Help Volume

Emulation: Setting Up

The Emulation Control Interface works with an *emulation module* or *emulation probe* to give you control of processor execution. Also, with a logic analyzer, you can coordinate trace measurements with processor execution. An analysis probe helps make easy connection between the logic analyzer and your system under test.

The easiest way to set up an emulator to work with the logic analysis system is to use the *Setup Assistant*.

- "Setting Up an E5900A Emulation Probe" on page 10
- "Setting Up an E5900B Emulation Probe" on page 11
- "Setting Up an E5901A Emulation Module" on page 12
- "Setting Up an E5901B Emulation Module" on page 13
- "Connecting to the Emulator" on page 40
- "Disconnecting from the Emulator" on page 46

See Also

For help on the Emulation Control Interface for a particular processor, connect to the emulator and then select *Help*.

"Emulation Control Demo Mode" on page 47

"To decide if you have an E5900A or an E5900B" on page 18

"To decide if you have an E5901A or an E5901B" on page 19

"Modifying Probe LAN Addresses" on page 35

"Modifying Interconnected Probe LAN Addresses (E5901B)" on page 36

"Using an E5901A Emulation Module on Your LAN" on page 38

"To update firmware" on page 50

"Solving Problems" on page 60

Main System Help (see the *Agilent Technologies 16700A/B-Series Logic Analysis System* help volume)

The Setup Assistant (see the *Setup Assistant* help volume)

Glossary of Terms (see page 77)

Contents

Contents

Contents

1

Setting Up and Starting Emulation Control

Setting Up an E5900A Emulation Probe

To use an E5900A emulation probe with the logic analysis system's Emulation Control Interface, follow these steps:

1. Connect the emulation probe to a power source.
   - "Connecting the E5900A Emulation Probe to a Power Source" on page 14
2. Connect the emulation probe to your LAN and configure the LAN parameters.
   - "Setting Up an E5900A Emulation Probe on Your LAN" on page 24
3. Start an emulation session. Once you have started an emulation session, you will have access to processor-specific emulation windows and help topics.
   - "To Connect to an Emulation Probe" on page 43

See Also

- "To obtain LAN information" on page 32
- "Setting Up a Point-to-Point Connection (E5900A)" on page 27
- The emulation *User's Guide* for information on connecting the emulation probe to a PC or workstation.

Setting Up an E5900B Emulation Probe

To use an E5900B emulation probe with the logic analysis system's Emulation Control Interface, without using an E5901B emulation module, follow these steps:

1. Connect the emulation probe to a power source.
   - "Connecting the E5900B Emulation Probe to a Power Source" on page 16
2. Connect the emulation probe to your LAN and configure the LAN parameters.
   - "Setting Up an E5900B Emulation Probe on Your LAN" on page 28
   - "To configure LAN parameters using a serial connection" on page 75
3. Start an emulation session. Once you have started an emulation session, you will have access to processor-specific emulation windows and help topics.
   - "To Connect to an Emulation Probe" on page 43

See Also

- "To obtain LAN information" on page 32
- "Setting Up a Point-to-Point Connection (E5900B)" on page 31
- "Setting Up an E5901B Emulation Module" on page 13
- The emulation *User's Guide* for information on connecting the emulation probe to a PC or workstation.

Setting Up an E5901A Emulation Module

To use an E5901A or 16610A emulation module with the logic analysis system's Emulation Control Interface, follow these steps:

1. Load firmware for your target processor into the emulation module. If you used the *Setup Assistant*, the firmware has already been loaded.
   - "To update firmware" on page 50
2. Start an emulation session. Once you have started an emulation session, you will have access to processor-specific emulation windows and help topics.
   - "To Connect to an Emulator (E5901A)" on page 41

See Also

- "Using an E5901A Emulation Module on Your LAN" on page 38

Setting Up an E5901B Emulation Module

To use an E5900B emulation module with the logic analysis system's Emulation Control Interface, follow these steps:

1. Connect the E5901B emulation module to the E5900B emulation probe.
   - "Connecting the E5901B to the E5900B" on page 18
2. Connect the emulation probe to your LAN and configure the LAN parameters.
   - "Setting Up an Interconnected E5900B Emulation Probe on Your LAN" on page 30
   - "To configure LAN parameters using a serial connection" on page 75
3. Start an emulation session. Once you have started an emulation session, you will have access to processor-specific emulation windows and help topics.
   - "To Connect to an Emulator (E5901B)" on page 42

See Also

- "To obtain LAN information" on page 32
- "Setting Up a Point-to-Point Connection (E5900B)" on page 31
- The emulation *User's Guide* for information on connecting the emulation probe to a PC or workstation.

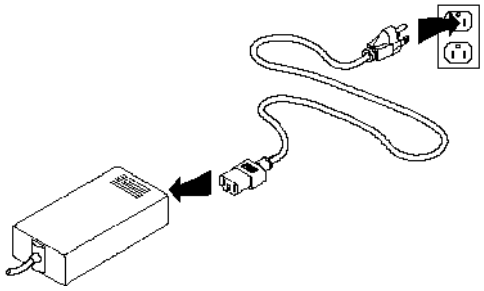
Connecting the E5900A Emulation Probe to a Power Source

The emulation probe is shipped from the factory with a power supply and cord appropriate for your country. If the cord you received is not appropriate for your electrical power outlet type, contact your Agilent Technologies sales and service office.

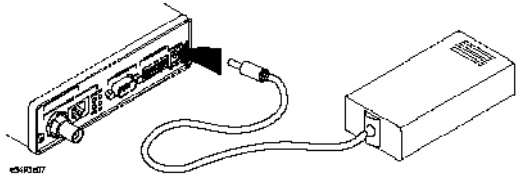
WARNING: **Use only the supplied power supply and cord. Failure to use the proper power supply could result in electric shock.**

CAUTION: Use only the supplied power supply and cord. Failure to use the proper power supply could result in equipment damage.

1. Connect the power cord to the power supply and to a socket outlet.



2. Connect the power cord to the back of the emulation probe.



The power lamp on the target side of the probe will light.

The emulation probe does not have an On/Off switch. Plug in the power cord to turn the probe ON, and unplug the power cord to turn the

probe OFF.

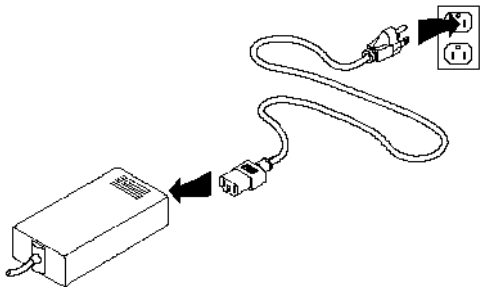
Connecting the E5900B Emulation Probe to a Power Source

If you are using the E5900B emulation probe on a LAN, without connecting it to an E5901B emulation probe, you need to connect it to a power supply as follows:

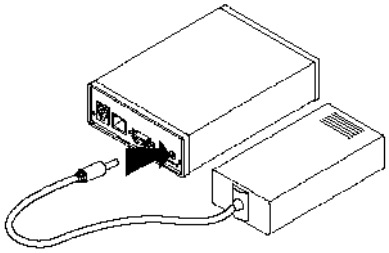
WARNING: **Use only the supplied power supply and cord. Failure to use the proper power supply could result in electric shock.**

CAUTION: Use only the supplied power supply and cord. Failure to use the proper power supply could result in equipment damage.

1. Connect the power cord to the power supply and to a socket outlet.



2. Connect the power cord to the back of the emulation probe.



3. Turn the emulation probe ON.

   The LED next to the switch is lit when the probe is ON and is being supplied with power.

NOTE: Power for the E5900B emulation probe can come from either an E5901B emulation module (through the module/probe interconnect cable) or from the power supply shown here.

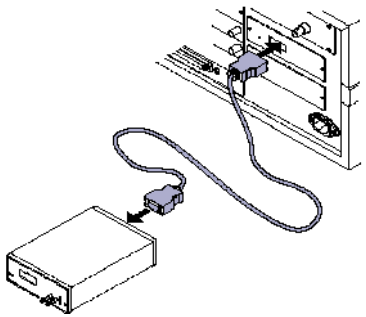
See Also

- "Connecting the E5901B to the E5900B" on page 18

Connecting the E5901B to the E5900B

To connect the E5901B emulation module to the E5900B emulation probe:

1. Connect one end of the module/probe interconnect cable to the E5901B emulation module in the logic analysis system mainframe.
2. Connect other end of the module/probe interconnect cable to the E5900B emulation probe.



3. Turn the emulation probe ON.

   The LED next to the switch is lit when the probe is ON and is being supplied with power.

Power is supplied by the 16700-series logic analysis system through the module/probe interconnect cable. The external power supply is not necessary for normal operation.

Remember that you also need to connect the emulation probe to the LAN.

To decide if you have an E5900A or an E5900B

There are two kinds of emulation probes: the E5900A and the E5900B. Use the following information to decide which kind you have.

E5900A

- Label: E5900A or no product number
- Target connection: through target interface module (*TIM*) or *analysis probe*

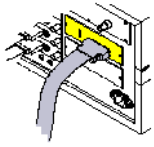
E5900B

- Label: E5900B
- Target connection: directly to background debug port on the target system or on an analysis probe
- Host connection: Often connects to logic analysis system through a LAN connection and through a module/probe interconnect cable attached to a E5901B *emulation module*

To decide if you have an E5901A or an E5901B

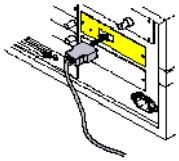
There are two kinds of emulation modules: the E5901A and the E5901B. Use the following information to decide which kind you have.

E5901A



- Label: E5901A or HP 16610A
- Connects to: target interface module (*TIM*) or *analysis probe*

E5901B



- Label: E5901B
- Connects to: E5900B *emulation probe*

Initializing Emulation Probe LAN Addresses

Use the *Init Probe LAN Addresses...* dialog to set the LAN parameters for an emulation probe when:

- The emulation probe does not have a LAN address yet, and
- The emulation probe is not connected to an E5901B emulation module.

NOTE: For an E5900A emulation probe, switch S6 must be OFF to set the LAN parameters.

To open the Init Probe LAN Addresses... dialog

- Move the mouse cursor over the emulation probe tool in the workspace, press and hold the right mouse button, move the mouse cursor over *Init Probe LAN Addresses...*, and release the right mouse button.

To set the LAN parameters

1. Enter the *link-level address* of the probe you wish to set up and the *internet address* you want to assign to it.

   The *gateway address* is set to the gateway address which was set for the logic analysis system. If you wish to use a different gateway address, enter it in the *Gateway IP* field.

   The *subnet mask* is set to the subnet mask which was set for the logic analysis system. If you wish to use a different subnet mask, enter it in the *Subnet Mask* field.

2. Select *OK*.

   If "ERROR - no response from emulation probe" is displayed, check that the emulation probe is properly connected to the LAN. Then try selecting *OK* again. If you still get the error, make sure the emulation probe's power-up self-test passes (see your emulation probe manual).

   If "The 16700B and 16702B logic anlyzers cannot initialize emulation probes in a point to point manner!" is displayed, see “Setting the LAN address for point-to-point connection” on page 22.

   If no error message is displayed, the *internet address* and other network

parameters have been stored in nonvolatile memory within the emulation probe.

The emulation probe automatically sets a subnet mask based on the subnet mask used by other devices on the network.

See Also

"To obtain LAN information" on page 32

"Setting Up an E5900A Emulation Probe on Your LAN" on page 24

"Setting Up an E5900B Emulation Probe on Your LAN" on page 28

"Setting Up an E5900B Emulation Probe on Your LAN" on page 28

"Setting the LAN address for point-to-point connection" on page 22

Setting the LAN address for point-to-point connection

If you are trying to use the logic analyzer in a point to point connection to the emulation probe and you do NOT have the LAN address of the emulator initialized the following information is important.

