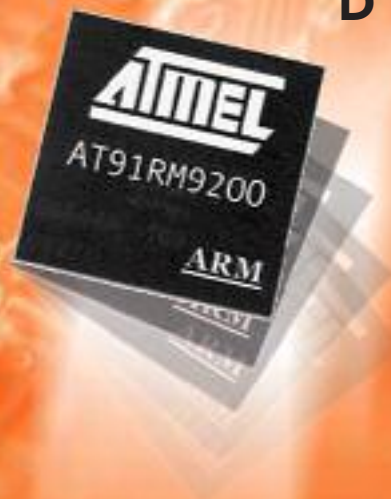




AT91  
THIRD PARTY  
DEVELOPMENT  
TOOLS



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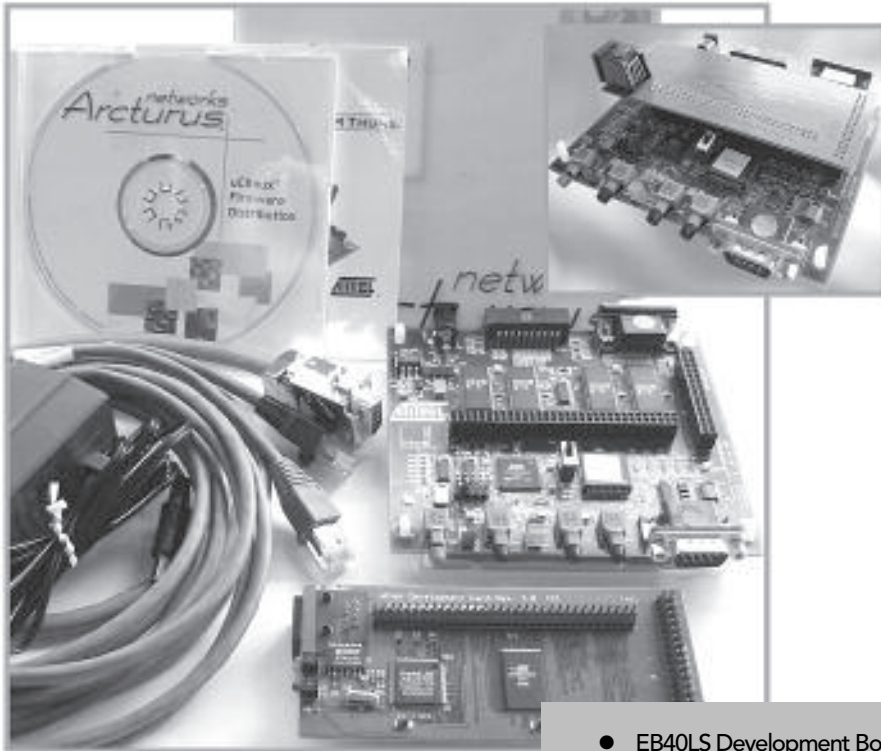
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iSYSTEM	winIDEA
Lauterbach Datentechnik	TRACE32 Power View
Micetek	Hitool IDE
Signum Systems	Chameleon Multi-Core Debugger
<b>JTAG ICE Interfaces</b>	
Abatron	BDI1000 / BDI2000
ARM	Multi-ICE® JTAG Interface Unit
Ashling	Opella, Genia, Vitra
Epitools	JEENI® Intelligent JTAG Debug Probe
Epitools	MAJIC® Intelligent JTAG Debug Probe
Green Hills Software	Green Hills Probe™
Green Hills Software	Slingshot™
iSYSTEM	iC3000 iTRACE
iSYSTEM	iC3000 JTAG
Lauterbach Datentechnik	TRACE32-ICD
Macraigor Systems	Macraigor Systems On-Chip Debugging Tools
Signum Systems	JTAGjet, JDSnet
<b>RTOS</b>	
Accelerated Technology	Nucleus Plus
Arc	Precise/MQX™ RTOS and Precise/RTCS™ TCP/IP Stack
Arcturus Networks	uClinux Embedded Operating System for Microcontrollers
Green Hills Software	ThreadX® Real-Time Operating System
InterNiche Technologies	ChronOS™
Kadak Products	AMX™ RTOS
Micetek	uClinux Package for Atmel ARM Microcontroller
Micro Digital Associates	SMX® Simple Multitasking Executive
Silicomp Research	Open Source Real Time Operating System
<b>Flash Programmers</b>	
BP Microsystems	Universal Engineering Programmer
Macraigor Systems	Macraigor Systems' Flash Programming Application
<b>Socket &amp; Adapters</b>	
Emulation Technology	AT91 Sockets, Adapters & Test Accessories

**Software IP**

Arcturus Networks	Embedded Firmware Suites for Converged IAD/RG/CPE Devices
ARM	ARM MOVE <sup>®</sup> Technology for Digital Audio
InterNiche Technologies	NicheStack <sup>™</sup> TCP/IPv4, v6 or both
InterNiche Technologies	NicheView <sup>™</sup> and WebPort <sup>™</sup>
InterNiche Technologies	Interniche Options and Add-ons
Kadak Products	KwikNet TCP/IP Stack
Micro Digital Associates	smxFile <sup>™</sup> File Manager
Micro Digital Associates	smxNet <sup>™</sup> TCP/IP Network Stack
Netbricks	Softmodem Bricks
NexGen Software	NexGenGUI4 <sup>®</sup> Portable Graphical User Interface SDK
NexGen Software	NexGenIP <sup>®</sup> Portable Embedded TCP/IP Suite
NexGen Software	NexGenSURFon <sup>®</sup> Embedded XML based micro-browser SDK
RTJ Computing	simpleRTJ - Java Virtual Machine
Silicomp Research	Open Source Software Components
Spirit Corp	MP3 Decoder

**Consultants**

# Embedded uClinux Development Platform



The Arcturus™ AT91 Embedded uClinux Development Kit is the ideal reference platform to evaluate and develop uClinux™ systems on the ARM™ architecture. The development kit includes all the required hardware and software to get up and running right out of the box. Based on an enhanced version of the popular ATMEL™ EB40 board (EB40LS), the ARM7TDMI development kit features 2MB of Flash and 2MB of SRAM, ensuring adequate system resources. The Arcturus EB40LS also incorporates 10BaseT Ethernet support, including file system, TCP/IP and embedded web server. If your development requires a royalty-free, mature, robust operating system in combination with a cost-effective, efficient ARM7 core, the uClinux ARM7TDMI Development Kit is ideal for you.

uClinux is the industry standard embedded operating system for SoC microcontrollers. Arcturus, the originator of uClinux provides uClinux 2.0.38 which is optimized specifically for the Atmel AT91 Architecture and capable of operating in 2MB/2MB. Complete with GNU tools, source and

- EB40LS Development Board with AT91 ARM7TDMI processor and 2MB SRAM
- uCnet Development Card with 10BaseT Ethernet and additional 2MB of Flash
- uClinux software CD including source
- GNU Tools
- Cable kit
- Power Supply
- Reference Manual

binary code, uClinux embedded on the EB40LS development board creates a powerful, robust platform to develop low-cost ARM based devices. uClinux is royalty-free including run-time, TCP/IP stack, keeping the total cost of ownership low, while reducing time-to-market. Arcturus offers expert services in all aspects of uClinux including full system design, hardware development and system integration.

### Arcturus Firmware Suites

Optional value-add Firmware Suites are available from Arcturus to enable Voice, Media, remote management and VPN. Arcturus Firmware Suites are ideal for the development of next generation converged IAD's, RG and CPE devices. For license terms, contact Arcturus sales.

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e-mail:  
sales@arcturusnetworks.com

### Web Site

[www.arcturusnetworks.com](http://www.arcturusnetworks.com)

## The Wireless Remote Access Platform (WRAP™)



The WRAP Starter Kit is a turnkey evaluation and development environment based on BlueGiga's WRAP™ MicroServer Technology. It combines following elements: ARM7 processor, Linux operating system and Wireless Network Interface (Bluetooth).

The kit is a flexible tool providing developers with a hardware platform and the software tools for the easy building of embedded wireless applications to sit on top of any WRAP product.

The kit is ideal for developing wireless applications, whether the aim is to replace cables, network your devices or simply let your machines become accessible from handheld devices (mobile phones, PDAs).

- Includes all needed hardware, software and physical interfaces to develop, test and run Bluetooth applications (Based on AT91R40807)
- WRAP Software™ with Full Bluetooth Protocol Stack (including LAN Access and Serial Port Profiles) and WRAP Bluetooth Socket Interface
- uCLinux embedded operating system
- HTTP Server
- GNU Compilers & Tools
- WABA (Java-like) Virtual Machine
- Automated Installation Tools

Development and test of Wireless Bluetooth applications for:

- Cable replacement
- Mobile control (Man-to-Machine)
- Remote machine monitoring, access/control, data logging and connection to ERP systems
- Wireless M2M

### Europe

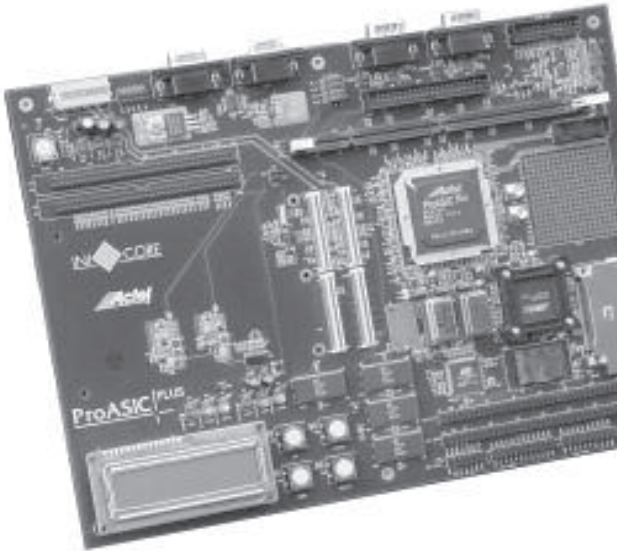
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FIN- 02200 ESPOO  
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Fax (+358) 94-124-0452

### Web Site

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Contacts

## System Design Board SDB-750



- ARM7TDMI CPU Subsystem Using
- AT91R40807 from Atmel
- eCOS Operating System from RedHat
- 1,000,000 System Gates ProASIC<sup>PLUS</sup> from Actel (SBD-1000)
- 2 MByte SRAM, 16 MByte FLASH
- 64-bit wide SRAM (PC100 DIMM)
- Compact Flash Slot
- Serial I/O: UART, I2C, CAN, LVPECL
- User Interface with LCD, LEDs and Keys
- In-System-Programming Support
  - CPU reprograms ProASIC<sup>PLUS</sup>
- LCD Display 2 line, 16 Characters each
- PMC Expansion, Supporting
  - IEEE P1386.1
  - PCIMG 2.15 (PTMC)
  - 64-bit PCI
- 2 CPU Extension Slots
- Versatile Clock Circuitry
- Real Time Clock with Backup Battery

The SDB-750 is powered by the industry-leading ARM7TDMI 32-bit RISC processor based AT91R40807. In combination with the 2 MBytes SRAM and 16 MBytes of program memory (FLASH), the board operates in a standalone mode. It is complemented with an up to one million gate ProASIC<sup>PLUS</sup> FPGA from Actel. The SDB-750 is an ideal platform to prototype your next ASIC, based on the ATMEL AT91 microcontrollers.

The SDB-750 can be used in a wide range of applications. Whether high performance, compute-intensive applications or industrial applications making use of the two on-board CANbus channels or systems in need of advanced power management, they are all well supported by the AT91 CPU. The PMC port with the PTMC extension opens the door to the telecom sector.

### Software Support

The SDB-750 runs the eCos operating system from RedHat. Software design is supported with the GCC tool suite running on Linux and Windows platforms. The JTAG in-circuit emulator (ICE) interface eases system debugging. Also, a serial port can be used to interface to a GDB debugger running on a host computer. To ease software development, a monitor application is provided using the LCD display, the keyboards and LEDs as the user interface.

### In-System Programming

The SDB-750 supports the reprogramming of the FPGA by using a standard JTAG header or by the on-board RISC-processor, the AT91R40807.

### Interfaces and Hardware Support

The SDB-750 is designed to support real System-on-Chip applications. The external CPU can be disabled and replaced with a controller residing inside the ProASIC<sup>PLUS</sup> device. All external resources such as SRAM and FLASH memory are available to the on-board CPU.

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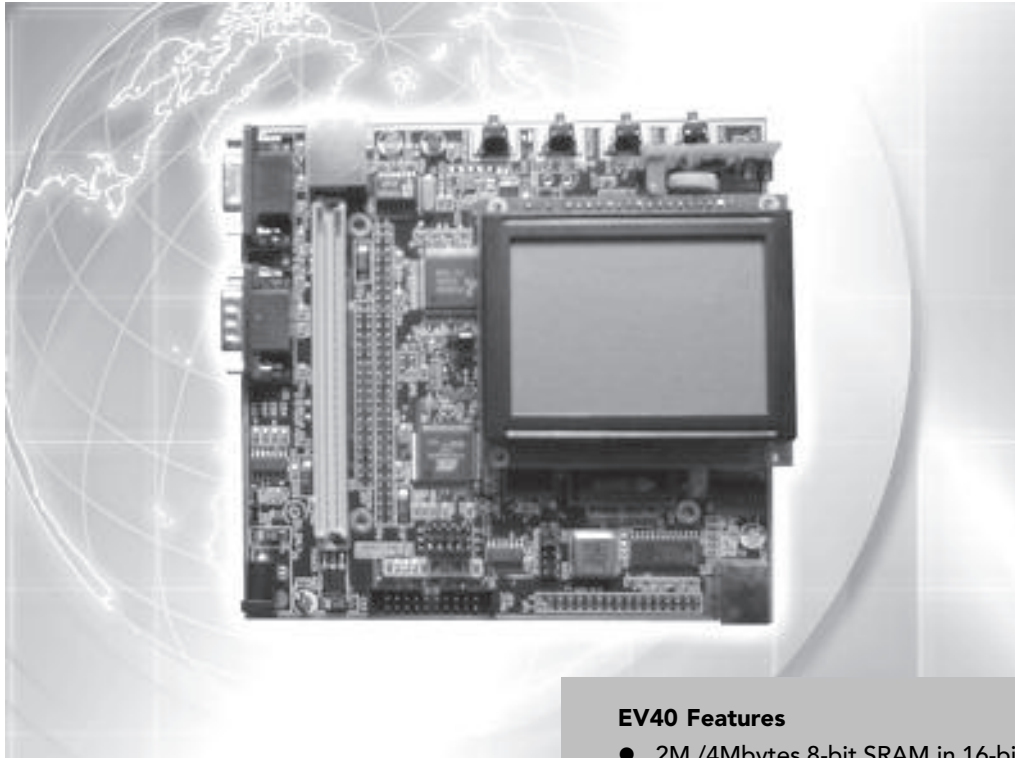
### Web Site

[www.inicore.com](http://www.inicore.com)

Contacts

## MICETEK's Evaluation Board for AT91 40-Series

# MICETEK



EV 40 can be used to support Atmel's AT91 M40800 / R40807 / M40807 / R40008 ARM7 TDMI chips. This board offers features for full-speed design, easy chip evaluation, and early hardware & software development. It also comes with free schematic, and gives hardware engineers a reference design that can be applied to their own boards later.

### Optional Memory Board with EBI connector

2M bytes 8-bit SRAM, in 16-bit groups  
4M bytes 16-bit Flash

### EV40 Features

- 2M /4Mbytes 8-bit SRAM, in 16-bit groups
- 2M/6M Bytes 16-bit Flash
- 128x64 graphic LCD module
- One 8 segments LED
- On board clock source selection
- 10 Base-T Ethernet controller
- Buttons and LEDs for input and output
- 2 channel RS232 ports
- Touch panel interface connector(optional)

### EV40 Standard Interface

- 20-pin JTAG interface connector
- Ethernet interface connector (RJ45)
- EBI extension interface
- PC104 interface
- I/O extension interface
- 2DB9 RS232 interface
- USB interface connector (Optional)

### Board Support package (optional)

- uCLinux
- ThreadX
- UCOS/II

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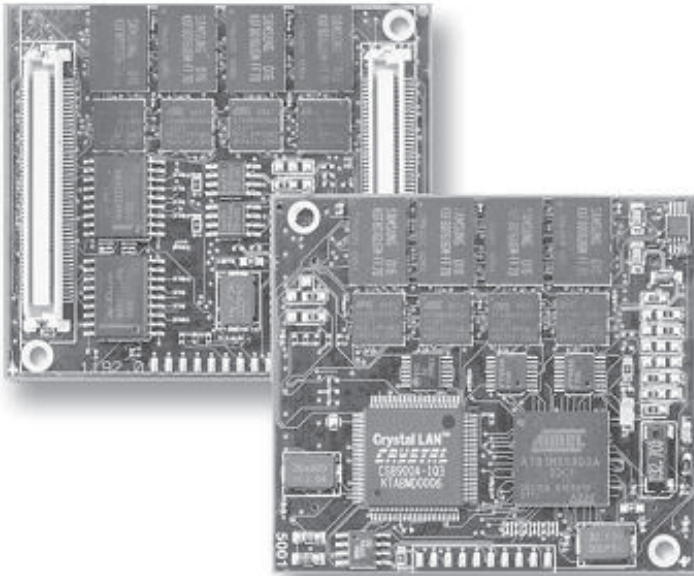
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64891397  
Fax (+86) 10-64961633  
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[www.micetek.com](http://www.micetek.com)

Contacts

## phyCORE®-ARM7/AT91M55800A



Based on the Atmel AT91M55800A controller, the phyCORE-ARM7 offers processing power combined with extremely low power consumption in a minimum form factor. Up to 16 MB Flash and 8 MB SRAM populate the module as external memory. Two 82C900 devices support dual 2.0B CAN interfaces, while a CS8900A enables 10 Mbit/s Ethernet communication. A JTAG-interface supports download of user code and debugging. All applicable logic signals are broken out to two high-density (0.635 mm.) connectors. The board boasts a low EMI design for OEM integration into target hardware. Reduce development time and costs by implementing our insert-ready SBC modules.

The module is also available in a Rapid Development Kit that contains all necessary ingredients for immediate start-up and evaluation. Kits include:

- SBC module
- Development Board with hardware supporting immediate start-up and programming of the module: DB-9 connectors (as RS-232/485 and CAN interfaces); RJ-45 Ethernet, JTAG and power connectors
- AC adapter
- serial cable
- PHYTEC Spectrum CD including evaluation software tools, demo programs and extensive documentation

- Subminiature Single Board Computer (53 x 60 mm)
- 32-bit RISC Atmel AT91M55800A
- CS8900A 10BaseT Ethernet controller
- Flash: up to 16 MB  $\mu$ BGA (ISP)
- SRAM: up to 8 MB  $\mu$ BGA
- Serial: up to 8KB SPI-EEPROM (optional FRAM)
- 16-bit external data bus
- SRAM battery back-up support
- Three asynchronous serial interfaces
- Dual 82C900 CAN controller decoded via TLE6250 CAN transceivers
- JTAG-Interface

Our Kits offer a Rapid Development solution by providing you with all the necessary ingredients with which to jump-start your embedded design, reduce time-to-market and propel your concept to prototype and finished product.



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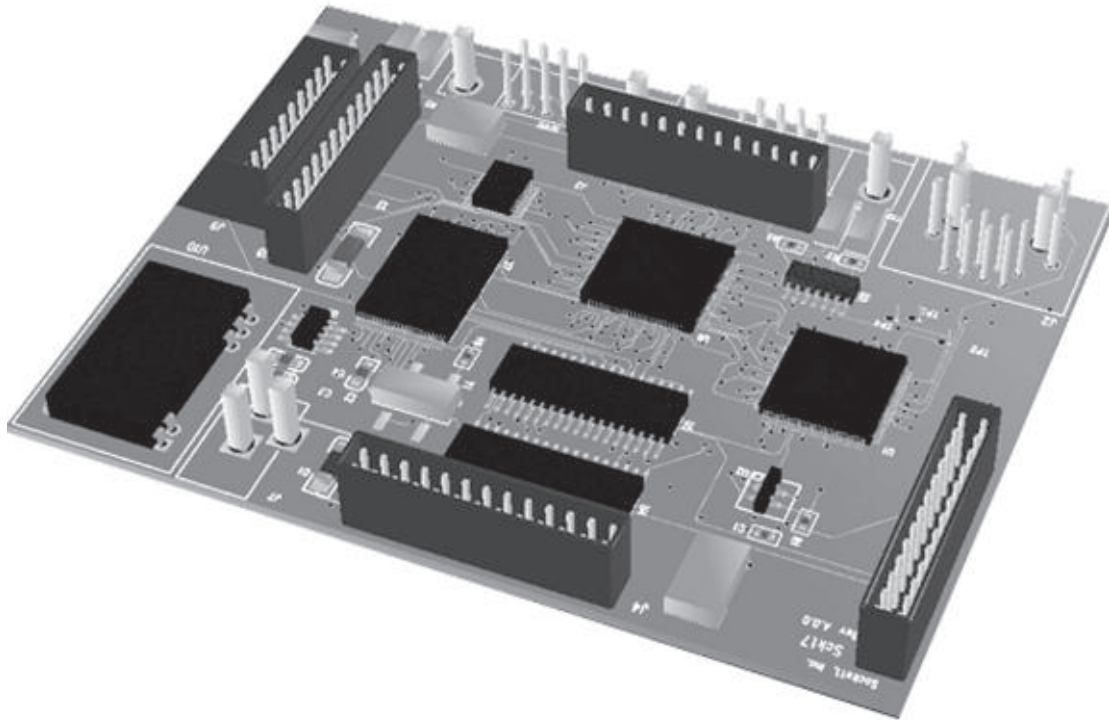
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e-mail: info@phytec.de

### Web Site

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## OEM Module Solution



### USA

Socket1, Inc  
6540 Lusk Blvd  
C-163  
San Diego, CA 92121  
USA  
James Musselman  
Tel. (+1) (858) 404-0008  
Fax (+1) (858) 404-0018

### Web Site

[www.socket1.com](http://www.socket1.com)

- Embedded Processing with 32 bit industry standard power

32 bit ARM Microprocessor

- Compatible with 8 bit budget

- Ethernet port

- RS232 Serial port

- TCP/IP stack - option

eCos Open Source RTOS - Source always included

- GNU C/C++ tool suite

Ready to create your application and network

- Low cost, no license fees or royalties ever

- Suitable for industrial instruments, network appliance, Serial to Ethernet converter.

