



# VxWorks for Industrial Systems

Stay Ahead of the Curve with the Most Widely Used Commercial RTOS

## INDUSTRY SNAPSHOT

Global competition makes it critical for industrial system manufacturers to refresh their products, and in fact 76% of manufacturers are pursuing a smart manufacturing initiative to make their platforms more flexible and easier to upgrade through software updates than legacy, fixed hardware systems. They seek to transform to a new architecture, reducing OPEX while improving velocity for increasing functional needs. These new platforms must support TQM initiatives, automating testing at scale, while adopting digital feedback loops and software updates.

They also need software developers who know the latest programming and tools and can continuously improve product security, safety, and reliability. Add to this list the need to enable easy software updates, remain price competitive, and, in some cases, minimize the time and cost of certifying systems.

Success requires agility and innovation, and Wind River® invests heavily in its VxWorks® real-time operating system (RTOS). VxWorks delivers hard real-time performance, determinism, and low latency along with the scalability, security, and safety required for industrial applications, such as robotics, control automation, manufacturing and transportation systems. It is the world's most widely used commercial RTOS, with more than 35 years in the field and billions of devices.

### Industrial System Challenges

- Develop modern, software-defined systems
- Satisfy real-time performance requirements
- Lower the cost of safety certification
- Implement better security to safeguard systems

### Why VxWorks

- Leading RTOS with cutting-edge features and developer tools
- Proven track record in safety-critical applications
- Foremost RTOS for intelligent edge computing and cloud-based development
- Built-in support for the latest security technologies

## VXWORKS: PIVOTAL TO SUCCESS

### Utilize Modern Software Development Techniques and Tools

The new crop of software developers wants to use the modern programming languages and tools they learned in school, not to have to train on old or proprietary software environments. VxWorks leverages low-level virtual machine (LLVM) as a tools foundation to support current popular languages and libraries such as C++17, Rust, Boost libraries, and Python 3.9. Developers can be productive on Day One, not needing to know what's under the hood of VxWorks.

VxWorks is the only commercial RTOS to support OCI-compliant containers to improve the deployment and management of applications at the intelligent industrial edge, and more readily support a CI/CD process.

VxWorks supports cutting edge technologies such as Tensorflow, pandas, and NumPy to accelerate integration of AI/ML applications into next-generation industrial automation.

Wind River Studio is the first cloud-native platform for developing, deploying, operating, and servicing mission critical intelligent edge systems. With Studio, developers can employ a CI/CD process to create, deploy, and operate VxWorks-based industrial applications.

### Increase Reliability with Safety Software Protection

Many connected industrial systems require an RTOS that offers flexibility and scalability while maintaining the determinism and low latency required by mission- and safety-critical applications. One of the ways VxWorks achieves high reliability is by enforcing time and space partitioning, which can isolate safety-critical and non-safety-critical code on a multi-core processor, helping to prevent reliability and performance issues due to unintended interactions between applications while supporting system consolidation. For instance, the enhanced scheduler implements time partitioning to prevent applications from overloading the CPU, and space partitioning isolates user-mode application memory from kernel-mode memory.

### Reduce Cost and Risk with a Pre-certified RTOS

When developing safety-critical systems, avoid the cost and time associated with creating the binaries and artifacts needed to certify the RTOS you're using. VxWorks Cert Edition provides all the information you need to obtain a range of safety-critical certifications, including IEC 61508 SIL 3, DO-178C DAL A, ISO 26262 ASIL D, and IEC 62304. Since VxWorks is certified for various standards, system manufacturers do not have to retest or recertify the code for those standards areas for which VxWorks has been certified — thus saving time and money and speeding up the development process. Furthermore, the RTOS code has been thoroughly vetted by more than 750 safety certification programs over the last 20 years.

## Secure Data and Systems from Boot-up to Power Down

Every day new security threats arise, making it critical to have a strategy for safeguarding systems, software, network connections, and data. To address rising threats from the growth of connected devices, VxWorks comes with comprehensive security capabilities, such as a hardened kernel, secure communications, and data protection. Design your embedded system to the necessary level of security at every stage of operation: boot-up, app execution, data transmission, idle, and power down.

## TRUSTED SOFTWARE SOLUTIONS

VxWorks and its Studio tools provide industrial system developers with a complete solution for transforming the most demanding environments. With more than 35 years of experience building safe and secure embedded systems, Wind River is well versed in satisfying the real-time requirements of industrial applications and enabling the next generation of highly competitive systems.

VxWorks has been chosen by global industry leaders as the trusted foundation to power billions of safety-critical intelligent devices, machines, and systems. VxWorks is the secure, safe, reliable, and certifiable RTOS for medical infusion pumps and imaging systems, energy production automation, manufacturing robots, train control systems, and other safety-critical devices.

Learn more at [www.windriver.com/solutions/industrial](http://www.windriver.com/solutions/industrial).

WINDRIVER