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WIND RIVER PROBE

Wind River® Probe is a USB connectivity solution for reliably connecting host development environments to targets under development. Using the on-chip debugging capabilities available in most embedded microprocessors, Wind River Probe enables developers to connect to the target via the JTAG, EJTAG, XDP, or BDM interface and communicate information to and from the host PC through a USB 1.x-compliant and 2.0-compliant interface.

Wind River Probe has the following features:

- USB 2.0 compliance
- No external power supply needed
- Simple plug-and-play host connection
- Extensible support of ARM, ColdFire, Intel®, MIPS, and Power architectures
- Support for Linux and Windows hosts
- Adaptability to custom hardware



Figure 1: Wind River Probe.

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COMPONENTS

USB Connectivity

By combining USB 2.0 compliance with Wind River JTAG accelerator technology, Wind River Probe speeds downloads to the target and improves utilization of the full JTAG scan chain. This provides developers with a more responsive debug interface compared with parallel-port interface-based probes and products compliant only with USB 1.x. The improved download speed offers users more development iterations per day, in addition to a more responsive and generally improved debug experience. The USB connector provides a smaller, easy to plug and play connection method that is more reliable than parallel port connections. Wind River Probe also eliminates the need for an external power supply.

JTAG Connector

The 100MHz JTAG clock speeds of Wind River Probe far surpass the requirements for any device software CPU products available today—ensuring it will support new silicon from major CPU vendors for years to come. Probe supports I/O voltage tracking from 0.9v to 3.3v, so it can automatically plug and play from one device to another. Hot insertion lets users plug and play on the target board without altering the target state—removing the need to reset or power cycle the target board once a connection is made or removed. In addition, Wind River Probe is adaptable to the target board under development—it can provide slew rate control, JTAG clock skew control, and programmable target termination control.

Debug Connector

Wind River Probe supports the Samtec debug interface connector. The Samtec connector provides better electrical and physical JTAG connections that support high-speed processors through a high-speed impedance-controlled connector. The connector also supports keying to prevent illegal insertion, support for EMI shielding if desired, and hot swap capability based on its integrated ground capability. This connector is provided in a footprint similar in size to that of the 16-pin JTAG connectors in common use.

Customers can deploy the new Samtec connector on their own hardware to take full advantage of this leading interconnect system. For designs that do not use the Samtec connector, Wind River Probe offers adapters to interface with traditional JTAG/EJTAG/XDP/BDM connectors.

HOST SOFTWARE SUPPORT

Wind River Workbench

Wind River Probe is fully compatible with Wind River Workbench, the industry-leading, open, extensible development suite. Wind River Workbench On-Chip Debugging is specifically configured to meet the needs of developers early in the device software development cycle—handling initial board bring-up and validation, developing device drivers, incorporating low-level software capabilities, and developing C/C++ applications. Workbench On-Chip Debugging offers a feature-rich development suite optimized for the capabilities of JTAG-based debugging using Wind River ICE 2 and Wind River Probe JTAG debug units.

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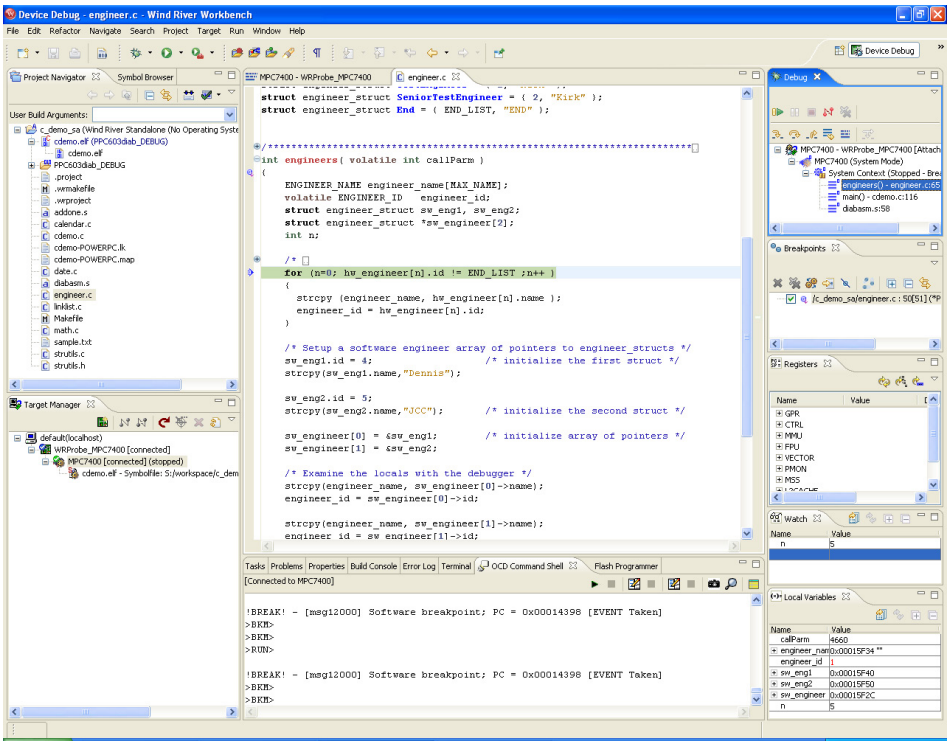