- Product Design and Development Services
- Engineering Services for complete turnkey solution
- Open Source Software tools
- Hardware board for a Rapid Development Platform suitable for OEM solution

- Complete software and hardware design services are available.

- Object oriented design

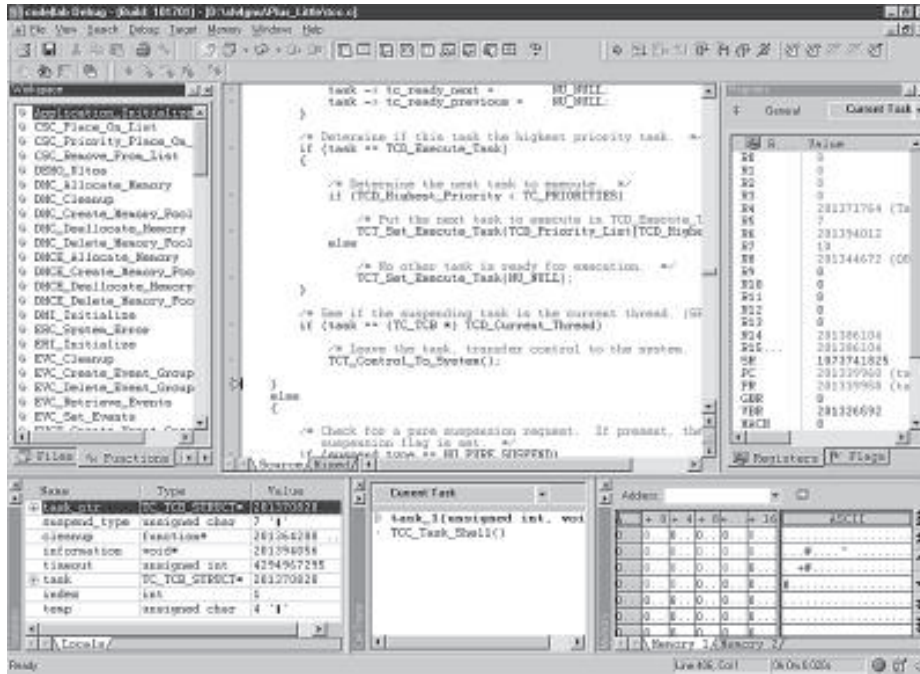
- Highly integrated solutions to Software Engineering and Hardware requirements.

- Custom solutions can be developed with your own software and/or hardware requirements in mind to exactly satisfy your design goals.

Socket1, Inc. can provide an OEM module with Atmel AT91 CPU, memory, and ethernet port to form the CPU core of your product, or the PCB artwork can be supplied or pasted into your own pcb. Thus, it can form a building block component with a TCP/IP stack included.



## code|lab Debug



- Powerful hardware-assisted software debugger
- RTOS independent
- Software independent
- Your choice of compiler
- Your choice of third party plug-ins
- Open API for plug-in development
- Wide choice of debug communication - Serial, JTAG, Ethernet, ROM Emulation, etc.

Embedded software development is becoming more complex every day. Schedules and budgets get tighter while higher performance is demanded. To deal with these demands, developers of embedded systems require comprehensive development tools that include complex remote debugging. code|lab Debug is ATI's hardware-assisted software debugging tool.

Traditionally, debuggers have been specifically designed for each target and engineers are forced to learn a new environment for every combination of software, CPUs, peripherals, and boards. code|lab Debug shatters this pattern! Regardless of the combination, regardless of where you are within your project's development cycle, you enjoy the same workstation-hosted front-end that does not change as you replace any part of the system!

code|lab Debug provides best-in-class support for advanced debugging features including scripting, complex analysis, and hardware-assisted debugging. It is an exceptionally powerful and easy to use C/C++ source-level debugger, incorporating sophisticated scripting and powerful hardware-assisted features and complex

breakpoints in addition to a complete range of more traditional functions.

code|lab Debug adapts to many different embedded CPUs, C/C++ tools, debug connections, and target boards without requiring new tools.

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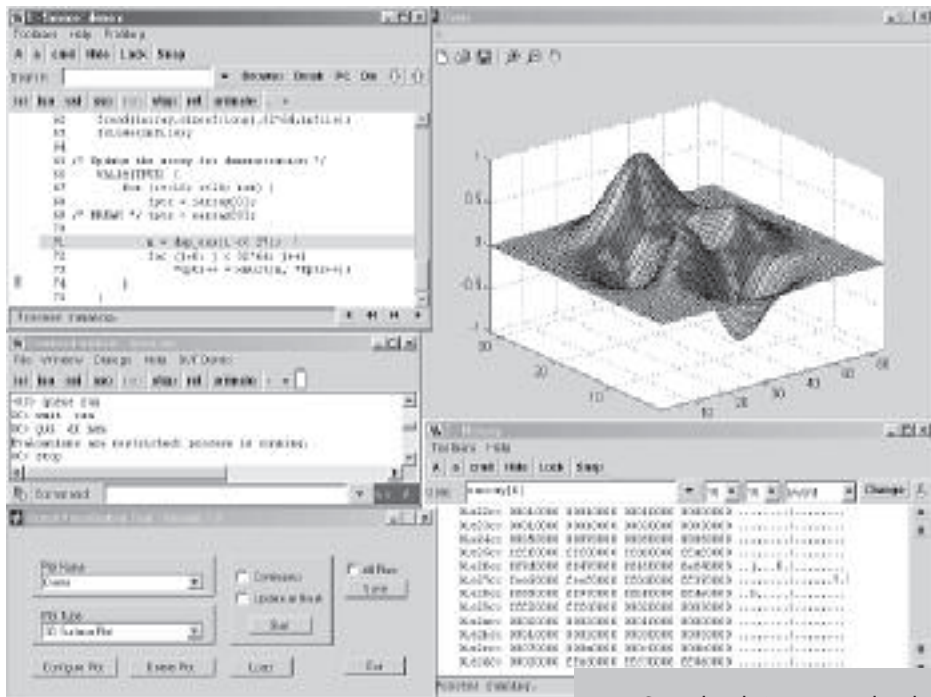
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### Web Site

[www.acceleratedtechnology.com](http://www.acceleratedtechnology.com)



## MetaDeveloper™ Embedded Development Toolset



ARC International offers a highly optimized and robust tool suite for ARM®-based embedded development. ARC's MetaDeveloper for ARM includes the C/C++ Compiler, SeeCode™ Debugger, simulator, assembler, linker, profiler, RTOS and networking application prototyping, IDE and optional Precise/MQX™ RTOS and Precise/RTCS™ TCP/IP networking stacks.

ARC's MetaWare Compiler gives developers complete control over the compiler's language enforcement, code generation and optimizations that pay off in tighter code and faster programs.

The SeeCode Debugger goes beyond traditional RTOS awareness to include complete networking stack detail. SeeCode features include: compatibility with popular JTAG emulators, source and assembly code display, conditional breakpoints and watchpoints, register/variable queries and value setting of memory and registers. In addition, SeeCode's multi-processing capabilities allow up to 256 debug applications in a single session.

Field-proven for over 20 years, ARC's MetaDeveloper for ARM goes to extraordinary lengths to compile even the most complex applications correctly, supply meaningful error messages and generate fast, compact code that places minimal demands on the target environment.

ARC's MetaDeveloper for ARM has been seamlessly integrated with ARC's Precise/MQX™ RTOS and Precise/RTCS™ Networking Stacks. No longer are you at the mercy of multiple vendors

- Seamlessly integrated, robust tool suite
- Highly scalable development tools
- Support for C and C++ compilers
- Transparent support of target hardware or simulator
- Support for a variety of emulators
- Graphical user interface or command-line operation
- Mixed assembly and source-level debugging
- Flexible displays of peripherals and registers
- Easily re-targets to new processors and operating systems
- Multiple-processor debugging
- ELF object module format, DWARF debug record format
- Compiler optimizations allow for compact code and fast performance
- Libraries delivered in C source - including PIC/PID
- MQX RTOS available off-the-shelf with board support packages for Atmel's evaluation kits
- Software easily ports to custom hardware

working together today and not tomorrow - leaving you stuck with non-cooperating vendors and unsynchronized, obsolete releases. The synergy created by this comprehensive software development environment leaves you with one reliable vendor - reducing your design risk, development costs and ultimately, time-to-market.

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Contacts

## RealView™ Compilation Tools



**RealView™**  
ARM® Tools by ARM

The RealView Compilation Tools, part of the RealView development solution, provide the full set of software components required to build C and C++ applications targeting the 32-bit ARM and 16-bit Thumb® instruction sets.

ARM Developer Suite™ (ADS) is still available for purchase, please see our website <http://www.arm.com>, for further details. An evaluation version of ADS is included in the AT91 Series Evaluation Kits.

- Optimizing ANSI C Compiler, Optimizing Embedded C++ Compiler (EC++)
  - Industry leading optimization for code size or performance
  - Support for all ARM CPUs.
- Linker
  - ELF and DWARF industry standards adopted for object file and debug table formats
  - Seamless interworking of ARM and Thumb object code
  - Scatter-loading feature supports placement of code and data within sophisticated target memory maps
- Assembler
- Image Conversion Tool
- ARM Object file Librarian/Archiver
- C Libraries
- RogueWave C++ Libraries

# ARM

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### Israel - Phoenix

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Tel. (+972) 9-7644800

### Japan/Asia Pacific - YDC Corporation

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## RealView™ Development Solution



ARM® RealView development solution provides designers with the ideal tools for creating and analyzing systems based on ARM technology. The RealView development solution is fully integrated and provides a complete solution to any design or System-on-Chip (SoC) integration challenge.

The RealView solution includes:

- RealView Debugger
- RealView Compilation Tools
- RealView ARMulator ISS
- RealView ICE and Trace

### RealView Debugger

The ARM RealView Debugger is a leading component of ARM's RealView development solution. It delivers multi-core mixed architecture debugging and OS awareness of applications for all ARM core-based devices.

The RealView Debugger complements ARM's existing tool solutions (ARM Developer Suite™ (ADS), Multi-ICE® and MultiTrace™), as well as providing performance improvements when used with the new RealView ICE and RealView Trace module.

- Multi-core debugging - Multiple ARMs
  - Multiple processor windows within the same debugger kernel
- Mixed-core debugging
  - ARM plus DSP Group's OakDSP and TeakLiteDSP
  - High integrity synchronised debugging
- OS aware debugging
  - ATI Nucleus, Symbian OS and Express Logic ThreadX
- Works with all of ARM's existing tools solutions
  - Consumes images from the ARM Developer Suite (ADS) v1.2 compiler and RealView Compiler Tools v1.2
  - Multi-ICE and MultiTrace
  - RealView ICE and RealView Trace
- Non Stop Debug Support using RealMonitor
- Trace and Analysis Support
- Command Line Interface and Script supportstom hardware

### Extended Target Visibility

Extended Target Visibility significantly increases the access into the target SoC or standard product by providing the facility to view and update hardware resources outside of the core. Viewing of memory mapped peripherals is enabled in a user-friendly manner (i.e. enumeration can be assigned and displayed for particular register/peripheral values).



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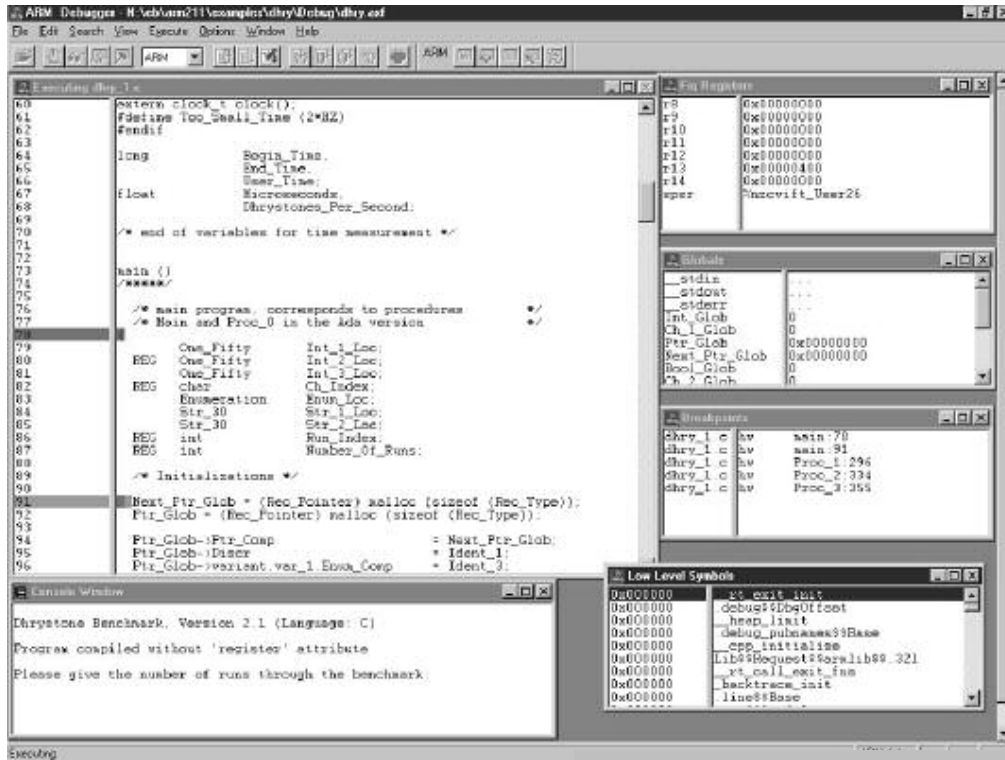
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## ADS: ARM® Developer Suite



The ARM Developer Suite (ADS) is available through EPI's distribution channels.

Like the earlier ARM toolkits, ADS provides a complete software development solution for those creating applications for the Atmel ARM microcontrollers. An ADS includes compilers (for Embedded C++ and C), an assembler, a linker, instruction set simulators, and several debuggers.

The code generation tools in an ADS include the expected optimization choices relative to speed, size, and debug level. They are capable of producing processor-specific optimization for the ARM7 and ARM9 based microcontrollers.

The Instruction Set Simulators included in an ADS provide accurate simulation of ARM and Thumb core-based processors. They allow you to develop and benchmark code before hardware is available.

Three debuggers are included in an ADS. They are:

- Integrated development environment
- C/C++ source-level debugger
- Library Manager
- Support for RDI 1.51 debugger interface
- Support for ELF and DWARF 2.0 file formats
- Sophisticated on-line documentation
- ARM Application Library
- Real-time Trace capability
- Integrated support for Embedded C++

- AXD -- the ARM extended Debugger
- ADW/ADU -- the ARM Debugger for Windows/Unix
- armsd -- the ARM symbolic debugger

The extendible ADS debug architecture allows you to select different debug targets without changing debuggers. This extends to interfacing to any RDI-compliant target, such as the JEENI®, any of the MAJIC® probes, the ARMulator or Angel.

The new AXD debugger includes:

- New look and feel GUI
- New improved window management
- Improved data display, formatting and editing
- Integrated command-line interface

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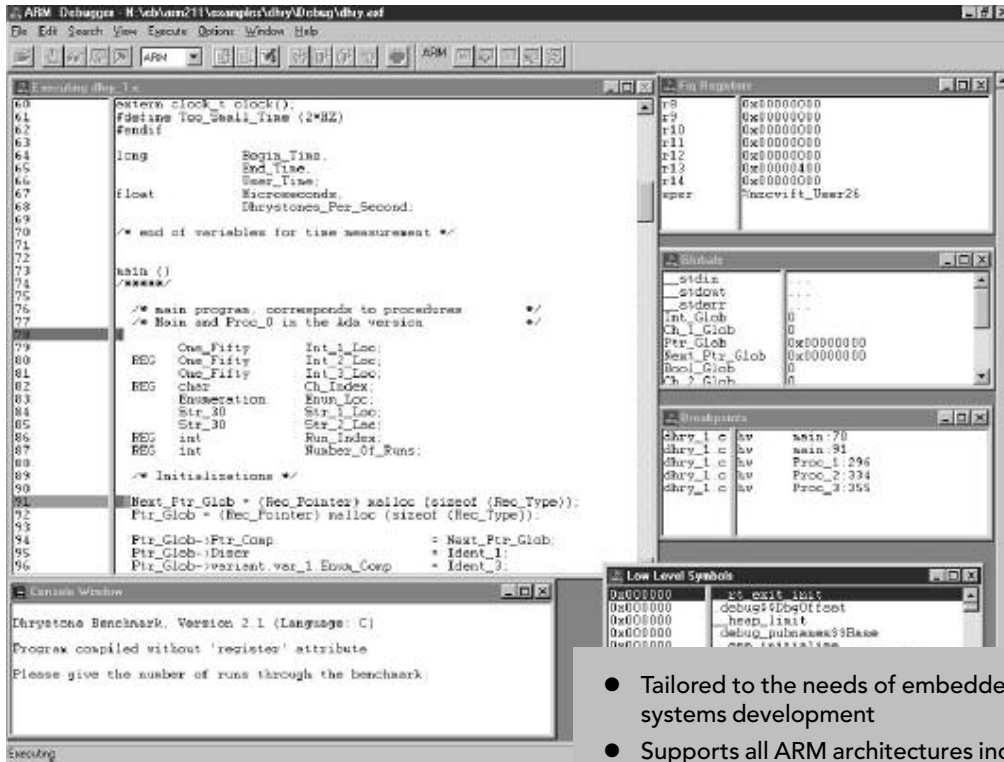
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## CCE-SDT



EPI's CCE-SDT Development environment offers a complete solution for any C- or assembler-based development project, along with an optional C++ upgrade. The Compiler produces high-quality, fast-performing and robust code. This optimizing ANSI C compiler supports the architecture and memory spaces of the target processor including the 32-bit ARM instruction set and the 16-bit Thumb instruction set.

The Project Manager automatically detects the interdependencies between source files at build time, eliminating complex make files. A simple click on reported errors moves the view pointer to that line of source code and then invokes your editor automatically.

The Thumb-aware debugger integrated seamlessly into the development environment, giving you a natural progression from code generation to code debugging. It has very powerful display capabilities, including a Watch window for variables, registers and memory locations.

The Instruction Set Simulator provides an accurate and speedy development environment before target hardware becomes available. It runs stand-alone on your host computer.

- Tailored to the needs of embedded systems development
- Supports all ARM architectures including Thumb and ARM920
- Available for PC, Sun and HP hosts
- ANSI C compliant, optimizing cross-compiler and run-time library source
- Assembler and linker
- Supports ARM and Thumb instruction sets
- Program size optimizations
- Execution speed optimizations
- Project manager for easy source control (MS Windows)
- Windowing debugging interface
- Source/assembler interleaving
- Easy breakpoints
- Powerful Call graph
- Fast Instruction Set Simulator

The target resident debug kernel runs on your target ROM and provides a development platform for those processors with the EmbeddedICE macrocells. It communicates with the debugger by a dedicated port and provides a very low-cost debugging environment.

EPI offers two versions of this popular ARM software toolkit, CCE-SDT (V2.11a) and CCE-SDT25 (V2.51).

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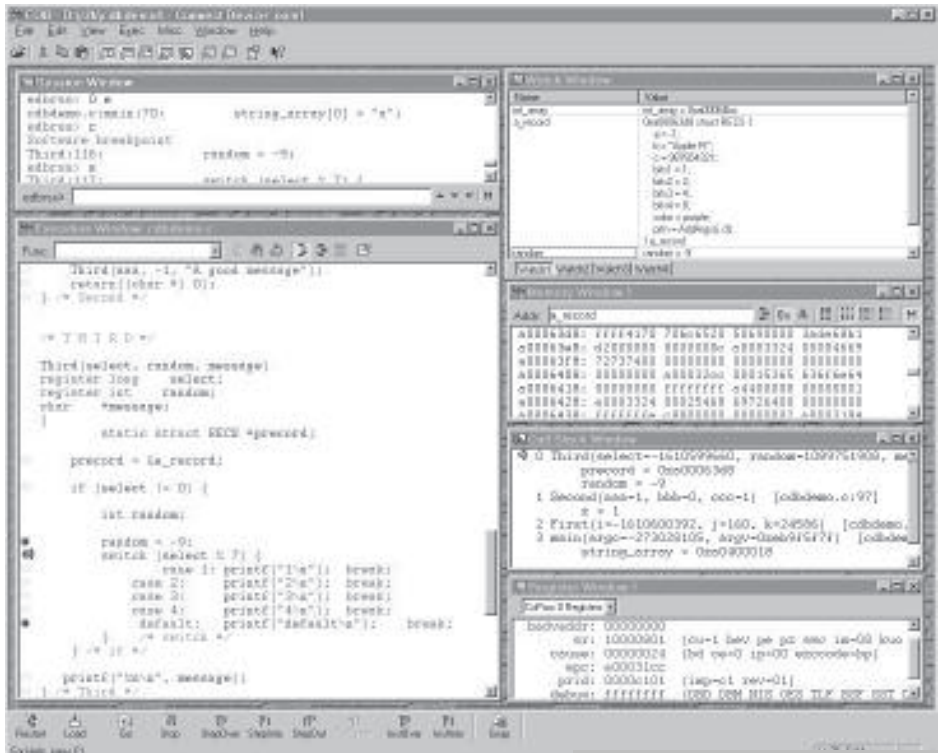
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## EDB - GUI C source-level debugger



- The most extensive list of supported ARM cores in the industry
- Customizable RTOS support
- Sophisticated breakpoint control features
- Multi-CPU context support
- Extensible debugger command language
- Extensive set of GUI debugger window types
- Fully compatible with EPI's MAJIC® Series of debug probes

The EDB C source-level debugger is robust, reliable and full-functioned. It was designed specifically to meet the requirements of debugging RISC-based embedded systems. EDB is ideal when used with the other EPI software compilation tools, but it also is excellent for use in debugging code generated by the compilers of other software vendors. This makes EDB ideal for bringing up operating systems, driver code, and interrupt handlers, which have been compiled using GNU tools.

