

## Providing a flexible and affordable motion control platform for specialty manufacturers

Manufacturing is becoming more focused on providing motion control, embedded intelligence, and even robotics. Methodologies such as Industry 4.0, the Internet of Things (IoT), and Smart Manufacturing are helping to drive these changes and compel companies to create a tighter integration between operational and informational technologies.

For original equipment manufacturers (OEMs), these trends mean they are under intense pressure to build more sophisticated machine control into their products and processes while keeping costs as low as possible.

"Many manufacturers think using machine control for motion is difficult and expensive," says Clay Shoup, industry account manager for Omron Automation Americas. "But the Omron Sysmac platform provides an integrated and affordable solution for automating functions, including the complex axes control required for motion. Components are compact, modular, and easy to wire, which means OEMs can integrate them while laying the groundwork for adding more control capability when needed."

### Automation enables OEMs to standardize and compete globally

Omron recently consulted with two small industrial equipment manufacturers to help them optimize how they use automation to compete. The first company is a market leader in industrial band saws for metalworking. The second company specializes in manufacturing precision chassis castings and machining solutions for automotive customers around the world.

Both companies are vulnerable to firms offering similar products at lower costs. The band saw manufacturer responded by adding machine control to some products using components sourced from multiple vendors. The custom fabrication manufacturer's situation was somewhat different. They were looking for ways to further automate its assembly processes as a way to drive higher efficiency and quality.

"Both companies required a more rational approach to machine control in general and motion in particular," says Ray Driver, industry account manager for Omron Automation Americas. "They really wanted an affordable and flexible platform for using automation as a competitive advantage."

### CP1 series of programmable controllers anchors new strategy

Cost was a key issue for each company, and controllers are often the most expensive component of any solution. After reviewing each project's requirements, Omron recommended using the CP1 series controller for position-control tasks.

The CP1 series is compact and modular, which makes it ideal for integration into existing equipment and as a logic device for adding motion to manual processes. Despite its small size, it is a full-feature PLC capable of multi-axis positioning and simple loop and variable speed control. Its high-speed pulse outputs support connections for up to four encoders, while Ethernet-compatible units include socket services that simplify remote access and communication in connected environments.

### ■ Business Need

Automation adoption in manufacturing processes may not only result in higher production throughput; it also allows for greater uniformity and conformity to quality specifications. The high cost and complexity associated with setup however is often a barrier for implementation.

### ■ Unique Solution

The Omron CP1 series of machine controllers provide a scalable, economic, efficient and easy to use platform to integrate motion and build automation processes. Coupled with Omron's extensive product offering, manufacturers are able to take advantage of global scale and product breadth.

### ■ Customer Benefits

The CP1 series is compatible with CPU-powered Omron machine controllers, including the NJ/NX series. Because Omron components are designed to work together, users can preserve original investments while adding capabilities such as vision, sensing, and robotics as they grow.



"The CP1 is compatible with a wide range of sensors, switches, inverters, relays, drives and programmable terminals," Shoup says. "Customers can replace multiple suppliers and use it to create a variety of automation solutions."

## Function blocks simplify motion programming

Until recently, small manufacturers have often avoided machine control because they considered the technology too complex. While some control products, in fact, do require the combined efforts of a team of programmers, Omron automation solutions are different.

"Omron provides software with function block libraries and one-key inputs that makes programming simple," Driver says. "You don't need a programming team to automate or do motion. One person can copy and paste function blocks and assemble programs."

The PLC software used with the CP1 also contains function blocks for setting parameters and reading and writing data. An available set of MODBUS function blocks provides real-time control and monitoring of up to 31 inverters, and a built-in editor allows users to write and insert structured text if needed.

## Omron machine control is designed to evolve

Because machine control is becoming pervasive across industries, Omron designs its solutions so they can adapt to many roles while continuing to evolve over time. This flexibility was critical to both the band saw manufacturer and the custom fabricator. Decision makers at both organizations saw the value in being able to add vision, sensing, and robotics to their initial CP1 investment.

"They wanted more scalability and a pathway for growth," Shoup says. "Because so much of the Omron platform is integrated, it is easy for customers to move from fairly simple to more sophisticated automation and even robotics."

Customers can add more powerful machine controllers, such as the NJ/NX series of devices, for example, while continuing to use the CP1 series where appropriate. Unlike the CP1, the NJ/NX series allow reprogramming, local storage and integration with up to three relational databases over Ethernet, EtherNet/IP, EtherCAT, PROFINET or DeviceNet. With EtherCAT, the NJ/NX series also provides synchronous control from input through to output and refresh cycles with less than 1 microsecond of jitter between units.

Programming remains simple even as the platform becomes more sophisticated. With the Omron Sysmac Studio software suite and its integrated development environment (IDE), customers can continue to insert function blocks and structured text directly into ladder programs while gaining advanced functions such as name confirmation, serial ID matching, administrator access rights, controller write protections, and 32-digit security passwords to help prevent unauthorized connections to the system.

Omron's global network of automation centers, technical offices, and authorized distributors also means customers enjoy ready access to machine commissioning and other services.

"Omron makes automation a very affordable investment," Driver says. "Its simple designs and centralized controls make it practical for any size manufacturer."

Omron Automation is a global automation partner that creates, manufactures and services fully integrated automation solutions. We provide controls, vision, safety, motion and robotics for the automotive, semiconductor, food/beverage, packaging, pharmaceutical and infrastructure industries.

For over 80 years, Omron has helped industrial businesses maximize potential by solving problems creatively. Currently headed by President Yoshihito Yamada, our company is 36,000 employees strong—providing products and services in more than 110 countries worldwide.

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