If you are putting the logic analyzer and the emulation probe on an existing LAN network then you should be able to first connect the logic analyzer to the LAN with an appropiate LAN address and then initialize the emulation probe using the "Init Probe LAN Addresses" utility. If you have trouble initializing the emulation probe LAN addresses refer to "Setting the emulator LAN addresses with a serial cable and terminal".

If you just received the emulation probe from the factory the initial LAN address is set to 192.0.2.233 and should be able to directly use it without having to initialize it to something else. Hence you should be able to "Connect to Emulator" using the address "192.0.2.233".

If you are trying to use the logic analyzer in a point to point connection and you need to initialize the emulator LAN address you may get the following error:

```
The 16700B and 16702B logic anlyzers can not initialize
emulation probes in a point to point manner!

As an alternative, the emulation probe LAN address
```

```
could be initialized with a serial cable and a terminal.
Refer to "Help" in "Init Probe LAN Addresses".
```

This error can be solved in one of two ways:

1. Initialize the LAN address of the emulation probe using a serial cable connected to a terminal. Refer to "Setting the emulator LAN addresses with a serial cable and a terminal"

2. Add a LAN hub between the logic analyzer and the emulation probe to initialize the LAN of the emulation probe.

   A LAN hub must be used between the logic analyzer and the emulation probe for LAN initialization to work. In addition, the normal (non blue) LAN cables must be used with the LAN hub. Connect one normal (non blue) LAN cable between the LAN hub and the Logic Analyzer and connect a second normal (non blue) LAN cable between the LAN hub and the emulation probe.

   This setup needs to be used to initialize the emulator LAN. Now use the "Init Probe LAN Addresses" utility.

   Once the emulator LAN is initialized a single blue LAN cable can be used in a point to point connection. Remove the hub and connect the blue LAN cable directly between the logic analyzer and the emulator.

Setting Up an E5900A Emulation Probe on Your LAN

The easiest way to set up the emulation probe on your network is to use the Setup Assistant.

NOTE: If you have an emulation module installed in your system hardware, you cannot use the Setup Assistant to set up the emulation probe. The Setup Assistant will recognize the emulation module and ignore the emulation probe. In this case, refer to the manual for your emulation probe for setup instructions.

The emulation probe has two LAN connectors:

- A BNC connector that can be directly connected to an IEEE 802.3 Type 10BASE2 cable (ThinLAN). When using this connector, the emulation probe provides the functional equivalent of a Medium Attachment Unit (MAU) for ThinLAN.
- An IEEE 802.3 Type 10BASE-T (StarLAN) connector.

NOTE: Use either the 10BASE2 or the 10BASE-T connector. Do *not* use both. The emulation probe will not work with both connected at the same time.

Before the Emulation Control Interface can connect to the emulation probe, the probe's LAN parameters (that is, its IP address, gateway address, and subnet mask) must be set up. If you don't have the probe's *link-level address*, *internet address*, *gateway address*, and *subnet mask* see “To obtain LAN information” on page 32.

With the emulation probe:

1. Physically connect the emulation probe to your network.

   This connection can be made by using either the 10BASE-T connector or the 10BASE2 BNC connector.

NOTE: Make sure the emulation probe is on the same subnet as the logic analysis system during initial setup; otherwise, probe LAN address setup will fail. After initial setup, you can modify the emulation probe's LAN parameters using the Emulation Control Interface before moving the probe to a different subnet.

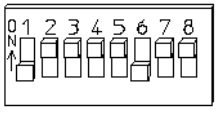
Another thing that will cause emulation probe LAN address setup to fail is a BOOTP daemon, running elsewhere on your network, that is configured to respond to the *link-level address* of the emulation probe.

Note also that it's possible to use the emulation probe connected directly to the logic analysis system with the supplied point-to-point 10BASE-T cable. This is called the *standalone configuration*. In the standalone configuration, the logic analysis system and the emulation probe form an isolated network.

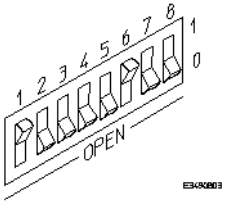
2. Set the configuration switches to indicate the type of connection that is to be made.

   Switch S1 must be set to OFF/OPEN, indicating that a LAN connection is being made. Switch S6 must be set to OFF/OPEN, to allow programming of the LAN parameters.

   Switch S5 should be ON/CLOSED if you are connecting to the BNC connector:

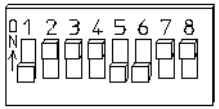


   -OR-

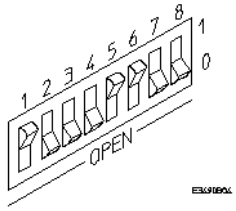


   Switch S5 should be OFF/OPEN if you are connecting to the 10BASE-T

connector:



-OR-



If you are using the 10BASE-T connector, see "To set the 10BASE-T configuration switches (E5900A)" on page 33.

Set all other switches to ON/CLOSED.

3. Cycle power on the emulation probe by unplugging the power cord and then plugging it in again. You must cycle power before switch changes take effect.
4. Wait at least 20 seconds for the emulation probe to connect to the LAN.

In the logic analysis system interface:

1. Drag the emulation probe tool  from the toolbox to the workspace.
2. Move the mouse cursor over the emulation probe tool in the workspace, press and hold the right mouse button, move the mouse cursor over *Init Probe LAN Addresses...*, and release the right mouse button.
3. Set the LAN parameters. (see page 21)

Return to the emulation probe:

1. Set switch S6 to ON/CLOSED.
2. Cycle power on the emulation probe by unplugging the power cord and then plugging it in again.

Return to the logic analysis system interface:

1. Verify that your emulation probe is now active and on the network by starting a user session. See “Connecting to the Emulator” on page 40.

See Also

“Initializing Emulation Probe LAN Addresses” on page 21

“Setting Up an E5900B Emulation Probe on Your LAN” on page 28

Setting Up a Point-to-Point Connection (E5900A)

A point-to-point connection is also called a *stand-alone configuration*. The logic analysis system and the emulation probe from an isolated network with only two nodes.

1. Physically connect the emulation probe to the logic analysis system:
   a. Use a point-to-point 10Base-T cable (Agilent part number 5061-7342) to connect the emulation probe directly to the logic analysis system.
   b. Set the configuration switches for a LAN configuration:
      - Set switch 1 to OPEN (OFF), indicating that a LAN connection is being made.
      - Set switch 5 to OPEN (OFF), indicating a 10BASE-T connection.
   c. Cycle power on the emulation probe. Leave the emulation probe powered on while you configure the network.
   d. While you are near the emulation probe, write down the *link-level address* of the emulation probe. This address is printed on a sticker near the LAN connector on the emulation probe, labelled "LLA".
2. Configure the network on the logic analysis system:
   a. In the main system window, select *System Admin*.
   b. Select *Network Setup...*.
   c. Select *Standard* to turn on networking.

      Leave the network parameters with the default values. The IP address

should be 192.0.2.231.

d. In the Network Setup dialog, select *OK*.

3. Configure the network on the emulation probe:

   a. From the emulation probe icon, select *Init LAN Addresses...*.

   b. Enter the link-level address of the emulation probe, which you wrote down earlier.

   c. Enter the following IP address: 192.0.2.233

   d. Enter the following subnet mask: 255.255.255.0

   e. Select *OK* then follow the instructions.

If you have multiple emulation probes and you are making an isolated network between the emulation probes and the logic analysis system, you will need to add a network hub to the network. Then assign 192.0.2.234 to the second emulation probe and increment the internet address for each additional emulation probe.

Setting Up an E5900B Emulation Probe on Your LAN

The easiest way to set up the emulation probe on your network is to use the Setup Assistant.

NOTE: If you have an E5901A emulation module installed in your system hardware, you cannot use the Setup Assistant to set up the emulation probe. The Setup Assistant will recognize the E5901A emulation module and ignore the emulation probe. In this case, refer to the manual for your emulation probe for setup instructions. If you have an E5901B emulation module, you can use the Setup Assistant assistant to set up the interconnected emulation probe.

The emulation probe has an IEEE 802.3 Type 10/100Base-TX LAN connector.

Before the Emulation Control Interface can connect to the emulation probe, the probe's LAN parameters (that is, its IP address, gateway

address, and subnet mask) must be set up. If you don't have the probe's *link-level address*, *internet address*, *gateway address*, and *subnet mask*, see "To obtain LAN information" on page 32.

With the emulation probe:

1. Physically connect the emulation probe to your network.

NOTE: If the E5900B emulation probe is not connected to an E5901B emulation module, then make sure the emulation probe is on the same subnet as the logic analysis system during initial setup; otherwise, probe LAN address setup will fail. After initial setup, you can modify the emulation probe's LAN parameters using the Emulation Control Interface before moving the probe to a different subnet.

Another thing that will cause emulation probe LAN address setup to fail is a BOOTP daemon, running elsewhere on your network, that is configured to respond to the *link-level address* of the emulation probe.

Note also that it's possible to use the emulation probe connected directly to the logic analysis system with the supplied point-to-point LAN cable. This is called the *standalone configuration*. In the standalone configuration, the logic analysis system and the emulation probe form an isolated network.

2. Cycle power on the emulation probe by turning the power switch OFF then ON again.
3. Wait at least 20 seconds for the emulation probe to connect to the LAN.

In the logic analysis system interface:

1. Drag the emulation probe tool  from the toolbox to the workspace.
2. Move the mouse cursor over the emulation probe tool in the workspace, press and hold the right mouse button, move the mouse cursor over *Init Probe LAN Addresses...*, and release the right mouse button.
3. Set the LAN parameters. (see page 21)

Return to the emulation probe:

1. Cycle power on the emulation probe by turning the power switch OFF then ON again.

Return to the logic analysis system interface:

1. Verify that your emulation probe is now active and on the network by starting a session. See “Connecting to the Emulator” on page 40.

Setting Up an Interconnected E5900B Emulation Probe on Your LAN

The easiest way to set up the emulation probe on your network is to use the Setup Assistant.

NOTE: If you have an E5901A emulation module installed in your system hardware, you cannot use the Setup Assistant to set up the emulation probe. The Setup Assistant will recognize the E5901A emulation module and ignore the emulation probe. In this case, refer to the manual for your emulation probe for setup instructions. If you have an E5901B emulation module, you can use the Setup Assistant assistant to set up the interconnected emulation probe.

The emulation probe has an IEEE 802.3 Type 10/100Base-TX LAN connector.

Before the Emulation Control Interface can connect to the emulation probe, the probe's LAN parameters (that is, its IP address, gateway address, and subnet mask) must be set up. If you don't have the probe's *link-level address*, *internet address*, *gateway address*, and *subnet mask*, see “To obtain LAN information” on page 32.

With the emulation probe:

1. Physically connect the emulation probe to your network.

   Note also that it's possible to use the emulation probe connected directly to the logic analysis system with the supplied point-to-point LAN cable. This is called the *standalone configuration*. In the standalone configuration, the logic analysis system and the emulation probe form an isolated network.

2. Cycle power on the emulation probe by turning the power switch OFF then ON again.
3. Wait at least 20 seconds for the emulation probe to recognize the LAN.

In the logic analysis system interface:

1. Set the LAN parameters. (see page 36)

Return to the logic analysis system interface:

1. Verify that your emulation probe is now active and on the network by starting a session. See “Connecting to the Emulator” on page 40.

Setting Up a Point-to-Point Connection (E5900B)

1. Physically connect the emulation probe to the logic analysis system:
   a. Use a point-to-point 10/100Base-T cable (such as part number 5061-7342) to connect the emulation probe directly to the logic analysis system.
   b. Leave the emulation probe powered on while you configure the network.
   c. While you are near the emulation probe, write down the *link-level address* of the emulation probe. This address is printed on a sticker near the LAN connector on the emulation probe, labelled "LLA".
2. Configure the network on the logic analysis system:
   a. In the main system window, select *System Admin*.
   b. Select *Network Setup...*.
   c. Select *Standard* to turn on networking.

