User's Guide

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For Safety information, Warranties, and Regulatory information, see the pages behind the index.

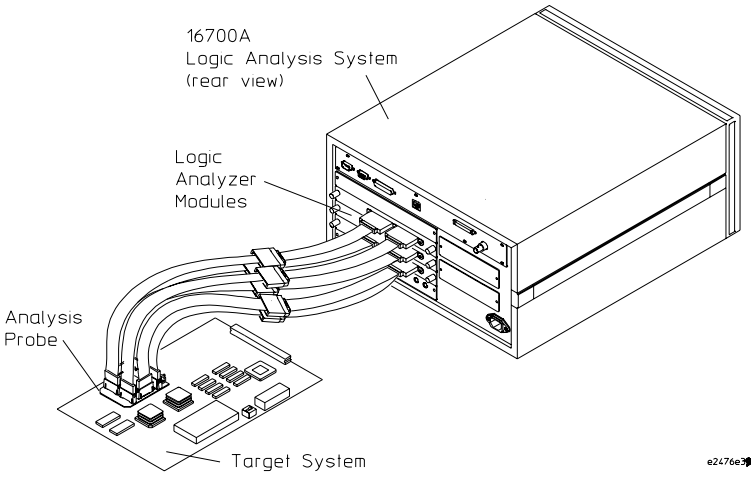
Solutions for the Toshiba TMPR3904

Solutions for the Toshiba TMPR3904—At a Glance

This manual describes several ways to connect an Agilent Technologies logic analysis system to your target system. These connections use an analysis probe (or custom probing), plus an emulation module (for an emulation solution).

Analysis Probe

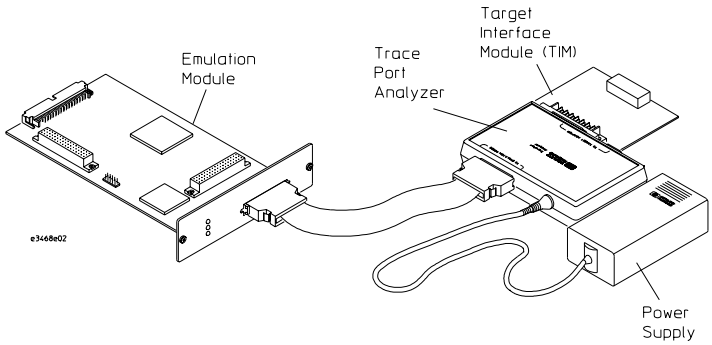
The analysis probe connects your logic analyzer to your target system for state and timing analysis. The analysis probe can be used with an Agilent Technologies 16600A/700A-series logic analysis system. The analysis probe can be purchased alone, or as part of an emulation solution.



If your target system has the appropriate connectors, you can connect the logic analyzer directly to the target system and use the emulation solution user interface software without the analysis probe.

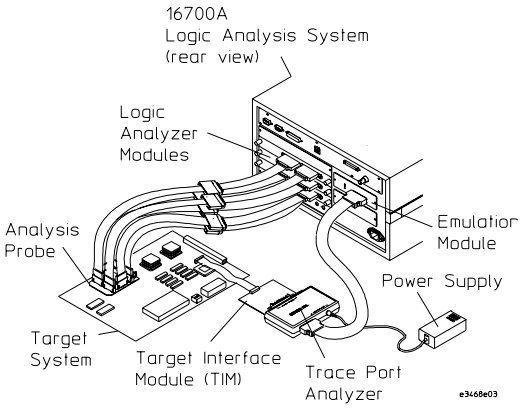
Emulation Module

The emulation module plugs into your Agilent Technologies 16600A/700A-series logic analysis system frame. The emulation modules lets you use the target processor's built-in background debugging features, including run control and access to registers and memory. A high-level source debugger can use the emulation module to debug code running on the target system. You can connect the emulation module to the analysis probe or you can connect it to a debug port on the target system through the provided target interface module (TIM)...



Emulation Solution

The emulation solution includes an analysis probe, an emulation module, a trace port analyzer, cables and adapters, and the Agilent Technologies B3759A Emulation Solution User interface software (For analyzing high-level code). This solution is designed to be used with an Agilent Technologies 16600A/ 700A-series logic analysis system.



Note Trace Port Analyzer (E5903A#800) must be used with Emulation Module.

In This Book

This book documents the following products:

Analysis Probe		
Processors supported	Agilent Technologies **Product ordered**	**Includes**
TMPR 3904	E9600A	E8026A QFP analysis probe and E5346A high density adaptor cables

Emulation Solution		
Processors supported	Agilent Technologies **Product ordered**	**Includes**
TMPR 3904	E9500A	E8026A QFP analysis probe, 16610A emulation module, E3468A target interface module (TIM), E5890A Trace Port Analyzer, B3759A #800 Emulation Solution User Interface

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1

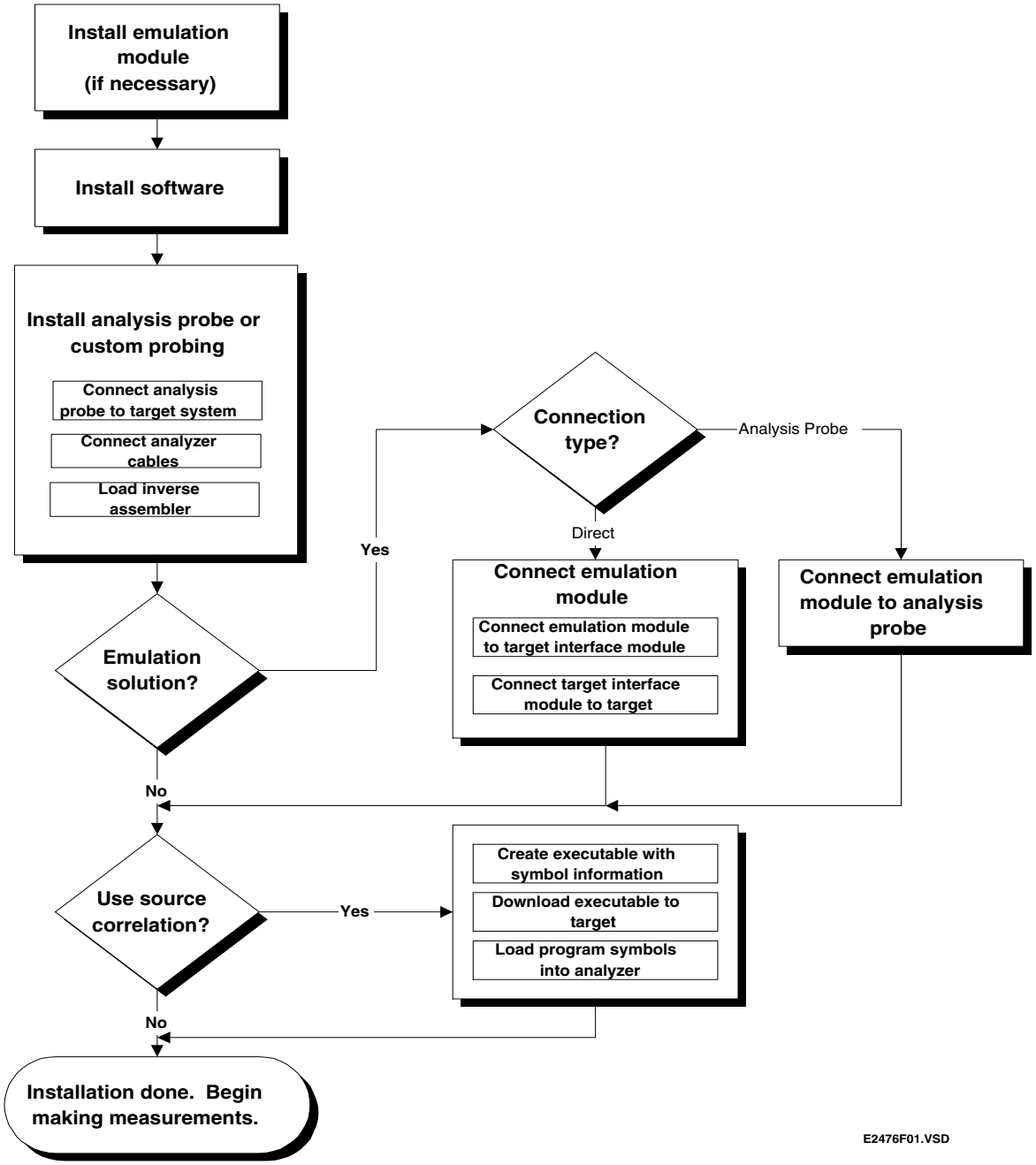
Overview

Overview

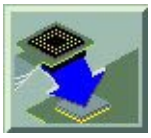
This chapter describes:

- Setup Checklist
- Equipment used with the analysis probe
- Equipment used with the emulation module
- Equipment used with the trace port analyzer
- Additional information sources

Setup Flowchart



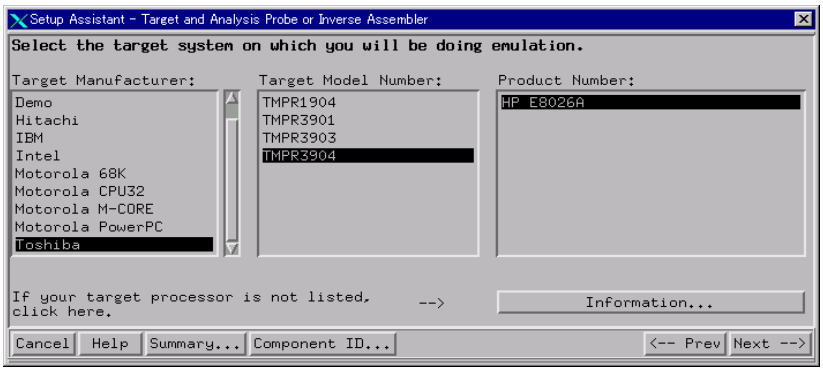
Setup Assistant



The Setup Assistant is an online tool for connecting and configuring your logic analysis system for microprocessor and bus analysis. The Setup Assistant is available on the Agilent Technologies 16600A and 16700A-series logic analysis systems. You can use the Setup Assistant in place of the connection and configuration procedures provided in this manual.

This menu-driven tool will guide you through the connection procedures for connecting the logic analyzer to an Analysis Probe, an emulation module, or other supported equipment. It will also guide you through connecting an Analysis Probeto the target system.

Start the Setup Assistant by clicking its icon in the system window.



If you ordered this Analysis Probe or emulation solution with your Agilent Technologies 16600A/700A-series logic analysis system, the logic analysis system has the latest software installed, including support for this product. If you received this product after you received your logic analysis system, see the "Installing Software" chapter.

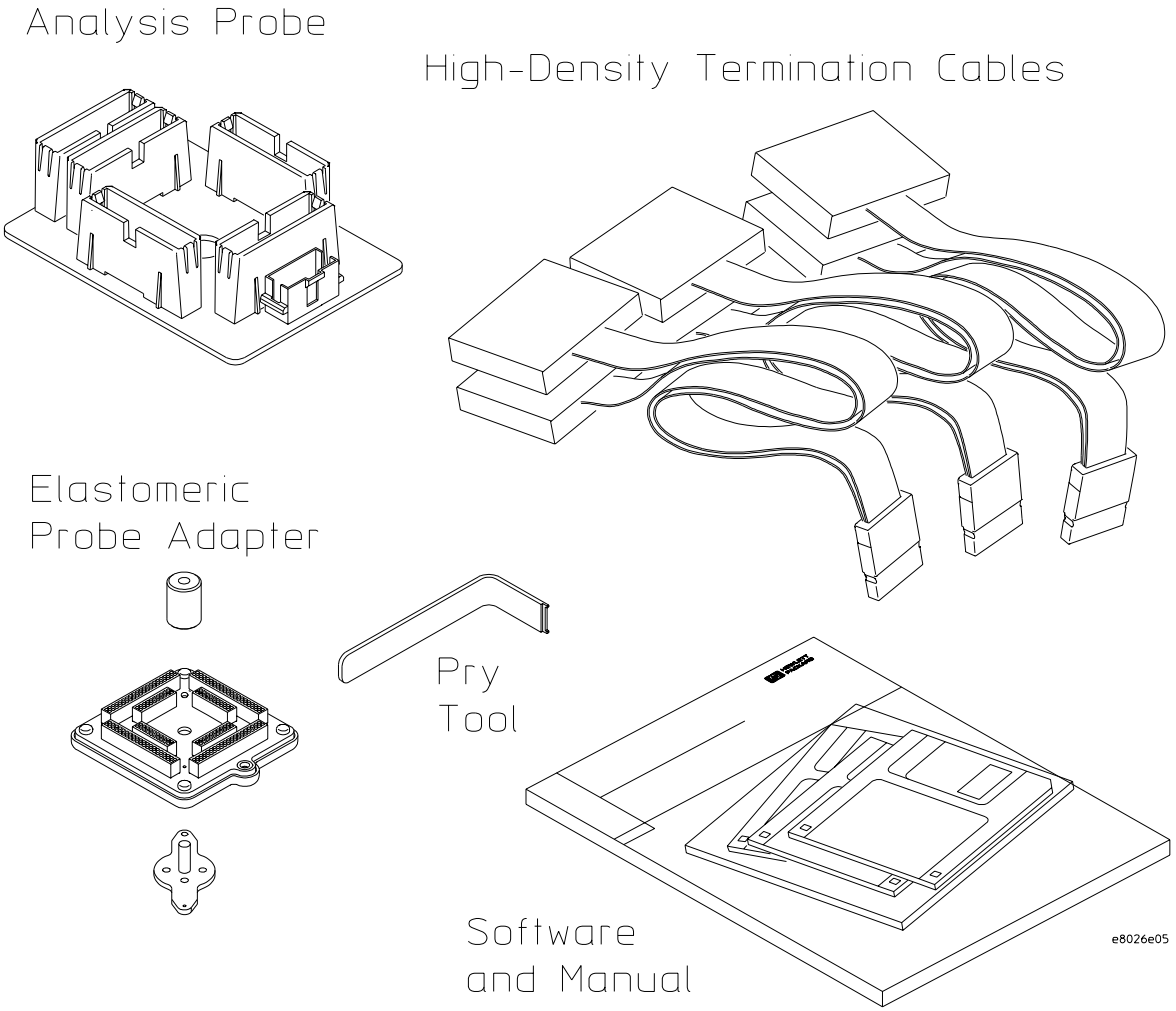
Analysis Probe

This section lists equipment supplied with the analysis probe and equipment requirements for using the analysis probe.

Equipment supplied

The equipment supplied with the analysis probe is shown in the illustration on the next page. It is listed below.

- Agilent Technologies E8026A analysis probe circuit board.
- An elastomeric probe adaptor.
- A retainer kit.
- Three Agilent Technologies E5346A high-density adaptor cables.
- Logic analyzer configuration files on a CDROM (for Agilent Technologies 16600A/ 700A series logic analysis systems).
- This User's Guide



Equipment Supplied with the Agilent Technologies E8026A Analysis Probe

Minimum equipment required

For state and timing analysis of an TMPR3904 target system, you need all of the following items.

- The Agilent Technologies E8026A Analysis Probe.
- One of the logic analyzers listed on page 20.

Additional equipment supported

Emulation module

The Agilent Technologies E8026A has a built-in connector for an Agilent Technologies 16610A emulation module.

Agilent Technologies B3759A #800 Interface Software

The interface software can be used with the analysis probe to control your logic analyzer and inverse assembly of the trace result.

Logic analyzers supported

The table below lists the logic analyzers supported by the Agilent Technologies E8026A analysis probe and B3759A #800 interface software. Logic analyzer software version requirements are shown on the following page.

The Agilent Technologies E8026A and B3759A #800 require six logic analyzer pods (102 channels) for inverse assembly.

Logic Analyzers Supported

Logic Analyzer	Channel Count	State Speed	Timing Speed	Memory Depth
16600A	204	100 MHz	125 MHz	64k states
16601A	136	100 MHz	125 MHz	64k states
16602A	102	100 MHz	125 MHz	64k states
16550A	102/card	100MHz	250MHz	4k states
16710A	102/card	100MHz	250MHz	8k states
16711A	102/card	100MHz	250MHz	32k states
16712A	102/card	100MHz	250MHz	128k states
16555A (two cards)	68/card	110MHz	250MHz	1M states
16555D (two cards)	68/card	110MHz	250MHz	2M states
16556A (two cards)	68/card	100MHz	200MHz	1M states
16556D (two cards)	68/card	100MHz	200MHz	2M states
16557D (two cards)	68/card	135MHz	250MHz	2M states

Logic analyzer software version requirements

The logic analyzer must have the latest software to make a measurement with the Agilent Technologies E8026A. The latest Agilent Technologies 16600A/16700A logic analyzer software version is on the CDROM shipped with this product.

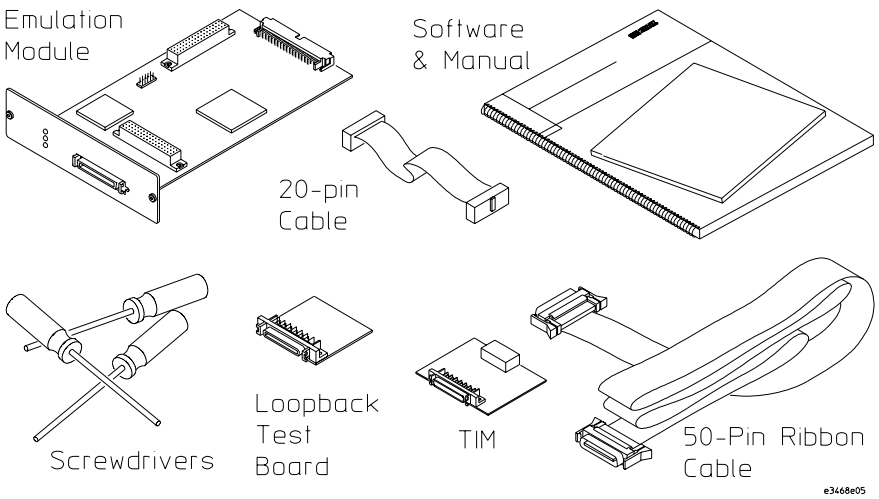
Emulation Module

This section lists equipment supplied with the emulation module and lists the minimum equipment required to use the emulation module.

Equipment supplied

The equipment supplied with your emulation module includes:

- An Agilent Technologies 16610A emulation module. If you ordered an emulation module as part of your Agilent Technologies 16600A or 16700A logic analysis system, it is already installed in the frame.
- A target interface module (TIM) circuit board.
- A emulation module loopback test board (Agilent part number E3496-66502).
- Firmware for the emulation module on a CD-ROM.
- A 50-pin ribbon cable for connecting the emulation module to the target interface module.
- A 20-pin ribbon cable for connecting the target interface module to the target system.
- One Torx T-8, one Torx T-10, and one Torx T-15 screwdriver (if the emulation module was not installed at the factory).
- This User's Guide.



Equipment Supplied with the Agilent Technologies E3468A Emulation Module

Minimum equipment required

The following equipment is required to use the emulation module:

- A method for connecting to the target system. The Agilent Technologies E8026A analysis probe provides a debug port connector. You can also design a debug port connector on the target system.
- An Agilent Technologies 16600A or 16700A logic analysis system.
- E5903A#800 Trace Port Analyzer
- A user interface on the host computer, such as B3759A#800 Emulation Solution Interface or 3rd party's high-level source debugger .

