

PowerPC Embedded Processor Evaluation Kits

Highlights

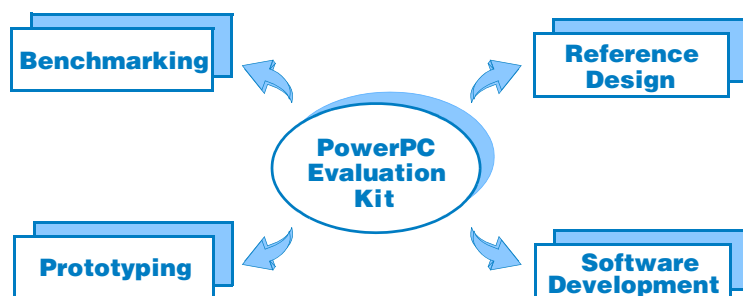
Kit Components

- PowerPC reference board
- Limited Capacity High C/C++ compiler, linker and assembler
- RISCWatch debugger for use in ROM Monitor mode only
- Run-time libraries
- Network services
- ROM monitor with source code
- Sample applications
- Schematics and documentation
- Cables and power supply

Functional Benefits

The ability to:

- Connect host via serial or ethernet port
- Employ remote IPL (BOOTP and TFTP)
- Have remote file system, and source-level test/debug capabilities
- Share ethernet port between the ROM monitor and an application program
- Directly access input/output port(s) through C function calls
- Use the expansion connector to test and debug custom/prototype hardware and software in a PowerPC development environment
- Have Embedded ABI for PowerPC compatibility
- Use provided host tools to build ROM monitor and boot images, and to reprogram flash memory
- Use run-time libraries for ANSI C compatibility, initialization, I/O, network services, and PowerPC register access functions



Product Description

Make more right decisions than your competitors and you will design a better product. You will also design it faster, and at a lower cost. If your evaluation and development processes are focused on a PowerPC embedded processor, a PowerPC Evaluation Kit will help you to obtain the right information to reach more right decisions.

The greatest value provided by these kits may well be their versatility. They are versatile because they support decision-making processes in several phases of product development. For example, they support:

- **Benchmarking** — If you are undecided on your processor platform, the kit will help in your comparison to other processors — highlighting the advantages of PowerPC embedded processors.
- **Reference Design** — Use the appropriate kit as a reference design

to shorten your development cycle.

We provide schematics and boot ROM source code and encourage you to refine or redesign them to your requirement.

- **Prototyping** — After selecting PowerPC as your processor solution, the kit becomes a valuable design aid. Use an evaluation board as a solid foundation. Then, add application-specific components to a board that plugs into the board's expansion interface. Through this interface, you can quickly integrate design elements with more assurance of success.
- **Software Development** — With a PowerPC Evaluation Kit, software development doesn't have to wait for hardware development. Both development efforts can proceed on a parallel course. In addition, your kit aids in making hardware and software integration easier.

A Comprehensive Solution

Development support systems this versatile must be comprehensive. That's why all PowerPC Evaluation Kits include all the hardware, software and documentation required to provide decision support for your design success.

Hardware —

At the heart of your Evaluation Board is the embedded controller that meets your specifications. All kits include flash memory and DRAM, with expansion options.

As any comprehensive evaluation board should, our evaluation boards have all the right connections. Both the second serial port and the ethernet port enable remote IPL (BOOTP and TFTP), a

remote file system and remote source and assembly code debug. A JTAG connector is provided on all evaluation boards to assist in debugging expansion prototype hardware using RISCWatch or other JTAG-compatible debuggers. Our 403xx kit board also has a RISCTrace connector for real-time trace.

Expansion connectors are provided on all boards to allow you to test custom prototype hardware in a PowerPC development environment.

Evaluation board hardware schematics are included in your kit. You are invited to use these schematics as a starting point for your embedded design.

Software —

Your kit will include a limited capacity IBM High C/C++* compiler, an

assembler, and a linker — all with the ability to run on your host system. Run-time libraries are provided for ANSI C compatibility, initialization, I/O, network services and PowerPC register access functions.

The kit also contains source code for the ROM Monitor, as well as sample programs for reuse in developing embedded applications.

Host tools are provided for building ROM monitor and boot images, and for reprogramming the flash memory. Source and assembly level debug of application code can be achieved by running the provided RISCWatch software in ROM monitor mode.

