SOLUTIONS FOR MANUFACTURING

Driving Digital Transformation in Factory Automation

MANUFACTURING CHALLENGES

- Increase efficiency
- Permanently reduce OPEX
- Update or replace legacy, single-purpose systems
- Improve flexibility and agility to meet changing market demands
- Connect and manage factory systems and equipment
- Ensure system security to prevent outside intrusion
- Functional Safety to prevent injury and save lives

WIND RIVER SOLUTIONS

- **Wind River Helix Device Cloud:** Secure device lifecycle management that enables remote monitoring, managing, securing, and updating of hundreds to thousands of networked IIoT devices and machines
- **Wind River Titanium Cloud:** Family of virtualization platforms that enables digital transformation from legacy hardware to virtualized automation environment, reducing OPEX and increasing agility
- **VxWorks:** Industry-leading real-time operating system for connecting, securing, and running IIoT systems, networks, and devices
- **Wind River Linux:** Industry-leading open source operating system for connecting, securing, and running IIoT systems, networks, and devices

THE CHALLENGE

In the global economy, industrial manufacturers face increased pressure to be agile and innovative. Producers in the automotive, aviation, high-tech, food and beverage, textile, and pharmaceutical sectors must be able to adjust quickly to changing market demands and competitive challenges. But many manufacturing facilities are saddled with legacy systems that make innovation difficult if not impossible, and replacing existing infrastructure is daunting. Systems and machinery have often been in place for decades and are expensive to maintain, yet replacing them involves risking a costly production slowdown or a potential drop in quality.

Manufacturing and industrial automation, ripe for innovation, face stringent requirements. Factories depend on highly reliable, always available systems that are safe and secure and that operate in real time, even as cybersecurity threats rear their heads seemingly every day. With so many moving parts—robot arms, assembly lines, packaging mechanisms—applications must be able to seamlessly address device deployments, updates, failovers, and security issues.

Manufacturing operations actually have a competitive advantage at their fingertips: the enormous amounts of data generated by their equipment and systems. The challenge is being able to capture and analyze that data and take decisive action based upon it. Next-generation systems must give operators that capability.

THE SOLUTION

A combination of Industrial Internet of Things (IIoT) technologies and software-defined architecture (SDA) from Wind River® is enabling manufacturers around the world to centralize and virtualize their industrial control systems, ushering in a new era of flexibility and innovation. With a virtualized compute environment, operators can move beyond the constraints of legacy systems and fully optimize their operations. The use of open standards allows producers to permanently reduce OPEX by using commercial off-the-shelf (COTS) hardware rather than maintaining a customized infrastructure. Updates can take place instantly and remotely, via software that allows for seamless device failover.

Wind River delivers a comprehensive set of solutions from cloud to device that enable manufacturers to accelerate the digital transformation of factory floors and start to reap the benefits quickly. The following solutions can be integrated into a COTS infrastructure solution or combined into a comprehensive solution:

- Wind River Helix™ Device Cloud
- Wind River Titanium Control
- VxWorks®
- Wind River Linux
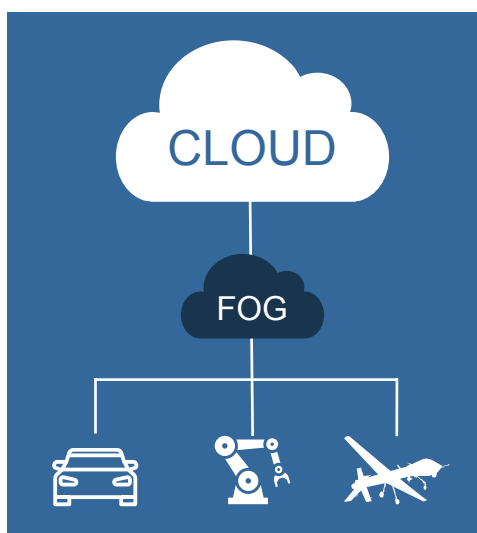
Discover how these Wind River solutions can drive digital transformation for your manufacturing business and facilities.

Wind River Helix Device Cloud

Device Cloud is the IoT device management platform that enables you to implement and operate a truly connected factory, reducing the complexity of managing a large-scale device deployment. Operators can monitor, manage, service, and update the devices that control factory equipment, remotely and securely. Industrial manufacturers can use Device Cloud to collect and integrate data from any number of devices, machines, and systems, enabling you to track device status and content, diagnose problems remotely, and proactively determine when updates are needed.

