, for example, because of a change in its quality standards or for environmental reasons.

New capabilities needed. Older SCSs typically lack a robust SPC system, making it difficult to collect or use data from the manufacturing line. In addition, most older systems are expensive, awkward and difficult to connect to a network.

Noncommittal customers. Some customers are unable to commit to a long-term agreement to purchase parts, making the supplier reluctant to invest in a new SCS. A retrofit allows the supplier to maintain production efficiency for a smaller investment.

Benefits of Retrofitting

Retrofitting an SCS provides an array of benefits, including decreased

scrap, rework and downtime, and increased throughput.

Typically, a retrofit reduces scrap 20 to 40 percent, rework 40 to 60 percent and system downtime 30 to 50 percent while boosting part throughput 20 to 30 percent. Payback can occur in as few as 6 weeks.

In addition, retrofitted equipment is easier to maintain because spare parts are more readily available. And, retrofitting can save floor space. Samsomatic's SC3 controller, for example, can replace up to four older controllers.

Another advantage is the ability to create a closed-loop system that can receive and process input signals from gage heads, minimizing operator error. SPC can improve both process-capability (C_p , C_{pk}) and machine-capability (C_m , C_{mk}) values on the line, and the compensating strategy can deliver more precise control via multiple-parts averaging. This increases dimensional precision and part-to-part repeatability.

Centralizing control also streamlines training. And because today's controllers are Windows-based, they are easier for operators to learn and use.

Troubleshooting is simplified, too, because one display allows viewing of all input/output signals simultaneously. And, automatic SPC frees operators and engineers from the time-consuming tasks of logging data and making calculations offline.

Choosing a Retrofitter

Like any equipment purchase, the decision to retrofit or not should be made carefully. And if a company opts to retrofit its SCS, equal care should be exercised when choosing the service provider. The following criteria should

be met when selecting a retrofitter:

■ Payback is a key consideration. The retrofitter should be able to demonstrate a clear ROI for the project.

■ The retrofitter should have an established track record and be able to work with products from multiple companies.

■ The retrofitter should provide a concise timeframe for completing the project. A quick turnaround minimizes downtime.

■ The retrofitter should provide a complete solution. It should offer training that allows operators to quickly get up to speed on the new SCS. Ongoing technical support is important, too. The retrofitter should also be able to provide a total system, one that encompasses gaging, tool positioning, controls and software. In most successful implementations, a customer-support team—comprised of a service technician, sales engineer and technical expert—is involved.

■ Lastly, it's important to establish and keep the lines of communication open. The retrofitter's representatives should understand the customer's goals, priorities, timeline and budget up front. And the partners should maintain a dialog during the project to ensure it stays on track.

The company that keeps these criteria in mind will be well-positioned to maximize the return on its manufacturing equipment investment.

About the Author

Wilfried Nordhoff is president of Samsomatic Ltd., Plymouth, Mich., and Samsomatic Fertigungstechnik GmbH, Frankfurt, Germany. For more information on the company's products and services, call (734) 455-3434 or visit www.samsomatic.com.