

# Hardware Reference Designs

for PPMC 750/755/7400

**Wind River**

*Reference designs*

## Reference platform for preproduction design, prototyping, and evaluation

Wind River's PPMC 750/755/7400 reference design is a single board computer (SBC) that allows development to begin before the hardware is available. This board offers a solid platform for both hardware and software engineers to use in evaluating and prototyping designs that closely parallel their final applications. The PPMC 750/755/7400 also gives software engineers a live target on which to begin developing and testing application code.

Like all Wind River reference designs, the PPMC 750/755/7400 comes complete with detailed schematics, board support

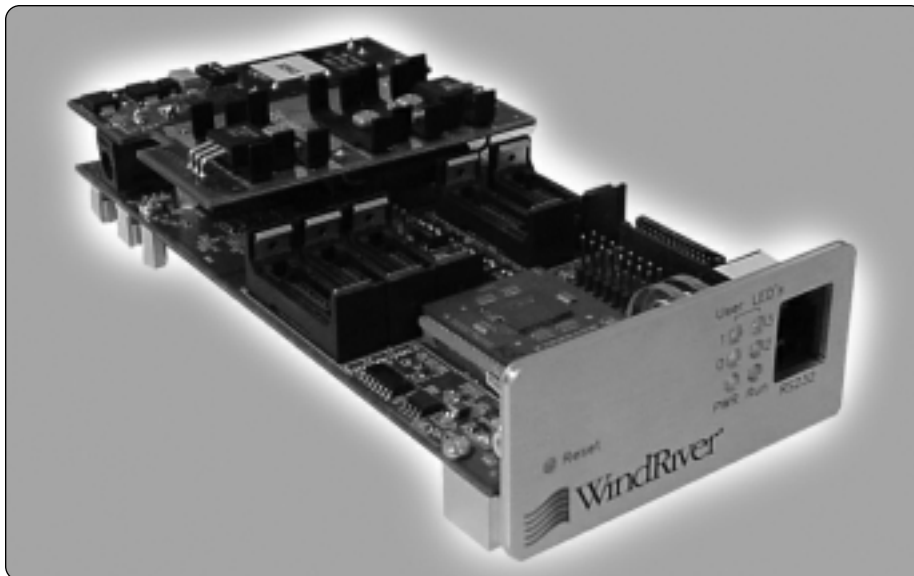
package (BSP), visionBOOT boot loader, user documentation, and power supply.

The PPMC 750/755/7400 is a processor PCI mezzanine card (PPMC) that can either be operated as a standalone SBC or mounted on a PPMC carrier board and connected through a PCI interface.

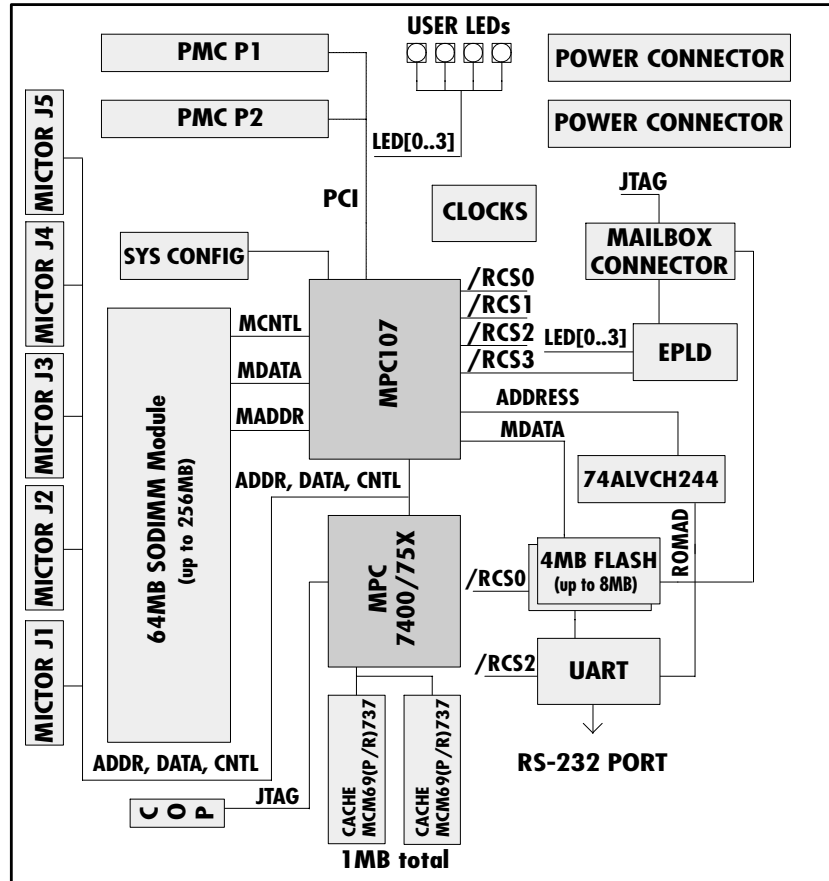
Wind River's PPMC 750/755/7400 comes standard with 64MB of SDRAM and 4MB of flash. It is user expandable to 256MB of SDRAM and 8MB of flash. It also includes 1MB of on-board synchronous burst SRAM cache memory.

