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Industrial Automation Enters the Internet Era

Rockwell, Emerson, National Instruments and other industrial OEMs are leading the charge to use Internet-linked microcontrollers. Next—a big shift toward wireless?

By Karen D. Schwartz, illustration by Carie Henry -- Electronic Business, 10/1/2002

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College students have one less excuse to hide dirty laundry under the bed. A new Web-enabled control system, based on **IBM Corp.** technology, is being installed on 9,000 washing machines and dryers at campuses nationwide. The machines will offer students the ability to check on machine availability, add fabric softener remotely and receive notification when a load is complete, via either a wired or wireless connection to the Internet, courtesy of the campus computer network. In addition, the Internet-enabled controllers in use at a Boston College pilot project reduce downtime by alerting offsite operators to maintenance needs.



Internet-enabled washers and dryers are just one example of the soaring popularity of embedded microprocessors with Internet connectivity in [industrial applications](#), either within factories or installed as part of commercial equipment. While 33% of the microcontrollers sold last year for [industrial control](#) had Internet capabilities, that proportion will grow to roughly 62% by 2004, according to Microcontroller.com, a consulting firm in Boston that specializes in the embedded systems market. Note that although the microcontroller market for [industrial applications](#) will grow only 4% from 2001 to 2004, the Internet-embedded microcontroller market will grow 116%, the consulting firm predicts.

Impressive reductions in cost and other financial benefits achieved by manufacturers and [industrial](#) equipment operators are responsible in large part for the dramatic increase in the use of Internet-enabled microcontrollers. For example, **Rockwell Automation Inc.** with headquarters in Milwaukee, reports that an automated factory production scheduling system, based on Internet-enabled microcontrollers inside board stuffers and other assembly equipment, reduced manufacturing cycle times by more than 80%. Furthermore, improvements in communications and logistics in the factory allowed the company to reduce shop-floor space by 50% (see "Rockwell Automation—Internet Pioneer," below).

These benefits largely result from a collection of standards-based technologies such as the Internet, Ethernet and the Web browser, instead of the proprietary interfaces and systems typically found in [industrial](#) equipment. The ubiquity of the Internet allows more opportunities for equipment to communicate with a wide range of devices outside the factory floor, including enterprise resource planning (ERP) systems at corporate headquarters, desktop computers, pagers, laptops, personal digital assistants (PDAs) and many other devices used by customers and suppliers.

Fast Rise of Web-enabled Controllers

While Web-enabled microcontrollers totaled 33% of the industrial control microcontroller market in 2001, that proportion will grow to 62% by 2004. (thousands of \$)

"It's much easier to get manufacturing status, inventory status or any other piece of information you might want to know about the manufacturing process in one of your factories if that information is available via the Web," says Joe Jensen, general manager of **Intel Corp.'s** Embedded [Intel](#) Architecture Division, Chandler, AZ. "You

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