Some of the many windows available to you in EDB include Execution, Session, Values Watch, Memory, Registers, Call Stack, Trace Data, Trace specification editor, Breakpoint editor and I/O window.

Full scrolling operation allows large amounts of data to be viewed easily and conveniently. Hyper-linking between display windows allows the data in each window to be correlated quickly with your source code and with other views of the data. You can even display a structure in your own custom format.

Part of EDB's integrated RTOS debug support is the ability to characterize each breakpoint as either unqualified or applying only to specific threads.

When used with compatible debug probes, EDB automatically provides the GUI interface to allow easy configuration of the probe and meaningful display of the collected data.

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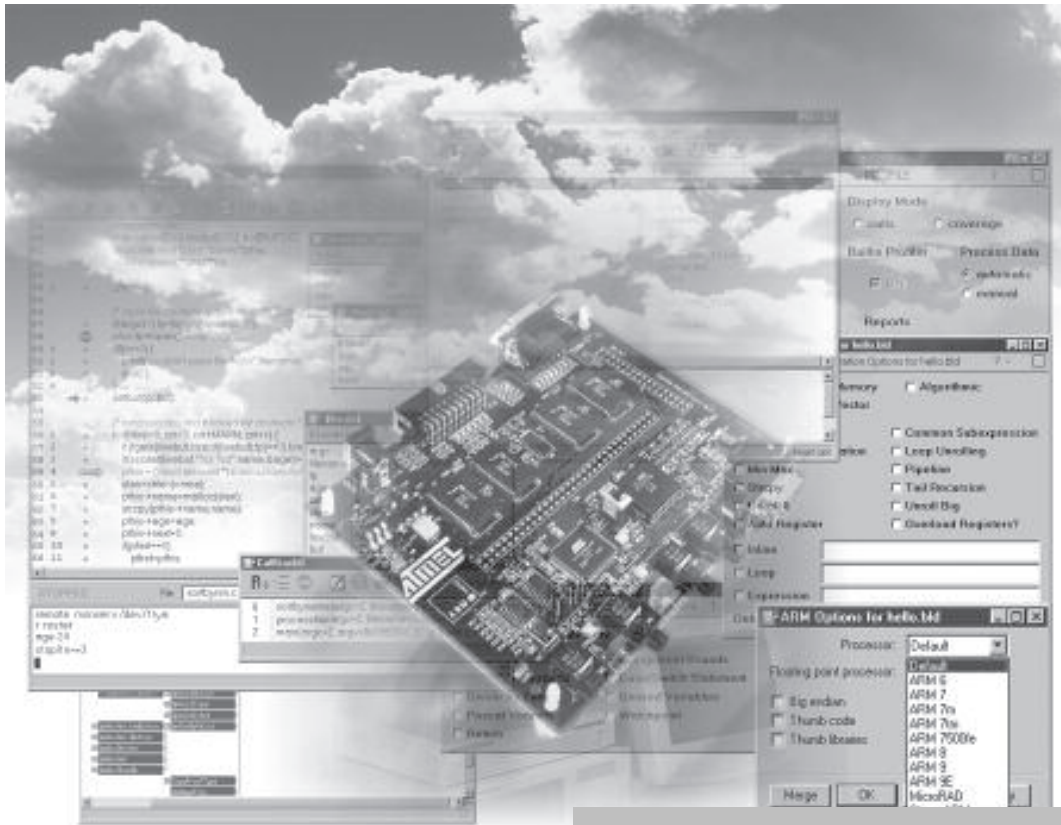
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## MULTI® Development Environment Optimizing C and C++ Compilers



### Optimizing Compilers

Green Hills Optimizing C, C++, and EC++ Compilers have a well-earned reputation for producing very high quality code for ARM 7, ARM 9, and Thumb. Code written in different languages can be mixed into a single executable. Green Hills Compilers use the same global optimizer and code generator. Code may be optimized for maximum speed or for minimum code size on a module-by-module basis and even at the function level.

### Integrated Development Environment

The MULTI Integrated Development Environment is a comprehensive suite of tools for embedded applications. MULTI provides a direct graphical interface with all Green Hills Compilers, and supports multi-language development and debugging. MULTI consists of a project builder, source debugger, performance profiler, run-time error checking, graphical browser, text editor, and version control system.

### Code Balance™

Green Hills Offers a powerful utility program the CodeBalance Optimizing Profiler, that enables the user to make critical performance/code-size trade-offs. By analyzing the performance profile

- Optimizing Compilers: C, C++, Embedded C++
- MULTI Integrated Development Environment: Source-level Debugger, Performance Profiler, Version Control, and more
- Real-Time Operating System Support: ThreadX, VxWorks/Tornado, Custom
- Remote Debugging: Green Hills Probe, Green Hills Slingshot, EmbeddedICE, Multi-ICE, Angel ROM Monitor, Agilent Probe, Macraigor Systems OCD

on a function by function basis, CodeBalance performs recompilation in 16 - bit mode starting with the functions that take the least amount of executable time. This achieves code-size reduction with minimal increase in execution time.

### Technical Support

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## IAR Systems development tools for ARM and AT91



IAR Systems offers a set of highly sophisticated and easy-to-use embedded development tools for AT91 microcontrollers—tools that carry you through the different development phases, from early design to code generation and debugging on the hardware. From Idea to Target!

### **IAR visualSTATE for AT91**

IAR visualSTATE for AT91 is an integrated suite of tools for the entire embedded software development process. IAR visualSTATE for AT91 contains a UML-compliant graphical design environment, advanced verification and validation tools, and a very powerful code generator. Due to its unique technology, it is possible to perform exhaustive testing and to generate reliable and production-ready C code in just a few seconds.

### **Other IAR Systems tools for ARM application development**

IAR Embedded Bluetooth Protocol Stack, IAR PreQual for Bluetooth and the Bluetooth Starter Kit. Please visit [www.iar.com](http://www.iar.com) for more information.

### **IAR Embedded Workbench**

- Full integration of the C/Embedded C++ compiler, debugger and other tools under the modular and extensible Integrated Development Environment (IDE).
- Supports the ARM7™, ARM9™ and ARM9E™.
- Specific peripheral header files and debugger I/O register definitions are available for the AT91M40800, AT91R40807, AT91M40807, AT91M42800A, AT91M55800A, AT91M63200 and AT91M43300 derivatives.
- Highly optimized ISO/ANSI standard C and Embedded C++ compiler supporting ARM and Thumb mode.
- C++ template support\*.
- All required ISO/ANSI C libraries and extended C/EC++ library available, including STL\* (Standard Template Libraries).
- Support for a wide range of industry-standard symbolic formats including ELF/DWARF version 2.
- Unique debugging features including complete support for stack backtrace, versatile monitoring of registers, structures, call chain, locals, global variables and peripheral registers, profiling and code coverage.
- Support for CMX-RTX™ RTOS\*.
- Hardware debugging support: ARM Multi-ICE and other RDI-based JTAG interfaces such as EPI MAJIC, MAJIC-MIX, MAJIC-PLUS, Abatron BDI1000/BDI2000 and Aiji OPENice32-A900, Macraigor's Raven and Wiggler, Ashling OPELLA, Jeeni\* JTAG Interfaces, ARM Angel\* and Atmel AT91 Evaluation boards.
- Professional edition includes tools for graphical design, test and documentation.

(\* Available in Q1, 2003 release)



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**iSYSTEM**

## WinIDEA



WinIDEA is the ultimate Integrated Development Environment, which contains all the necessary tools in one shell.

WinIDEA consists of a project manager, multi-file C source editor, build manager and high level source debugger. The build manager can be configured to support any third party command line driven compiler toolset. WinIDEA offers workgroup support for projects where several developers share same project code. C-like Script language is built in to facilitate automation and testing.

During complete development cycle you can stay within WinIDEA. You can write your code, run the compiler, assembler and linker and debug your software and hardware within one tool. It works with all our development tools: iC1000, iC2000, iC3000, iC4000 and iLA128. You have to invest your time and money only once, to get familiar with WinIDEA. WinIDEA is easy to learn, increases your productivity and speeds up the development cycle. This will help you to get your products ready in-time for market.

One of the goals in the development of winIDEA was to achieve a tight integration of all stages of program development (edit, build and debug) by a single application.

The integrated project manager and multi file editor serve as area for writing and debugging the program source. The build manager can be configured to support any third party command

- Project Manager
- Multi-File C Source Editor
- Build Manager
- Workgroup Support
- High Level Source Debugger
- Script Language
- Extensive Help
- Watch Window
- Real Time Watch Window
- Variable Window
- Call Stack

line driven compiler toolset, featuring background compilation, multiple build targets, file level compiler settings and much more. Typically where several developers work on a project and share the code, the source/revision control is used. Most popular third party source control tools can be integrated in winIDEA. High-level source debugger completely controls the program execution flow. Using debug commands and special debugger windows every software and hardware bug or critical issue can be found and inspected. C-like Script language can be used to facilitate testing and automation. Many predefined API functions are available and new can be added on request. The extensive context sensitive help covers all aspects of winIDEA.

WinIDEA runs on Windows NT 4.0, Windows XP, Windows ME, Windows 2000 and Windows 95/98 platforms.

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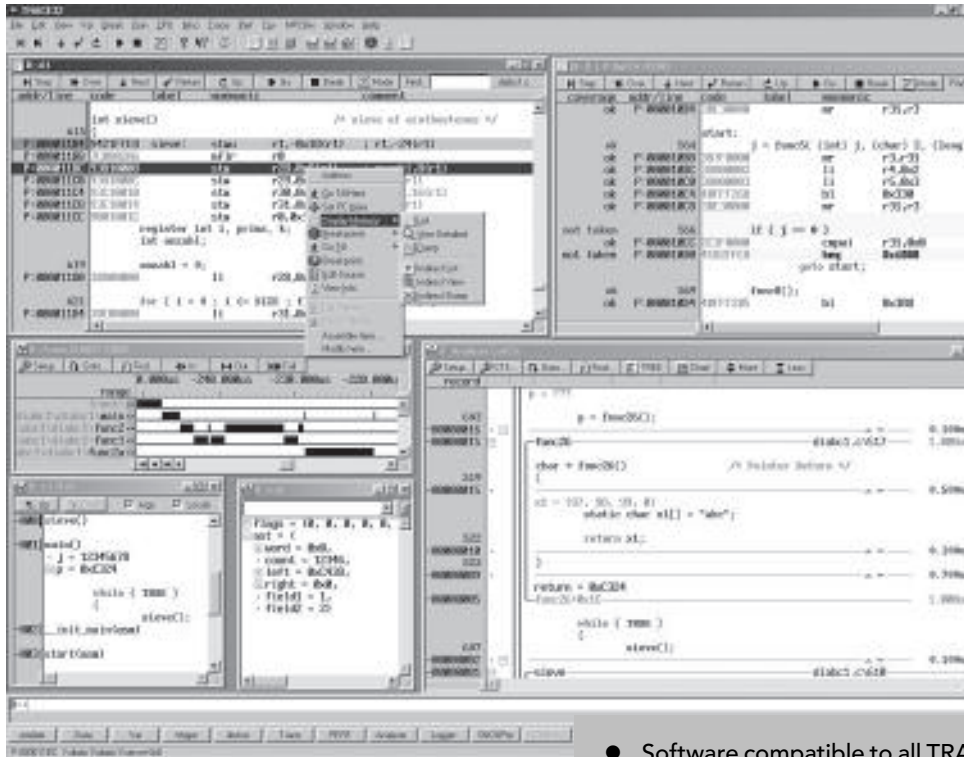
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## Trace32-PowerView



The Graphical User Interface (GUI) TRACE32-PowerView is the powerful IDE with same intuitive look and feel as all TRACE32 Tools. It works together with all third party compilers and can be integrated to editors and CASE-Tools. The complete GUI can be customized comfortably to the requirements of each project. A powerful, easy script language supports you to change the GUI, run test programs or automate command sequences. No other system offers more flexibility.

The Instruction-Set Simulator for ARM Cores allows assembler and HLL debugging on C or C++ level also for optimized code. An unlimited number of software breakpoints is available and advanced breakpoint features make it simple to break on complex conditions.

Furthermore the TRACE32 IDE provides a trace for the Instruction-Set Simulator to analyze the program-flow after program execution. This way executed source code can be displayed together with data and time information. And after you started Lauterbachs "Edge of the Art" analysis feature Context Tracking System (CTS) you will see a clear structured display of program flow, function nesting, timestamp and global as well as local variables. With CTS you can step your application backwards in addition to reach former states of memory and registers.

- Software compatible to all TRACE32 tools
- Easy HLL and assembler debugging
- Interface to all compilers for C and C++
- Integration to Editors, CASE Tools
- Customizable windows
- Powerful script language
- Hardware simulation
- Advanced support breakpoints
- Memory allocation Statistics with graphical displays
- RTOS Debugger

### Supported Third Party Compilers

ARM (AIF and ELF/DWARF), Cygnus, Green Hills, IAR, Arc.

### Supported RTOS

AMX, ChorusOS, embOS, Nucleus PLUS, OSE, pSOS+, RealTime Craft, RTXC, SMX, Symbian OS, ThreadX, VxWorks

### Supported Host Systems

PC (Windows XP, Windows ME, Windows2000, Windows NT, Windows 95/98, Linux), Workstation (HP-UX, SUNOS, Sun Solaris)

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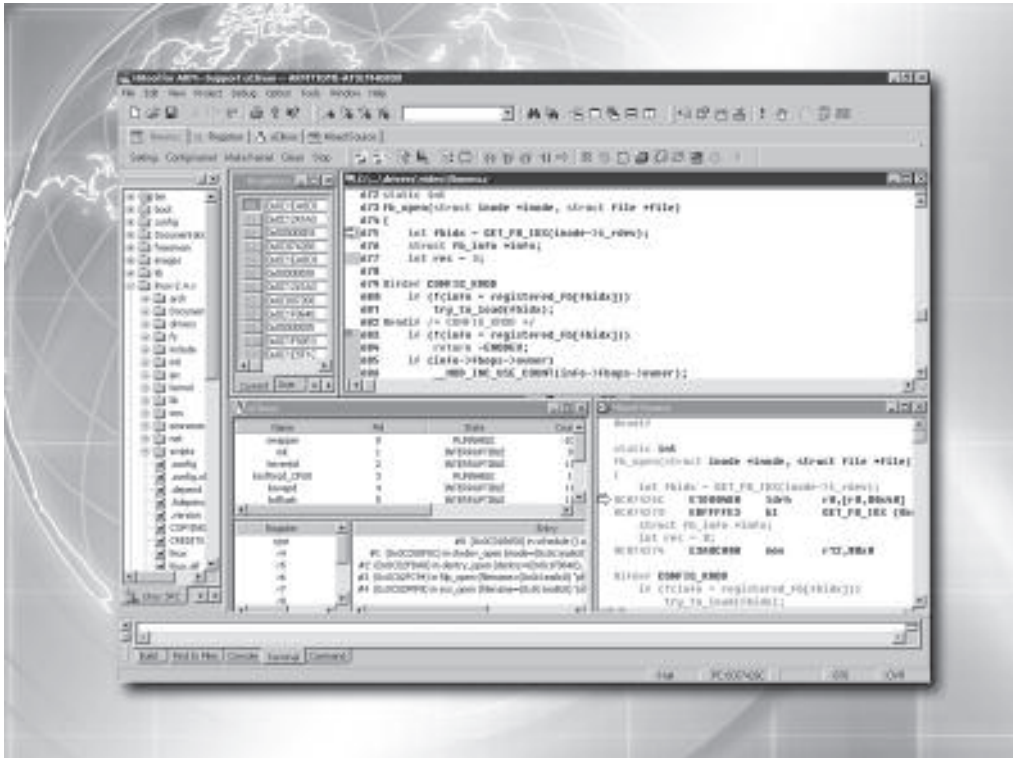
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## Hitool IDE

Task Info panel to bring up the uClinux window



HItool IDE is a "convenience driven, point and click" support tool. Combining state-of-the-art debugging facilities with the intuitive simplicity of a Windows-based environment, each major function contains a "point and click" window or tool to make debugging fast, flexible, and direct.

Now, HItool makes it even easier to access multiple functions and windows from not only one main source window, but from multiple access points. HItool runs under Windows 95 above and Windows NT 4.0 above.

The power and functionality of HItool provide the ideal environment for developing system that uses ARM chips, such as the AT91M40800 microcontroller from Atmel. It integrates GNU C/C++ compiler, Editor, Project-Build, & Instruction-Set Simulator, Source-Level-Debugger in the same environment, and supports a high-speed parallel, Ethernet connection between a host debugger and target microprocessor. The leader IDE for embedded Linux kernel & application debugging under Windows environment.

- Intuitive Debugging Windows
- Easy Project Configuration
- All New Graphical Symbols
- Fast and Easy Source Browsing
- Powerful and Easy Data Watching
- Quick and Easy Display of Calls
- Flexible Memory Display
- Easy Viewing of Registers
- Fast, Robust Target Control
- Project-Wide "Grep"
- Instruction-set Simulator
- RTOS aware of debugging
- Network Remote Debugging

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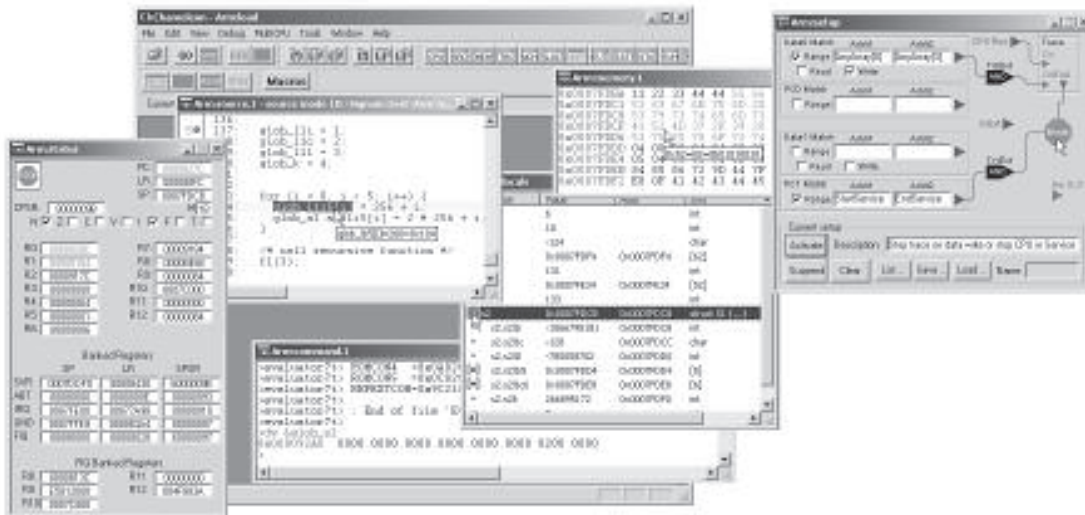
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## Chameleon Multi-Core Debugger



Chameleon works with a variety of hardware emulation devices (JTAG, BDM, ICE and simulators) to provide a consistent GUI interface to an embedded project at all stages of the development cycle.

Chameleon Debugger supports up to 256 homogeneous or heterogeneous CPUs in a single debugging environment. Information about all active CPUs is displayed on the same screen and is CPU context sensitive to make the debugging process faster and easier.

Chameleon is rich in the latest debugging features, such as fly-over variable watch, drag and drop variables, symbol browsing, complex variable implode/explode, script language for automatic testing, ETM set-up and trace windows, and more. Step-into, Step-out and Step-over modes are supported for both C and assembly levels. Our unique schematic like, graphical interface for complex events is quick, intuitive and incredibly easy to use.

With the Virtual I/O feature, all of the PC host file and I/O resources are available to the target for data saving, message printing and console I/O. Chameleon Debugger may be used remotely over any TCP/IP network where target sharing is required.

### Compilers Supported

- ARM (ADS)
- GNU (GCC)
- Green Hills Software (Multi-2000)
- IAR (EWARM)

- Only \$1,500 (with JTAGjet ICE)
- Supports all AT91 ARM devices, DSPs and other CPUs in SoC applications
- High-speed downloads > 500 Kbytes/sec
- Real-time embedded trace support (ETM)
- Multi-core homogeneous & heterogeneous device support
- Debugs multiple cores on the same screen
- Supports all major C/C++ compilers
- Compatible with other JTAG ICEs
- Integrated Flash programming
- Unlimited software breakpoints
- The easiest, most intuitive GUI for setting complex breakpoints and trace triggers
- Host Virtual I/O for target system usage
- Macros for automated debug and testing
- Optional API for manufacturing tests
- Real-time logging to outside applications

- Keil (PKARM)
- ... and others soon.