## Features

- MPC75x/7400 at 400MHz
- Motorola MPC107 memory/PCI controller
  - Up to 100MHz memory bus
  - 32-bit PCI bus up to 66MHz
- 64MB SDRAM (expandable up to 256MB)
- 4MB flash (expandable up to 8MB)
- 1MB L2 cache
- RS-232 Interface
- User LEDs
- JTAG debug connection
- Mictor connectors
- 8-bit mailbox connector
- visionBOOT boot loader
- VxWorks board support package
  - PCI Ethernet driver
  - RS-232 driver
  - Memory configuration
  - Timer driver



## PPMC 750/755/7400 BLOCK DIAGRAM



### Benefits

#### Experienced support

As a supplier of reference designs and hardware-assisted debugging tools for an array of microprocessors, Wind River has the experience to provide knowledgeable, responsive application and technical support for development projects.

#### Free detailed schematics

All Wind River reference designs come with free schematics in electronic format. Schematics give hardware engineers a solid design for use in building their own boards.

### Tools integration

Wind River reference designs and hardware-assisted debugging tools are preintegrated. Every board has its own register files, so developers can immediately begin using all of Wind River's tools.

### Board support packages

Because even the best hardware design is useless without software support, Wind River provides the source code for board support packages available with VxWorks® 5.4 and VxWorks AE. Developers can fully utilize and modify the source code for current and future projects.

### Accelerated early development

Firmware, hardware, and production test engineers can all take advantage of Wind River's reference designs. Firmware and hardware engineers can adapt Wind River's reference designs to their own, enabling them to reduce development time. Production test engineers can use the board and visionICE II/visionPROBE II debugging tools to design and prototype complex and efficient production algorithms before the custom hardware is prototyped.

### **visionBOOT**

visionBOOT provides boot loading that can use TFTP downloading of an image from a flash file system, an HTTP server, or a disk. The flash file image includes a VxWorks image and a diagnostic script that can be used to test the board hardware. visionBOOT is built with the visionWARE software development suite, which can be purchased separately.

visionWARE automatically generates visionBOOT and diagnostics and can program flash and field programmable gate arrays (FPGAs).

### **Emulators for turnkey development**

visionICE II and visionPROBE II JTAG emulators are designed to handle the full lifecycle of an embedded project. These tools offer JTAG-preconfigured hardware diagnostic tests, which are crucial for hardware bring-up phases. The features and fast download speed of visionICE II and visionPROBE II help shorten software engineers' projects.

