Help Volume

System: HP 16600A/16700A Logic Analysis System

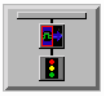
- Making Measurements (see page 97) - Setting up a measurement, loading a config file, etc.
- Measurement Examples (see the *Measurement Examples* help volume) - Setting up common measurements.
- Using Measurement Tools (see page 73) - Instrument, Analysis, Display, Emulation and Utility tools.
- System Overview (see page 93) - Getting to know your logic analysis system.
- System Administration (see page 16) - Setting up and maintaining your logic analysis system.
- Connectivity (see the *PC Connectivity* help volume) - Netscape, Home Page, Remote Front Panel, and the RPI.
- Getting Help (see page 91) - Available help resources and searching for help.

***The File Management Tools* (see page 63)**

Use the *File Manager* to perform the common tasks of loading or saving measurement configurations and data. The File Manager can access both the flexible disk and internal/external hard drives.

- Create, Delete, or Rename a Directory (see page 63)
- Load, Save, Copy, Delete, Move, Rename, or Compress a File (see page 63)
- Other File Manager Operations (see page 63)

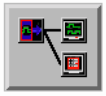
***The Intermodule Window* (see page 12)**



The *Intermodule* window graphically depicts the internal arming sequence between measurement modules and any external trigger connections to a target system. With multiple instrument measurements, use the Intermodule window to adjust the order of trigger arming, and to compensate for timing skew between the modules.

- Example - Multiple Instrument Measurement (see page 123)
- Example - Multiple Analyzer Measurement (see page 130)
- Configure Arming Control Between Instrument Tools (see page 135)
- Configure Arming Control Between Analyzers (see page 137)
- Configure External Triggering with the Port In/Out Signal (see page 119)
- Adjusting Intermodule Skew (see page 112)
- Understanding the Run/Group Run Function (see page 147)

***The Workspace Window* (see page 14)**



The *Workspace* window shows a graphical layout of your measurement configuration. Use the Workspace window to alter your measurement by adding or deleting tools, or by changing the data flow connections between tools.

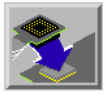
- Adding Tools to a Measurement Configuration (see page 174)
- Deleting Tools from a Measurement Configuration (see page 174)
- Changing the Connections between Tools (see page 175)

The System Administration Tools (see page 16)

Use the *System Administration* tools to set up system defaults, configure network connections, and perform maintenance on the operating system file set.

- Network Setup, File System Connectivity, and Network Utilities (see page 16)
- Product Licensing, Printer Setup, Time/Date, and Self-Test (see page 16)
- User Accounts and Changing Passwords (see page 17)
- Installing, Listing, and Removing Software (see page 17)
- Saving and Reloading System Settings (see page 45)

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



The *Setup Assistant* is an automated tool for connecting and configuring your logic analyzer for processor measurements. This menu-driven tool helps you connect and configure an analysis probe, an emulation probe, or a source viewer.

See Also

- Using the Help System (see the *Help On Help* help volume)
- Online Help Information on the World Wide Web (see page 91)
- Japanese Help Volumes (see page 99)
- Glossary of Terms (see page 179)

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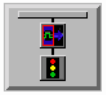
HP 16600A/16700A Series Logic Analysis System

The Intermodule Window



The *Intermodule* window shows a graphical representation of the internal arming sequence between measurement modules, and any external trigger connections to a target system or other instruments. In measurements using multiple instruments tools or analyzers, the Intermodule window is used to modify the order that measurement modules are armed to trigger, and to compensate for any timing deviations (skew adjust) between the modules probing.

The purpose of using multiple instruments or analyzers in the same measurement is generally for two reasons. The first is to capture different types of system data at the same point in time. The second reason is to trigger the measurement from one type of data while capturing a different type.

For example, you might have a timing analyzer trigger on a glitch, and at the same time, signal an oscilloscope to capture the glitch and a state analyzer to capture the program flow around the glitch.

Getting Started

- Overview of a Multiple Instrument Configuration (see page 140)
- Overview of a Multiple Analyzer Configuration (see page 138)

Measurement Examples

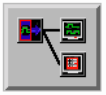
- Using a Timing Analyzer and an Oscilloscope (see page 123)
- Using Both Analyzers (see page 130)
- Port In - Starting Measurements from External Triggers (see page 119)
- Port Out - Triggering External Instruments (see page 120)

See Also

- Using the Correlation Dialog (see page 110)
- Run/Group Run Function (see page 147)
- Adjusting Intermodule Skew (see page 112)

- Group Run Arming Tree (see page 135)
- Arming Tree (see page 137)

The Workspace Window



The *Workspace* window is a graphical layout of the measurement configuration. In the more complex measurements, the Workspace is used to change the configuration by adding or deleting tools, or by changing the data flow connection scheme between tools.

- Adding or Deleting Tools (see page 174)
- Connecting Tools Together (see page 175)
- Repositioning Tools in the Workspace (see page 177)
- Clearing the Workspace (see page 176)
- Loading Configuration Files (see page 81)
- Saving Configuration Files (see page 83)
- Printing Windows - Configurations (see page 37)

See Also

Print Options (see page 41)

Run All Function (see page 147)

“Workspace Options” on page 14

Workspace Options

The following options are available in the Workspace window.

Grid Mode

When *Snap Grid* is turned on, tool icons are always positioned (snapped) to a grid layout. When the *Snap Grid* is turned off, tool icons can be placed or moved anywhere on the workspace. To see the

grid lines used with the Snap Grid, select *Toggle Grid Lines*.

Auto Arrange Icons

When *Auto Arrange Icons* is selected, all tool icons on the workspace are automatically placed on a grid layout.

Screen Saver

When the *Screen Saver* is used, the display goes dark after the selected time period. The display reappears after the mouse is moved, or, any key on the keyboard is pressed.

The System Administration Tools

The *System Administration Tools* window is where you set up system defaults, network configurations, and perform maintenance on the operating system file set.

Networking

- Analysis System Network Setup

  "Configuring the Network" on page 17

  "Using the Name Resolver to Alias IP Addresses" on page 21

- Windows 95/NT File System Connectivity

  "Mapping Windows/NT Network Drives" on page 22

  "Share Analyzer Drive" on page 27

- "Configuring the NFS" on page 30

- Network Utilities

  "FTP (file transfer protocol)" on page 34

  "Telnet" on page 35

  "Ping" on page 36

Admin

- Licensing Products (see page 36)

- "Printer Setup" on page 38

- Other Printer Functionality

  "Printing Windows - Configurations" on page 37

  Printing to a File (see page 41)

Configuring the Network

NOTE: This operation may require *System Administration Privileges*. (see page 18)

You configure a network to set connectivity between all other networks and computers on those networks. With a properly configured network, you can interact with other computers to run the logic analysis system as well as perform file operations or run programs on other computers.

Network Setup

1. From the Networking tab in the System Administration Tools window, click *Network Setup ...*.
2. Click Networking *Enable*.
3. Type the Hostname (see page 19).
4. Type the Internet Address (IP) (see page 19).
5. Type the Gateway Name (see page 19).
6. Type the Gateway IP (see page 20).
7. Type the Subnet Mask (see page 20).
8. Click *OK*.

NOTE: To start the network setup from the factory default settings, click *Default Network* before performing the steps above.

See Also

"Using the Name Resolver to Alias IP Addresses" on page 21

"Emulation Network Setup" on page 20

System Administration Privileges

Your System Administrator is the first person who accesses the *User Accounts* dialog and gives himself system administration privileges. From that point forward, the *User Accounts...* pick is unavailable for all users except the users with system administration privileges. There can be more than one System Administrator. However, the first administrator must initially give all other administrators privileges so they can gain access to the restricted areas when they login the first time. If User Accounts are not used, all users have system administration privileges.

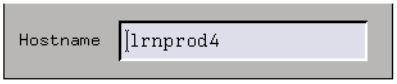
At the time users login, the system software checks for system administration privileges and sets the appropriate access mask on all restricted areas of the system.

Only the System Administrator can perform the following system-level tasks:

- Configure the network.
- Enable or Disable the Secure Mode and the use of user accounts.
- Add and remove individual user accounts.
- Set the system-wide default file permissions (see page 88).
- Set user permissions for new file creation.
- Set the system time.
- Set NFS export permissions from the logic analysis system.

Hostname

The *Hostname* is the name of your local computer or logic analysis system. The name can contain only lower case letters, numbers, underscores(_), and dashes(-). It must start with a lowercase letter. Get the hostname from your *system administrator*.



Internet Address (IP)

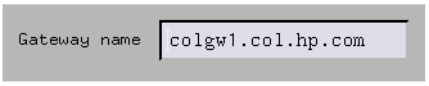
The *Internet Address (IP)* is a four-part code in integer dot notation. The assignment of an internet address uniquely identifies your computer among all those located on your network or any other network. Get this IP address from your *system administrator*.

See Also "Using the Name Resolver to Alias IP Addresses" on page 21

Gateway Name

The *Gateway name* is the name of the computer that routes traffic from one network to another. If you plan to communicate with a computer on a different network, you must specify the gateway computer name. No entry in this field will disable the gateway. The

gateway name can contain only lowercase letters, numbers, underscores(_), and dashes(-). It must start with a lowercase letter. Get the gateway name from your *system administrator*.

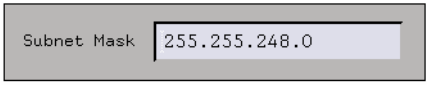


Gateway IP

The *Gateway IP* is a four-part code in integer dot notation. The assignment of the gateway IP allows the logic analysis system to connect between other networks and subnetworks. The gateway IP must be set to the address of the gateway machine. No entry in this field will disable the gateway. Get the gateway address from your *system administrator*.

Subnet Mask

The *Subnet Mask* is an assigned group of bits that helps to quickly identify your subnetwork. If you have a gateway machine and your network is partitioned into subnetworks, you must specify a subnet mask. The subnet mask is a four-part code in integer dot notation. An example of an 18-bit subnet mask is shown below. Get the subnet mask from your *system administrator*.



Emulation Network Setup

Emulation probes, both standalone and interconnected to an emulation module, need to be configured with LAN parameters.

The procedure for starting an connecting an emulation probe to the network depends on which kind of emulator you are using:

- Setting Up an E5900A Emulation Probe (see the *Emulation: Setting Up* help volume)
- Setting Up an E5900B Emulation Probe (see the *Emulation: Setting Up* help volume)
- Setting Up an E5901B Emulation Module (see the *Emulation: Setting Up* help volume)

An easy way to configure an emulation probe is to use the *Setup Assistant*. Use the Setup Assistant if:

- You have a single E5900B emulation probe interconnected to an E5901B emulation module, or
- You have an emulation probe and NO emulation module is installed in your logic analysis system.

The Setup Assistant will not allow you to set up a standalone emulation probe if an emulation module is installed.

See Also

- Using an E5901A Emulation Module on Your LAN (see the *Emulation: Setting Up* help volume)
- To obtain LAN information (see the *Emulation: Setting Up* help volume)
- The Setup Assistant (see the *Setup Assistant* help volume)

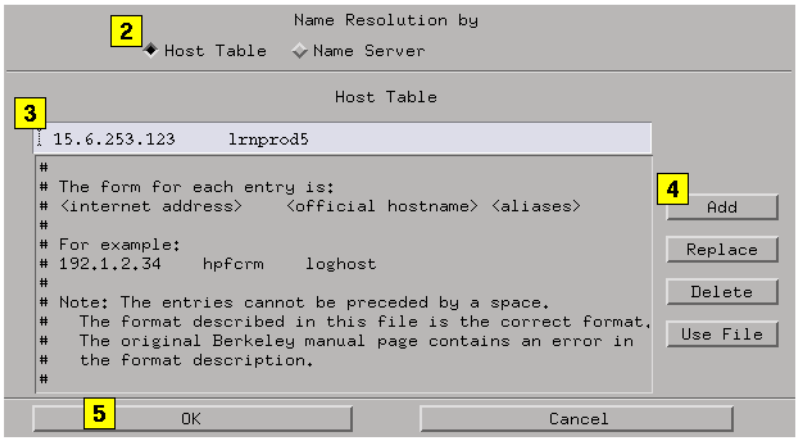
Using the Name Resolver to Alias IP Addresses

The *Name Resolver* is used to assign custom names (aliases) to the Internet IP addresses. With an alias assigned to the Internet IP Address, you simply type in the alias in any IP address field. The configuration interprets it as the correct IP address. Alias names are usually set in either a local Host Table or a Name Server on the network.

1. From the Network Setup dialog, click *Name Resolver...*.
2. In the Name Resolution Dialog, select Host Table and click the text entry field for the alias names.
3. Type in the Internet IP Address (see page 19) followed by a space, and

then the alias name.

4. Click *Add*.
5. Click *OK*.



Mapping Windows/NT Network Drives

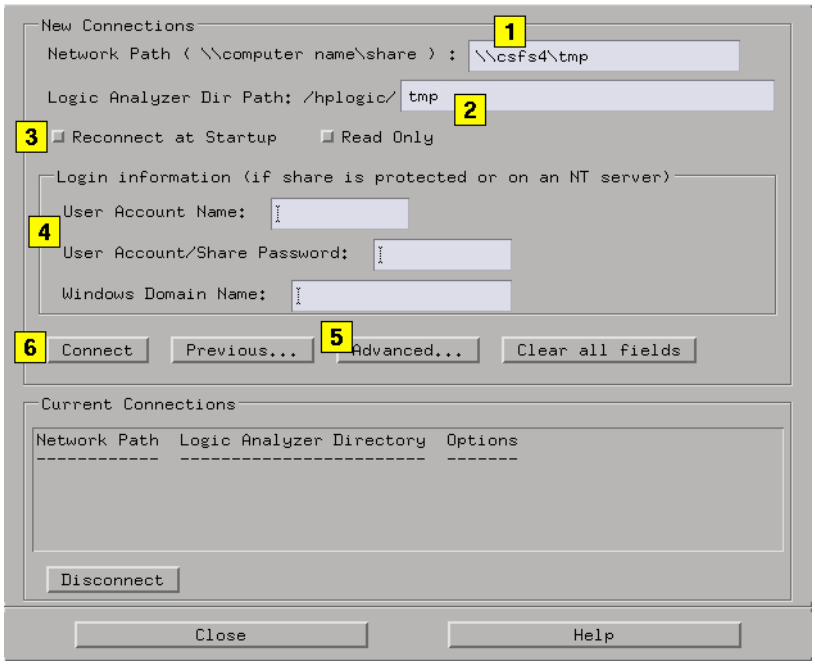
The *Map Windows Drive* dialog is used to designate a share in a Windows/NT computer to be available for file operations performed from the logic analysis system.

NOTE: The logic analysis system only allows the use of one mapped directory per server at a time. If more than one directory must be mapped, you must disconnect the previously connected share before mapping the new one. Also, do not disconnect a share mapping while files are being accessed. The resulting file contention may cause long delays or an unstable logic analysis system.

There are two ways to connect to a remote file system. One way is to create a new connection. The other way is to reconnect to a previous connection.

Creating a New Connection

1. Type in the Network Path (see page 25). The network path consists of the IP address or the server name, followed by the specified share name.
2. Type in the Logic Analyzer Dir Path (see page 25).
3. Set the *Reconnect at Startup* (see page 24) as desired. When activated, this feature automatically re-establishes the Windows/NT connectivity to the logic analyzer directory at each new analyzer session startup.
   Set the *Read Only* if necessary. See the note below.
4. Optional - Type in the Login Information (see page 25) if the share is protected.
5. Optional - Click *Advanced...* to correct inconsistent naming (see page 26) of the Windows netbios computer and the TCP/IP hostname.
6. Click *Connect*.



NOTE: If the CD-ROM you are using is shared from a Windows 95 server, the *Read Only* field must be enabled.

Choose a Previous Connection

If a connection has been made in the past, the connection and its options will appear in a dialog found by clicking the *Previous...* button. To re-establish a previous connection, do the following.

1. Click *Previous...*.
2. Select the desired connection from the list in the PC Previous Connections dialog.
3. Click *Select*.

NOTE: For security reasons, password information is not saved when the Previous dialog is used. In this case, you are required to re-enter Share passwords.

Disconnect a Current Connection

A list of *Current Connections* appears at the bottom of the dialog. This is a list of all connections to remote file systems. If you *Disconnect* a share mapping when either a file is still open, or a file operation is in progress, the resulting file contention may cause long delays or an unstable system. Terminate all file operations and interaction with the remote file system before you disconnect the share mapping.

To disconnect a share mapping, click the desired connection in the Current Connections list, and then click *Disconnect*.

Reconnect at Startup

If you plan to reconnect at each startup, make sure to enable the feature when you configure the connection the first time. This field cannot be edited. The only way to change the configuration is to disconnect, and then configure as a new connection. Also, be sure to keep the connection active when you exit a session. In other words, do not select the *Disconnect* field at the bottom of the dialog when you exit a session.