### Other JTAG Interfaces Supported

- ARM (Multi-ICE)
- Signum Systems (JDSnet & JTAGjet)

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## BDI1000/BDI2000



The BDI1000 and BDI2000 (BDI Family) provide JTAG debugging for the ARM-based AT91 family. With the BDI family, you can control and monitor the microcontroller solely through the stable on-chip debugging services. You do not waste time and target resources with a software ROM monitor, and you eliminate the cabling problems typical of ICEs. This combination runs even when the target system crashes and allows developers to continue investigating the cause of the crash. An RS232 interface with a maximum speed of 115k Baud and a 10Base-T Ethernet interface are available for the host interface.

### Debugger Support

ARM (ADW/AXD), Esmertec (Jbed), GNU (GDB), Mentor Graphics (XRAY), Wind River Systems (Tornado)

### Host Support

Windows 95/98/2000/NT, Unix, Linux (depends-on debugger)

- Source-level debugging for ARM7TDMI and ARM9TDMI cores
- Assist in bringing up new hardware
- Supports debugging of multiple cores
- Ethernet debugging available for target systems without network capability
- Built-in on-board programming of popular Flash memories
- Internal break register supported (allows debugging of code running out of a read-only memory)
- Fast download speed: up to 120K bytes/s
- No target communication channel (e.g. serial line) is wasted for debugging purposes
- Easy to connect to target
- 3 years hardware warranty

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## Multi-ICE® JTAG Interface Unit



Multi-ICE Interface Unit is a JTAG emulator for ARM® core-based System-on-Chip (SoC) devices.

ARM's popular JTAG-based In-Circuit Emulator (ICE), Multi-ICE, provides unparalleled depth and breadth of support for all ARM core-based devices, which contain the Embedded-ICE™ logic. ARM develops Multi-ICE support for all new ARM cores during the design and validation phase, ensuring that Multi-ICE supports all the features of the new cores. JTAG emulation allows the core to be started and stopped under control of the connected debugger software. The user can then examine and modify registers and memory, and set breakpoints and watchpoints. Multi-ICE also provides support for code download, trace and RealMonitor™ for real-time debug.

The Multi-ICE unit strengthens the features and usability of the ARM tool chain with:

- Fast download 130KB/s on a 400 MHz PII
- Stepping speeds greater than 50 steps/second
- Debug of multiple ARM and mixed architecture devices
- Support for all current ARM cores, including the ARM7™, ARM9™ and ARM9E™, ARM10™
- Debug of very low voltage cores (down to 1V)
- Debug of slow (sleep mode) or variable frequency designs
- Code download to Flash memory
- Host console I/O services (such as printf) without stopping the processor
- Attach to an already running target without halting

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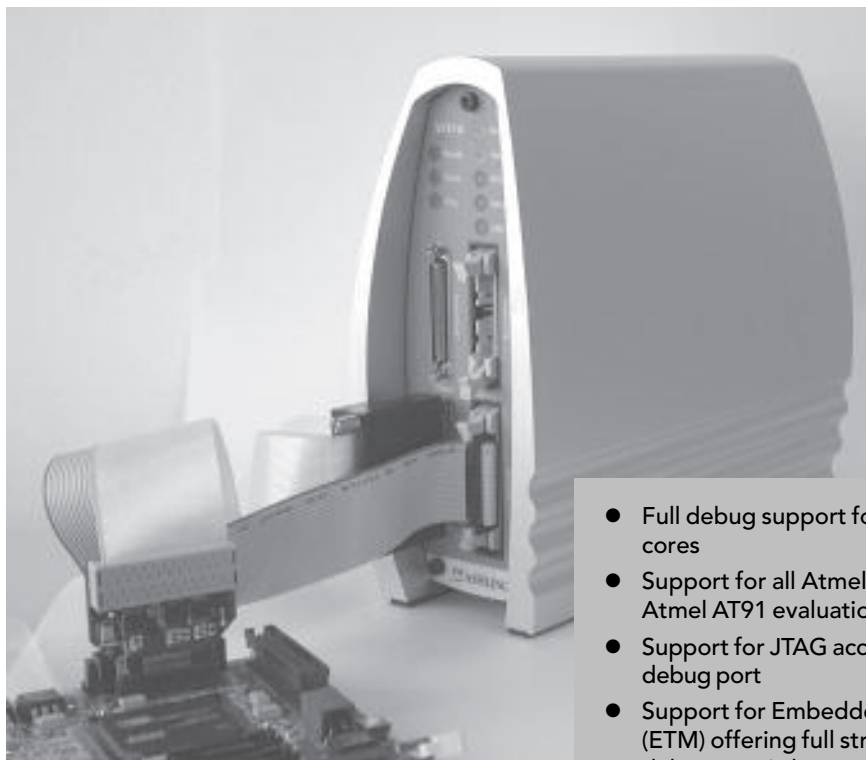
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## Opella, Genia, Vitra



- Full debug support for ARM7 and ARM9 cores
- Support for all Atmel AT91 devices and Atmel AT91 evaluation boards
- Support for JTAG accessed EmbeddedICE debug port
- Support for Embedded Trace Macrocell (ETM) offering full strength trace debugging (where ETM resource is included on silicon)
- Compatible with all popular third party compiler tools
- Flash memory programming
- Tools compatibility with third party debuggers (incl. AXD and ADW from ARM Ltd.)
- Logic analyzer signal capture capability
- NEW!!- Support for EmbeddedICE-RT and RealMonitor, allowing 'non-stop debug'

Ashling Microsystems offer a range of tools to support debug of ARM core based systems including AT91 related products. The product line offers varying degrees of debug capability according to the embedded systems developer's needs and budget.

**Opella** : The Opella for ARM emulator is an EmbeddedICE emulator and permits run/stop control of ARM core implementations using JTAG-based control of the target's EmbeddedICE debug control port. Opella for ARM is a standalone unit, small and easy to use, controlled by Ashling's PathFinder debugger, or indeed third party debuggers. Opella is available with either USB or parallel port host connection options. Debug control is non-intrusive and requires no target system resources.

**Genia** : An enhanced EmbeddedICE debug controller, offering serial, USB and Ethernet connection to the host. This has its own embedded processor putting it in the class of 'power debugger'. Its built-in processing power allows much of the debug-port signals' generation overhead be removed from the host debugger, thus freeing it for other tasks. This embedded power, combined with high speed Ethernet/USB host connection options serve to accelerate the entire target application debug cycle. Remote debug capability is provided over TCP/IP.

**Vitra** : A complete system for both run-time control and trace debugging.

The Vitra for ARM emulator not only incorporates all of the functionality of the Genia for ARM, but also supports real time instruction and data trace as provided by the Embedded Trace Macrocell port present on certain ARM implementations.

Ashling's powerful source level debugger, PathFinder, serves as the user interface for all Ashling ARM products. Where the user prefers to work with a third party debugger, the Ashling tools are available with suitable driver software (Note RD11.51 compliance).

Supported debuggers include AXD and ADW from ARM Ltd (both SDT and ADS versions), as well as IAR C-Spy (EWARM) and Metrowerks Codewarrior for ARM.



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## JEENI® Intelligent JTAG Debug Probe



The JEENI® (JTAG EmbeddedICE EtherNet Interface) debug probe is a completely non-intrusive interface that communicates to the ARM CPU core via JTAG, using the existing boundary scan pins. Complete processor control means that you can start, stop and single-step execution; read and write to registers, memory and the I/O system; and download code to target RAM - all within most commonly-available debugger interfaces for ARM.

The JEENI probe is a plug-and-play replacement for those using the ARM BlackICE/EmbeddedICE JTAG interface. The JEENI probe greatly speeds up the download of code to facilitate your test and debug efforts. The JEENI probe is ready to run with any supported debugger and any Atmel development board that supports a JTAG interface to the ARM7TDMI core.

The JEENI probe is supported by most commonly-available debugger interfaces for ARM, including the EPI CCE-SDT, ARM ADS, ARM AXD, Accelerated Technology Code|Lab Debug, GNU gdb, Green Hills MULTI, Arc SeeCode, and others.

- Non-intrusive, uses no target resources
- Supports ARM "DI" CPU cores
- High-speed download
- Ethernet and serial interface for fast, flexible host interface
- Two hardware breakpoints
- Unlimited software breakpoints
- ROMless booting
- Internal ARM cached processor assures fast operation
- Four status LEDs
- Slow clock support
- Universal 5V connector
- Support for RTOS-aware debuggers



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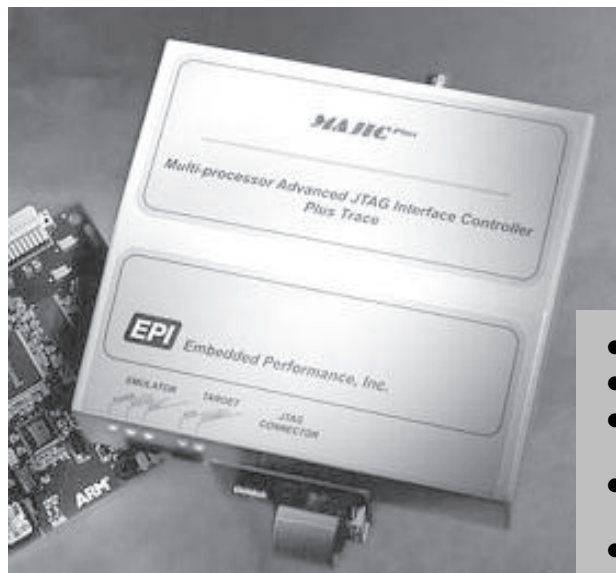
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## MAJIC® Intelligent JTAG Debug Probe



- Ideal for SoC-based applications
- Non-intrusive, uses no target resources
- 10/100Base-T Ethernet and serial I/O ports for fast, flexible host interface
- Supports the ARM EmbeddedICE™ Macrocell
- Supports all ARM cores (requires "DI" Macrocells)
- Supports on-chip hardware breakpoints, unlimited software breakpoints
- Programmable JTAG clock (TCK = 0 to 40 MHz)
- Programmable trigger-in and trigger-out connections
- High-speed download of application code
- Easy firmware updates through flash
- Sleep mode and RT clock support
- RDI 1.5.1 debugger interface
- EDB for ARM integrated debugger (optional)
- ETM (Embedded Trace Macrocell) support (MAJIC-PLUS only)

Each MAJIC® (Multi-processor Advanced JTAG Interface Controller) intelligent debug probe provides a high-speed hardware interface between at least one ARM processor (with the EmbeddedICE on-chip debug interface) and at least one industry-standard debugger. For up-to-date information on supported cores, differentiating features, debug interface protocols and compatible debugger software, see the ARM Hardware Selection Guide page on our website.

So, which one is right for you?

■ A MAJIC® probe allows one debugger to communicate with one processor through a single TAP on a JTAG device chain.

■ A MAJIC-MX® probe is a multi-core and multi-session tool. You can debug multiple processors with one MAJIC-MX probe. Multiple debuggers to communicate through a single MAJIC-MX probe to processors on the same multi-TAP chain. It also supports those cores with an on-chip trace buffer.

■ A MAJIC-PLUS® probe has all of the capabilities of a MAJIC-MX probe, plus it supports Real-Time Trace for those processors that have ETM.

Completely non-intrusive, each MAJIC probe communicates to the CPU core by JTAG using the existing boundary scan pins. It uses no target

memory and requires no porting to the target system. Using the on-chip debug facilities of the ARM EmbeddedICE (DI) Macrocell, each MAJIC probe provides control of and visibility into the executing program's behavior, even when the CPU is executing from cache, flash or ROM embedded within an SoC.

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## Green Hills Probe™



### **Advanced Debug Device**

The Green Hills Probe marks a dramatic advance in debug technology. With many debugger functions handled by an on-board 32-bit processor and reconfigurable logic, Green Hills Software has succeeded in off-loading much of the debugger's functionality onto faster, dedicated hardware. Running the responsive ThreadX® RTOS, the Probe handles multiple functions in real-time, freeing the host, minimizing intrusiveness and speeding up responsiveness compared to earlier probe architectures.

The Green Hills Probe is an advanced hardware debug device that enables the MULTI® Debugger to load, control, debug and test a target system without the need for prior board initialization. Through the JTAG port, the Probe can debug and control the core state (such as CPU internal registers) as well as the system state (external ram and flash memory). In addition to viewing the state, the Probe provides run control and conditional and complex breakpoints both in volatile and nonvolatile memory. The Probe is ideal for all stages of your product's development -- board bring up, where nothing is running on your target, full blown application debugging, and manufacturing test and programming.

- Easy configuration and setup
- Flexible host interfaces
- High speed download
- Supports a variety of targets
- Source-level and multicore debugging
- Local intelligence
- OCD/JTAG target control
- Flash programming
- Built-in hardware diagnostics
- Register view and board customization
- Support for a variety of targets

### **MULTI Integration**

Combined with the Green Hills MULTI IDE, the Probe supports source level debugging, EventAnalyzer, application run-time error checking, and memory leak detection. Array bounds, assignment bounds, NULL deference, case/switch statement, and divide by zero run-time exception conditions can be quickly identified and reported before their affects are masked by other events.

### **Processors Supported**

The Green Hills Probe supports all ATMEL AT91 processors.

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# JTAG ICE INTERFACES

Green Hills  
Software Inc.

## Slingshot™



Green Hills Software's Slingshot™ is an advanced USB hardware debug device that enables the MULTI® Debugger to load, control, debug, and test a target system without the need for prior board initialization, an RTOS or even a ROM monitor. Through an EJTAG, JTAG, or BDM test port, Slingshot can debug and control the core state (such as CPU internal registers) as well as the system state (external ram and flash memory).

In addition to viewing the state, Slingshot provides run control and conditional and complex breakpoints for both volatile and nonvolatile memory. Slingshot is ideal for all stages of your product's development from board bring up, where nothing is running on your target, to full blown application debugging, to manufacturing test and programming.

### Advanced Technology

Slingshot marks a dramatic advance in debug technology. With many debugger functions handled by an on-board 32-bit processor, Green Hills Software has succeeded in off-loading much of the debugger's functionality onto faster, dedicated hardware. Slingshot's dedicated 32-bit processor speeds up debug operations by reducing latencies over the debug port (JTAG, EJTAG, COP, or BDM). This translates into rapid single instruction steps, quick memory and register

- High-speed downloads of up to 100 kb/sec
- Easy to use
- Variety of targets
- USB host interface
- Full MULTI integration
- Small size
- Low cost

view refreshes, and fast application downloads while debugging through MULTI.

### High-Performance, Low-Cost

Slingshot is a high-performance, low cost micro-processor debug probe with a USB host interface. Slingshot outperforms other probes which are three to four times its cost.

Additionally, Slingshot is software compatible with the Green Hills Probe™, the industry leader in high-performance debug probe technology. This provides flexibility and allows easy transition within Green Hills Software's micro-processor probe product family.



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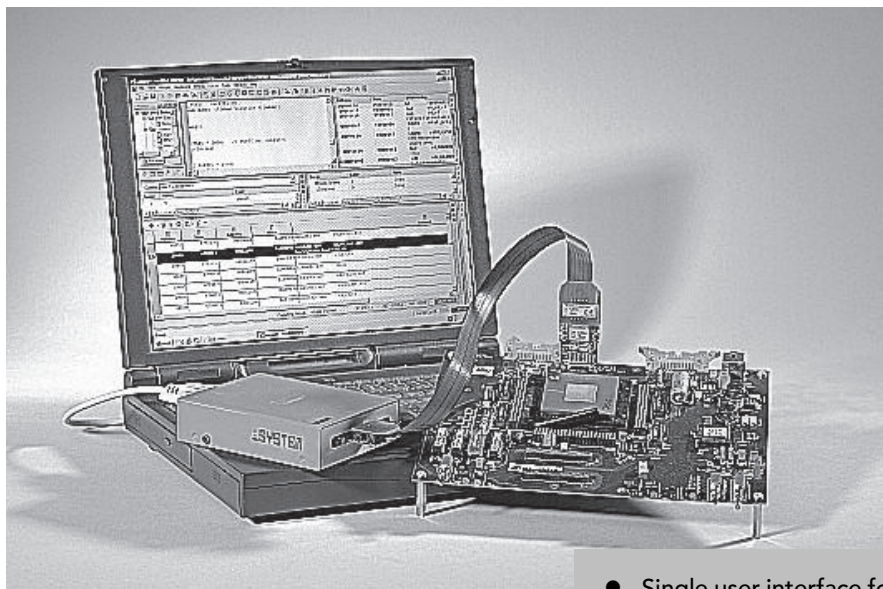
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## iC3000 iTRACE



### ETM and iTRACE

iSYSTEM now offers iTRACE, a state of the art development tool featuring outstanding performance despite its compact size. iTRACE connects to the ARM7/ARM9 based target through a single iTRACE Probe ETM. The debugger connects to the JTAG port and to the ETM port, if the ETM is integrated, via a single standard Mictor connector.

Through the probe, all the on-chip debugging features are supported, including ETM trigger configuration. Through the JTAG debug port, the ETM is configured and triggers are set. The ETM outputs the necessary information through the ETM port where it is collected by the iTRACE ETM Probe. The port width may be 4, 8 or 16-bit, depending on the CPU implementation. The captured information is transferred to the PC where the debugger restores program execution based on restored buses (address, data, control) and downloaded code. The analyzed information is displayed in winIDEA.

The iTRACE system is driven with easy-to-use winIDEA. It features a project manager, multi-file C source editor, build manager where any third party compiler can be integrated and high-level C/C++ source debugger. The winIDEA interface offers workgroup support for projects where several developers share the same project code and incorporates a C-like script language to facilitate automation and testing. The program also supports popular version control systems and RTOS debugging support. A true 32-bit application, winIDEA runs on Windows NT, XP, 2000, and 95/98 platforms.

- Single user interface for debugging and trace capture/analysis, winIDEA
- Single debug connection to the target
- Target voltage from 1.8 v to 5v
- Multi-core debugging support
- On-chip breakpoints, unlimited software BPs
- Flash programming support
- Little and Big Endian byte ordering
- ARM/THUMB disassembler
- C/C++ high level debugging
- Call stack
- Powerful script language for automation and test
- ETM Trace, featuring:
  - Support for Normal, Halfrate, Mux and DeMux recording modes
  - Up to 200MHz support
  - Time stamps
  - 128K frames buffer
  - Four AUX inputs
  - Full on-chip trigger support
  - Trace window interface with Timing View and high-level State View
- Source level debugging for C and ASM

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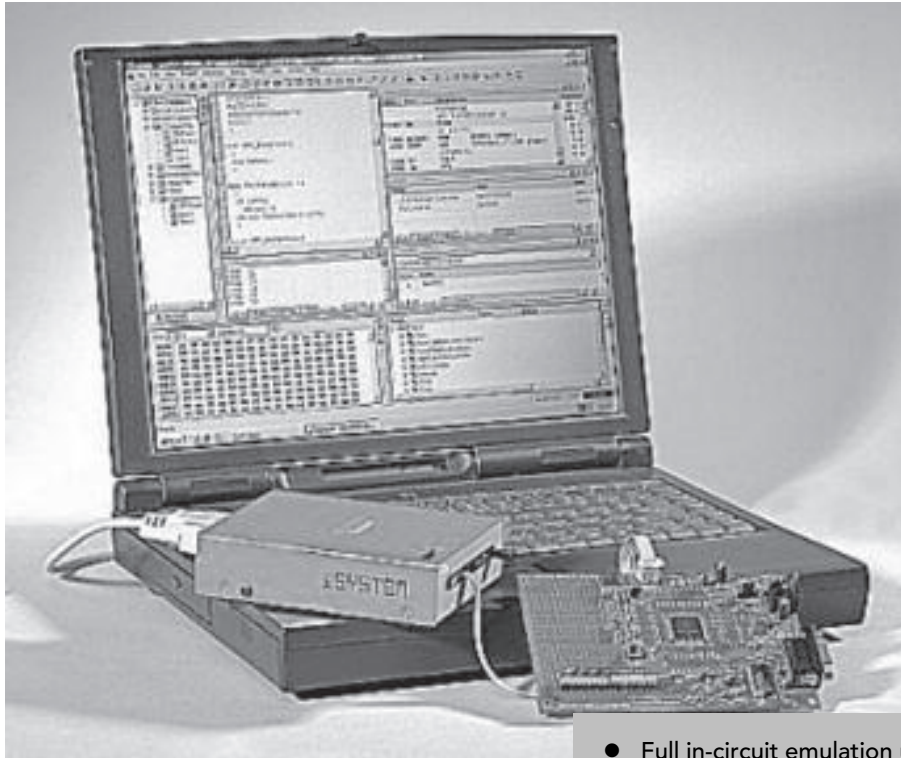
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## iC3000 JTAG



### **iUSD - the intelligent Universal Serial Debug Interface**

The iC3000 supports a wide range of serial debug interfaces, including ARM's Embedded ICE JTAG interface.

iSYSTEM has developed an iCARD for each of the various serial debug interfaces. Simply "swap the card" to support a new debug interface, preserving your investment in the base iC3000 system. The compact iCARD (the same size and style as a PCMCIA card) plugs into the card slot of the iC3000 unit.

Standard features include: hot-insert to the target while the target is running, on-chip programming, in-system programming, and generation of programming voltage. The prescribed programming voltage is generated by the iC3000 development system and provided to the target system through the iCARD.

