Windows CE is establishing itself as a viable technology choice in automation applications ranging from programming software to drives troubleshooting. As manufacturers expand on Windows CE-based developments that can cut across several industries and applications, users will have the ability to solve applications with the most appropriate solutions, regardless of their current system platform.

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What is Windows CE?

Microsoft developed Windows CE as a way to allow a variety of personal computer (PC) and non-PC devices to communicate with each other, share information with Windows-based PCs, and connect to the Internet. It differs from other Windows operating systems in that CE applications may be designed for specific hardware devices and are not necessarily automatically portable across multiple device types.

Compact size, platform flexibility, and hard real time capabilities (expected in Version 3.0) have made Windows CE an attractive possibility for a range of industrial applications—both for mobile computing and embedded applications.

Trends

The need for devices to program and troubleshoot industrial electronic equipment has existed as long as the equipment itself. Most companies have offered various portable or handheld devices that are easily transportable. These devices typically have been task- or target-specific, and limited in usability and productivity features.

Commercial CE-based handheld personal computers (HPC) provide a platform for maintenance and troubleshooting of industrial equipment. HPCs have instant on capabilities, and the RAM- or ROM-based software eliminates the need for disk drives—allowing users to go to work without waiting to boot up.

They are similar in size to a typical multimeter tester carried by many electricians, and will easily fit in a pocket or tool pouch. They have small, but clear and readable, displays and full-function keyboards. Most have enough memory to host several applications and can be expanded with low-cost flash memory.

On-board serial ports allow interfacing to most types of industrial equipment and provide an important additional feature—auto synchronization with desktop computers. This allows automatic archiving of changes made on the plant floor by connecting to the serial port of a desktop unit and eliminates the need to manually record changes or move files.

One example of this technology is the Rockwell Software RSPocketLogix, which provides users with a familiar look and feel and HPC-specific features such as display zooming and navigational tabs for tasks most used in troubleshooting and debugging. The software is designed to interface to multiple Rockwell Automation controller families from a single program while providing flexibility and value to the customer. In the future, engineers or maintenance persons with a single HPC will be able to work on most Allen-Bradley controllers, drives, and DeviceNet devices.

Because Windows CE can be embedded on industrial devices, users soon will be able to extend the same troubleshooting and maintenance software capabilities to their dedicated fixed machine interfaces.

Troubleshooting drives

Troubleshooting drives is already possible with new software running under Windows CE. In the past, monitoring and troubleshooting drives on the factory floor involved carrying a laptop computer from drive to drive. Engineers had to be especially careful that the laptop had the appropriate card and connection devices to interface with the drive s communication module. The process was labor intensive and time consuming compared to current tools. Today, CE-based software running on an HPC can make troubleshooting and configuring drives on the factory floor much easier by performing online programming and troubleshooting, creating a highly portable, simple method to configure and monitor drive parameters.

Software-based control

Recently, PC-based control—defined as combining industrial PC hardware with control

software, often called a soft PLC has become increasingly popular in applications requiring large amounts of memory, an open platform, or alternative programming languages. Today, standard Windows NT is the operating system of choice for PC-based control because it allows users to make the most of the primary advantages of a PC environment—integration and customization.

Because of its open and modular approach to control systems, Windows CE can better serve small, cost-effective dedicated systems. This means that PC-based control users will be able to more closely match the right level of control with specific application needs.

Windows CE also answers a dilemma for users with applications requiring hard real-time. Before the advent of CE, users requiring hard real-time control had been forced to choose proprietary PC-based control systems, specifically those based on real-time extensions, or in some cases chose to stay with traditional PLC control. Windows CE will allow hard real-time control because it is the option that does not sacrifice the integration benefits of an open platform.

Easing communications

As manufacturing begins to migrate toward Windows CE as the standard for operating systems, communication across all levels of operation will make it much easier to integrate the factory floor to the top floor. The barriers that once inhibited or restricted the flow of information between machine-level applications and supervisory applications that run on Windows 98 or NT will be reduced.

Windows CE will allow an application to benefit from the flexibility of open technology and the price advantage and simplicity of an integrated electronic operator interface (EOI) device.

As Windows CE technology becomes available on industrial computers, the end-user will be able to incorporate a variety of human machine interface (HMI) and control software packages into the application while still maintaining the simplicity of an integrated product—in effect, combining the best of both types of operator-interface applications.

Additional mobile applications

Windows CE is a good choice for mobile data collection applications. The full-featured operating system provides on-board computing power for both traditional statistical process control and specialized or custom quality control algorithms. Its rich graphical environment can

produce graphical data displays and graphically driven user interfaces including work instructions, CAD information, and inspection plans for complex or intricate data collection tasks.

The compact nature of CE allows devices to be more portable with reduced complexity so training efforts and resources can be focused on the quality program rather than on using the data collection tools. The power-conscious components designed for Windows CE allow a device to operate for an entire shift without recharging or exchanging batteries. Users also have found that batteries tend to last longer in handheld devices, are more easily recharged, and are easier to swap out, making extended troubleshooting and monitoring of devices even easier.

Finally, the open architecture of CE has generated broad-based appeal. Direct Win32 support facilitates code reuse from other data collection or specialized applications. A portable data collector with an open Windows CE architecture is even more attractive because of the wealth of third party applications and accessories. Now, a single unit not only can collect data of all kinds, but can provide other digital functionality including e-mail, network client, and wireless messaging. **MT**

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