NOTE: For security reasons, you cannot reconnect to a PC share map that is password protected.

Network Path

What you type into the *Network Path* field will take the form \\computer_name\share_name, where computer_name is the IP address or name of the Windows server you are connecting to.

You can locate the computer name by right-clicking on *Network Neighborhood* under the Windows system, then selecting *Properties* from the pull-down menu. Locate the tab labeled *Identification* and the *Computer Name* is specified there.

The share_name is the name that was specified for the *Share Name* in the share dialog on the server where the share was created. To find the Share Name under a Windows system, go to the drive where the share is located, right-click on the directory, then select *Sharing* from the pull-down menu. The share name is specified in the dialog that appears.

Logic Analyzer Directory Path

The *Logic Analyzer Dir Path* points to the directory location in the analyzer that is mapped to the Windows share. The directory is based off of the main directory */hplogic/*. The default name given to the sub-directory is the same as the Share Name designated in the Network Path field.

NOTE: Some characters such as "$" are not allowed in UNIX filenames. If a *Share Name* has one of these characters in its name, the default Logic Analyzer Dir Path will be illegal, and you must change it manually.

Login Information

The *Login Information* is only required if the share is password or account protected, that is, it is NOT a public share. If the share is a Windows 95 share, with ONLY password protection, typically only the *User Account/Share Password* field is required. If the share is a Windows NT/95 share that is protected on a user account basis, the *User Account Name* and *User Account/Share Password* fields are both required. If the share is protected on a user account basis with NT domain authentication, all fields are required.

User Account Name

This field allows the user to specify what his login account name is. This is required for a share that has its permissions based on user accounts.

User Account/Share Password

This field allows the user to specify the password for either his account, or just the password for a share that is password protected. Note that this field will display "*" characters as you type your password for security purposes.

NOTE: If you are mapping to a Windows system, and after entering the *User Account/ Share Password* you have trouble connecting, try entering the *Windows Domain Name*.

Windows Domain Name

This field allows the user to specify the name of the domain the user account name should be authenticated under. This may be a necessary field if the Windows server is using NT domain authentication.

Naming Server and Client Netbios Names

NOTE: This operation may require the help of your *System Administrator*

Use the *Advanced...* field to access a dialog used to correct naming inconsistencies between the Windows netbios computer name and the TCP/IP hostname of the same computer. The logic analysis system must be provided with the name that is specified under the Windows netbios environment.

For example, a Windows PC with the computer name of "testpc" is connected to a TCP/IP network with an internet address of "joe-pc.company.com". Since "testpc" and "joe-pc" are different names, the logic analysis system has no way of knowing the two names point to the same computer.

Server Netbios Name

This field is used to specify the netbios name of the Windows server PC with the share you wish to map. This name can be found by right-clicking on the *Network Neighborhood* icon on the server PC and selecting *Properties*. The *Identification* tab in the dialog that appears will show the name of the computer.

Client Netbios Name

This field is used to specify the netbios name of the logic analysis system if it is different from the hostname specified in the *Network Setup* dialog. You will need to contact your network administrator if you do not know what the netbios name of the logic analysis system is.

NOTE: For convenience, it is usually easier to make sure these two names are the same so the *Advanced...* field is not necessary.

Share Analyzer Drive

The *Share Logic Analyzer Directory* dialog is used to designate a directory in the logic analysis system to be available for file operation performed from a Windows/NT computer.

NOTE: If you are configuring a Windows/NT share for the first time, your *system administrator* may have to set up the appropriate permissions and security on the remote computer.

There are two ways to share a logic analysis directory to remote Windows/NT systems. One way is to create a new share. The other way is to reconnect to a previous share.

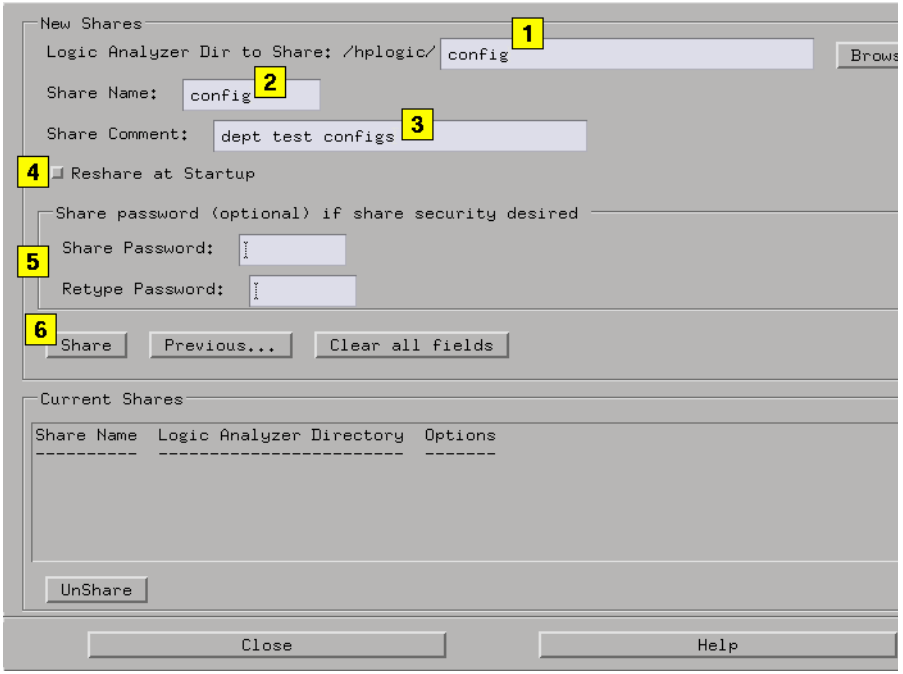
Creating a New Share

1. Type the directory name that you want accessible from a Windows/NT computer.

   The directory you choose must be a sub-directory based off of */hplogic/*. You can also use the *Browse* field to access a graphical file

manager to help in specifying a directory name.

2. Type in the Share Name (see page 29).
3. Optional - Type in a Share Comment (see page 30).
4. Set the *Reshare at Startup* as desired. When activated, this feature automatically re-establishes the share connectivity to the remote Windows/NT computer at each new analyzer session startup. See the note below.
5. Optional - Type in a Share Password (see page 30), and then retype the password to verify it was typed correctly.
6. Click *Share*.



NOTE: If you plan to Reshare at each startup, make sure to enable the feature, and be sure to keep the share as a current active share. In other words, do not select the *UnShare* field at the bottom of the dialog when you exit a session.

Choose a Previous Share

If a connection has been made in the past, the connection and its options will appear in a dialog found by clicking the *Previous...* button. To re-establish a previous Share, do the following.

1. Click *Previous*..
2. Select the desired Share from the list of PC Previous Connections.
3. Click *Select*.

NOTE: For security reasons, password information is not saved when the Previous dialog is used. In this case, you are required to re-enter Share passwords.

Disconnect a Current Share

A list of *Current Shares* appears at the bottom of the dialog. This is a list of all remote file system connections that are sharing the file system of the logic analysis system. If you *UnShare* a share mapping when either a file is still open, or a file operation is in progress, the resulting file contention may cause long delays or an unstable system. Terminate all file operations and interaction with the remote file system before you disconnect the share mapping.

To disconnect a current share, click the desired connection in the Current Shares list, and then click *UnShare*.

Share Name

The *Share Name* is simply a literal name for the share. By default, a name is assigned using the base name of the directory name. The base name is the text to the right of the front-slash (/) in the path name.

Example:
If the directory name path you choose is */hplogic/test_1*,
then the default Share Name would be *test_1*.

You can change the default name if you desire. Directory names can only include the following alphanumeric characters:
0-9, a-z, A-Z, (-), (+), (_), (.), (/), and (:).

Share Comment

Use the *Share Comments* field to tag a Share directory with a desired note. Any *Share Comment* you type, is displayed with the Share Name when browsing the logic analyzer directories from a remote Windows/NT computer.

Using a Share Password

If a *Share Password* is used, the user of the Windows/NT computer will be prompted to type in the password before being allowed to perform file operations in the logic analyzer directory.

NOTE: If no Share Password is used, the logic analyzer directory will have open access with no file security.

Changing a Share Password

If a Share is set up to use a password, it will show up in the list of currently active shares as being password protected. To change the password on a currently active share, follow the procedure below.

To change an encrypted password, follow the procedure below.

1. Select the Share in the *Current Shares* list.
2. Select *UnShare*.
3. Select the *Previous...* field, and then select the Share from the list.
4. Type in a *Share Password*, and then retype the password to verify it was typed correctly.
5. Select *Share*.

Configuring the NFS

The *NFS Client Setup* (Network File System) dialog lets you create network connections to remote computers for the purpose of mounting their file systems to your local logic analysis system.

The benefit of a mounted file system is that you can interact with the

remote directories/files using the File Manager in the logic analysis system. You also have the benefit of using the disk space in the remote computer rather than the disk space in the logic analysis system.

After an NFS connection is made, you will access the remote directories/files under the */hplogic* directory in the logic analysis system.

NOTE: If you are configuring an NFS mount for the first time, your *system administrator* may have to set up the appropriate permissions and security on the remote computer.

There are two ways to connect to a remote file system. One is to create a new connection. The other is to reconnect to a previous connection.

Creating a New Connection

1. From the Networking tab in the System Administration Tools window, click *Mount NFS Filesystem ...*.
2. From the NFS Client Setup dialog that appears, type in the *Remote host:* (see page 32) name. Optional - Use *Browse Hosts...* (see page 33) to select a remote host and a remote directory path from a predefined list.
3. Type in the *Remote dir path:* (see page 32).
4. Type the *Local dir path:* (see page 33). Optional - Use *Browse Local...* (see page 33) to select a directory path from a predefined list.
5. Choose the desired Options... (see page 33).
6. Click *Mount*.

Choose a Previous Connection

If a connection has been made in the past, the connection and its options will appear in the NFS Previous Connections dialog, obtained by clicking the *Previous...* button.

1. From the System Administration Tools window, click *Mount NFS filesystem...*.

2. From the NFS Client Setup dialog that appears, click *Previous...*.
3. Click the desired connection from the *NFS Previous Connections* list.
4. Click *Select*.
5. Click *Close*.

By choosing from the *NFS Previous Connections* list, you automatically get the defined options (see page 33) of that previous connection.

Unmount a Current Connection

A list of *Current Connections* appears at the bottom of the NFS Client Setup dialog. This is a list of all connections to remote file systems that your logic analysis system is currently mounted to. If you try to disconnect a mount when either a file is still opened by you, or a file manager operation is still in progress, you will get a *Device busy* error. Terminate all of your interaction with the mounted file system before you disconnect the mount.

To disconnect a current connection, click the desired connection in the Current Connections list, then click *Unmount*.

Remote Host

The *Remote host:* field designates the remote computer's name. It can take the form of an alias, or a 4-part IP address integer. The remote host name, plus the remote directory path, becomes the *Network Path* listed in the Current Connections or NFS Previous Connections lists.

Remote Directory Path

The *Remote dir path:* field designates a directory path on the remote machine. Type the remote directory path in the text field.

Example

```
/hplogic/test
```

Local Directory Path

The *Local Directory* field designates the local directory. If the local directory you entered does not exist, a one-level directory is created for you using the name you typed. Note that only one level will be created automatically for you.

Example

```
/hplogic/test - where /test was created for you.
```

Options

- The *Read/Write - Read only* option determines if you can read or write to the mounted file system.
  If the exported file system is *Read only*, then you cannot have a Read/Write option. It must be specified Read only.
- The *Hard - Soft* option determines if a request is continually repeated until success (Hard), or if a request is made four (4) times, then aborts (Soft).
- The *Reconnect at Startup* options reconnects to the file system every time the logic analysis system is turned on.

Using Browse Hosts

The *Browse Hosts...* field is used to access a predefined list of remote host machine names and the directories that are mountable.

1. Click *Browse Hosts...*
2. From the Browse NFS Hosts dialog, either select a host name from the upper list, or type in a host name in the text entry field.
3. Click *Show Directories*.
4. Select the desired directory, and then click *Select*.

Using Browse Local

The *Browse Local...* field accesses a *Local Directory Browser* similar to a file manager. Use this Local Directory Browser to build a directory path.

FTP (file transfer protocol)

Once you have established an FTP (file transfer protocol) connection, you can perform FTP commands on files in both the logic analysis system and a remote workstation, PC. If you are in *Secure Mode*, you can only perform FTP commands from the logic analysis system.

The following example copies a password file to a remote system, and then copies it back to the logic analysis system.

1. From the Networking tab in the System Administration Tools window, click *FTP ...*.
2. In the FTP Site dialog that appears, type the alias name or IP address of the remote workstation, PC, or other logic analysis system, and click *OK*. See the note below.
3. In the FTP window that appears, type your *Login*, and press the Enter key.
4. Type in your *Password*, and press the Enter key.
5. From the ftp window that appears, copy the example file "password.example" to a directory in the remote system. For example: put /local_etc/password.example /"remote_dir_name"/.
6. Copy the file back to the logic analysis system. For example: get / "remote_dir_name"/"new_filename" /local_etc/.

To Terminate the FTP Session

To terminate your FTP connection, type "quit".

NOTE: Alias names that are not located in */etc/host* on your remote machine may not be recognized by the logic analysis system. If this is the case, use the Internet IP address instead of the alias name.

FTP Connection from PC to Logic Analysis System

Use this procedure if you want to make an FTP connection from a remote PC or Workstation to the logic analysis system.

NOTE: An FTP connection from a remote PC or Workstation is not allowed when the logic analysis system is in *Secure Mode*.

1. From the command line of your remote computer, type: ftp "machine_name".
2. For the login name, use "anonymous".
3. For the password, use "nopass".

Telnet

The ability to Telnet (connect) to other workstations, PCs, or logic analysis systems lets you run and view programs resident to these remote machines. As an example, you can run multiple logic analysis systems from the same display.

When identifying a remote machine during a telnet login process, you can use either the Internet IP address (see page 19), or a predefined alias name (see page 21). If you use an alias name, see the note below.

The following example shows how to Telnet to a remote logic analysis system and display its session on your local logic analysis system.

1. From the system window in your local logic analysis system, click the *System Administration* icon. Then from the Networking tab in the System Administration Tools window, click *Telnet ...*.
2. Type the name of the remote logic analysis system, and click *OK*.
3. From the Telnet window that appears, type "hplogic", and press the *Enter* key.

NOTE: "hplogic" will not work if the remote logic analysis system is in *Secure Mode*. In this case, enter a login and password that is within the user accounts (see page 51) of the remote logic analysis system.

4. From the Session Manager dialog of the new remote session, click *Display Session on Another Display*.
5. From the Remote Setup dialog that appears, type the name of the local

display, and click *Start*.

To Terminate the Telnet Session

To terminate your remote session, click *Exit* in the remote System window. Then from the remote Session Manager window, click *Disconnect*. This will remove both the remote System window and Session Manager window from the local display.

NOTE: Alias names that are not located in */etc/host* on your local machine may not be recognized by the logic analysis system. If this is the case, use the Internet IP address instead of the alias name.

Ping

Ping is a utility to check LAN communication with remote hosts. To ping a remote host, simply type in the remote host machine name and click *OK*.

To stop the pinging, type control-C.

Licensing Policy for the Logic Analysis System

License Policy:

Select logic analysis system product software is licensed for single use only. Licenses are nodelocked and are valid for the life of the product. Software updates do not affect the license.

Nodelock Mode:

Product licenses are shipped or first installed in nodelock mode. Nodelock mode allows use of the product license only on the node (HP 16600-Series or HP 16700-Series logic analyzer) on which it is installed. Products ordered with a logic analysis system will be installed and ready to run. Products purchased aftermarket will require customers to access Agilent's password redemption Web site to obtain

the appropriate passwords. The Web site URL and alternate contact instructions are provided on the Entitlement Certificate shipped with the licensed product.

Temporary Licenses:

In most instances, a single temporary (demo) license is available for any product not previously licensed on a node. The temporary license is valid for the number of calender days specified in the *Demo Time* column. The demo time starts from first entry of the password in the license management window. The temporary password for any node on any tool set is "demo".

License Management:

Licenses are managed from the License Management window, obtained by clicking *Licensing...* under the Admin tab in the System Administration Tools window. License management does not require Unix expertise. Licenses are reserved at the start of a measurement session. They remain in use (reserved) until the measurement session is terminated.

Password Backup:

Passwords can be backed up to floppy disk by selecting *Save...* under the Admin tab in the System Administration Tools window. Passwords can only be restored on the logic analysis system where they were initially installed in nodelock mode.

Printing Windows - Configurations

The print windows operation lets you print either the current window, all currently open windows, or just a selected window. Also if you are in the Listing Display window, you can print data to a file.

NOTE: When printing windows to a printer, only the currently displayed viewing area of the window or computer screen is printed. If any data or configuration fields appear off-screen, scroll the desired data or configuration fields into the window's viewing area before printing.

