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The HP MultiProbe System

HP 16535A
HP E5320A
HP E5321A
HP E5322A

Configuration Guide

**For use with the
HP 16500B Logic
Analysis System**

The HP MultiProbe system makes it possible to connect scope probes to hundreds of nodes simultaneously, then select any two signals at a time for scope acquisition and viewing, without having to move scope probes. The HP MultiProbe system is part of HP's 16500B logic analysis system, so you have all the tools you need to solve difficult problems in complex digital hardware.

This document gives you the information you need to order an HP MultiProbe system.

An HP MultiProbe system consists of:

- One or more HP MultiProbe pods (up to four pods can be connected at once)
- An HP 16535A MultiProbe control module
- An HP 16500B logic analysis main-frame
- An oscilloscope
- An HP 16505A prototype analyzer (optional)

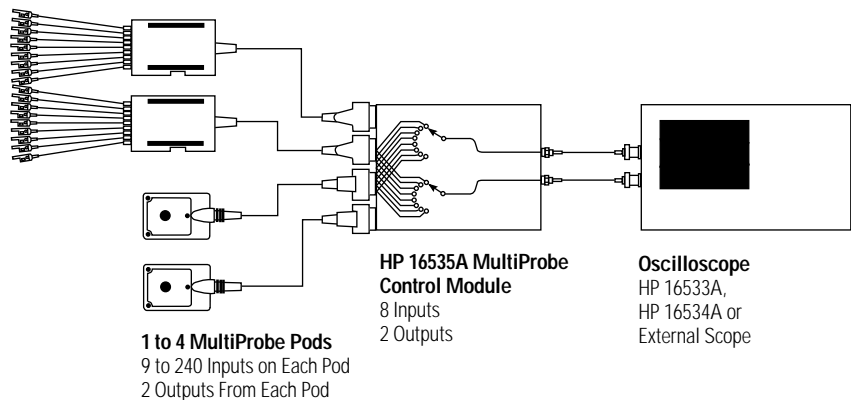


Figure 1.
HP MultiProbe system block diagram.

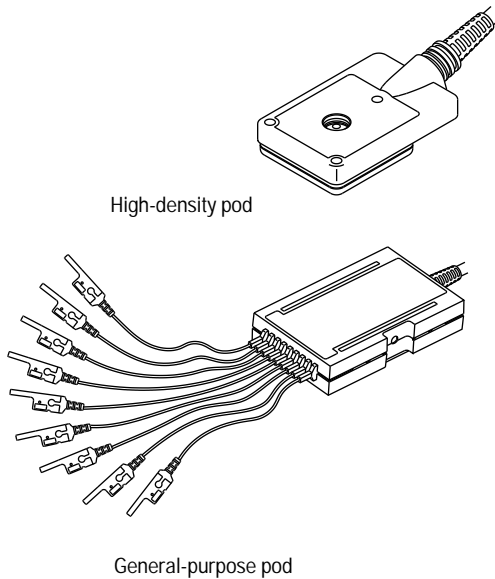


Figure 2.
HP MultiProbe pods

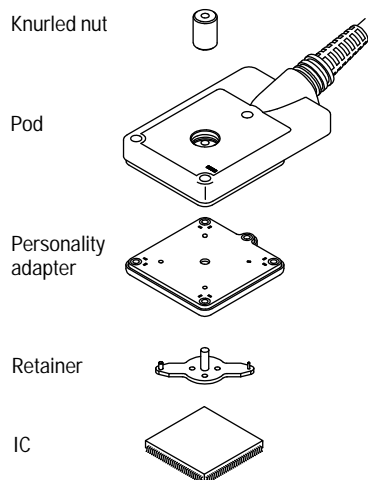


Figure 3.
HP MultiProbe
high-density pod
components

MultiProbe Pods

HP MultiProbe pods are available in two styles:

- High-density pods, which connect to all leads of an IC
- A general-purpose pod with nine flying-lead inputs, HP E5320A

Configuring an HP MultiProbe High-density Pod

HP MultiProbe high-density pod components

An HP MultiProbe high-density pod requires the following items:

- **The pod.**
Choose the correct pod from the accompanying tables.
- **A personality adapter.**
The personality adapter adapts the pod to the specific IC package. The personality adapter allows you to select which pins to use to connect the pod ground to grounded pins on the IC. You will need a different personality adapter for each IC that has ground on different pins. You will program the grounds in the personality adapter after you receive it, by blowing fuses. When you receive the personality adapter, all inputs are connected to the pod ground by fuses. Personality adapters are listed in table 2.

