

**FuturePlus Systems Corporation**



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# **PCI Scope Preprocessor Users Manual-FSPCI64S**

**For Hewlett-Packard Logic Analysis Systems**

**Revision 1.0**

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# Introduction

The PCI Scope Preprocessor module provides a complete interface between any PCI add-in slot and the HP MultiProbe system. The Preprocessor interface connects the signals from the PCI Local bus to the inputs of a 208 PQFP package used as the MultiProbe connection point.

The PCI Scope Preprocessor is a passive bus monitor which does not assert any signals on the PCI bus. The PCI bus signals are terminated with 10pf terminators at the maximum allowed stub length so that they provide the worst case PCI load. Since the PCI Scope Preprocessor does not actively buffer the PCI bus signals no skew is introduced.

The MultiProbe configuration software on the diskette sets up the MultiProbe control module for analog analysis of the PCI Local Bus.

This manual is organized to help you quickly find the information you need.

## How to Use This Manual

- The **Analyzing the PCI Local Bus** chapter introduces you to the PCI Scope Preprocessor and lists the minimum equipment required and accessories supplied for PCI bus analysis.
- The **Analog Analysis** chapter explains how to configure the PCI Scope Preprocessor to perform analog analysis on your PCI bus.
- The **General Information** chapter provides some general information including the operating characteristics for the PCI Scope Preprocessor module and the pinout.

# Analyzing the PCI Local Bus

This chapter introduces you to the PCI Scope Preprocessor and lists the minimum equipment required and accessories supplied for PCI Local Bus analysis.

## Duplicating the Master Diskette

Before you use the PCI Preprocessor software, make a duplicate copy of the master diskette. Then store the master diskette and use the back-up copy to configure your logic analysis system. This will help prevent the possibility of losing or destroying the original files in the event the diskette wears out, is damaged, or a file is accidentally deleted.

To make a duplicate copy, use the Duplicate Diskette operation in the disk menu of your logic analyzer. For more information, refer to the reference manual for the HP16500B mainframe.

## Accessories Supplied

The PCI Scope Preprocessor product consists of the following accessories:

- The PCI Scope interface hardware, which includes the interface circuit module.
- The MultiProbe configuration software on a 3.5 inch diskette.
- This operating manual

## Minimum Equipment Required

The minimum equipment required for complete analysis of a PCI Local Bus consists of the following equipment:

- An HP16500B based Logic Analyzer
- An HP 16535A MultiProbe Control Module
- A 208 pin MultiProbe Pod (HP part number E5322A)



- An Oscilloscope
- The PCI Scope Preprocessor Product
- A PCI target bus

## Signal Naming Conventions

This operating manual uses the same signal notation as the PCI LOCAL BUS SPECIFICATION - REVISION 2.1. That is, a # symbol at the end of a signal name indicates that the signal's active state occurs when it is at a low voltage. The absence of a # symbol indicates that the signal is active at a high voltage.

## Connecting the 208 pin MultiProbe Pod to the PCI Scope Preprocessor

To use the MultiProbe Pod two steps are necessary:

1. Install the PCI Scope Personality adapter option 101 to the 208 pin MultiProbe pod. For information on how to configure the personality adapter from a blank personality adapter using the calibration fixture refer to the chapter on Analog Analysis in this users manual.

*Do not touch the contact are on the MultiProbe Pod conductive elastomer, which is on the bottom of the probe adapter. If foreign material sticks to the contact area remove it using adhesive tape.*

2. Align the 208 Pin MultiProbe Pod with the retainer that is mounted on the top of the 208 pin package that is on the PCI Scope Preprocessor. Attach the pod tightly using the knurled nut. *The pod will not lie flat against the board.*

## Installing the PCI Scope Preprocessor

The PCI Scope Preprocessor can be installed in any slot of the PCI Local bus.

1. Install the MultiProbe pod as described in the previous section.
2. Align the PCI module with the appropriate slot on the target system and plug the module into the PCI connector.

If your PCI Local bus is 32 bits the upper portion of the edge connector will not be inserted into any connector. This will not affect the modules operation on a 32-bit PCI Local bus.

## Setting up the MultiProbe control card for PCI Analysis

The PCI Scope Preprocessor comes with MultiProbe compatible configuration files that assigns all the PCI signals to their proper pins. To load the files:

1. Install the PCI Scope Preprocessor software diskette in the HP16500B mainframe floppy drive
2. If you have not already done so create the directory MULTIPRB on your hard disk and copy the files

PCI\_MUL.DUT and PCI.ADP from your PCI Scope Preprocessor diskette to that directory.