### **iC3000 ActiveEmulator and winIDEA - the adaptable team**

The iC3000 ActiveEmulator is a universal and adaptable emulator solution for high performance applications. By swapping the iCARD and

- Full in-circuit emulation up to 100MHz bus speed
- Hardware and software breakpoints
- On-chip and in-system flash programming
- Multiple voltage support (2V, 3V, 5V)
- Variable clock speed
- Multi processor support
- Universal Serial Bus (USB) and serial (COM) high speed PC interfaces Ethernet (TCP/IP) interface (optional)
- DC-Power supply 8V - 24V
- AC-Power supply 90V-240V
- Small compact size ideal for mobile operation (120mm x 90mm x 30mm)
- Driven with winIDEA™ Integrated Development Environment
- Source level debugging for C and ASM

ActivePOD, the system is reconfigured for an alternate target microcontroller, preserving your investment in the base iC3000 system.

Likewise, the software interface to the iC3000 is also adaptable. The winIDEA integrated development environment includes project management, integration of all popular compilers/assemblers, make & build, and debugger. One easy-to-use interface for all your embedded development needs.

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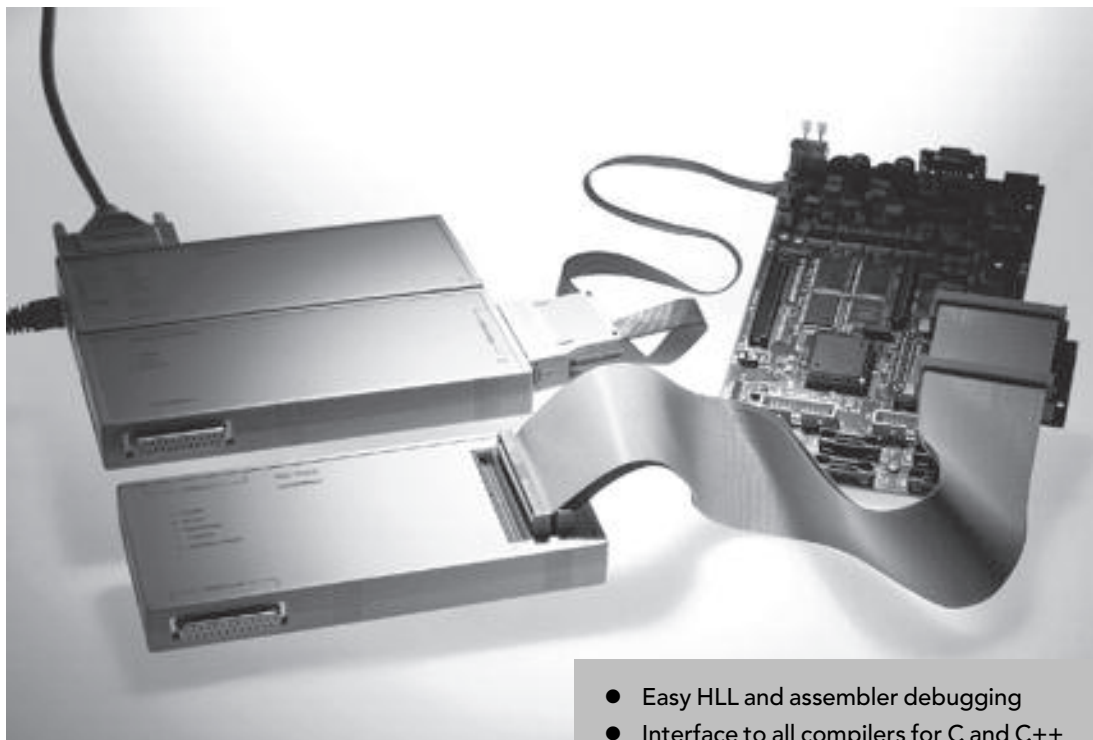
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## Trace32-ICD



### JTAG Interface

The JTAG Debugger TRACE32-ICD provides a complete set of development and testing tools for the AT75C, AT76C, AT78C and AT91 microcontrollers based on an ARM7TDMI core. The advanced modularity of TRACE32-ICD allows to extend the debugger with an EPROM simulator or an I/O simulator. TRACE32 works with the highest variety of host interfaces. The communication link to the host is done by printer port, USB or Ethernet allowing a high-speed transfer. It is possible to share a TRACE32 in a LAN of PCs and workstations.

### Debugger

TRACE32-ICD is controlled by TRACE32-PowerView the powerful IDE allowing HLL debugging on C or C++ level. It works together with all third party compilers. It allows unlimited software breakpoints, but also supports the hardware break- and watchpoints provided by the EmbeddedICE macrocell. A flash programming utility is included. The comfortable windowed user interface is completely configurable by the user, no other system offers more flexibility.

- Easy HLL and assembler debugging
- Interface to all compilers for C and C++
- Comfortable support of hardware break- and watchpoints provided by the EmbeddedICE macrocell
- Download speed up to 1MByte/s
- FLASH programming utility
- RTOS awareness
- Instruction set simulator
- Trigger-in and trigger-out connector
- High-speed link via Ethernet, USB or LPT

### Supported Third Party Compilers

ARM (AIF and ELF/DWARF), Cygnus, Green Hills, IAR, ARC

### Supported RTOS

AMX, ChorusOS, embOS, Nucleus PLUS, OSE, pSOS+, RealTime Craft, RTXC, SMX, Symbian OS, ThreadX, VxWorks

### Supported Host Systems

PC (Windows XP, Windows ME, Windows2000, Windows NT, Windows 95/98, Linux),  
Workstation (HP-UX, SUNOS, Sun Solaris)

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## Macraigor Systems On-Chip Debugging Tools



Macraigor Systems provides a suite of ARM7TDMI and ARM9TDMI hardware and software debugging tools, that are designed for price-sensitive customers.

Macraigor Systems offers three hardware products: Wiggler, Raven, and the mpDemon. With these products, customers can connect to their target from their host system via Ethernet, parallel, or serial. Development engineers have complete control over the target, including starting, stopping and resetting the target, downloading, controlling cache, modifying and displaying registers and memory, essentially everything you would expect from debugging tools.

Macraigor's products are interoperable with a wide selection of integrated development environments and software debuggers. This results in a tremendous amount of flexibility for development engineers. A complete listing of compatible software can be found on the Macraigor web site at [www.macraigor.com](http://www.macraigor.com).

In addition to the support of third party applications, Macraigor offers its own software products, including the OCD Commander and a build of the GNU tools. OCD Commander is a free assembly level debugger that supports the reading and writing of registers and memory, complete target

- Low cost on-chip debugging hardware and software
- High speed downloads
- Flash memory programming
- Hardware and software breakpoints
- Ethernet, parallel and serial host interfaces
- Multi-core processor debugging
- Interoperability with all major 3rd party software debuggers
- Free GNU tools suite
- Free OCD Commander assembly level debugger
- Support for Windows and Linux host systems

control, downloading to target, single stepping, hardware and software breakpoints, and diagnostics. The GNU build includes the compiler, linker and a version of GDB. An in-circuit flash programming application is also available. It programs and verifies flash memory via JTAG, and supports all of the major flash manufacturers.

**OCDemon™**

**Macraigor Systems**

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## JTAGjet, JDSnet



### Hardware

JTAGjet provides a complete set of debugging tools during development, integration and production environments. Coupled with C compiler or Assembler, JTAGjet provides everything that is needed for creating even the most sophisticated embedded applications based on the Atmel AT91 ARM microcontrollers.

The heart of the JTAGjet consists of a high-speed logic (FPGA) that is optimized for fast downloads, fast window refreshing and instruction stepping at speeds > 200 steps/sec. Using the parallel port, target RAM may be loaded at rates exceeding 500K bytes/sec.

The optional 1M deep **ETM Trace Module** allows real-time tracing of program flow and data transactions as well as dozens of programmable trace triggering and filtering resources. Using these ETM resources allows capturing up to 1 million program or data events spread out over long periods of time.

### Debuggers & Compilers Supported

ARM (ADS), GNU, Green Hills Software (Multi), IAR (EWARM), Keil, Signum Systems (Chameleon), and others.

### Chameleon Multi-Core Debugger

Chameleon works with a variety of hardware emulation devices (JTAG, BDM, ICE and simulators) to provide a consistent GUI interface to an embedded project at all stages on the development cycle. Chameleon Debugger supports up to 256

- Only \$1,500 (with Chameleon Debugger)
- High-speed downloads > 500 Kbytes/sec
- USB 2.0 and LPT port connections
- Ethernet connection (JDSnet)
- 1M deep ETM trace module for program and data tracing (optional)
- Automatic 2.5-5V target voltage sensing
- Ideal for SoC applications
- Supports all major C/C++ compilers
- Debugs multiple cores on the same screen
- Compatible with most other debuggers
- Supports all AT91 ARM7 & ARM9 cores
- Integrated Flash programming
- Programmable JTAG clock (0 - 50 MHz)
- Unlimited software breakpoints
- Non-intrusive, uses no target resources
- Host Virtual I/O for target system usage
- Optional API for manufacturing tests

homogeneous or heterogeneous CPUs on a single debugging screen. Chameleon displays information about all active CPU on the same screen and is CPU context sensitive to make the switching between processes faster and easier. Chameleon offers the latest debugging features, such as fly-over variable watch, drag and drop variables, virtual I/O (semi-hosting), complex variable implode/explode, script language for automatic testing, symbol browsing, ETM set-up and trace windows, and more. Step-into, Step-out and Step-over modes are supported for both C and assembly levels. Our unique schematic like, graphical interface for complex events is quick, intuitive and incredibly easy to use.

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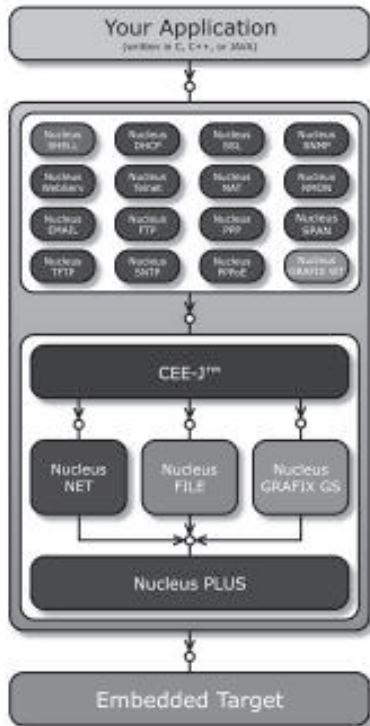
### Web Site

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Contacts



## Nucleus PLUS



- No royalties, C source code provided
- Scalable: 4 KB-45 KB, depending on necessary functionality
- Written in ANSI C
- Deterministic, low interrupt latencies
- Extensible: make new services by combining existing services
- Configurable: easily exclude services not used
- Dynamic creation of all Nucleus PLUS tasks
- Intertask communication: mailboxes, variable queues, pipes, task synchronization, counting semaphores, events, UNIX-like signals
- One-shot and multiple-shot timers
- Memory management: fixed partitions, variable length (malloc)
- Place any Nucleus PLUS component in any area of memory

The Nucleus PLUS kernel provides efficient, high performance task management, inter-task communication, inter-task synchronization, memory management, and component query features. Optimizations in system clock, interrupt and compiler register usage are only part of the advanced features provided by Nucleus PLUS. The kernel handles difficult issues such as priority inversion while minimizing the interrupt latency to a few microseconds.

If there is a processor family in the embedded industry, Nucleus PLUS most likely supports it. This is possible since it is written primarily in ANSI C. So, porting Nucleus PLUS to new processor families is straightforward and reliable. To port Nucleus PLUS we need only modify the system initialization, task management, and timer control modules. The portability of Nucleus PLUS benefits the user by allowing him to change processors without concern for the new architecture. Further, it allows a developer to execute their application easily on new hardware (board) designs.

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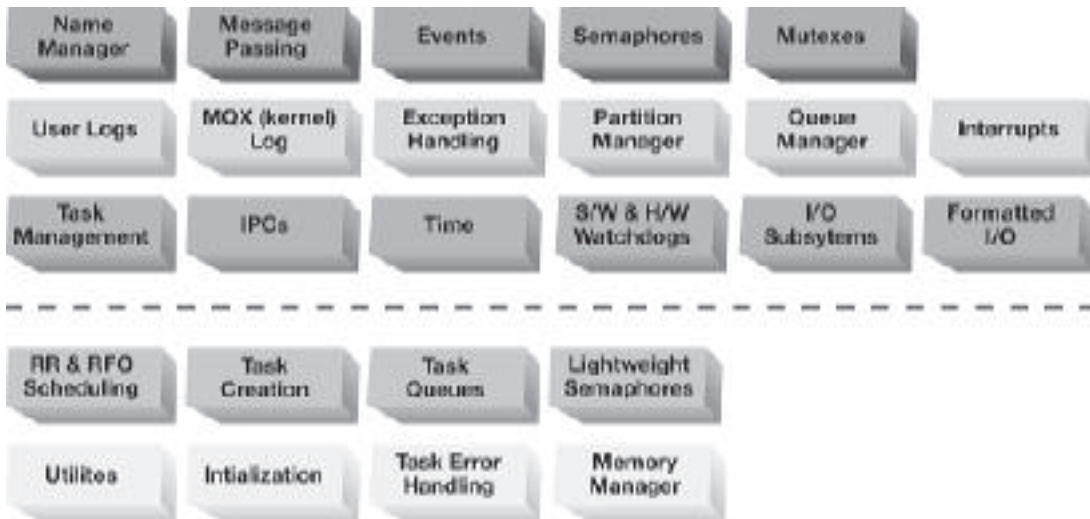
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## Precise/MQX™ RTOS and Precise/RTCS™ TCP/IP Stack



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e-mail: [info@arc.com](mailto:info@arc.com)

**Web Site**

[www.arc.com](http://www.arc.com)

Precise/MQX is a scalable component-based Real-Time Operating System (RTOS) to allow you full control over its size and functionality. MQX features include multiple memory pools, MMU support, picosecond resolution for timers, lightweight components, task restarts and callout functions. MQX is delivered in full source code.

RTCS is a compact, portable embedded TCP/IP networking stack. RTCS includes standard support for Ethernet and serial media and contains proprietary optimizations in addition to standard TCP/IP optimizations that address data handling, processor-specific checksums, and routing between different media. RTCS also includes a wide variety of optional components including: HTTP, SNMPv3, POP3, SMTP, IPSec, PPPoE, OSPF, BGP4 and NAT.

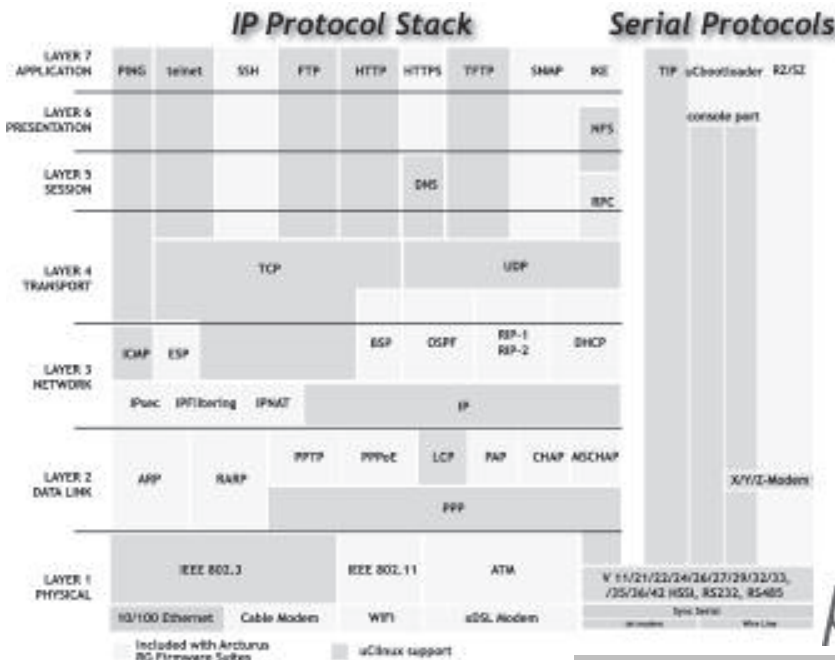
ARC's system software has been seamlessly integrated with ARC's MetaWare tool suite. No longer are you at the mercy of multiple vendors working together today and not tomorrow - leaving you stuck with non-cooperating vendors and unsynchronized, obsolete releases. The synergy

- Seamlessly integrated, robust system software solution
- Small, configurable size
- Fast, deterministic performance
- Easily ports to custom hardware
- Portable adaptive technology
- Support for multiple configurations
- Control of source code
- Full feature set
- Supports DSP
- Wide range of optional components
- MQX available off-the-shelf with board support packages for Atmel's evaluation kits

created by this comprehensive software development environment leaves you with one reliable vendor - reducing your design risk, development costs and ultimately, time-to-market.

Contacts

# uClinux™ Embedded Operating System for Microcontrollers



## uClinux™

Arcturus developed uClinux™ as an essential, embedded implementation of Linux. It still has the functionality you'd expect from a full blown Linux system yet it's optimized to meet the reduced system requirements of an embedded environment. uClinux is complete with it's own collection of libraries (uClibc), employs the GNU Compiler Collection (GCC) and supports debugging with GDB stub/server (DDD graphic front end), JTAG and BDM. uClinux includes robust support for numerous architectures and platforms, broad driver support and applications ranging from server-side DHCP, port forwarding, IP masquerading to MMI/HMI graphic interface utilities. uClinux is ideally suited to any application looking for a low cost, royalty free, embedded OS to provide robust network and inter-device connectivity.

uClinux support is available for the AT91/AT75 and other ARM core Architectures. Arcturus offers expert services in all aspects of uClinux including full system design, hardware development and system integration.

### Firmware Suites

Optional Firmware Suites and hardware reference platforms are ideal for the development of next generation converged IAD's, RG and CPE devices. For license terms, and hardware design availability contact Arcturus sales.

### MIBflex™

The flexible, extensible, embedded management and control infrastructure. MIB-II compliant, XML extended architecture.

- Industry standard operating system for SoC Microcontrollers
- No-Royalty, low total cost of ownership
- Source code available
- Not reliant on an MMU
- Complete TCP/IP support
- Embedded Web servers with or without CGI
- Embedded uC libraries collection
- Filesystem Support for NFS / JFFS / CRAMFS / EXT2FS / MINIX / SMB / FAT32
- POSIX Compliant Threading
- GNU Tools GCC/GDB
- Realtime Available
- Fully customizable
- Extensible and scalable
- Multi-platform support
- Optional Arcturus Firmware Suites available

### sentryVPN™

The total embedded network security and routing solution. WiFi, Firewalling, Authentication, and Encryption using IPSec, IKE and standard cryptographic algorithms

### SIPstream™

Complete embedded voice, media and session control system. Including Applications, CODECS and support for multi-port DSP voice.

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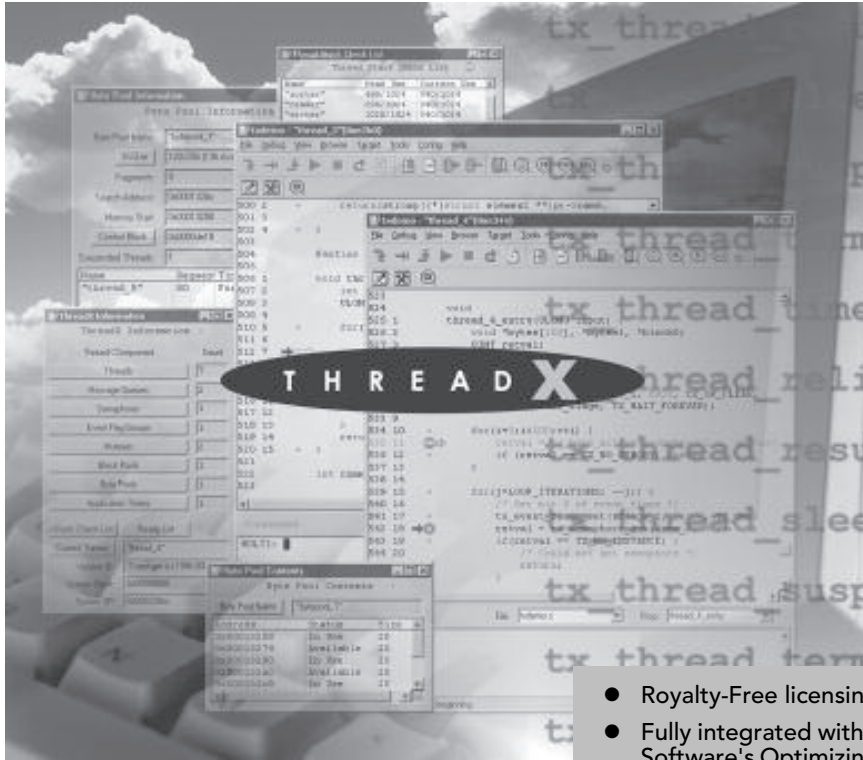
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## ThreadX® Real-Time Operating System



### ThreadX®

ThreadX provides real-time ARM developers with the most technically advanced multitasking solution on the market today. Its PicoKernel™ design results in very high performance and extremely small memory requirements - requiring less than 4K bytes for minimal usage. ThreadX also provides embedded ARM CPU applications with significant technical innovations, including extremely fast software timers and a mechanism to help reduce context switching called Preemption Threshold™.

ThreadX is completely integrated with Green Hills Software's Optimizing Compilers and MULTI® Integrated Development Environment (IDE) and is available through Green Hills Software.

### ThreadX/MULTI Solution

Green Hills Software's MULTI 2000 Integrated Development Environment works seamlessly with the ThreadX embedded real-time kernel and provides detailed, kernel-aware information to developers. MULTI for ThreadX is fully aware of the seven ThreadX kernel components and includes live, easy-to-understand summary lists and detailed individual views of all ThreadX component types: threads, message queues, semaphores,

- Royalty-Free licensing
- Fully integrated with Green Hills Software's Optimizing Compilers and MULTI® IDE
- Multitask EventAnalyzer showing RTOS Activities
- Per-task and systemwide execution profiling
- Comprehensive run-time error checking, including per-task stack overflow
- Powerful multitasking and system debugging features
- Advanced features- Preemption Threshold™
- Small footprint
- Fast system services
- Source code provided

event flag groups, memory block pools, memory byte pools and application timers.

