**CodeTAP®-BDM**

for Motorola CPU32

**Highlights**

- Support for all CPU32 processors and controllers, both 3- and 5-volt, with display windows for processor peripheral registers and chip selects
- CodeTAP®-BDM joins Applied’s advanced CPU32 emulators to provide a full range of debug power at low cost
- MWX-ICE debugger supports compiler and target debug needs:
  - point-and-click operation
  - optimized C /C++ debugging
  - robust peripheral register and target interface features
  - common interface with other Applied emulation tools
- Ethernet communications (optional on Windows PC hosts) provides LAN connectivity and high-speed downloads to target systems
- RTOS-Link™/KA option provides high-level view of RTOS data structures and allows task qualification for breakpoints from within MWX-ICE
- Fully transparent system requires no target memory space, I/O ports, interrupts, or chip selects
- External triggers facilitate using CodeTAP-BDM with other instruments

**Companion Products**

- CodeTEST™ Software Verification Tools provide a suite of tools for software developers and testers, including memory allocation analysis, performance analysis, code coverage analysis and trace analysis. CodeTEST and CodeTAP-BDM are designed to work together to provide comprehensive embedded software debug control and measurement.

**Debug Software in Your Target**

CodeTAP®-BDM puts compact, low-cost debug power in the hands of every CPU32 software engineer. Using the Background Debug Mode resources found on every CPU32 processor and controller, CodeTAP-BDM allows the software engineer to plug the powerful MWX-ICE debugger into any CPU32 target without linking code, writing drivers, reserving interrupts, or modifying hardware.

**Intuitive Multi-Windowed Debugger**

The MWX-ICE debugger helps get your product to market fast. It combines extraordinary power to debug optimized C /C++ code with an easy-to-use multi-windowed interface for both workstation and PC platforms. And MWX-ICE provides a modern, point-and-click interface for display and setup of CPU32 peripheral registers. With the RTOS-Link/KA option, one debugger combines all the functions you need from initializing the CPU to monitoring high-level OS calls. That means no more switching between debuggers or using low-level terminal mode commands to move from peripheral bit-setting to high-level C++ application code.

We also offer tools to support these Motorola Products: 68020/EC020, 68030/EC030, 68040/EC040, 68040V, 68060/EC/LO060, 68000/EC/HC000, 68330/340, 68331/2, 68302, ColdFire
Comprehensive CPU32 Support
Unlike debuggers ported from software monitors, MWX-ICE and CodeTAP-BDM are processor- and target-aware. To view or program CPU32 peripherals and chip selects, simply open a register window. View bit values and definitions from within MWX-ICE. Set the CodeTAP-BDM to quickly program CPU peripherals with initial values to avoid loss of the debug session and lengthy reboot and download operations after target resets or crashes. Use MWX-ICE to assemble code patches directly to memory. With CodeTAP-BDM you have fine-grained control over target bus width and code space with every read and write cycle.

High-Speed Communications for Big Jobs
Ethernet communication is included with CodeTAP-BDM for Sun and HP workstations, and is an available option for use on Windows PC hosts. The Ethernet link allows shared use of CodeTAP-BDM on a LAN, and provides high-speed download to quickly move large C/C++ applications into your target. For Windows PC users without a LAN or with restricted budgets, a High-Speed Serial card provides a low-cost, high-throughput point-to-point communication capability. And for field debugging with a notebook PC, CodeTAP-BDM supports RS-232 serial communications to let you debug anywhere, anytime.

Plug-and-Go Target Connection
CodeTAP-BDM plugs directly into any 3- or 5-volt Motorola standard 8- or 10-pin Berg header on prototype and production target boards. For target boards without Berg headers, the CodeTAP-BDM system includes “flying lead” cables to connect to individual target pins. CodeTAP-BDM’s Clock Sense Connector guarantees maximum throughput to the target.
Get Active Control for Passive Instruments
External triggers allow CodeTAP-BDM to be an active controller for passive bus and logic monitoring instruments. The triggers provide run/pause signals to external instruments such as logic analyzers. The external break input allows another instrument to signal CodeTAP-BDM to break. Active control allows CodeTAP-BDM to serve as the central element in production test, service, and hardware verification environments.

RTOS-Level Visibility and Control
Applied’s RTOS-Link/KA option provides access to important RTOS data structures and task status summaries. You can use task-qualified breakpoints to focus on specific tasks in a debug session.

A Selection of Compatible Tools
CodeTAP-BDM joins Applied’s family of emulators for CPU32 processors so engineers and project managers can choose both lower-cost tools for everyday use and more powerful tools to root out the toughest bugs. A compatible family, all the tools share a common debug front-end to leverage experience and training.

CodeTEST Companion Tools
Test, Analyze and Measure Code Performance
Software development is made from equal parts of debugging and testing code. The CodeTAP-BDM provides an exceptional set of tools to debug code; CodeTEST offers the same for testing code. In fact, CodeTEST is the first software verification tool suite crafted specifically for embedded software. It offers memory allocation analysis to help you locate memory leaks and detect improper uses of malloc() and free(). Performance analysis provides real-time module duration and call-pair linkages for up to 32,000 functions. The coverage analysis package clarifies the effectiveness of your test suite to help you develop higher quality code. Finally, the trace analysis package offers multiple ways to view the execution history of your program and, thereby, see the “big picture” about the operation of your software.
CodeTAP-BDM for Motorola CPU32

Microprocessor Support
3- and 5-volt Motorola CPU32 microprocessors and microcontrollers with Background Debug Mode

Host Requirements

PC Environment
PC386, Microsoft Windows 3.1 or higher, 16 MB RAM, ISA or EISA slot
Sun Environment
Sun SPARC, Sun OS 4.1, 16 MB RAM
Solaris 2.2 or above
HP Environment
HP 9000, HP-UX 9.0 or above, 20 MB swap

Communications
RS-232C serial interface (PC)
High-speed Synchronous Serial interface (PC)
Ethernet (Sun/HP standard, PC optional)

Power Requirements
2A at 5V maximum; 1.3A at 5V typical
Powered from target or external supply

Physical Specifications
Dimensions (LWH): 5.6 X 1.0 X 3.0” (14.22 X 2.54 X 7.62 cm)
Weight: 5 oz.
Ambient Humidity: 0–90% non-condensing
Operating temperature: 32–104° F (0–40° C)

Optional Software Development Tools
ANSI C/C++ cross-compiler
Cross-assembler
Embedded linking loader
Object module librarian

MWX-ICE High-Level Debugger
Efficient Sourc-Level Debug
Window-oriented interface (X-Window support on Sun SPARCstation and HP 9000)
Support for C/C++ on PC, Sun, and HP
Access to all global, local, stack-based and register-based variables in source-code form
Full C-typing features for commands and macros
Execution breakpoints can be set on line numbers, C statements, program labels, and memory addresses
Line assembler patches code directly

Target and CPU Awareness
Window register displays for CPU32 peripherals and chip selects
Decode register-bit value definitions
(331/332 and 360 processors)
Automatic CPU32 register initialization
Control of bus-width and function code attributes for all target bus cycles

Advanced Testing and Set-Up Capabilities
Construct complex macros containing C-like statements and debugger commands
Record and play back debugging sessions

File Format Compatibility
MRI toolchain; IEEE 695; a.out

RTOS-Link/KA
View RTOS data structures, qualify breakpoints by task

Breakpoint System
64 software execution breakpoints
Asynchronous breaking allowed under control of host debugger
External breakpoint trigger in and out
One hardware execution breakpoint (68360)
One hardware data address breakpoint (68360)

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