      Leave the network parameters with the default values. The IP address should be 192.0.2.231.
   d. In the Network Setup dialog, select *OK*.
3. Configure the network on the emulation probe:

a. In the Setup Assistant window, select *Next*.

b. Select *Init LAN...*.

c. Enter the link-level address of the emulation probe, which you wrote down earlier.

d. Enter the following IP address: 192.0.2.233

e. Enter the following subnet mask: 255.255.255.0

f. Select *OK* then follow the instructions.

If you have multiple emulation probes and you are making an isolated network between the emulation probes and the logic analysis system, you will need to add a network hub to the network. Then assign 192.0.2.234 to the second emulation probe and increment the internet address for each additional emulation probe.

To obtain LAN information

- Write down the *link-level address* of the emulation probe.

  You will need this address when setting up the probe's LAN parameters.

- If you are going to use the emulation probe connected directly to the logic analysis system with a point-to-point 10BASE-T cable (in other words, a *standalone configuration* where the logic analysis system and the emulation probe form an isolated network):

  - Use an internet address that is one greater or less than the logic analysis system. For example, if the logic analysis system's internet address is 192.0.2.231 (which is the default), use internet address 192.0.2.232 for the emulation probe.
  - Use gateway address "0.0.0.0".
  - Use subnet mask "255.255.255.0".

  Otherwise, get the following information from your local network administrator or system administrator:

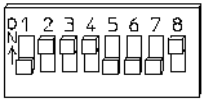
  - An *internet address* for the emulation probe.

- The *gateway address*.
- The *subnet mask*.

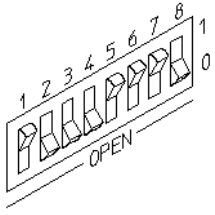
To set the 10BASE-T configuration switches (E5900A)

Leave switches S7 and S8 set to ON/CLOSED unless one of the following conditions is true:

- If the LAN cable exceeds the standard length, set switch S7 to OFF/OPEN.



-OR-



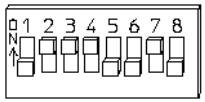
The emulation probe has a switch-selectable, twisted-pair receiver threshold. With switch S7 set to OFF/OPEN, the twisted-pair receiver threshold is lowered by 4.5 dB.

This setting should allow you to use cable lengths up to about 200 meters. If you use a long cable, consult your LAN cabling installer to ensure that:

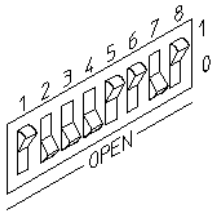
- The device at the other end of the cable has long cable capability.
- The cable is high-grade, low-crosstalk cable with crosstalk attenuation greater than 27.5 dB.

When switch S7 is set to ON/CLOSED, the LAN port operates at standard 10BASE-T levels. You can use up to 100 meters of UTP cable.

- If your network doesn't support Link Beat integrity checking, or if the emulation probe is connected to a non-10BASE-T network (such as StarLAN), set switch S8 to LINK BEAT OFF (OFF/OPEN).



-OR-



NOTE: Setting switch S8 to OFF/OPEN when Link Beat integrity checking is required by your network will cause the remote MAU to disable communications.

When switch S8 is set to ON/CLOSED, a link integrity pulse is transmitted every 15 milliseconds in the absence of transmitted data. It expects to receive a similar pulse from the remote MAU. This is the standard link integrity test for 10BASE-T networks.

Modifying Probe LAN Addresses

To change the LAN address of an emulation probe which is not connected to an E5901B emulation module:

1. End any emulation sessions that may be running.
2. From emulation probe icon, select *Modify Probe LAN Addresses...*.

   * Enter the current LAN name or internet address of the emulation probe.
3. Select *Read Addresses* to read the current settings.
4. Enter the *internet address*, *gateway address* and *subnet mask* in the appropriate fields.
5. Select *OK*.
6. Cycle power on the emulation probe. The new addresses will take effect after you do this.

Modifying Interconnected Probe LAN Addresses (E5901B)

1. End any emulation sessions that may be running.
2. From the E5901B emulation module icon, select *Modify Interconnected Probe LAN Addresses...*.
3. Select *Read Probe Addresses* to read the current settings.
4. Enter the *internet address*, *gateway address* and *subnet mask* in the appropriate fields.
5. Select *OK*.
6. Cycle power on the emulation probe. The new addresses will take effect after you do this.

Modifying the Emulation Module Port

Sometimes you may need to change the port number of an E5900A emulation module so that your debugger can connect to it through the logic analysis system.

To change the port number:

1. From the emulation module icon, select *Update Firmware*.
2. Select *Modify Lan Port...*.
3. Enter the new port number in the Lan Port Address field.

The new port number must be greater than 1024 and must not already be assigned to another emulation module.

See Also

- "Using an E5901A Emulation Module on Your LAN" on page 38

Using an E5901A Emulation Module on Your LAN

If your logic analysis system is connected to a LAN, a debugger or a telnet program running on another computer can communicate with the E5901A emulation module.

NOTE: If you are using an emulation probe, configure the debugger or telnet program to communicate directly with the emulation probe over the LAN. This applies even if you are using an E5900B emulation probe which is connected to an E5901B emulation module.

To set up LAN communication with an E5901A emulation module, you need the following information:

- The IP address or LAN name of the logic analysis system. The IP address of the logic analysis system is displayed on the E5901A emulation module icon.
- The gateway address of the logic analysis system, if required by your debugger or telnet program.
- The port number of the emulation module.

Port numbers

The port number depends on how many emulation modules are installed, and on whether you are connecting using a debugger or a telnet program.

For debugger connections, the port number of the first emulation module in a 16600A/700A-series logic analysis system is 6470. The default port of a second module (in an 16700A series system) is 6474. The default port numbers of a third and fourth module in an expansion frame are 6478 and 6482. These port numbers can be changed (in the Update Firmware window), but that is rarely necessary.

For telnet connections, the port numbers are 6472, 6476, 6480, and 6484.

Some debuggers do not provide a means to specify a port number. In

that case, the debugger will always connect to the first emulation module.

To start a telnet connection

1. Check that no Emulation Control Interface sessions are running for the emulation module.
2. Start the telnet program. For example, on a UNIX system, enter:

```
telnet <IP_address> 6472
```

Using a debugger

If you plan to use a debugger with the emulator, it is best to end the emulation session before running the debugger. Using a debugger with the Emulation Control Interface is not recommended because:

- The interfaces 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

- "To decide if you have an E5901A or an E5901B" on page 19
- Configuring the Network (see the *Agilent Technologies 16700A/B-Series Logic Analysis System* help volume)
- "Modifying the Emulation Module Port" on page 37
- The manual for your emulation module or processor solution.
- The documentation for your debugger or telnet program.

Connecting to the Emulator

Connecting to an emulator (starting an emulator session) gives you access to the Emulation Control Interface which is part of you logic analysis system.

The procedure for connecting to an emulator is depends on which kind of emulator you are using:

- "To Connect to an Emulator (E5901A)" on page 41 - If you have an E5901A or 16610A emulation module.
- "To Connect to an Emulator (E5901B)" on page 42 - If your E5900B emulation probe is connected to an E5901B emulation module.
- "To Connect to an Emulation Probe" on page 43 - If your emulation probe is connected to the LAN but not to an emulation module.

There is separate Emulation Control Interface software (and associated help) for each microprocessor family. When you connect, the logic analysis system will check which firmware is loaded into the emulator, then start the appropriate Emulation Control Interface.

The Emulation Control Interface and its associated help are slightly different for each microprocessor.

Using a debugger

You can connect a debugger to the emulator using a LAN connection.

- If you are using an E5901A emulation module, use the LAN address of the logic analysis system (displayed on the emulation module icon) and the port number of the emulation module.
- If you are using an E5901B emulation module, use the LAN address of the interconnected emulation probe (displayed on the emulation module icon).
- If you are using an emulation probe, you can find the LAN address in the Modify LAN Addresses window.

If you plan to use a debugger with the emulator, it is best to disconnect from the emulator before running the debugger. Using a debugger with

the Emulation Control Interface is not recommended because:

- The interfaces 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.

The IP address displayed on the emulation module icon is the IP address of the logic analysis system. You may use this address to access the emulation module over the LAN using a debugger. You must disconnect from the emulator before you use another tool, such as a debugger, with the emulation module.

See Also

"To decide if you have an E5901A or an E5901B" on page 19

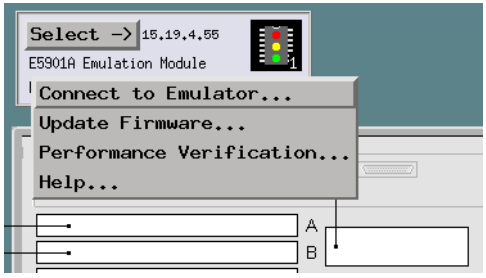
"Emulation Control Demo Mode" on page 47

"Disconnecting from the Emulator" on page 46

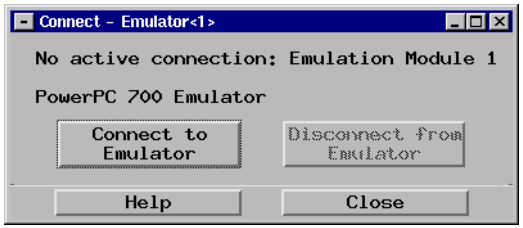
"Using an E5901A Emulation Module on Your LAN" on page 38

To Connect to an Emulator (E5901A)

1. Select the emulation module instrument in the system window.
2. Select *Connect to Emulator...*.



3. Select *Connect to Emulator* in the "Connect" window to start a session.



If you have problems starting a session with an emulation module, check the following:

- Ensure you have made proper connections between your emulation module, TIM (target interface module) or analysis probe, and your target system:
  - Your cable connections are good.
  - You are using the correct TIM for your emulator.

    -OR-
  - You have properly connected to the analysis probe (if the analysis probe has a 50-pin connector for your emulation module).
- Validate that proper firmware is installed:

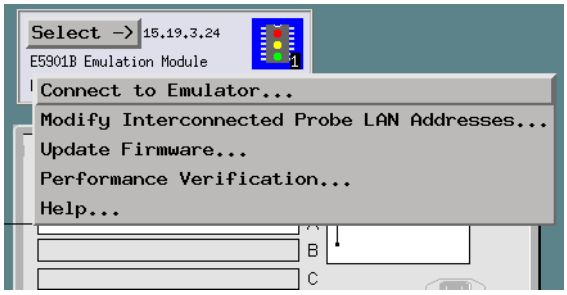
  Select *Update Firmware...* in the system window, and in the window that opens, select *Display Current Version*. The emulator firmware that is listed must support the processor used in your target system. If not, refer to “To update firmware” on page 50.

To Connect to an Emulator (E5901B)

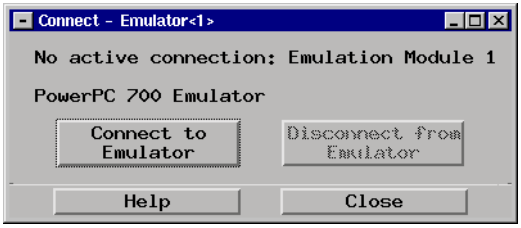
Before you can start a session, the E5900B emulation probe must be connected to the E5901B emulation module and to your LAN. The power switch on the emulation probe should also be ON.

