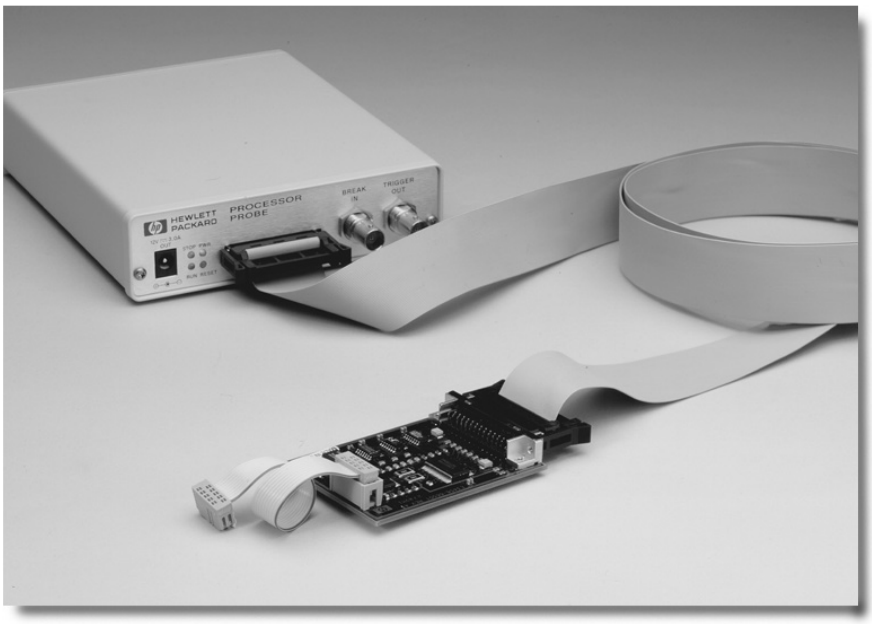
HP E3458A Processor Probe for Motorola CPU32 Microcontrollers

Product Overview

For hardware and software designers



Easy Connection To Your Target System

The processor probe controls the target microcontroller through the Motorola background debug mode (BDM) port.

The BDM technology allows you to control processor operation even if there is no software monitor on your target system. This feature is particularly helpful during the development of your target system boot code.

The HP E3458A processor probe only accesses the debug pins of the target microcontroller and affects no other signals, for a more stable operation

The HP E3458A processor probe provides in-circuit debugging for target systems using embedded Motorola CPU32 and CPU32+ microcontrollers.

The processor probe can be used by hardware designers who need to control target microcontroller operation during prototype hardware turn-on, or by software designers who need to debug code at source level.

Product Description

The HP E3458A processor probe helps you to debug your target system by providing the following capabilities :

- Microcontroller run-control (reset, run, single step, break)
- High-speed code downloading to target RAM or FLASHPROM
- Memory/registers display and modification
- Breakpoint set/modify

The HP E3458A processor probe is controlled over your local area network (LAN) or an RS-232 line.

Supported Microcontrollers

MC68330
MC68331/L331
MC68332/L332
MC68F333
MC68334
MC68335
MC68336
MC68338
MC68339
MC68340
MC68341
MC68349
MC68360/EN360/PM360
MC68370
MC68371
MC68376

The list of supported microcontrollers is subject to change. Contact your HP representative for latest information.

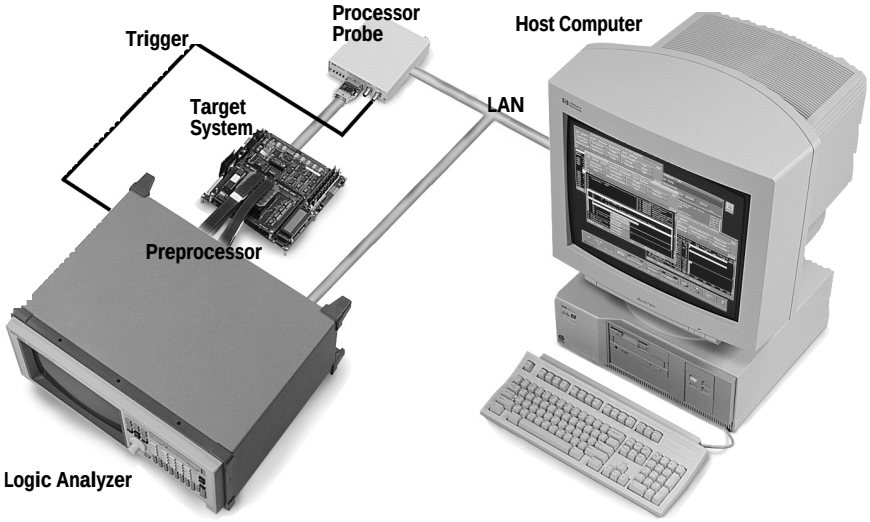


figure 2: Control and analyze in real-time your CPU32 target system with a processor probe coupled with a HP logic analyzer

Debug Solutions For The Whole Design Team

To meet the needs of your hardware and software team, the HP E3458A processor probe can be used in a variety of configurations.