Print this window

Print this window prints the current window.

Print all windows

Print all windows prints all open windows. This option is only available in the Workspace window.

Print any window

Print any window prints any open window that you click on.

Print to file

Print to file prints data from the Display tool to a file. This option is only available in the Listing Display window.

See Also

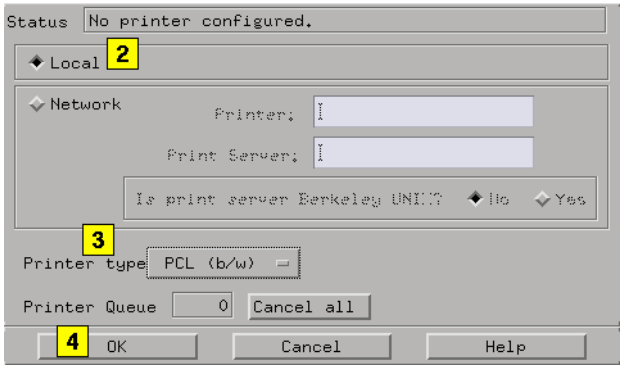
Setting Print Options (see page 41)

Setup the Printer (see page 38)

Printer Setup

Local Printer Setup

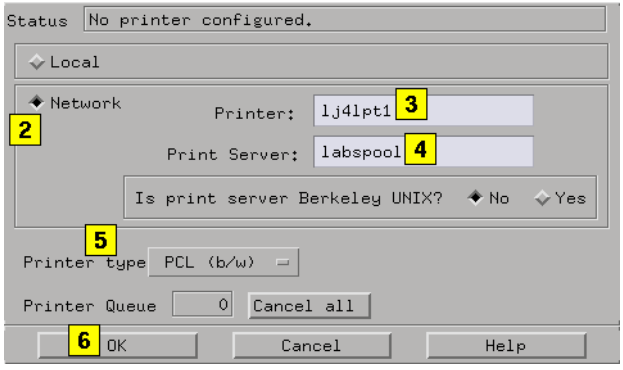
1. From the Admin tab in the System Administration Tools window, select *Printers ...*.
2. From the Printer Setup dialog that appears, click *Local*.
3. In the *Printer type* pulldown, select the printer type you are connecting.
4. Click *OK*.



Network Printer Setup

Use this procedure if you are using a Unix print server. If you are using a Windows NT print server, click this link. (see page 40)

1. From the Admin tab in the System Administration Tools window, select *Printers* ....
2. From the Printer Setup dialog that appears, click *Network*.
3. Type in the recognized *Printer* name. See the note below.
4. Type in the recognized *Print Server* name. In addition to being listed in a network host table, the print server name must be listed in the host table (see page 21) in the logic analysis system.
5. In the *Printer type* pulldown, select the printer type you are connecting.
6. Click *OK*.



NOTE: Consult your *system administrator* for the required printer name and print server name. These names should be located in the network's host table or name server. The print server name must also be listed in the host table (see page 21) in the logic analysis system.

Windows NT Server Configuration

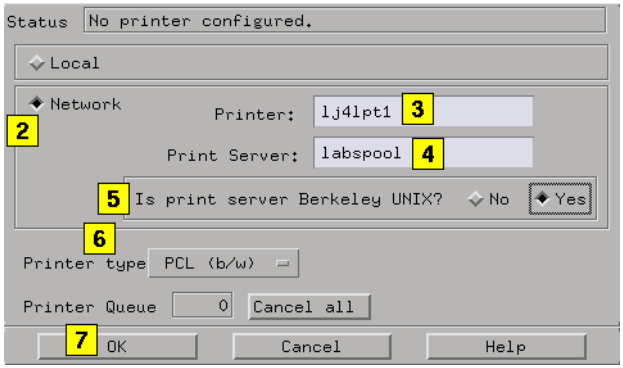
From the Windows Interface:

1. From the Main file group, select *Control Panel*, then *Network*.
2. Select the *Services* tab.
3. Click *Add...*, select *TCP/IP Printing*, and click *OK*. At this point, NT will automatically install the Berkeley Unix LPD print server.
4. From the Control Panel, select *Services*.
5. From the Services control panel, select *TCP/IP Print Server*, and click *Startup...*.
6. Change Startup Type to *Automatic*.
7. Configure your printers on the NT machine as you normally would.

From the System Administration Tools Window:

NOTE: Do not put white space in the printer name.

1. From the Admin tab in the System Administration Tools window, select *Printers ...*.
2. Click *Network*.
3. Type in the recognized *Printer* name. See the note below.
4. Type in the recognized *Print Server* hostname. In addition to being listed in a network host table, the print server name must be listed in the host table (see page 21) in the logic analysis system.
5. Select *Yes* to Berkeley UNIX server.
6. In the *Printer type* pulldown, select the printer type you are connecting.
7. Click *OK*.

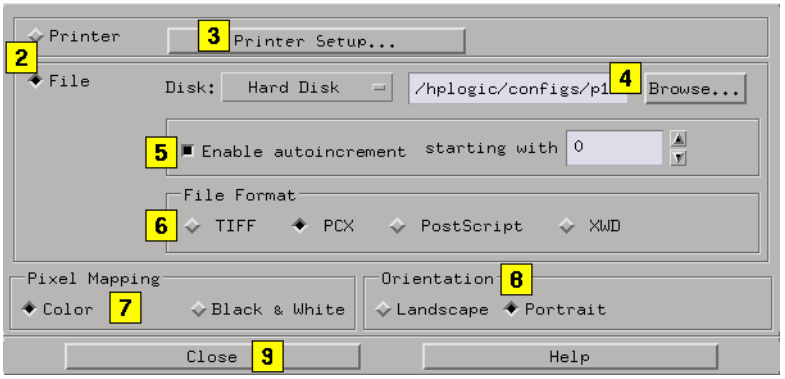


NOTE: Consult your *system administrator* for the required printer name and print server name. These names should be located in the network's host table or name server. The print server name must also be listed in the host table (see page 21) in the logic analysis system.

Print Options

The *Print Window Options* dialog lets you set print destination, file format type, filename autoincrement, and color/b&w; pixel mapping.

1. In the tool window menu bar, click *File*, and *Print Options*.
2. From the Print Window Options dialog, select the destination as either *Printer* or *File*.
3. If *Printer* is selected, configure the Printer Setup (see page 38) dialog.
4. If *File* is selected, type in the path and filename. You can also click *File* and use the File Selection dialog to enter a path and filename.
5. Optional - If *File* is selected, autoincrement (see page 42) the filename.
6. Optional - If *File* is selected, select the file format type.
7. Set the Pixel Mapping (see page 42) to *Color* or *Black & White*.
8. Set the Orientation to *Landscape* or *Portrait*.
9. Click *Close*.



See Also

"Printing Windows - Configurations" on page 37

"Printer Setup" on page 38

"Windows NT Server Configuration" on page 40

Autoincrement filenames

Use the Autoincrement feature when you are saving multiple files, and you don't want to type in a new filename for each new file. As files are saved, the base filename remains the same with only the extension being incremented.

Example

filename.0
filename.1
filename.2
filename.3

Pixel mapping

Use the pixel mapping feature when you want to print a faxable black and white hardcopy.

Configuring the System Clock

NOTE: This operation may require *System Administration Privileges*. (see page 18)

1. From the System Administration Tools window, select *Time/Date...*.
2. Click in the desired value field, and backspace or delete the current numbers.
3. Type the new values, and click *OK*. At this point, you are asked to reboot the logic analysis system.

Running the Self Tests

The Self Test function of the logic analysis system performs functional tests on both the System and any installed modules.

1. From the Admin tab in the System Administration Tools window, click *Self-Test...*.
2. Read the Question dialog and click *Yes* if you wish to run the self tests.
3. From the Self Test window, select the desired area to test by clicking on the appropriate tab. Your choices are either the *System* boards, modules in the *Master Frame*, or modules in the optional *Expander Frame*.
4. Run the tests in one of the following ways:
   - Test All – To test all boards or modules under a tab, click *Test All* at the bottom of the Self Test window.
   - Test a single board or module – To test a single board or module under a tab, select the desired board or module, and then select either a single component or click *Test All* at the bottom of the board or module test dialog.
5. When you are finished running self tests, select *Quit*. Then restart your session from the Session Manager window.

NOTE: For complete information on self tests, test options, troubleshooting, and service procedures, refer to the optional service guides available for the system or the desired modules.

See Also "More on Self Tests" on page 44

More on Self Tests

Self Test lets you get confidence that the hardware is configured and operating correctly, and enables the HP factory to test the product.

Self Tests and Session Management

When Self Test is entered, the current measurement session is exited. You are warned of this prior to entering Self Test so you can save any important data and configurations. The closure of the measurement session is necessary because Self Test leaves the hardware in an unknown state when it is finished. Restarting the measurement session is then required to properly initialize the hardware.

Testing Multi-Card Modules

Under each tab is a list of boards or measurement modules. When selected, each individual board or module lists a set of its own individual tests. Some measurement modules are composed of multiple cards where one card is called the master and the others are called expanders. Self tests for a multiple card set are always tested through the master card. Test results for the expander cards will track results for the master card. In some cases, the self tests can identify a problem to either an expander or master card. In this case, the failure counts shown on an expander card may differ from those shown for a master card.

Test Options

Test options are set from the *Options* pulldown in the menu bar. They are provided only as a convenience to the user. They are intended for factory use only.

User Action Required

When running "All Tests", some of the tests may have a test result of "Not executed". In some cases, this message is because the test does not apply to the current hardware configuration. In other cases, it indicates the test requires some type of user action. These tests should be individually selected, and when user action is required, a dialog will appear to direct the user. The tests that require user action are listed below.

CPU Board

- Floppy Drive Test: A DOS formatted floppy must be in the drive.
- External SCSI Test: A powered-up CD-ROM drive must be on the bus.

HP16517A Timing Module

- Skew Adjust: Not a test; used for calibration.

HP16522A Stimulus Module

- Output Stimulus Vectors: Not a test; provides continuous signal output.

HP16534A Scope Module

- ADC Test: There must be no stimulus on the scope inputs.

HP16550 State and Timing Module

- Show Activity: Not a test; provides continuous output of signal input levels.

HP16610A Emulator Module

- Internal PV Test: A loop back connector must be installed.

NOTE: For complete information on self tests, test options, troubleshooting, and service procedures, refer to the optional service guides available for the system or the desired modules.

Saving and Reloading System Settings

The *Save System Settings* and *Load System Settings* fields are

located under the *Admin* tab of the System Administration Tools dialog. By saving your system settings to a flexible disk or a mounted directory, you create a backup file that can be used to quickly setup new systems, or restore a current system's settings after a re-ignite procedure (see page 46).

To save or reload your system settings, select the desired items, then select *Save to File*, or *Load Settings*. If an item is not valid, or was not initially saved to the file, the selection is greyed out in the interface. Also, a *.set* file extension is automatically added for you.

Flexible Disk Backup - Re-ignite

NOTE: Unless changed in the file browser, the flexible disk is the default drive when saving a backup file. If you are going to re-ignite your logic analysis system, you MUST save the settings to the flexible disk or a mounted directory. Files saved on the analyzer's hard disk will be lost during the re-ignite procedure (see page 46).

What System Settings are Saved

- Printer Settings (see page 47)
- Network Settings (see page 47)
- User Account Information (see page 49)
- License Information (see page 50)
- Custom Color Settings (see page 50)
- Web Settings (see page 50)
- Session Manager (see page 50)
- E-mail on Trigger (see page 51)

Re-ignite Procedure

The re-ignite procedure is a process used to restore the operating system to the hard disk. Since user configurations, data files, and license passwords are lost during this procedure, it is recommended that you save the system settings to a backup flexible disk or a mounted directory.

Printer Settings

Printer settings are located under the *Printers...* field on the Admin tab of the System Administration Tools dialog.

- Printer Local or Network
- Network - Printer Name
- Network - Server Name
- Is print server Berkeley UNIX - No/Yes
- Printer Type

NOTE: Information in the Printer Queue, and any Print Options (see page 41) are not saved.

Network Settings

Network settings are located on the Networking tab of the System Administration Tools dialog.

Network Setup...

- Networking - Enable/Disable
- Hostname
- Internet Address (IP)
- Gateway Name
- Gateway IP
- Subnet Mask
- All *Name Resolver...* information

Map 95/NT Network Drive...

NOTE: The following information is only saved if the *Reconnect at Startup* option is enabled.

- Network Path

- Logic Analyzer Dir Path
- Reconnect at Startup
- Read only
- All *Current Connections* information

Share Analyzer Drive...

NOTE: The following information is only saved if the *Reshare at Startup* option is enabled.

- Logic Analyzer Dir to Share
- Share Name
- Share Comment
- Reshare at Startup
- All *Share Password* information
- All *Current Shares* information

Mount NFS Filesystem...

NOTE: The following information is only saved if *Reconnect at Startup* under the *Options...* field is enabled.

- Remote Host
- Remote Dir Path
- Local Dir Path
- All NFS *Options* information
- All *Current Connections* information

Network Services

Even though *Network Services* is found under the Security tab of the System Administration Tools dialog, the following settings are saved under the *Network* settings selection.

- Web Server
- Shared Console (VNC)
- Remote Programming Interface
- pcnfsd (for PC NFS)

User Accounts

User Accounts settings are located on the Security tab of the System Administration Tools dialog. In addition to the user account directory structure, the following settings are saved:

NOTE: If you save user accounts while you are in secure mode, after you load this system settings file, you will be in secure mode. Because of this, it is very important that you know a sys user and his password before loading a secure saved user account file. Similarly, if you save user accounts while you are not in secure mode, after you load the system settings file, you will not be in secure mode.

User Accounts...

- Secure Mode - Disabled/Enabled
- All current accounts information
- User-specific custom colors
- User-specific Web bookmarks and Web preferences

NOTE: It should be noted that no specific user account data is saved.

Network Services

Even though *Network Services* is found under the Security tab of the System Administration Tools dialog, the following settings are saved under the *Network* settings selection.

- Web Server
- Shared Console (VNC)
- Remote Programming Interface

- pcnfsd (for PC NFS)

Licenses

License information can only be saved and reloaded on the same logic analysis system. If you are setting up new logic analysis systems using a backup system settings file, all settings can be loaded except the license information. However, if you are performing the re-ignite procedure (see page 46) to the same logic analysis system, all settings including the license information can be reloaded.

Custom Colors

The custom color settings saved are the system colors located in the Waveform and Listing Tool's menu bar *Edit - Set default attributes...*. In the Distribution and Chart tool, system colors are located under *Options - Color*.

Custom colors for users in Secure Mode are saved and restored with the *User Accounts* (see page 49) selection.

Web Settings

If you are using the logic analysis system in a stand-alone unsecured mode, the following settings are saved.

- Bookmarks
- Preferences

Bookmarks and Preferences for users in Secure Mode are saved and restored with the *User Accounts* (see page 49) selection.

Session Manager Settings

The following Session Manager settings are saved and restored with the *Network Setup* (see page 47) selection.

- Window size
- Exclusive or Shared session

E-mail on Trigger Settings

You configure the e-mail on trigger from within a Sequence level under the *Trigger Tab* in the analyzer tool. The only setting that is saved is the SMTP server name, and it is saved and restored with the *Network Setup* (see page 47) selection.

Setting Up User Accounts

When you power up the instrument for the first time, you are in an open-networked unsecured mode. Any user can access the logic analysis system and store data with no record of access. By definition, you are in the open-networked mode when *Secure Mode* is disabled.

User accounts are useful when large project teams share lab equipment. In this environment, one or more users are set up with a user account and given a login and password. User accounts add the security of restricted use, plus the ability to trace all network activity and file ownership. By definition, you are in the secured user accounts mode when your System Administrator enables the *Secure Mode* field.

For more information on the user environment, refer to The User Environment and Session Control (see page 86).

The default factory configuration is the open-networked unsecured mode. Use the following procedures to set up user accounts and add security to your system through the *Secure Mode*. You can set up user accounts either individually, or by importing a file.

NOTE: Any user can set up user accounts and become the system administrator the first time the User Accounts dialog is accessed. To modify user account after *Secure Mode* has been enabled, *System Administration Privileges*. (see page 18) are required.

Adding User Accounts Individually

1. From the Security tab in the System Administration Tools window, click *User Accounts...*
2. At the bottom on the window, click *Add...*.

3. From the Add-User Account dialog, type in the user's *Login Name*.
4. Type in the user's *Password* (see page 53), and then the user's *Password Again*.
5. Optional – Type in the user's *Encrypted Password*.
6. Optional - Type in a *Password Age* (see page 54).
7. Type in the *User Identity* and *Group Identity*.
8. Type in the user's *Real Name*.
9. Select the File Permissions (see page 88) field, and select the desired system default read/write permissions.
10. Optional – Check *Has Admin Privileges* if you want to give the new user System Administrator privileges.
11. Click *Add*. Repeat the above from step 3 for the next user account, or, click *Cancel* to exit the dialog.
12. Toggle the *Secure Mode* field to *Enabled*. Enabling this field will activate the use of user accounts and set the system to a secured team use environment.
13. Click *OK* to close the User Accounts dialog.
14. At this point, you will be asked to verify the reboot of the logic analysis system. A reboot is necessary to implement the system level change of the secured user accounts mode.