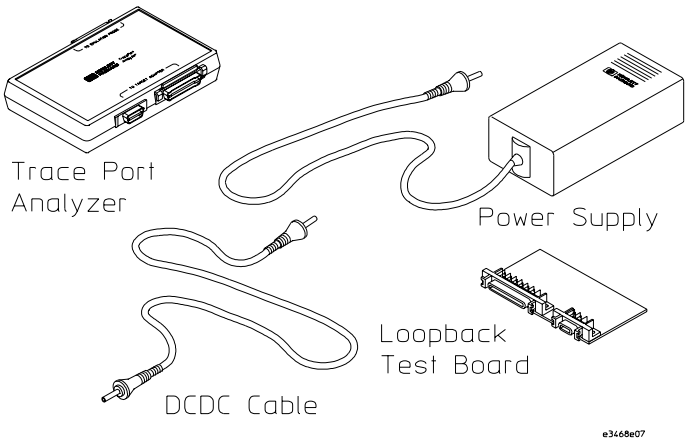
Trace Port Analyzer

This section lists equipment supplied with the trace port analyzer and lists the minimum equipment required to use the trace port analyzer.

Equipment Supplied

The equipment supplied with your trace port analyzer includes:

- Trace Port Analyzer
- A 12V power supply
- DC-DC power code for connection with the Emulation probe
- A trace port analyzer loopback test board (Agilent part number: E5890-66502)



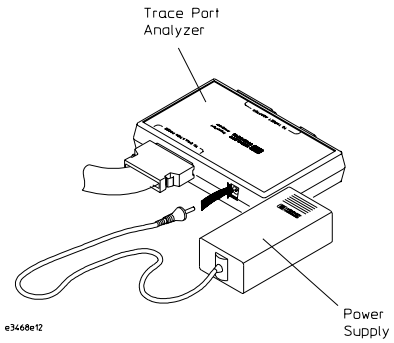
Minimum equipment required

The following equipment is required to use the trace port analyzer:

- An emulation module.
- A 50-pin data cable (supplied with the emulation module or probe).
- A method for connecting to the target system. The Agilent Technologies E8026A analysis probe provides a debug port connector. You can also design a debug port connector on the target system.
- A host computer such as a PC, a workstation, or an Agilent Technologies 16600A or 16700A logic analysis system.
- E5903A#800 Trace Port Analyzer

A user interface on the host computer, such as B3759A#800 Emulation Solution Interface or 3rd party's high-level source debugger .

To connect a Trace Port Analyzer to a power source



Power-On the logic analyzer first, then connect power to the Trace Port Analyzer.

Emulation Solution

An emulation solution uses the equipment and software already described in this chapter.

The combination of an analysis probe, an emulation module, a trace port analyzer, and an Agilent Technologies 16600A or 16700A logic analysis system lets you both trace and control microprocessor activity on the target system.

The analysis probe supplies signals from the target microprocessor to the logic analyzer. A configuration file sets up the logic analyzer to properly interpret these signals.

You can use a Agilent Technologies B3759A #800 interface software to configure and control the target processor and to download program code.

Additional Information Sources

Additional or updated information can be found in the following places:

Newer editions of this manual may be available. Contact your local Agilent Technologies representative.

If you have an analysis probe, the instructions for connecting the probe to your target microprocessor are in the analysis probe documentation. The ***Solutions for the Toshiba Tx19/39 Series User's Guide*** provides information on using the analysis probe and emulation module together.

Application notes may be available from your local Agilent Technologies representative or on the World Wide Web at:

http://www.agilent.com/find/logicanalyzer

The **measurement examples** include valuable tips for making emulation and analysis measurements. You can find the measurement examples under the system help in your Agilent Technologies 16600A/700A logic analysis system.

2

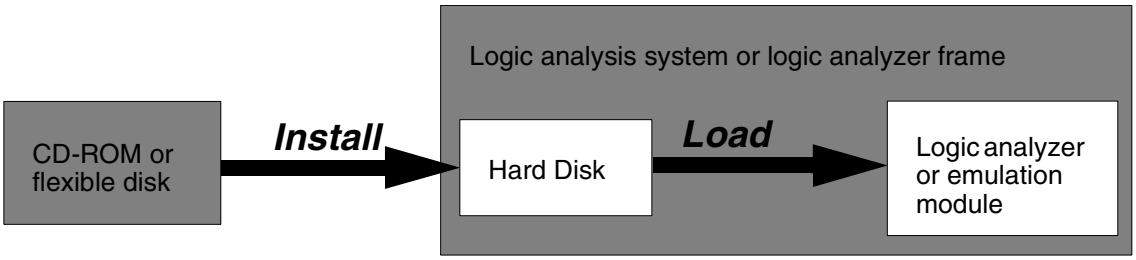
Installing Software on a 16600A/700A

Installing Software on a 16600A/700A

This chapter explains how to install the software you will need for your analysis probe or emulation solution.

Installing and loading

Installing the software will copy the files to the hard disk of your logic anlysis system. Later, you will need to **load** some of the files into the appropriate hardware module.



What needs to be installed

Agilent Technologies 16600A/700A-series logic analysis systems

If you ordered an emulation solution with your logic analysis system, the software was installed at the factory.

The following files are installed when you install a processor support package from the CD-ROM:

- Logic analysis system configuration files
- Personality files for the Setup Assistant
- Emulation module firmware

To list software packages which are installed (16600A/700A)

- In the System Administration Tools window, click **List...** .

To install the software from CD-ROM (16600A/700A)

Installing a processor support package from a CD-ROM will take just a few minutes. If the processor support package requires an update to the Agilent Technologies 16600A/700A operating system, installation may take approximately 15 minutes.

If the CD-ROM drive is not connected, see the instructions printed on the CD-ROM package.

1. Turn on the CD-ROM drive first and then turn on the logic analysis system.
2. Insert the CD-ROM in the drive.
3. Click the **System Admin** icon.
4. Click **Install...** .

   Change the media type to "CD-ROM" if necessary.
5. Click **Apply**.
6. From the list of types of packages, select "PROC-SUPPORT."

   A list of the processor support packages on the CD-ROM will be displayed.
7. Click on the "Tx19/39" package.

   If you are unsure if this is the correct package, click Details for information on what the package contains.
8. Click **Install...** .

   The dialog box will display "Progress: completed successfully" when the installation is complete.
9. Click **Close**.

The configuration files are stored in /hplogic/configs/hp/*processor*.

See Also

The instructions printed on the CD-ROM package for a summary of the installation instructions.

The online help for more information on installing, licensing, and removing software.

3

Setting Up the Analysis Probe

Setting Up the Analysis Probe

This chapter shows you how to connect the logic analyzer to the target system throught the analysis probe. If you are using custom probing, turn to page 54.

If you are connecting to an Agilent Technologies 16600A-series or 16700A series logic analyzer, use the Setup Assistant to connect and configure your system (see page 18). Use this manual for additional information, if desired.

If you are not using the Setup Assistant, follow the instructions given in this chapter. This chapter covers the following tasks; the order shown here is the recommended order for performing these tasks.

- Read the power on/off sequence
- Connect the analysis probe to the target system
- Connect the analysis probe to the logic analyzer

Setting Up the Analysis Probe Hardware

Setting up the Analysis Probehardware consists of the following major steps:

- Turn off the logic analyzer and the target system.
- Connect the Elastomeric Probing System retainer to the target system.
- Attach the Analysis Probe circuit board and adapter to the retainer.
- Attach the labels to the Agilent Technologies E5346A High-Density cables, then connect the cables to the Analysis Probe.
- Connect the logic analyzer pods to the high-density adapter cables.

The remainder of this section describes these general steps in more detail.

Turn off the logic analyzer and the target system

To protect your equipment, remove the power from both the logic analyzer and the target system before you make or break connections. The logic analyzer should always be powered up before the target system. When powering down, power down the target system first and then power down the logic analyzer.

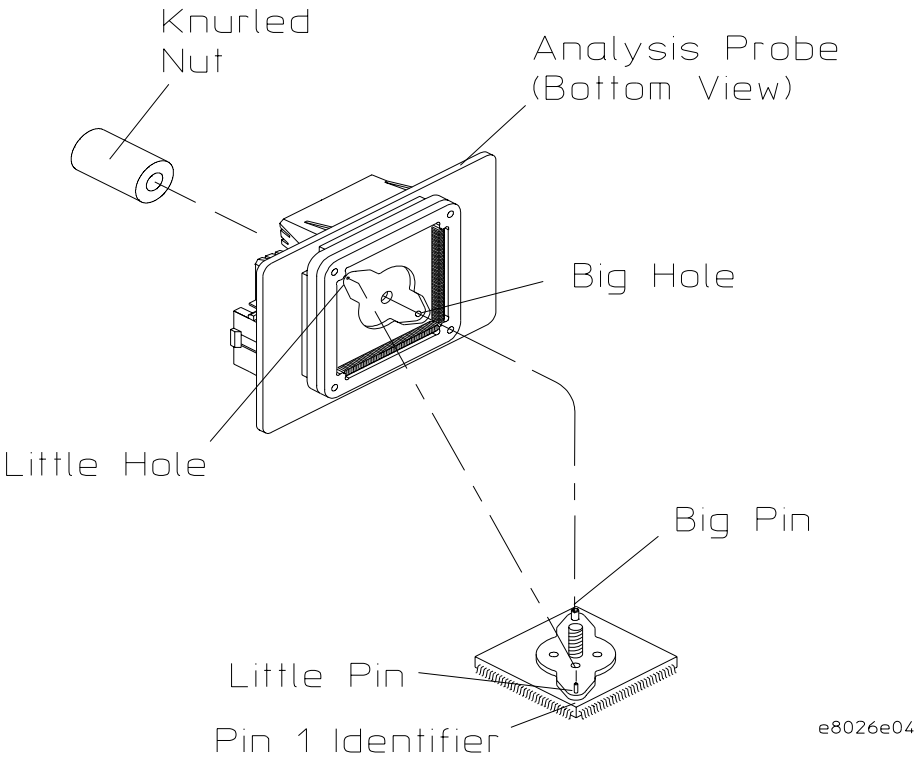
To connect the Analysis Probe to the target system

Use the following steps to connect the Analysis Probe to the target system.

CAUTION **Equipment Damage.** To prevent equipment damage, be sure to remove power from both the target system and the logic analyzer whenever the Analysis Probe is being connected or disconnected.

1. **Turn off the target system and logic analyzer.**
2. **Using the instructions in the *Agilent Technologies QFP Elastomeric Probing System Installation Guide:***
   - Prepare to attach the Retainer to the QFP microprocessor
   - Test the alignment before adhering the Retainer
   - Adhere the Retainer to the QFP microprocessor
   - Install the Agilent Technologies E8026A Analysis Probeas described in "Install the Probe Adapter"
3. **Using the illustration on the next page, note the following indicators:**
   - position of Pin 1 on the microprocessor
   - position of little pin on the retainer
   - position of little hole on the probe adapter

CAUTION Serious damage to the target system or Analysis Probe can result from incorrect connection. Note the position of pin 1 on the target system and Analysis Probe prior to making any connection. Also, take care to align the pins so that all pins are making contact.



Pin 1 Alignment for Target System and Analysis Probe

To disconnect the Analysis Probe from the target system

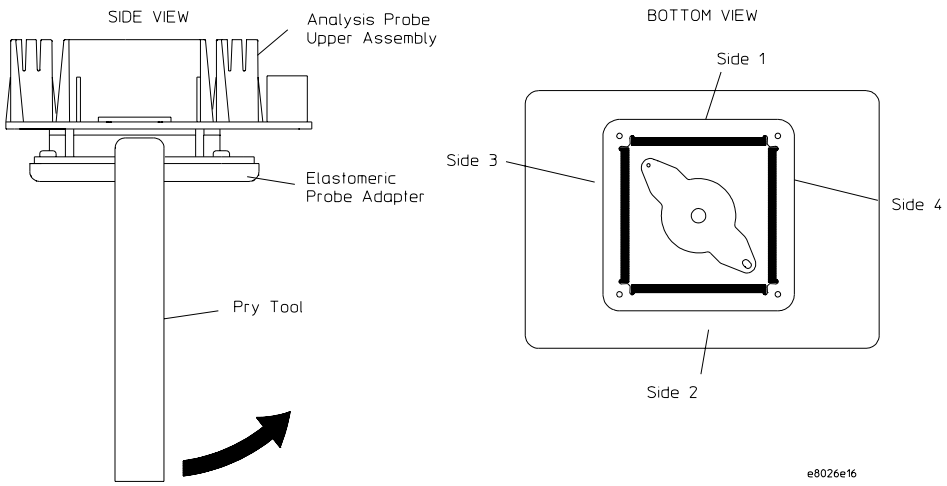
Use the following steps to disconnect the Analysis Probe from the target system.

1. **Remove power from the target system.**
2. **Remove power from the logic analyzer.**
3. **Unscrew the knurled nut.**
4. **Lift the Analysis Probe straight up.**

To separate the Analysis Probe upper assembly from the probe head

Agilent Technologies does not recommend separating the Analysis Probe upper assembly from the elastomeric probe head. However, unforeseen circumstances might require you to separate the assembly.

Use the Cam Tool supplied. Insert the tool into the one side, and rotate it until the connectors begin to separate. Repeat this process for the other three sides in consecutive order until the Analysis Probe upper assembly and the elastomeric probe head are separated.

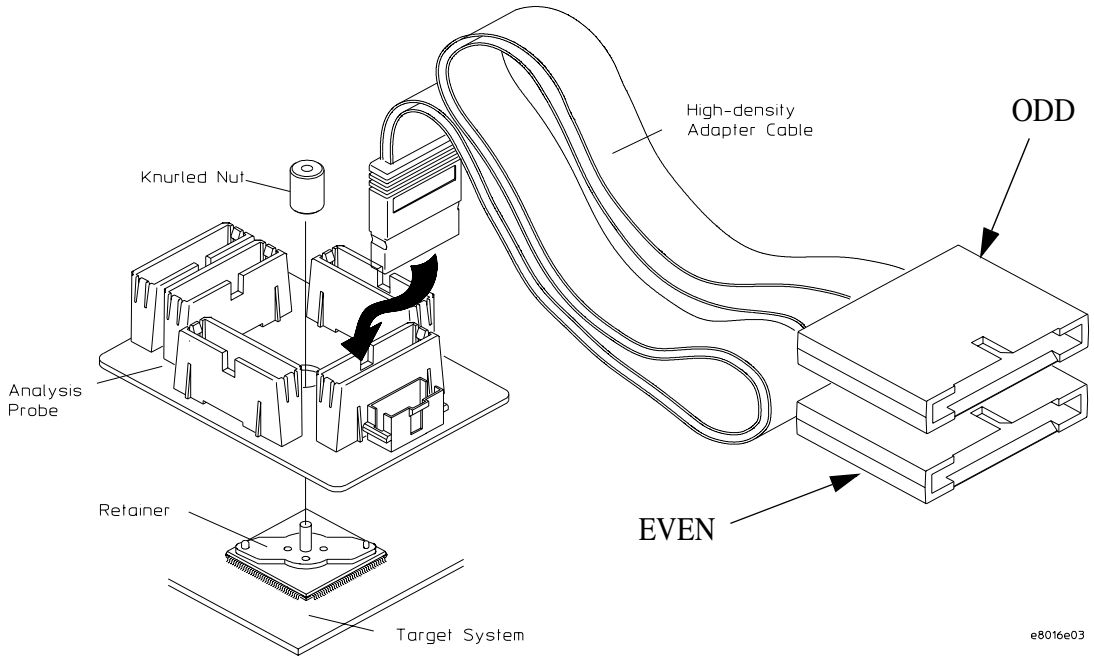


To reconnect Analysis Probe and probe head

Place the elastomeric probe head in its protective cover. Orient the elastomeric probe head and the Analysis Probe upper assembly as shown in the illustration on the previous page. As you begin to insert the pins of the Analysis Probe upper assembly into the sockets on the elastomeric probe head, ensure that all of the pins are engaging. Look closely at both ends of all four sockets to ensure all pins are properly mated. Gently apply pressure until the connectors are fully mated.

To connect the high-density adapter cables to the Analysis Probe

The high-density adapter cables, and labels to identify them, are included with the Agilent Technologies E8026A Analysis Probe. The labels identify the cables by the pod number, and "o" or "e" (for odd or even). Attach the labels to the cables, then connect the cables to the connectors on the Analysis Probeas shown in the following illustrations.



High-Density Adapter Cables

Setting up the Logic Analyzer

Connect the logic analyzer pod cables to the logic analyzer and to the mictor connector on the Analysis Probe. The E8026A analysis probe uses 6 or 8 logic analyzer pods depend on your target system's configuration. Please refer to your connection type from the table below.

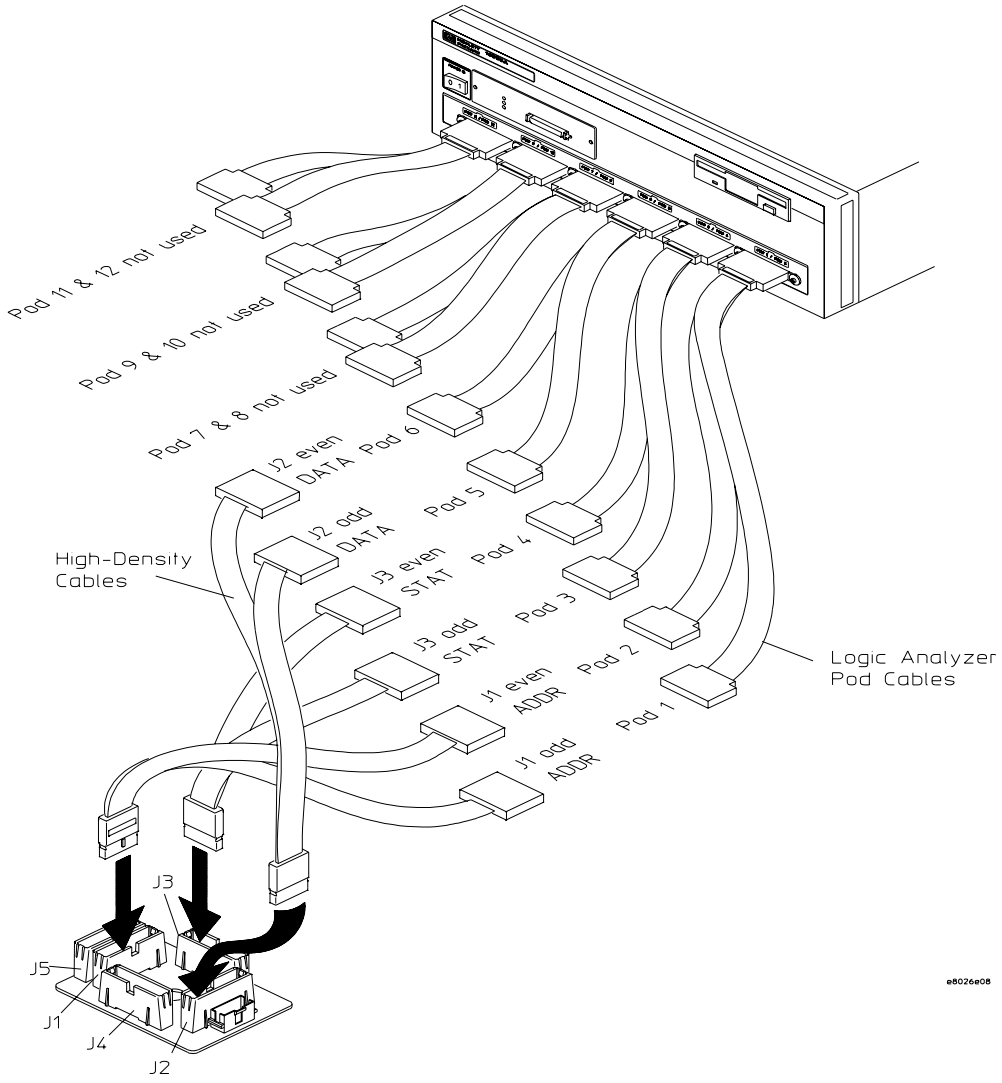
	Logic Analyzer	Config File	Connection Type
When A24-A31 bits are completely decoded by the chipselect on your target system	16600A 16601A 16602A	TX3904F_0 (TX3904F_0H for Half Mode)	A
	16700A + 16550A	TX3904F_0 (TX3904F_0H for Half Mode)	B
	16700A+ 16710/11/12	TX3904F_0 (TX3904F_0H for Half Mode)	B
	16700A + 16555/56/57 x 2	TX3904M_0 (TX3904M_0H for Half Mode)	C
When only some bits of A24-A31 are decoded by the chipselect on your target system	16600A 16601A	TX3904F_1 (TX3904F_1H for Half Mode)	D
	16700+ 16550A x2	TX3904F_1 (TX3904F_1H for Half Mode)	E
	16700A+ 16710/11/12 x2	TX3904F_1 (TX3904F_1H for Half Mode)	F
	16700A+ 16555/56/57 x2	TX3904M_1 (TX3904M_1H for Half Mode)	G

Note

If your 16700A Logic Analyzer equips with three card analyzer (One master, and two slave modules) and your connection type is “C” or “G”, you must detach one of the slave module on your logic analyzer. (One master, and one slave) Refer to the analyzer manual for the instruction on how to detach the module.