Figure 2: Wind River Workbench.

Wind River Workbench contains the following components:

- Standards-based Eclipse framework
- Development environment: build system, project manager, editor, symbol browser, and static analysis
- Multi-context-aware debugger: target connection support via on-chip debugging and agent-based solutions (agent solutions provided with Wind River platform products)
- Target OS awareness for VxWorks® and Wind River Linux, supporting both kernel-and user-mode debugging for Linux
- On-chip debugging target connection plug-in and on-chip debugging connection to Wind River Probe; includes on-chip debugging views and capabilities
- Instruction set simulator (for supported architectures)
- Compilers
  - Wind River Diab Compiler (best-in-class optimizing compiler)
  - Wind River GCC Compiler for VxWorks
  - Wind River GCC Compiler for Linux

On-Chip Debugging API

Wind River On-Chip Debugging API provides C/C++ and Visual Basic programmers with direct access to Wind River Probe or Wind River ICE 2 JTAG debug units. This access can be utilized by engineers in the manufacturing environment for flash programming and gaining access to the built-in diagnostic features available in Wind River Probe. Access can also be used as an interface to customize software GUIs.

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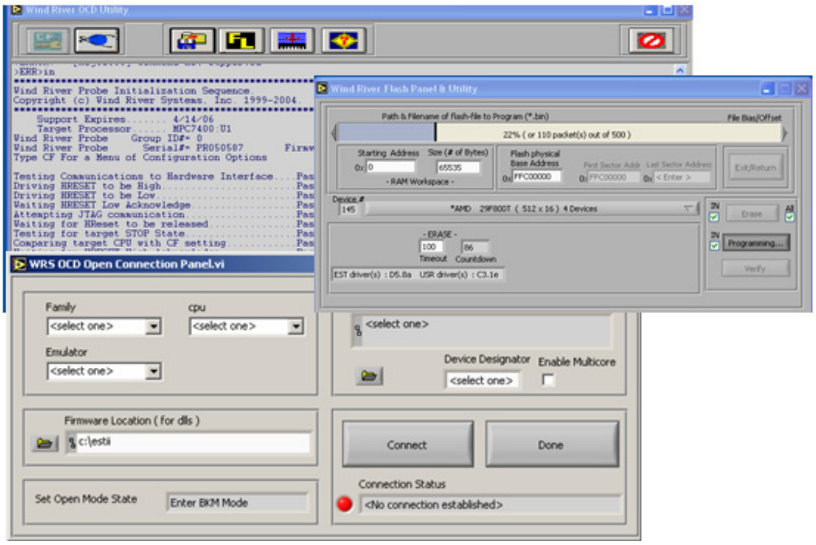


Figure 3: Wind River On-Chip Debugging API with Wind River On-Chip Debugging Utility

TECHNICAL SPECIFICATIONS

- USB host connection
- Single-core, single-thread debug operation
- Extensible support for additional processor families and processor architectures
- JTAG/EJTAG/XDP/BDM run control and program download
- Built-in hardware diagnostics
- Flash memory programming
- Source-level debugging via Wind River hardware-optimized software debuggers
- Support for the usage of memory management units (MMUs) to create virtual memory or protected applications
- Support for VxWorks, Wind River Linux, and open source Linux 2.6 kernels
- Internal register configuration
- Additional custom registers
- Open API

Supported Architectures

Wind River Probe supports single-core and single-thread debug operations (even on multi-core devices). For details on currently supported processors, refer to the processor support matrix at www.windriver.com/products/OCD/. Wind River is continually adding new processor support. If you do not see your processor listed, contact your Wind River sales representative.