Adding User Accounts by Importing a File

If you have multiple users that require user accounts, it might be easier to simply import a password file. If you plan to import password files, the files must follow the specified format for a password file. An example of a password file with the specified format is located in "/local_etc/" in the File Manager window.

You can use the example password file to generate your own file. Copy the file to a word processor, edit the file, and then copy it back to the /local_etc/ directory under a new name. For an example of copying files to other systems, refer to FTP (file transfer protocol) (see page 34).

1. From the Security tab in the System Administration Tools window, click

User Accounts...

2. Click *Import...*. Then from the Import Account Dialog that appears, select the Default File Permissions (see page 88) field and set the desired system default read/write permissions.
3. Click *Import File*. From the file browser that appears, select the file name to import, and click *OK*.
4. From the Import Account dialog, click *OK*.
5. From the User Accounts dialog, edit the desired accounts giving at least one user system administration privileges.
6. Toggle the *Secure Mode* field to *Enabled*. Enabling this field will activate the use of user accounts and set the system to a secured team use environment.
7. Click *OK*.
8. At this point, you will be asked to verify the reboot of the logic analysis system. A reboot is necessary to implement the system level change of the secured user accounts mode.

Enabling/Disabling User Accounts

Once you have a list of user accounts in the system, your System Administrator can enable or disable user accounts by toggling the *Secure Mode* field. When you change the working mode, you will be asked to power down the system, and then power it back up. This enables the network to identify the new working mode.

Editing the User Accounts List

To delete a user from the accounts list, click the desired User Account, and click *Delete*.

To modify user information in the accounts list, click the desired User Account, make the appropriate changes in the Account Information dialog, and then click *Modify*.

Legal Passwords

- Passwords must be at least 6 characters long.

- Passwords cannot be circular shift of your login ID.
- Old and new passwords must differ by at least 3 positions.

Passwd Man Page

The following man page documents the use of a password file.

```
NAME
      passwd - password file, pwd.h

 DESCRIPTION
      passwd contains the following information for each user:

           +  login name
           +  encrypted password
           +  numerical user ID
           +  numerical group ID
           +  reserved field, which can be used for identification
           +  initial working directory
           +  program to use as shell

      This is an ASCII file.  Each field within each user's entry is
      separated from the next by a colon.  Each user is separated from the
      next by a newline.  This file resides in the /etc directory.  It can
      and does have general read permission and can be used, for example, to
      map numerical user IDs to names.  If the password field is null and
      the system has not been converted to a trusted system, no password is
      demanded.

      If the shell field is null, /usr/bin/sh is used.

      The encrypted password consists of 13 characters chosen from a 64-
      character set of "digits" described below, except when the password is
      null, in which case the encrypted password is also null.  Login can be
      prevented by entering in the password field a character that is not
      part of the set of digits (such as *).

      The characters used to represent "digits" are . for 0, / for 1, 0
      through 9 for 2 through 11, A through Z for 12 through 37, and a
      through z for 38 through 63.

 PASSWORD AGE
      Password aging is put in effect for a particular user if his encrypted
      password in the password file is followed by a comma and a nonnull
      string of characters from the above alphabet.  (Such a string must be
      introduced in the first instance by a superuser.) This string defines
      the "age" needed to implement password aging.

      The first character of the age, M, denotes the maximum number of weeks
      for which a password is valid.  A user who attempts to login after his
      password has expired is forced to supply a new one.  The next
      character, m, denotes the minimum period in weeks that must expire
      before the password can be changed.  The remaining characters define
      the week (counted from the beginning of 1970) when the password was
      last changed (a null string is equivalent to zero).  M and m have
      numerical values in the range 0 through 63 that correspond to the 64-
      character set of "digits" shown above.  If m = M = 0 (derived from the
      string . or ..), the user is forced to change his password next time
      he logs in (and the "age" disappears from his entry in the password
      file).  If m > M (signified, for example, by the string ./), then only
      a superuser (not the user) can change the password. Not allowing the
      user to ever change the password is discouraged, especially on a
      trusted system.

      Trusted systems support password aging and password generation.  For
      more information on converting to trusted system and on password, see
```

```
     the HP-UX System Administration Tasks Manual and sam(1M).

     getpwent(3C) designates values to the fields in the following
     structure declared in <pwd.h>:

          struct passwd {
              char    *pw_name;
              char    *pw_passwd;
              uid_t   pw_uid;
              gid_t   pw_gid;
              char    *pw_age;
              char    *pw_comment;
              char    *pw_gecos;
              char    *pw_dir;
              char    *pw_shell;
              aid_t   pw_audid;
              int     pw_audflg;
          };

     It is suggested that the range 0-99 not be used for user and group IDs
     (pw_uid and pw_gid in the above structure) so that IDs that might be
     assigned for system software do not conflict.

     The user's full name, office location, extension, and home phone
     stored in the pw_gecos field of the passwd structure can be set by use
     of the chfn command (see chfn(1)) and is used by the finger(1)
     command.  These two commands assume the information in this field is
     in the order listed above.  A portion of the user's real name can be
     represented in the pw_gecos field by an & character, which some
     utilities (including finger) expand by substituting the login name for
     it and shifting the first letter of the login name to uppercase.

SECURITY FEATURES
     On trusted systems, the encrypted password for each user is stored in
     the file /tcb/files/auth/c/user_name (where c is the first letter in
     user_name).  Password information files are not accessible to the
     public.  The encrypted password can be longer than 13 characters .
     For example, the password file for user david is stored in
     /tcb/files/auth/d/david.  In addition to the password, the user
     profile in /tcb/files/auth/c/user_name also contains:

          +  numerical audit ID
          +  numerical audit flag

     Like /etc/passwd, this file is an ASCII file.  Fields within each
     user's entry are separated by colons.  Refer to authcap(4) and
     prpwd(4) for details.  The passwords contained in /tcb/files/auth/c/*
     take precedence over those contained in the encrypted password field
     of /etc/passwd.  User authentication is done using the encrypted
     passwords in this file .  The password aging mechanism described in
     passwd(1), under the section called SECURITY FEATURES, applies to this
     password .

NETWORKING FEATURES
   NFS
     The passwd file can have entries that begin with a plus (+) or minus
     (-) sign in the first column.  Such lines are used to access the
     Network Information System network database.  A line beginning with a
     plus (+) is used to incorporate entries from the Network Information
     System.  There are three styles of + entries:

          +           Insert the entire contents of the Network Information
                      System password file at that point;

          +name       Insert the entry (if any) for name from the Network
                      Information System at that point

          +@name      Insert the entries for all members of the network
                      group name at that point.

     If a + entry has a nonnull password, directory, gecos, or shell field,
     they override what is contained in the Network Information System.
```

```
     The numerical user ID and group ID fields cannot be overridden.

     The passwd file can also have lines beginning with a minus (-), which
     disallow entries from the Network Information System.  There are two
     styles of - entries:

          -name       Disallow any subsequent entries (if any) for name.

          -@name      Disallow any subsequent entries for all members of
                      the network group name.

WARNINGS
     User ID (uid) 17 is reserved for the Pascal Language operating system.
     User ID (uid) 18 is reserved for the BASIC Language operating system.
     These are operating systems for Series 300 and 400 computers that can
     coexist with HP-UX on the same disk.  Using these uids for other
     purposes may inhibit file transfer and sharing.

     The login shell for the root user (uid 0) must be /sbin/sh.  Other
     shells such as sh, ksh, and csh are all located under the /usr
     directory which may not be mounted during earlier stages of the bootup
     process. Changing the login shell of the root user to a value other
     than /sbin/sh may result in a non-functional system.

     The information kept in the pw_gecos field may conflict with
     unsupported or future uses of this field.  Use of the pw_gecos field
     for keeping user identification information has not been formalized
     within any of the industry standards.  The current use of this field
     is derived from its use within the Berkeley Software Distribution.
     Future standards may define this field for other purposes.

     The following fields have character limitations as noted:

          +  Login name field can be no longer than 8 characters;

          +  Initial working directory field can be no longer than 63
             characters;

          +  Program field can be no longer than 44 characters.

          +  Results are unpredictable if these fields are longer than the
             limits specified above.

     The following fields have numerical limitations as noted:

          +  The user ID is an integer value between -2 and UID_MAX
             inclusive.

          +  The group ID is an integer value between 0 and UID_MAX
             inclusive.

          +  If either of these values are out of range, the getpwent(3C)
             functions reset the ID value to (UID_MAX).

EXAMPLES
   NFS Example
     Here is a sample /etc/passwd file:

          root:3Km/o4Cyq84Xc:0:10:System Administrator:/:/sbin/sh
          joe:r4hRJr4GJ4CqE:100:50:Joe User,Post
          4A,12345:/home/joe:/usr/bin/ksh
          +john:
          -bob:
          +@documentation:no-login:
          -@marketing:
          +:::Guest

     In this example, there are specific entries for users root and joe, in
     case the Network Information System are out of order.

          +    User john's password entry in the Network Information System
               is incorporated without change.
```

```
          +    Any subsequent entries for user bob are ignored.

          +    The password field for anyone in the netgroup documentation
               is disabled.

          +    Users in netgroup marketing are not returned by getpwent(3C)
               and thus are not allowed to log in.

          +    Anyone else can log in with their usual password, shell, and
               home directory, but with a pw_gecos field of Guest.

   NFS Warnings
     The plus (+) and minus (-) features are NFS functionality; therefore,
     if NFS is not installed, they do not work.  Also, these features work
     only with /etc/passwd, but not with a system that has been converted
     to a trusted system.  When the system has been converted to a trusted
     system, the encrypted passwords can be accessed only from the
     protected password database, /tcb/files/auth/*/*.  Any user entry in
     the Network Information System database also must have an entry in the
     protected password database.

     The uid of -2 is reserved for remote root access by means of NFS.  The
     pw_name usually given to this uid is nobody.  Since uids are stored as
     signed values, the following define is included in <pwd.h> to match
     the user nobody.

          UID_NOBODY  (-2)

FILES
     /tcb/files/auth/*/*          Protected password database used when
                                  system is converted to trusted system.
     /etc/passwd                  Standard password file used by HP-UX.

SEE ALSO
     chfn(1), finger(1), login(1), passwd(1), a64l(3C), crypt(3C),
     getprpwent(3), getpwent(3C), authcap(4), limits(5).

STANDARDS CONFORMANCE
     passwd: SVID2, SVID3, XPG2
```

Change Password

You do not require system administration privileges to change your password.

1. From the Security tab in the System Administration Tools window, click *Change Password...*
2. If your account previously had a password, you will enter it in the *Old Password* field.
3. Enter your new password (see page 53) in the *New Password* field.
4. Enter it again in the *New Password Again* field.
5. Click *OK*.

Web Server Security

Use this selection to allow or prevent access to the web page of this logic analysis system from other workstations or personal computers.

- Select *On* if you wish to allow other workstations and personal computers to access the home page of this logic analysis system.
- Select *Off* to prevent other workstations and personal computers from accessing the home page of this logic analysis system.

Shared Console (VNC) Security

Use this selection to allow or prevent sharing of the graphical user interface by remote workstations or personal computers.

- Select *On* if you wish to allow the graphical user interface to be shared with remote workstations or personal computers.
- Select *Off* if you wish to prevent sharing of the graphical user interface by other workstations and personal computers.

NOTE: To prevent a current shared session from being terminated, changes to the VNC Security (turning off) will take effect after the current session is closed.

Remote Programming Interface Security

Use this selection to allow or prevent connection to the remote programming port (Port 6500) by other workstations or personal computers connected on the same LAN.

- Select *On* if you wish to accept remote programming connections from other workstations and personal computers to the remote programming port of this logic analysis system.
- Select *Off* if you wish to reject all remote programming connections to the remote programming port of this logic analysis system.

pcnfsd (For PC NFS) Security

Use this selection to allow access and operation of the logic analysis system by PC NFS file system packages that require pcnfsd capabilities.

- Select *On* if you are using a PC NFS file system package to operate the logic analysis system, and your package requires pcnfsd capabilities in the logic analysis system.
- Select *Off* if you are not using a PC NFS file system package that requires pcnfsd capabilities in the logic analysis system.

Install Software

1. From the Software Install tab in the System Administration Tools window, select *Install...*.
2. In the Software Install dialog that appears, select the media type *File System*.
3. If you are loading software from a Hard Disk and NFS, type in the path to the files you are installing, or use the graphical *Browse*. Make sure the remote file system is mounted.
4. Click *Apply*.
5. From the list of files that appear, click the desired file, and then click *Install...*.

See Also

List all Installed Software (see page 60)

Remove Software Files (see page 59)

Configuring the NFS (see page 30)

Remove Installed Software

1. From the Software Install tab in the System Administration Tools window,

select *Remove...*.

2. From the Software Remove dialog, select the file to remove, and click *Remove...*.
3. Click *Continue* to remove the selected file.

See Also

Install Software (see page 59)

List all Installed Software (see page 60)

List Installed Software

Use the Software *List...* field to view all system files currently installed on the hard disk. In addition, specific file information such as file size or version is shown. To get detailed information on any specific file, select the file, and click the *Details...* field.

To list installed software, access the System Administration Tools window, click the *Software Install* tab, and then click the *List...* button.

See Also

Install Software (see page 59)

Remove Software Files (see page 59)

The User Interface - Icons, Tabs, and Navigation

The graphical user interface is designed to help you configure measurements and quickly navigate between windows.

The System Window

The *System window* (see page 102) visually displays the personality of your logic analysis system. It graphically shows which measurement modules are installed and what run control capability is available.

The System window is used as a *home base* for making measurements. By clicking a measurement module icon, you not only gain access to all instrument *Setup* windows, but you automatically connect Display tools to the Instrument tool in the Workspace window.

Tabs

The use of *Tabs* (see page 103) throughout the interface helps you quickly navigate between tool setup windows, and other functional areas within tool windows.

The Icon Bar

A system *Icon Bar* (see page 104) is located in the System window to allow you quick access to these functional areas:

Workspace (see page 14)

Intermodule (see page 12)

System Administration (see page 16)

File Manager (see page 63)

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

The Window Manager

When you view the logic analysis system locally, it makes a window manager available that places all minimized windows at the bottom of the display in a task bar.

If you telnet into the logic analysis system remotely, you do not see the window manager. Because you are viewing the instrument from your remote computer, you are using the remote machine's window manager.

File Management Tools

Use the *File Manager* window to perform the common tasks of loading or saving measurement configurations. The File Manager has all the standard functionality for performing operations on files and directories on both the flexible and hard disk drives.

Directories

- "Make a Directory" on page 64
- "Delete a Directory" on page 64
- "Rename a Directory" on page 65

Files

- "Autoloading a File" on page 64
- "Loading Configuration Files" on page 81
- "Saving Configuration Files" on page 83
- "Copy a File" on page 65
- "Delete a File" on page 66
- "Move a File" on page 66
- "Rename a File" on page 66
- "Compressing Files - PKZIP" on page 67

Other Operations

- "Format a Floppy Disk" on page 69
- "Refresh the File Manager" on page 69
- "Mounting an External Hard Drive" on page 70

See Also

"File Types" on page 78

"Default Directory Descriptions" on page 68

Autoloading a File

The following procedure designates a file to automatically load at session startup.

1. From the menu bar in the File Manager window, click *Options*, then *Autoload...*.
2. From the Autoload File dialog that appears, click the *Enable Autoload* field, then select the directory and filename you want loaded at startup.
3. Select *OK*.

Make a Directory

1. From the File Manager dialog, set the *Current Disk:* to the desired disk drive.
2. If necessary, double-click directory names to build a path to the level where you want the new directory.
3. Select the *Create Directory* tab.
4. Type the new directory name. Directory names can only include the following alphanumeric characters:
   0-9, a-z, A-Z, (-), (+), (_), (.), and (:).
5. Click *Create Directory*.
6. To close the File Manager dialog, click *Close*.

Delete a Directory

1. From the File Manager dialog, set the *Current Disk:* to the desired disk drive.

2. If necessary, double-click directory names to build a path to the directory you want to delete.
3. Select the directory to delete, then select the *Delete* tab.
4. Click *Delete*, then *Yes* to verify.
5. To close the File Manager dialog, click *Close*.

Rename a Directory

1. From the File Manager dialog, set the *Current Disk:* to the desired disk drive.
2. If necessary, double-click directory names to build a path to the directory you want to rename.
3. Select the directory to rename, then select the *Rename* tab.
4. Type in the new name, then click *Rename*. Directory names can only include the following alphanumeric characters:
   0-9, a-z, A-Z, (-), (+), (_), (.), and (:).
5. To close the File Manager dialog, click *Close*.