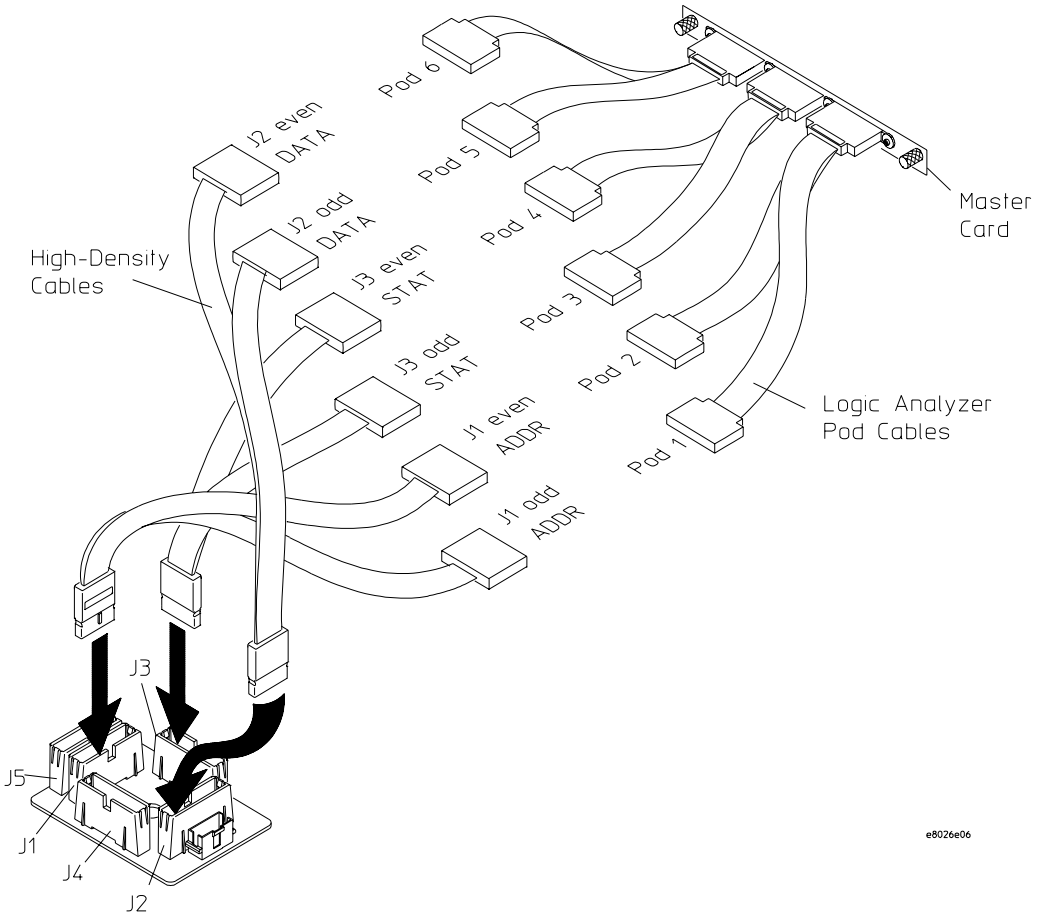
Connection Type ‘A’
To connect to the 16600/1/2A analyzer

Connect the pod cables to the Analysis Probe according to the pod diagram below.



Connection Type ‘B’
To connect to the 16550A/710A/711A/712A one-card analyzer

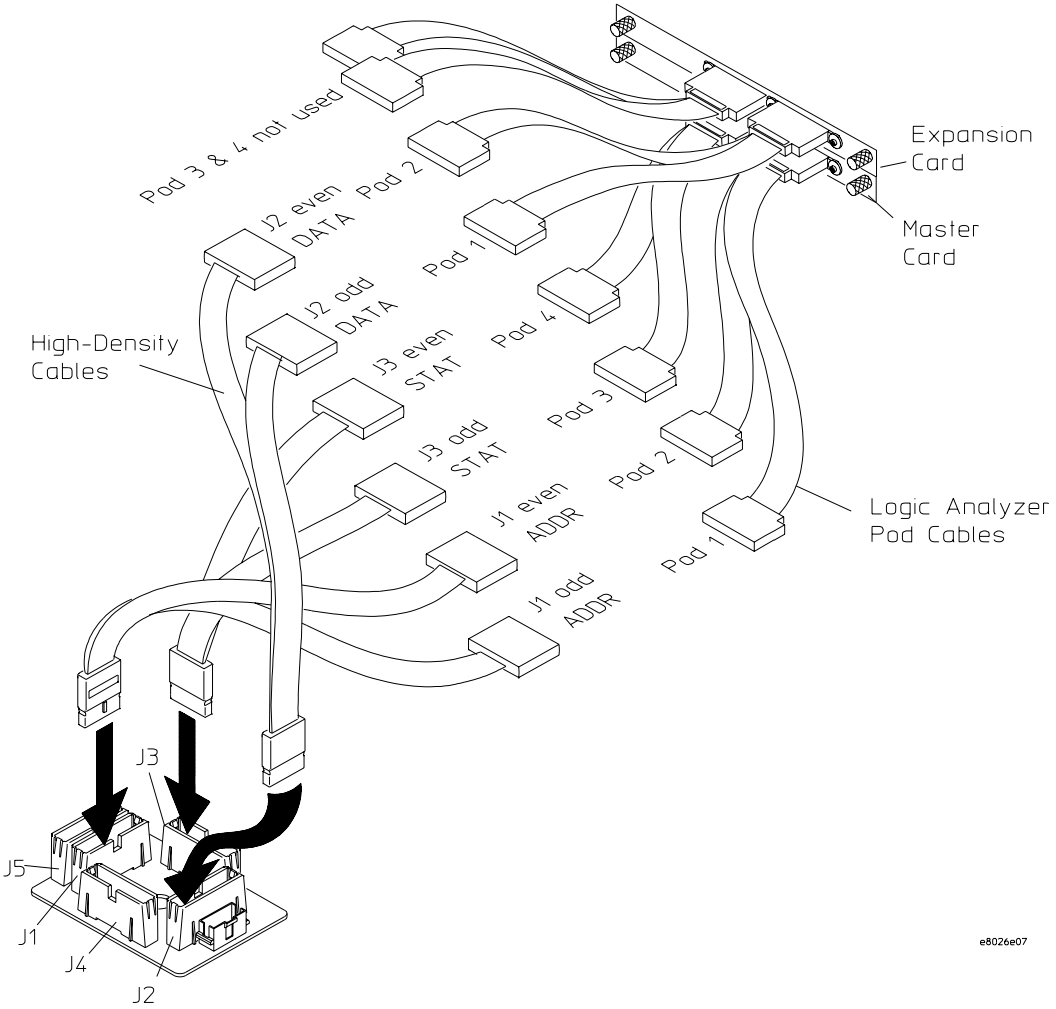
Connect the pod cables to the Analysis Probe according to the pod diagram below.



If your analyzer has two 16550/710/711/712A cards, connect all the cables to the “Master” module.

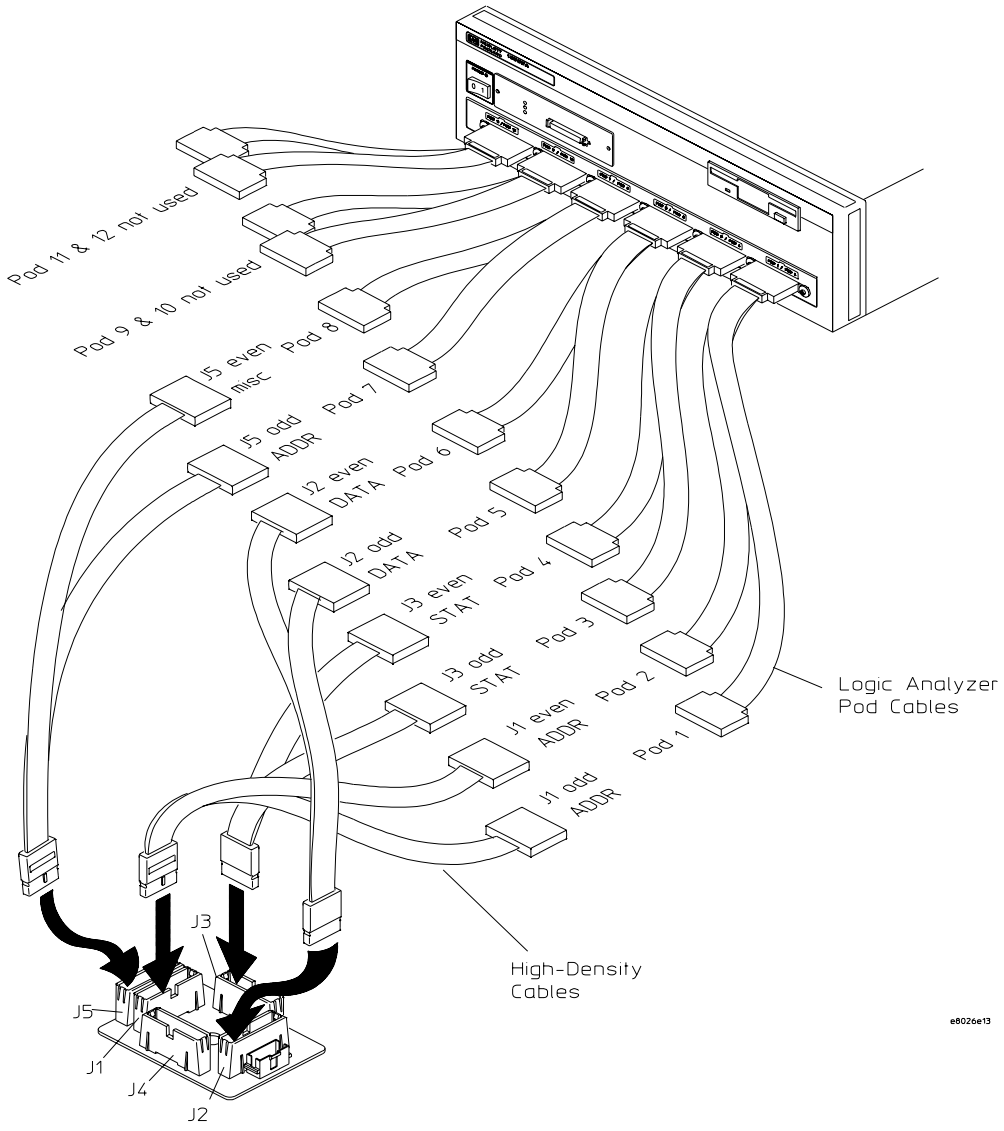
Connection Type ‘C’
To connect to the 16555/56/57A two-cards analyzer

Connect the pod cables to the Analysis Probeaccording to the pod diagram below.



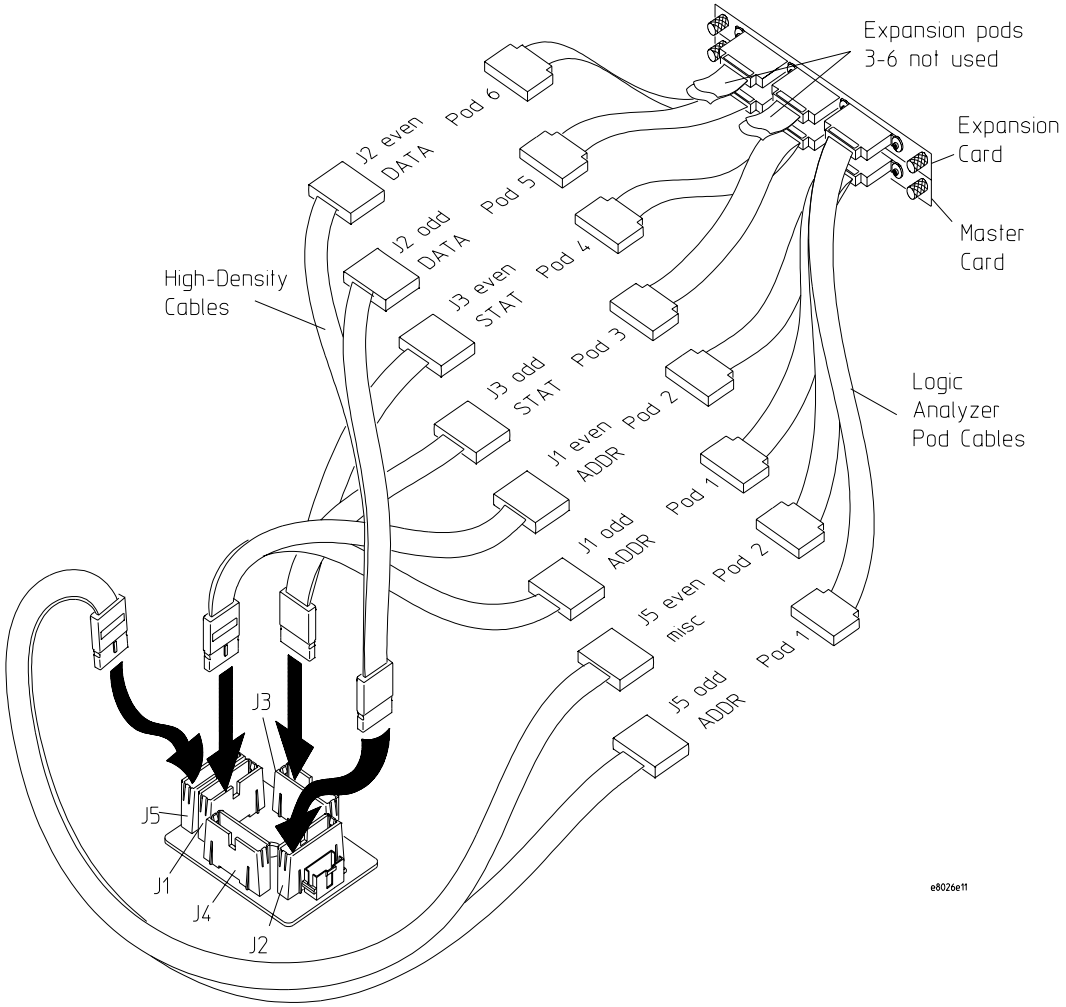
Connection Type ‘D’
To connect to the 16600/1A analyzer

Connect the pod cables to the Analysis Probe according to the pod diagram below.



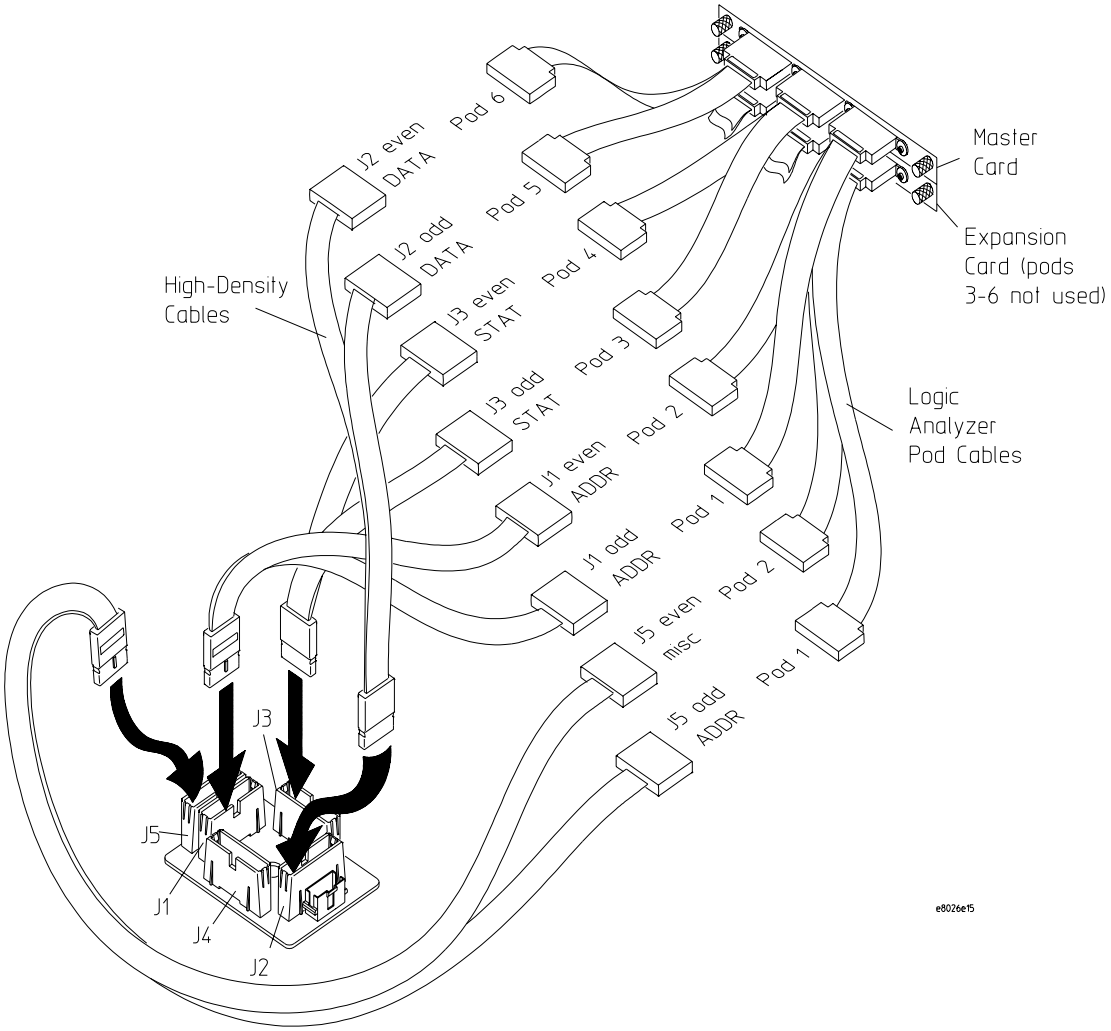
Connection Type ‘E’
To connect to the 16550A two-cards analyzer

Connect the pod cables to the Analysis Probe according to the pod diagram below.



