



Standardize Automation System Components for Smart, Strategic Asset Management

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In this tight economy, industrial companies are seeking new ways in which to maximize productivity while driving down operating expenses, engineering and maintenance time and costs. Here's how some companies are getting that done...

Virtually every industry is being affected by today's economic crunch, whether they are manufacturing industrial or consumer products, or processing and packaging food and beverage products, chemicals, pharmaceuticals and the like. And, virtually all industrial plants rely on automated machinery and systems to keep operations running efficiently.

To save time and money, some companies are now standardizing machinery and automation system components as much as possible, and outsourcing production of configured components to qualified suppliers. In doing so, they have found it faster and easier to assemble and/or reconfigure shop floor systems and to replace machine parts as needed to keep equipment up and running to meet production needs.

Outsourcing of configured components has also proven to deliver financial value that reflects in a company's bottom line. Some adopters of this strategy cite measurable savings on component costs when compared with the cost of in-house or job shop machining. Others have noted that their cash position has improved due to reduced inventory – especially if the standardized, configured components can be delivered reliably and affordably on short notice.

Configurable Components: A Practical Approach

Understanding the concept of configurable components is relatively simple. Automation and motion control equipment and machines, no matter how specialized, are typically comprised of a number of individual components, such as linear shafts, actuators, bushings, linear guides, locating pins, ball screws, as well as extrusions, machined steel plates and associated hardware.

Reputable suppliers have the ability to configure these kinds of components to extremely precise specifications relative to dimensions, materials, machining and finishes. Once designed and configured to the end user's specifications, they can be standardized within a database and given a unique part number for easy reordering via the supplier's catalog or online ordering site.

Build vs. Buy: Decision Factors

Let's take a look at some of the factors an engineering manager would need to consider in deciding whether to build or buy a single-axis, motor-driven, ball screw linear actuator – a commonly used mechanical component in automated machines and systems.

To **build** the linear actuator, an engineer must calculate:

- the forces, loads and tolerance build-up for each discrete component used in the actuator
- the mechanical specifications relative to size, strength, dimensions and fit
- the functional life of each component, including overall durability and maintenance requirements
- any specialized environmental or industry requirements concerning construction materials, surface finish, lubrication requirements, friction or noise generation

Only after these calculations and evaluations are complete can the unit be specified and the components ordered. If a variety of vendors are used, the user must await delivery of all components before starting the build.

To **buy** a linear actuator, the engineer can evaluate offerings from one or more preferred suppliers using printed or online catalogs. The correct size, speed, accuracy, positioning repeatability, load, total stroke, motor capability and other feature information need to be factored in. However, this information is usually provided by reputable component suppliers at the overall unit level, not at the granular level of each of its discrete components. Thus, an immediate time savings is realized right at the start.

Additional questions concerning the functional durability of the unit, its lifespan, maintenance requirements, and availability within the desired timeframe can usually be answered swiftly via detailed catalog data, technical sheets or a telephone call.

Pricing is always a prime factor, of course. When pricing the build of a linear actuator, there's the obvious expense of purchasing individual components separately, often from various vendors with all the associated paperwork. A single-axis motor-driven ball screw actuator will require multiple parts, including ball screw, guide, support units, brackets, stopper, table and base. Added to these costs are the time and labor required for design, assembly, testing and inspection.

By contrast, by configuring and purchasing a linear actuator online from a reputable supplier requires only the selection of the most cost-effective solution – which typically will come in lower, often dramatically lower, than the build cost. And, since maintenance of a purchased unit is generally lower, long-term cost of ownership is also reduced.

These are the reasons why many leading industrial firms have decided to purchase configured components from a single, reliable external source. Simply put, the cost is lower costs, it takes less time – and allows more predictable budgeting because design costs are minimal and procurement is fast and easy.

MeadWestvaco Saves Costs With Configured Over Custom-Built Components

MeadWestvaco Corporation is a leading designer/builder of automated packaging systems for the food and beverage, media/entertainment, personal care, home and garden, cosmetics, and healthcare industries. The company replaced its custom-designed mechanical components with configurable components from Misumi USA, a global supplier of standard and configurable mechanical components for automated assembly and motion control.