400 Family Evaluation Kit Features	401xx	403xx
Hardware		
Embedded Controller / Microprocessor	401GF	403GA or 403GC
Processor Speed	25/50/75/100 MHz	25/33MHz
CPU Bus Speed	25/33MHz	25/33MHz
DRAM	8MB (2 to 64MB)	4MB (exp. to 64MB)
SRAM	512K	
Flash Memory	2 AMD 29F040 (1MB), or 29F010 (256K)	AMD 29F010 (128K), or 29F040 (512K)
Memory Controller	Altera** FPGA	On-Chip (403GA & GC)
LCD Panel	FEMA** CM162B-SGT1LY	
PowerPC to PCI Bridge	PLX Technology**, PCI9060-3	
PCI Bus Clock Speed	Same as CPU bus speed, or set by host	
DMA Controller		On-Chip (403GA & GC)
Interrupt Controller	2 Intel 82C59 (cascaded)	On-Chip (403GA & GC)
Ethernet Controller	National DP83902AV (10Base2, 10BaseT)	National DP83902AV (10base2)
RS-232 Serial Port(s)	2 (National PC16553)	1 on 403GA & GC, and 1 National 16550
Parallel Port	1 (National PC16553)	
TOD Clock/NVRAM	Dallas DS1643L-12	
Expansion Capability	SQUALL, 1 PCI Slot, logic analyzer / direct processor bus	120-pin Eurocard Type-R (AMP 650874-4)
Power Supply and Cables	Yes	Yes
Documentation and Schematics	Yes	Yes
PLD/FPGA Equations	Yes	Yes
Additional Functionality	401 card can be plugged into a computer PCI bus, or can have PCI I/O cards plugged into it	
Software		
High C++ Compiler, Assembler, and Linker	Yes	Yes
Run-Time Libraries	Yes	Yes
ROM and Boot Image Tools	Yes	Yes
RISCWatch Debugger (ROM Monitor)	Yes	Yes
Sample Applications	Yes	Yes
Source Code for ROM Monitor	Yes	Yes

600 Family Evaluation Kit Features**602****603 & 604****Hardware**

Embedded Controller / Microprocessor	602	603, 603ev, 604, 604e-v1
Processor Integration Method		256-pin DIMM daughter cards on motherboard
Processor Speed	80MHz	Multiple Options
CPU Bus Speed	40MHz	60/66MHz
DRAM	4MB (exp. to 128MB)	8MB (exp. to 256MB)
L2 Cache		512K, expandable to 1MB
Flash Memory (AMD 29F010 or 29F040)	2MB	128KB (exp. to 512KB)
Memory Controller	Xilinx** FPGA	IBM27-82660
LCD Panel	Optrex** DMC16117 (1 x 16)	
PowerPC to PCI Bridge		IBM27-82660
PCI Bus Clock Speed		66MHz
PCI to ISA Bus Bridge		Intel** 82378ZB SIO
DMA Controller		Intel 82378ZB SIO
Interrupt Controller(s)	Xilinx FPGA	Intel 82378ZB SIO, IBM MPIC
Ethernet Controller	Fujitsu** MB86964, (10baseT, AUI)	AMD** AM79C970A, (10base-T)
RS-232 Serial Port(s)	2 (National** 16552)	2 (National PC87332, Super I/O)
Parallel Port		1 (National PC87332, Super I/O)
Floppy Disk Controller		1 (National PC87332, Super I/O)
SCSI Controller		Symbios** 53C810I
Keyboard & Mouse Controller		Intel 8042H
Business Audio		Crystal** CS4232
TOD Clock	SGS Thomson** MK48T02	Dallas** DS1385S
Expansion Capability	200-pin Berg Micropax**	3 ISA and 2 PCI slots
Power Supply and Cables	Yes	Yes
Chassis		Yes
Documentation and Schematics	Yes	Yes

Software

High C++ Compiler, Assembler, and Linker	Yes	Yes
Run-Time Libraries	Yes	Yes
ROM and Boot Image Tools	Yes	Yes
RISCWatch Debugger (ROM Monitor)	Yes	Yes
Sample Applications	Yes	Yes
Source Code for ROM Monitor	Yes	Yes

Host Requirements

- RISC System/6000* running AIX* 3.2 or 4.1
- 386, 486 or Pentium** running DOS/Windows** 3.1 with a Windows** Sockets compatible TCP/IP protocol stack
- SPARCStation** or equivalent running

Solaris** 2.3 (or higher) or SunOS** 4.1.3 with OpenWindows**

Support

All Evaluation Board Kits are compatible with the PowerPC Embedded ABI and are supported by several third party development tool vendors. Many other third-party real time operating systems

vendors also have board support packages for your evaluation board.

More and more engineers are using our evaluation kits in support of their development efforts. Call your nearest IBM Microelectronics office, or contact us on the World-Wide Web for more information.



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