To connect to the emulator:

1. Select the emulation module instrument in the system window.
2. Select *Connect to Emulator...*.



3. Select *Connect to Emulator* in the "Connect" window to start a session.



If you have problems connecting to an E5901B emulation module, check the following:

- Ensure you have made proper connections between your emulation module, emulation probe, and your target system.
- Validate that proper firmware is installed:

  Select *Update Firmware...* in the system window, and in the window that opens, select *Display Current Version*. The emulator firmware that is listed must support the processor used in your target system. If not, refer to “To update firmware” on page 50.

See Also

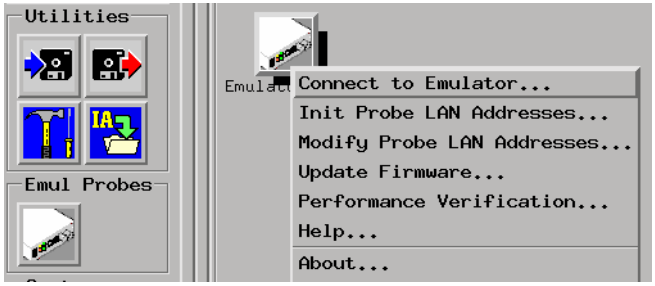
“Setting Up an E5901B Emulation Module” on page 13

To Connect to an Emulation Probe

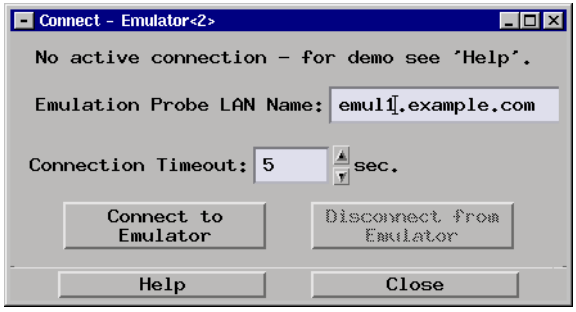
Before you can start a session, the emulation probe must be connected to a power source and to your LAN.

Follow these steps to start a session:

1. Open the Workspace window.
2. Drag the emulation probe icon onto the workspace.
3. Select the icon then choose *Connect to Emulator...*.



4. In the "Connect" window, enter the LAN name or the *internet address* of the emulation probe you wish to use.



5. Select *Connect to Emulator* to start a session.

If you have problems starting a session with an emulation probe, check the following:

- Ensure you have made proper connections between your emulation probe and your target system:
  - Your cable connections are good.
  - (E5900A only) You are using the correct TIM for your emulator.

    -OR-
  - (E5900A only) You have properly connected to the analysis probe (if the analysis probe has a 50-pin connector for your emulation probe).

- Validate that proper firmware is installed:

  Select *Update Firmware...* in the system window, and in the window that opens, select *Display Current Version*. The emulator firmware that is listed must support the processor used in your target system. If not, refer to *To update emulation probe firmware* within the "To update firmware" on page 50 help screen.

- If you get a timeout message, try increasing the *Connection Timeout* value. Then try to connect to the emulator again.

- If you still cannot connect, refer to "If you have LAN connection problems (E5900A)" on page 65 or "If you have LAN connection problems (E5900B)" on page 67.

See Also

- "Emulation Control Demo Mode" on page 47
- "Setting Up an E5900A Emulation Probe" on page 10
- "Setting Up an E5900B Emulation Probe" on page 11
- "To decide if you have an E5900A or an E5900B" on page 18

Disconnecting from the Emulator

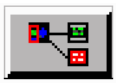
1. Select the Emulation Module icon or Emulation Control Interface icon and then select *Disconnect from Emulator*.
2. In the Connect - Emulator window, select *Disconnect from Emulator*.

Emulation Control Demo Mode

To run a demo, you must use the Emulation Probe icon:

Do NOT use the Emulation Module icon:

The Emulation Probe icon is available in the Workspace Window (see the *Agilent Technologies 16700A/B-Series Logic Analysis System* help volume).



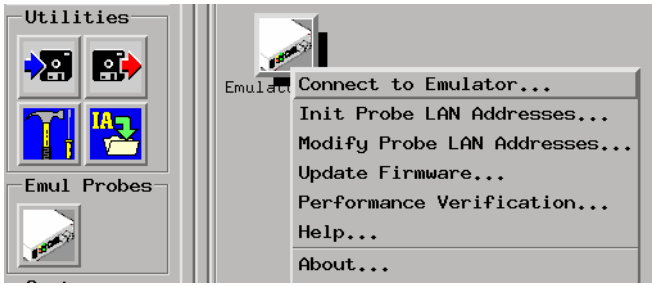
The Emulation Probe icon is displayed in the Workspace window even if you do not have an emulation module or emulation probe connected to your system.

The demo mode allows you to view all of the emulation windows without connecting to a target system.

The demo mode does require that you have installed the processor support package for the processor you select.

To start the demo mode:

1. Open the Workspace window.
2. Drag an emulation probe icon onto the workspace.
3. Select the emulation probe icon (in the Workspace window) and then select *Start Session...*.



4. In the "Session - Emulator" window, enter the name of the appropriate demo in the *Emulation Probe LAN Name* field:

   For the E5900A/B Option 100 MPC82xx emulation probe, enter **demoE3453a**

   For the E5900A/B Option 070 PowerPC 7xx probe, enter **demoE3454a**

   For the E5900B Option 070 PowerPC 7xx probe with MPC745/755 firmware, enter **demoE3454b**

   For the E5900A Option 090 M-CORE Emulation probe, enter **demoE3455a**

   For the E5900A Option 050 MPC500 Embedded PowerPC probe, enter **demoE3456a**

   For the E5900A/B Option 300 ARM7 Emulation probe, enter **demoE3459a**

   For the E5900B Option 110 MPC74xx probe, enter **demoE3463a**

   For the E5900A/B Option 060 PowerPC 60x probe with PPC603ei firmware, enter **demoE3477i**

   For the E5900A Option 030 M683xx probe, enter **demoE3490a**

   For the E3491A Pentium probe, enter **demoE3491a**

   For the E3493A Pentium Pro, Pentium II, Pentium II Mobile, and Mobile Module probe, enter **demoE3493a**

   For the E5900A/B Option 060 PowerPC 603/604 probe, enter **demoE3494a**

   For the E3495A PowerPC 403 probe, enter **demoE3495a**

For the E5900A/B Option 080 MPC800 probe, enter **demoE3497a**

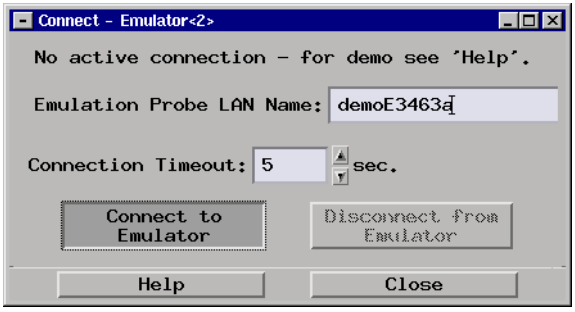
For the E3467A SH7750 probe, enter **demoE3467a**

For the E3468A TX19/39 probe, enter **demoE3468a**

For the E3469A SH7709A/29 probe, enter **demoE3469a**

For the E8151A TX3927 probe, enter **demoE8151a**

5. Select *Start Session*.



In the demo mode, all windows, menus, and buttons will behave as if the Emulation Control Interface is connected to an emulation probe. No data can be displayed in most windows, however, because there is no target processor to provide the data.

The following features might not work as you expect:

- In the Command Line Interface window, commands have no effect. This includes the help command.
- In the Registers window, all registers have zero values.
- The Memory window shows the same data, regardless of which address you enter.
- In the Memory Disassembly window, the same instructions are always displayed, regardless of which address you specify.
- For emulation probes which support several processor types, the demo mode is only available for one processor type.

To update firmware

Update the firmware if:

- The emulation module or emulation probe is being connected to a new analysis probe or *TIM*, or
- The emulation module was not shipped already installed in the logic analysis system, or
- You have an updated version of the firmware.

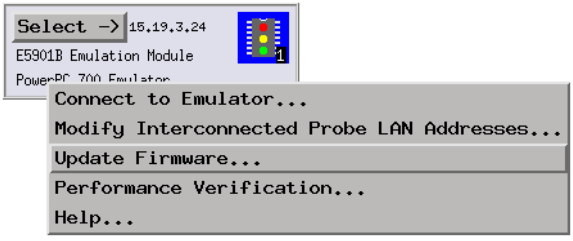
To install firmware from a CD-ROM to the hard disk

- Follow the instructions printed on the CD-ROM jacket.

  This will install the firmware onto the logic analysis system hard disk. Continue with either the "To update emulation module firmware" or the "To update emulation probe firmware" instructions.

To update emulation module firmware

1. End any emulation sessions that may be running. Remove any emulation module icons from the workspace in the Workspace window.
2. Install the firmware onto the logic analysis system's hard disk, if necessary.
3. In the system window, select the emulation module and select *Update Firmware*.



4. In the Update Firmware window, select the firmware version to load.

   Select the *Additional Information* button to display additional information about the firmware you selected.

5. Select *Update Firmware*.

To update emulation probe firmware

1. End any emulation sessions that may be running.
2. Install the firmware onto the logic analysis system's hard disk, if necessary.
3. In the workspace window, drag the emulation probe icon onto the workspace.
4. Select the emulation probe icon and select *Update Firmware...*.
5. In the Update Firmware window, enter the LAN name or address of the emulation probe.
6. In the Update Firmware window, select the firmware version to load.

   Select the *Additional Information* button to display additional information about the firmware you selected.
7. Select *Update Firmware*.
8. Cycle power on the emulation probe.

To display the current firmware version

- Select *Display Current Version* to see what firmware version is already installed in your emulation module or emulation probe.

To install firmware from another source

If you obtained firmware from another source, such as from an ftp server or a World Wide Web site: //www.agilent.com/find/sw-updates

- Follow the instructions provided with the firmware, OR
- Copy the firmware files into /logic/run_cntrl/firmware on the logic analysis system hard disk. Be sure to copy *all* of the files which begin with the product number of the firmware for your microprocessor.

Testing the E5900B Emulation Probe

Agilent emulation probes have built-in self tests, or "performance verification" tests.

Before running probe performance verification:

1. Leave the emulation probe connected to the LAN and to the power supply or module/probe interconnect cable.
2. End any Emulation Control Interface or debugger sessions.
3. Disconnect the target cable from the target system. (Turn the power switch on the emulation probe OFF while you do this.)
4. Connect an SMB cable from the "Break In" connector to the "Trigger Out" connector on the emulation probe. (If you aren't concerned about these signals, you may omit this step and ignore any related test failures.)

Now, to run probe performance verification:

1. From the Emulation Control Interface icon, select *Performance Verification...*.
2. Select *Start PV*.

   If a test fails, contact technical support.

Testing using a serial connection

You can also run the performance verification tests using a serial connection instead of a LAN connection. To do this:

1. Connect the emulation probe to a terminal or a computer's RS-232 serial interface.
2. Access the probe's built-in terminal interface (see “To connect the E5900B emulation probe via RS-232” on page 71).
3. Enter the `pv` command.

   Options available for the "pv" command are explained in the help screen displayed by typing "help pv" at the prompt.

NOTE: Running the `pv` command destroys the current configuration of the emulation probe by performing a cold system reboot after the command has completed.

Examples (using a serial connection):

To execute all tests one time:

```
pv 1
```

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

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

The tests available through this command can be displayed as follows:

```
R>pv -l
  Tests Available For: HPE8130A Series Emulation System
    Test  1: Powerup PV Results
    Test  2: Emulation Module Port Feedback Test
    Test  3: Run Control FPGA Test
    Test  4: Run Control Clock Test
    Test  5: Break In and Trigger Out SMB Feedback Test
    Test  6: Target Board Adapter Feedback Test (FACTORY ONLY)
R>
```

See Also

- The *User's Guide* for your emulation probe or emulation solution.

