



www.intertesttech.com

Bone Piles?



Convert to assets...



...using μ Master



Hardware Debug Solutions

fast, automated diagnosis
even for 'dead' boards



Faulty boards?

– μ Master can debug them!

μ Master is the complete solution for the hardware debug of processor-based boards. It supports a wide range of UUT CPU's, including Intel®, AMD®, and Freescale™ Semiconductor / IBM® processor families. To see the μ Master Overview and Demonstration movies, visit:

<http://www.intertesttech.com/ate/presentations.htm>

What benefits does μ Master provide?

- Automatic fault diagnosis – even for dead boards.
- Convert your stockpiles of faulty boards into financial assets.
- Rapid fault location - full diagnosis in seconds.
- Detailed component-level diagnostics facilitate less skilled debug and repair.
- Optional I/O Emulation Unit, with closed-loop feedback, checks data transfers through all I/O ports including audio, video, custom I/O, etc.
- Automated database fault logging allows statistical analysis and control of the repair process.
- Fast and easy to connect to UUT.
- Supplied with an extensive library of pre-programmed tests.
- Automatic Test Program Generation.
- Supports wide range of processors – low-cost upgrades for new varieties.
- Open architecture – supports 3rd party instrumentation, test executives and programming languages.
- Flash device programming.

Who uses μ Master?

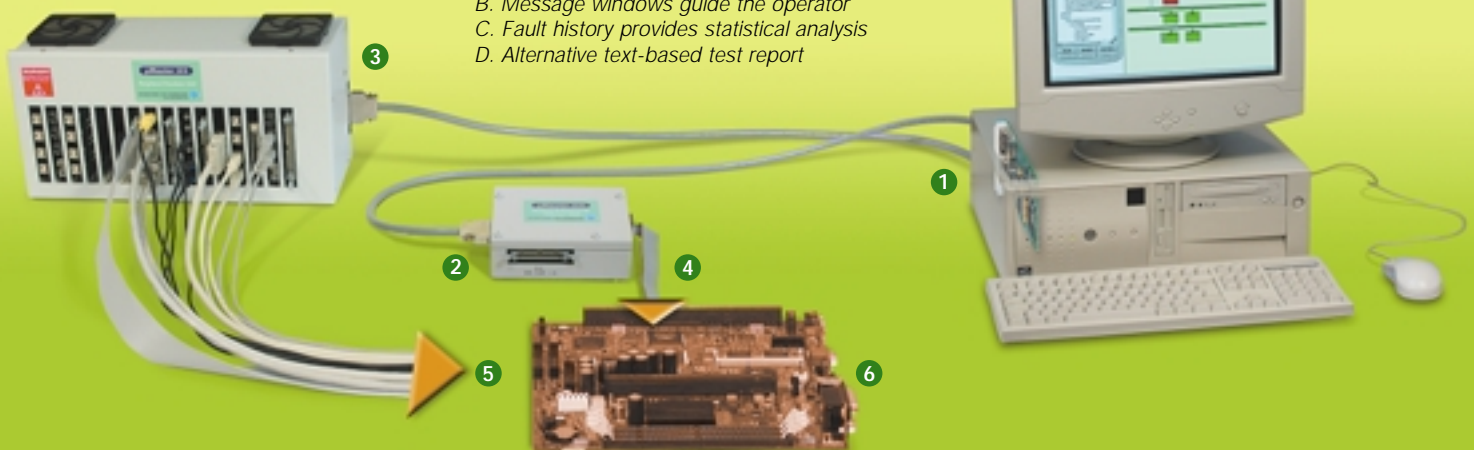
The world's leading manufacturers of embedded systems, single board computers (SBC's) and PC's use μ Master test solutions to eliminate stockpiles of faulty boards, and to assist in the repair of manufacturing fall-out and field returns. μ Master is also used in development debug, where it can significantly reduce lead times. Application areas include:

- Telecoms and Networking.
- Computing - servers, workstations, notebooks, hand-held computing devices, SBC's, etc.
- Heavy Industries - Automotive, Avionics, etc.
- Entertainment - set-top boxes, internet applications, game consoles.
- Commercial goods - data storage, office automation, graphics and imaging.



1. Functional Test Controller Card (PCI or PXI)
2. Processor Control POD (Debug Port and/or JTAG)
3. Optional I/O Emulation Unit
4. Cable to UUT debug port
5. Cables to UUT I/O ports
6. Unit Under Test (UUT)