Copy a File

1. From the File Manager dialog, select the file you want to copy.
2. If necessary, set the *Current Disk*, and double-click directory names to build a path to the file you want to copy.
3. Select the *Copy* tab.
4. Select a *Destination:* for the file you are copying. Do this by either selecting the desired disk drive and typing a path and filename, or, *Browse...* a graphical file list to select a path and filename. You can also quickly copy the same path as the source file.
5. Click *Copy*.
6. To close the File Manager dialog, click *Close*.

Delete a File

1. From the File Manager dialog, set the *Current Disk:* to the appropriate disk drive.
2. Select the file to delete. If necessary, double-click directory names to build a path to the file you want to delete.
3. Select the *Delete* tab.
4. Click *Delete*.
5. Click *Yes* to verify.
6. To close the File Manager dialog, click *Close*.

Move a File

1. From the File Manager dialog, select the file you want to move.
2. If necessary, set the *Current Disk*, and double-click directory names to build a path to the file you want to move.
3. Select the *Move* tab.
4. Select a *Destination:* for the file you are moving. Do this by either selecting the desired disk drive and typing a path and filename, or, *Browse...* a graphical file list to select a path and filename. You can also quickly copy the same path as the source file.
5. Click *Move*.
6. To close the File Manager dialog, click *Close*.

Rename a File

1. From the File Manager dialog, set the *Current Disk:* to the desired disk drive.
2. If necessary, double-click directory names to build a path to the directory

you want to rename.

3. Select the file to rename, then select the *Rename* tab.
4. Type in the new name, then click *Rename*. Filenames can only include the following alphanumeric characters:
   0-9, a-z, A-Z, (-), (+), (_), (.), and (:).
5. To close the File Manager dialog, click *Close*.

About File Extensions

When saving configuration files, file extensions (characters following a "." in the filename) will be ignored by the system. Instead, default file extensions (see page 78) are automatically appended. When saving data files from the File Out (see the *File Out Tool* help volume) tool, you can use file extensions. You can list all files by using a single asterisk (*) after the directory path.

Compressing Files - PKZIP

This operation compresses files. Use this operation prior to copying files to floppy disk for purpose of transfer.

To Compress a File - PKZIP

1. From the File Manager dialog, double-click directory names to build a path to the file you want to compress.
2. Click the file name you want to compress.
3. From the menu bar select *Compress*, then *PkZip*.
4. Type in a new (compressed) file name, then click *OK*. You can only use the following alphanumeric characters in a filename:
   0-9, a-z, A-Z, (-), (+), (_), (.), and (:).
5. To close the File Manager dialog, click *File* in the menu bar, then select *Close*.

To Uncompress a File - PKUNZIP

1. From the File Manager dialog, double-click directory names to build a path

to the file you want to uncompress.

2. Click on the desired file you want to uncompress.
3. From the menu bar select *Compress*, then *PKunzip*.
4. To close the File Manager dialog, click *File* in the menu bar, then select *Close*.

See Also "More About PKZIP" on page 68

More About PKZIP

ASCENT SOLUTIONS, Inc. (ASi) provides compatible, open systems data compression solutions such as PKZIP, Multizip, and WinZip. ASI solutions are 100% cross-platform compatible, and support a variety of platforms, including Unix, MVS, AS/400, VM, VSE, VMS, Windows, Netware, Macintosh, DOS, and OS/2. Data compression options are available in both stand-alone and developer's versions.

ASCENT SOLUTIONS, Inc. (ASi)
9009 Springsboro Pike
Miamisburg, OH 45342

Contact:
Voice: (937) 847-2374
FAX: (937) 847-2375
Email: info@asizip.com

Default Directory Descriptions

configs/

This directory is used to store user workspace configuration and data files.

etc/

This directory is for internal use only.

ia/

This directory is used to store inverse assembly files. It is read only and can only be modified through the installation and remove process for processor support packages.

log/

Error log files generated by system crashes and errors are automatically saved to this directory. Error log files, along with saved configuration files, can be used to recreate and fix system error conditions.

omfs/

This directory is used to store Object Management Files (OMF) or executable files that are used by the built-in symbol utility.

demo/

This directory is used to store product demonstration files. Several processor trace files use IA files stored in the *ia* directory. This directory and its files may be deleted if disk space is required.

Format a Floppy Disk

This operation formats new floppy disks in DOS format.

1. Insert the new floppy disk into the disk drive of the logic analysis system.
2. From the menu bar in the *File Manager* dialog, select *Disk*, then click *Format*.
3. To close the File Manager dialog, click *File* in the menu bar, then select *Close*.

Refresh the File Manager

If you add, delete, or rename a file while the File Manager window is

open, the directory you are in will not show the latest changes until you refresh the directory by selecting *Disk*, then *Refresh Current Directory*.

Mounting an External Hard Drive

The following installation guidelines show the important sequence of steps when connecting or disconnecting the external hard drive. For the complete procedure, refer to the "Logic Analysis Systems Installation Guide".

Connecting the External Hard Drive

CAUTION: It is very important to follow the sequence of steps exactly when connecting or disconnecting the external hard drive. The external hard drive should be the first device that receives power, and the last device to be shut down. If you do not follow the correct sequence of steps, data on the external hard drive may become corrupt or the drive may become unreadable.

1. Power down the logic analysis system frame.
2. Connect the external hard drive.
3. Power up the external hard drive.
4. Power up the logic analysis system frame.
5. From the interface, mount the external hard drive. See the procedure *Mounting the External Hard Drive* below.

Disconnecting the External Hard Drive

The following guidelines must be followed before removing the external hard drive from its case, or disconnecting the drive from the logic analysis system.

1. From the interface, unmount the external hard drive. See the procedure *Unmounting the External Hard Drive* below.
2. Power down the logic analysis system frame.
3. Power down the external hard drive.

4. Disconnect the external hard drive.

Mounting the External Hard Drive

CAUTION: If this is the first time mounting the external hard drive, or if the drive is corrupt, you will get a message asking if you want to format the disk. If you choose to format the drive, all data on that drive will be lost.

1. From the Icon bar in the main system window, select the *System Admin* icon, then from the System Administration Tools window that appears, select the *Admin* tab.
2. From the System Administration Tools window select *Mount External Disk...*.
3. In the Mount External Disk dialog, set a *SCSI Address* number. Select the same number that is displayed in the green LCD on the front panel of the external hard drive.
4. In the *Local Path:* field, type in the local directory name where the drive will be mounted. This should be either an existing empty directory, or, one that does not yet exist. If it does not exist, it will be created automatically for you.
5. Select *Mount* to mount the drive. The drive is now accessible through this directory.

Unmounting the External Hard Drive

1. From the Icon bar in the main system window, select the *System Admin* icon, then from the System Administration Tools window that appears, select the *Admin* tab.
2. From the System Administration Tools window select *Mount External Disk...*.
3. In the Mount External Disk dialog, select the drive from the *Current Connections* list, then select *Unmount*. This will not affect the files on the drive. They will just not be accessible until the drive is mounted again.

Product Description

The HP 16600A-Series and HP 16700A-Series logic analysis systems are a scalable family of frames that allow you to time-correlate measurements across domains from analog signals to source code. Both new frames support most measurement solutions of the HP 16500 frame as well as future analysis modules and microprocessor solutions.

Included in both the HP 16600A and HP 16700A-Series frames is an integrated Web server and Home Page. Use the Home Page as the starting point to upload PC connectivity software that enables remote front-panel control and post-processing within an Excel spreadsheet.

The graphical user interface provides easier measurement setup and product use. For microprocessor measurements, a *Setup Assistant* leads you through the setup process.

The HP 16700A-Series

The HP 16700A-Series logic analysis system frame has five slots for measurement modules, and two dedicated emulation module slots.

The HP 16600A-Series

The HP 16600A-Series logic analysis system frames offer a more focused solution. The HP 16600A-series frames include an embedded logic analyzer acquisition module with a channel width of 68, 102, 136 or 204 channels, depending on the model. State clock speed is up to 100 MHz, and full-channel timing speed is up to 125 MHz. In half-channel acquisition mode, timing speed is up to 250 MHz.

One modular slot is available for integration of an oscilloscope, pattern generator, or another logic analyzer. Also included in the frame is one dedicated slot for an emulation module.

Master List of All Tool Help Volumes

All Instrument, Display, Utility, and Analysis tools, have their own specific help volume. The *Help* menu within each tool window accesses its own help volume. You can access specific *Tool Help Volumes* below, or, you can return to the *Main Help Volume.* (see page 2)

See Also: Online Help Information on the World Wide Web (see page 91)

The Instrument Tools

- HP 16600-Series Built-In Logic Analyzer (see the *HP 16600A-Series 100 MHz State/250 MHz Timing Logic Analyzer* help volume)
- HP 16517A High Speed Timing Analyzer (see the *HP 16517A 4GHz Timing/1GHz State Logic Analyzer* help volume)
- HP 16522A Pattern Generator (see the *HP 16522A 200 MHz Pattern Generator* help volume)
- HP 16533/34A Oscilloscopes (see the *HP 16533/34A Digitizing Oscilloscope* help volume)
- HP 16550A Logic Analyzer (see the *HP 16550A Logic Analyzer* help volume)
- HP 16554A Logic Analyzer (see the *HP 16554A .5M Sample Logic Analyzer* help volume)
- HP 16555A/D Logic Analyzer (see the *HP 16555A/D 110MHz State/500 MHz Timing Logic Analyzer* help volume)
- HP 16556A/D Logic Analyzer (see the *HP 16556A/D 100 MHz State/400 MHz Timing Logic Analyzer* help volume)
- HP 16557D Logic Analyzer (see the *HP 16557D 140 MHz State/500 MHz Timing Logic Analyzer* help volume)
- HP 16710A Logic Analyzer (see the *HP 16710 8K sample Logic Analyzer* help volume)
- HP 16711A Logic Analyzer (see the *HP 16711 32K sample Logic Analyzer* help volume)

- HP 16712A Logic Analyzer (see the *HP 16712 128K sample Logic Analyzer* help volume)
- HP 16715A Logic Analyzer (see the *HP 16715A 167 MHz State/667 MHz Timing Logic Analyzer* help volume)
- HP 16716A Logic Analyzer (see the *HP 16716A 167 MHz State/2 GHz Timing Zoom Logic Analyzer* help volume)
- HP 16717A Logic Analyzer (see the *HP 16717A 333 MHz State/2 GHz Timing Zoom Logic Analyzer* help volume)
- HP 16718A Logic Analyzer (see the *HP 16718A 333 MHz State/2 GHz Timing Zoom Logic Analyzer* help volume)
- HP 16719A Logic Analyzer (see the *HP 16719A 333 MHz State/2 GHz Timing Zoom Logic Analyzer* help volume)

See Also: Using Symbols (see page 152)

The Display Tools

- Listing Display (see the *Listing Display Tool* help volume)
- Waveform Display (see the *Waveform Display Tool* help volume)
- Chart Display (see the *Chart Display Tool* help volume)
- Distribution Display (see the *Distribution Display Tool* help volume)

See Also: Using Markers in the Display Tools (see the *Markers* help volume)

The Analysis Tools

- Pattern Filter Analysis (see the *Pattern Filter Tool* help volume)
- Compare Tool (see the *Compare Tool* help volume)

Add-on Toolsets

- DataComm Analysis (see the *DataComm Analysis Toolset* help volume)
- System Performance Analysis - SPA (see the *System Performance Analyzer* help volume)
- Source Viewer (see the *Listing Display Tool* help volume)

- Serial Analysis (see the *Serial Analysis Tool* help volume)
- Memory Expansion Interface (see the *HP E2485A Memory Expansion Interface* help volume)

NOTE: If an add-on tool is not installed, you will see a message stating that the help volume could not be found. If you wish to purchase any of these add-on toolsets, call your local Hewlett Packard sales representative.

The Utility Tools

- File In Tool (see the *File In Tool* help volume)
- File Out Tool (see the *File Out Tool* help volume)

The Emulation Control Interface Tools

NOTE: Help for each processor-specific emulation control interface is installed with the processor support package for the processor. If support for a processor is not installed, you will see a message stating that the help volume could not be found. Additional processors may be supported. To see help for processors not listed here, start an Emulation Control Interface session then click *Help*.

- Setting Up and Starting Emulation Control (see the *Emulation: Setting Up* help volume)
- Emulation - ARM7 (see the *Emulation: ARM7* help volume)
- Emulation - M-CORE (see the *Emulation: M-CORE* help volume)
- Emulation - MPC8xx Embedded PowerPC (see the *Emulation: PowerPC 8xx* help volume)
- Emulation - MPC82xx (see the *Emulation: MPC82xx* help volume)
- Emulation - M683xx (see the *Emulation: Motorola 683xx* help volume)
- Emulation - Pentium (see the *Emulation: Pentium and Pentium w/ MMX Technology* help volume)
- Emulation - Pentium Pro (see the *Emulation: Pentium Pro and Pentium II Processor family* help volume)

- Emulation - PowerPC 4xx (see the *Emulation: PowerPC 4xx* help volume)
- Emulation - PowerPC 500 (see the *Emulation: PowerPC 5xx* help volume)
- Emulation - PowerPC 60x (see the *Emulation: PowerPC 603/604* help volume)
- Emulation - PowerPC 7xx (see the *Emulation: PowerPC 7xx* help volume)
- Emulation - SH7750 (see the *Emulation: Hitachi SH7750* help volume)
- Emulation - TX19/39 (see the *Emulation: Toshiba TX19/39* help volume)

PC Connectivity

- HP 16700 Series Connectivity (see the *PC Connectivity* help volume) - The Home Page and Remote Front Panel Control

Overview - Starting a New Measurement

This overview shows how the graphical interface is used to configure the logic analysis system for simple measurements.

1. Connect the appropriate probing (see page 144) to your target system.
2. From the *System* window, (see page 106) click the desired Instrument tool icon, then select *Setup*. If you are configuring a multi-instrument measurement, click on all desired Instrument tool icons.

   When you click on a tool icon and select *Setup*, two things occur. First, a set of tabbed setup windows for the selected Instrument tool appear. Next, the commonly required Display tools are automatically connected to the Instrument tool in the Workspace window. (see page 14)
3. From the Setup windows that appear, configure the appropriate parameters for the measurement you are performing.

   For example, a logic analyzer will require specific pod, clock, and channel assignments. Also, a trigger specification is required if you want the measurement to start at a specific point in the execution of the target system. See *"Setting up Instrument Tools"* below.
4. Click the Instrument tool icon and select the desired Display tool. (see page 107) The Display tool will show the captured *data set*. In addition to viewing captured data, use Display tools to place markers in the data, or to connect a multi-instrument configuration.
5. From any open window, click *Run All*.

Setting up Instrument Tools

Depending on the Instrument tool used and the type of measurement being made, the setup varies. For more specific information on configuring Instrument tools, refer to the following list of tools (see page 73).

Loading & Saving Configuration Files

Trace data and the settings you have made in system tools can be saved to hard or floppy disk in configuration files.

The Load Configuration and Save Configuration windows can be accessed:

- From the *File Manager*, navigate to the desired file, select it, and press *Load* or *Save*.
- From any tool, select *File->Load Configuration* or *File->Save Configuration*

When saving config files:

- You can save the system settings along with the current data (Save Config and Data) or just save the settings (Save Config Only).
- You can save settings and data for all configured tools (instruments, analysis and display tools) or just an instrument.

When loading config files:

- You can load settings/data for all tools configured at the time of saving, or just the instrument.
- Data saved in a config file is always loaded.

See Also

- "File Types" on page 78
- "What Gets Loaded" on page 79

To Load and Save

- Loading Configuration Files (see page 81)
- Saving Configuration Files (see page 83)

File Types

When saving tool configurations, one or more files will be created in the destination file system. For example:

```
test_setup.__A  16601_LA_Config
test_setup.___  System Config
```

A file for each instrument tool involved in the *Save* process will be created. An additional file may be created to store additional system information.

- The same file name prefix is used for all of the files. (The name you specified)
- The file suffix indicates the card slot of the instrument whose parameters were saved, or 3 underscores for system information.
- The file type indicates the type of data contained in the file.

See Also

- "What Gets Loaded" on page 79
- "Other File Types" on page 80

What Gets Loaded

When loading a config file, the destination selector determines which of the files will be loaded into actual instruments. You only need to highlight one of the files created in a given *Save*, and the system software will load the correct data.

Given these files:

```
test_setup.__A  16601_LA_Config
test_setup.___  System Config
```

If the above file `test_setup.__A` is highlighted, and *All* is selected as the destination, the information in file `test_setup.___` is also loaded.

If the file `test_setup.__A` is highlighted, and a specific analyzer is selected as the destination, only the analyzer data is loaded, no related system information.

Selecting *All* as the destination will deactivate the selections for *Load Config and Tools* and *Load Config Only*. When *All* is not selected, you have these options:

- Load Config and Tools - Load into the selected instrument and all of the tools connected to it at the time of saving.