MULTI for ThreadX is a powerful, finely tuned package designed to dramatically reduce development time for your next embedded project. MULTI for ThreadX includes Green Hills™ world-class Optimizing C, C++, and Embedded C++ Compilers; MULTI IDE, including source-level debugger, program builder, execution profiler, browser, editor, run-time error checker; and version control system; and the high-performance ThreadX real-time kernel.

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**ChronOS™****interniche**  
technologies, inc.

ChronOS, InterNiche's multitasking kernel is a portable, ROMable, preemptive, real-time operating system (RTOS) that is highly scalable and flexible. ChronOS is based on  $\mu$ C/OS and has a number of enhancements to improve networking performance and take advantage of the small size and speed of InterNiche protocols.

InterNiche's combination of ChronOS and its Internet protocols and applications provides a range of solutions that can be matched by only one other company. The difference is that they charge run time royalties and InterNiche does not. ChronOS and InterNiche protocols have no run time royalties

- CPU independent
- Small memory requirement
- Extremely fast context switching
- Counting Semaphores
- Mutual Exclusion Semaphores
- Event Flags
- Message Mailboxes
- Message Queues
- Task Management (Create, Delete, Change Priority, Suspend/Resume etc.)
- Fixed Sized Memory Block management
- Time Management
- Constant and deterministic execution time

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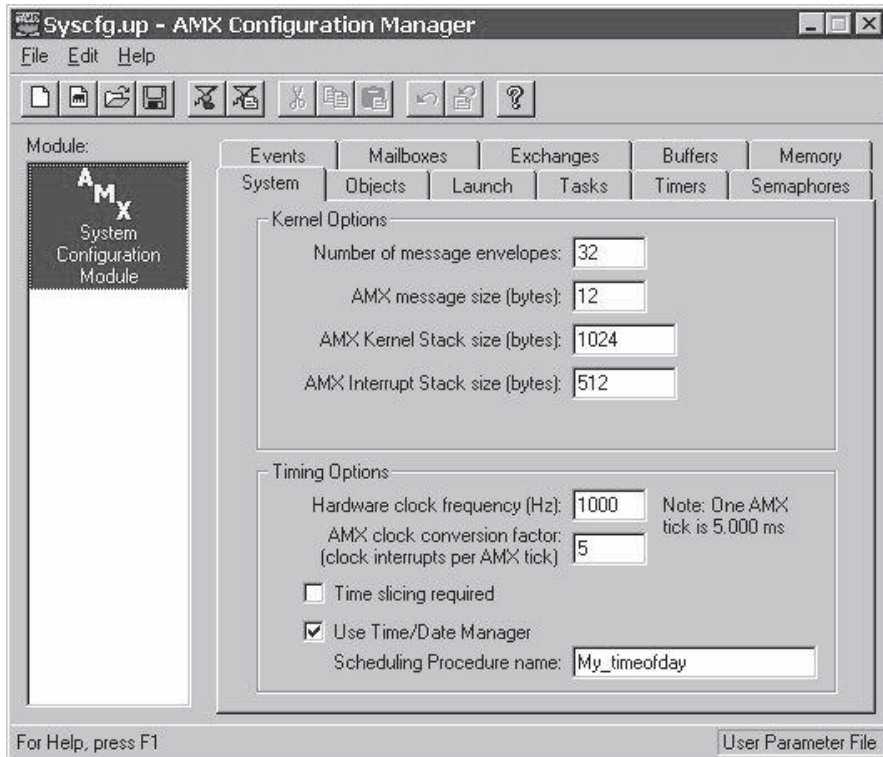
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AMX is a full featured real-time multitasking kernel for the ARM, StrongARM and ARM Thumb microprocessor families. AMX has been tested on the Atmel AT91EB40, EB42 and EB63 Evaluation Boards.

AMX is a simple, readily understandable software development tool which meets the stringent requirements of all real-time applications. First released in 1980, the AMX family of kernels has been used worldwide at more than 2,000 embedded systems development sites.

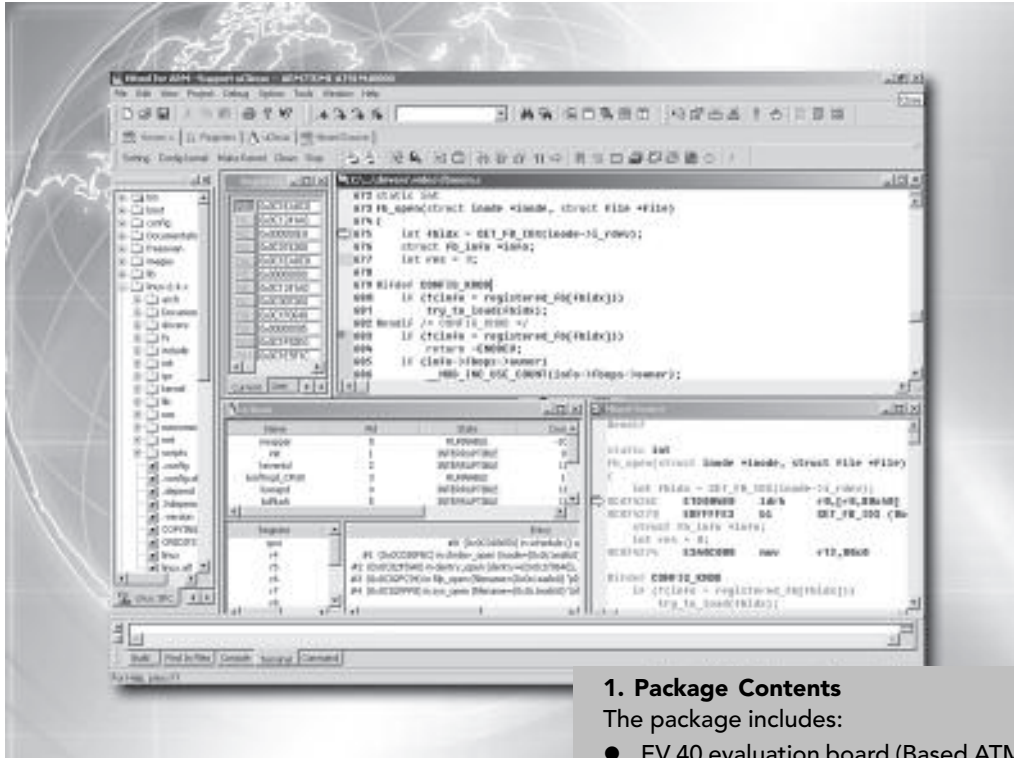
AMX is delivered ready for development on a PC with Windows. Source code of all AMX modules is provided with AMX to permit AMX to be ported to any development platform. A sample program is provided to illustrate the proper use of many of the AMX services.

AMX is offered with a liberal site license agreement. Executable application modules incorporating AMX can be distributed without royalties.

AMX documentation is comprehensive and includes tutorial explanations and examples.

- Windows® based Configuration utility eases system construction
- Compact ROMable kernel with optimized execution speed
- Mailbox, semaphore, resource, event, list, buffer and memory managers
- KwikNet® TCP/IP Stack provides a full suite of protocols
- KwikPeg™ GUI allows you to create a graphical user interface on your embedded system
- Clear and comprehensive manuals
- No royalties; source code included
- Envable track record for reliability and support

Contacts

uLinux Package for Atmel ARM Microcontroller **MICETEK**

MICETEK's uLinux package is a real total solution for ATMEL ARM microcontrollers, with powerful tool - HITool IDE, that is the leader development tool for debugging uLinux device under Windows environment. It can debug uLinux Kernel as well as user's application through JTAG emulator in C and Assembly source level, and Especially, it can support "debugging kernel and applications" in the same debugging session simultaneously. It also can debug user application through RS232 or Ethernet using MDB agent. Speed your products to market.

### 1. Package Contents

The package includes:

- EV 40 evaluation board (Based ATMEL AT91R40807) with uLinux BSP.
- uLinux kernel and Application source code for EV 40 platform.
- HITool IDE for uLinux .
- ARM uLinux tool chains for cygwin.
- uLinux task debug monitor-MDB

### 2. Features

- **Full uLinux Supporting:** 2.0.x/2.4.x kernel, File system, device driver, TCP/IP stack...
- **Simplified environment:** All the development is under Microsoft Windows, which includes: Kernel configuration and compiling, application compiling, file system formation, kernel debugger and user application debugger.
- **Various debugging modes:** JTAG Debugger tool, MDB via Ethernet port and serial port are supported. If used JTAG debugger tool, both application code and kernel (include device drivers) can be debugged.

**Trace:** Offers a kernel trace tool to help user to analyse the whole system.

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#### Web Site

[www.micetek.com](http://www.micetek.com)

Contacts



## SMX<sup>®</sup> Simple Multitasking Executive

SMX is a modular RTOS that has been designed with an architecture to meet the needs of small to medium size embedded systems. It features small, efficiently written modules and thus works well on less expensive processors such as the AT91 Family. The modules are highly independent. This permits leaving out those that are not needed, in order to save cost and space. smx offers the following services:

- Hard real-time multitasking
- File management
- Networking
- User interface
- Special services
- Debugger and tool support

Extensive drivers are available with SMX products, and SMX supports many popular tool chains. This allows you to minimize the time spent writing device drivers and to continue using the tools with which you are familiar.

Micro Digital's objective is to provide each customer with a complete solution that saves programming expense and speeds time-to-market. To further this goal, SMX products come with complete, well-written manuals. Also, all orders are pre-installed, integrated, and tested with the chosen tool chain, before they are shipped.

This is further backed up by the best support in the RTOS industry. The programmers who wrote the code provide your support. If you find a bug, Micro Digital's support team will fix it NOW. If you do not understand something, we will explain it clearly. We are here to work with you. We also provide customization and consulting services.

Our goal is to provide products with richness of features and with fast performance in order to provide good solutions for the problems embedded programmers are likely to encounter. These problems often cannot be anticipated. Hence, Micro Digital delivers a kernel that has more than enough capability to prevent costly schedule overruns and missed sales opportunities.

- Unique, 3-level application structure:
  - Background tasks
  - Foreground tasks (Isr's)
  - isr's
- Almost no interrupt latency
- Fast task switching
- Preemptive, round-robin, and timeslice scheduling
- Multiple tasks per priority level
- Dynamic priorities
- Hooking of custom task entry and exit routines into scheduler
- Scheduler locking
- Small memory footprint
- Dynamic objects
- Protected heaps
- Fast and standard block pools
- Better stack sharing model than OSEK
- Indirect messaging via exchanges
- Message priorities and priority passing
- Client/Server messaging
- Pipes and buckets for easy I/O integration
- C++ support
- Timeouts on all task waits
- Cyclic and one-shot timers directly launch foreground tasks for tight timing control.
- Good selection of third-party tools supported
- Task-aware debugging
- Used in hundreds of applications

*If you are looking for a responsive RTOS company with excellent products, Micro Digital is your solution.*

**USA**

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 2900 Bristol Street, G-204  
 Costa Mesa, CA 92626  
 Tel. (+1) 714-437-7333  
 Fax (+1) 714-432-0490  
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 Contact Person:  
 Betty Martin-Danner

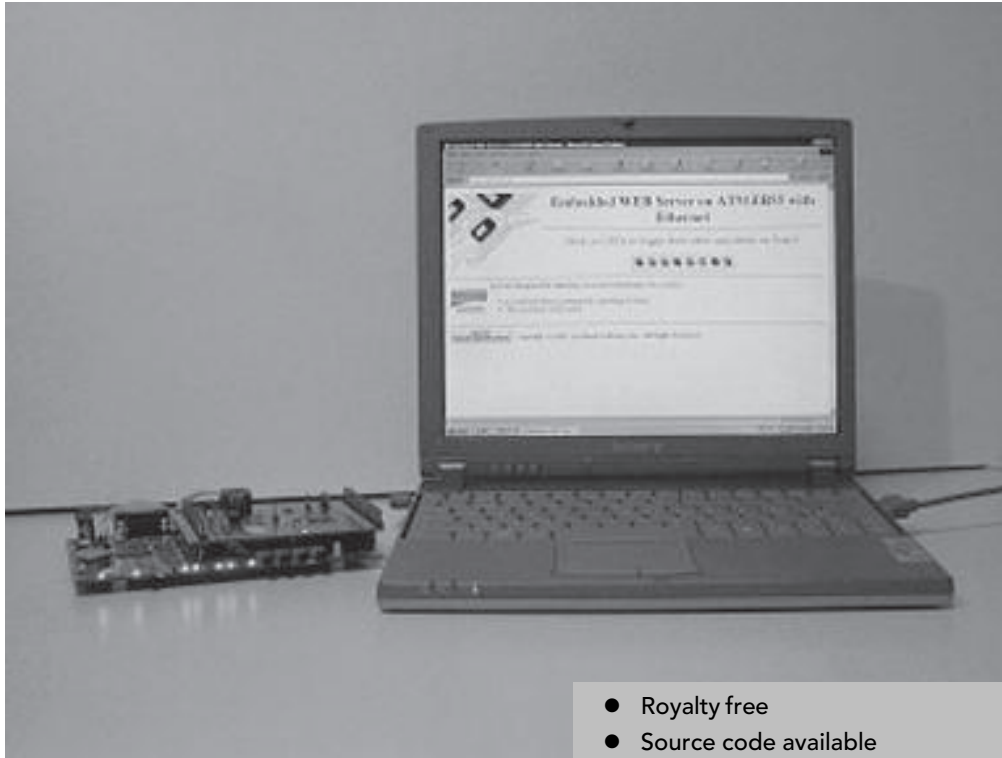
**Web Site**

[www.smxinfo.com/atmel.htm](http://www.smxinfo.com/atmel.htm)

Contacts



## Open Source Real Time Operating System



- Royalty free
- Source code available
- Real Time
- Small memory footprint
- Full support
- Development Tools

The Open Source Software evolution model has resulted in a fairly high rate of innovation for software with richer functionality and higher quality. The time is now right for the embedded systems market to benefit from the open source movement.

A well known open source operating system is Linux. However, Linux is not the right operating system for every need. Embedded systems is definitely a market where one size does not fit all. For deeply embedded applications where every kilobyte counts, the functionally rich and megabyte-sized standard Linux configurations are not appropriate.

Driven by the requirements of the embedded systems market, the open source community, led by Red Hat, has developed the eCos kernel. eCos is an open source real time operating system kernel with Linux compatible API's. A key feature of eCos is that it is highly configurable. It can be downsized to a minimum 32K footprint, but enhanced versions fit the needs of fully connected Internet appliances. By running a selected service level, embedded systems developers can tune the target system to their needs.

Thanks to its Linux compatibility, Embedded Linux applications are easily ported on eCos, and all the Linux development tools are available.

Silicomp develops custom EL/IX and eCos BSPs (Board Support Packages) tuned to your hardware and software requirements, with industrial strength. And life cycle support. Silicomp customers enjoy both the benefits of Open Source technologies (royalty free, freedom of choice) and the benefits of commercial products (support, engineering services available).

More information can be found at:

**[www.ri.silicomp.com](http://www.ri.silicomp.com)**

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### **Web Site**

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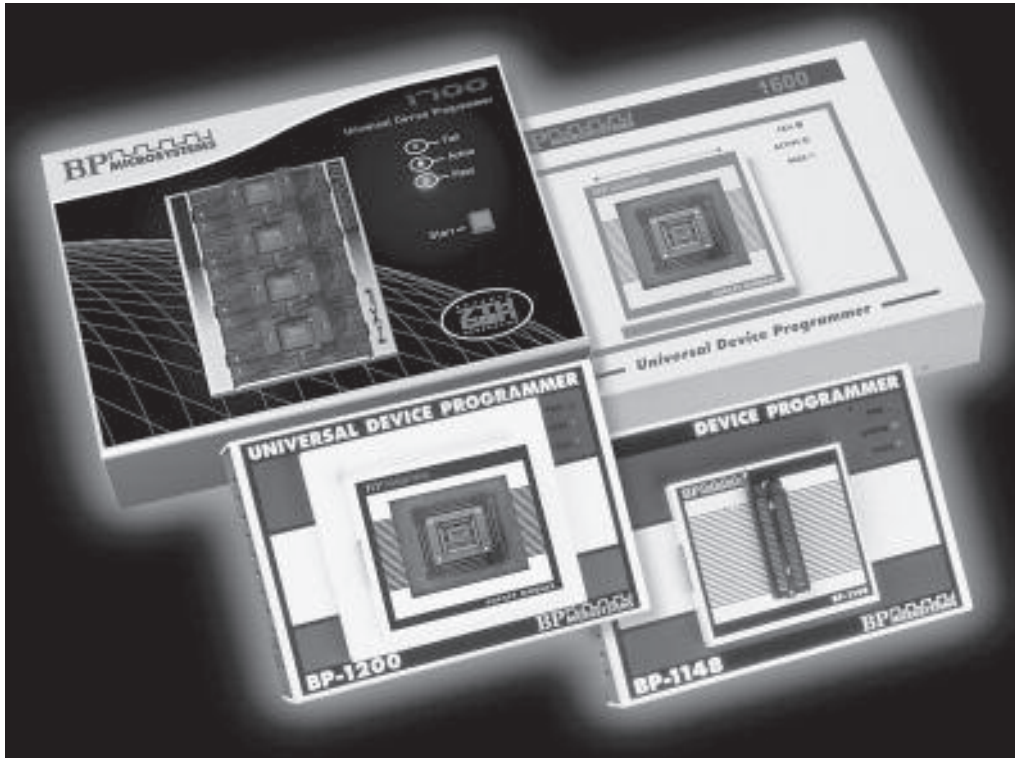
Contacts

## FLASH PROGRAMMERS

BP Microsystems

### Universal Engineering Programmer

**BP** MICROSYSTEMS



**USA**

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Contact Name

Sales

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**Web Site**

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Device programmers from BP Microsystems support more devices, more packages and offer the industry's best value with software updates and warranties.

BP Micro programs over 18,000 devices--- more than any one else--- in more package types.

Our programmers are designed for the latest complex high density and low voltage devices down to 1.5V. BP Micro supports over 900 regular and high-speed FX socket modules for packages from the largest DIP to the smallest uBGA.

To help you get your design to market faster, our engineering programmers use the same algorithms that run on our manual and automated production programmers- which includes the largest installed base and industry standard for fine-pitch automated programming systems. They also come standard with Jobmaster™ software which allows users to easily set up, save and securely transfer job information and programming data, even by email, between facilities around the country or around the world.

Since 1985, BP Microsystems has set the standard in device programmers and we back each programmer with the best support in the industry in 57 countries worldwide. So no matter what device you're programming, you'll find the right

- Support for over 18,000 devices including the latest Flash, FPGAs, and Microcontrollers
- Support for devices down to 1.5V (Vdd)
- Up to 4 high-speed programming sockets per site on Seventh Generation products
- Over 900 socket modules available from DIP to uBGA
- Offer software support and warranty on all programmers

programmer at the right price from BP Microsystems.

Contacts

# FLASH PROGRAMMERS

Macraigor  
Systems

## Macraigor Systems' Flash Programming Application

**OCDemon™**  
Macraigor Systems

### USA

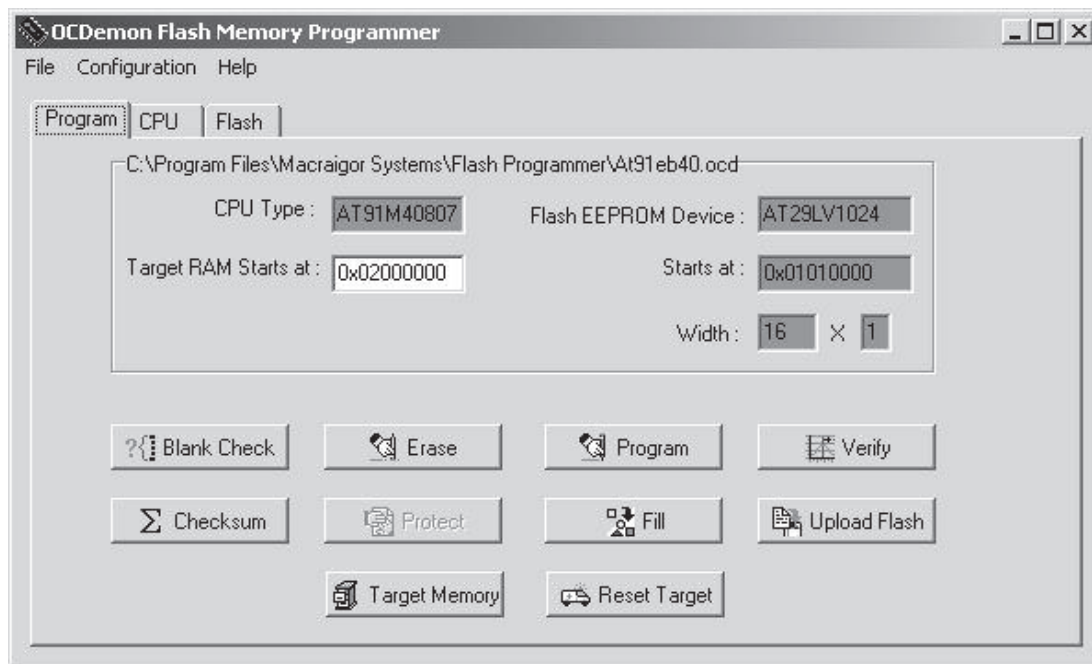
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[www.macraigor.com](http://www.macraigor.com)



Macraigor Systems' Flash Programming application lets you program flash memory on your target board, via the on-chip debug connection. The application works in concert with Macraigor's hardware tools, Wiggler, Raven and mpDemon.