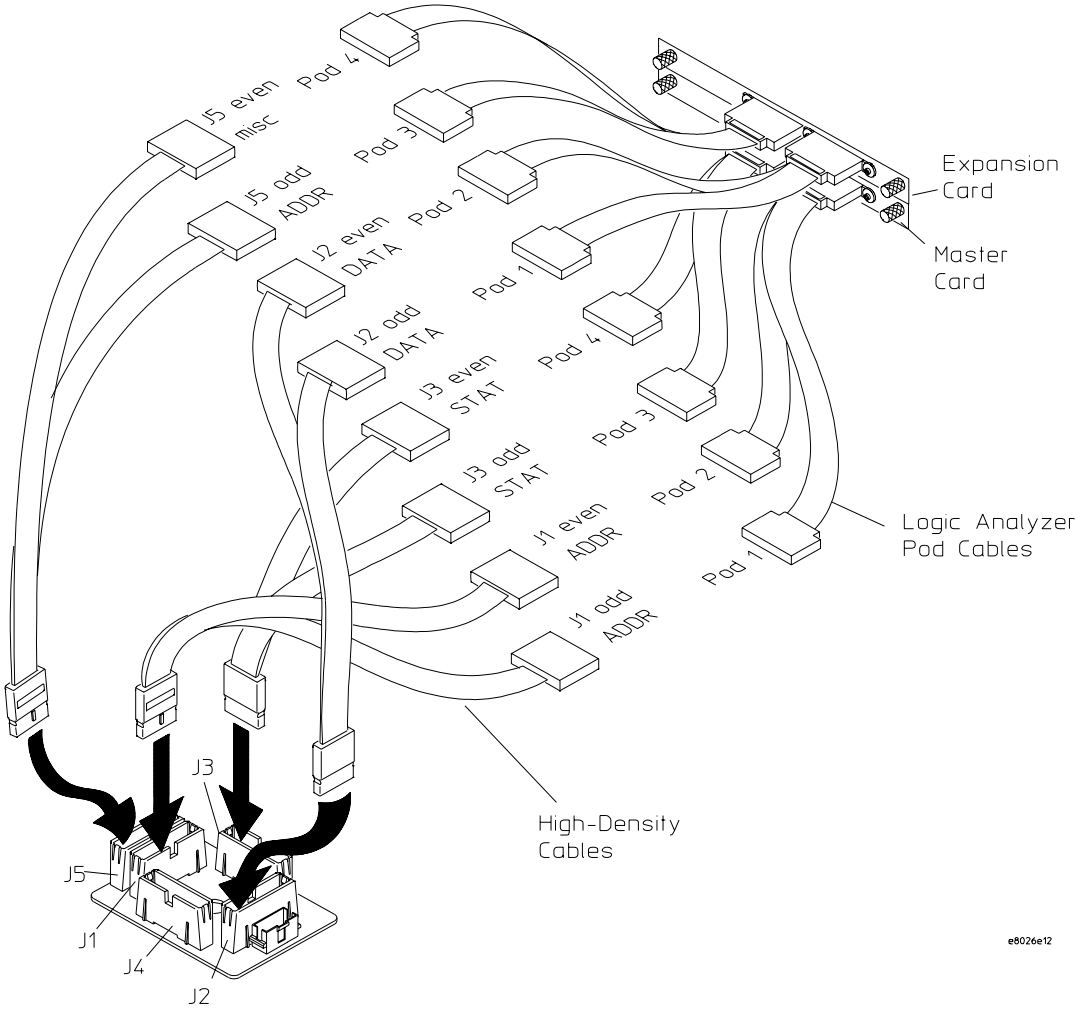
Connection Type ‘F’
To connect to the 16710/1/2A two-cards analyzer

Connect the pod cables to the Analysis Probe according to the pod diagram below.



Connection Type ‘G’
To connect to the 16555/6/7 three-cards analyzer

Connect the pod cables to the Analysis Probe according to the pod diagram below.



CAUTION

All operations must be done on the Agilent Technologies B3759A (Emulation Interface Software) except for the MSA.

After finishing MSA, don't touch anything on the state analysis listing window, although it pops up. Any changing on this window migt cause a fatal error on a Agilent Technologies B3759A (Emulation Interface Software).

You can still operate other modules like analog scope. Also as long as you don't remove a state analysis machine, you can operate a workspace to perform cross domain measurement.

4

Designing Connectors for Custom Probing for the B3759A #800 software

Designing Connectors for Custom Probing for the B3759A #800 software

This chapter shows you how to design logic analyzer connectors on your target system for use with the Agilent Technologies B3759A #800 emulation solution user interface software.

If you are using an Agilent Technologies E8024A analysis probe, skip this chapter.

This chapter consists of the following sections:

- Using the General Purpose (GP) probes
- Designing logic analyzer connectors on your target system for the Agilent Technologies B3759A #800 emulation solution user interface software.

Direct Probing with GP Probes

If you are using general-purpose (GP) probes, connect the individual probes to the signals according to the signal-to-connector mapping tables, as shown in chapter 10. Use the figures in chapter 3 to determine which logic analyzer pods to use for the signal groups.

It is helpful to label the probe headers before installing the probes. You should connect the ground signal for the analyzer clock(s), and two to four signal grounds per pod.

Designing and Using Built-in Connectors

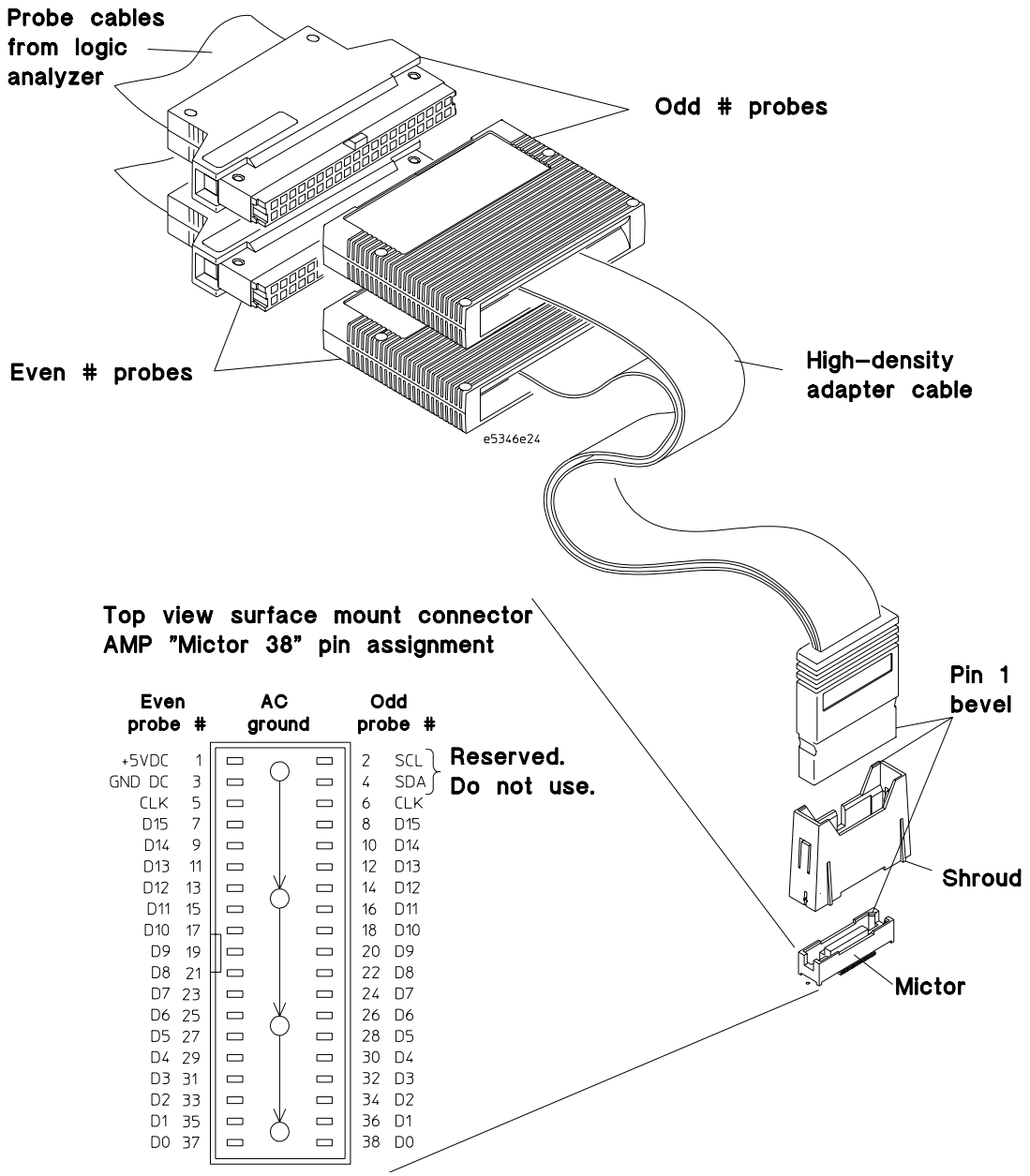
You can design analyzer-compatible connectors into the target board, and connect the logic analyzer cables to these connectors according to the figures in chapter 3. The primary concerns when using built-in connectors are:

- The board real estate required by the connectors
- Ensuring that the logic analyzer connection is properly terminated
- Ensuring that the microprocessor pins connect to the proper logic analyzer probes. See the "Hardware Reference" chapter for pinouts.

The connection scheme shown in this section uses 38-pin connectors on the target sysem, and high-density termination cables to connect to the logic analyzer. Each connector and cable supports two logic analyzer pods. The part numbers for built-in connectors and cables are shown below. An illustration of the components is shown on the following page.

Part Numbers for Built-in Connectors and Cables

Part Number	Description
Agilent 1252-7431, or AMP 2-767004-2	2 x 19 header. A minimum of three connectors (six logic analyzer pods) is required; up to six may be used.
Agilent E5346-44701	Optional connector-support shroud
Agilent E5346A	High-density termination cable. One required for each 2x19 connector.



Connectors, Shroud, and High-density Termination Cables

AMP Mictor 38 Connectors

Each Mictor 38 connector carries 32 signals plus two clocks (CLK1 for two logic analyzer pods). The high-density termination cables are required to connect the logic analyzer cables to the connector (Agilent part number E5346A). These cables contain the required termination. One cable is required for every two logic analyzer pods.

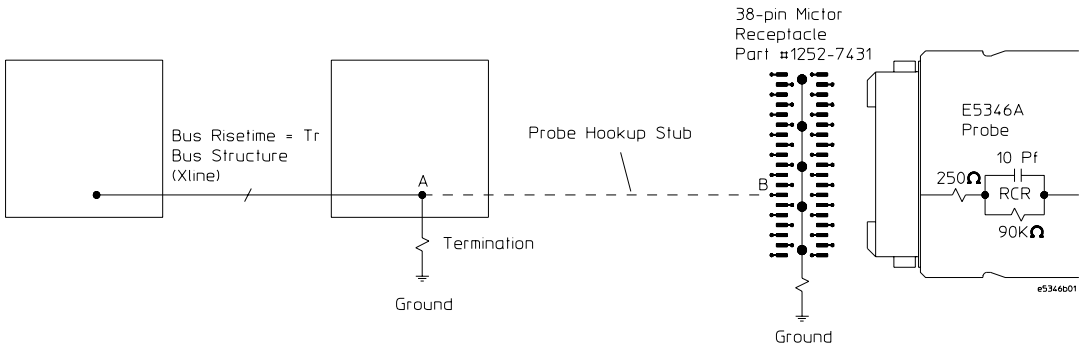
The figure on the previous page shows the pinout for a Mictor 38 connector. Refer to the "Hardware Reference" chapter (page <Reference>) for the tables showing the microprocessor signals for each pin. Note that the +5V pin (pin 1) is used to supply power from the logic analyzer to any active devices on an interface board. In most instances, this pin should not be used.

To increase the structural support for the cables, you can also use cable support shrouds (Agilent part number E5346-44701) on each connector. The figures on the following page show the mechanical layouts for the shrouds and headers.

Design Considerations

The connector must be located close enough to the target signal so that the stub length created is less than $^1/_5$ the T_r (bus risetime, see figure below). For PC board material, (er = 4.9) and Z_o in the range of 50 - 80Ω, use a propagation delay of 160 ps/inch of stub.

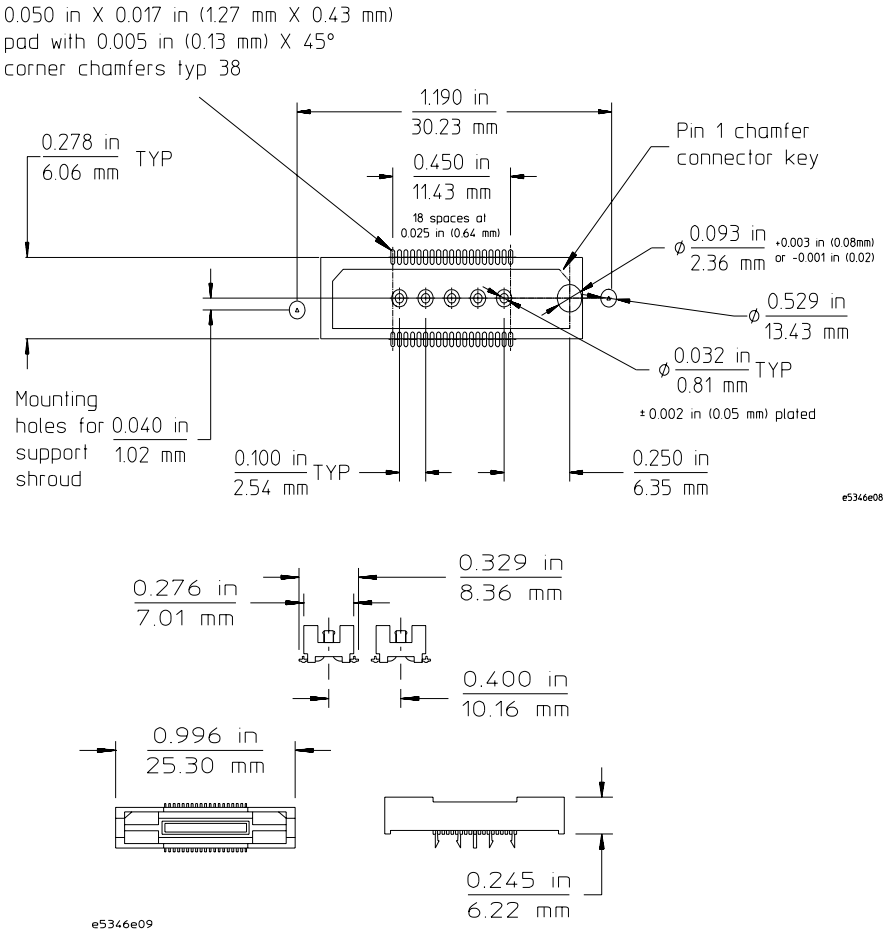
Each probed signal line must be able to supply a minimum of 600 mV to the probe tip and handle a minimum of 90 KΩ shunted by 10 pF. The maximum input voltage to the high-density cables is ±40V peak.



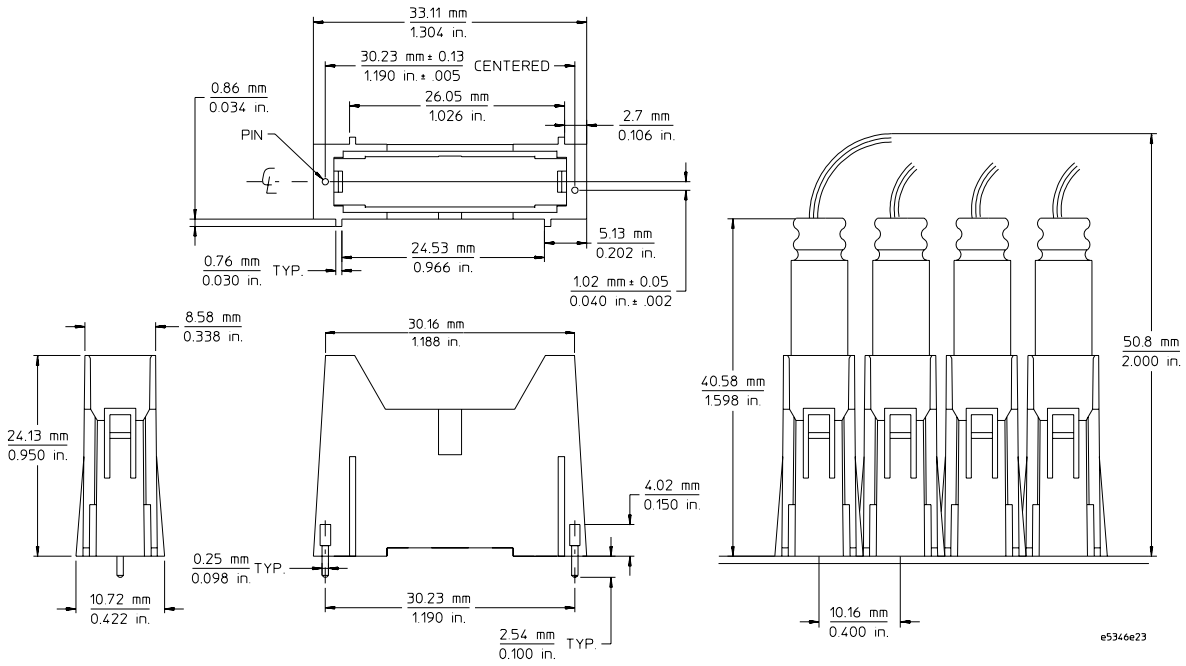
2x19 Header Design Rules

Support shroud

The support shrouds (Agilent part number E5346-44701) provides additional strain relief between the connectors and the high-density termination cables. The shroud requires two through-hole connections to the target board. It fits around the header, and mounts directly to the target board. The following figures show the mechanical connections for the shrouds and connectors.



Support Shroud Mechanical Information



2x19 Header Mechanical Information

Connecting the Logic Analyzer to the Target System Connectors

The procedures for connecting and configuring the logic analyzer are listed in chapter 3.

Installing the Emulation Module

Installing the Emulation Module

This chapter shows you how to install an emulation module in your Agilent Technologies 16600A/700A-series logic analysis system.

If your emulation module is already installed in your logic analysis system frame, you may skip this chapter.

CAUTION

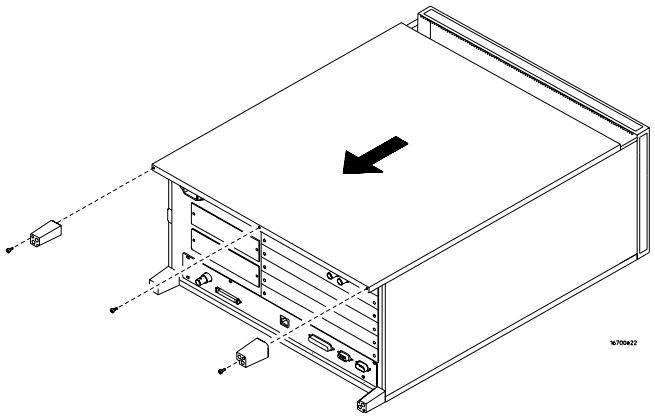
These instructions are for trained service personnel. To avoid dangerous electric shock, do not perform any service unless qualified to do so. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Electrostatic discharge can damage electronic components. Use grounded wriststraps and mats when you handle modules.