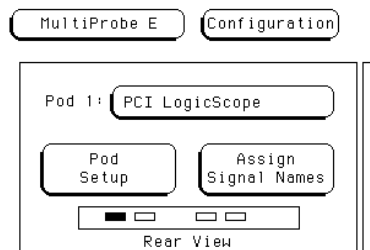
3. Access the configuration menu of the MultiProbe Control card.
4. Select POD setup for the POD that will be connected to the Scope Preprocessor.
5. On the next menu select #2 *Specify POD adapter* and then select the file PCI.ADP and select *proceed*.
6. Return to the MultiProbe Configuration menu and Select *Assign Signal Names*
7. From the File selection menu select the MULTIPRB directory on the hard disk.
6. Select the field next to File.

Select the file PCI\_MUL.DUT

7. Load the file

With PCI\_MUL displayed in the File field, select *Load File*.

Once you have completed loading these two files the PCI Scope Preprocessor is ready for PCI analog analysis and the configured POD in the MultiProbe configuration menu will appear as below



For further information on the operation of the MultiProbe Control Card refer to the HP 16535A MultiProbe Users Guide.

### **Connecting the MultiProbe Control Card to an Oscilloscope**

The operation of the PCI Scope Preprocessor is independent of the Oscilloscope that is attached to the MultiProbe Control Card. Refer to the HP 16535A MultiProbe Control Users Guide for information on how to attach to the Oscilloscope.

# Analog Analysis

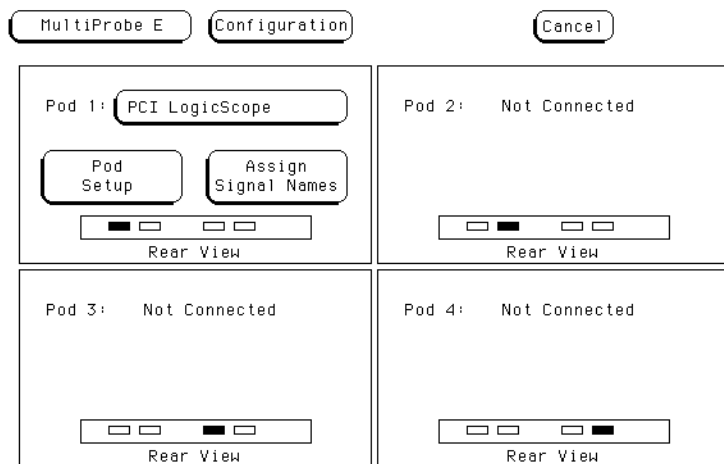
## Installation Quick Reference

Since the PCI Scope Preprocessor interface contains only passive matching terminators it introduces negligible skew to the PCI Local Bus signals.

The following procedure describes the major steps required to perform analog analysis measurements with the PCI Scope Preprocessor module.

1. Install the PCI Scope Preprocessor module into a slot in the target PCI Local bus.
2. Load the PCI MultiProbe configuration file `PCI_MUL.DUT` from the `MULTIPRB` directory on the hard disk. See page 9 for details on how to load this file.

Once the file is loaded the POD that is connected to the PCI Scope Preprocessor will be assigned the name `PCI LogicScope` as shown below



## Selecting the PCI signals to acquire

Select the oscilloscope for each MultiProbe output using the Select Signals menu of the MultiProbe control module.

1. Access the Select Signals menu.
2. Select the scope for each output

**a) Choose the output (Output 1 or Output 2) of the control module that is connected to the pod that is attached to the PCI Scope Preprocessor.**

In the Select Signal menu, select the Output field to choose Output 1 or Output 2 of the control module. For example, Output D1 would be output 1 from the control module in slot D.

**b) Select the scope that you will use.**

In the Select Signal menu, select the scope field, then choose the scope. You are selecting the scope that is connected to the outputs that you chose in the previous step.