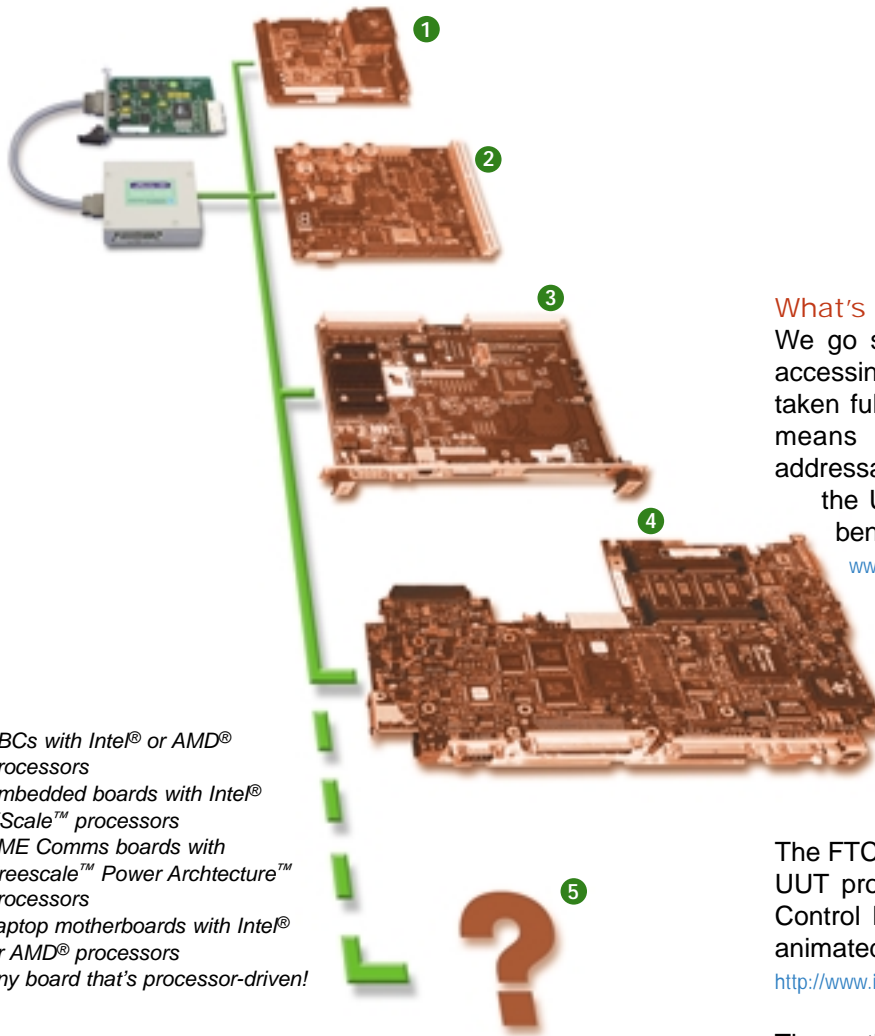
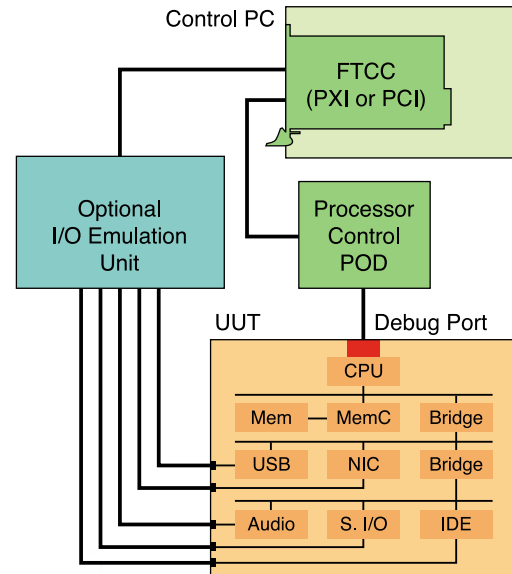
- A. Block diagram shows failing devices in red
B. Message windows guide the operator
C. Fault history provides statistical analysis
D. Alternative text-based test report



Whatever your needs – we can satisfy them!

Very easy operation

µMaster is designed for minimum effort. Built-in diagnostic routines identify faults in seconds. At the click of a button, all addressable board components and I/O ports are checked. Comprehensive diagnostic reports can even indicate components to replace. Failure statistics are provided by the automated fault logging database. For new boards, the Automatic Test Generation (ATG) tool captures boot and initialization sequences, converting these into ready-to-use diagnostic routines.



1. SBCs with Intel® or AMD® processors
2. Embedded boards with Intel® XScale™ processors
3. VME Comms boards with Freescale™ Power Architecture™ processors
4. Laptop motherboards with Intel® or AMD® processors
5. Any board that's processor-driven!

Wide range of CPU support

As can be seen from the diagram above, µMaster solutions are available to debug UUT's driven by a wide range of processors. We constantly expand this range – for the latest developments see: http://www.intertesttech.com/ate/products_hd5.htm

What's the underlying technology?

We go straight to the heart of the UUT, directly accessing the processor via its debug port. Having taken full control of the processor, we use it as a means to sequentially test and diagnose all addressable buses and components, even when the UUT is "dead" or unable to boot. See the benefits of µMaster in dead board debug here:

www.intertesttech.co/ate/products_dead_board_debug.htm

The diagram above shows the basic configuration required to test and diagnose a processor board, including all I/O ports. At the top left is the µMaster Functional Test Controller Card (FTCC). This is available in PCI and PXI form factors.