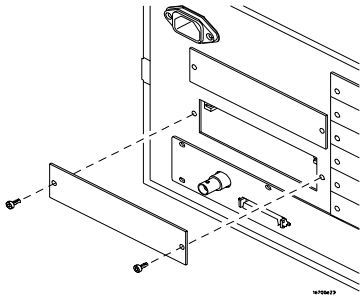
To install the emulation module in a 16700A-series logic analysis system or a 16701A expansion frame

You will need T-10 and T-15 Torx screw drivers.

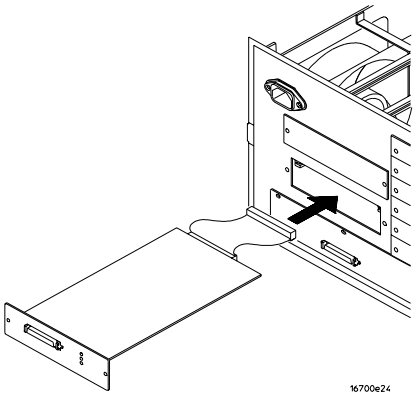
1. Turn off the logic analysis system and REMOVE THE POWER CORD.
   Remove any other cables (such as probes, mouse, or video monitor).
2. Turn the logic analysis system frame upside-down.
3. Remove the bottom cover.



4. Remove the slot cover.
   You may use either slot.

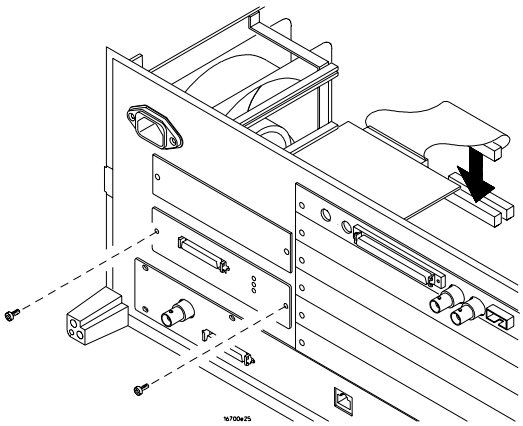


5 Install the emulation module.



6 Connect the cable and re-install the screws.

You may connect the cable to either of the two connectors. If you have two emulation modules, note that many debuggers will work only with the "first" module: the one toward the top of the frame ("Slot 1"), plugged into the connector nearest the back of the frame.



7 Reinstall the bottom cover, then turn the frame right-side-up.

8 Plug in the power cord, reconnect the other cables, and turn on the logic analysis system.

The new emulation module will be shown in the system window.

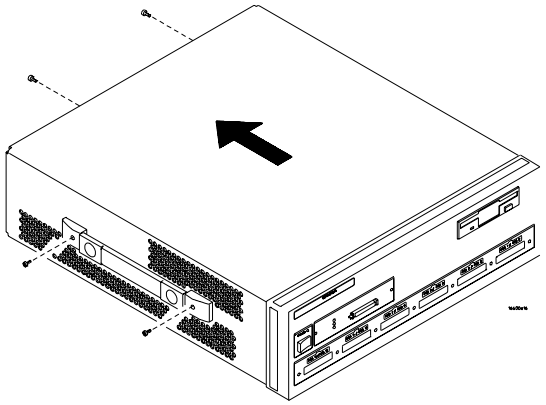
See Also

See page 18 for information on giving the emulation module a "personality" for your target processor.

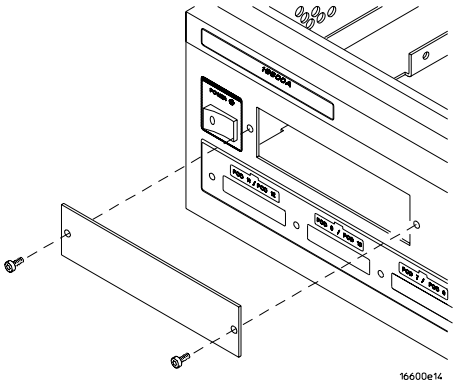
To install the emulation module in a 16600A-series logic analysis system

You will need T-8, T-10, and T-15 Torx screw drivers.

1. Turn off the logic analysis system and REMOVE THE POWER CORD.
   Remove any other cables (such as probes, mouse, or video monitor).
2. Slide the cover back.

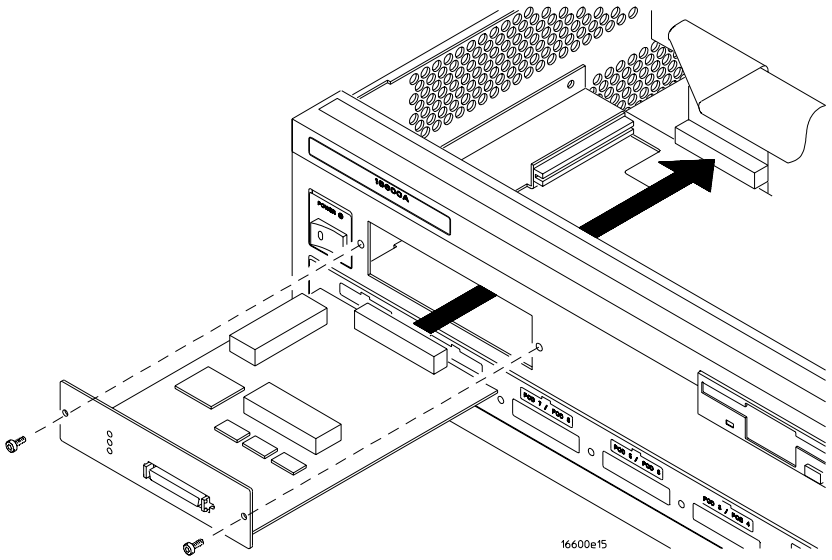


3. Remove the slot cover.



4 Install the emulation module.

5 Connect the cable and re-install the screws.



6 Reinstall the cover.

Tighten the screws snugly (2 N•m or 18 inch-pounds).

7 Plug in the power cord, reconnect the other cables, and turn on the logic analysis system.

The new emulation module will be shown in the system window.

See Also

See page 18 for information on giving the emulation module a "personality" for your target processor.

6

Connecting the Emulator

Connecting the Emulator

This chapter shows you how to connect the emulator to the target system and how to configure the emulator and target processor.

Overview

Here is a summary of the steps for connecting and configuring the emulator:

1. Make sure the target system is designed to work properly with the emulator. (Page 74.)
2. Install the emulation module in your logic analysis system, if necessary. (Page 64.)

   If you are connecting an emulation module to an Agilent Technologies 16600A/700A-series logic analysis system, use the Setup Assistant to guide you through steps 3-4.
3. Connect the emulator to your target system using the 50-pin cable and the TIM or an analysis probe. (Page 77.)
4. Update the firmware of the emulator, if necessary. (Page 81.)
5. Verify communication between the emulator and the target
6. Configure the emulator
7. Test the connection between the emulator and the target
8. Connect a debugger to the emulator, if applicable.

Using the Emulation Control Interface

The Emulation Control Interface in your Agilent Technologies 16600A/700A-Series logic analysis system allows you to control an emulator (an emulation module or an emulation probe).

As you set up the emulator, you will use the Emulation Control Interface to:

- Update firmware (which preloads or changes the processor-specific personality of the emulator).
- Change the LAN port assignment (rarely necessary).
- Run performance verification tests on the emulator.

The Emulation Control Interface allows you to:

- Run, break, reset, and step the target processor.
- Set and clear breakpoints.
- Read and write registers.
- Read and write memory.
- Read and write I/O memory.
- View memory in mnemonic form.
- Read and write the emulator configuration.
- Download programs (in Motorola S-Record or Intel Hex format) to the target system RAM or ROM.
- View emulator status and errors.
- Write and play back emulator command script files.

If you have an emulation probe, this interface also allows you to configure the LAN address of the emulation probe.

Using the logic analysis system's intermodule bus does not require the Emulation Control Interface to be running. If the emulation module icon is in the Intermodule window, then it will be able to send and receive signals. Therefore if you are using a debugger, you can use an analyzer to cause a break.

Using a debugger with the Emulation Control Interface is not recommended because:

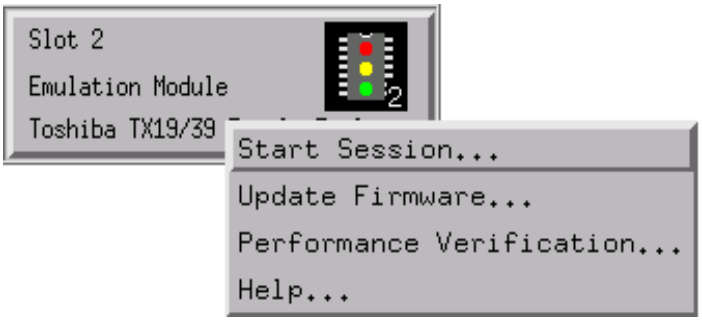
- The interface can get out of synchronization when commands are issued from both interfaces. This causes windows to be out-of-date and can cause confusion.
- Most debuggers cannot tolerate another interface issuing commands and may not start properly if another interface is running.

See Also

All of the Emulation Control Interface windows provide online help with a Help button or a Help->On this window menu selection. Refer to the online help for complete details about how to use a perticular window.

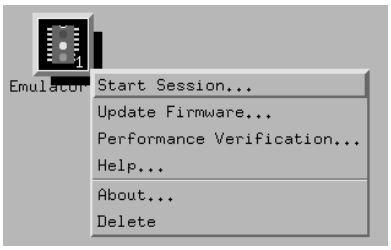
To start the Emulation Control Interface from the main System window (emulation module)

1. In the System window, click the emulation module icon.
2. Select **Start Session...**.



To start the Emulation Control Interface from the Workspace window (emulation module)

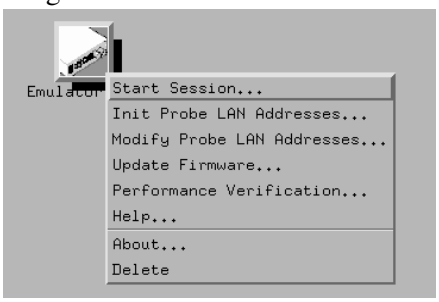
1 Open the Workspace window.
2 Drag the Emulator icon onto the workspace.
3 Right-click the Emulator icon, and then select **Start Session...**.



To start the Emulation Control Interface from the Workspace window (emulation probe)

If you have a stand-alone emulation probe connected to the logic analysis system via LAN, use the Emulation Probe icon instead of the Emulation Module icon.

1 Open the Workspace window.
2 Drag the Emulation Probe icon onto the workspace.
3 Right-click the Emulation Probe icon, and select **Start Session....**



4 In the Session window, enter the IP address or LAN name of the emulation probe, then click **Start Session**.

Designing a Target System

This section will help you design a target system that will work with the Agilent Technologies E3468A Emulation Module.

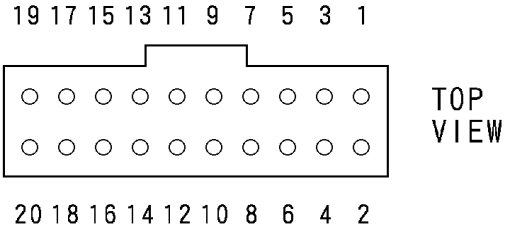
Wiring the N-wire

To connect the Agilent Technologies E5900A #800 Emulation Probe to your target system, you have to prepare the following 20 signals called N-wire on your target system using the 20-pin connector.

N-wire

Cable Pin Number	Signal	TMPR3904 Pin Number
1	RESET	80
3	V_{DD}	79
5	DRESET	78
7	SDI/DINT	77
9	DBGE	76
11	SDA0/TPC	76
13	PCST[0]	74
15	PCST[1]	73
17	PCST[2]	72
19	DLCK	71
Odd Pins	V_{SS}	

Pin assignments for 20-pin connector is the following.



20-pin connector

You can use following connectors.

Supplier	Product Number	Description
AMP	104069-1	Shrouded - Right Angle
AMP	104068-1	Shrouded - Vertical
AMP	104549-2	Shrouded - Vertical (SMT)

CAUTION Locate the 20-pin connector within 10cm (4 inches) from the microprocessor on your target system. If the 20-pin connector is located further than 10cm (4 inches) away from the microprocessor, Agilent Technologies E5900A #800 Emulation Probe may not work correctly.

Target V_{DD}

The Agilent Technologies E3468A Emulaiton Module may draw up to 10 mA from target V_{DD}.

Precautions when you design your target system

You need to pay attention to the following limitations when you design your target system.

CAUTION While the monitor program is running, the processor's memory access cycles to the monitor area (0xff200000 - 0xff3fffff) cause bus cycles to be driven to the target system. You need to design your target system so that it may not cause errors such as address error at such bus cycles. Refer to the processor manual for the details. See "Glossary" for "monitor program".

CAUTION You can NOT use debug functions of TMPR3904 microprocessor, since these functions are reserved for the Agilent Technologies E3468A emulation module only.

Connecting the Emulation Module to the Target System

Choose one of the following methods for connecting the emulation module to a target system.

- Directly through a debug port connector on the target board.
- Through an Agilent Technologies E8026A analysis probe, which provides a direct connection to the debug port pins.

After you have connected the emulation module to your target system, you need to update the firmware with "Setup Assistant" from your logic analyzer.

See Also

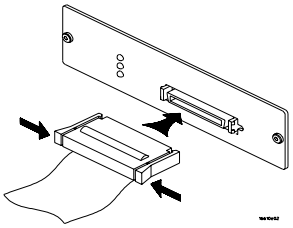
For information on designing a debug port on your target board, see page 74.

For a list of the parts supplied with the emulator, see page 24.

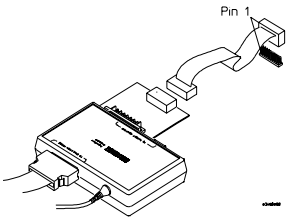
To connect to a target system using a debug port

The emulation module can be connected to a target system through a 20-pin debug port. The emulator should be connected to a 20-pin male 2x10 header connector on the target system using the 20-pin conductor cable assembly provided.

1. Turn off the target system and disconnect it from all power sources.
2. Plug one end of the 50-pin cable into the emulator.



3. Plug the other end of the 50-pin cable into the Trace Port Analyzer.
4. Plug the target interface module into the Trace Port Analyzer.
5. Plug one end of the 20-pin cable into the target interface module.
6. Plug the other end of the 20-pin cable into the debug port on the target system.



7. Turn on the power to the logic analysis system and then the target system.

See Also

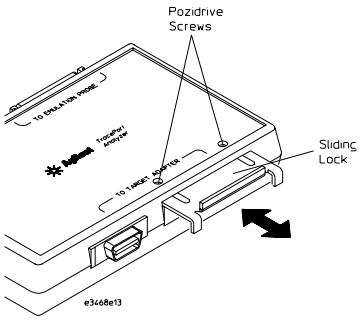
"Designing a Target System" (page 74) for information on designing a target system for use with the emulator.

Note

To lock connectors

The Trace Port Analyzer has a aligning lock to prevent the TIM from being disconnected.

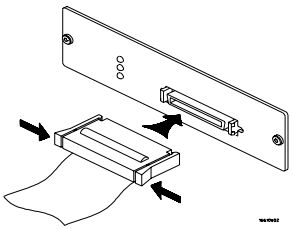
1. Loosen the two screws
2. Slide a lock out as shown
3. Connect the TIM.
4. Slide lock in
5. Tighten the screws



To connect to a target system using an analysis probe

The Agilent Technologies E8026A analysis probe provides a 20-pin connector for direct connection to the debug port pins. You may directly connect your emulation module to this port to control your target system using the 20-pin conductor cable assembly provided.

1 Turn off the target system and disconnect it from all power sources.
2 Plug one end of the 50-pin cable into the emulation module.



3 Plug the other end of the 50-pin cable into the Trace Port Analyzer.
4 Plug the target interface module into the Trace Port Analyzer.
5 Plug one end of the 20-pin cable into the target interface module.
6 Plug the other end of the 20-pin cable into the debug port on the analysis probe.
7 Turn on the power to the logic analysis system and then the target system.

To update Firmware

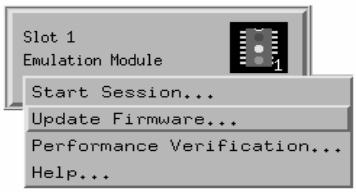
Always update firmware by installing a processor support package. This will ensure that the version of the Emulation Control Interface software is compatible the version of the emulator firmware.

To display current firmware version information

1 In the Update Firmware window, click Display Current Version.
There are usually two firmware version numbers: one for "Generics" and one for the personality of your processor.

To update firmware for an emulation module using the Emulation Control Interface

1 End any run control sessions which may be running.
2 In the Workspace window, remove any Emulator icons from the workspace.
3 Install the processor support package from the CD-ROM, if necessary.
4 In the system window, click the emulation module and select **Update Firmware...**.



5 In the Update Firmware window, select the firmware to load into the emulation module.
6 Click **Update Firmware**.
In about 20 seconds, the firmware will be installed and the screen will update to show the current firmware version.

See Also

"Installing Software" beginning on page 38 for instructions on how to install the processor support package from the CD-ROM.

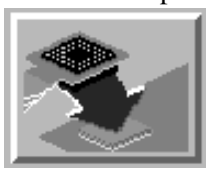
To update firmware for an emulation module using the Setup Assistant

The Setup Assistant is an online tool for connecting and configuring your logic analysis system for microprocessor and bus analysis. The Setup Assistant is available on the Agilent Technologies 16600A and 16700A-series logic analysis systems.

This menu-driven tool will guide you through the connection procedures for connecting the logic analyzer to an analysis probe, an emulation module, or other supported equipment. It will also guide you through connecting an analysis probe to the target system.

Do not use the Setup Assistant to connect an emulation probe if you already have an emulation module installed.

1. Install the processor support package from the CD-ROM.
2. Start the Setup Assistant by clicking its icon in the system window.



3. Follow the instructions displayed by the Setup Assistant.

See Also

Page 33for instructions on how to install a the processor support package from the CD-ROM.

Configuring the Emulator

The emulator has several user-configurable options. These options may be customized for specific target systems and saved in configuration files for future use.

The easiest way to configure the emulator is through the Emulation Control Interface in an Agilent Technologies 16600A or 16700A logic analysis system.
If you use the Emulation Control Interface, please refer to the online help in the Configuration window for information on each of the configuration options.

You may also use the emulator configuration window of your debugger (B3759A #800) to configure your emulator.

To configure using the Emulation Control Interface

The easiest way to configure the emulators is to use the Emulation Control Interface.

1 **Start an Emulation Control Interface session.**

From an emulation module:

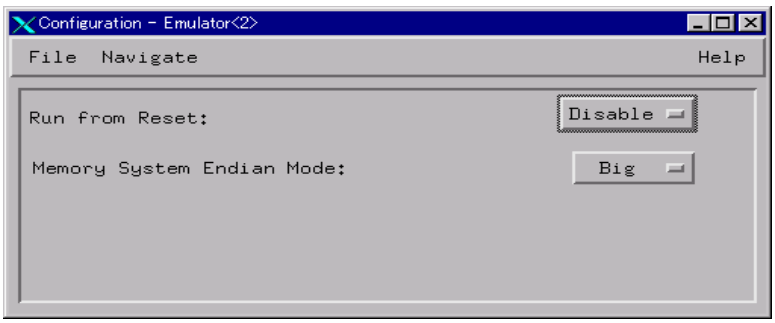
- In the system window, click the Emulation Control Interface icon, and then select “Start Session...”.