Solution 1 : For software design, the processor probe can be controlled by source-level debuggers.

Solution 2 : Signal analysis and real-time trace of target code execution can be added by logic analyzers and preprocessor interfaces to the first solution for cost effective, enhanced software debug and hardware/software integration.

Solution 3: For a fully integrated environment that offers the best view into target system activity, the processor probe can be controlled directly from an HP 16505A prototype analyzer .

Software Debug Capabilities

You can control the processor probe through a third-party C or C++ debugger that is compatible with your code design or simulation environment. You do not have to relearn a new debugger |interface.

Using a debugger connected to the processor probe through the LAN, you control the target microcontroller from the familiar context of your source code. For example, you can set a breakpoint simply by pointing to a source line and clicking a mouse button. You can also access and modify high-level variables.

Supported third-party debuggers include :

- **Microtec**
- **Software Development Systems**
- **Cad UI**

Add Real-time Measurements With HP Analysis Tools

By adding a logic analyzer and a preprocessor interface to the processor probe and analyzing the microcontroller's signals you can solve real-time hardware/software integration problems.

Signal and bus analysis provided by a logic analyzer helps find the root cause of hardware problems.

To solve software defects, an HP logic analyzer, combined with the HP software analyzer tool set, offers real-time source-level visibility into target code execution.

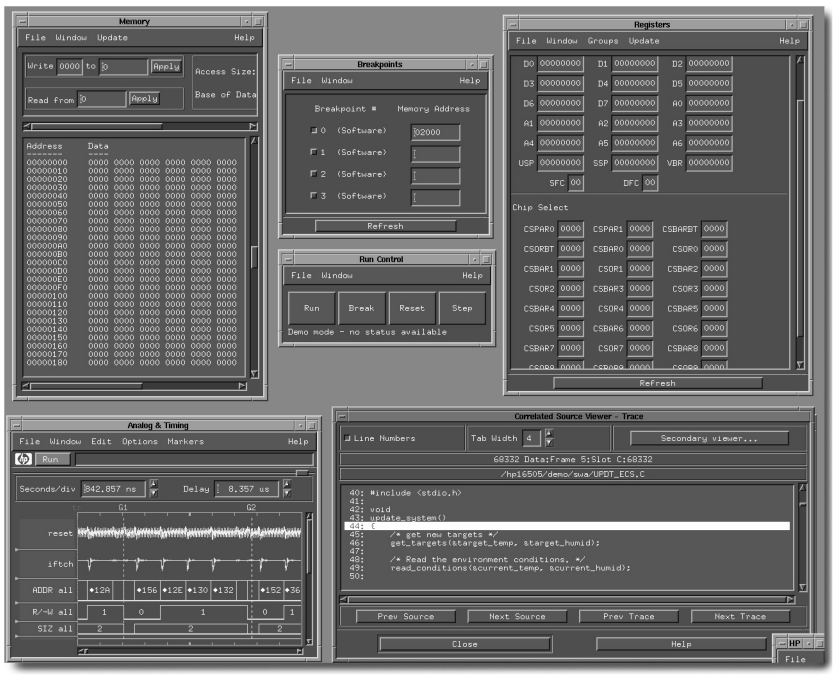
The HP E3458A processor probe can trigger or be triggered by the HP logic analyzer. This scheme offers extensive breakpoint capabilities. For example, the target microcontroller can be stopped by the HP E3458A on the following logic analyzer trigger conditions:

- Stop target system when variable equals a specific value
- Stop target system when the variable value written is out side a specified range (pointer destruction)
- Stop target system when a routine is executed before another routine
- Break after a sequence of events

Control Your Target Microprocessor From Your HP 16505A Prototype Analyzer

A graphical interface, provided with the processor probe, offers you the easiest, most intuitive way to control your target microcontroller from your HP 16505A prototype analyzer.

From the same screen, you can control and analyze at multiple levels your target prototype. You can even use this environment to debug in assembly mode the driver layers of the microprocessor's application.



Features

- Graphical interface to all processor probe features.
- Easy set-up of the microproces sor's control environment.
- Multiple breakpoint configuration - hardware, soft ware,microprocessor internal breakpoint registers.
- Ability to write command scripts to stimulate some parts of the hardware.
- Ability to use with or without a logic analyzer.

