

PROCESSOR-CONTROLLED TEST DEBUG HARDWARE SOLUTION

ARE YOU HAVING PROBLEMS DEBUGGING OR TESTING PROCESSOR BASE SBC, SERVERS, WORKSTATIONS, DESKTOP, AND MOBILE OR EVEN EMBEDDED DESIGNS?

– PROCESSOR-CONTROLLED TEST CAN DEBUG THEM!

Processor-Controlled Test (PCT) is the complete solution for the hardware debug of processor-based boards. PCT supports a wide range of CPU's including Intel®, AMD®, and Freescale™ Semiconductor/ IBM® processor families.

WHAT BENEFITS DOES PCT PROVIDE?

- Rapid fault location - full diagnosis in seconds.
- Detailed component-level diagnostics facilitate less skilled debug and repair.
- Part and pin level coverage.
- Fast and easy to connect to UUT.
- Supplied with an extensive library of pre-programmed tests.
- Automatic test program generation.
- Automatic fault diagnosis – even for non-booting boards.
- Flash device programming.
- Convert your stockpiles of faulty boards into financial assets.
- 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.
- Open architecture – supports 3rd party instrumentation, test executives and programming languages.

WHO USES PCT?

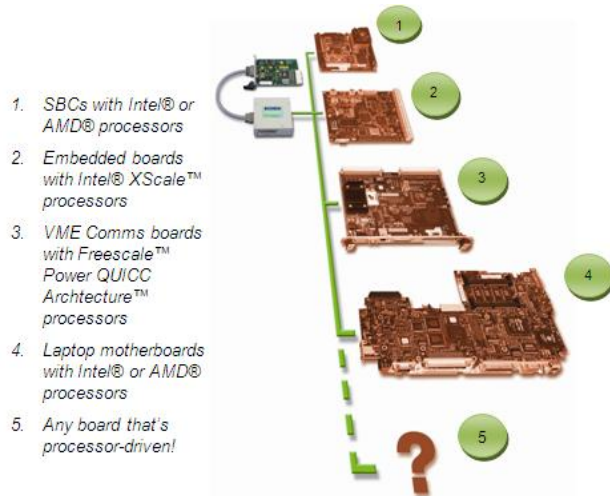
The world's leading developers and manufacturers of embedded systems, single board computers, servers, and PC's use PCT in development debug, where it can significantly reduce lead times as PCT provides control over the CPU and chip sets without the need for BIOS or boot code. They also use PCT as the solution to eliminate stockpiles of faulty boards, and to assist in the repair of manufacturing fall-out and field returns. 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

To see the Processor-Controlled Test Overview and Demonstration movies, visit:

http://www.asset-intertech.com/products_hd6.htm

ASSET InterTech, Inc.



VERY EASY OPERATION

PCT 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.

WIDE RANGE OF CPU SUPPORT

As can be seen from the diagram above, PCT 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.asset-intertech.com/products_hd5.htm

WHAT'S THE UNDERLYING TECHNOLOGY?

We go straight to the core 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 PCT in dead board debug here:

http://www.asset-intertech.com/products_dead_board_debug.htm

The diagram above shows the basic configurations required to test and diagnoses a processor board, including all I/O ports. At the top left is the PCI-200EJ controller card. The controller card 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.asset-intertech.com/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.asset-intertech.com/products_pe1.htm

Technical Specifications

Hardware

Host PC Requirements

- Platform:
 - 100% compatible IBM® PC, with a spare PCI slot
 - 1GHz CPU – 512MB Memory -600MB Disk Space
- Operating System:
 - -Microsoft® Windows® 98, 2000, XP, or Vista™.

ASSET PCI-200EJ Controller Card

- 33MHz + 5V PCI:
 - Voltages supported
 - .8v,.9v, 1.2v, 1.5v, 2.5v, 3.3v, 5.0v
 - TCK frequency supported
1MHz, 2MHz, 4MHz, 5MHz, 6MHz, 10MHz, 20MHz

Processor Control POD's

POD's are available for the following UUT processors:

- Intel®
 - Pentium® (all), Celeron® (all), Core™ (all) Xeon® (all), ATOM, Nehalem microarchitecture and XScale™ processors.
- AMD®
 - Athlon™, Duron™, Opteron™, Sempron™ and Turion™ processors.
- IBM® / Freescale™ Power Architecture™
 - Virtually the complete range (see link below).
- AMCC® processors.
 - 440, 460
- ARM7®/ ARM9® processors (and derivatives).
- Texas Instruments™ processors.

For latest supported processors see

http://www.asset-intertech.com/products_hd5.htm

UUT Test Access

- Via processor's debug port, or JTAG port, using: - manufacturer's on-board connector or an interposer.

DFT specification can for processor connectivity can be found at:

http://www.asset-intertech.com/download/app1_debug_port_design_guidelines.pdf

- 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 PCT. Support is provided for flash devices from AMD, ATMEL, Fujitsu, Intel, MACRONIX, SGS_Thompson, Sharp, Spansion, and SST.

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	SCSI	IrDA
Modem Emulator	Serial	Parallel (IEEE 1284)
LCD checker	Audio	Video checker
Ethernet LAN	USB	IEEE 1394/Firewire
Battery Emulator	IDE	General Purpose I/O
Analog/Digital	Switch card	Prototyping card

For the complete list, or for more information on any of these cards, go to:

http://www.asset-intertech.com/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

Pre-Programmed Tests

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.

Technical Specifications

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.

For a description of the hardware components please refer to the figure below.

Processor-Controlled Test
Hardware Components List



Note* Items 1 and 8 are not provided by ASSET

- 1 Control PC *
- 2 PCI-200EJ Controller
- 3 PCI to Processor POD Cable
- 4 Processor POD
- 5 I/O Emulation Unit
- 6 I/O Plug-in Cards
- 7 I/O Feedback Cable
- 8 UUT