MeadWestvaco's systems comprise a large number of mechanical parts which need to be precisely sized for each of its machine systems. Michael F. Flagg, P.E., a senior design engineer for the company's Consumer Solutions Group, explains how the configurable component concept meets MeadWestvaco's needs.

"We are always looking for new ways to improve the efficiencies of our projects," Flagg notes. The group decided to test the concept by retrofitting one of MeadWestvaco's most popular multiple packaging systems – the Duodozen® 1250 Series – with configurable mechanical components. The result? Cost savings of about 50 percent on configured components over custom-made parts. "This was huge," he says, and the results led him to encourage colleagues to design and engineer other machines around the idea of using configurable components.

MeadWestvaco engineers now download native CAD files directly from their supplier's Website and insert the files directly into the machine drawing, which eliminated the need to create additional engineering drawings.

"The components arrive perfectly machined and ready to use, so the applications now open to us are virtually limitless," Flagg reports. "We used to avoid using machined components such as linear shafts because they were too expensive. Now we can get them exactly how we need them at a fraction of the in-house cost. And, with no minimum order required and rapid delivery assured, we can even create trial-and-error prototypes and stay within budget." For MeadWestvaco, the result has been better machine design and performance, as well as improved modularity and repeatability – all at a lower cost.

ATS Reduces System Design and Maintenance Time and Costs

Automation Tooling Systems, Inc. (ATS) provides custom-designed manufacturing automation systems to customers around the globe. Headquartered in Cambridge, ON, Canada, the firm has 17 manufacturing facilities in the U.S., Canada, Europe, Southeast Asia and China.

ATS engineers discovered Misumi's configurable components as the company was planning to launch its FlexsysPAK System, a highly modular, automated packaging, assembly and dispensing platform based on the company's Supertrak pallet conveyor line.

ATS builds FlexsysPAK Systems to each customer's application specifications. Traditionally, bringing such a complex product as FlexsysPAK to market would require substantial lead time because of the hundreds of different components involved. However, using dimensionally precise configurable components along with Misumi's online CAD Configurator, ATS was able to reduce engineering requirements and time-to-market.

"Using the configurator minimized the time needed to make 3-D models of purchased parts," says Mike Baljak, CAD support specialist for the mechanical design group at ATS. "Previously, modeling a part not available in our library would require searching the supplier's catalog then modeling the part from the dimensions provided, which increased the possibility of modeling errors and rework. Now, it's as simple as logging onto the Website. It makes designing more efficient, which saves time and money, and gives us time to focus on more important aspects of the design, such as increasing quality."

To facilitate ordering, once ATS engineers have parametrically configured the standard automation components needed for each customer assembly being designed, they can download the native CAD file directly into the assembly model. The component then becomes a purchased item which is added to the bill of material.

Different component materials and surface finishes can also be selected, and dimensional specifications can be selected in 1-millimeter increments. Additional design options include wrench flats, the location of the wrench flat, set screw flats, key grooves and V-grooves. The end result is a vastly streamlined process for the design and delivery of ATS automated systems, as well as for maintenance and part replacement down the line.

Configurable Components: A Competitive Advantage

As we have seen, some key benefits these industrial companies have realized by replacing custom-built automation system components with standardized configurable machined components include:

- Cost savings of up to 50 percent over the cost of in-house or custom production and machining
- Reduced engineering and build time by up to 60 percent, resulting in greater efficiency and faster time-to-market
- Greater modularity and flexibility of systems and interoperability of parts

Finding a global supplier that can quickly deliver high-quality configured components at competitive prices can provide a strong competitive advantage for industries reliant on plant floor automation. In addition to the dramatic time and cost savings cited, implementing this strategy can help open the door to greater flexibility in plant floor system design – and potentially pave the way to pursue new opportunities that may previously been considered too costly to undertake.

To sum up, configurable components offer the best of all worlds because they combine the reliability, price and lead times of stocked components with the design flexibilities of custom components – all without the hassle and expense of doing the work in-house. That's undeniably an effective way to manage plant assets and constrained resources in tight economic times.

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