- **Avoid costly downtime:** Device Cloud helps keep operations humming smoothly by immediately alerting operators to any issues with tools for remote diagnosis and repair.
- **Enable predictive maintenance:** Sensors on equipment can tell operators when a machine is showing signs of wear or is in need of repair, eliminating the need for routine preventive maintenance that requires equipment shutdown.
- **Leverage device data:** Device Cloud can collect and aggregate equipment data to give managers insights for making operational decisions and finding opportunities to improve efficiency.
- **Support security:** Device Cloud enables system operators to monitor devices and their communications for vulnerabilities and securely deliver software patches and upgrades at scale to mitigate threats.
- **Facilitate scalability:** The system supports upgrading new devices when they are first activated in the field and pushing out new updates as they are released through the Device Cloud console.

Wind River Titanium Control

With Titanium Control, the future of industrial automation has arrived. Part of our Wind River Titanium Cloud™ virtualization platform, Titanium Control is an ultrareliable, on-premise cloud infrastructure platform that delivers the uptime and performance needed for industrial applications and control services at any scale. Automation hardware such as distributed control systems (DCSes) and programmable logic controllers (PLCs) become 100% digital representations, bringing unprecedented flexibility and reducing OPEX dramatically.

Titanium Control's open architecture gives you the flexibility to:

- Accelerate deployment by eliminating the need to integrate, test, and document multiple technology components from different vendors.
- Incorporate components from multiple sources and avoid vendor lock-in.
- Replace components quickly without affecting other areas of operation.
- Take advantage of technological innovations as they become available.
- Adjust quickly to changing market demands.

By virtually any measure, Titanium Control delivers the results you demand:

- **Uncompromising reliability:** Titanium Control meets and often outperforms legacy system standards for reliability, uptime, and low latency. When operational processes must not fail, Titanium Control ensures that your services run when, where, and how they need to, always.
- **Cost reduction:** Titanium Control lowers the cost of deployment, repair, and replacement compared to legacy systems and equipment and further reduces costs by allowing the use of standard, off-the-shelf servers.

- **Security:** An extensive, built-in, fully integrated and multi-layered security framework protects your systems against network-borne threats.

Operating Systems

Wind River was a pioneer and is still the market leader in real-time operating systems for embedded and networked devices. Today, we offer a choice of solutions:

- **VxWorks** is the world's most widely deployed real-time operating system, powering some two billion devices. It delivers unrivaled deterministic performance and sets the standard for a scalable, future-proof, safe, and secure operating environment for connected devices in IIoT. Key features are:
  - **A proven real-time operating system:** VxWorks is proven in mission-critical applications, where security is paramount.
  - **Security:** Best-in-class, pre-integrated security functionality throughout the VxWorks product line includes foundational security capabilities for devices, while Security Profile for VxWorks brings enhanced device, communication, and management security.
  - **Safety-critical certification support:** Wind River VxWorks Cert Platform provides a COTS solution for functional safety applications that must be certified to IEC 61508.
  - **Multi-core capabilities:** With virtual machines, you can consolidate your core safety-certified and non-safe code on a single VxWorks real-time hosting safety platform.
  - **Integrated virtualization:** Virtualization Profile for VxWorks integrates a real-time embedded, Type 1 hypervisor with support for virtual machines into the VxWorks core for consolidation of multiple standalone hardware platforms onto a single multi-core platform.

- **Wind River Linux** is the embedded operating system of choice for device software developers who want a combination of open source flexibility and commercial-grade reliability. It provides improved out-of-box experience with optimized cross-architecture runtime. Wind River Linux security builds on our robust development and commercialization processes that make Wind River the world's leading embedded Linux OS.

  – **Yocto Project:** Wind River Linux is a Yocto Project Compatible open source baseline and one of the project's largest contributors of technology. Developers can leverage the flexibility of an optimized open source platform without compromising security.

  – **ISO 9001 certification:** Wind River Linux development and maintenance processes have been certified to the ISO 9001:2015 quality management system standard.

  – **Security features:** Wind River Linux provides an extensive list of security features that help secure access, functions and data.

  – **Security support services:** Wind River Linux provides ongoing threat mitigation in deployed systems against common vulnerabilities and exposures (CVEs).

The Wind River suite provides manufacturers with a complete solution for transforming automation in the most demanding environments: industry-leading operating systems connecting to an ultra-reliable, on-premise network virtualization platform and working in tandem with a secure, centralized device management platform.

With 30 years of experience building safe and secure embedded systems, Wind River is well versed in the exacting, real-time requirements of manufacturers. Today, we are enabling the next generation of IIoT and virtualization technologies to drive the digital transformation of industrial manufacturing.