For an emulation probe:

- In the workspace window, drag the emulation probe icon onto the workspace, and then select “Start Session...”.

2 **Open a Configuration window.**

Select “Configuration...” from the Emulation Control Interface icon or from the Navigate menu in any Emulation Control Interface window.



3 **Set the configuration options, as needed.**

The configuration selections will take effect when you close the configuration window or when you move the mouse pointer outside the window.

4 **Save the configuration settings.**

To save the configuration settings, open the File Manager window and click **Save...**.

See Also

Help->**Help on this window** in the Configuration window for information on each of the configuration options.

Help in the Emulation Control Interface menu for hep on starting an Emulation Control session.

Testing the emulator and target system

After you have connected and configured the emulator, you should perform some simple tests to verify that everything is working.

See Also

"Troubleshooting the Emulator" on page 115 for information on testing the emulator hardware.

To test memory accesses

1. Start the Emulation Control Interface and configure the emulator, if necessary.
2. Open the Memory window.
3. Write individual locations or fill blocks of memory with patterns of your choosing.

   The access size is the size of memory access that will be used to write or read the memory values.
4. Use the Memory I/O window to stimulate I/O locations by reading and writing individual memory locations.

To test with a running program

To more fully test your target, you can load simple programs and execute them.

1. Compile or assemble a small program and store it in a Motorola S-Record or Intel Hex file.
2. Use the Load Executable window to download the program into RAM or flash memory.
3. Use the Breakpoints window to set breakpoints. Use the Registers window to initialize register values.

   The new register or breakpoint values are sent to the processor when you press the Enter key or when you move the cursor out of the selected register field.
4. In the Run Control window, click Run.
5. Use the Memory Mnemonic window to view the program and use the Memory window to view any output which has been written to memory.

Hardware Reference

Hardware Reference

This chapter contains additional reference information including the specifications and characteristics for the analysis probe and the emulation probe, as well as signal mapping for the Agilent Technologies E8026A analysis probe and the B3759A #800 software. It consists of the following information:

- Analysis probe reference
- Emulation module reference
- Trace Port Analyzer reference

Analysis probe-operating characteristics

The following operating characteristics are not specifications, but are typical operating characteristics for the Agilent Technologies E8026A TMPR3904 analysis probe.

Product Characteristics

Microcontroller Supported	Toshiba TMPR3904
Package Supported	208-pin QFP
Pods Required	8,or 10logic analyzer pods (four high-density adapter cables) are required for disassembly depending on your target system's memory Two high-density adapter cables are available for additional signal analysis.

Electrical Characteristics

Power Requirements	None.	
Signal Line Loading	10pF, 100 kohms on all signals.	

Environmental Characteristics

Temperature	Operating	0 to + 50 degrees C +32 to +131 degrees F
Altitude	Operating	4,600 m 15,000 feet
Humidity	Up to 75% noncondensing. Avoid sudden, extreme temperature changes which could cause condensation on the circuit board.	

Theory of operation

The Agilent Technologies E8026A analysis probe is a passive probe. All signals are routed through to the logic analyzer without passing through any additional circuitry.

Analysis probe - signal-to-connector mapping

The following tables show the electrical signal-to-connector mapping implemented by the Agilent Technologies E8026A TMPR3904 Analysis Probe and the B3759A #800 interface software.

TMPR3904 Signal List

Connector	Analyzer Bit	TMPR3904 Pin #	Signal Name	Analyzer Label	Analyzer Label
J1odd (6)	CLK1	-	-		
J1odd (8)	15	51	A15		
J1odd (10)	14	50	A14		
J1odd (12)	13	49	A13		
J1odd (14)	12	48	A12		
J1odd (16)	11	47	A11		
J1odd (18)	10	46	A10		
J1odd (20)	9	45	A9		
J1odd (22)	8	42	A8		
J1odd (24)	7	41	A7		
J1odd (26)	6	40	A6		
J1odd (28)	5	39	A5		
J1odd (30)	4	37	A4		
J1odd (32)	3	36	A3		
J1odd (34)	2	35	A2		
J1odd (36)	1	33	A1		
J1odd (38)	0	-	-		
J1even (5)	CLK1	-	-		
J1even (7)	15	105	SCS3		
J1even (9)	14	106	SCS2		
J1even (11)	13	107	SCS1		
J1even (13)	12	108	SCS0		
J1even (15)	11	77	CE1[1]		
J1even (17)	10	76	CE1[0]		
J1even (19)	9	75	CE0[1]		
J1even (21)	8	74	CE0[0]		
J1even (23)	7	63	A23		
J1even (25)	6	62	A22		
J1even (27)	5	59	A21		
J1even (29)	4	58	A20		
J1even (31)	3	57	A19		
J1even (33)	2	56	A18		
J1even (35)	1	55	A17		
J1even (37)	0	54	A16		

Connector	Analyzer Bit	TMPR3904 Pin #	Signal Name	Analyzer Label	Analyzer Label
J2odd (6)	CLK1	-	-		
J2odd (8)	15	154	D15		
J2odd (10)	14	155	D14		
J2odd (12)	13	158	D13		
J2odd (14)	12	159	D12		
J2odd (16)	11	160	D11		
J2odd (18)	10	161	D10		
J2odd (20)	9	162	D9		
J2odd (22)	8	163	D8		
J2odd (24)	7	166	D7		
J2odd (26)	6	167	D6		
J2odd (28)	5	168	D5		
J2odd (30)	4	169	D4		
J2odd (32)	3	170	D3		
J2odd (34)	2	171	D2		
J2odd (36)	1	174	D1		
J2odd (38)	0	175	D0		
J2even (5)	CLK1	-	-		
J2even (7)	15	134	D31		
J2even (9)	14	135	D30		
J2even (11)	13	136	D29		
J2even (13)	12	138	D28		
J2even (15)	11	139	D27		
J2even (17)	10	140	D26		
J2even (19)	9	141	D25		
J2even (21)	8	143	D24		
J2even (23)	7	144	D23		
J2even (25)	6	145	D22		
J2even (27)	5	146	D21		
J2even (29)	4	149	D20		
J2even (31)	3	150	D19		
J2even (33)	2	151	D18		
J2even (35)	1	152	D17		
J2even (37)	0	153	D16		

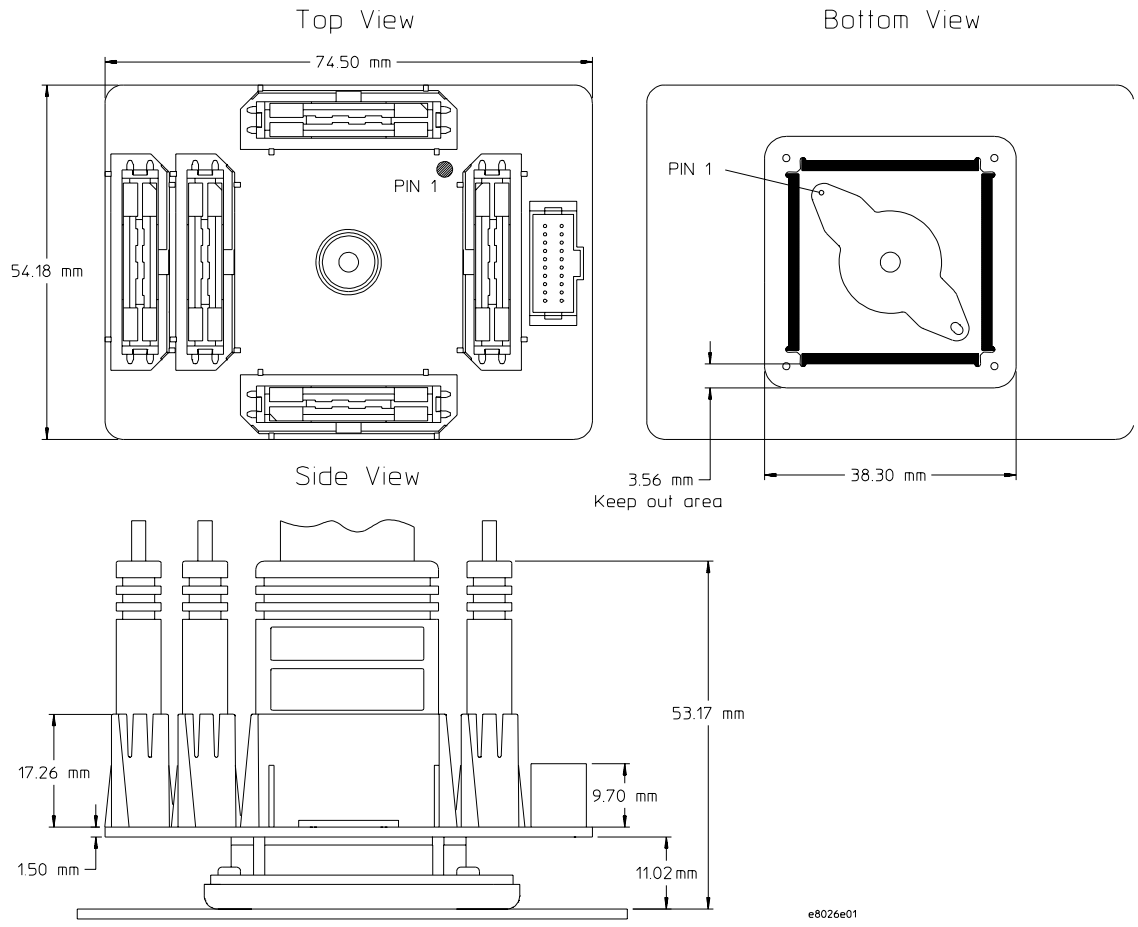
Connector	Analyzer Bit	TMPR3904 Pin #	Signal Name	Analyzer Label	Analyzer Label
J3odd (6)	CLK1	196	RESET		
J3odd (8)	15	21	RAS1[3]		
J3odd (10)	14	20	RAS1[2]		
J3odd (12)	13	18	RAS1[1]		
J3odd (14)	12	17	RAS1[0]		
J3odd (16)	11	16	RAS0[3]		
J3odd (18)	10	13	RAS0[2]		
J3odd (20)	9	12	RAS0[1]		
J3odd (22)	8	1	RAS0[0]		
J3odd (24)	7	4	R/W		
J3odd (26)	6	199	BSTART		
J3odd (28)	5	3	LAST		
J3odd (30)	4	197	ACK		
J3odd (32)	3	5	BE3		
J3odd (34)	2	6	BE2		
J3odd (36)	1	7	BE1		
J3odd (38)	0	8	BE0		
J3even (5)	CLK1	202	SYSCLK		
J3even (7)	15	198	BUSERR		
J3even (9)	14	203	PLLOFF		
J3even (11)	13	204	CLKEN		
J3even (13)	12	32	WE		
J3even (15)	11	31	TOUT3		
J3even (17)	10	30	TOUT2		
J3even (19)	9	28	TOUT1		
J3even (21)	8	27	TOUT0		
J3even (23)	7	26	CAS3		
J3even (25)	6	25	CAS2		
J3even (27)	5	23	CAS1		
J3even (29)	4	22	CAS0		
J3even (31)	3	78	OE0		
J3even (33)	2	80	OE1		
J3even (35)	1	82	SWE1		
J3even (37)	0	81	SWE0		

Connector	Analyzer Bit	TMPR3904 Pin #	Signal Name	Analyzer Label	Analyzer Label
J4odd (6)	CLK1	128	CTS0		
J4odd (8)	15	127	CTS1		
J4odd (10)	14	126	SIN0		
J4odd (12)	13	125	SIN1		
J4odd (14)	12	124	SCLK		
J4odd (16)	11	123	TIMIN1		
J4odd (18)	10	122	TIMIN2		
J4odd (20)	9	121	TIMOUT1		
J4odd (22)	8	120	TIMOUT2		
J4odd (24)	7	118	PIO7		
J4odd (26)	6	117	PIO6		
J4odd (28)	5	116	PIO5		
J4odd (30)	4	115	PIO4		
J4odd (32)	3	113	PIO3		
J4odd (34)	2	112	PIO2		
J4odd (36)	1	111	PIO1		
J4odd (38)	0	110	PIO0		
J4even (5)	CLK1	-	-		
J4even (7)	15	185	INT7		
J4even (9)	14	184	INT6		
J4even (11)	13	183	INT5		
J4even (13)	12	182	INT4		
J4even (15)	11	181	INT3		
J4even (17)	10	179	INT2		
J4even (19)	9	178	INT1		
J4even (21)	8	177	INT0		
J4even (23)	7	176	NMI		
J4even (25)	6	-	-		
J4even (27)	5	-	-		
J4even (29)	4	-	-		
J4even (31)	3	133	RTS0		
J4even (33)	2	132	RTS1		
J4even (35)	1	131	SOUT0		
J4even (37)	0	130	SOUT1		

Connector	Analyzer Bit	TMPR3904 Pin #	Signal Name	Analyzer Label	Analyzer Label
J5odd (6)	CLK1	-	-		
J5odd (8)	15	-	-		
J5odd (10)	14	-	-		
J5odd (12)	13	-	-		
J5odd (14)	12	-	-		
J5odd (16)	11	90	BUSREL		
J5odd (18)	10	89	BUSGNT		
J5odd (20)	9	87	HALF		
J5odd (22)	8	86	Boot16		
J5odd (24)	7	73	A31		
J5odd (26)	6	72	A30		
J5odd (28)	5	71	A29		
J5odd (30)	4	70	A28		
J5odd (32)	3	67	A27		
J5odd (34)	2	66	A26		
J5odd (36)	1	65	A25		
J5odd (38)	0	64	A24		
J5even (5)	CLK1	-	-		
J5even (7)	15	-	-		
J5even (9)	14	-	-		
J5even (11)	13	-	-		
J5even (13)	12				
J5even (15)	11	-	-		
J5even (17)	10	103	BUSREQ		
J5even (19)	9	102	HAVEIT		
J5even (21)	8	95	DONE		
J5even (23)	7	101	DREQ3		
J5even (25)	6	100	DREQ2		
J5even (27)	5	99	DREQ1		
J5even (29)	4	98	DREQ0		
J5even (31)	3	94	DACK3		
J5even (33)	2	93	DACK2		
J5even (35)	1	92	DACK1		
J5even (37)	0	91	DACK0		

Circuit Board Dimensions

The following figure gives the dimentsions for the Analysis Probe assembly. The dimensions are listed in millimeter.



Emulation Module, Trace Port Analyzer - Operating characteristics

The following operating characteristics are not specifications, but are typical operating characteristics for the Agilent Technologies 16610A emulation module, trace port analyzer, and TX19/39 target interface module.

Processor Compatibility

The Agilent Technologies E3468A Tx19/39 Series emulator supports the TMPR 1904, 3901, 3903 and 3904 microprocessors.

Emulation Module Electrical Characteristics

Maximum Ratings

Characteristics for the Tx19/39 Embedded MIPS	Notes	Symbol	Min	Max	Unit
Input voltage range		V_{in}	-0.5	5.5	V
Input voltage range (Vtt)			1.3	1. 7	V
Input High Voltage		V_{ih}	$^2/_3V_{tt}$ + 0.2		V
Input Low Voltage		V_{il}		$^2/_3V_{tt}$ - 0.2	V
Input High Current		I_{ih}		-15	µA
Input Low Current		I_{il}		100	µA
Output High Voltage		V_{oh}	2.4	3.3	V
Output Low Voltage		V_{ol}		0.5	V
Output High Current		I_{oh}	8		mA
Output Low Current		I_{ol}	-16		mA

Trace Port Analyzer Electrical Characteristics

Characteristics for the Tx19/39 Trace Port Analyzer	Notes	Symbol	Min	Max	Unit
Input voltage range			-0.5	5.5	V
Input High Voltage			2.0		V
Input Low Voltage				0.7	V
Input High Current				-32	mA
Input Low Current				32	mA
Output High Voltage			2.4		V
Output Low Voltage				0.45	V
Output High Current			25		mA
Output Low Current			-25		mA

Emulation Module Environmental Characteristics

The Agilent Technologies 16610A emulation module meets the environmental characteristics of the logic analysis system in which it is installed.

For indoor use only.

Trace Port Analyzer Environmental Characteristics

Temperature

Operating, 0 to +40 °C (+32 to +104 °F); nonoperating, -40 to +60 °C (-40 to +140 °F).

Altitude

Operating/nonoperating 4600 m (15 000 ft).

Relative Humidity

15% to 95%.

For indoor use only.

8

Troubleshooting the Analysis Probe

Troubleshooting the Analysis Probe

If you encounter difficulties while making measurements, use this chapter to guide you through some possible solutions. Each heading lists a problem you may encounter, along with some possible solutions.

If you still have difficulty using the analyzer after trying the suggestions in this chapter, please contact your local Agilent Technologies service center.

CAUTION When you are working with the analyzer, be sure to power down both the analyzer and the target system before disconnecting or connecting cables, probes, and analysis probes. Otherwise, you may damage circuitry in the analyzer, analysis probe, or target system.

Logic Analyzer Problems

This section lists general problems that you might encounter while using the logic analyzer.

Intermittent data errors

This problem is usually caused by poor connections, incorrect signal levels, or marginal timing.

- Remove and reseat all cables and probes, ensuring that there are no bent pins on the analysis probe interface or poor probe connections.
- Adjust the threshold level of the data pod to match the logic levels in the system under test.
- Use an oscilloscope to check the signal integrity of the data lines.

  Clock signals for the state analyzer must meet particular pulse shape and timing requirements. Data inputs for the analyzer must meet pulse shape and setup and hold time requirements.

See Also See "Capacitive Loading" in this chapter for information on other sources of intermittent data errors.

Unwanted triggers

Unwanted triggers can be caused by instructions that were fetched but not executed.

- Add the prefetch queue or pipeline depth to the trigger address to avoid this problem.

  The logic analyzer captures prefetches, even if they are not executed. When you are specifying a trigger condition or a storage qualification that follows an instruction that may cause branching, an unused prefetch may generate an unwanted trigger.

No activity on activity indicators

•Check for loose cables, board connections, and analysis probe interface connections.

•Check for bent or damaged pins on the analysis probe.

No trace list display

If there is no trace list display, it may be that your trigger specification is not correct for the data you want to capture, or that the trace memory is only partially filled.

•Check your trigger sequencer specification to ensure that it will capture the events of interest.

•Try stopping the analyzer; if the trace list is partially filled, this should display the contents of trace memory.

Analyzer won't power up

If logic analyzer power is cycled when the logic analyzer is connected to a target system or emulation probe that remains powered up, the logic analyzer may not be able to power up. Some logic analyzers are inhibited from powering up when they are connected to a target system or emulation probe that is already powered up.

•Disconnect all logic analyzer cabling from the analysis probe. This will allow the logic analyzer to power up. Reconnect logic analyzer cabling after power up.

Analysis Probe Problems

This section lists problems that you might encounter when using an analysis probe. If the solutions suggested here do not correct the problem, you may have a damaged analysis probe. Contact your local Agilent Technologies Sales Office if you need further assistance.

Target system will not boot up

If the target system will not boot up after connecting the analysis probe interface, the microprocessor (if socketed) or the analysis probe interface may not be installed properly, or they may not be making electrical contact.

