

Case Study

Wonderware Software and Kontron, Inc.

Ultra Low Voltage
Intel® Pentium® M Processor

Human-Machine Interface
and Touch-Panel Computers

Industrial Automation

Wonderware and Kontron Improve Factory Efficiency through Standards-Based, Pre-Integrated Automation and Control Systems

Summary

Problem

One of the more time-consuming tasks of the factory control engineer is the installation, configuration and management of the automation and control software. The more time spent on such maintenance tasks, the less time available to perform duties that can improve factory productivity and efficiency. This problem is sometimes compounded by incompatibility between hardware and software—common in the industrial world—where reliance on proprietary hardware systems produces an unwieldy mix of drivers, operating systems, and platform configurations. Even two different hardware products from the same vendor may use different platform specs. With a paucity of control engineers on the factory floor today, manufacturers can ill afford to spend time solving these compatibility problems.

Solution

According to Wonderware, the solution lies in the pre-installation of software onto a suitable hardware platform that manufacturers can buy as a factory-ready bundle. Kontron and Wonderware are offering just such a solution for the human machine interface (HMI) visualization and industrial control process that factories use to operate their automated systems. The award-winning, Windows*-based Wonderware InTouch* HMI software is now available pre-installed on Kontron Touch Panel Computers (TPCs) for a solution-ready HMI system. This greatly reduces the time needed for installing and configuring a standard computer and HMI software. By bundling the TPC with the HMI software, customers no longer have to worry about compatibility, and must simply add their customized InTouch application files prior to deployment.

Why Kontron?

The Kontron TPCs met all of Wonderware's hardware specs and performance requirements, including offering a range of screen sizes and chassis designs all based on the same underlying hardware platform. "This was especially important," explains David Gardner, Product Manager at Wonderware, "because we can offer customers a variety of systems to fit their environment without changing our software or modifying the system in any way." Wonderware also preferred Kontron's TPCs because they use the Ultra Low Voltage Intel® Pentium® M processor, which enables Wonderware and Kontron to deliver the bundle in a fanless design that can withstand the harsh conditions of most factory settings.

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—Ingrid Einsiedler
Kontron Spokesperson

The Dark Side of Automation—System Incompatibility

Automation is credited with many productivity and efficiency gains: increased factory output, greater manufacturing precision, lower costs, fewer errors, safer factories—the list goes on. The successes have been so great that manufacturers are automating more and more of their processes. After all, increasing global competition creates pressure to maximize production values at the lowest possible cost.

Because more systems are being automated, the factory must contend with a continual in-flow of new applications and hardware. Control engineers are tasked with the installation, configuration, deployment and maintenance of these systems—which often come from different vendors. Because the industrial segment relies heavily on custom-built, proprietary solutions, many of these software and hardware components are not architected to meet common technology standards. This can create a compatibility problem.

It's a problem between different computing hardware platforms installed on the factory floor. It's a problem when the factory tries to share data with the corporate office. It's a problem when the software won't run on the hardware. And then there's the problem of keeping up with routine changes in drivers, operating systems and hardware performance variables.

These issues have plagued the industrial segment from the beginning, but they have recently become magnified. As manufacturers shed full-time workers in favor of contract help or automated processes, there are fewer engineers left to perform the maintenance work that keeps these disparate systems running cohesively. When combined with the trend toward more automated systems and control processes, the problem only becomes more complex.

But factories can ill afford to devote their scarce human resources to solving compatibility issues and routine computer maintenance. They need their engineers to spend time on tasks that can improve overall productivity and efficiency.

Standardized Solutions Can Help

Wonderware recognized this problem years ago, which is why they developed the first human machine interface (HMI) solution for visualization and control processes based on the Windows* operating system. "Standard architectures help facilitate compatibility and interoperability among software and hardware," explains Gardner. "Windows is the most standard OS in the computing industry, and it is compatible with more third-party applications and hardware than anything else out there."