The FTCC connects to either the Debug Port of the UUT processor, or a JTAG port, via a Processor Control POD. See the following web page for an animated diagram of the complete test process:

http://www.intertesttech.com/ate/products_hd4.htm

The optional I/O Emulation Unit stimulates and measures activity at I/O ports, avoiding the need to attach real devices for full functional testing. This reduces test times and provides better diagnostics. See the full range of programmable digital / analog measurement cards and signal generators here:

http://www.intertesttech.com/ate/products_pe1.htm

Technical Specs

Hardware

Host PC Requirements

- Platform:
 - 100% compatible IBM® PC, with a spare PCI slot
 - or a PXI chassis controlled by a 100% compatible IBM® PC, plus one spare PXI slot.
- Operating System:
 - Microsoft® Windows® 98, 2000, XP, or Vista™.

Functional Test Controller Card

- 33MHz +5v PCI or PXI.

Processor Control POD's

POD's are available for the following UUT processors:

- Intel®
 - Pentium® (all), Celeron® (all), Core™ (all) Xeon® (all), and XScale™ processors.
- AMD®
 - Athlon™, Duron™, Opteron™, Sempron™ and Turion™ processors.
- IBM® / Freescale™ Power Architecture™
 - Virtually the complete range (see link below).
- AMCC® processors.
- ARM® processors (and derivatives).
- Texas Instruments™ processors.
- See www.intertesttech.com/ate/products_hd5.htm for the latest range.

UUT Test Access

- Via processor's debug port, or JTAG port, using:
 - manufacturer's on-board connector
 - a simple bed-of-nails
 - an interposer*
- All tests run at FULL processor speed.
- Typically, only 5-10 test points are needed.

Flash Programming

Many common flash devices can be programmed via the FTCC and Processor Control POD.

Optional I/O Emulation Unit

A wide range of plug-in cards is available for the optional I/O Emulation Unit to test I/O ports:

- Keyboard / Mouse
 - IDE
 - Parallel (IEEE 1284)
 - IrDA
 - Video checker
 - Ethernet LAN
 - Battery Emulator
 - General Purpose I/O
 - Switch card
 - For the complete list, or for more information on any of these cards, go to:
- SCSI
 - USB
 - Serial
 - Audio
 - LCD checker
 - IEEE 1394 / Firewire
 - Modem Emulator
 - Analog/Digital
 - Prototyping card

http://www.intertesttech.com/ate/products_pe1.htm

Software

User Interface

- Very easy to operate – built-in tests diagnose faults in seconds.
- Comprehensive diagnostic reports can even indicate components to replace.
- Built-in Automatic Test Program Generation.

Software (cont.)

Pre-Programmed Tests²

Start/stop processor, Read memory, Write memory, Read I/O, Write I/O, RAM Test (SRAM, DRAM, SDRAM, DDR SDRAM, RAMBus...), ROM CRC/Checksum, Fill Memory, Check Memory, Breakpoints, Run UUT.

Automatic Test Generation (ATG)

Using a known-good board and our selection of ATG tools, partial or complete diagnostic programs can be quickly created for many UUT's. The ATG includes a library of pre-programmed tests for many chipsets and devices from companies including 3Com*, ALi*, Broadcom*, Cirrus Logic*, Conexant*, DEC*, ENE Technology*, ESS Technology*, IBM*, Intel*, LSI Logic*, National*, NEC*, NeoMagic*, nVidia*, O₂Micro*, Realtek*, ServerWorks*, SigmaTel*, SiS*, SST*, Texas Instruments*, Toshiba*, Tundra*, VIA Technologies*, Winbond*, etc. We continuously expand the ATG library, and update this via the web.

Test Development

We develop new test programs and modify existing ones to meet customers' specific needs when they have insufficient in-house resources. [Please contact us](#) for a free quotation.

Open Architecture

Our test solutions have an open architecture, allowing them to be integrated easily with new or existing test solutions.

Supported Programming Languages

- C, C++, Microsoft® Visual Basic®, Microsoft® Visual C++®, National Instruments™ CVI™.

Supported Test Executives

- National Instruments™ TestStand™.
- Any Microsoft® Windows®-based Test Executive.

3rd Party Instruments

- Switches, DMM's, DSO's, etc.

1. An interposer is a breakout circuit, which sits between the processor and its socket. Interposers are only available for selected processors.
2. The range of available tests varies between processor families. This list only shows a typical sample.

*All trademarks and registered trademarks are acknowledged as the property of their respective owners.

Distributed by:

Headquarters: Larkin house, Oldtown Road, Letterkenny, Co. Donegal, Ireland
Tel: +353 74 918 8100 - Fax: +353 74 918 8128 - E-mail: sales@intertesttech.com
US Sales Office: 2694, 21st Avenue, San Francisco CA 94116, USA
Tel: +1 415 753 5376 - Cell: +1 415 710 0349 - E-mail: sales_usa@intertesttech.com

www.intertesttech.com