THE SUPERIOR CONTROLLER

THE INDUSTRIAL WORLD SHIFTS TO WINDOWS NT

Being an independent control systems integrator, Superior Controls implements a variety of hardware/software solutions: From large DCS systems to small micro PLC projects. And we're noticing a trend.

Why are Foxboro, Yokagowa, Honeywell, ABB, and Bailey Controls entering the market with Windows NT-(WNT)-based DCS systems? Why does Intellution and Wonderware now sell so many Windows NT-based MMI systems, (60–70% of all packages according to Intellution). Why has Rockwell Software and so many others rushed to market WNT-based MMI and control packages?

> **"we can expect to see more WNT operating systems on the plant floor."**

As users ourselves, we've found WNT to be enormously reliable as an MMI for industrial control applications. For example, it absolutely must run continuously 24 hours a day especially when compared to the Windows Operating System.

WNT was released in the late summer of 1993 by Microsoft, and was the result of the efforts of Dave Cutler and his engineering team. Cutler was previously one of the architects of VMS, the very successful DEC operating system. Some say the letters WNT were selected because they are the next sequential letters in the alphabet from

www.superiorcontrols.com
Our New Web Page

Superior Controls is officailly a member of the World-wide Web highway.

Come visit us at http://www.superior-controls.com to find examples of automation projects, samples of our most recent newsletters, directions to our engineering facility and panel shop, as well as a little bit of autobiographical data.

Visit us periodically as we promise to continually update our web site.

If you would like to send us a message—just click on the e-mail button and begin typing. See you on the Web!

INSIDE

VMS, (film buffs may remember HAL and IBM in the *Year 2001* movie). Whatever the reason, WNT has more in common with VMS and Unix than Windows 3.1.

WNT was written from scratch as a high-end 32-bit operating system (as opposed to Windows which is 16 bit). Thus the name stands for Windows New Technology. It has an identical user interface to Windows 95. It supports multiprocessors, is portable to several chip types (DEC's Alpha, Intel, etc.), and has built in networking , but most important for industrial users, it is multitasking. Multitasking means that multiple programs can run simultaneously without crashing and/or bringing down the entire system.

Until recently, the biggest detriment to using WNT for real time industrial control purposes was the lack of deterministic capabilities. The time the system required to respond to an input depended on the other activities such as how many and which programs were running.

Scheduling issues are critical to a real-time OS. Input signals need to be sampled deterministically, PID loops need to be updated regularly, and safety interlocks must be responded to immediately. With a 32-level variable priority preemptive scheduler, WNT is far from real time. That is, until recently.

A small Cambridge, Massachusetts, company called VentureCom, sponsored by major players in the controls community (including Allen-Bradley, Rockwell Software, Schneider Automation, Intellution, and Wonderware), has modified the WNT HAL (Hardware Abstraction Layor) to produce a customized high frequency, deterministic timer facility specifically for doing control. This extension does not modify the WNT kernal, so compatibility is maintained with all presently available software for the NT

Superior Controls Headquarters—implementing PC, PLC & DCS control systems.

while providing control responses that can be preemptive and deterministic down to 100 microseconds (yes—microseconds) on a 90 MHz Pentium processor.

So what does all this mean to you and Superior Controls? It means that we can expect to see more WNT operating systems on the plant floor. A wide variety of WNT-based software options will soon become available reducing the attractiveness of proprietary hardware and operating systems. Several PLC manufacturers have anticipated this WNT shift and have already embraced PC-based processors such as Allen-Bradley's 1747 open controller, Siemens M7 PLC and Modicon's Quantum PLC. These hardware packages could be ready to use at the same time as the modified WNT system which is expected to begin shipping the summer of '97.

Superior Controls is involved in industrial control projects in which both the information handling and the control is accomplished using the PC. We expect to see more of these projects in the future as we anticipate greater automation affordability and opportunity for all of us.

Ice Cream Batch Control—Deliciously Successful

Superior Controls was recently asked to implement an automated Ice Cream Batch control system for manufacturing facilities in Ohio and Massachusetts. The challenge of this implementation was to provide complete installation and start-up in one weekend.

The existing system at each plant consisted of a 10-year-old PLC and a 20–25 year-old large control drum sequences. For those of you too young to know, mechanical control drums were cylindrical devices that turned like a clock, activating and deactivating contacts that controlled the appropriate field equipment such as pumps, valves, etc.

Superior Controls provided an Allen-Bradley PLC on a panel insert, prewired to accommodate approximately 160 field instrument signals. A PC was configured with Intellution's FIX package and Visual BASIC that provides the operator with graphical displays, recipe selection, batch reports, and manual override capabilities.

To automatically produce a tasty delight like Chocolate Swirl or Fresh Cookie Dough ice cream, the FIX package was preconfigured with *all* of the ice cream recipes. When activated, the appropriate recipe was downloaded to the Allen-Bradley PLC which, in turn, added the correct amounts of milk, cream, fructose, corn syrup, etc. In addition, CIP or "Clean In Place" sequences were programmed into the PLC to automatically clean the valves, pumps, and tanks used to create the most recent batch of ice cream.

Both ice cream facilities were manufacturing at full capacity and could afford only a weekend of downtime for the conversion. On a Friday, Superior Controls' engineers and technicians began disconnecting and carefully labeling the field wiring from the old system of the Massachusetts facility. Working through the night, they removed the old equipment and began installing, rewiring and attaching the new control system. This system absolutely, positively had to function flawlessly for Monday morning production or the whole plant would be shut down. Saturday was spent wiring the new system and by Saturday night the PLC and PC were ready for production test runs. Due to the weeks of in-house testing and simulation at Superior Controls, the PLC/PC logic worked flawlessly. Recipes, CIP sequences, reports, and alarms were tested all day Sunday. The result: Monday morning production began on schedule.

Three weeks later in Ohio, the second ice cream facility was just as successfully converted over a weekend. Doug Brenner, senior project engineer at Superior Controls, says, "I've acquired a new taste for ice cream. I plan to savor all the different recipes this summer." To celebrate, Superior Controls threw an ice cream party, of course, for employees and clients.

> "Due to the weeks of in-house testing & simulation at Superior Controls, the PLC/PC logic worked flawlessly."

SUPERIOR CONTROLS WELCOMES THREE NEW PROFESSIONALS

We are pleased to welcome three experienced engineers to out Superior Controls team who joined us last quarter.

Virginia Fernandes has more than seven years experience designing chemical and pharmaceutical plants for a large Boston-based consulting firm and systems integrator. She is an electrical engineer with extensive knowledge of field instrumentation and pharmaceutical validation requirements.

Normand Bergeron, a talented mechanical engineer, joins us from the motion control industry. He has several years experience specifying and implementing variable speed drives and servos.

Slav Doroshenko, a civil engineer with extensive studies in control software, joins Superior Controls from the CNC industry. For the past several years, Slav has been implementing and using CNC equipment while taking advanced programming courses at night.

These three experienced professionals are adding their invaluable skills to Superior Controls —and we're glad they're part of our team.