The compatibility problem is also what's driving the industrial manufacturing segment to adopt more systems built with standards-based, off-the-shelf hardware. According to Ingrid Einsiedler, a spokesperson for Kontron, a leading developer of embedded hardware platforms, "systems that use common interfaces and standard hardware architecture are much less likely to have compatibility issues. Customers can choose components from different vendors and have a strong degree of confidence that these systems will work together."

But even choosing standardized hardware platforms and software solutions doesn't always solve the compatibility problem. "Our customers still must contend with changes in drivers, operating systems and platform configurations when they try to get the software up and running on their selected hardware system," says Gardner.

A Bundled Hardware-Software Solution

That's why Wonderware came up with the idea of integrating the hardware and software before it gets to the manufacturer. Gardner explains it this way: "We wanted to eliminate the compatibility problems for our customers and make it easier for them to deploy our software. If we bundle our software with a hardware system, we can be sure our customers are getting the optimum configuration for our HMI solution, and we can get it up and running before it's shipped. This takes the guesswork, frustration and headache away from the customer."

About Wonderware

Wonderware is a business unit of Invensys plc and is a leading supplier of industrial automation and information software. Founded in 1987, Wonderware pioneered the use of the Microsoft Windows* operating system in human machine interface (HMI) software for manufacturing operations. Wonderware's software products and solutions are based on the ArchestrA* architecture from Invensys, powering intelligent plant decisions in real time.

About Kontron

A global leader in embedded computer technology and mobile rugged solutions, Kontron supplies a diversified customer base of OEMs, system integrators and application providers in the automation, test and measurement, communications, medical, gaming and entertainment, military, aerospace, public safety, transportation, and energy market segments. Kontron is a Premier member of the Intel® Communications Alliance, a community of communications and embedded developers and solutions providers committed to the development of modular, standards-based solutions on Intel® technologies. This gives Kontron earliest access to leading-edge Intel technologies and privileged engineering support.



They had to be picky, because the award-winning Wonderware InTouch* HMI software has an excellent reputation to uphold. As the industry's first Windows-based HMI solution for visualization and control processes in the factory, it runs on a touch-panel computer (TPC) that is usually located on the factory floor, in an environment with lots of dirt and grime, spilled/splashed liquids (not necessarily water), shock and vibration, heat and humidity. Wonderware needs to bundle its InTouch software with a TPC that is rugged enough to withstand these harsh conditions, while also being easy to use and highly responsive to human touch.

One of the most important requirements was that Wonderware did not want to design the hardware themselves. "We don't have the time, resources or expertise to build hardware," explains Gardner. "Wonderware needs to focus on creating excellent software solutions that power industrial automation systems, which means our hardware needs to come 'solution-ready.' We wanted a hardware vendor with a good selection of available platforms, where we might be able to make some minor adjustments to fit our specs, and then work together to take that product to market. This way we can reach the market more quickly, as well as conserving resources."

Gardner also notes that "there is a lot more risk involved in developing a completely custom hardware product. The unit costs are higher and it takes more time. And we're not necessarily sure about the future—what happens if our customers don't buy? There's a much higher cost risk to developing a custom solution."

With these thoughts in mind, Wonderware engineers identified several objectives that shaped their search for the optimum, off-the-shelf TPC platform:

- Find one TPC platform that is capable of meeting the needs of 80% of the factories out there.
- Find a vendor willing to commit to a long life cycle—measured in years—for their selected TPC.
- Choose a TPC that comes in a variety of screen sizes and exterior materials to suit multiple deployment scenarios, without alterations to the underlying platform.
- Make sure that the chosen TPC is rugged and durable—complying with common industrial manufacturing standards—to withstand the harshest conditions of the factory setting.
- Choose a standards-based platform from a reliable supplier that is already optimized for the Windows operating system.

Kontron Offers Versatile, Scalable, "Consistent" Platform

As Wonderware conducted their search for the ideal TPC, they were struck by the lack of consistency between platforms, even from the same vendor. "We looked at some manufacturers with families of TPCs, and we noticed that every single one of them was completely different. When they changed screen sizes, they also changed the underlying platform—the motherboard, CPU, interfaces—all of these components were unique and not necessarily compatible," observes Gardner. "That makes our job really difficult, because we have to change the software for every configuration."