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ARM
ARM9
ARM11
ARM Cortex-A8
ARM Cortex-A9*
ARM Cortex-M3
ST Micro SPEAr1310

ATMEL AT9x*
Cavium Econa*
Freescale i.MX*
Marvell*
TI OMAP*

ColdFire
MCF52xx
MCF53xx
MCF54xx
MCF544xx

MIPS
MIPS 4Kc, 4Km, 4Kp, 4KEc
MIPS 5Kc, 5Kf
MIPS 20Kc
MIPS 24kc, 24kf
MIPS 25Kf
MIPS 74k*

Altera MP32*
Broadcom BCM11xx*, BCM12xx*, BCM14xx*
Broadcom BCM33xx*, BCM35xx*
Broadcom BCM47xx*

MIPS (continued)
Broadcom BCM5300x
Broadcom BCM53xx*, BCM5621x*, BCM58xx*
Broadcom BCM63xx*, BCM65xx*
Broadcom BCM70xx*, BCM71xx*
Broadcom BCM73xx*, BCM74xx*
Cavium OCTEON CN3xxx*
Cavium OCTEON Plus CN5xxx*
NEC VR41xx*, VR54xx*, VR55xx*, VR77xx*
NetLogic (RMI) AU1x00* (formerly AMD Alchemy)
NetLogic (RMI) XLR*, XLS*
Philips PR19xx*, PR39xx*, PR44xx*
Philips PNX30xx*, PNX73xx*, Philips PNX83xx*, PNX85xx*
PMC-Sierra RM79xx*, RM9xxx*
Toshiba TX49xx*
Wintegra Winpath*

Intel Architecture
Intel Atom*
Intel Core 2* Duo
Intel Core i3*
Intel Core i5*
Intel Core i7*
Intel Xeon*

XScale
Intel IXP4xx*
Intel IXP2xxx*
Intel IOP3xx*
Marvell PXA*

Power Architecture (PowerPC)
AMCC PPC403*
AMCC PPC405*
AMCC PPC440*
AMCC PPC460*
Freescale PPC5xx*
Freescale MPC512x*
Freescale MPC52xx*
Freescale MPC55xx*, MPC56xx*
Freescale/IBM PPC6xx*
Freescale/IBM PPC7xx*
Freescale MPC74xx*
Freescale MPC8xx*
Freescale MPC82xx*
Freescale MPC83xx*
Freescale MPC85xx*
Freescale MPC86xx*
Freescale QorIQ P1xxx*
Freescale QorIQ P2xxx*
Freescale QorIQ P4080*
P.A. Semi PA6T-1682M
ST Microelectronics SPC560xxx*
Xilinx Virtex-II Pro X2VP*
Xilinx Virtex-4 XC4V*

Host OS Support* (When Used with Wind River Workbench On-Chip Debugging 3.3.2 or Wind River On-Chip Debugging API 3.9.6)

- Fedora Core 13, 32-bit x86 and 64-bit x86-64
- Red Hat Enterprise Linux Workstation 6 (Update 1), 32-bit x86 and 64-bit x86-64
- Red Hat Enterprise Linux Workstation 5.0–5.7, 32-bit x86 and 64-bit x86-64
- Red Hat Enterprise Linux Workstation 4 (Update 9), 32-bit x86
- Ubuntu Desktop 10.04, 32-bit x86-32 and 64-bit x86-64
- SUSE Linux Enterprise Desktop 11.0, 32-bit x86-32 and 64-bit x86-64
- OpenSUSE 11.2, 32-bit x86-32 and 64-bit x86-64
- Windows XP Professional with Service Pack 3, 32-bit, x86
- Windows 7 with Service Pack 1, 32-bit x86 and 64-bit x86

*Specific processors only; for details on currently supported processors, refer to the processor support matrix at www.windriver.com/products/OCD/. If you do not see your processor listed, contact your Wind River sales representative.

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PROFESSIONAL SERVICES

Our professional services team delivers device software expertise within structured engagements that directly address key development challenges and contribute to the success of our clients. Our track record of timely delivery and in-depth understanding of market and technology dynamics makes Wind River a valuable implementation partner for clients worldwide. Based on our commercial-grade project methodology, service offerings include device design, BSP and driver optimization, software system and middleware integration, and legacy application and infrastructure migration.

Workbench Services

Whether you select Wind River Probe with Wind River Workbench On-Chip Debugging as a standalone product or as part of our platform solutions, Wind River Professional Services knows how to jump-start your development efforts. Even if you opt for a non–Wind River platform, Linux distribution, host operating system, or target architecture, we can help.

