

Wind River Helps Omron Shape the Factory of The Future

IoT-Powered Innovations Drive Digital Transformation in Manufacturing

The “factory of the future” is no longer a far-fetched vision—it’s happening today. The global trend toward data-driven manufacturing leveraging the Industrial Internet of Things (IIoT), Big Data analytics, and robotics is accelerating at a rapid clip. For automation developers, the growth potential is enormous. In a survey of IoT engineers conducted in 2016 by VDC Research, nearly two-thirds of respondents agreed that manufacturers are not yet realizing the full benefits of IoT connectivity. And VDC analyst Jared Weiner listed “data-driven manufacturing” as the top IoT trend to watch in 2017 (www.vdcresearch.com/News-events/ias-blog/Five-Industrial-Automation-Trends-in-2017.html).

Japan’s Omron Corporation is at the forefront of this smart manufacturing revolution, bringing integrated, intelligent, and interactive automation to production facilities around the world. A global leader in industrial automation, Omron is guided by its vision, “Bringing innovation to manufacturing through automation and enriching the lives of people around the world.” It’s a company that prides itself on collaborating with business partners and customers to “make innovation happen.” Omron’s Industrial Automation Business Unit serves customers in some 80 countries with a wide range of products, including factory automation controllers, sensors, switches, relays, and safety equipment.

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— Toshiki Natsui, Manager, Controller Product Management Group, Omron

OMRON CORPORATION

Industry

Industrial Automation
Business Unit

Solutions

- VxWorks
- Wind River Linux

Benefits

- Rapid and large-scale innovation in manufacturing processes leveraging IIoT and Big Data
- Development of an industrial PC (IPC) factory automation platform that integrates advanced control capabilities with data collection and analytics
- More intelligent, integrated, and interactive factory equipment and systems
- Flexible platform for rapid development and deployment of IoT applications
- Differentiated offering with a choice of reliable, robust, and secure Wind River real-time operating systems

THE CHALLENGE

Integrating Control, Data, and Development Capabilities into a Single Platform

Omron's programmable logic controllers (PLCs) enjoy a commanding market share, and the company is known for deep expertise in factory operations. Yet Omron's controller product team was well aware of emerging challenges and opportunities in the market, notably the growing demand for IoT capabilities in factories. The ability to collect and analyze information from interconnected machines on the factory floor holds tremendous promise for process innovations and efficiency gains in manufacturing. To deliver on that promise, Omron needed to bring a new type of control solution to its customers. And to make that solution happen, the company turned to Wind River®.

Two key challenges for bringing IoT into factories became apparent from the beginning.

"First, the PLC should not only control manufacturing systems but it also needs to work with general purpose PCs that are processing the data generated by those systems in the factory," explains Toshiki Natsui, manager of Omron's Controller Product Management Group.

"Second, the solution has to be able to handle complex application development needs. There is a wide variety of applications, especially for semiconductor manufacturing equipment. We recognized a big demand for a controller that allows for flexible application development using advanced programming languages."

Working closely with customers in the field, primarily in the automotive and semiconductor manufacturing equipment sectors, the Omron team began development of its first industrial PC (IPC) control platform. The goal was to create a total control solution combining advanced control capabilities with the ability to aggregate data from connected systems and devices. In addition, the PC-based control platform needed to meet high quality standards for performance and long-term reliability in harsh industrial environments.

THE APPROACH

Combining Secure IoT Connectivity with High-Speed, High-Precision Real-Time Automation

In mid-2016, Omron launched its IPC product line, a PC architecture-based platform that meets the strict quality and long-term reliability standards required for factory automation (FA) devices. The platform helps make manufacturing equipment smarter, improving productivity and output quality through IoT connectivity and Big Data analytics. It's part of the company's fully integrated Sysmac automation platform, which extends synchronous control across the entire factory floor.

Featured in the new IPC product line is the IPC RTOS Controller, built with a real-time operating system, which enables manufacturers to program real-time control of machine functionality while simultaneously executing advanced data processing tasks. The developers knew they needed a proven, secure, and reliable real-time operating system to address their customers' challenges. This is why the Omron team decided to offer their customers a choice of two industry-leading operating systems: VxWorks® and Wind River Linux.

"VxWorks has a well-established reputation in the semiconductor manufacturing equipment market, which was our initial target," Natsui says. The version of VxWorks they selected also includes VxSDK, an integrated development environment that enables end customers to build applications efficiently for VxWorks-powered devices.

Wind River Linux enables end users to take advantage of open source technology on a commercially optimized platform, reducing much of the complexity of managing the Linux kernel while leveraging the flexibility and efficiency of an open source OS.

"The IPC RTOS Controller supports both real-time control and information technology in one box," Natsui says.

"Users can choose VxWorks or Wind River Linux, depending on their preferences. Either way, they get fast and highly accurate automation technology combined with a flexible development and programming environment."

THE RESULT

Delivering the Factory of the Future, Today

Having successfully launched the IPC platform, Omron's industrial automation team plans to build on the experience to help more of their customers leverage IoT capabilities. "We can help our customers connect systems on networks inside the factory and optimize operations based on the data they generate to increase productivity," Natsui says. "It's not an easy thing that just anyone can do. We are in the unique position of having all the products required for generating, collecting, and analyzing data."

Omron is building on these strengths to advance its IoT capabilities. "Right now, our expertise is focused at the factory level and real-time data analysis at the edge. We are collaborating with partners who have expertise in cloud-based Big Data analytics and artificial intelligence, which will enable us to offer comprehensive IoT solutions to our customers."

Wind River stands to play a key role in Omron's IoT initiatives. "One of the biggest IoT challenges is security," Natsui points out. "We're looking at Security Profile

for VxWorks as a means of securing devices." Device management is also increasingly important to customers, he notes, and tools such as Wind River Helix™ Device Cloud for monitoring and maintaining field devices remotely are becoming imperative.

Companies like Omron, that are driving the digital transformation in manufacturing, rely on Wind River for both the technology and the expertise to turn intelligent IoT concepts into reality. "Wind River is leading IoT initiatives from the edge to the cloud," Natsui says. "It is one of the few companies that share our perspective on the IoT and view its potential the same way we do."



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