

CEWIN

HARD REAL-TIME – COST-EFFECTIVE – HIGH RELIABILITY

- WINDOWS® CE
- WINDOWS® XP EMBEDDED



CeWIN ○ KUKA ROBOT GROUP WORLDWIDE

KUKA Robot Group is a leading developer of hardware and software for real-time critical applications and has delivered over 75,000 systems worldwide. Founded in 1986, KUKA Robot Group, is one of the world's leading robotics manufacturers. KUKA Robot Group is a part of IWKA, a holding company with sales over 2 billion dollars annually. Our products are developed and marketed from locations in Augsburg, Germany and Clinton Township, USA. Technical support is available throughout the world.

FLEXIBILITY

GIVE YOUR NEXT SYSTEM NEW FLEXIBILITY AND CAPABILITIES WITH KUKA'S COST-EFFECTIVE TECHNOLOGY:

- Hyperthreading, multiprocessor and APIC support
- Hard real-time performance
- High-resolution real-time timer, granularity 0.8 microseconds
- Eliminates a second dedicated controller
- Faster, easier programming
- Lowers hardware costs, drastically increasing reliability (MTBF)
- Outstanding connectivity
- Access to powerful Windows XP API
- User-specified Windows XP execution time
- CeWIN starts as a service, no logon required
- Date/Time synchronization between Windows XP and Windows CE
- Non-proprietary – built on COTS operating system
- Availability of numerous hardware drivers
- Full support from a worldwide company



STRATEGIC ADVANTAGE –

SINGLE PROCESSOR OPERATION

KUKA's technology enables the Windows CE real-time operating system to coexist with Windows XP Embedded on a single processor. KUKA's CeWin provides a real-time extension to Windows XP operating system, eliminating the need for additional control hardware or costly intelligent co-processor boards. CeWin lowers costs, offers more features and delivers superior reliability in an industry-standard solution.

CeWin EXTENSION TECHNOLOGY

Real-time control must be accurate, reliable and cost-effective. Combining Windows CE and Windows XP Embedded on the same machine results in a powerful embedded operating system with hard real-time performance, plus the extensive high-end features and applications of Windows XP.

Think of the many possibilities for new products or significant product enhancements that KUKA's technology offers: increased capabilities, new functions, lower hardware costs, lower development costs, greater reliability. A new, yet proven, way to increase your competitive edge. Products using CeWin technology have years of operational experience in critical applications. Hundreds of industrial robots, industrial automation, process automation, medical equipment and other applications are in operation throughout the world. We have established a long-term relationship with Microsoft assuring seamless interoperability of our products. Users have the support of our applications engineers worldwide and our ongoing commitment to continuous product improvement.

 **CeWin**[®]

APPLICATIONS



CRITICAL
MEDICAL
SURGERY

FLEXIBLE
CONTROL
PLATFORM

EXERON
EDM
CONTROLLER



FLEXIBLE CONTROL PLATFORM



FLEXIBLE CONTROL PLATFORM



EXERON EDM CONTROLLER

CEWIN REAL-TIME APPLICATIONS

- PC-based industrial automation; including PLC, motion control, robotics, CNC
- Real-time test and measurement/ data recording
- Medical devices and equipment
- Military and Aerospace
- Windows CE target simulation with real-time behavior and hardware access

CRITICAL MEDICAL SURGERY

KUKA's technology provides the reliability and stability necessary to precisely and safely position the Accuray X-Ray delivery system during full-body radio surgery treatment. KUKA's software enables the motion control application and the operator interface running on Windows OS, to coexist on a single system. This eliminates the need for a separate dedicated user interface.

FLEXIBLE CONTROL PLATFORM

Phoenix Contact utilizes KUKA's CeWin in their next generation PC-based control platform. CeWin technology provides a highly flexible modular control platform while delivering the stringent real-time requirements for industrial automation and motion control applications. Both ProfiNet IO and INTERBUS interfaces are supported as well as Phoenix Contact's Windows-based PLC programming environment, PCWORKX.

EXERON EDM CONTROLLER

Exeron relies on CeWin to provide hard real-time control and a superior user interface for their PC-based EDM Controller. The control handles up to six axes and is easily integrated into a network because it is based on standard PC architecture.

A woman in a light blue hospital gown is lying on a medical table in a clinical setting. A large, white robotic arm is positioned above her, extending from the top left towards the center. The room has a clean, white background with a circular light fixture on the ceiling. The word "PRECISELY" is overlaid in large, orange, sans-serif capital letters across the middle of the image.

PRECISELY

A USER-FRIENDLY ENVIRONMENT

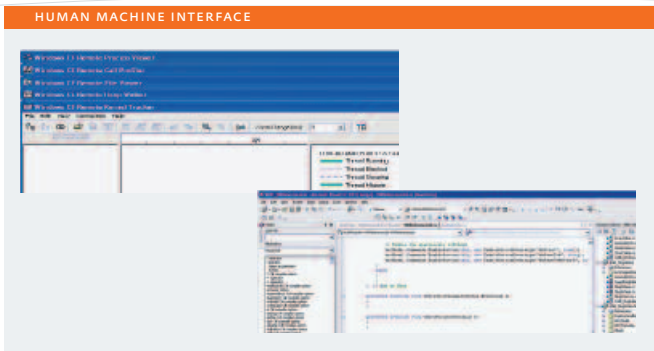
The Windows environment assures ease of programming, debugging and implementation. CeWIN programmers realize all the hardware and real-time features of Windows CE in a familiar Windows XP look and feel environment. They also have access to a wide range of third party software and drivers, as well as real-time analysis tools. CeWIN allows users to leverage familiar development tools and API's in the development of existing real-time applications. They can reuse existing code instead of having to port to someone else's proprietary API. And they can take advantage of the large pool of programmers

who already understand Windows XP and Windows CE, further speeding development and lowering development costs.