Testing the E5900A Emulation Probe

Agilent emulation probes have extensive built-in self tests, or "performance verification" tests.

Before running probe performance verification:

1. End any Emulation Control Interface sessions.
2. Disconnect the target cable from the emulation probe.
3. Attach the self-test (loop-back) adapter to the connector on the emulation probe.
4. Connect a BNC cable from the "Break In" connector to the "Trigger Out" connector on the emulation probe.

Now, to run probe performance verification:

1. From the Emulation Control Interface icon, open the Performance Verification window.
2. Enter the LAN address of the emulation probe.
3. Select the number of iterations to perform.
4. Select *emulation probe (System Tests)*.
5. Select *Start PV*.

   If a test fails, refer to the *Installation and Service Guide* for your emulation probe.

Some emulation probes have additional tests for the target interface module. To run the additional tests:

1. Select *Target Probe (Probe Tests)*.
2. Select *Additional Setup Information*.

   This will tell you whether your emulation probe supports the additional tests. If the "No Target Probe tests exist" message is displayed, you are done.

3. If there are additional tests, connect the target probe to the emulation probe or emulation module.
4. Configure the target probe for the test. For example, you may need to set a switch or attach a loopback cable. Follow the instructions that were displayed when you selected *Additional Setup Information*.
5. Select *Start PV*.

You can also run the performance verification tests using a serial connection instead of a LAN connection. This is the only way to verify the performance of the emulation probe's LAN interface hardware. To do this:

1. Connect the emulation probe to a terminal or a computer's RS-232 serial interface.
2. Access the probe's built-in terminal interface (see “To connect the E5900A emulation probe via RS-232” on page 69).
3. Enter the `pv` command.

   Options available for the "pv" command are explained in the help screen displayed by typing "help pv" at the prompt.

Examples (using a serial connection):

To execute all tests one time:

```
pv 1
```

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

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

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

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

The tests available through this command can be displayed as follows:

```
R>pv -l
  Tests Available For: HPE3499B Series Emulation System
    Test  1: Powerup PV Results
    Test  2: LAN 10Base2 Feedback Test
    Test  3: LAN 10BaseT Feedback Test
    Test  4: Break In and Trigger Out BNC Feedback Test
    Test  5: Target Probe Feedback Test
    Test  6: Boundary Scan Master Test
    Test  7: I2C Test
    Test  8: Data Lines Test
```

```
R>
```

On a good system, when the self-test adapter is connected, the RESET LED will light and the STOP and RUN LEDs will be out.

The results on a good system will be similar to the following:

```
R>pv 1

  Testing: HPE3499A Series Emulation System
    Test  1: Powerup PV Results                                  passed!
    Test  2: LAN 10Base2 Feedback Test                           passed!
    Test  3: LAN 10BaseT Feedback Test                           passed!
    Test  4: Break In and Trigger Out BNC Feedback Test          passed!
    Test  5: Target Probe Feedback Test                          passed!
    Test  6: Boundary Scan Master Test                           passed!
    Test  7: I2C Test                                            passed!
    Test  8: Data Lines Test                                     passed!
R>
  PASSED  Number of tests: 1           Number of failures: 0

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  HPE3499A Series Emulation System
    Version:   A.05.00
    Location:  Generics

  HPE3491A Pentium(tm) Processor Probe Emulator
    Version:   A.01.00

R>
```

There are some things you can do if a failure is found during one of these tests. Details of failure can be obtained through using a verbose level of 2 or more (example: `pv -v2 -d`).

- "Test 2: LAN 10BASE2 Feedback Test" on page 56
- "Test 3: 10BaseT Feedback Test" on page 57
- "Test 4: Break In and Trigger Out BNC Feedback Test" on page 59
- "Test 5: Target Probe Feedback Test" on page 59

See Also

- The *Installation and Service Guide* for your emulation probe.

Test 2: LAN 10BASE2 Feedback Test

For LAN 10BASE2 test, the following is an example of a failure which is *not* caused by a broken emulation probe.

```
R>pv -t2 -v2 1

  Testing: HPE3499A Series Emulation System
    Test # 2: LAN 10Base2 Feedback Test                    failed!
      FAILED - no lan connection (LAN probably not terminated)
  FAILED  Number of tests: 1           Number of failures: 1
```

Check to see that the port under test has a good cable connected to it and that the cable is properly terminated with a 50-ohm terminator on each end of the overall cable.

```
R>pv -t2 -v2 1

  Testing: HPE3499A Series Emulation System
    Test # 2: LAN 10Base2 Feedback Test                    failed!
      FAILED due to excessive collisions
  FAILED  Number of tests: 1           Number of failures: 1
```

The most common cause of this problem is poor termination of the cable or failure to remove the port under test from the LAN before performing the test. Check to see that the terminators are good (50 ohms) and that the emulation probe is isolated from any traffic on a system LAN.

```
R>pv -t2 -v2 1

  Testing: HPE3499A Series Emulation System
    Test # 2: LAN 10Base2 Feedback Test                    failed!
      FAILED - invalid Ethernet address in EEPROM
  FAILED  Number of tests: 1           Number of failures: 1
```

First check to see that a correct *link-level address* (also known as the Ethernet address) and *internet address* have been set in the virtual EEPROM by entering the "lan" command.

If the "lan" command shows bad information for the link-level address, a failure exists in the FLASH ROM, which requires service from Agilent.

If the "lan" command shows bad information for the internet address, try to set it to the correct value. If you are unable to set it to the correct value, a failure exists in the FLASH ROM, which requires service from Agilent.

Test 3: 10BaseT Feedback Test

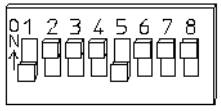
```
R>pv -t3 -v2 1
```

```
Testing: HPE3499A Series Emulation System
  Test # 3: LAN 10BaseT Feedback Test                    passed!
PASSED  Number of tests: 1          Number of failures: 0
```

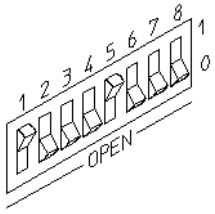
In addition to the internal checks performed in Test 2, Test 3 also checks for shorts on the cable connected to the network. If this test fails, disconnect the cable and run the test again. If the test then passes, the cable is faulty. If it still fails, it requires service from Agilent.

If the emulation probe passes this "pv" test, additional testing can be performed through exercising the connection to the network. To run this test:

1. Set configuration switch 1 and switch 5 to OFF/OPEN, and set all other configuration switches to ON/CLOSED (this enables LAN using 10BaseT).

   -OR-

2. Cycle power and wait for 15 to 30 seconds.
3. Then, `ping` the emulation probe from a computer on the LAN. See the LAN documentation for your computer for the location and action of the `ping` utility.

   If the emulation probe fails to respond to the `ping` request, verify that the LAN parameters (*internet address* and *gateway address*) are set correctly and that your host computer recognizes the internet address of the emulation probe. If all else is good, then failure to respond to a `ping` indicates a faulty emulation probe.

Test 4: Break In and Trigger Out BNC Feedback Test

```
R>pv -t4 -v2 1

  Testing: HPE3499A Series Emulation System
    Test # 4: Break In and Trigger Out BNC Feedback Test    failed!

      Break In not receiving Break Out HIGH
  FAILED  Number of tests: 1           Number of failures: 1
```

Before returning the emulation probe to Agilent, check to ensure that you have connected a good coaxial cable between the two BNCs. If the cable is good, the emulation probe is bad.

Test 5: Target Probe Feedback Test

A verbose output on this test can be extensive. For example, if you forget to plug in the self-test adapter, the test output might look like the following:

```
p>pv -t5 -v2 1

  Testing: HPE3499A Series Emulation System
    Test # 5: Target Probe Feedback Test                    failed!

      Bad 20 Pin Status Read when unconnected = 0x7fb7
                              Expected Value = 0xffb7
      Bad 20 Pin Status Read when connected= 7fb7
                             Expected Value = 0x7fb7
      Output 19 Low not received on Input 11
      Output 11 Low not received on Input 19
      Output 13 Low not received on Input 1
      Output 12 High not received on Input 6
      Output 12 and Input 6 not pulled high on release
      Output 8 Low not received on Input 10
      Output 7 Low not received on Input 20
      Output 4 Low not received on Input 14
      Output 2 Low not received on Input 18
  FAILED  Number of tests: 1           Number of failures: 1
```

If you get a verbose output like this, check to make sure the self-test adapter is connected properly.

Solving Problems

This problem-solving information applies to all emulation probes. Some of this information may not apply to your particular emulation probe.

Your emulation probe or emulation module manual has much more detailed and specific information.

- "If the E5900A probe flash EEPROM is corrupt" on page 60
- "If the E5900B probe flash EEPROM is corrupt" on page 61
- "If the LAN connection is "reset by peer"" on page 65
- "If you have LAN connection problems (E5900A)" on page 65
- "If you have LAN connection problems (E5900B)" on page 67
- "Testing the E5900A Emulation Probe" on page 54
- "Testing the E5900B Emulation Probe" on page 52
- "To connect the E5900A emulation probe via RS-232" on page 69
- "To connect the E5900B emulation probe via RS-232" on page 71
- "If you have RS-232 connection problems (E5900A)" on page 73
- "If you have RS-232 connection problems (E5900B)" on page 74

See Also

- The *Installation and Service Guide* or *User's Guide* for your emulation probe or processor solution.

If the E5900A probe flash EEPROM is corrupt

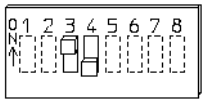
Data in an emulation probe's FLASH ROM can become corrupt if one of the following things happens during programming:

- A system fault.
- A loss of power to the emulation probe or the host computer (that is, the logic analysis system).

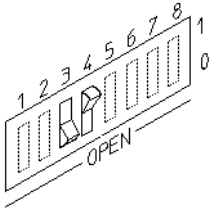
- A break in the communications channel.

If this happens, try the following steps:

1. Cycle power on the emulation probe and try updating the probe's firmware again.
2. If step 1 doesn't work, set switch S3 to ON/CLOSED and switch S4 to OFF/OPEN:



-OR-



Then, cycle power.

This will force the emulation probe to use only the boot ROM. Try running the firmware update again. If this is successful, return the switches to their normal configuration (S3 and S4 ON/CLOSED) and cycle power.

If the E5900B probe flash EEPROM is corrupt

Data in an emulation probe's FLASH ROM can become corrupt if one of the following things happens during programming:

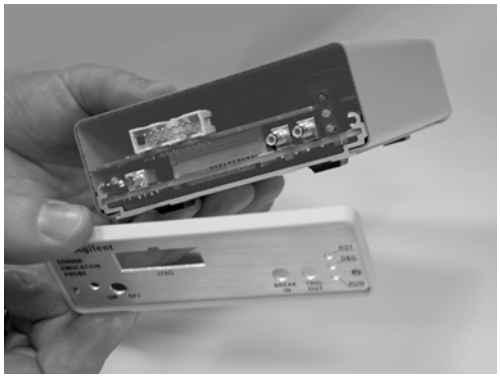
- A system fault.
- A loss of power to the emulation probe or the host computer (that is, the logic analysis system).
- A break in the communications channel.

If this happens, try cycling power on the emulation probe and updating the probe's firmware again.