- **A retainer.**
Retainers are available in kits of five retainers, two knurled nuts, and one tube of glue. The retainer is glued to the top of the IC. Retainers can be removed but cannot be reused. Retainer kits are listed in table 3.

- **A locator tool.**

A locator tool is required to install the retainer. The locator tool is specific to the IC package type. The locator tool can be used as many times as desired. Locator tools are listed in table 5.

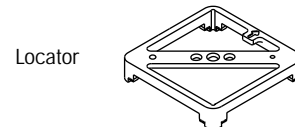


Figure 4. Locator tool

- **A calibration fixture.**

A calibration fixture is available for each pod. The calibration fixture is used for the following tasks:

- To perform self-calibration on the MultiProbe pod
- To program the ground connections on the personality adapter
- To verify that the proper pins were grounded in the personality adapter
- To check the pod and personality adapter for connectivity (shorts and opens)

A calibration fixture is included with the personality adapter kit for first-time use, options 001 and 002 (table 1). Additional calibration fixtures are available as part of the calibration kit, option 301.

(Note that there is no calibration kit, option 301, for 160-pin use, because the HP E5322A pod, which is used for 160-pin and 208-pin ICs, has 208 inputs.)

First-Time Use

For first-time use of an HP MultiProbe pod, refer to table 1.

The kits listed in table 1 include a personality adapter, a retainer kit, a locator tool, and a calibration fixture.

Personality adapters

To use the same HP MultiProbe pod on additional ICs of the same package style (number of pins and pin spacing) but have different pins grounded, order a personality adapter from table 2.

Retainer kits

To prepare additional ICs to attach HP MultiProbe pods, order a retainer kit from table 3.

Each retainer kit listed in table 3 includes five retainers, two knurled nuts, and one tube of glue.

Calibration kits

To calibrate every input of an HP MultiProbe pod, order a calibration kit, option 301.

The calibration kit contains:

- One calibration adapter.
A calibration adapter is similar to a personality adapter, but with no grounded inputs. This allows a signal to be injected into every input of the pod.
- One calibration fixture.

Locator tools

Additional locator tools may be ordered as needed. Select the desired locator tool from table 4.

For IC package style		Order
Number of pins	Pin Spacing	
160	0.65 mm	HP E5322A option 002
208	0.5 mm	HP E5322A option 001
240	0.5 mm	HP E5321A option 001

Table 1 Pods and personality adapter kits for first-time use

For IC package style		Order personality adapter
Number of pins	Pin Spacing	
160	0.65 mm	HP E5322A option 102
208	0.5 mm	HP E5322A option 101
240	0.5 mm	HP E5321A option 101

Table 2 Personality adapters

For IC package style		Order retainer kit
Number of pins	Pin Spacing	
160	0.65 mm	HP E5322A option 201
208	0.5 mm	HP E5322A option 201
240	0.5 mm	HP E5321A option 201

Table 3 Retainer kits

For IC package style		Order locator tool
Number of pins	Pin Spacing	
160	0.65 mm	HP E5322A option 203
208	0.5 mm	HP E5322A option 202
240	0.5 mm	HP E5321A option 202

Table 4 Locator tools

To change from	To	Order adapter kit
160-pin, 0.65-mm QFP	208-pin, 0.5-mm QFP	HP E5322A option 001
208-pin, 0.5-mm QFP	160-pin, 0.65-mm QFP	HP E5322A option 002

Table 5 Adapter kits to convert E5322A to different package styles

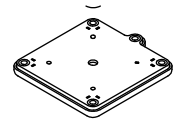


Figure 5. Personality adapter



Figure 6. Retainer

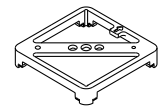


Figure 7. Locator tool

Converting from 208-pin to 160-pin or vice versa

If you already have an HP E5322A MultiProbe pod which is configured for 160-pin, 0.65-mm QFPs (option 002), you can use it on a 208-pin, 0.5-mm QFP by ordering the appropriate adapter kit from table 5.

If you already have an HP E5322A MultiProbe pod which is configured for 208-pin, 0.5-mm QFPs (option 001), you can use it on a 160-pin, 0.65-mm QFP by ordering the appropriate adapter kit from table 5.