3. Select the PCI signal for each output.

**a) Access the menu.**

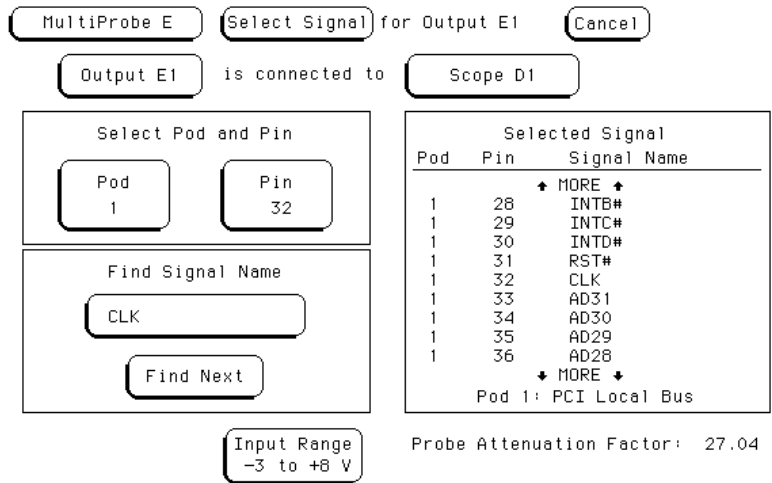
If you are using an HP1634A Oscilloscope, you can select signals in either the MultiProbe menu or the Scope menu. Using the Scope menu means that you do not need to change back to the MultiProbe menu every time you want to choose a different signal. If you are using any other scope access the MultiProbe Select Signal menu.

**b) Select the signals in one of the following ways:**

- Choose the PCI LogicScope Pod and the pin number of the PCI signal that you wish to see. Select the Pin Field, then use the keypad.
- Choose the PCI LogicScope Pod and pin number of the PCI signal. With the Pin field highlighted, use the knob (HP16500B mainframe only) to scroll through the Selected Signal list.
- Go directly to a signal name.

Select the Find Signal Name field, use the keypad to insert the signal name, then select Done to close the keypad. Select Find Next.

The below picture shows the Select Signal menu after loading the PCI\_MUL file into the MultiProbe Control module.



## Acquiring signals with an Oscilloscope

Using an HP16534A oscilloscope

If you are using an HP 16534A oscilloscope, then follow this procedure.

### 1. Access the oscilloscope menus.

To view your measurements with an HP16534A oscilloscope, you need to exit the MultiProbe Control menus, then enter the oscilloscope menus. Select the MultiProbe field, then select the oscilloscope module.

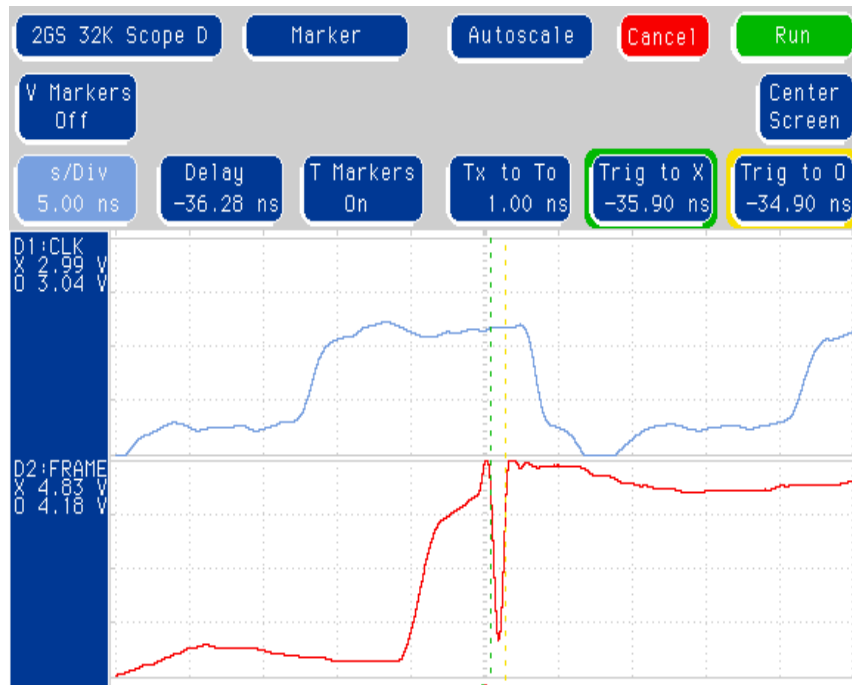
### 2. Use the oscilloscope controls to run and adjust the measurement.

If you need help, refer to the documentation on your oscilloscope.

### 3. Select new signals.

You can select signals from the oscilloscope Select Signals field, the oscilloscope Scroll Signal field, or the MultiProbe Select Signal menu. Selecting signals from the oscilloscope menus is possible only with the HP16534A Oscilloscope.

A scope picture taken with the PCI Scope Preprocessor of a glitch with FRAME# and the PCI clock appears below.