- Load Config Only - Load into the selected instrument, but not into any tools that were connected at the time of saving.

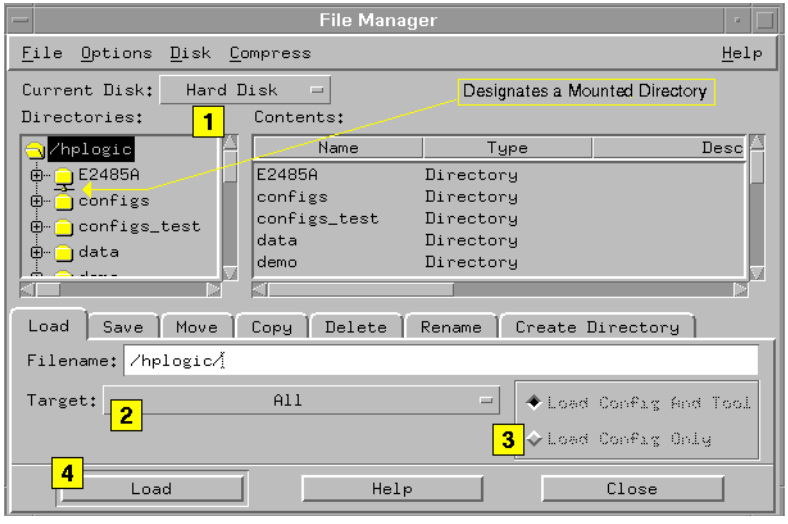
Other File Types

- .x - Typically an OMF or executable file. These files are used by the symbol utility.
- .ns - Output of the symbol utility when linked to a label. These files are used by the symbol utility.
- .pcx - Formatted bit map file.
- .tif - Tagged Image File Format.
- .eps - Extended Postscript file.
- .txt - Output of the File Out tool. This is an ASCII data file.

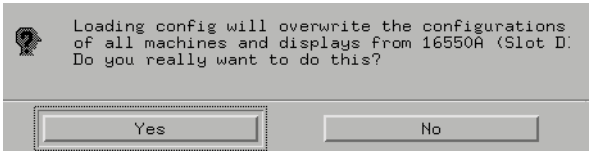
Loading Configuration Files

Load a configuration file by selecting *File->Load Configuration* in a tool window, or by clicking the *Load* tab in the File Manager.

1. From the *File Manager* window, select a file to load in the *Contents* frame of the dialog. You may need to navigate the local or mounted file system using the *Current Disk* field and the *Directories* frame to find the desired file. (Optionally, type the desired filepath and name in the "Filename" box.) Note that a mounted directory will have a different icon.
2. Choose a target (see page 82) that defines where the config will be loaded.
   - *All* will load all tools configured at the time of saving.
   - Selecting a specific instrument will narrow the loading to just that instrument.
3. If loading into a specific instrument, choose:
   - *Load Config and Tools* - loads the selected instrument and all tools connected to its output.
   - *Load Config Only* - loads only the selected instrument.
4. Click *Load*.



Loading a configuration file will overwrite the settings and data in the existing tools. This dialog will appear asking you to verify the loading of new data:



See Also

More About Configuration Files (see page 78)

Saving Configuration Files (see page 83)

Target for the Load File Operation

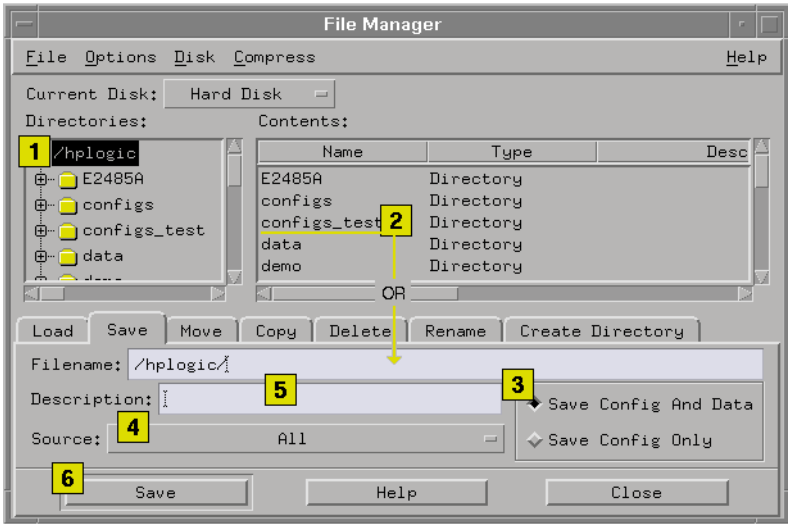
Only the chosen *Target* will have the load operation performed on it.

- All – All Instrument tools on the Workspace. This selection loads a complete *System Configuration* file.
- Instrument – Only the selected Instrument tool. This selection is used when you are only interested in loading a file into a particular instrument.

Saving Configuration Files

Save a configuration file by selecting *File->Save Configuration* in a tool window, or by clicking the *Save* tab in the File Manager.

1. From the *File Manager* window, in the *Directories:* frame, build a path to the directory where you want to save the config file.
2. Type the name of the new config file, or select an existing file in the *Contents:* frame for overwriting.
3. Select:
   - *Save Config and Data* - saves settings and the current contents of acquisition memory.
   - *Save Config Only* - saves only the current tool settings.
4. Select a source: (see page 84)
   - *All* - Saves settings for all currently configured tools.
   - A specific instrument - only saves settings for the selected instrument.
5. Optionally, enter a description of the config which will appear in the File Manager *Contents:* frame. (32 chars max)
6. Click *Save*.



See Also

More About Configuration Files (see page 78)

Loading Configuration Files (see page 81)

Source for the Save File Operation (see page 84)

Config and Data/Config Only Option (see page 85)

File Out Tool (see the *File Out Tool* help volume)

Source for the Save File Operation

Only the chosen *Source* will have the save operation performed on it.

- All – All Instrument tools on the Workspace. This selection saves a complete *System Configuration* file.
- Instrument – Only the selected Instrument tool. This selection is used when you are only interested in saving a file for a particular instrument.

Config and Data/Config Only Option

Configuration and Data

This option saves the instrument setup configuration and the data stored in acquisition memory. This file option generates the largest file size.

Configuration Only

This option saves just the instrument setup configuration. When reloaded, you must run the measurement again to acquire data. This option generates a smaller file size thus a faster file operation time.

The User Environment and Session Control

This overview describes the user environment of the logic analysis system. Specifically, it defines the difference between how the typical user interacts with the product compared to the *system administrator*. You also get a description of the two working use models: an "open-networked" system, and a "Secure Mode" environment where user accounts and passwords are assigned.

For the most part, the differences encountered while working in either use model occur during initial product configuration, or when you first start a measurement session. In addition, if the secured environment of *Secure Mode* is not enabled, there is no distinction between typical users and a System Administrator.

For more information on using the security of user accounts and its effects on the user environment, refer to Setting Up User Accounts (see page 51).

Ordinary Users vs System Administrator

If *Secure Mode* is enabled, the typical user can only perform the following system-level tasks:

- Change your own password.
- NFS-mount file systems to the instrument.
- Telnet and FTP to other networked systems.

If *Secure Mode* is enabled, only the System Administrator can perform the following system-level tasks:

- Configure the network.
- Enable the use of User Accounts.
- Add and remove individual User Accounts.
- Set the system-wide default file permissions (see page 88). Defaults at initial power-up are –rw–r—r— for files and –rwxr–xr–x for directories.
- Set user permissions for new file creation.

- Set the system time.
- Set NFS export permissions from the instrument.

Identifying your System Administrator

Your System Administrator is the first person who accesses the *User Accounts* dialog and assigns himself system administration privileges. From that point forward, the *User Accounts...* pick is unavailable for all users except the identified System Administrators. At the time a user logs in, the system software checks for system administration privileges and sets the appropriate access mask on the *User Accounts...* dialog as well as other restricted areas of the system.

For more information on System Administrator Privileges, refer to System Administration Privileges (see page 18).

Use Models - Open-Networked Compared to User Accounts

When you power up the instrument for the first time, you are in an open-networked unsecured mode. Any user can access the instrument and stored data with no record of access. By definition, you are in the open-networked mode when *Secure Mode* is not enabled.

The *User Accounts* mode is often used where large project teams share lab equipment. In this environment, one or more users are set up with a user account and given a login and password. User accounts add the security of restricted use, plus the ability to trace all network activity and file ownership. By definition, you are in *User Accounts* mode when your System Administrator enables the *Secure Mode*.

Switching between Open Network and User Accounts

Your System Administrator can switch between the open networked mode and the secured User Accounts mode at any time.

1. From the System Administration Tools window, click *User Accounts...*.
2. Toggle the Secure Mode field to either *Enabled* or *Disabled*.
3. Click *OK*.
4. At this point, you will be asked to verify the reboot of the logic analysis system. A reboot is necessary to implement the system level change of the

secured user accounts mode.

See Also

For more information on the Session Control windows used in starting a session, refer to Starting a Session (see page 89).

For more information on setting up the network, user accounts, and other system tasks, refer to System Administration Tools (see page 16).

About File Permissions

The *System Default File Permissions* specify a default value for accounts created either during the import process or during *Add*.

File permissions specify read/write access at three different levels. This maps directly to the UNIX(tm) definitions of user, group, and world access: the first two characters define permissions of the user, the second two are for groups, and the last two are for anyone, regardless of user or group identity.

rw———

The most restrictive permissions. No one other than the creator of the file is allowed to read or write it.

rwr——

Users who belong to the same group (the GID field in the account dialog) will be able to read the user's files, but cannot write to them.

rwrw—

The group can both read and write this user's files.

rwr–r–

All users can read these files, but only the creator can write to them.

rwrwr–

All users can read these files, and the group can both read and write to them.

rwrwrw

All users can read and write all files owned by this user.

Starting a Session

The *Session Manager* dialog is used to start a new exclusive session, start a shared session, or, if another user has already started a shared session, you can select to join the current shared session.

Session Startup

Exclusive session - Use this selection to start a session on the logic analysis system local display (Console), or, if you have telneted to the logic analysis system from a remote computer (RemoteX). With this type of session, you are the only user allowed access to the session.

Shared session - Use this selection to start a shared session on the logic analysis system. With this type of session, you are allowing other users to connect and share the front panel.

If the *Shared session* selection has changed to *Join the current shared session*, this indicates that a remote user has already started a shared session. Select *Join the current shared session* to join the session and display the analyzer on the local display.

Start Session

Select *Start Session* to display the logic analysis system main window from the session startup mode chosen in *Session Startup* described above.

Shutdown

Select *Shutdown* to terminate the current session.

Powerdown - This is a complete shutdown, and is used prior to turning the power off.

Restart - This is a reboot to a new session.

Close (Remote sessions only)

If you have a remote session running, a *Close* button is available. This terminates your remote session leaving the logic analysis system available for a new session.

CAUTION: Data and configurations ARE NOT restored after an *Exit*, a *Shutdown*, or remote session *Close*. Make sure to save your configuration.

Available Help Resources

- The HP 16600/16700 Configuration Guide is a booklet which explains how to set up your Logic Analysis System.
- Making Basic Measurements is a tutorial booklet which guides you through the user interface and basic system tools.
- The Online Help System is a group of task-oriented help volumes that are displayed in a window on your screen. Online help is accessed from a pulldown menu in each system tool or from a "Help" button in many system dialogs.
  - Using the Online Help System (see the *Help On Help* help volume)
  - Searching for information (see the *Help On Help* help volume)
- Online Help information is also available on the World Wide Web (see page 91).
- A volume of Measurement Examples (see the *Measurement Examples* help volume) will guide you in performing meaningful measurements with your system. Many common data measurements are described, with instructions for setting up the analyzer.
- Glossary of System Terms (see page 179)
- Logic Analyzer Terminology (see page 108)

Information on the Web

Enter the following URL:

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

This page contains logic analyzer microprocessor debug and emulation solution manuals and online help. To access the HTML version of this online help:

1. Click "Logic Analyzer Manuals and Online Help".
2. In the next page, under the heading, "HP 16600A/16700A-Series Logic

Analysis System," click "HP 16600A/16700A-Series Logic Analysis System Help".

3. In the page that appears, click "HP 1600A/16700A Logic Analysis System Help".

   You will see the top page of this online help.

System Overview

- Product Description (see page 72)
- The User Interface - Icons, Tabs, and Navigation (see page 61)
- Session Control and the User Environment (see page 86)
- "Frame Specifications and Characteristics" on page 93
- "How the Help System is Organized" on page 95

See Also

List of Tool Help Volumes (see page 73)

NOTE: For information on product Warranty and Safety Considerations, refer to the hardcopy *Installation Guide*.

Frame Specifications and Characteristics

The characteristics listed below apply to the 16600A-series frame and the HP 16700A-series frame. For specification or characteristic information on specific measurement cards that install into the frames, refer to the specific tool help volumes (see page 73) for each tool. For specification or characteristic information on the 16600A-Series built-in logic analyzer, click the following:

- 16600A-Series Built-In Logic Analyzer Specifications (see the *HP 16600A-Series 100 MHz State/250 MHz Timing Logic Analyzer* help volume)
- 16600A-Series Built-In Logic Analyzer Characteristics (see the *HP 16600A-Series 100 MHz State/250 MHz Timing Logic Analyzer* help volume)

NOTE: Definition of Terms To understand the difference between specifications (see page 94) and characteristics (see page 94), and what gets a calibration procedure (see page 95) and what gets a function test (see page 95), click the appropriate links within this note.

```
Power Requirements
  ~Line 115 V / 230 V
  48 - 66 Hz
  285 W (16600A-series frames)
  610 W (16700A-series frames, except 16701A)
  545 W (16701A frame)
  CAT II; POLLUTION DEGREE 2

Operating Environment Characteristics
  - Indoor use only.
  - Temperature
    Instrument (except disk and media): 0 to 50 degrees C (+32
                                        to 122 degrees F)
    Disk and media:                     10 to 40 degrees C (+50 to
                                        104 degrees F)
    Probe lead sets and cables:         0 to 65 degrees C (+32 to
                                        149 degrees F)
  - Humidity
    Instrument, probe lead sets, and cables: 8 to 80% relative humidity at
                                             40 degrees C (+104 degrees F)
  - Altitude      To 3000 m (10,000 ft)
  - Vibration
    Operating:    Random vibration 5-500 Hz, 10 minutes per axis,
                  approximately 0.2 g rms
    Nonoperating: Random vibration 5 to 500 Hz, 10 minutes per axis,
                  approximately 2.41 g rms; and swept sine resonant
                  search, 5 to 500 Hz, 0.50 g (0-peak), 5-minute
                  resonant dwell at 4 resonances per axis.
```

What is a Specification

A *Specification* is a numeric value, or range of values, that bounds the performance of a product parameter. The product warranty covers the performance of parameters described by specifications. Products shipped from the factory meet all specifications. Additionally, the products sent to HP Customer Service Centers for calibration and returned to the customer meet all specifications.

Specifications are verified by *Calibration Procedures*.

What is a Characteristic

Characteristics describe product performance that is useful in the application of the product, but that is not covered by the product warranty. Characteristics describe performance that is typical of the majority of a given product, but not subject to the same rigor associated with specifications.

Characteristics are verified by *Function Tests*.

What is a Calibration Procedure

Calibration procedures verify products or systems operate within the specifications. Parameters covered by specifications have a corresponding calibration procedure. Calibration procedures include both performance tests and system verification procedure. Calibration procedures are traceable and must specify adequate calibration standards.

Calibration procedures verify products meet the specifications by comparing measured parameters against a pass-fail limit. The pass-fail limit is the specification less any required guardband.

The term "calibration" refers to the process of measuring parameters and referencing the measurement to a calibration standard rather than the process of adjusting products for optimal performance.

What is a Function Test

Function tests are quick tests designed to verify basic operation of a product. Function tests include operator's checks and operation verification procedures. An operator's check is normally a fast test used to verify basic operation of a product. An operation verification procedure verifies some, but not all, specifications, and often at a lower confidence level than a calibration procedure.

How the Help System is Organized

The HP 16600A/16700A logic analysis system is modular. HP offers a choice of hardware and software tools you may install. As you add new tools, you also add the tool's help volume into the system.

When *Help* is accessed from the windows below the main icon bar, you get the system help volume. If you access *Help* from any analyzer, oscilloscope, pattern generator, or display/analysis tool window, you get help for that specific tool.

NOTE: Searching Across all Help Volumes For best results, when you don't know the specific help volume you are in, simply search the index. The keyword index search can search all installed help volumes.

Mouse Tip - How to navigate quickly through the Help System. (see page 143)

Master list of Help Volumes

The following link takes you to a master list of all help volumes. (see page 73)

More on using Help

For more information, see Using the Help System (see the *Help On Help* help volume)

Making Measurements

The Run Status Window

To be implemented...