- Ensure that you are following the correct power-on sequence for the analysis probe and target system.

  1. Power up the analyzer and analysis probe.
  2. Power up the target system.

  If you power up the target system before you power up the analysis probe, interface circuitry in the analysis probe may latch up and prevent proper target system operation.

- Verify that the microprocessor and the analysis probe interface are properly rotated and aligned, so that the index pin on the microprocessor (pin A1) matches the index pin on the analysis probe interface.
- Verify that the microprocessor and the analysis probe interface are securely inserted into their respective sockets.
- Verify that the logic analyzer cables are in the proper sockets of the analysis probe interface and are firmly inserted.

Erratic trace measurements

•Do a full reset of the target system before beginning the measurement.

Some analysis probe designs require a full reset to ensure correct configuration.

•Ensure that your target system meets the timing requirements of the processor with the analysis probe probe installed.

See “Capacitive loading” in this chapter. While analysis probe loading is slight, pin protectors, extenders, and adapters may increase it to unacceptable levels. If the target system design has close timing margins, such loading may cause incorrect processor functioning and give erratic trace results.

•Ensure that you have sufficient cooling for the microprocessor.

Ensure that you have ambient temperature conditions and airflow that meet or exceed the requirements of the microprocessor manufacturer.

Capacitive loading

Excessive capacitive loading can degrade signals, resulting in incorrect capture by the analysis probe interface, or system lockup in the microprocessor. All analysis probe interfaces add additional capacitive loading, as can custom probe fixtures you design for your application.

Careful layout of your target system can minimize loading problems and result in better margins for your design. This is especially important for systems that are running at frequencies greater than 50 MHz.

•Remove as many pin protectors, extenders, and adapters as possible.

•If multiple analysis probe interface solutions are available, use one with lower capacitive loading.

State Analysis Problems

This section lists problems that you might encounter while using the B3759A #800 emulation solution user interface software.

When you obtain incorrect inverse assembly results, it may be unclear whether the problem is in the analysis probe or in your target system. If you follow the suggestions in this section to ensure that you are using the analysis probe and inverse assembler correctly, you can proceed with confidence in debugging your target system.

No inverse assembly or incorrect inverse assembly

This problem may be due to incorrect synchronization, modified configuration, incorrect connections, or a hardware problem in the target system. A locked status line can cause incorrect or incomplete inverse assembly.

•Ensure that each logic analyzer pod is connected to the correct analysis probe connector.

There is not always a one-to-one correspondence between analyzer pod numbers and analysis probe cable numbers. Analysis Probes must supply address (ADDR), data (DATA), and status (STAT) information to the analyzer in a predefined order. The cable connections for each analysis probe are often altered to support that need. Thus, one analysis probe might require that you connect cable 2 to analyzer pod 2, while another will require you to connect cable 5 to analyzer pod 2. See Chapter 3 for connection information.

•Check the activity indicators for status lines locked in a high or low state.

•Verify that the STAT, DATA, and ADDR format labels have not been modified from their default values.

These labels must remain as they are configured by the configuration file. Do not change the names of these labels or the bit assignments within the labels. Some analysis probes also require other data labels. See Chapter 3 for more information.

•Verify that all microprocessor caches have been disabled.

In most cases, if the microprocessor caches remain enabled you should still get inverse assembly. It may be incorrect because a portion of the execution trace was not visible to the logic analyzer.

- Verify that storage qualification has not excluded storage of all the needed opcodes and operands.

Intermodule Measurement Problems

Some problems occur only when you are trying to make a measurement involving multiple modules.

An event wasn't captured by one of the modules

If you are trying to capture an event that occurs very shortly after the event that arms one of the measurement modules, it may be missed due to internal analyzer delays. For example, suppose you set an oscilloscope module to trigger upon receiving a trigger signal from the logic analyzer because you are trying to capture a pulse that occurs right after the analyzer's trigger state. If the pulse occurs too soon after the analyzer's trigger state, the oscilloscope will miss the pulse.

- Adjust the skew in the Intermodule menu.

  You may be able to specify a skew value that enables the event to be captured.

- Change the trigger specification for modules upstream of the one with the problem.

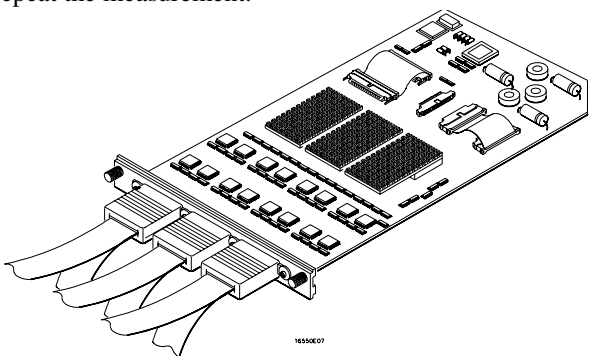
  If you are using a logic analyzer to trigger an oscilloscope module, try specifying a trigger state one state before the one you are using. This may be more difficult than working with the skew because the prior state may occur more often and not always be related to the event you are trying to capture with the oscilloscope.

Analysis Probe Messages

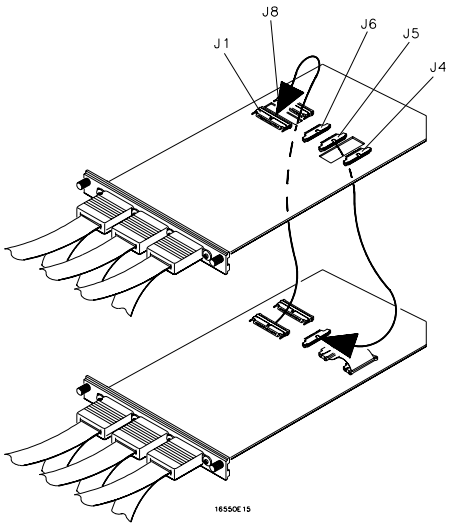
This section lists some of the messages that the analyzer displays when it encounters a problem.

"Measurement Initialization Error"

This error occurs when you have installed the cables incorrectly for one or two Agilent Technologies 16550A logic analysis cards. The following diagrams show the correct cable connections for one-card and two-card installations. Ensure that your cable connections match the silk screening on the card, and that they are fully seated in the connectors. Then, repeat the measurement.



Cable Connections for One-Card Agilent Technologies 16550A Installations



Cable Connections for Two-Card Agilent Technologies 16550A Installations

See Also

The *Agilent Technologies 16550A 100-MHz State/500-MHz Timing Logic Analyzer Service Guide*.

"No Configuration File Loaded"

This is usually caused by trying to load a configuration file for one type of module/system into a different type of module/system.

- Verify that the appropriate module has been selected from the Load {module} from File {filename} in the disk operation menu. Selecting Load {All} will cause incorrect operation when loading most analysis probe interface configuration files.

"Selected File is Incompatible"

This occurs when you try to load a configuration file for the wrong module. Ensure that you are loading the appropriate configuration file for your logic analyzer.

"Slow or Missing Clock"

- This error message might occur if the logic analyzer cards are not firmly seated in the logic analysis system frame. Ensure that the cards are firmly seated.
- This error might occur if the target system is not running properly. Ensure that the target system is on and operating properly.
- If the error message persists, check that the logic analyzer pods are connected to the proper connectors on the analysis probe interface. See Chapter 2 to determine the proper connections.

"Time from Arm Greater Than 41.93 ms"

The Agilent Technologies 16550A state/timing analyzers have a counter to keep track of the time from when an analyzer is armed to when it triggers. The width and clock rate of this counter allow it to count for up to 41.93 ms before it overflows. Once the counter has overflowed, the system does not have the data it needs to calculate the time between module triggers. The system must know this time to be able to display data from multiple modules on a single screen.

"Waiting for Trigger"

If a trigger pattern is specified, this message indicates that the specified trigger pattern has not occurred. Verify that the triggering pattern is correctly set.

- When analyzing microprocessors that fetch only from word-aligned addresses, if the trigger condition is set to look for an opcode fetch at an address not corresponding to a word boundary,

Returning Parts to Agilent Technologies for Service

The repair strategy for this emulation solution is board replacement.

Exchange assemblies are available when a repairable assembly is returned to Agilent Technologies. These assemblies have been set up on the "Exchange Assembly" program. This lets you exchange a faulty assembly with one that has been repaired, calibrated, and performance verified by the factory. The cost is significantly less than that of a new assembly.

To return a part to Agilent Technologies

1. Follow the procedures in this chapter to make sure that the problem is caused by a hardware failure, not by configuration or cabling problems.
2. Call your nearest Agilent Technologies sales office. Ask them for the address of the nearest Agilent Technologies service center.
3. Package the part and send it to the Agilent Technologies service center.

   Keep any parts which you know are working. For example, if only the target interface module is broken, keep the emulation module and cables.
4. When the part has been replaced, it will be sent back to you.

   The unit returned to you will have the same serial number as the unit you sent to Agilent Technologies.

To obtain replacement parts

The following table lists some parts that may be replaced if they are damaged or lost. Contact your nearest Agilent Technologies Sales Office for further information.

Analysis Probe Replaceable Parts

Agilent Part Number	Description
E5346A	High-density Cable
E8026-66501	Analysis Probe Circuit Board
E5350-23801	Cam Tool
E5322-60001	Retainer Kit
E5322-23803	Locator Tool
5081-7799	208 pin QFP Elastomeric Probe

Cleaning the Instrument

If the instrument requires cleaning:

1. Remove power from the instrument.
2. Clean the instrument with a mild detergent and water.
3. Make sure that the instrument is completely dry before reconnecting it to a power source.

9

Troubleshooting the Emulation Module

Troubleshooting the Emulation Module

If you have problems with the emulation module, your first task is to determine the source of the problem. Problems may originate in any of the following places:

- The connection between the emulation module and your debugger
- The emulation module itself
- The connection between the emulation module and the Trace Port Analyzer
- The connection between the Trace Port Analyzer and the Target interface module
- The connection between the target interface module and the target system
- The target system

You can use several means to determine the source of the problem:

- The troubleshooting guide on the next page
- The status lights on the emulation probe or emulation module
- The emulator "performance verification" tests
- The Trace Port Analyzer "performance verification" tests
- The emulator's built-in "terminal interface" commands

Emulation Module Troubleshooting Guide

Common problems and what to do about them

Symptom	What to do	See also
Commands from debugger have no effect	Your debugger may not be configured properly. If this does not work, continue with the steps for the next symptom....	page 119
Emulation module built-in commands do not work	**1** Run the emulation module performance verification tests.	page 128
	2 If the performance verification tests pass, then there is an electrical problem with the connection to the target processor OR the target system may not have been designed according to "Designing a Target System."	page 74, page 122
"Slow or missing clock" message after a logic analyzer run	Check that the target system is running user code or is in reset. (This message can appear if the processor is in background mode.)	
Host computer reports LAN connection problems	Follow the checklist in the "If you have LAN problems" section.	page 126
Commands from the Run Control tool or debugger have no effect	Verify LAN communication.	page 119

Status Lights

Emulation Module Status Lights

The emulation module uses status lights to communicate various modes and error conditions.

The following table gives more information about the meaning of the power and target status lights.

❍ = LED is off
● = LED is on
✳ = Not applicable (LED is off or on)

Power/Target Status Lights

Pwr/Target LEDs	Meaning
❍ Reset ❍ Break ❍ Run	No target system power, or emulation module is not connected to the target system
● Reset ❍ Break ❍ Run	Target system is in a reset state
❍ Reset ● Break ❍ Run	The target processor is executing in Debug Mode
❍ Reset ❍ Break ● Run	The target processor is executing user code
❍ Reset ● Break ● Run	Only boot firmware is good (other firmware has been corrupted)

Emulation Module Built-in Commands

The emulation module has some built-in "terminal interface" commands which you can use for troubleshooting. You can access the terminal interface using:

- A telnet (LAN) connection
- A "debugger command" window in your debugger

To telnet to the emulation module

You can establish a telnet connection to the emulation module if:

- A host computer and the logic analysis system are both connected to a local-area network (LAN), and
- The host computer has the telnet program (often part of the operating system or an internet software package).

To establish a telnet connection:

1. Find out the port number of the emulation module.

   The default port number of the first emulation module in an Agilent Technologies 16600A/700A series logic analysis system is 6472. The default port of a second module in an Agilent Technologies 16600A-series system is 6476. The default port numbers of a third and fourth module in an expansion frame are 6480 and 6484. These port numbers can be changed, but that is rarely necessary.
2. Find out the LAN address or LAN name of the logic analysis system.
3. Start the telnet program.

   If the LAN name of the logic analysis system is "test2" and you have only one emulation module installed, the command might look like this:

   ```
   telnet test2 6472
   ```
4. If you do not see a prompt, press the <Return> key a few times.

   To exit from this telnet session, type <CTRL>D at the prompt.

To use the built-in commands

Here are a few commonly used built-in commands:

Useful built-in commands

b	Break -- go into the background monitor state
cf	Configuration -- read or write configuration options
help	Help -- display online help for built-in commands
init	Initialize -- init -c re-initializes everything in the emulation module except for the LAN software; init -p is the equivalent of cycling power (it will break LAN connections)
lan	configure LAN address
m	Memory -- read or write memory
reg	Register -- read or write a register
r	Run -- start running user code
rep	Repeat -- repeat a command or group of commands
rst	Reset -- reset the target processor (the emulation module will wait for you to press the target's RESET button)
s	Step -- do a low-level single step
ver	Version -- display the product number and firmware version of the emulation module

The prompt indicates the status of the emulation module:

Emulation module prompts	
U	Running user program
M	Running in background monitor
p	No target power
R	Emulation reset
r	Target reset
?	Unknown state

Examples

To set register R0, then view R0 to verify that it was set, enter:

```
R>rst -m
M>reg r0=ffff
M>reg r0
  reg R0=0000ffff
```

To break execution then step a single instruction, enter:

```
M>b
M>s
  PC=xxxxxxxx
M>
```

To determine what firmware version is installed in the emulation module, enter:

```
M>ver
```

See Also

Use the help command for more information on these and other commands. Note that some of commands listed in the help screens are generic commands for Agilent Technologies emulators and may not be available for your product.

If you are writing your own debugger, contact Agilent Technologies for more information.

Problems with the Target System

This section describes how to determine whether your target system is causing problems with the operation of the emulation module.

What to check first

1 Try some basic built-in commands using the Command Line window or a telnet connection:

```
U>rst
R>
```

This should reset the target and display a "R>" prompt.

```
R>b
M>
```

This should stop the target and display an "M>" prompt.

```
M>reg r1
  reg r1=00000000
M>
```

This should read the value of the r1 register (the value will probably be different on your target system).

```
M>m 0..
  00000000   7c3043a6 7c2802a6 7c3143a6 4bf04111
  00000010   00000000 00000000 00000000 00000000
  00000020   00000000 00000000 00000000 00000000
  00000030   00000000 00000000 00000000 00000000
  00000040   00000000 00000000 00000000 00000000
  00000050   00000000 00000000 00000000 00000000
  00000060   00000000 00000000 00000000 00000000
  00000070   00000000 00000000 00000000 00000000
M>
```

This should display memory values starting at address 0.

```
M>s
```

This should execute one instruction at the current program counter.

If any of these commands don't work, there may be a problem with the design of your target system, a problem with the revision of the emulation you are using, or a problem with the configuration of the emulation module. The following steps will help you identify the problem.

2 Check that the emulation module firmware matches your processor. To do this, enter:

M>**ver**

See Also Page 119 for information on entering built-in commands.

To interpret the initial prompt

The initial prompt can be used to diagnose several common problems. To get the most information from the prompt, follow this procedure:

1 Connect the emulation module to your target system.

2 Set the default configuration settings. Enter:

```
M>init -c
```

You can enter this command at any prompt. The emulation module will respond with the same information as printed by the "ver" command.

If the response is "!ERROR 905! Driver firmware is incompatible with ID of attached device"

Make sure the target interface module is connected to the cable of the emulation module, then try the "init -c" command again.

If the initial prompt is "p>"

Check pin 3 on header.

If the initial prompt is "M>"

The processor entered debug mode without the help of the emulation module. Is another debugger connected?

If the initial prompt is "U>"

The emulation module is scanning the instruction register correctly. Now you can do some more tests:

4 Enter the reset command:

```
U>rst
R>
```

The "R>" prompt is a good response that indicates SRESET and HRESET are working.

Problems with the LAN Interface

If LAN communication does not work

If you cannot verify connection using the procedure in "To verify LAN communication", or if the commands are not accepted by the emulation module:

- ❑ Make sure that you wait for the power-on self test to complete before connecting.
- ❑ Make sure that the LAN cable is connected. Watch the LAN LED's on the back of the logic analysis system to see whether the system is seeing LAN activity. Refer to your LAN documentation for testing connectivity.
- ❑ Check that the host computer or debugger was configured with the correct LAN address. If the logic analysis system is on a different subnet than the host computer, check that the gateway address is correct.
- ❑ Make sure that the logic analysis system's IP address is set up correctly.

If it takes a long time to connect to the network

- ❑ Check the subnet masks on the other LAN devices connected to your network. All of the devices should be configured to use the same subnet mask.

  Subnet mask error messages do not indicate a major problem. You can continue using the emulation module.

  The subnet masks is set in the logic analysis system's System Admin window. If it then detects other subnet masks, it will generate error messages.

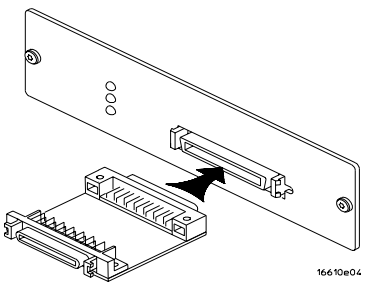
  If there are many subnet masks in use on the local subnet, the logic analysis system may take a very long time to connect to the network after it is turned on.

Problems with the Emulation Module

Occasionally you may suspect a hardware problem with the emulation module or target interface module. The procedures in this section describe how to test the hardware, and if a problem is found, how to repair or replace the broken component.

To run the built-in performance verification test using the logic analysis system (emulation module only)

1. End any Emulation Control Interface or debugger sessions.
2. Disconnect the 50-pin cable from the emulation module, and plug the loopback test board (Agilent part number E3496-66502) into the emulation module.



3. In the system window, click the emulation module and select **Performance Verification**.
4. Click **Start PV**.

   The results will appear on screen.

To run complete performance verification tests using a telnet connection (emulation module only)

1. Disconnect the 50-pin cable from the emulation module, and plug the loopback test board (Agilent part number E3496-66502) directly into the emulation module. Do not plug anything into the other end of the loopback test board.

   On a good system, the RESET LED will light and the BKG and USER LEDs will be out.
2. telnet to the emulation module.
3. Enter the **pv 1** command.

See Also

Options available for the "pv" command are explained in the help screen displayed by typing "help pv" or "? pv" at the prompt. Note, however, that some of the options listed may not apply to your emulation module.

Examples:

If you are using a UNIX system, to telnet to a logic analysis system named "mylogic", enter:

```
telnet mylogic 6472
```

Here are some examples of ways to use the **pv** command.