If this doesn't work try forcing the emulation probe to use only the boot ROM:

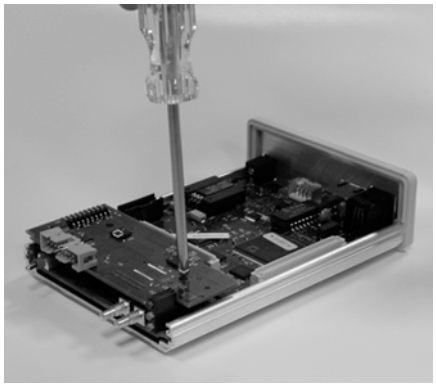
1. Turn OFF power to the emulation probe.
2. Disconnect all cables from the emulation probe, including the power cord, LAN cable, serial cable, module/probe interconnect cable, and target cable.
3. Remove the cover from the emulation probe.
   a. Remove the 2 nuts and 2 screws from the front of the emulation probe.

   b. Remove the front panel

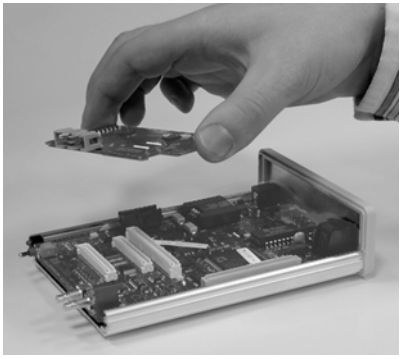


c. Grasp the top cover with one hand. With the other hand, pull the plate on the bottom of the emulation probe, so the top cover slides off.

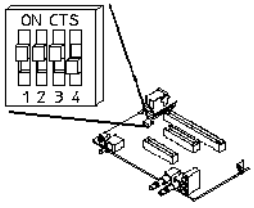
d. Remove the 3 nylon screws from the target board adapter.



e. Carefully lift the target board adapter from the main circuit board.



f. Set switch S4 to OFF. Leave all other switches ON.



g. Reassemble the cover. This is necessary to protect the product from possible damage.

h. Turn ON power to the emulation probe.

i. Update the emulation probe firmware. See “To update firmware” on page 50.

j. If this is successful:

1. Turn OFF power to the emulation probe.
2. Disassemble the cover.
3. Return the switches to their normal configuration (all switches ON).
4. Reconnect the target board adapter.
5. Reassemble the cover.
6. Turn ON power to the emulation probe.

If the LAN connection is "reset by peer"

If you get the "connection reset by peer" and "all emulation sessions terminated" error messages, the most likely causes are:

- The emulation probe has lost power.
- The connection timeout period has been exceeded. This can be due to physical disconnects or other LAN problems.

When these errors occur, nothing is saved and you will have to start the session again.

Depending on the cause of the problem, you may want to increase the connection timeout value before starting the session again.

If you have LAN connection problems (E5900A)

- Make sure you have connected the emulation probe to the proper power source and that the power light is lit.

  After powering up the probe, it takes up to one minute before the probe can be recognized on the network.

- Make sure the LAN cable is connected. Refer to your LAN documentation for testing connectivity. If you're using the 10BASE-T connection, check the “E5900A Emulation Probe LAN LEDs” on page 68.
- Make sure only one of the LAN ports is connected.
- Make sure the emulation probe communication configuration switches are set correctly.

  a. Check that switch S1 is OFF/OPEN (OFF/OPEN=attached to LAN. ON/CLOSED=attached to RS-232).

  b. Check that switch S5 is in the correct position for your LAN interface (either ON/CLOSED for 10BASE2, or OFF/OPEN for 10BASE-T).

  Unplug the emulation probe power cord and then plug it in again to make sure the switch settings are read correctly by the probe.

- Make sure the emulation probe's *internet address*, *gateway address*, and *subnet mask* are set up correctly.

  To check the above addresses, connect the emulation probe to a terminal or terminal emulator (see “To connect the E5900A emulation probe via RS-232” on page 69), and enter the "lan" command.

  The output looks something like this:

```
lan -i 15.5.24.116
lan -g 15.5.23.1
lan -p 6470
Ethernet Address : 08000909BAC1
Subnet Mask: 255.255.255.0
```

  The "lan -i" line of the output shows the internet address is 15.5.24.116 in this case. If the *internet address* is not what you expect, you can change it with the 'lan -i <new IP>' command.

  The "lan -g" line of the output shows the *gateway address*. Make sure it is the address of your gateway if you are connecting from another subnet. Otherwise it should be 0.0.0.0 if you are connecting from the local subnet.

  The "lan -p" line of the output shows the port is 6470. If the port is not 6470, you must change it with the "lan -p 6470" command.

  The "Subnet Mask" or "lan -s" line of the output shows the subnet mask. If necessary, change it with the 'lan -s <mask>' command.

- While you are connected to the probe's serial interface, run performance verification on the probe's LAN interface (see “Testing the E5900A Emulation Probe” on page 54).

If it takes a long time to connect

- 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 probe.

The emulation probe automatically sets its subnet mask based on the first subnet mask it detects on the network. 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

emulation probe may take a very long time to connect to the network after it is turned on.

To "clean up" the network, connect a terminal to the emulation probe. You can then see error messages that will help you identify which devices on the network are using the wrong subnet masks.

If you have LAN connection problems (E5900B)

- Make sure you have connected the emulation probe to the proper power source and that the power light is lit.

  After powering up the probe, it takes up to one minute before the probe can be recognized on the network.

- Make sure the LAN cable is connected. See “E5900B Emulation Probe LAN LEDs” on page 69 or refer to your LAN documentation for testing connectivity.

- Make sure the emulation probe's *internet address*, *gateway address*, and *subnet mask* are set up correctly.

  To check the above addresses, connect the emulation probe to a terminal or terminal emulator (see “To connect the E5900B emulation probe via RS-232” on page 71), and enter the "lan" command.

  The output looks something like this:

```
lan is enabled
   Link Status is UP
   100BaseTX
  lan -i 15.5.24.116
  lan -g 15.5.23.1
  lan -s 255.255.248.0
  lan -p 6470
  Ethernet Address : 08000909BAC1
```

  The "lan -i" line of the output shows the internet address is 15.5.24.116 in this case. If the *internet address* is not what you expect, you can change it with the 'lan -i <new IP>' command.

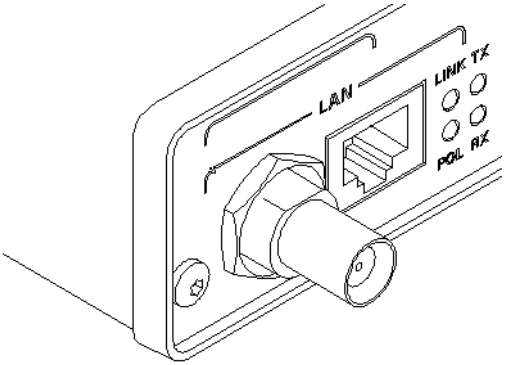
The "lan -g" line of the output shows the *gateway address*. Make sure it is the address of your gateway if you are connecting from another subnet.

The "lan -p" line of the output shows the port is 6470. If the port is not 6470, you must change it with the "lan -p 6470" command.

The "lan -s" line of the output shows the subnet mask. If necessary, change it with the "lan -s <mask>" command.

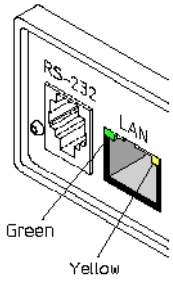
- While you are connected to the probe's serial interface, run performance verification on the probe's LAN interface (see “Testing the E5900B Emulation Probe” on page 52).

E5900A Emulation Probe LAN LEDs



LINK	Lit when 10BASE-T connection has a good link; not used for 10BASE2.
TX	Lit when LAN data is being transmitted.
POL	Lit when the polarity on the receive twisted pair is reversed for a 10BASE-T connection. The probe should still work properly in this situation, but other LAN devices may not work.
RX	Lit when LAN data is being received.

E5900B Emulation Probe LAN LEDs



The yellow LED, on the right side of the connector, indicates LAN activity (receive or transmit).

The green LED, on the left side of the connector, is lit when the LAN interface is operating in 100Base-Tx mode.

To connect the E5900A emulation probe via RS-232

The emulation probe has a 9-pin serial (RS-232) interface that you can use to connect to the probe's built-in "terminal interface". The serial connection lets you run performance verification on the probe's LAN interface or set up LAN parameters.

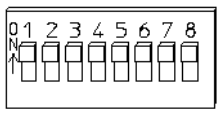
1. Set the probe's serial configuration switches.
   - Set switch S1 to ON/CLOSED (RS-232).
   - Set switches S2 through S4 to ON/CLOSED.
   - Set switch S5 to ON/CLOSED (HW HANDSHAKE ON) if your serial interface uses the DSR:CTS/RTS lines for flow control. Set S5 to OFF/OPEN (HW HANDSHAKE OFF) if your serial interface uses software flow control (XON/XOFF).

     If your serial interface supports hardware handshaking, you should use it (set switch S5 to ON/CLOSED). Hardware handshaking will make the serial connection much more reliable.

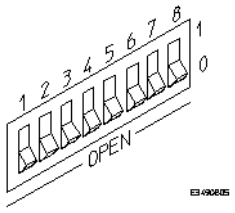
- Set switches S6 through S8 for the baud rate you will use. These switch settings are listed on the bottom of the emulation probe.

  The higher baud rates may not work reliably with all computer or terminal RS-232 interfaces. Make sure the baud rate you choose is supported by your computer or terminal's RS-232 interface.

For example, to use a baud rate of 9600 baud:



-OR-



2. Connect a serial cable.

CAUTION: Use a grounded, shielded cable. If the cable is not shielded, or if the cable is not grounded at the serial controller, the emulation probe may be damaged by electrostatic discharge.

Connect an RS-232C modem cable from the host computer to the emulation probe. The recommended cable is Agilent model number C2932A. This is a 9-pin cable with one-to-one pin connections.

3. Verify serial communications.

   a. Start a terminal emulator program on the host computer.

      If you are using a PC, the Terminal application in Microsoft Windows will work fine.

      If you are using a UNIX workstation, you can use a terminal emulator such as `cu` or `kermit`.

   b. Plug the power cord into the emulation probe.

When the probe powers up, it sends a message (similar to the one that follows) to the serial port and then displays a prompt:

```
                  Copyright (c) Hewlett-Packard Co. 1987
All Rights Reserved.  Reproduction, adaptation, or translation without prior
written permission is prohibited, except as allowed under copyright laws.

  HPE3499A Series Emulation System
    Version:   A.05.00
    Location:  Generics

 HPE3491A Pentium(tm) Processor Probe Emulator
    Version:   A.01.00

R>
```

The version numbers may be different for your emulation probe.

c. Press the Return or Enter key a few times.

You should see a prompt such as "R>" or "p>".

If you have problems, see “If you have RS-232 connection problems (E5900A)” on page 73.

Serial connections on a workstation

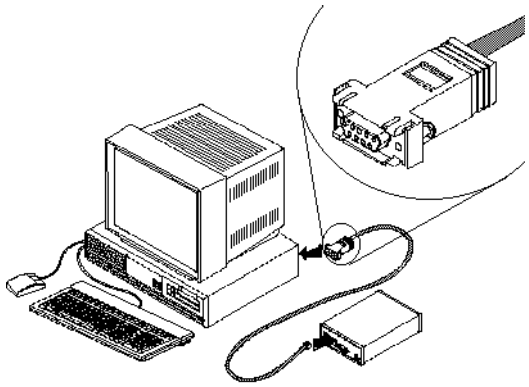
If you are using a UNIX workstation as the host computer, you need to use a serial device file. If a serial device file does not already exist on your computer, you need to create one. Once it exists, you need to ensure that it has the appropriate permissions so that you can access it. For help on setting up a serial device, see the system documentation for your workstation.

To connect the E5900B emulation probe via RS-232

The E5900B emulation probe has a 9600 baud RS-232 serial interface with an RJ12 connector.

The serial connection lets you set up LAN parameters.

1. Connect a serial cable. Use the DB9-to-RJ12 adapter and the serial cable supplied with the emulation probe.



2. Verify serial communications.

   a. Start a terminal emulator program on the host computer.

      If you are using a PC, the Terminal application in Microsoft Windows will work fine.