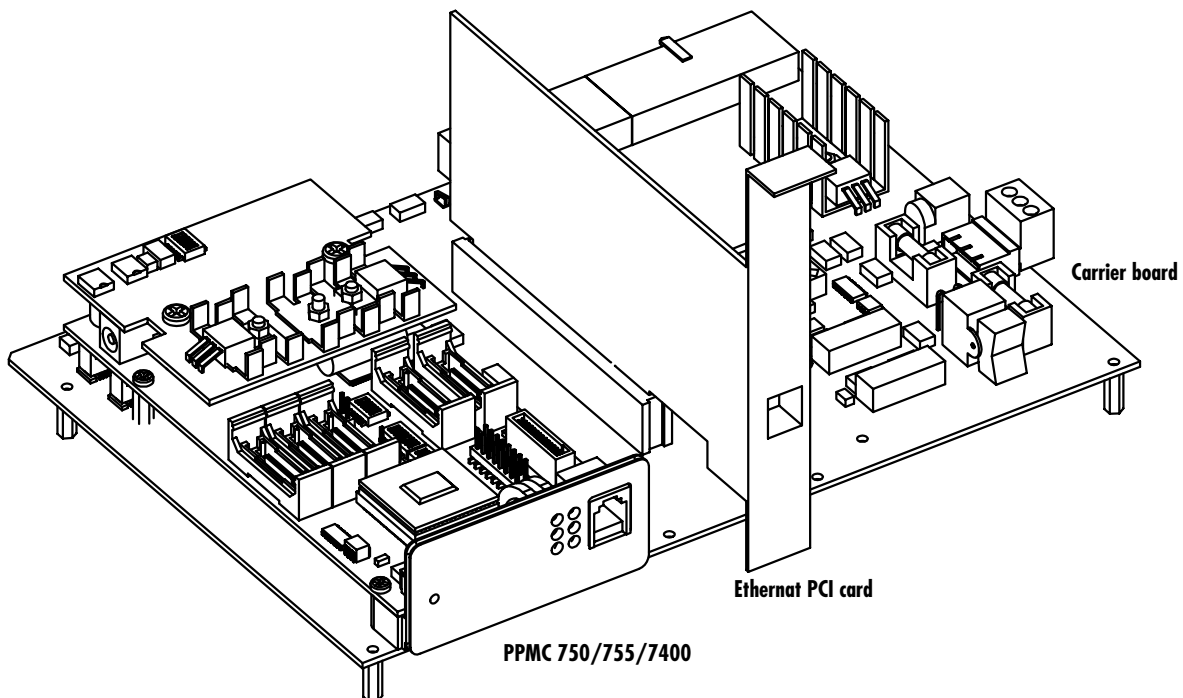
### **Flexible for prototyping**

Wind River makes it easy to access many of the external processor signals for off-board development of custom designed hardware. The PPMC 750/755/7400 board includes Mictor connectors that can be used as external connection points for signals.

### **JTAG/COP interface**

The Motorola recommended JTAG/COP interface can be accessed by the 16-pin connector located on the PPMC 750/755/7400 development board.

## **PPMC 750/755/7400 WITH CARRIER BOARD AND ETHERNET PCI CARD**



## EMBEDDED DEVELOPMENT SOLUTIONS

### Fully integrated solutions

Wind River offers fully integrated hardware and software solutions designed for all phases of embedded development, from early board bring-up to debug and production/test. This tool suite includes reference designs with schematics and BSPs, software debuggers, hardware-assisted on-chip debuggers, compilers, and other software tools.

### Hardware-assisted tools

Wind River's JTAG emulator tools include a high-performance debugging parallel cable for PCs (visionPROBE II) as well as a networked emulator complete with 10/100BaseT capabilities (visionICE II) for both PC and UNIX.

### Hardware tools benefits

- Real-time target control via on-chip debugging
- High-speed binary downloads to target
- Built-in hardware diagnostics
- Flash memory programming
- Source-level debugging
- Statistical performance analysis
- Internal register configuration

### Tornado integration

visionICE II and visionPROBE II are tightly integrated with the Tornado® development environment and enable core and optional Tornado tools to communicate with the target through JTAG. This provides board bring-up and debug support, crash diagnosis, as well as a fast download and debug channel, if Ethernet or serial channels are used.

### RTOS independent

Wind River provides an extensive line of embedded development tools for all embedded real-time operating systems (RTOSs) including in-house RTOSs, Wind River RTOSs, and other commercial embedded operating systems. Published application program interfaces (APIs) support easy integration of Wind River tools with other embedded operating systems.

### Source-level debuggers

Fully integrated with Wind River's hardware-assisted tools are source-level debuggers including visionCLICK, visionXD, and SingleStep™ with vision running on Windows and UNIX development hosts. In addition to point-and-click capability for major functions, these debuggers offer support for hardware, software, and complex breakpoints, a register configuration utility, built-in diagnostics, and complete run control.

### Software tools benefits

- Intuitive graphical user interface
- Easy project configuration that reduces project start-up time
- RTOS API kit allows choice of third-party tools
- Tight integration with Wind River's full suite of embedded development tools
- Powerful register configuration utility to reduce register programming time
- Sophisticated compiler optimization technology with finegrained compiler control
- Kernel awareness for task-aware debugging of VxWorks, proprietary operating systems, and many third-party operating systems

### The visionWARE developers kit

Wind River's visionWARE developers kit is designed for engineers developing software that interacts with and controls hardware. visionWARE extends JTAG emulator features with an application development framework that automatically generates a boot loader and a flash file system for custom boards that store and launch customer applications. It also generates a ready-to-run diagnostics program and target resident code to program advanced programmable devices, such as flash and FPGA, using a target Ethernet port.

#### Wind River Worldwide Headquarters

500 Wind River Way  
Alameda, CA 94501 USA  
Toll free 1-800-545-WIND  
Phone 1-510-748-4100  
Fax 1-510-749-2010  
Inquiries@windriver.com  
Nasdaq: WIND

For additional contact information,  
please see our Web site at [www.windriver.com](http://www.windriver.com).

Tornado, SingleStep, VxWorks, Wind River, and the Wind River logo are trademarks, registered trademarks, or service marks of Wind River Systems, Inc. All other names mentioned are trademarks, registered trademarks, or service marks of their respective companies. Printed on recycled paper.

©2001 Wind River Systems MCL-DS-755-0108