To execute both tests one time:

```
pv 1
```

To execute test 2 with maximum debug output repeatedly until a ^C is entered:

```
pv -t2 -v9 0
```

To execute tests 3, 4, and 5 only for 2 cycles:

```
pv -t3-5 2
```

The results on a good system with the loopback test board connected, are as follows:

```
M>pv 1

 Testing: E3499C Series Emulation System
   Test  1: Powerup PV Results                    Passed!
   Test  2: Target Probe Feedback Test            Passed!
   Test  3: Boundary Scan Master Test             Passed!
   Test  4: I2C Test                          Passed!
   Test  5: Data Lines Test                       Passed!
 PASSED  Number of tests: 1         Number of failures: 0

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written permission is prohibited, except as allowed under copyright laws.
```

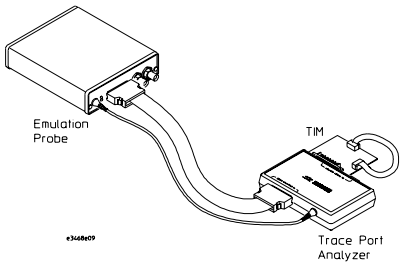
```
  E3499C Series Emulation System
    Version:   A.07.51 17Dec97
    Location:  Generics

  E3468A Toshiba TX19/39 Series Emulator
    Version:   A.01.00 Jan 99
M>
```

Problem with the Trace Port Analyzer and TIM

To perform the TIM and Trace Port Analyzer PV tests with an emulation probe/module

1. End any Emulation Control Interface or debugger sessions.
2. Disconnect the 20-pin cable from a target system, and plug the target end of 20-pin cable into loop-back connector on a TIM.



3. Telnet to the emulation probe/module.
4. Enter **pv 1** command.

The result will appear on screen as below.

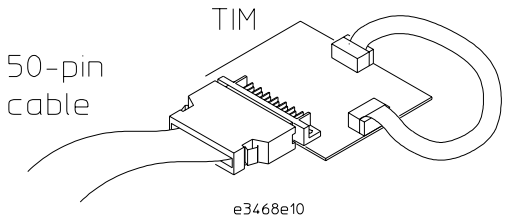
```
Testing: E3499B Series Emulation System
   Test  1: Powerup PV Results                    Passed!
   Test  2: LAN 10Base2 Feedback Test             Not Executed!
   Test  3: LAN 10BaseT Feedback Test             Not Executed!
   Test  4: Break In and Trigger Out BNC Feedback Test   Passed!
   Test  5: Target Probe Feedback Test            Not Executed!
   Test  6: Boundary Scan Master Test             Not Executed!
   Test  7: I2C Test                          Not Executed!
   Test  8: Data Lines Test                       Passed!
Testing: E3468A Toshiba TX19/39 Series Emulator
   Test  1: E3468 TIM/TP Test                     Passed!
 PASSED  Number of tests: 1         Number of failures: 0
```

E3499B Series Emulation System
Version: A.07.07 06Jul98 12:56 Proto
Location: Generics

E3468A Toshiba TX19/39 Series Emulator
Version: A.01.00 Jan 99

To perform the TIM only PV tests with an emulation probe/module

1. End any Emulation Control Interface or debugger sessions.
2. Disconnect the trace port analyzer, and connect a TIM to 50-pin cable directly.
3. Disconnect the TIM board from the trace port analyzer, and plug the loop-back board into the trace port analyzer.



4. Telnet to the emulation probe/module.
5. Enter **pv 1** command.

   The result will appear on screen as below.

```
Testing: E3499B Series Emulation System
   Test  1: Powerup PV Results                    Passed!
   Test  2: LAN 10Base2 Feedback Test             Not Executed!
   Test  3: LAN 10BaseT Feedback Test             Not Executed!
   Test  4: Break In and Trigger Out BNC Feedback Test   Passed!
   Test  5: Target Probe Feedback Test            Not Executed!
   Test  6: Boundary Scan Master Test             Not Executed!
   Test  7: I2C Test                          Not Executed!
   Test  8: Data Lines Test                       Passed!
Testing: E3468A Toshiba TX19/39 Series Emulator
   Test  1: E3468 TIM Test                        Passed!
 PASSED  Number of tests: 1          Number of failures: 0
```


E3499B Series Emulation System
Version: A.07.07 06Jul98 12:56 Proto
Location: Generics

If a performance verification test fails

- Details of the failure can be obtained through using a -v option ("verbose" level) of 2 or more.
- Check that the loopback test board is connected.
- If the problem persists, contact Agilent Technologies for assistance.

Returning Parts to Agilent Technologies for Service

The repair strategy for this emulation solution is board replacement.

Exchange assemblies are available when a repairable assembly is returned to Agilent Technologies. These assemblies have been set up on the "Exchange Assembly" program. This lets you exchange a faulty assembly with one that has been repaired, calibrated, and performance verified by the factory. The cost is significantly less than that of a new assembly.

To return a part to Agilent Technologies

1. Follow the procedures in this chapter to make sure that the problem is caused by a hardware failure, not by configuration or cabling problems.
2. In the U.S., call 1-800-403-0801. Outside the U.S., call your nearest Agilent Technologies sales office. Ask them for the address of the nearest Agilent Technologies service center.
3. Package the part and send it to the Agilent Technologies service center.

   Keep any parts which you know are working. For example, if only the target interface module is broken, keep the emulation module and cables.
4. When the part has been replaced, it will be sent back to you.

   The unit returned to you will have the same serial number as the unit you sent to Agilent Technologies.

The Agilent Technologies service center can also troubleshoot the hardware and replace the failed part. To do this, send your entire measurement system to the service center, including the logic analysis system, target interface module, and cables.

In some parts of the world, on-site repair service is available. Ask an Agilent Technologies sales or service representative for details.

To obtain replacement parts

The following table lists some parts that may be replaced if they are damaged or lost. The part numbers are subject to change. Contact your nearest Agilent Technologies Sales Office for further information.

Part numbers

Exchange Assemblies

Part Number	Description
16600-69515	Emulation module
E3468-66401	Programmed emulation probe assembly

Replacement Assemblies

Part Number	Description
E3492-61601	20-pin target cable
E3496-61601	50-pin cable
E3496-66502	Loopback test board
E3468-66501	Target Interface Module
16700-61608	Expansion cable for emulation module
0950-3043	Power supply for emulation probe
E5890-64301	Trace Port Analyzer
E5890-66502	Trace Port Analyzer loopback test board

Cleaning the Instrument

If the instrument requires cleaning:

1. Remove power from the instrument.
2. Clean the instrument with a mild detergent and water.
3. Make sure that the instrument is completely dry before reconnecting it to a power source.

Glossary

Analysis Probe

A probing solution connected to the target microprocessor. It provides an interface between the signals of the target microprocessor and the inputs of the logic analyzer. Formerly called a "preprocessor."

Elastomeric Probe Adapter

A connector that is fastened on top of a target microprocessor using a retainer and knurled nut. The conductive elastomer on the bottom of the probe adapter makes contact with pins of the target microprocessor and delivers their signals to connection points on top of the probe adapter.

Emulation Module

An emulation module is installed within the mainframe of a logic analyzer. It provides run control within an emulation and analysis test setup. See Emulation Probe.

Emulation Probe

An emulation probe is a standalone instrument connected to the mainframe of a logic analyzer. It provides run control within an emulation and analysis test setup. Formerly called a "processor probe" or "software probe." See Emulation Module.

Extender

A part whose only function is to provide connections from one location to another. One or more extenders might be stacked to raise a probe above a target micoprocessor to avoid mechanical contact with other components installed close to the target microprocessor. Sometimes called a "connector board."

Flexible Adapter

Two connection devices coupled with a flexible cable. Used for connecting probing hardware on the target microprocessor to the analysis probe.

General-Purpose Flexible Adapter

A cable assembly that connects the signals from an elastomeric probe adapter to an analysis probe. Normally, a male-to-male header or transition board makes the connections from the general-purpose flexible adapter to the analysis probe.

High-Density Adapter Cable

A cable assembly that delivers signals from an analysis probe hardware

interface to the logic analyzer pod cables. A high-density adapter cable has a single Mictor connector that is installed into the analysis probe, and two cables that are connected to corresponding odd and even logic analyzer pod cables.

High-Density Termination Adapter Cable

Same as a High-Density Adapter Cable, except it has a termination in the Mictor connector.

Jumper

Moveable direct electrical connection between two points.

Mainframe Logic Analyzer

A logic analyzer that resides on one or more board assemblies installed in an Agilent Technologies 16500, 1660x, or 16600A/700A-series mainframe.

Male-to-male Header

A board assembly that makes point-to-point connections between the female pins of a flexible adapter or transition board and the female pins of an analysis probe.

Preprocessor

See Analysis Probe.

Preprocessor Interface

See Analysis Probe.

Probe adapter

See Elastomeric Probe Adapter.

Processor Probe

See Emulation Probe.

Prototype Analyzer

The Agilent Technologies 16505A prototype analyzer acts as an analysis and display processor for the Agilent Technologies 16500B/C logic analysis system. It provides a windowed interface and powerful analysis capabilities. Replaced by Agilent Technologies 16600A/700A-series logic analysis systems.

Run Control Probe

See Emulation Probe and Emulation Module.

Setup Assistant

A software program that guides a user through the process of connecting and configuring a logic analyzer to make measurements on a specific microprocessor.

Shunt Connector.

See Jumper.

Software Probe

See Emulation Probe.

Solution

Agilent Technologies' term for a set of tools for debugging your target system. A solution includes probing, inverse assembly, the Agilent Technologies B4620B Source Correlation Tool Set, and possibly an emulation module.

Stand-alone Logic Analyzer

A standalone logic analyzer has a predefined set of hardware components which provide a specific set of capabilities. It is designed to perform logic analysis. A standalone logic analyzer differs from a mainframe logic analyzer in that it does not offer card slots for installation of additional capabilities, and its specifications are not modified based upon selection from a set of optional hardware boards that might be installed within its frame.

Target Control Port

An 8-bit, TTL port on a logic analysis system that you can use to send signals to your target system. It does not function like a pattern generator or emulation module, but more like a remote control for the target's switches.

Target Interface Module

A small circuit board which connects the 50-pin cable from an emulation module or emulation probe to signals from the debug port on a target system.

TIM

See Target Interface Module.

Trace Port Analyzer

A small logic analyzer which was spcialized for PC-Trace function dedicated in Tx19/39 series processors.

Trigger Specification

A set of conditions that must be true before the instrument triggers. See the printed or online documentation for your logic analyzer for details.

Transition Board

A board assembly that obtains signals connected to one side and rearranges them in a different order for delivery at the other side of the board.

1/4-Flexible Adapter

An adapter that obtains one-quarter of the signals from an elastomeric probe adapter (one side of a target microprocessor) and makes them available for probing.

Index

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Agilent Technologies

Manufacturer's Address: Digital Design Product Generation Unit
1900 Garden of the Gods Road
Colorado Springs, CO 80907 USA

declares, that the product

Product Name: Trace Port Analyzer

Model Number(s): Agilent Technologies E5903A

Product Option(s): All

conforms to the following Product Specifications:

Safety: EN 61010-1:1993 / IEC 1010-1:1990+A1
UL 3111
CSA-C22.2 No. 1010.1:1993

EMC: EN 55011:1991 / CISPR 11:1990 - Group 1 Class A
IEC 555-2:1982 + A1:1985 / EN 60555-2:1987
IEC 555-3:1982 + A1:1990 / EN 60555-3:1987 + A1:1991
IEC 801-2:1991 / EN 50082-1:1992 4 kV CD, 8 kV AD
IEC 801-3:1984 / EN 50082-1:1992 3 V/m, {1kHz 80% AM, 27-1000 MHz}
IEC 801-4:1988 / EN 50082-1:1992 0.5 kV Sig. Lines, 1 kV Power Lines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

This product was tested in a typical configuration with Agilent Technologies test systems.

Colorado Springs, 08/10/98

Ken Wyatt

Ken Wyatt / Product Regulations Manager

European Contact: Your local Agilent Technologies Sales and Service Office or Agilent Technologies GmbH, Department ZQ / Standards Europe, Herrenberger Strasse 130, D-71034 Böblingen Germany (FAX: +49-7031-14-3143)

Product Regulations

Safety

IEC 1010-1:1990+A1 / EN 61010-1:1993
CSA-C22.2 No. 1010.1:1993

EMC

This Product meets the requirement of the European Communities (EC) EMC Directive 89/336/EEC.

CE
ISM 1-A

N279

Emissions

EN55011/CISPR 11 (ISM, Group 1, Class A equipment)
EN60555-2 / IEC555-2
EN60555-3 / IEC555-3

Immunity

EN50082-1	Code[1]	Notes[2]
IEC 801-2 (ESD) 4kV CD, 8kV AD	1	
IEC 801-3 (Rad.) 3 V/m	1	
IEC 801-4 (EFT) 0.5 kV, 1kV		

[1]Performance Codes:
1 PASS - Normal operation, no effect.
2 PASS - Temporary degradation, self recoverable.
3 PASS - Temporary degradation, operator intervention required.
4 FAIL - Not recoverable, component damage.

[2]Notes: (none)

Sound Pressure Level

N/A

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Agilent Technologies

Manufacturer's Address: Digital Design Product Generation Unit
1900 Garden of the Gods Road
Colorado Springs, CO 80907 USA

declares, that the product

Product Name: Logic Analyzer Mainframe

Model Number(s): Agilent Technologies 16700A

Product Option(s): All

conforms to the following Product Specifications:

Safety:	IEC 1010-1:1990+A1 / EN 61010-1:1993	
	UL3111	
	CSA-C22.2 No. 1010.1:1993	
EMC:	CISPR 11:1990 / EN 55011:1991	Group 1 Class A
	IEC 555-2:1982 + A1:1985 / EN 60555-2:1987	
	IEC 555-3:1982 + A1:1990 / EN 60555-3:1987 + A1:1991	
	IEC 801-2:1991 / EN 50082-1:1992	4 kV CD, 8 kV AD
	IEC 801-3:1984 / EN 50082-1:1992	3 V/m, {1kHz 80% AM, 27-1000 MHz}
	IEC 801-4:1998 / EN 50082-1:1992	0.5 kV Sig. Lines, 1 kV Power Lines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

This product was tested in a typical configuration with Agilent Technologies test systems.

Colorado Springs, 09/22/97

John Strathman, Quality Manager

European Contact: Your local Agilent Technologies Sales and Service Office or Agilent Technologies GmbH, Department ZQ / Standards Europe, Herrenberger Strasse 130, D-71034 Böblingen Germany (FAX: +49-7031-14-3143)

Product Regulations

Safety

IEC 1010-1:1990+A1 / EN 61010-1:1993
UL3111
CSA-C22.2 No. 1010.1:1993

EMC

This Product meets the requirement of the European Communities (EC) EMC Directive 89/336/EEC.

CE
ISM 1-A

Emissions

EN55011/CISPR 11 (ISM, Group 1, Class A equipment),
IEC 555-2 and IEC 555-3

N279

Immunity

EN50082-1	Code[1]	Notes[2]
IEC 801-2 (ESD) 4kV CD, 8kV	3	
AD	1	
IEC 801-3 (Rad.) 3 V/m	3	
IEC 801-4 (EFT) 0.5 kV, 1kV		

[1]Performance Codes:
1 PASS - Normal operation, no effect.
2 PASS - Temporary degradation, self recoverable.
3 PASS - Temporary degradation, operator intervention required.
4 FAIL - Not recoverable, component damage.

[2]Notes: (none)

Sound Pressure Level

Less than 60 dBA

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Agilent Technologies
Manufacturer's Address:	Digital Design Product Generation Unit 1900 Garden of the Gods Road Colorado Springs, CO 80907 USA

declares, that the product

Product Name:	Logic Analyzer
Model Number(s):	Agilent Technologies 16600A, 16601A, 16602A, 16603A
Product Option(s):	All

conforms to the following Product Specifications:

Safety:	IEC 1010-1:1990+A1 / EN 61010-1:1993 UL3111 CSA-C22.2 No. 1010.1:1993	
EMC:	CISPR 11:1990 / EN 55011:1991	Group 1 Class A
	IEC 555-2:1982 + A1:1985 / EN 60555-2:1987	
	IEC 555-3:1982 + A1:1990 / EN 60555-3:1987 + A1:1991	
	IEC 801-2:1991 / EN 50082-1:1992	4 kV CD, 8 kV AD
	IEC 801-3:1984 / EN 50082-1:1992	3 V/m, {1kHz 80% AM, 27-1000 MHz}
	IEC 801-4:1998 / EN 50082-1:1992	0.5 kV Sig. Lines, 1 kV Power Lines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC and carries the CE marking accordingly.

This product was tested in a typical configuration with Agilent Technologies test systems.

Colorado Springs, 08/18/97

John Strathman, Quality Manager

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Product Regulations

Safety

IEC 1010-1:1990+A1 / EN 61010-1:1993
UL3111
CSA-C22.2 No. 1010.1:1993

EMC

This Product meets the requirement of the European Communities (EC) EMC Directive 89/336/EEC.

CE
ISM 1-A

Emissions

EN55011/CISPR 11 (ISM, Group 1, Class A equipment),
IEC 555-1 and IEC 555-2

N279

Immunity

EN50082-1	Code[1]	Notes[2]
IEC 801-2 (ESD) 4kV CD, 8kV	3	
AD	1	
IEC 801-3 (Rad.) 3 V/m	3	
IEC 801-4 (EFT) 0.5 kV, 1kV		

[1]Performance Codes:
1 PASS - Normal operation, no effect.
2 PASS - Temporary degradation, self recoverable.
3 PASS - Temporary degradation, operator intervention required.
4 FAIL - Not recoverable, component damage.

[2]Notes: (none)

Sound Pressure Level

Less than 60 dBA

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Agilent Technologies shall not be liable for errors contained herein or for damages in connection with the furnishing, performance, or use of this material.

Safety

•This apparatus has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Measuring Apparatus, and has been supplied in a safe condition. This is a Safety Class I instrument (provided with terminal for protective earthing). Before applying power, verify that the correct safety precautions are taken (see the following warnings). In addition, note the external markings on the instrument that are described under "Safety Symbols."

Warning

• Before turning on the instrument, you must connect the protective earth terminal of the instrument to the protective conductor of the (mains) power cord. The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. You must not negate the protective action by using an extension cord (power cable) without a protective conductor (grounding). Grounding one conductor of a two-conductor outlet is not sufficient protection.

• Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuseholders. To do so could cause a shock or fire hazard.

• Service instructions are for trained service personnel. To avoid dangerous electric shock, do not perform any service unless qualified to do so. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

• If you energize this instrument by an auto transformer (for voltage reduction), make sure the common terminal is connected to the earth terminal of the power source.

• Whenever it is likely that the ground protection is impaired, you must make the instrument inoperative and secure it against any unintended operation.

• Do not operate the instrument in the presence of flammable gasses or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

• Do not install substitute parts or perform any unauthorized modification to the instrument.

• Capacitors inside the instrument may retain a charge even if the instrument is disconnected from its source of supply.

• Use caution when exposing or handling the CRT. Handling or replacing the CRT shall be done only by qualified maintenance personnel.

Safety Symbols

Instruction manual symbol: the product is marked with this symbol when it is necessary for you to refer to the instruction manual in order to protect against damage to the product.

Hazardous voltage symbol.

Earth terminal symbol: Used to indicate a circuit common connected to grounded chassis.

WARNING

The Warning sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a Warning sign until the indicated conditions are fully understood and met.

CAUTION

The Caution sign denotes a hazard. It calls attention to an operating procedure, practice, or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product. Do not proceed beyond a Caution symbol until the indicated conditions are fully understood or met.

Agilent Technologies
P.O. Box 2197
1900 Garden of the Gods Road
Colorado Springs, CO 80901

Product Warranty

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For warranty service or repair, this product must be returned to a service facility designated by Agilent Technologies.

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