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But Kontron was different. They offered a single, consistent platform for their whole family of TPCs. "The only features that vary in the Kontron TPC are the screen size and the bezel. Everything inside is the same," Gardner notes. "Kontron's TPCs come in 10, 12, 15, and 17-inch screen sizes, and we also have the choice between stainless steel and aluminum exteriors—both of which are important in different factory settings. This kind of variation matters a great deal. But the hardware specs have to be consistent so that we only need to create one system software image."

Wonderware was also satisfied by Kontron's willingness to provide their TPC platform for a period of years, not just months. "This is important to our ability to support the industrial segment. It takes time to launch new products into this industry, and we need that time to recoup our costs. Plus, these systems get deployed for many years, and we need to know that there is a long life cycle for our hardware to match our software roadmap," Gardner explains.

Kontron also met all of Wonderware's requirements for the harsh conditions of the factory. The features delivered by Kontron, considered essential to this environment, include:

- Rugged enough to withstand shock and vibration
- Designed to operate in extended temperature and high-humidity settings
- Built in conformance with IP65 ratings
- Offered modular and flexible expansion options

Platform Standardization Made Possible with Intel

Inside the Kontron TPCs are low-power, high-performance Intel® processors and chipsets, which allow Kontron to deliver the consistent, standard platform needed for the Wonderware software and selected OS. "The scalability of the Intel® Architecture allows us to build a single platform, and then vary it in performance and features to meet different customer requirements,"

explains Einsiedler. "We use ETX CPU modules for our TPCs, allowing the customer to choose a variety of solutions based on performance and price. The software doesn't need to change between these platforms because the underlying architecture is always the same."

The newest bundled version of the Kontron TPC and the Wonderware InTouch HMI software is a fanless solution based on the Ultra Low Voltage Intel® Pentium® M processor. "There are no other embedded processors producing such low power and high performance to enable the fanless design right now," explains Einsiedler. "We found that Intel is way ahead of the competition in this regard, and they are meeting an important industry need."

Other features of the Kontron TPC that are important to the industrial automation segment and Wonderware customers are a front-side USB port, 24VDC (so customers don't need a PSU), two free PCI slots, LVDS for graphical solutions, and all of the rugged features needed for the industrial market segment. The Kontron TPC also provides an option for running on a CF (CompactFlash*) card so that the users do not need a hard disk drive and can further meet the toughest industrial requirements.

Industrial Customers Agree

Gardner says the fanless design is very important to their customers, especially in environments where heat and humidity come into play. "The harsh conditions of the factory can crash a computer if it isn't properly designed to withstand these elements," explains Gardner. "Our customers have told us that the fanless design systems have proven to be much more reliable than the fanned systems they previously used."

Using standardized hardware platforms and software allows Wonderware's customers to maximize their use of the engineers' time. "Pre-tested hardware/software product combinations, as well as pre-installed and setup hardware/software bundles, give our customers a stable base for meeting plant-wide or corporate standards," Gardner explains. "These standardizations and product bundles are also beneficial when working with contract employment, where familiarity with common architectures and the advance testing/pre-integration work lowers the risk of problems or failure during installation or maintenance."

"Having a single source of support for a solution is also a time-saver. When there are problems or support questions, there is a single point of contact for the control engineer," adds Gardner. "They don't have to waste time going back and forth between the hardware and software vendor, trying to work out problems that affect both suppliers."

Bundled Application Server is Next in Line

Wonderware has already had great success with the fanless Kontron TPC bundle. So much so that they are now developing additional bundled solutions, including an application server that can run all of its historical intelligence capturing and analysis applications in a single platform. "Right now customers buy our products and put them on their own servers. But we've had requests for an integrated solution that runs right out of the box," says Gardner. "Although it is still in development, our application server will be built by Kontron and will use Intel Architecture."

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