The application includes a demonstration file which allows you to ERASE, FILL, BLANK CHECK, CHECKSUM, and VIEW MEMORY of your flash devices. The programming application will read and program binary files, Motorola S-records, Intel Hex, and ELF files.

### Flash Devices Supported

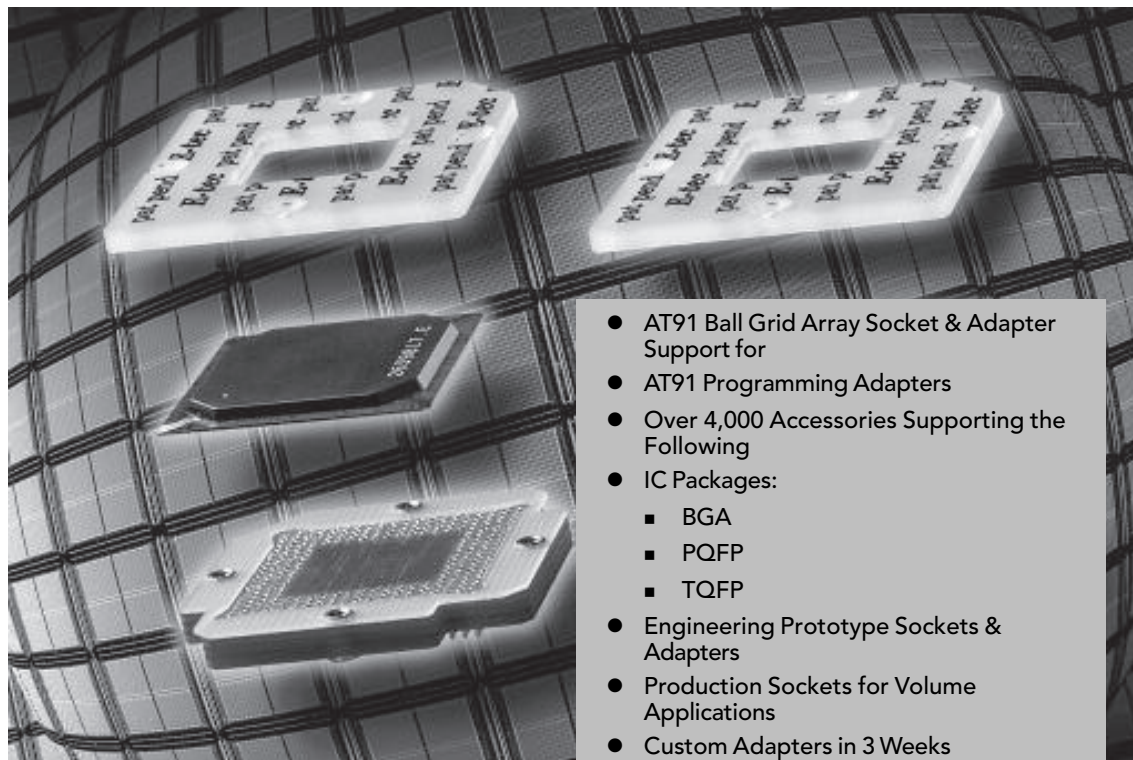
Macraigor's Flash Programmer supports flash devices from Atmel and other manufacturers. At your request, Macraigor Systems will add the programming algorithms for flash devices that are not supported.

- Low cost flash programming application
- Operates with Wiggler, Raven or mpDemon
- Supports devices from all of the major flash manufacturers
- Algorithms can be added for new flash devices
- Support for Windows host systems

Contacts



## AT91 Sockets, Adapters, & Test Accessories



- AT91 Ball Grid Array Socket & Adapter Support for
- AT91 Programming Adapters
- Over 4,000 Accessories Supporting the Following
- IC Packages:
  - BGA
  - PQFP
  - TQFP
- Engineering Prototype Sockets & Adapters
- Production Sockets for Volume Applications
- Custom Adapters in 3 Weeks
- New Online Store  
[www.1800adapter.com](http://www.1800adapter.com)

### New Online Store for Quick Answers

Emulation Technology, Inc. offers a complete online store and catalog of adapters, sockets and test accessories supporting Atmel AT91 ARM-based products. These development and production tools and accessories provide you with an interface between your AT91 device and your prototype/production circuit board, logic analyzer or oscilloscope. ET supports every stage of the debug and production process. Price, delivery, drawings, Atmel chip cross-references and online technical support are all available.

### Programming Adapters

Over 370 different programming adapters are available with complete pricing, drawings and delivery on our Web site. This product line of adapters quickly converts your Dual-in-line (DIP) programmer socket into the new chip package you want to program.

### Logic Analyzer/Emulator /Scope Adapters

Bug Katchers extend the leads and label the signals of your IC so it's easy to attach test leads. These adapters fit between your Atmel processors and its socket or surface-mount pads, and accept test leads from logic analyzers, emulators and oscilloscopes.

### Complete BGA Socket Support

Our four levels of socket support provide solutions up to 9 GHz in solderless BGA sockets and surface mount and up to 1 GHz in thru hole production socket systems.

### PQFP Test Clips

The ET PQFP Clip allows for hands-free testing of surface-mounted PQFP and TQFP devices. It provides hardware connection for testing and logic analysis.

### Debugging Accessories

We offer a complete line of Micro Grippers test clip probes with accessible lead pitches down to 0.3mm. as well as prototyping adapters, vacuum pens, extraction tools, dummy packages, test probes, and cost reduction adapters.

### Ordering Information

Log on to our web site, call our headquarters or any of our 61 distributors for immediate assistance.

### USA

Emulation Technology, Inc.  
Worldwide Headquarters  
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CA 95051-1301 U.S.A.  
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(1-800-232-7837)  
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### Web Site

[www.1800ADAPTER.com](http://www.1800ADAPTER.com)

## Embedded Firmware Suites for Converged IAD / RG / CPE Devices



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M5V 2K6

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e-mail:  
sales@arcturusnetworks.com

### Web Site

[www.arcturusnetworks.com](http://www.arcturusnetworks.com)

### Firmware Suites

Arcturus Firmware Suites are a sophisticated collection of protocols, drivers, applications and interface support simplified into three understandable product based groups. Firmware Suites are extensible, customizable and highly integrated, ensuring interoperability and robustness.

#### MIBflex™

The flexible, extensible, embedded management and control infrastructure. MIB-II compliant, XML extended architecture. SNMP and web enabled.

#### sentryVPN™

The total embedded network security and routing solution. WiFi, Firewalling, Authentication, and Encryption using IPSec, IKE and standard cryptographic algorithms

#### SIPstream™

Complete embedded voice, media and session control system. Powered by SIP features, Applications, CODECs and support for multi-port DSP voice.

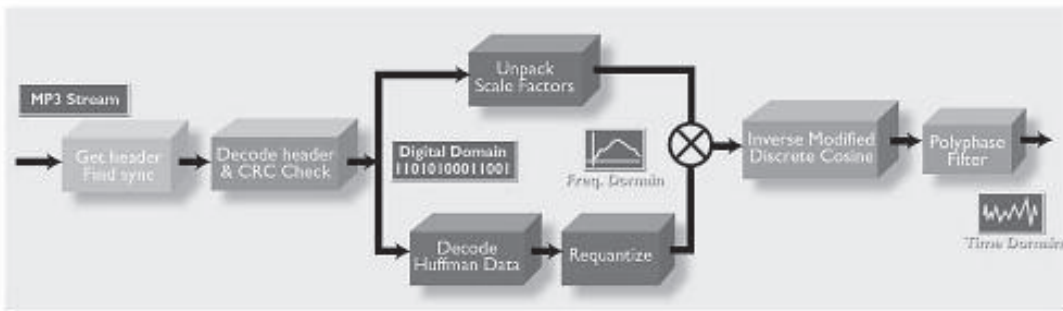
- Arcturus software, hardware, tools, OS, Firmware Suites (stacks) and integration support ensures a highly integrated end-to-end, single source product solution.
- uClinux embedded operating system is the royalty-free way to develop embedded products.
- Arcturus fast-start kits and OEM modules, feature highly integrated, fully tested hardware and firmware bundles and reduce time-to-market.
- Highly scalable, modular and easily customizable software architecture is ideal for platform design and ensures product life.
- Firmware support for various SoC based Architectures including ARM

### Solutions

Arcturus Networks provides a complete line of end-to-end hardware and firmware solutions for next generation converged IAD, RG and CPE devices. Arcturus solutions reduce product cost by providing highly integrated support for Voice, Media, Security, Virtual Private Networking, and Remote Management on devices with minimal hardware resources. Arcturus Fast-Start kits, reduce time-to-market for OEMs by integrating firmware with market ready hardware reference platforms based on low-cost, industry leading SoC microcontrollers.

Contacts

## ARM MOVE® Technology for Digital Audio



### MP3 and AAC Digital Audio codecs

ARM MOVE technology is a set of codec components that have been highly optimised for the ARM architecture. The combination of small memory footprint and low processor bandwidth requirements means it is possible to architect audio solutions requiring no additional hardware or extra programmable signal processing devices. All the codec functions may be executed in software on the ARM core.

MOVE technology supports the key audio standards defined by MPEG - MP3 and AAC- for both encoding and decoding. The software has been designed to be simple to integrate into your applications, with a common API provided for both the encoders and decoders. Rigorous testing against ISO test vectors ensures the highest possible quality and lowest risk. The software is already in use in a range of commercial products.

The high performance of the software (only 23MHz for AAC decode for example) means that

- AAC and MP3 codes available now
- High performance - low footprint
- Fully ISO standard compliant
- Robust and simple OS independent APIs
- Sample application to accelerate integration
- Mature, tried and tested in the market
- Comprehensive documentation
- On-going support and product maintenance
- Free evaluations

power consumption is kept to a minimum, and ensures sufficient processor headroom to execute additional parts of the users audio solution.

MOVE technology also provides the following additional products:

MPEG-4 Video Encoder Library

MPEG-4 Decoder Library

JPEG Still Image Codec

G.726 Voice codec

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#### Korea

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Fax (+82) 31-713-8225

#### Taiwan

ARM  
Tel. (+886) 2-2627-1681  
Fax (+886) 2-2627-1682

#### Israël

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Fax (+972) 9-7677020

#### China

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Fax (+86) 21 62351207

#### Web Site

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Contact Us

## NicheStack™ TCP/IPv4, v6 or both



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e-mail: [sales@iniche.com](mailto:sales@iniche.com)

### Web Site

[www.iniche.com](http://www.iniche.com)

One size does not fit all applications, so InterNiche Technologies, Inc. has developed four TCP/IP implementations for developers of embedded systems:

#### NicheLite™

A 12Kbyte, single-interface IPv4 stack supporting a mini-Sockets API

#### NicheStack™

A full featured IPv4 stack, with Sockets, multiple interfaces, and supporting IPSec

#### NicheStack/v6

Our newly introduced implementation of TCP/IP supporting IPv6 protocol

#### NicheStackv4/v6

Our flagship stack, supporting both IPv4, IPv6 and "6-over-4" tunneling.

All of our stacks support the options you would expect of CPU and Memory intensive implementations: Zero Copy, Blocking and NonBlocking i/o, Slow Start and predictive header algorithms, delayed ACKs and the like. Also

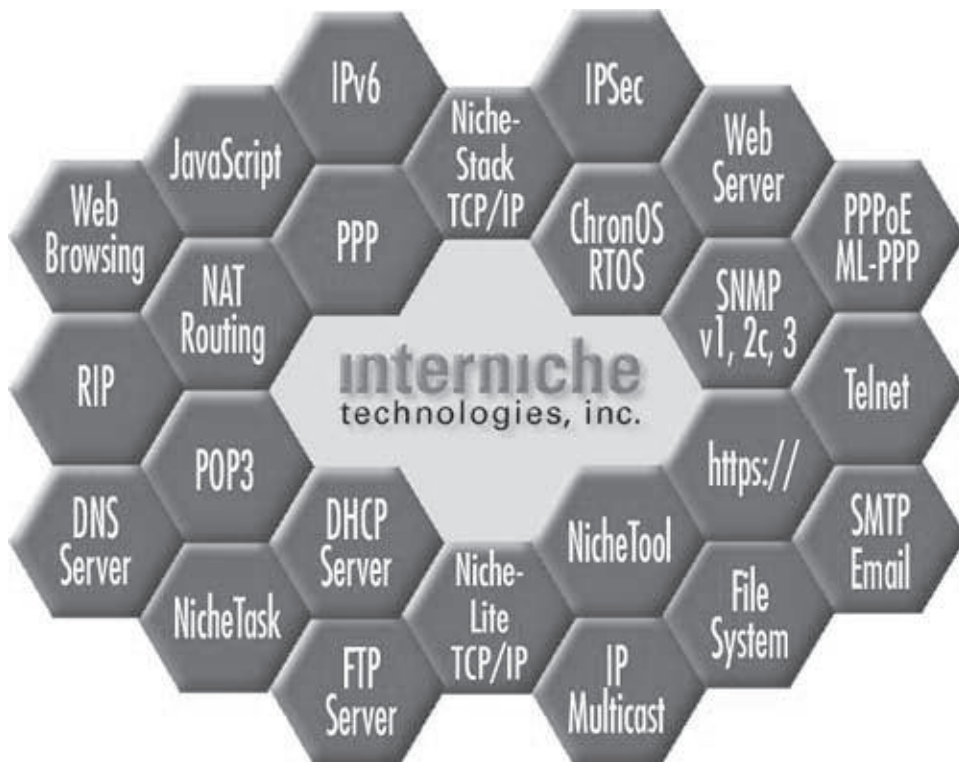
included with our stacks is NicheTool™, a diagnostic and tuning suite designed to help you verify your port and optimize your application's memory utilization and throughput.

Regardless of which stack best fits your needs, they share characteristics common with all InterNiche products: they were developed with careful attention to run-time performance, ease of configuration, respect for memory constraints unique to embedded systems, and portability. All InterNiche stacks are implemented in ANSI "C" and are delivered in full source code with technical documentation, examples and 12 months of support.

Contacts

## NicheView™ and WebPort™

**interniche**  
technologies, inc.



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### NicheView Browser

InterNiche's portable NicheView is a complete drop-in software module for embedded systems developers, adding World Wide Web Browser functionality to embedded systems. Pointing device, keyboard, color, and bit-mapped display are optional rather than assumed. NicheView provides a generic interface for input events, such as keystrokes, clicks, etc., and output streams, which pass text blocks, images, and other content to device drivers. Support for HTML 3.2, Frames, Forms Tables, graphics and Javascript are among the many features of NicheView.

- Browser Features: HTML 3.2, Frames, Forms, Tables. Options for graphics, Javascript and SSL
- Webserver features: HTTP 1.1 subset, SSI, CGI, JavaScript, MD5 optional

### WebPort Web Server

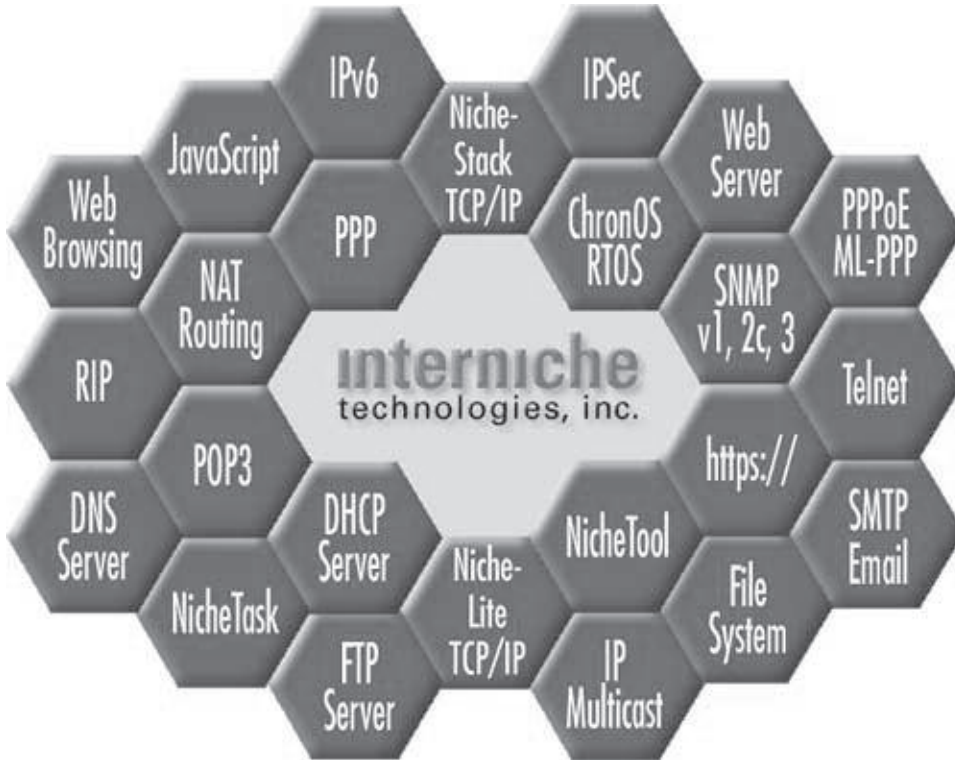
By implementing WebPort™ in a target device, users can "point" any World Wide Web Browser at the device, to configure, manage, and monitor it through WebPort's serving of both static and dynamic data. WebPort includes standard Web server features such as CGI and SSI, and enhances them to address common embedded system issues, such as lack of a native file system, limited ROM/RAM, and limitations (or a complete lack) of the "shell" which would normally execute CGI requests.

**InterNiche** Our extensive experience in networking has allowed us to develop a Web server and browser which are the smallest, fastest, easiest, and least expensive path to making your device WWW enabled.

Contacts

## InterNiche Options and Add-ons

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technologies, inc.



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### Web Site

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In addition to its TCP/IP, Web Server and Embedded Browser products, InterNiche offers a suite of comprehensive solutions for Security, routing, SNMP and web based management protocols to embedded system developers wishing to easily add communications, networking and management to their designs while investing a minimum of time or expense. Common attributes of all InterNiche software are small code size, high performance, complete documentation and best-in-the-industry license and warranty. InterNiche products have been developed from the ground up to address the needs unique to designers of high quality embedded systems. This means that our products are not only complete from a features standpoint, but also have minimal system and memory requirements.

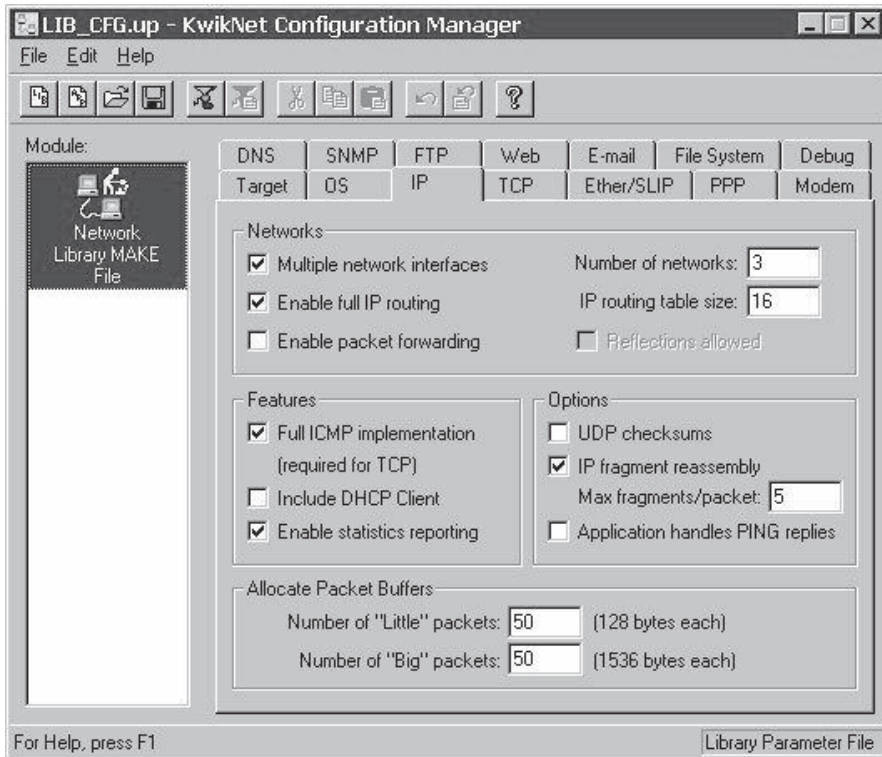
- ChronOS™ RTOS
- IP Security (IPSec)
- IKE
- SSL
- NAT Router
- RIP v1 and v2
- FTP Server
- Telnet Server
- PPP and PPP over Ethernet
- DHCP Server
- DNS Server
- POP3 and SMTP clients
- SNMPv1, v2c and v3
- MultiLink PPP
- IGMP/IP Multicast

Since 1989 InterNiche has been providing CPU independent embedded networking solutions to companies whose products range from process control to mobile communications to networking products such as routers and switches and Network System on Chip applications. Whatever your market or architecture, InterNiche has all the software you need to Internet-enable your product

Contacts



## KwikNet TCP/IP Stack



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Fax (+33) 1 69 85 54 26  
e-mail:  
didier.raffenoux@netbricks.net

**Web Site**  
[www.kadak.com](http://www.kadak.com)

The KwikNet TCP/IP Stack and its various options enable you to add networking features to your products with a minimum of time and expense. KwikNet gives you a compact, reliable, high performance TCP/IP stack built with KADAK's characteristic simplicity, flexibility and reliability.