No matter which development environment you use, Wind River Professional Services can extend Workbench to adapt to your needs with the following offerings:

- Extend Workbench processor support
- Extend Workbench target OS support
- Validate Workbench on Linux host environment
- Validate Eclipse plug-ins
- Integrate agents

Installation and Orientation

Proper installation and orientation of Wind River Workbench On-Chip Debugging means you won't waste time solving easily avoidable problems before you can begin your next development project. Wind River offers an Installation and Orientation Service to ensure that your project starts on time and without hassle by delivering the following:

- Onsite installation: Guided install on your hardware and host platform, along with a sample build process, demonstrations, and examples of customizations
- Hands-on orientation: Architecture, development file system, adding open source packages, porting drivers, addressing design issues
- Advice: Introduction to Wind River support channels and processes, additional services, project review, and consultation

EDUCATION SERVICES

Education is fundamentally connected not only to individual performance, but also to the success of a project or entire company. Lack of product knowledge can translate into longer development schedules, poor quality, and higher costs. The ability to learn—and to convert that learning into improved performance—creates extraordinary value for individuals, teams, and organizations. To help your team achieve that result, Wind River offers flexible approaches to delivering product education to best fit your time, budget, and skills development requirements.

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Personalized Learning Program

Wind River offers a unique solution to minimize the short-term productivity drop associated with the process of adopting new device software technology, and optimize the long-term return on investment in a new device software platform. The Wind River Personalized Learning Program delivers the right education required by individual learners to accomplish their jobs. The program identifies work-related skill gaps, generates development plans, materials, and learning events to address these skill gaps, and quantifies the impact of the development activities for each individual user.

This programmatic, focused, and project-friendly approach to skills development results in a significant increase in the personal productivity of your teams, improved efficiency in the processes they employ, and faster adoption of the technology you have purchased. Personalized Learning Programs deliver improved business performance—customers have reported a return on investment ranging from 18 to 30 percent over a traditional training approach. Consult your local Wind River sales representative for more information on Personalized Learning Programs.

Public Courses

Wind River public courses are scheduled for your geographical convenience. They are conducted over one to five days, using a mixed lecture and interactive lab classroom format that leverages the experience of Wind River instructors and other course participants. Courses provide a fast, cost-effective way for students to become more productive with Wind River technology.

Benefits of public courses include the following:

- A conceptual introduction that orients students to the subject matter
- A selective examination of the details, focusing on the most commonly used areas, or on areas with which users tend to be least familiar
- Personal guidance and hands-on application of individual tools and course concepts
- The chance to grasp device software concepts, as well as the fundamental issues involved in real-time design
- The knowledge needed to develop device drivers, perform hardware porting, or develop applications
- Answers to specific questions about topics addressed in the course

Courses of interest to Wind River Probe customers may include Workbench for On-Chip Debugging; Wind River General Purpose Platform, VxWorks Edition; Wind River General Purpose Platform, Linux Edition; and Workbench for Linux. Consult your local Wind River sales representative or visit education.windriver.com for course schedules and fees.

In addition to these Wind River–sponsored courses, we also offer half-day seminars on a regional basis for processor architecture and OS development training. Refer to education.windriver.com or contact your local Wind River sales representative for information on courses in your area.

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Onsite Education

If you have a large project team or a number of new users, you may benefit from custom onsite education. Instructors will consult with you and, based on the workshop series curriculum, determine which topics should be included and emphasized. This type of education offers an opportunity for one-on-one discussions with our instructors about your specific project needs, technical requirements, and challenges—all in the comfort of your own office.

Advantages of onsite education include the following:

- The entire team gains a common knowledge base.
- Onsite education helps ensure that knowledge and skills will transfer from the classroom to the workplace.
- The location saves employees both travel expenses and time away from the office.

SUPPORT SERVICES

Wind River provides full technical support for our development solutions, including Wind River Workbench, Wind River Workbench On-Chip Debugging, Wind River ICE 2, Wind River Probe, and Wind River Linux and VxWorks platforms. Our products are backed by the most comprehensive customer support network in the industry.

The Wind River global support organization is staffed with experienced engineers who have extensive knowledge of Wind River products and device software development. With six major support centers and 21 additional support hubs worldwide, our local experts can help diagnose problems, provide guidance, and answer basic "How do I…?" questions.

Support is available 24/7 at our online Wind River Support Network or by email at support@windriver.com. The website provides patches, manuals, the latest errata, tech tips, and application notes. Visit Wind River Support Network at www.windriver.com/support, or consult our Customer Support User's Guide at www.windriver.com/support/resources/csug.pdf.

Wind River experts are also available for telephone support during standard business hours. If you cannot find the information you need through Wind River Support Network, contact our global support team:

North America, South America, and Asia/Pacific

support@windriver.com

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Fax: 510-749-2164

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Wind River is a world leader in embedded and mobile software. Wind River has been pioneering computing inside embedded devices since 1981, and its technology is found in more than 1 billion products. Wind River is headquartered in Alameda, California, with offices in more than 20 countries. To learn more, visit Wind River at www.windriver.com.

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