REDUCE HARDWARE

INCREASE RELIABILITY

With CeWIN there is no need for separate control hardware or costly intelligent coprocessor boards. Because hardware component count is significantly reduced, MTBF is drastically increased. Costs are further reduced because system size and weight can be cut. In addition, using CeWIN, Windows CE real-time application performance is unaffected by Windows XP occurrences.



HUMAN MACHINE INTERFACE

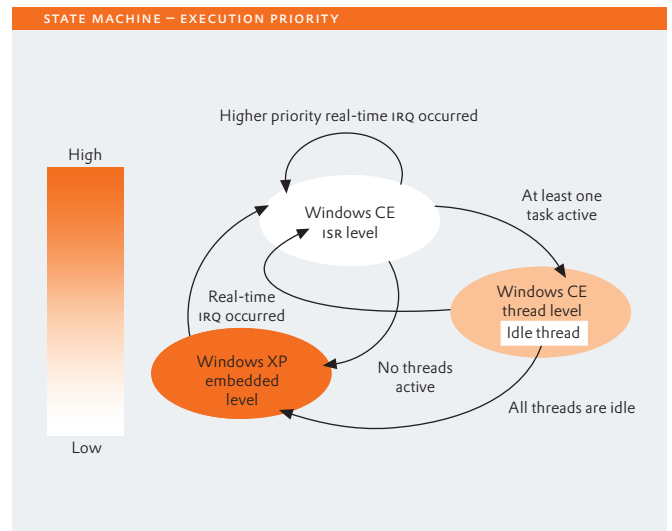
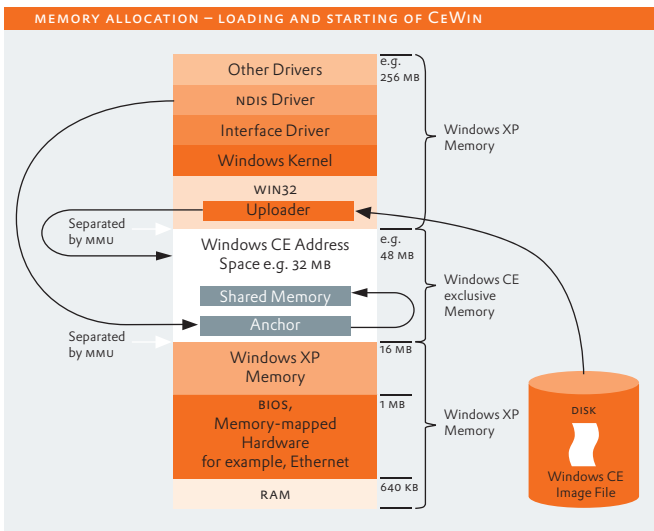
Familiar Microsoft development tools speed development.

MEMORY ALLOCATION

KUKA's CeWIN utilizes the x86 MMU to protect Windows CE memory from Windows XP.

STATE MACHINE

KUKA's CeWIN assures complete execution of all real-time threads before switching back to Windows XP.





FASTER DEVELOPMENT CYCLES

CEWIN developers enjoy a faster development cycle working in the well-known and thoroughly proven Windows environment. Using familiar development suites such as Microsoft Platform Builder and Visual Studio for the development of visualization and real-time applications, programmers can reuse their existing Windows XP and Windows CE software knowledge. CEWIN also includes examples of source code for many drivers to further expedite application development.

WINDOWS CE ADVANTAGES

Windows CE is being used more and more in embedded control systems and industrial automation devices. It offers a number of distinct advantages: a small footprint, very fast response and hardware control interrupts can be accessed easily.

- Real-time deterministic response measured in microseconds
- Hardware access to ISA and PCI plug-in boards, no kernel driver to develop

- Communication between Windows XP and Windows CE via TCP/IP (virtual network) or shared memory
- Use of DCOM or SOAP as middleware for communication is possible
- Wide array of software and drivers for Windows CE including: OPC server, drivers for fieldbus and measurement hardware and many more
- Known development tools – Microsoft Platform Builder, Target Designer and embedded Visual C++
- Availability of powerful, graphical real-time analysis tools (Kernel Tracker, Profiling)
- Comprehensive documentation (HTML, MSDN, newsgroup)

WINDOWS XP ADVANTAGES

Application development with Windows XP provides:

- Multitasking, intertask communication
- Components for Windows XP Embedded included

- Connectivity: TCP/IP .NET, Java, Winsock, COM/DCOM, SOAP and file sharing
- HTTP server, ISAPI, ASP, SOAP server, SOAP Client
- Programming languages: C, C++, C#, Visual Basic
- Proven development tools – Microsoft Visual Studio

CEWIN PRODUCT FAMILY

- CEWIN PE (Professional Edition) supports all Windows CE features
- CEWIN LE (Light Edition) offers basic functionality with lower licensing cost

EVALUATE CEWIN

KUKA's technology is used in applications worldwide. We invite you to contact your KUKA representative for a copy of CEWIN extension software for a time-limited evaluation. For further information please contact us on the web at:

www.kuka-rtos.com

Sales and Support.

MONTFORT WERBUNG

CE FLV.11141 / 11106UK Technical data and illustrations, non-binding for delivery. Subject to change.



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