

VxWorks 653 for Integrated Modular Avionics

To be competitive in the aerospace and defense avionics market, device manufacturers must deliver increasingly complex products at or below budget, within constantly shrinking time frames. In avionics applications, human lives are often at stake—so devices must be reliable, durable, and safe.

Most legacy avionics systems are federated systems, designed to support a single isolated application on a dedicated micro-processor in a dedicated location on an aircraft. However, as application demands have grown, engineers have been forced to deploy applications into inappropriate locations on obsolete platforms. To be competitive, modern avionics systems designers cannot use the federated platforms of past systems—they must create a new integrated platform that enables the robust scheduling of many applications on a single device.

To meet this need, the avionics industry has created a specification for Integrated Modular Avionics (IMA) systems: ARINC 653. When implemented correctly, this global specification enables multiple avionics vendors, or hosted-function suppliers, to safely deploy multiple applications on a single platform, while maintaining complete system compliance with tough safety standards like DO-178B, DO-254, and DO-297.

Wind River offers the only ARINC 653 product that safely and reliably delivers the promise of ARINC 653 to the IMA marketplace. VxWorks 653 enables the true reduction of size, weight, and power (SWaP) and bill of materials (BOM) on the industry's most advanced aircraft.

Reduced Risk Produces Better Products

VxWorks 653 is completely compliant with ARINC 653 Supplement 1 and Supplement 2 Part 1. It provides robust partitioning in time and space to ensure fault containment in accordance with strict IMA and ARINC 653 requirements.

Wind River's VxWorks 653 platform comes with Wind River Workbench, a fully integrated, Eclipse-based development suite designed to support development, test, and certification of applications to meet RTCA DO-178B Level A and EUROCAE ED-12B. The platform offers DO-178B Level A qualified development and verification tools that assist in the application test for credit, and also enable the insertion of new applications into a tested environment without forcing a retest of the entire platform. This facilitates faster deployment of ARINC 653 systems, conserving certification testing resources and reducing the cost of change.

VxWorks 653 is backed by the avionics industry's most comprehensive set of certification artifacts, available as an add-on, that supports all DO-178B Level A and EUROCAE ED-12B requirements. These certification artifacts are provided on a hyperlinked, browseable DVD to simplify safety verification and auditing. This DVD contains more than 65,000 support

Features & Benefits

- Reduced BOM cost through high performance
 - Two-level virtual machine architecture enables high performance; maintains very low jitter
 - Scalable to 255 partitions with up to 2K processes per partition
 - Simultaneous support for ARINC 653, VxWorks, POSIX, Ada, Java, and C++ at multiple safety levels
- Reduced development time and cost
 - Separate role-based development, per DO-297 for platform provider, application developer, and system integrator allows teams to work in parallel
 - Wind River Workbench development suite based on standard Eclipse
- Reduced DO-178B platform certification time and cost
 - True application independence—build, debug, test, certify, and recertify applications separately
 - DO-297 role separation via DO-178B qualified development tools
 - Complete 2GB sealed DVD with all DO-178B Level A/ED-12B evidence
 - Entire DVD with more than 65,000 files hyperlinked for easy traceability and examination
 - Independent build process reduces the impact of code changes across multiple developers
- Proven on the world's most challenging aircraft
 - Airbus MRTT and Airbus A400
 - Boeing C-130 AMP, Boeing KC-767 Tanker, Boeing 787 Dreamliner, and Boeing P-8A Multi-Mission Maritime Aircraft

Development Suite

GNU Compiler	System Viewer
DO-178B Qualified Verification Tools	Wind River Workbench
Integrated Simulator	XML Configuration Suite

Software Partners

Ada 95/2005 Compilers for VxWorks	ARINC 664 Compliant Stack
DO-178B Certification Services	Simulation Platform

OS

DO-178B Level A/B/C/D Certification Evidence*
DO-1788 Network Stack (UDP/IPV)*
VxWorks 653

* Optional

Hardware Partners

COTS Boards

Services

Education and Installation		Platform Customization	
System Design	Hardware/Software Integration	Design Services	

VxWorks 653 Platform

files, including all requirements, designs, tests, reviews, source code, build files, test results, annotated object-level code coverage, and tool qualification data.

An Optimized, Integrated Development Suite

VxWorks 653 integrates Wind River Workbench, including tools created specifically for developers of IMA applications that require DO-178B certification. The development suite consists of a project facility to define application resources, an integrated simulation tool, and an XML configuration tool to easily define the static configuration records required for ARINC 653 applications.

The DO-178B qualified XML configuration tool suite allows developers to make changes to application and/or system configuration information without rebuilding and retesting the entire system. Changes to independent applications can be made without the need to retest or recertify other applications or the underlying OS in the system. This significantly reduces the time to initial certification, as well as the cost of change and maintenance throughout the device life cycle. In addition, this tool fully complies with the "DO-297 IMA Development Guidance and Certification Issues Document," enabling intellectual property and security separation between the platform provider, application developer, and system integrator.

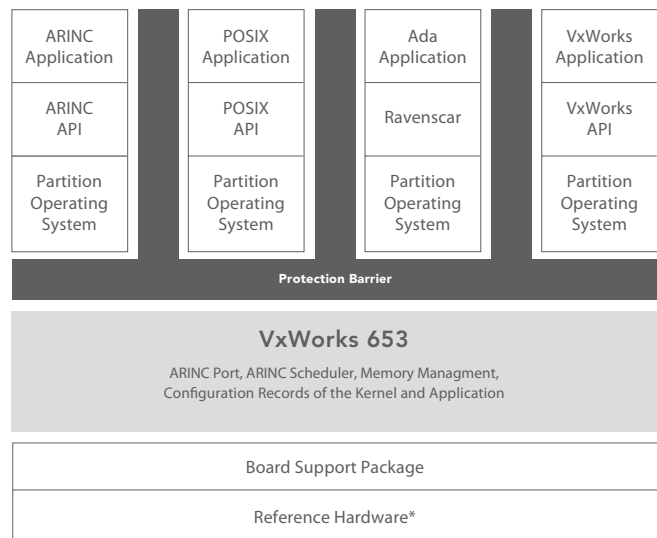
Unique to this platform are three high-performance tools that aid in the deployment of certified applications. They allow developers to measure CPU use by individual applications or all applications; report memory usage of various areas of the OS, including heaps, stacks, ports, and health monitoring memory use; and monitor traffic across sampling and queuing ports. Along with the OS, the interfaces to these tools are DO-178B qualified, enabling testing of the exact deployment environment for certification.

A Proven, Reliable Partner Enables Success

The right technology partner can greatly increase your odds of succeeding in a highly competitive marketplace. As the industry leader in Device Software Optimization (DSO), Wind River has met and exceeded the requirements of our customers and their markets for over 25 years. More than 4,000 businesses have leveraged our skills, experience, and expertise to successfully deploy and support more than 350 million devices. A vibrant, publicly traded company, Wind River is positioned to stay the course with established device manufacturers and new companies alike.

Commercial-Grade Support and Services Speed Time-to-Market

VxWorks 653 includes full access to Wind River's worldwide support organization, with 24/7 product support and training available through multiple channels. We also offer a specialized Aerospace & Defense Services Practice—our team of engineers has extensive experience delivering design, integration, and optimization services tailored to the needs of your industry, is fully equipped to protect ITAR technical data, and is able to meet government accounting needs.



Integrated Modular Avionics Design with VxWorks 653

* Optional



Wind River is the global leader in Device Software Optimization (DSO). We enable companies to develop, run, and manage device software faster, better, at lower cost, and more reliably. www.windriver.com

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