      If you are using a UNIX workstation, you can use a terminal emulator such as `cu` or `kermit`.

   b. Power on the emulation probe.

      When the probe powers up, it sends a message (similar to the one that follows) to the serial port and then displays a prompt:

```
        Copyright (c) Agilent Technologies, Inc. 1999
All Rights Reserved.  Reproduction, adaptation, or translation without prior
written permission is prohibited, except as allowed under copyright laws.

  HPE8130B Series Emulation System
    Version:   A.01.00 17Nov99
    Location:  Generics

  HPE3454A PowerPC 700 JTAG Emulator
    Version:   A.03.07 02Dec99
    R>
```

      The message displayed may be different for your emulation probe.

   c. Press the Return or Enter key a few times.

      You should see a prompt such as "R>" or "p>".

   If you have problems, see “If you have RS-232 connection problems (E5900B)” on page 74.

Serial connections on a workstation

If you are using a UNIX workstation as the host computer, you need to use a serial device file. If a serial device file does not already exist on your computer, you need to create one. Once it exists, you need to ensure that it has the appropriate permissions so that you can access it. For help on setting up a serial device, see the system documentation for your workstation.

If you have RS-232 connection problems (E5900A)

If you have problems communicating with the serial port on an E5900A emulation probe:

- Make sure you have connected the emulation probe to the proper power source and the power light is lit.
- Make sure you have properly configured the data communications configuration switches on the probe.

  Unplug the emulation probe power cord and then plug it in again to make sure the probe's switch settings are read correctly.
- Make sure you have properly configured the data communications parameters on the terminal or host computer.
- Make sure you are using the correct RS-232 cable.

  The most common type of data communications configuration problem involves the configuration of the emulation probe as a DTE device instead of as a DCE device. If you are using the wrong type of cable, no prompt will be displayed.

  A cable with one-to-one connections will work with a PC or an HP 9000 Series 700 workstation.

If you're connecting to a PC with Microsoft Windows

- Remember that Windows 3.1 only allows two active RS-232 connections at a time. If you want to be warned when you violate this restriction, choose Always Warn in the Device Contention group box under 386 Enhanced in the Control Panel.
- Use the "Terminal" program (usually found in the Accessories windows program group) and set up the "Communications..." settings as follows:

```
Baud Rate: 9600 (or whatever you have chosen for the probe)
Data Bits: 8
Parity: None
Flow Control: hardware
Stop Bits: 1
```

- With certain RS-232 cards, connecting to an RS-232 port where the emulation probe is turned OFF (or is not connected) will hang the PC. The only way to get control back is to reboot the PC. Therefore, you should turn ON the probe before attempting to connect via RS-232.

If you have RS-232 connection problems (E5900B)

If you have problems communicating with the serial port on an E5900B emulation probe:

- Make sure you have connected the emulation probe to the proper power source, the power switch is on, and the power light is lit.
- Make sure you have properly configured the data communications parameters on the terminal or host computer.
- Make sure you are using the serial cable and DB9-to-RJ12 adapter supplied with the emulation probe.

If you're connecting to a PC with Microsoft Windows

- Remember that Windows 3.1 only allows two active RS-232 connections at a time. If you want to be warned when you violate this restriction, choose Always Warn in the Device Contention group box under 386 Enhanced in the Control Panel.
- Use the "Terminal" program (usually found in the Accessories windows program group) and set up the "Communications..." settings as follows:

```
Baud Rate: 9600
Data Bits: 8
Parity: None
Flow Control: hardware
Stop Bits: 1
```

- With certain RS-232 cards, connecting to an RS-232 port where the emulation probe is turned OFF (or is not connected) will hang the PC. The only way to get control back is to reboot the PC. Therefore, Agilent recommends you always turn ON the probe before attempting to connect

via RS-232.

To configure LAN parameters using a serial connection

1. Connect the serial cable from the host computer to the emulation probe.

   See “To connect the E5900B emulation probe via RS-232” on page 71 or “To connect the E5900A emulation probe via RS-232” on page 69.

2. Start a terminal emulator program on the host computer.

   If you are using a PC, the HyperTerminal application in Microsoft Windows will work fine.

   If you are using a UNIX workstation, you can use a terminal emulator such as cu or kermit.

3. Configure the terminal emulator program for:

```
Communication rate: 9600 baud
Bits: 8
Parity: none
Stop bits: 1
Flow control: none
```

   Turn on power to the emulation probe.

   When the emulation probe powers up, it sends a version message to the serial port, followed by a prompt.

4. Press the Return or Enter key a few times.

   You should see a prompt such as "p" or "R".

   For information about the commands you can use, enter ? or help at the prompt.

5. Display the current LAN configuration values by entering the lan command:

```
R> lan
lan is enabled
   Link Status is UP
   100BaseTX
  lan -i 15.5.24.116
  lan -g 15.5.23.1
  lan -s 255.255.248.0
```

```
  lan -p 6470
  Ethernet Address : 08000909BAC1
R>
```

The Ethernet address, also known as the link level address, is preassigned at the factory, and is printed on a label on the emulation probe.

6. Enter the following command:

```
lan -i <internet> [-g <gateway>] [-p <port>] [-s <subnet>]
```

The lan command parameters are:

-i *internet* The IP address which you obtained from your network administrator.

-g *gateway* The gateway address. Setting the gateway address allows access outside your local network or subnet.

-s *subnet* This changes the subnet mask.

-p *port* This changes the base TCP service port number, normally 6470.

Do not change the default port numbers (6470, 6471) unless they conflict with some other product on your network. The numbers must be greater than 1024. If you change the base port, enter the new value in the configuration of your debugger (and, for UNIX workstations, in the /etc/services file).

7. Cycle power on the emulation probe.

The IP address and any other LAN parameters you change are stored in nonvolatile memory and will take effect when the emulation probe is powered off and back on again.

For example, to assign an IP address of 192.6.94.2 to the emulation probe, enter the following command:

```
R>lan -i 192.6.94.2
```

Cycle power on the emulation probe so that the new address will take effect.

8. Verify your emulation probe is now active and on the network.

Once you have set a valid IP address, you can use the telnet utility to connect to the emulation probe, and use the lan command to change LAN parameters.

absolute Denotes the time period or count of states between a captured state and the trigger state. An absolute count of -10 indicates the state was captured ten states before the trigger state was captured.

acquisition Denotes one complete cycle of data gathering by a measurement module. For example, if you are using an analyzer with 128K memory depth, one complete acquisition will capture and store 128K states in acquisition memory.

analysis probe A probe connected to a microprocessor or standard bus in the device under test. An analysis probe provides an interface between the signals of the microprocessor or standard bus and the inputs of the logic analyzer. Also called a *preprocessor*.

analyzer 1 In a logic analyzer with two *machines*, refers to the machine that is on by default. The default name is *Analyzer<N>*, where N is the slot letter.

analyzer 2 In a logic analyzer with two *machines*, refers to the machine that is off by default. The default name is *Analyzer<N2>*, where N is the slot letter.

arming An instrument tool must be armed before it can search for its trigger condition. Typically, instruments are armed immediately when *Run* or *Group Run* is selected. You can set up one instrument to arm another using the *Intermodule Window*. In these setups, the second instrument cannot search for its trigger condition until it receives the arming signal from the first instrument. In some analyzer instruments, you can set up one analyzer *machine* to arm the other analyzer machine in the *Trigger Window*.

asterisk (*) See *edge terms*, *glitch*, and *labels*.

bits Bits represent the physical logic analyzer channels. A bit is a *channel* that has or can be assigned to a *label*. A bit is also a position in a label.

card This refers to a single instrument intended for use in the Agilent Technologies 16700A/B-series mainframes. One card fills one slot in the mainframe. A module may comprise a single card or multiple cards cabled together.

channel The entire signal path from the probe tip, through the cable and module, up to the label grouping.

click When using a mouse as the

pointing device, to click an item, position the cursor over the item. Then quickly press and release the *left mouse button*.

clock channel A logic analyzer *channel* that can be used to carry the clock signal. When it is not needed for clock signals, it can be used as a *data channel*, except in the Agilent Technologies 16517A.

context record A context record is a small segment of analyzer memory that stores an event of interest along with the states that immediately preceded it and the states that immediately followed it.

context store If your analyzer can perform context store measurements, you will see a button labeled *Context Store* under the Trigger tab. Typical context store measurements are used to capture writes to a variable or calls to a subroutine, along with the activity preceding and following the events. A context store measurement divides analyzer memory into a series of context records. If you have a 64K analyzer memory and select a 16-state context, the analyzer memory is divided into 4K 16-state context records. If you have a 64K analyzer memory and select a 64-state context, the analyzer memory will be divided into 1K 64-state records.

count The count function records periods of time or numbers of state transactions between states stored in memory. You can set up the analyzer count function to count occurrences of a selected event during the trace, such as counting how many times a variable is read between each of the writes to the variable. The analyzer can also be set up to count elapsed time, such as counting the time spent executing within a particular function during a run of your target program.

cross triggering Using intermodule capabilities to have measurement modules trigger each other. For example, you can have an external instrument arm a logic analyzer, which subsequently triggers an oscilloscope when it finds the trigger state.

data channel A *channel* that carries data. Data channels cannot be used to clock logic analyzers.

data field A data field in the pattern generator is the data value associated with a single label within a particular data vector.

data set A data set is made up of all labels and data stored in memory of any single analyzer machine or

instrument tool. Multiple data sets can be displayed together when sourced into a single display tool. The Filter tool is used to pass on partial data sets to analysis or display tools.

debug mode See *monitor*.

delay The delay function sets the horizontal position of the waveform on the screen for the oscilloscope and timing analyzer. Delay time is measured from the trigger point in seconds or states.

demo mode An emulation control session which is not connected to a real target system. All windows can be viewed, but the data displayed is simulated. To start demo mode, select *Start User Session* from the Emulation Control Interface and enter the demo name in the *Processor Probe LAN Name* field. Select the *Help* button in the *Start User Session* window for details.

deskewing To cancel or nullify the effects of differences between two different internal delay paths for a signal. Deskewing is normally done by routing a single test signal to the inputs of two different modules, then adjusting the Intermodule Skew so that both modules recognize the signal at the same time.

device under test The system under test, which contains the circuitry you are probing. Also known as a *target system*.

don't care For *terms*, a "don't care" means that the state of the signal (high or low) is not relevant to the measurement. The analyzer ignores the state of this signal when determining whether a match occurs on an input label. "Don't care" signals are still sampled and their values can be displayed with the rest of the data. Don't cares are represented by the *X* character in numeric values and the dot (.) in timing edge specifications.

dot (.) See *edge terms*, *glitch*, *labels*, and *don't care*.

double-click When using a mouse as the pointing device, to double-click an item, position the cursor over the item, and then quickly press and release the *left mouse button* twice.

drag and drop Using a Mouse: Position the cursor over the item, and then press and hold the *left mouse button*. While holding the left mouse button down, move the mouse to drag the item to a new location. When the item is positioned where you want it, release the mouse button.

Using the Touchscreen:
Position your finger over the item, then press and hold finger to the screen. While holding the finger down, slide the finger along the screen dragging the item to a new location. When the item is positioned where you want it, release your finger.

edge mode In an oscilloscope, this is the trigger mode that causes a trigger based on a single channel edge, either rising or falling.

edge terms Logic analyzer trigger resources that allow detection of transitions on a signal. An edge term can be set to detect a rising edge, falling edge, or either edge. Some logic analyzers can also detect no edge or a *glitch* on an input signal. Edges are specified by selecting arrows. The dot (.) ignores the bit. The asterisk (*) specifies a glitch on the bit.

emulation module A module within the logic analysis system mainframe that provides an emulation connection to the debug port of a microprocessor. An E5901A emulation module is used with a target interface module (TIM) or an analysis probe. An E5901B emulation module is used with an E5900A emulation probe.

emulation probe The stand-alone equivalent of an *emulation module*. Most of the tasks which can be performed using an emulation module can also be performed using an emulation probe connected to your logic analysis system via a LAN.

emulator An *emulation module* or an *emulation probe*.