Japanese Help Volumes

A portion of the online help system has been localized to Japanese.

- To view available Japanese help from a product window "Help" button, select "Select Help Language -> Japanese" from the "Help" pulldown in the workspace window. (If Japanese help is not available, English help will be displayed.)
- To always view English help from a product window "Help" button, select "Select Help Language -> English" from the "Help" pulldown in the workspace window.
- Within the help system, display English help by accessing "Main System Help" from any tool page, then clicking "Using Measurement Tools".
- Within the help system, display Japanese help by accessing "Main System Help" from any tool page, then clicking "Japanese Help Volumes".

To view the English and Japanese versions of a help volume at the same time:

1. Enter the English help system and navigate to the desired help page.
2. Select "Open Second Help Window (Japanese)" from the "Help" pulldown in the workspace window.
3. Navigate to the desired Japanese help page.

These help volumes have been localized to Japanese:

- HP 16600A/16700A Series Logic Analysis System Help (Japanese) (see the *HP 16600A/16700A Logic Analysis System (Japanese)* help volume)
- Measurement Examples (Japanese) (see the *Measurement Examples (Japanese)* help volume)
- Using the Listing Tool (Japanese) (see the *Listing Display Tool (Japanese)* help volume)
- Using the Chart Tool (Japanese) (see the *Chart Display Tool (Japanese)* help volume)
- Using the Distribution Tool (Japanese) (see the *Distribution Display*

Tool (Japanese) help volume)

- Using the Digital Waveform Tool (Japanese) (see the *Waveform Display Tool (Japanese)* help volume)
- Working With Markers (Japanese) (see the *Markers (Japanese)* help volume)
- HP 16557D 135MHz State/500MHz Timing Logic Analyzer (Japanese) (see the *HP 16557D 140 MHz State/500 MHz Timing Logic Analyzer (Japanese)* help volume)
- Using the Compare Tool (Japanese) (see the *Compare Tool (Japanese)* help volume)
- Using the File In Tool (Japanese) (see the *File In Tool (Japanese)* help volume)
- Using the File Out Tool (Japanese) (see the *File Out Tool (Japanese)* help volume)
- Using the Pattern Filter Tool (Japanese) (see the *Pattern Filter Tool (Japanese)* help volume)
- The Setup Assistant (Japanese) (see the *Setup Assistant (Japanese)* help volume)
- Using the Help System (Japanese) (see the *Help On Help (Japanese)* help volume)

To return to the main English help system page:
HP 16600A/16700A Series Logic Analysis System Help (English) (see the *HP 16600A/16700A Logic Analysis System* help volume)

Using the HP 16701A Expansion Frame

The HP 16700A logic analysis system can be expanded to a total of ten slots by connecting an HP 16701A expander frame. When connected, the two frames create a tightly coupled system fully controlled by the HP 16700A.

NOTE: The HP 16600A logic analysis system is not expandable.

Expanded System Features

- Combined total of ten module slots.
- Module arming/triggering between all modules.
- 2-nanosecond time correlation between modules.
- External PORT IN and PORT OUT connectors on the HP 16700A frame.

Connecting the HP 16701A Expansion Frame

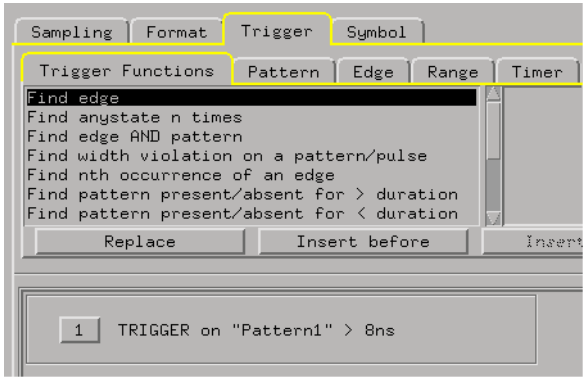
A 68-pin shielded flat cable connects the expansion frame to the main frame. Connect one end of the cable to the HP 16700A port marked "To HP 16701A Expansion Frame". Connect the other end of the cable to the HP 16701A port marked "HP 16700A".

System Power-Up

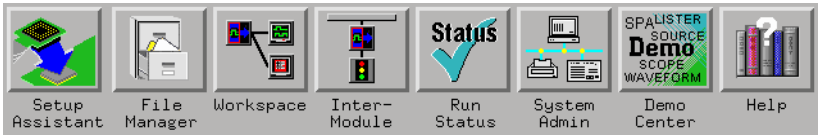
The HP 16701A expansion frame's power supply is controlled by the HP 16700A mainframe. Because the power is controlled by the mainframe, the expansion frame's power switch must be turned on before the mainframe is turned on, or the expansion frame will not be recognized as part of the system.

The System Window

Navigation with Tabs



Navigation with the Icon Bar



Setup Assistant

The *Setup Assistant* window is used to start the automated process of setting up a microprocessor analysis measurement.

File Manager

The *File Manager* window is used to perform the common tasks of loading or saving measurement configurations. The File Manager has all the standard functionality for performing operations on files and directories on both the flexible and hard disk drives.

Workspace

The *Workspace* shows a complete graphical representation of the tools and how they are connected for your measurement configuration. New tools are primarily added from within Display tool windows, however, for specific applications, the Workspace window may also be used.

For more specific configurations, or for modifications to an existing configuration, use the Workspace to add or delete tools, or to add, delete, or change the connection scheme between tools.

Intermodule

The *Intermodule* window shows a graphical representation of the internal arming sequence between measurement modules, and any external trigger connections to a target system or other instruments.

In measurements using multiple instruments or machines, the Intermodule window is used to modify the order that measurement modules are armed to trigger, and to compensate for any timing deviations (skew adjust) between module probing.

Run Status

The *Run Status* window is used to monitor the run function, and feed back information on the progress of elements such as pre-store, trigger status, and post-store.

System Administration

The *System Administration* window is used to setup system defaults, network configurations, and perform maintenance on the operating system file set. If you are working in a multi-user environment, you set up user accounts in this dialog.

Demo Center

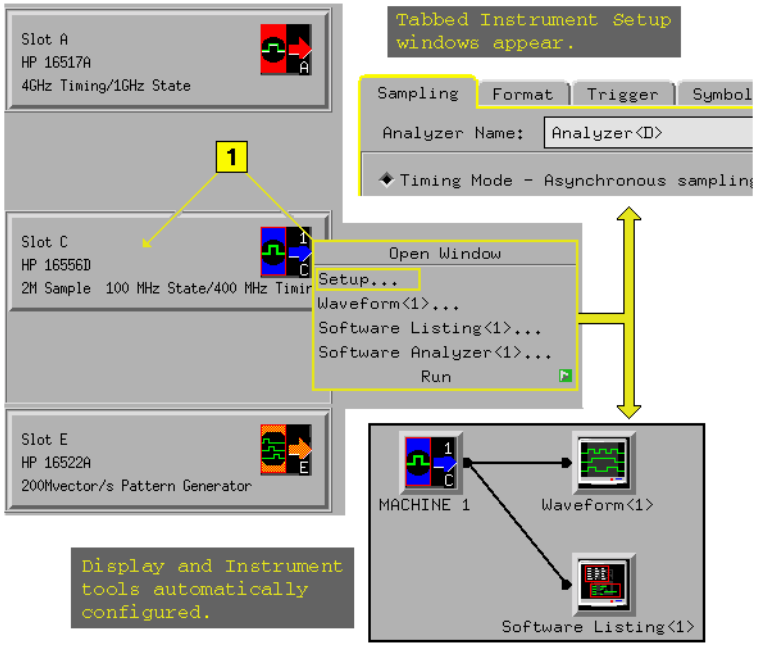
The *Demo Center* is used to learn about the main features of your logic analysis system. By using the demo data files, you can view trace data as it would normally appear, without needing to connect to a target system.

Help

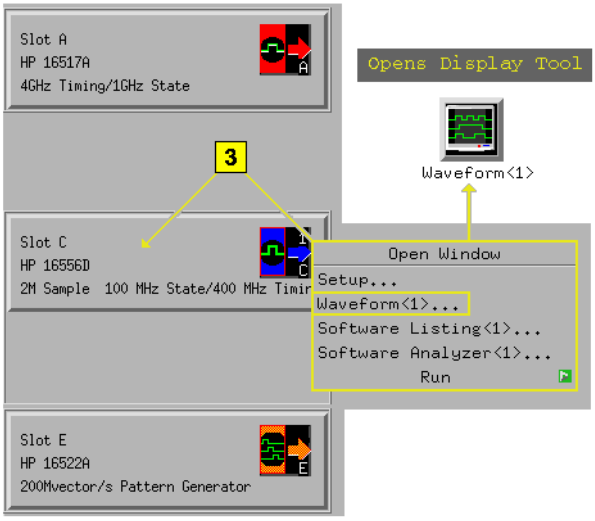
The *Help* icon in the System Icon Bar accesses the main help system for the frame and system level operations.

All Instrument, Display, Analysis, and Utility tools have their own specific help volumes.

Automatic Measurement Configuration



Accessing Display Tools



System Terminology

New Terms

Some of the terminology used in your logic analysis system has changed with the release of the HP 16600A/16700A series. If you are familiar with certain terminology, use this page to identify system components by their old and new name.

For a full list of current system terminology, see the Glossary of System Terms (see page 179).

- Old: preprocessor New: analysis probe
  This hardware device is connected between your target system and a logic analyzer to gather signals for analysis and display.
- Old: software analyzer New: source correlation tool set
  This software add-on allows you to correlate your trace data with the source code that was used to generate the running program. The window in which the decoded instructions are displayed is called the source viewer.
- Old: processor probe New: emulation module/emulation probe
  These devices connect between your target system and your logic analysis system for run/stop/break control of your target processor. An emulation module plugs into a card slot in your logic analysis system, while an emulation probe is an external device which can connect directly to your logic analysis system or to a local network.

Other Terms

- state measurements may be referred to in the industry as synchronous or periodic measurements.
- timing measurements may be referred to in the industry as asynchronous measurements.

Using the Mixed Signal Tab

A mixed signal measurement captures data and displays results from more than one instrument tool. All displayed signals are time-correlated and typically displayed in the same display tool. An example of a mixed signal application would be when Using a Timing Analyzer and an Oscilloscope (see page 123).

The *Mixed Signal* tab is used to import signals from other instruments into the display tool.

NOTE: Ideally, before you use the Mixed Signal tab to import a signal, the instrument tool from which the signal will come should be configured and able to successfully capture its own *data set*. If any required part of the configuration is not correct, such as Arming or Time Tags, a Correlation Dialog (see page 110) will appear to help correct the configuration.

1. Click the *Mixed Signal* tab.
2. Select the desired signal.
3. Click *Connect*.
4. Click *Group Run*. Running the measurement at this point makes the new imported signals available for insertion.
5. From the menu bar in the display window, click *Edit*, then select *Insert*.
6. From the Label Selection Dialog that appears, select the desired signal to import, then click *Apply*.
7. Click *OK*.

Using the Correlation Dialog

Two required elements of a multiple instrument configuration are the *Arming Signal* and the *Time Correlation of Data Sets*. The Correlation dialog is used to help you correct any configuration problems with these two elements. If you run a measurement and the Correlation dialog appears, reconfigure any inputs that show errors.

- Armed From – For each *Input Name*, set the *Armed From* field to either the Group Run or another instrument. This allows the arming signal to create an ordered triggering sequence between instruments. For more information, refer to "The Arming Signal", in the Overview - Multiple Instrument Configuration (see page 140).
- Time Tags – Each data set must be acquired in reference to a common time base or time reference. Timing analyzers are always referenced to the timebase of the measurement. However, if you are using a State analyzer, you must set its Count field to Time (time tags). For more information, refer to "Time Correlation of Data Sets", in the Overview - Multiple Instrument Configuration (see page 140).

Using the Analysis Tab

The logic analysis system allows you to use a variety of tools to filter, compare, and display the measurement data. Depending on where in the configuration you place these tools, you can generate multiple views of only the data you are interested in seeing.

The *Analysis* tab is used to insert tools into your configuration from the current display.

NOTE: Using the Analysis tab to insert tools is a convenient way to expand a basic configuration. However, if your measurement requires a more complex reconfiguration, the system will notify you to perform the reconfiguration from the Workspace window.

1. From the current display window, click the *Analysis* tab.
2. Highlight the desired tool to create within the configuration.
3. Click *Create*. If desired, you can verify the placement of the new tool from the Workspace window.

Adjusting Intermodule Skew

Skew is a small timing deviation between instruments configured in an intermodule measurement. It is usually due to variances in internal probing delays from one instrument to another. When desired, you should adjust skew after new acquisitions are displayed.

The purpose of adjusting skew is to visually align waveforms in the display so you can mark data or look for eye patterns within the context of all displayed data sets.

In the following example, a Timing analyzer (bit 0) and an oscilloscope (ch 1) are connected to the same glitch signal. Both waveforms are displayed in the same Waveform display.

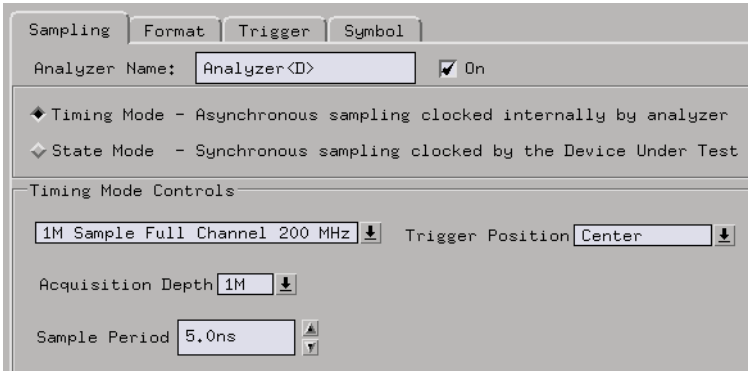
1. From the System window, click the logic analyzer icon, then select *Setup...*.
2. Configure a timing analyzer (see page 113) to trigger on the first occurrence of the glitch.
3. From the System window, select the oscilloscope icon, then select *Setup/Display*.
4. From the oscilloscope window, configure the oscilloscope (see page 114) to trigger immediately.
5. From the Icon Bar in the System window, select the Intermodule icon.
6. From the Intermodule window, configure the Group Run Arming Tree (see page 115) so the *Group Run* field arms the timing analyzer and the timing analyzer arms the oscilloscope.
7. From the Intermodule window, select *Navigate*, then *Analyzer N* (your analyzer), then select *Waveform...*.
8. From the Waveform display, select *Group Run*. This will update the display showing the glitch.
9. From the Waveform display, select the *Mixed Signal* tab.
10. From the Mixed Signal tab, import the oscilloscope signal (see page 116) into the Waveform display.

11. From the menu bar in the Waveform display, select *Options...*, then select *Reference trigger...*, then select the timing analyzer as the trigger reference.
12. Select *Group Run* to update both data sets.
13. Place Markers (see page 117) on a common point and measure the interval.
14. From the Intermodule window, select *Intermodule Skew...*, then Adjust the skew (see page 117) to align displayed waveforms visually.

Configure the Timing Analyzer

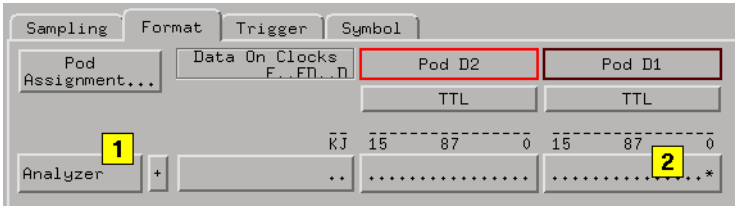
The Sampling Tab

Configure the Sampling tab as shown below.



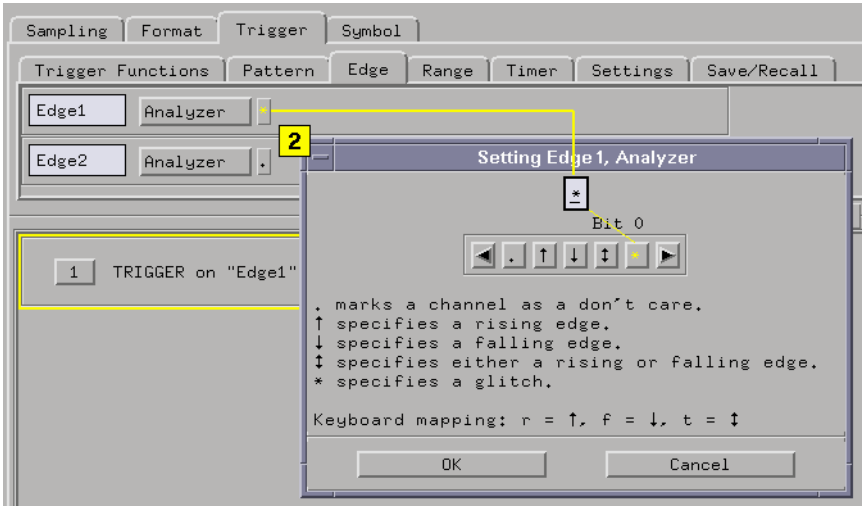
The Format Tab

1. Configure the Format tab with one label called *Analyzer*.
2. Assign the bit that maps to the input probe signal.



The Trigger Tab

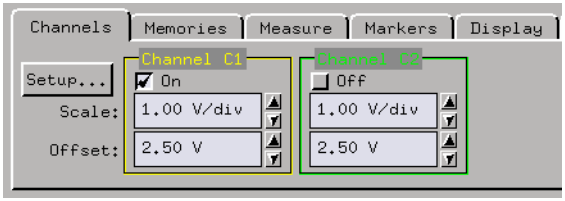
1. Under Trigger Functions, select *Find edge*, then select *Replace*.
2. Select the *Edge* tab and set the first *edge1* term to a *Glitch*.