Multiprocessor Control

On a single HP 16505A prototype analyzer, you can control multiple processor probes in order to build a complete multiprocessor debug environment.

Access To Internal Registers

All microprocessor's registers can be displayed and modified. You can customize the register window by selecting which register group to display. Just click on the register's current value to modify it.

Some processors have internal breakpoint registers that can be accessed through the user interface.

Memory Display/modification

Memory can be displayed in various numeric formats, including disassembly mode for code visualization. When the processor is stopped, the assembly memory window highlights the current instruction.

Perform memory modification or memory block fill to check processor access or to reinitialize memory areas.

Command Files

If you want to analyze target signals for a specific microcontroller access or understand why a specific target failure occurs, you can write command files in order to reproduce the problem, then isolate the cause with the measurement tools integrated into the HP 16505A prototype analyzer.

Preprocessor Configuration

If you are using an HP logic analyzer coupled with an HP preprocessor interface for Motorola CPU32 microcontrollers (HP E8115A, E8116A, E8118A, E2448B, E8123A) and an HP E3458A processor probe, the graphical interface offers you an easy way to configure the preprocessor for address reconstruction.

Address reconstruction allows you to trace the target code execution at the source level even if some address bus pins are used for other purposes (e.g. Chip Select) . In this mode, the preprocessor reconstructs the complete address bus in real-time, increasing trace readability.

Platforms And Networks

Remotely access the processor probe graphical user interface from workstations, X-Terminals or PCs running X11 emulation software. You can also use an SVGA monitor to locally control and view the measurements at your lab bench. Use your design tools via the standard network capabilities of the HP 16505A prototype analyzer, including FTP, NFS, Telnet and X-windows client/server.

Physical Connection

Access to the target system is made through the Motorola standard 8- or 10 pin connector. If your target system does not incorporate the connector, you can access the BDM pins on the microcontroller directly using the flying lead probes that are provided.
To improve accessibility to the target microcontroller, the cable between the HP E3458A processor probe and the target microcontroller is three feet long. This cable is terminated by a TIM (Target Interface Module) for signal adaptation.

You don't need to design a specific debug connector on your target system for the HP E3458A processor probe if you are using an HP logic analyzer coupled with a Motorola CPU32 preprocessor interface (HP E8115A, E8116A, E8118A, E2448B, E8123A). The processor probe can be connected directly to the preprocessor.

Specifications

Voltages	
	Both 3.3 V and 5 are supported
Download Rate	
	Four megabytes per minute when the target is running at full speed.
FlashProgramming	
	The HP E3458A processor probe can program your target system flash during product development or manufacturing. There is no size limitation on the flash image because the software probe copies the image directly from the host computer to your target system.
	AMD 12V Embedded
	AMD 5V Embedded
	AMD Flashwrite
	Intel Auto
	Intel Quickpulse
Electrical Loading on Target System	
Pin 1,2,4,6,7,8,9,10	
	:40pF, 7.5K to Vdd
Pin 9	Idd<10mA at 5V
RS-232	
	1200 through 115200 baud rate supported
Physical	
	155 mm Width x 161mm Depth x 65 mm Height
Temperature	
	Operating 0dC to +55dC (+32dF to +131dF)
	Non operating - 40 dC to + 70dC (-40dF to +158 dF)
Altitude	
	Operating 4600m (15000Ft)
	Non operating 15300m (50000 Ft)
Humidity	
	15% to 95% Relative
Safety Approvals	
	IEC1010-1:1990
	AMD 1:1992
	UL 1244
	CSA-C22.2 No 231
	(series M-89)

Ordering information

HP E3458A	The HP E3458A processor probe
#AAV	Sun SPARC station media and documentation for connection with Masterworks (does not include Masterworks)
#AAY	HP 9000 series 700 station media and documentation for connection with Masterworks (does not include Masterworks)

Warranty Information

This Hewlett-Packard product has a warranty against defects in material and workmanship for a period of one year from date of shipment. During this warranty period, Hewlett-Packard Company will, at its option, either repair or replace products that prove to be defective.

Related HP Literature

HP E8115A/16A/18A Motorola CPU32 Microntrollers Preprocessor Interface,
5965-5904E

HP E2448B Motorola 68360 preprocessor interface,
5965-7443E

HP16500C Logic Analysis System - HP16505A Prototype Analyzer,
5965-3187E

The HP B4620A Software Analyzer Tool Set,
5964-9333E

The HP B3740A Software Analyzer,
5962-7114E

For more information about Hewlett-Packard test & measurement products, applications, services, and for a current sales office listing, visit our web sites,

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You can also contact one of the following centers and ask for a test and measurement sales representative.

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