Ethernet address See *link-level address*.

events Events are the things you are looking for in your target system. In the logic analyzer interface, they take a single line. Examples of events are *Label1 = XX* and *Timer 1 > 400 ns*.

filter expression The filter expression is the logical *OR* combination of all of the filter terms. States in your data that match the filter expression can be filtered out or passed through the Pattern Filter.

filter term A variable that you define in order to specify which states to filter out or pass through. Filter terms are logically OR'ed together to create the filter expression.

Format The selections under the logic analyzer *Format* tab tell the

logic analyzer what data you want to collect, such as which channels represent buses (labels) and what logic threshold your signals use.

frame The Agilent Technologies or 16700A/B-series logic analysis system mainframe. See also *logic analysis system*.

gateway address An IP address entered in integer dot notation. The default gateway address is 0.0.0.0, which allows all connections on the local network or subnet. If connections are to be made across networks or subnets, this address must be set to the address of the gateway machine.

glitch A glitch occurs when two or more transitions cross the logic threshold between consecutive timing analyzer samples. You can specify glitch detection by choosing the asterisk (*) for *edge terms* under the timing analyzer Trigger tab.

grouped event A grouped event is a list of *events* that you have grouped, and optionally named. It can be reused in other trigger sequence levels. Only available in Agilent Technologies 16715A or higher logic analyzers.

held value A value that is held until the next sample. A held value can exist in multiple data sets.

immediate mode In an oscilloscope, the trigger mode that does not require a specific trigger condition such as an edge or a pattern. Use immediate mode when the oscilloscope is armed by another instrument.

interconnect cable Short name for *module/probe interconnect cable*.

intermodule bus The intermodule bus (IMB) is a bus in the frame that allows the measurement modules to communicate with each other. Using the IMB, you can set up one instrument to *arm* another. Data acquired by instruments using the IMB is time-correlated.

intermodule Intermodule is a term used when multiple instrument tools are connected together for the purpose of one instrument arming another. In such a configuration, an arming tree is developed and the group run function is designated to start all instrument tools. Multiple instrument configurations are done in the Intermodule window.

internet address Also called Internet Protocol address or IP address. A 32-bit network address. It

is usually represented as decimal numbers separated by periods; for example, 192.35.12.6. Ask your LAN administrator if you need an internet address.

labels Labels are used to group and identify logic analyzer channels. A label consists of a name and an associated bit or group of bits. Labels are created in the Format tab.

line numbers A line number (Line #s) is a special use of *symbols*. Line numbers represent lines in your source file, typically lines that have no unique symbols defined to represent them.

link-level address Also referred to as the Ethernet address, this is the unique address of the LAN interface. This value is set at the factory and cannot be changed. The link-level address of a particular piece of equipment is often printed on a label above the LAN connector. An example of a link-level address in hexadecimal: 0800090012AB.

local session A local session is when you run the logic analysis system using the local display connected to the product hardware.

logic analysis system The Agilent Technologies 16700A/B-series mainframes, and all tools designed to work with it. Usually used to mean the specific system and tools you are working with right now.

machine Some logic analyzers allow you to set up two measurements at the same time. Each measurement is handled by a different machine. This is represented in the Workspace window by two icons, differentiated by a *1* and a *2* in the upper right-hand corner of the icon. Logic analyzer resources such as pods and trigger terms cannot be shared by the machines.

markers Markers are the green and yellow lines in the display that are labeled *x*, *o*, *G1*, and *G2*. Use them to measure time intervals or sample intervals. Markers are assigned to patterns in order to find patterns or track sequences of states in the data. The x and o markers are local to the immediate display, while G1 and G2 are global between time correlated displays.

master card In a module, the master card controls the data acquisition or output. The logic analysis system references the module by the slot in which the master card is plugged. For example, a 5-card Agilent Technologies 16555D would be referred to as *Slot C:*

machine because the master card is in slot C of the mainframe. The other cards of the module are called *expansion cards*.

menu bar The menu bar is located at the top of all windows. Use it to select *File* operations, tool or system *Options*, and tool or system level *Help*.

message bar The message bar displays mouse button functions for the window area or field directly beneath the mouse cursor. Use the mouse and message bar together to prompt yourself to functions and shortcuts.

module/probe interconnect cable

The module/probe interconnect cable connects an E5901B emulation module to an E5900B emulation probe. It provides power and a serial connection. A LAN connection is also required to use the emulation probe.

module An instrument that uses a single timebase in its operation. Modules can have from one to five cards functioning as a single instrument. When a module has more than one card, system window will show the instrument icon in the slot of the *master card*.

monitor When using the Emulation Control Interface, running the monitor means the processor is in debug mode (that is, executing the debug exception) instead of executing the user program.

panning The action of moving the waveform along the timebase by varying the delay value in the Delay field. This action allows you to control the portion of acquisition memory that will be displayed on the screen.

pattern mode In an oscilloscope, the trigger mode that allows you to set the oscilloscope to trigger on a specified combination of input signal levels.

pattern terms Logic analyzer resources that represent single states to be found on labeled sets of bits; for example, an address on the address bus or a status on the status lines.

period (.) See *edge terms*, *glitch*, *labels*, and *don't care*.

pod pair A group of two pods containing 16 channels each, used to physically connect data and clock signals from the unit under test to the analyzer. Pods are assigned by pairs in the analyzer interface. The number of pod pairs available is determined

by the channel width of the instrument.

pod See *pod pair*

point To point to an item, move the mouse cursor over the item, or position your finger over the item.

preprocessor See *analysis probe*.

primary branch The primary branch is indicated in the *Trigger sequence step* dialog box as either the *Then find* or *Trigger on* selection. The destination of the primary branch is always the next state in the sequence, except for the Agilent Technologies 16517A. The primary branch has an optional occurrence count field that can be used to count a number of occurrences of the branch condition. See also *secondary branch*.

probe A device to connect the various instruments of the logic analysis system to the target system. There are many types of probes and the one you should use depends on the instrument and your data requirements. As a verb, "to probe" means to attach a probe to the target system.

processor probe See *emulation probe*.

range terms Logic analyzer resources that represent ranges of values to be found on labeled sets of bits. For example, range terms could identify a range of addresses to be found on the address bus or a range of data values to be found on the data bus. In the trigger sequence, range terms are considered to be true when any value within the range occurs.

relative Denotes time period or count of states between the current state and the previous state.

remote display A remote display is a display other than the one connected to the product hardware. Remote displays must be identified to the network through an address location.

remote session A remote session is when you run the logic analyzer using a display that is located away from the product hardware.

right-click When using a mouse for a pointing device, to right-click an item, position the cursor over the item, and then quickly press and release the *right mouse button*.

sample A data sample is a portion of a *data set*, sometimes just one point. When an instrument samples the target system, it is taking a single

measurement as part of its data acquisition cycle.

Sampling Use the selections under the logic analyzer Sampling tab to tell the logic analyzer how you want to make measurements, such as State vs. Timing.

secondary branch The secondary branch is indicated in the *Trigger sequence step* dialog box as the *Else on* selection. The destination of the secondary branch can be specified as any other active sequence state. See also *primary branch*.

session A session begins when you start a *local session* or *remote session* from the session manager, and ends when you select *Exit* from the main window. Exiting a session returns all tools to their initial configurations.

skew Skew is the difference in channel delays between measurement channels. Typically, skew between modules is caused by differences in designs of measurement channels, and differences in characteristics of the electronic components within those channels. You should adjust measurement modules to eliminate as much skew as possible so that it does not affect the accuracy of your measurements.

state measurement In a state measurement, the logic analyzer is clocked by a signal from the system under test. Each time the clock signal becomes valid, the analyzer samples data from the system under test. Since the analyzer is clocked by the system, state measurements are *synchronous* with the test system.

store qualification Store qualification is only available in a *state measurement*, not *timing measurements*. Store qualification allows you to specify the type of information (all samples, no samples, or selected states) to be stored in memory. Use store qualification to prevent memory from being filled with unwanted activity such as no-ops or wait-loops. To set up store qualification, use the *While storing* field in a logic analyzer trigger sequence dialog.

subnet mask A subnet mask blocks out part of an IP address so that the networking software can determine whether the destination host is on a local or remote network. It is usually represented as decimal numbers separated by periods; for example, 255.255.255.0. Ask your LAN administrator if you need a the subnet mask for your network.

symbols Symbols represent patterns and ranges of values found on labeled sets of bits. Two kinds of symbols are available:

- Object file symbols - Symbols from your source code, and symbols generated by your compiler. Object file symbols may represent global variables, functions, labels, and source line numbers.
- User-defined symbols - Symbols you create.

Symbols can be used as *pattern* and *range* terms for:

- Searches in the listing display.
- Triggering in logic analyzers and in the source correlation trigger setup.
- Qualifying data in the filter tool and system performance analysis tool set.

system administrator The system administrator is a person who manages your system, taking care of such tasks as adding peripheral devices, adding new users, and doing system backup. In general, the system administrator is the person you go to with questions about implementing your software.

target system The system under test, which contains the microprocessor you are probing.

terms Terms are variables that can be used in trigger sequences. A term can be a single value on a label or set of labels, any value within a range of values on a label or set of labels, or a glitch or edge transition on bits within a label or set of labels.

TIM A TIM (Target Interface Module) makes connections between the cable from the emulation module or emulation probe and the cable to the debug port on the system under test.

time-correlated Time correlated measurements are measurements involving more than one instrument in which all instruments have a common time or trigger reference.

timer terms Logic analyzer resources that are used to measure the time the trigger sequence remains within one sequence step, or a set of sequence steps. Timers can be used to detect when a condition lasts too long or not long enough. They can be used to measure pulse duration, or duration of a wait loop. A single timer term can be used to delay trigger until a period of time after detection of a significant event.

timing measurement In a timing measurement, the logic analyzer samples data at regular intervals according to a clock signal internal to the timing analyzer. Since the analyzer is clocked by a signal that is not related to the system under test, timing measurements capture traces of electrical activity over time. These measurements are *asynchronous* with the test system.

tool icon Tool icons that appear in the workspace are representations of the hardware and software tools selected from the toolbox. If they are placed directly over a current measurement, the tools automatically connect to that measurement. If they are placed on an open area of the main window, you must connect them to a measurement using the mouse.

toolbox The Toolbox is located on the left side of the main window. It is used to display the available hardware and software tools. As you add new tools to your system, their icons will appear in the Toolbox.

tools A tool is a stand-alone piece of functionality. A tool can be an instrument that acquires data, a display for viewing data, or a post-processing analysis helper. Tools are represented as icons in the main window of the interface.

trace See *acquisition*.

trigger sequence A trigger sequence is a sequence of events that you specify. The logic analyzer compares this sequence with the samples it is collecting to determine when to *trigger*.

trigger specification A trigger specification is a set of conditions that must be true before the instrument triggers.

trigger Trigger is an event that occurs immediately after the instrument recognizes a match between the incoming data and the trigger specification. Once trigger occurs, the instrument completes its *acquisition*, including any store qualification that may be specified.

workspace The workspace is the large area under the message bar and to the right of the toolbox. The workspace is where you place the different instrument, display, and analysis tools. Once in the workspace, the tool icons graphically represent a complete picture of the measurements.

zooming In the oscilloscope or timing analyzer, to expand and contract the waveform along the time base by varying the value in the s/Div

field. This action allows you to select specific portions of a particular waveform in acquisition memory that will be displayed on the screen. You can view any portion of the waveform record in acquisition memory.

Index

Publication Number: 5988-9068EN
January 1, 2003

Agilent Technologies