The KwikNet TCP/IP Stack includes support for: TCP, UDP, IP, ICMP, ARP and BOOTP (DHCP client). Optional Protocols include PPP, FTP, TFTP, HTTP, TELNET and SNMP.

The KwikNet TCP/IP Stack includes data link layer network drivers for SLIP (with serial loopback and crossover drivers) and Ethernet (with an Ethernet loopback driver). An NE-2000 Ethernet device driver and an INS8250 serial device driver are included. Ethernet device drivers are available for common Ethernet controllers.

### KwikNet Configuration Manager

The KwikNet Configuration Manager is a Windows utility which ensures that KwikNet is always properly configured for your use. The illustration shows the Manager's edit window as it appears while configuring your KwikNet Libraries.

- Windows® based Configuration utility eases system construction
- High throughput, RFC compliant stack
- Reentrant, compact and ROMable
- Standard TCP, UDP sockets interface
- Ready to use with the AMX™ RTOS
- Porting Kit eases port to any target processor with or without an RTOS
- Clear and comprehensive manuals
- No royalties; source code included
- Enviably track record for reliability and support

### KwikNet Porting Kit

The KwikNet Porting Kit makes it easy for you to port KwikNet to the target processor of your choice. The kit permits KwikNet to be used with any real-time operating system or without an RTOS at all.

### KwikNet for AMX

KwikNet for AMX is ready for use with KADAK's AMX RTOS. When used with AMX, no KwikNet porting is required.

## smxFile™ File Manager

smxFile™ is a robust, DOS-compatible file system for hard real-time embedded systems. It supports all device types commonly used in embedded systems. smxFile features high-performance file i/o and also provides disk directory management. smxFile is written in ANSI C. Source code is provided. The API is similar to POSIX and DOS. The device driver interface is similar to UNIX, but simpler. A portable, standalone version is available.

This package is the latest in a series of DOS file system software packages that have been marketed since 1987. It and its predecessors have been included in hundreds of commercial embedded applications.

smxFile is integrated with SMX®. Multiple tasks may perform simultaneous file i/o. Low-level i/o calls to the same disk are serialized via semaphores since actual disk operations are inherently non-reentrant.

- FAT 12/16/32
- DOS/Win9x compatible
- Long file names (VFAT)
- Extensive drivers:
  - Floppy
  - IDE Hard Disk
  - DiskOnChip®
  - LS-120
  - PCMCIA-ATA
  - PCMCIA-linear flash
  - Ultra DMA
  - SCSI
  - Zip®
  - RAM disk
  - ROM disk
  - BIOS devices
- 20 MByte/sec sustained transfer rate (IDE Ultra-DMA)
- Up to 2 terrabyte disks
- 55 KB typical code footprint
- 20 KB typical data footprint
- Multitasking support
- Contiguous file support
- Source code included



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Fax (+1) 714-432-0490  
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Contact Person:  
Betty Martin-Danner

### Web Site

[www.smxinfo.com/atmel.htm](http://www.smxinfo.com/atmel.htm)



## smxNet™ TCP/IP Network Stack

smxNet is a TCP/IP network stack, which has been optimized for use in real-time embedded systems. It offers RFC-compliant TCP and conforms to the Berkeley sockets API. smxNet is fully integrated with smx®. Several higher-level protocols are also available and described herein.

smxNet works well for small ROM'ed hosts, as well as larger hosts. No disk services are required. It can configure itself after power up, using BOOTP. ROM requirements are small and configurable to application requirements -- see Table to the right. RAM requirements are tunable to the application and vary from about 35KB (PPP) or 60KB (Ethernet) to about 150 KB (including optional packages). Use of smxNet with 16-bit processors and small memory is feasible. A no copy operating mode improves UDP and TCP performance. **smxNet provides extensive error monitoring and reporting.**

Also included are a wide selection of 10BaseT, 100BaseT, and serial drivers.

Optional modules include PPP, FTP, TFTP, NFS, Telnet, SNMP, DHCP, MicroWeb Server, and MicroBrowser. PPP supports autodial / autoanswer and permits connection to an ISP for Internet access. FTP, TFTP, and NFS are used for file transfers. The MicroWeb Server permits obtaining information and controlling an embedded unit via a standard browser running on another computer on the network or via the internet.

MicroBrowser is a nearly complete HTML 4.0 compliant browser, with frames support. It has a very small code footprint (under 250KB). MicroBrowser allows an operator to access remote Web sites via a network to obtain needed information. Coupled with smxFile or smxCD, it can also be used to access local HTML files for operator instruction, training and other purposes.

### smxNet ROM Requirements (KB)

Function	ARM
1. IP + ARP + UDP	48 <sup>1</sup>
2. IP + ARP + TCP/UDP	73 <sup>1</sup>
3. DNS	5
4. Fragmentation	4
5. BOOTP	2
6. ICMP	1
7. FTP Client	15
8. FTP Server	22
9. FTP/TFTP/TELNET <sup>3</sup>	26
10. NFS Client <sup>3</sup>	
11. NFS Server <sup>3</sup>	
12. SNMP V2	40
13. DHCP Client	9
14. DHCP Server	6
15. DHCP Client or Server	14
16. MicroWeb Server	23
17. SMTP	16
18. POP3	17
19. Drivers	
a. PPP + CHAP	41
b. PPP (no CHAP)	35
c. SLIP + CSLIP + MODEM	10
d. Ethernet	3

Notes:

1. Includes NE2000 Ethernet Driver

As you can see, you will be well connected with SMX.

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## Softmodem Bricks



Netbricks is a leading developer and supplier of portable software compliant with protocol standards as published by the governing institutions around the world (ITU, ETSI, ANSI, IETF, 3GPP, ...).

Netbricks supplies its source code to over 350 major telecommunication equipment developers, networking manufacturers and OEMs. Netbricks software and hardware enable customers to achieve a low risk, fast time-to-market with reduced development costs while creating leading edge equipment. The companies' expertise in software covers ISDN, ATM, SS7, SOFTMODEM, V5, LES, X.25, FAX, SIGTRAN, SIP, MGCP/MEGACO, .... For its Hardware products, Netbricks is committed to PCI, Compact PCI and PMC standards and to No-DSP solutions through host signal processing.

Today, Netbricks has validated solutions in software for the new emerging technologies in VoDSL, Voice Gateway, Next generation networks (NGN), Signal processing for modem and voice ....

With offices in France, UK, USA and Israel and a network of carefully selected partners. Netbricks has the ability to provide local support and professional services wherever your location.

- Support of the following modem modulations:
  - ITU V.22bis (2400bps)
  - ITU V.23 with reverse (75/1200 bps) and (1200/75 bps)
  - ITU V.22 (1200bps/2400bps )
  - ITU V.32bis
  - ITU V.32
  - ITU V.21 (300bps)
  - ITU V.34/V.90 data and Fax Modem
  - Bell 212A (1200bps)
  - Bell 103 (300bps).
- Training stage, full-duplex
- CNG / CED generation and detection
- DTMF detection
- Support of V.42/V.42bis and MNP4/MNP5 through V42-BRICKS
- Support of Modem AT commands through AT-BRICKS
- Support of ISDN signaling through ISDN-BRICKS.
- Support of PTSN signaling through DAA
- Support of V.120, PPP, ML PPP, AO/DI through Netbricks-Bricks products
- Support of T.30 Fax protocol through FAX-BRICKS (T4 multi-dimensional, ECM)
- Support of TR29 class 2 through AT-BRICKS
- Full implementation of ITU V.17 group 3 fax support of the following modem modulation : V.17, V.29, V.27ter, V.21
- Physical entity for support of softmodem functions

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wdc@netbricks.com

### WebSite

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## NexGenGUI4® Portable Graphical User Interface SDK



### Graphical User Interface

NexGenGUI4® is a high-end Graphical User Interface which includes NexGenGRAPH, NexGenDECODE, and NexGenWIDGET4®.

The heart of NexGenGUI4® is an event manager that manages any kind of event, sent either by the input or the widget driver.

The event manager then processes and dispatches these events in a logical way.

A window manager, used to handle the window decoration, is also provided.

The basic graphical functions as well as the video driver are handled in NexGenGRAPH, whereas the widgets included in NexGenWIDGET4® are used to create the general look&feel.

NexGenGUI4® is carefully layered and is totally portable since it exports all its dependencies to NexGenOS®. Each of the software modules that together constitute NexGenGUI4®, is customisable and thus the developer can choose exactly the features required for the user interface. Depending on the complexity of the wanted UI, the total memory footprint varies between 120 and 200 kB of code.

The NexGenGUI4® architecture is suitable for various embedded devices, like mobile phones, PDAs, and STBs as well as for industrial embedded

- Fully written in ANSI C
- Highly optimized
- Reentrant and ROMable
- Fast and reliable
- Polling or RTOS mode
- Modular and well layered
- No CPU/OS dependencies
- Scalable [120 - 200 kB]
- Rich set of widgets
- Everything is customisable
- Complete set of input drivers
- Various screen sizes supported
- 1/2/4/8 resolution modes
- GIF/JPEG decoders
- Customisable event manager
- Add/remove window manager
- C pre-processor to build a UI
- Portable across 16/32-bit
- Fully tested
- Royalty free
- Per-project licensing
- Source code or library

devices. As an example, see NexGenSURFon®, which has been built using NexGenGUI4® as the heart of its rendering engine.

The NexGenGUI4® architecture is suitable for various embedded devices, like mobile phones, PDAs, and STBs as well as for industrial embedded devices. As an example, see NexGenSURFon®, which has been built using NexGenGUI4® as the heart of its rendering engine.

### Additional Networking Protocols

NexGenIP : Portable TCP/IP suite

NexGenSURFon : Embedded micro-browser

NexGenWIDGET4 : Embedded Widgets

NexGen  
Software

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Contacts

## NexGenIP® Portable Embedded TCP/IP Suite



### Embedded TCP/IP Suite

NexGenIP is designed to be used "out of the box" in your embedded products.

NexGenIP is very carefully architected to meet the most demanding applications. It is designed to be delivered in source code or as a library so it can be configured to use only the exact features that you need.

This makes sense for both the size and the performances.

NexGenIP supports TCP, UDP, IP, ICMP, IGMP, ARP, Ethernet and Multicast. Some additional features like asynchronous events on TCP/UDP are implemented.

A BSD 4.4A socket interface (sync/async) is available.

NexGenIP can be used either in polling or RTOS mode. All dependencies have been isolated in a dedicated layer called NexGenOS (once NexGenOS supports a CPU, the stack can be shipped even in binary).

By such way, the stack is totally portable on any boards and OS(es) and can be shipped by OEM directly to their own customers.

- Fully written in ANSI C
- Highly optimized (17-50 KB)
- Reentrant and romable
- Small critical section
- RTOS open interface
- Polling or RTOS mode
- Fully tested
- No royalties
- Source code or Library

Our products have been ported on  $\mu$ C/OS, Nucleus, RTKernel, XEC, embOS, OSE, DOS, Win32, Linux, QNX, Neutrino, pSOS, VRTX32, OS20, VxWorks and in polling mode (no OS required).

### Additional Networking Protocols

NexGenPPP(oE) : Point to Point Protocol - ADSL

NexGenIPSec : IP security

NexGenWEB : HTTP server and client

NexGenMAIL : POP3, SMTP

NexGenREMOTE : FTP, Telnet (client/server)

NexGenBOOT : BOOTP, DHCP (client/server)

NexGenNAT : Network Address Translation

NexGenSNMP : SNMPv2c

NexGenIMAP4 : IMAP

NexGenRESOLV : Sync/Async DNS w/ cache

NexGenRIPv2 : Routing Protocol Version

NexGenSURFon : Embedded Browser

NexGenGUI4 : Embedded GUI

## NexGenSURFon® Embedded XML based micro-browser SDK

NexGen  
Software



- Fully written in ANSI C
- XML/XHTML/HTML compliant
- HTTP/FTP/File support
- Customisable parser
- GIF(89a) and JPEG support
- Enhanced caching capabilities
- Concurrent downloading
- Portable rendering engine
- Customisable widgets
- Scalable screens
- Colour and greyscale
- Any input device supported
- 60 - 100 kB scalable
- Platform independant
- Polling or RTOS mode
- Any TCP/IP stack supported
- Source code or library

### Micro-browser SDK

NexGenSURFon® is an XML/XHTML/HTML-Basic browser able to display and to exploit the pages sent by a web server.

The XHTML standard inherits from XML and is compatible with HTML4. XML enables more standardized hypertext-based documents and separates the content from the rendering. The user can enrich the content by adding tags, which will be decoded later on and processed by some parser. Most of the tags are application-oriented, giving the developers the possibility to either exchange reliable, well-formatted information or to extend their applications by processing some appropriate work. More information on XHTML is found at [www.w3c.org](http://www.w3c.org).

NexGenSURFon® is specifically designed to address the embedded device requirements with constraints like memory footprint, portability and OS independence.

NexGenSURFon® is well layered and its architecture offers a rich, extensible set of features. It is for example possible to plug a new parser or to

add and remove some particular tags/scripts to match a new XML instance. The rendering engine uses the widgets available with NexGenGUI4®, and thus both the behaviour and the look & feel can easily be changed using different widgets.

Everything has been tried to be thought for extending the features on the most flexible way while keeping the memory footprint and performance usable on an embedded device like a mobile phone, a PDA, an STB or a low-end embedded industrial device.

NexGenSURFon® is totally portable and platform independent.

### Additional Networking Protocols

NexGenIP : Portable TCP/IP suite

NexGenSURFon : Embedded micro-browser

NexGenGUI4 : Portable GUI SDK

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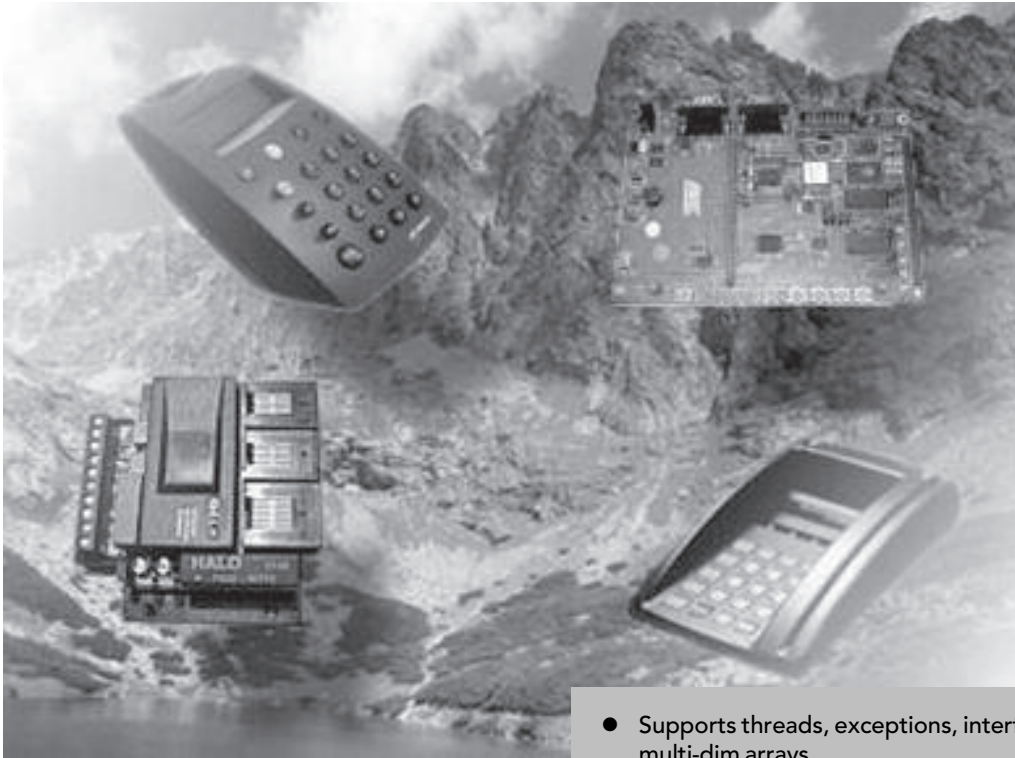
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## simpleRTJ - Java Virtual Machine



The **simpleRTJ** is a clean room implementation of the Java Virtual machine that has been specially optimised to run on devices with limited amount of memory and without the support of any RTOS.

It has all the key features that are required from any decent VM implementation including multi-threading and garbage collection. The simpleRTJ's customisation options make it ideal to run on a wide range of 8, 16 and 32 bit microcontrollers as it can be easily tailored to suit the target system.

### Performance

- Uses pre-linked Java application, which significantly reduce the application start-up times as no dynamic class loading is required.
- Pre-linked classes allow VM to execute bytecodes at full speed without any delays that are otherwise required to resolve constant pool symbolic references.
- Efficient memory and method frames allocation schemes improve overall VM performance

### Possible applications.

- Smart cards, smart card readers/writers.
- Electronic payment terminals.

- Supports threads, exceptions, interfaces, multi-dim arrays
- Can operate as mini JavaOS
- Three-color mark & sweep garbage collection
- Soft real-time support via javax.events
- Small memory footprint (17-23KB)
- Flexible start-up configuration
- Runs java apps up to 16MB in size

- Factory automation.
- Robotic controllers.
- Small consumer devices - pagers, cellular phones, etc..
- Electronic toys.
- Various embedded devices

### Requirements.

- A host computer capable of running Java and target processor development tools.
- ANSI C cross-compiler for the target processor or microcontroller.
- JDK 1.2, JBuilder or similar Java IDE for compiling Java applications and running the ClassLinker.
- Additional tools for uploading binary images into the target devices

### Australia

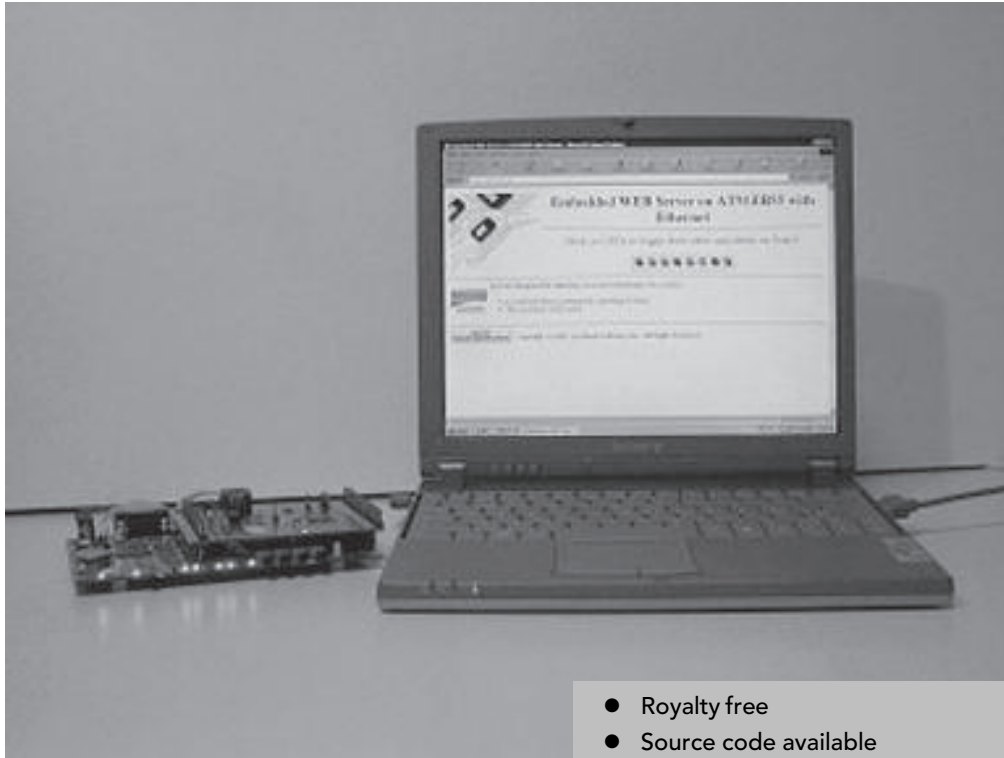
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## Open Source Software Components



- Royalty free
- Source code available
- State of the art
- Small memory footprint
- Full support
- Development Tools

The Open Source Software evolution model has resulted in a fairly high rate of innovation for software with richer functionality and higher quality. The time is now right for the embedded systems market to benefit from the open source movement. A flood of software components is now available from the open source community. However many of these are not suited for embedded systems products, or do not meet the quality requirements of that market.

Silicomp is maintaining a permanent technology watch of open source software components available worldwide. Through this permanent survey, the most adequate software items are selected, adapted to the requirements of the embedded systems market, and brought to industrial strength; to form a coherent set of modular components matching the needs of embedded systems designers.

Within its open source offering, Silicomp offers Internet software components such as TCP/IP stacks, Internet services such as embedded web server or FTP server, telecommunication software such as support for PPP, IEEE 802.11, specific hardware support such as SPI or CAN, a complete

Flash File System, or support for industrial hardware or protocols such as I2C or Modbus or Profibus. Thanks to its open source components offering, Silicomp customers combine the benefits of open source technologies with those of commercial products. More information can be found at:  
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## MP3 Decoder



- Compliant with ISO MPEG standards
- Tested on a variety of input bit streams
- High sound quality
- Extremely high robustness to damaged MP3 bit streams
- Very low MIPS and memory requirements
- Can be easily ported to any RISC or DSP platform

SPiRiT's MP3 decoder supports MPEG 1, 2 Audio Layer III standards and their low bit rate extension MPEG 2.5. It could be effectively used in such applications as portable audio systems, wireless communications, car audio systems, set-top boxes, Internet appliances and PDAs.

MIPS	Program Memory	Data Memory
25	31 Kbytes	24 Kbytes

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