## The PCI Personality Adapter option 101

When the PCI Personality Adapter 101 is not in use, keep it in its original container. The file PCI.ADP matches the configuration of the PCI Personality Adapter and configures the MultiProbe for PCI Analysis. If you wish to configure your own Personality adapter follow the instructions for **Programming the ground connections** in your 208 MultiProbe High-Density Pod Installation guide and program all the even numbered connections to ground.

# General Information

This chapter provides additional reference information including the characteristics and signal connections for the PCI Scope Preprocessor module.

## **Characteristics**

The following operating characteristics are not specifications, but are typical operating characteristics for the PCI Scope Preprocessor module.

### ***Preprocessor Interface Compatibility***

32/64 bit PCI Local bus accepting the short card length and universal connector pinout. All PCI local bus ground pins of the universal board pinout are connected to the ground plane of the PCI Scope Preprocessor module.

### ***JTAG Boundary Scan***

The PCI Scope Preprocessor does not implement JTAG Boundary SCAN. Pins TDI and TBO (pins 4a and 4b) are connected together so the scan chain is not broken.

### ***The PCI Present Pins***

No connection is made to the PCI signals PRSNT1# and PRSNT2#.

### ***Standards Supported***

The PCI Local Bus Specification Revision 2.1

### ***Power Requirements***

The PCI Scope Preprocessor contains no active components and therefore requires no power.

### ***MultiProbe Pods required***

The PCI Scope Preprocessor requires one 208 pin MultiProbe Pod with the option 101 personality adapter.

### ***Signal loading***

Per the PCI Local Bus Specification the PCI Scope Preprocessor presents only one electrical load on each PCI bus signal. The PCI Scope Preprocessor is designed to present a worst case load (10pf) at the maximum stub length. For

information on the electrical loading of the MultiProbe Pod refer to your Hewlett-Packard MultiProbe specification.

***Operations***

All PCI Local Bus operations supported.

***Environmental  
Temperature***

Operating: 0 to 55 degrees C (+32 to +131 degrees F)

Non operating: -40 to +75 degrees C (-40 to +167 degrees F)

***Altitude***

Operating: 4,600m (15,000 ft)

Non operating: 15,300m (50,000 ft)

***Humidity***

Up to 90% non condensing. Avoid sudden, extreme temperature changes which would cause condensation on the preprocessor module.

***Testing and  
Troubleshooting***

There are no automatic performance tests or adjustments for the PCI Scope Preprocessor module. If a failure is suspected in the PCI Scope Preprocessor module contact the factory or your FuturePlus Systems authorized distributor.

***Servicing***

The repair strategy for the PCI Scope Preprocessor is module replacement. However, if parts of the PCI Scope Preprocessor module are damaged or lost contact the factory for a list of replacement parts.



## Signal Connections for the MultiProbe POD

The below table shows the connection from the PCI Local Bus to the PQFP package that acts as the MultiProbe Contact point.

If the pin is not listed it is Grounded.

PCI Signal	PQFP pin
AD50	1
AD51	3
AD52	5
AD53	7
AD54	9
AD55	11
AD56	13
AD57	15
AD58	17
AD59	19
AD60	21
AD61	23
AD62	25
AD63	27
INTA#	53
INTB#	55
INTC#	57
INTD#	59
RST#	61
CLK	63
AD31	65
AD30	67
AD29	69
AD28	71
AD27	73

AD26	75
AD25	77
AD24	79
C/BE3#	81
AD23	83
AD22	85
AD21	87
AD20	89
AD19	91
AD18	93
AD17	95
AD16	97
C/BE2#	99
FRAME#	101
IRDY#	103
TRDY#	105
DEVSEL#	107
STOP#	109
LOCK#	111
SDONE	113
PERR#	115
SBO#	117
SERR#	119
PAR	121
C/BE1#	123
AD15	125
AD14	127
AD13	129
AD12	131
AD11	133
AD10	135

AD09	137
C/BE0#	139
AD08	141
AD07	143
AD06	145
AD05	147
AD04	149
AD03	151
AD02	153
AD01	155
AD00	157
ACK64#	159
REQ64#	161
C/BE7#	163
C/BE6#	165
C/BE5#	167
C/BE4#	169
PAR64	171
AD32	173
AD33	175
AD34	177
AD35	179
AD36	181
AD37	183
AD38	185
AD39	187
AD40	189
AD41	191
AD42	193
AD43	195
AD44	197

AD45	199
AD46	201
AD47	203
AD48	205
AD49	207