Each kit in table 5 contains a personality adapter, a retainer kit, a locator tool, and a calibration fixture.

General-Purpose MultiProbe Pod, HP E5320A

The HP E5320A general-purpose pod has nine flying lead scope probes. It comes with a variety of accessories for attachment to surface-mount devices and test points.

- A flexible ground pin that can be used for hand-held probing
- Four signal probe pins that can be used for hand-held probing
- 10 ground extenders to connect the probe tips to 0.025" square pins on 0.1-inch centers
- Short, solderable wires that can be used to connect the probe tips to signal and ground on any solderable surface (10 signal and 10 ground leads included)
- 10 pin-and-socket ground extender leads

The accessories can be deleted by ordering option 001.

The HP E5320A is provided with a calibration fixture, which is used to calibrate the pod. To delete the calibration fixture, order option 002.

Surface mount grabbers can be ordered separately by ordering HP part number 16517-82108 (20 grabbers included). Grabbers are not recommended for signals with a rise time faster than ~2ns.

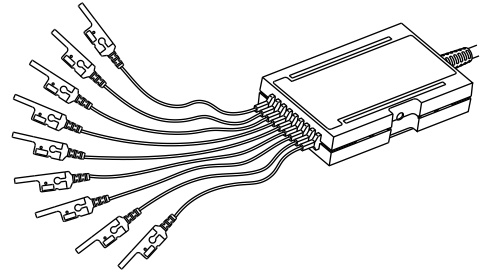


Figure 8.
The HP E5320A
general-purpose pod

Control Module

The HP 16535A two-output MultiProbe control module performs the following functions:

- Provides power and control to the MultiProbe pods
- Selects any two signals from any of the pods to apply to the oscilloscope
- Provides the user interface for the MultiProbe system on the HP 16500B screen

Each control module accepts up to four pods and has two outputs which must be connected to the oscilloscope. The control module includes SMA-BNC cables, which are used to connect its outputs to the inputs of the oscilloscope.

One control module is required. Multiple control modules can be used when more than four MultiProbe pods are needed, or when more than two scope channels are desired. When using the HP 16533A or 16534A oscilloscope module, the control module and its associated scope module must be in the same HP 16500B mainframe or HP 16501 expander frame.

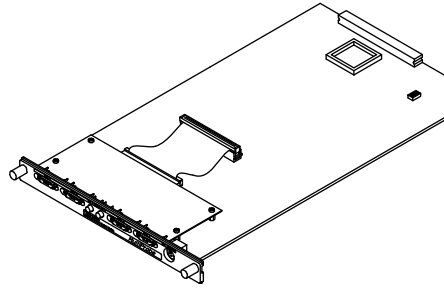
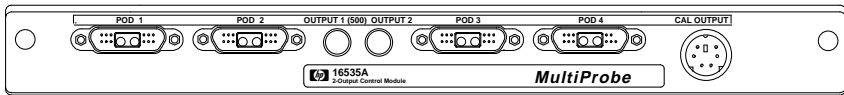


Figure 9.
Control module



Oscilloscope

The HP MultiProbe system can be used with any oscilloscope. When the HP 16533A or 16534A oscilloscope module is used with an HP MultiProbe system in the same HP 16500B mainframe:

- The user interface for the MultiProbe channel input selection is integrated into the oscilloscope user interface on the HP 16500B screen.
- The calibration factors for the MultiProbe system are automatically applied in the oscilloscope.

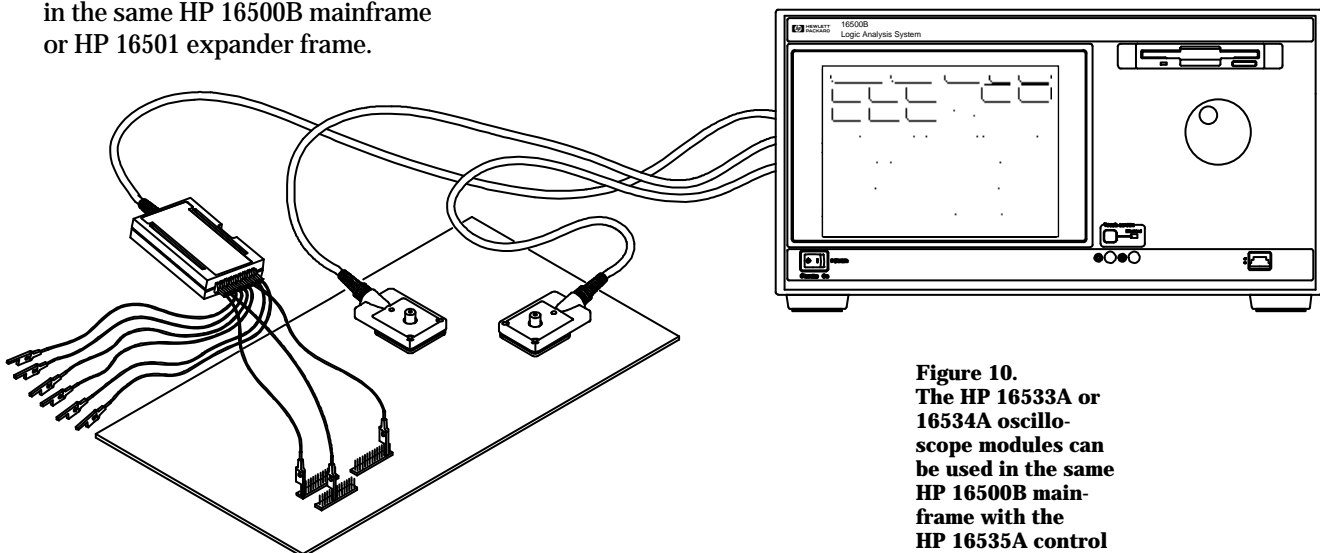


Figure 10.
The HP 16533A or 16534A oscilloscope modules can be used in the same HP 16500B mainframe with the HP 16535A control module.

Worksheet for Ordering HP MultiProbe System Components

Pods, as Needed. Up to Four Pods Can be Connected at One Time.

9-to-2, general-purpose MultiProbe pod	HP E5320A
Has nine miniature scope-probe flying-lead inputs	
Delete accessories.....	Option 001
Delete calibration fixture.....	Option 002
240-to-2 high-density MultiProbe pod	HP E5321A
240-pin QFP personality adapter kit.....Option 001	
240-pin personality adapter	
Retainer kit	
Locator tool	
Calibration adapter	
Calibration fixture	
240-pin QFP personality adapter	Option 101
Retainer kit for 240-pin QFP.....Option 201	
Five retainers	
Two knurled nuts	
One tube of glue	
Locator tool	Option 202
Calibration kit.....Option 301	
Calibration adapter	
Calibration fixture	
208-to-2 high-density MultiProbe pod	HP E5322A
208-pin QFP personality adapter kit.....Option 001	
208-pin personality adapter	
Retainer kit	
Locator tool	
Calibration adapter	
Calibration fixture	
208-pin personality adapter.....	Option 101
160-pin personality adapter kit.....Option 002	
160-pin personality adapter	
Retainer kit	
Locator tool	
Calibration fixture	
160-pin personality adapter.....	Option 102
Retainer kit for both 160-pin and 208-pin QFPs.....Option 201	
Five retainers	
Two knurled nuts	
One tube of glue	
208-pin QFP locator tool.....	Option 202
160-pin QFP locator tool.....	Option 203
Calibration kit.....Option 301	
Calibration adapter	
Calibration fixture	

Control module , one required	
HP Two-output MultiProbe control module	HP 16535A
Oscilloscope , one required	
2-GSa/s, 500-MHz oscilloscope module for HP 16500B	HP 16534A
1-GSa/s, 250-MHz oscilloscope module for HP 16500B	HP 16533A
Any other oscilloscope can be used with the HP MultiProbe system.	
Logic analyzer mainframe , one required	HP 16500B
Prototype analyzer , optional.....	HP 16505A

For more information, see the following HP publications:

Description	HP Publication Number
<i>The HP MultiProbe System</i> brochure.....	5964-0239E
<i>The HP MultiProbe System</i> technical specifications	5964-0237E
<i>1 Gigasample/second and 2 Gigasample/second Oscilloscope Modules for the HP 16500B Logic Analysis System</i> HP 16533A and 16534A product overview	5964-0238E
<i>The HP 16500B Logic Analysis System</i> brochure	5963-2118E
<i>The HP 16505A Prototype Analyzer</i> brochure.....	5963-1857E

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