Configure the Oscilloscope

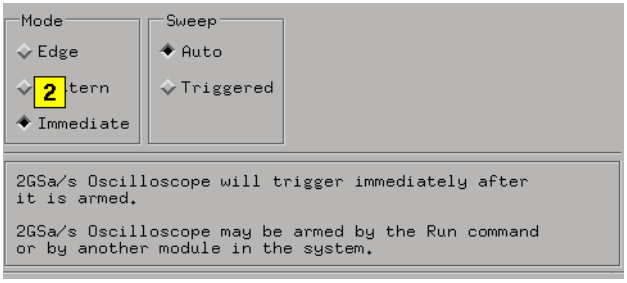
Channels Setup

1. Configure channel 1 as shown below. Turn channel 2 off.



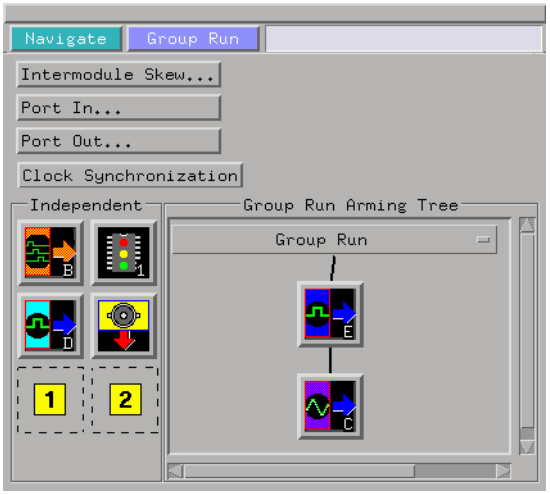
Trigger Setup

1. From the bottom of the oscilloscope window, select the *Trigger* field.
2. Set the Trigger Mode field to trigger *Immediate*.
   This will cause the oscilloscope to trigger and begin running as soon as the arming signal is received from the Timing analyzer.



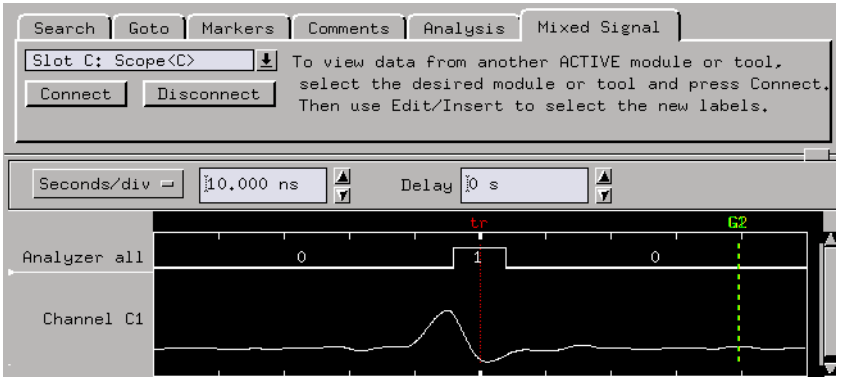
Configure the Group Run Arming Tree

1. From the Intermodule window, select the analyzer icon, then select *Group Run* as the arming device.
2. Select the oscilloscope icon, then select the analyzer as the arming device. The result is an arming tree that has the analyzer armed when the Group Run field is selected. Then the scope is armed, when the analyzer triggers on the glitch, and the scope is configured to trigger immediately.



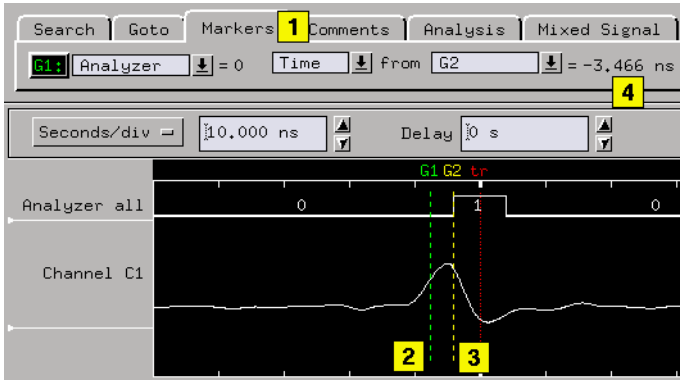
Configure the Waveform Display

1. Select the oscilloscope instrument.
2. Select *Connect*.
3. Expand the seconds per division and increase the height of the scope signal for a better view of the glitch.



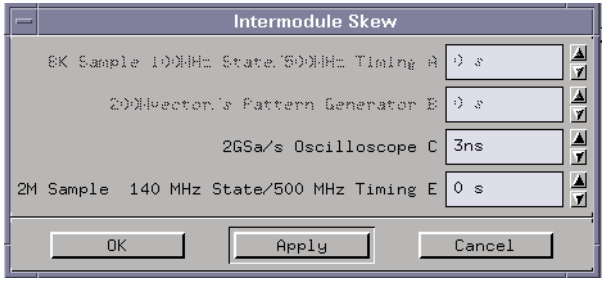
Placing Markers for an Interval Reading.

1. From the Waveform display, select the Markers tab.
2. Place one Time marker on the leading edge of the scope glitch.
3. Place a second Time marker on the leading edge of the analyzer glitch.
4. Read the difference between the two Time markers.



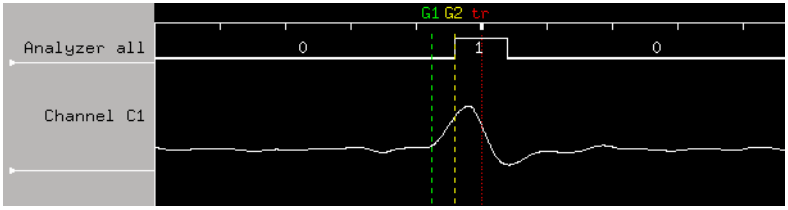
Adjust the Skew

Set the skew setting of the oscilloscope to the time difference you measured between the two Time marker, then select *Apply*.



The result of the skew adjustment moves the oscilloscope signal over to the right (positive) so that it visually aligns itself with the analyzer

trigger signal.



Starting Measurements from External Triggers

Using the Port In Signal

The analysis frame can automatically start a measurement using a signal from an external instrument or system. The arming pulse is connected to the PORT IN BNC on the rear panel of the analysis frame.

Port In Characteristics

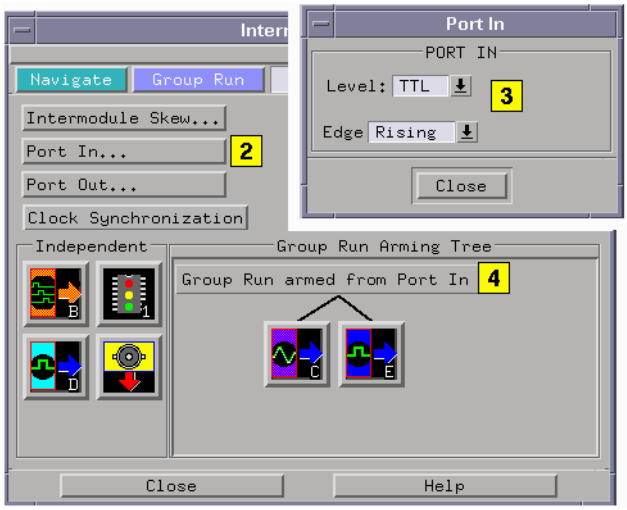
The signal from the external instrument must have the following characteristics.

```
Input Resistance = 4 kOhms
Levels = TTL, ECL, or User Defined from -4.0 V at 1.5 mA to +5 V at 1.6 mA
Input Voltage = -6 V at 1.5 mA to +6 V at 1.6 mA
```

Starting Measurements from External Triggers

1. Connect the arming pulse from the external instrument to the PORT IN BNC connector on the analysis frame.
2. From the Intermodule window, select *Port In*.
3. Set the Port In voltage level and edge to match the arm signal from the external instrument. You can set the analysis frame to match a TTL, ECL, or user-defined level.
4. Select the large *Group Run* button and choose *Group Run armed from Port In*.
5. Start the external instrument or system.

When the external instrument sends a pulse to the PORT IN BNC, the Instrument tool(s) that are directly beneath the Group Run are armed and begin searching for their respective trigger conditions.



Using the Port Out Signal

You can configure an Instrument tool in the Group Run Arming Tree to communicate its Trigger to the PORT OUT BNC connector on the rear panel of the analysis frame. This signal is used to start or stop an external instrument or system.

The Port Out Signal may be programmed through the User Interface to transmit the instrument tool Trigger directly (Feedthrough Mode) or transmit a pulse (Pulsed Mode) initiated by the instrument tool Trigger.

The Polarity of the Port Out Signal is selectable as either *Active High* or *Active Low*. Active High means that the Port Out Signal transitions from low to high when Trigger occurs in the instrument tool associated with Port Out. Active Low means that the Port Out Signal transitions from high to low when Trigger occurs in the instrument tool associated with Port Out.

Port Out may also be Disabled. When disabled, Port Out becomes a high impedance (Tri-State) output and will not transition high or low, regardless of the state of any associated instrument tool Trigger.

NOTE: When Port Out is disabled, the selectable fields associated with TYPE and POLARITY are also disabled and thus have no meaning.

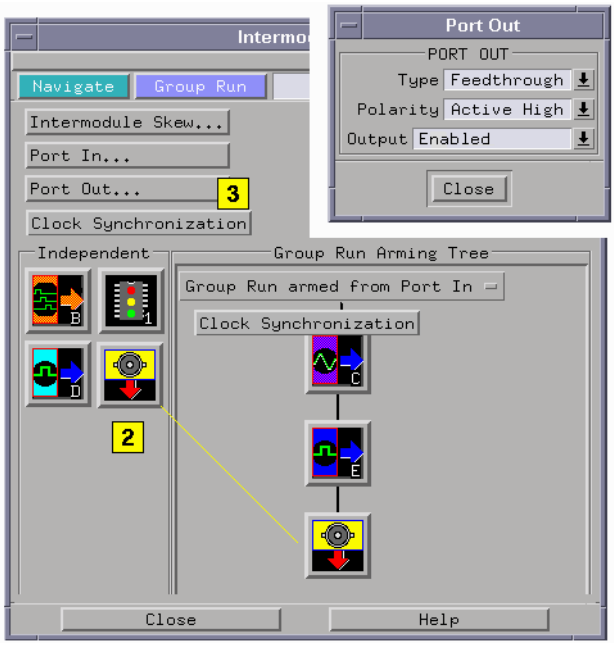
Port Out Signal Characteristics

The Port Out Signal is designed to drive a 50 Ohm Load. It is highly recommended that, for good signal quality, the Port Out Signal be terminated in 50 Ohms to Ground.

```
VOH (Output High Level)= >2.0 V into a 50 Ohm Load to Ground.
VOL (Output Low Level)=  <0.5 V into a 50 Ohm Load to Ground.
Pulse Width in Pulsed Mode= Approximately 60 nanoseconds to 140 nanoseconds.
```

Triggering External Instruments

1. Connect the PORT OUT BNC connector on the analysis frame to the arm or trigger input of the external instrument.
2. From the Intermodule window, select the *PORT OUT* icon, then select the instrument tool you want the Port Out armed by.
   When configured, the PORT OUT icon appears beneath the selected module in the Group Run Arming Tree.
3. Select *Port Out...*, then configure the Port Out parameters.


Intermo
Navigate
Group Run
Intermodule Skew...
Port In...
Port Out...
3
Clock Synchronization
Port Out
PORT OUT
Type
Feedthrough
Polarity
Active High
Output
Enabled
Close
Independent
Group Run Arming Tree
Group Run armed from Port In
Clock Synchronization
B
1
D
2
C
E
Close
Help

Using a Timing Analyzer and an Oscilloscope

In the following example we use an oscilloscope to trigger on a glitch and a timing analyzer to capture bus data after the glitch. Both the timing waveforms and the glitch are time-correlated and displayed in the same display.

NOTE: Before you begin configuring the measurement, connect the appropriate probing (see page 144) for your measurement.

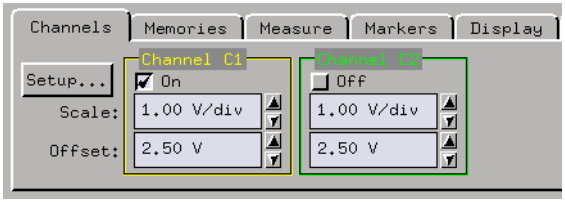
1. From the System window, select the oscilloscope icon, then select *Display...*.
2. From the oscilloscope window that appears, configure the oscilloscope (see page 124) to trigger on a glitch.
3. From the System window, select the logic analyzer icon, then select *Setup...*.
4. From the analyzer window, configure the analyzer (see page 125) to trigger on the first occurrence of data.
5. From the Icon Bar in the System window, select the Intermodule icon.
6. From the Intermodule window, configure the Group Run Arming Tree (see page 127) so the *Group Run* field arms the oscilloscope and the oscilloscope arms the logic analyzer.
7. From the Intermodule window, select *Navigate*, then *Analyzer N* (N=the slot analyzer is in), then *Waveform...*.
8. From the Waveform display that appears, select the *Mixed Signal* tab.
9. From the Mixed Signal tab, import the oscilloscope signal (see page 128) into the Waveform display.
10. From the menu bar in the Waveform display, select *Options...*, then select *Reference trigger...*, then select the oscilloscope as the trigger reference.
11. Select *Group Run* to run the measurement.

Configure the Oscilloscope

Depending on the kind of glitch you are triggering on, the type of probes used, and the speed of your system, your configuration could vary from the one shown. In this example, we are triggering on a positive glitch that is present for less that 20 ns.

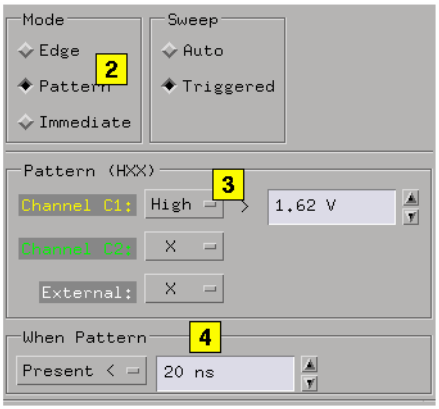
Channel Setup

1. From the *Channels* tab in the oscilloscope window, select *Setup...*.
2. From the Channels Setup dialog, configure channel 1 as shown below. Turn channel 2 off.



Trigger Setup

1. From the *Channels* tab in the oscilloscope window, select *Trigger...*.
2. Set the Mode field to *Pattern*.
3. Configure the pattern as a high pulse on channel 1.
4. Qualify the pattern to be present for less than 20 ns.
5. Select *Close*.



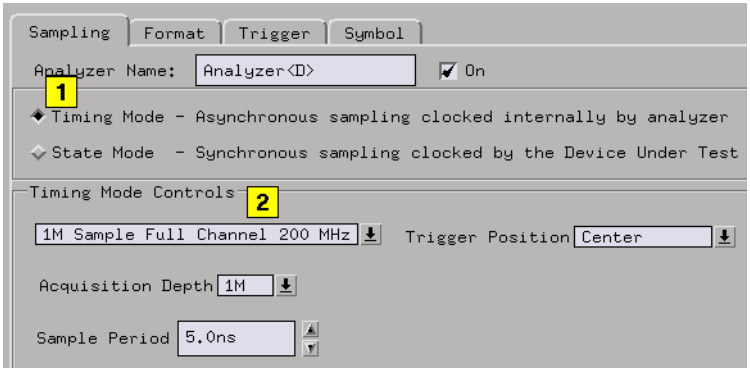
When the oscilloscope triggers on the glitch, the arm signal is sent to the next instrument tool.

NOTE: Remember, the arm signal does not automatically start the next instrument tool. The arm signal simply tells the next instrument that it can start evaluating its own trigger specification and run when trigger conditions are satisfied.

Configure the Logic Analyzer

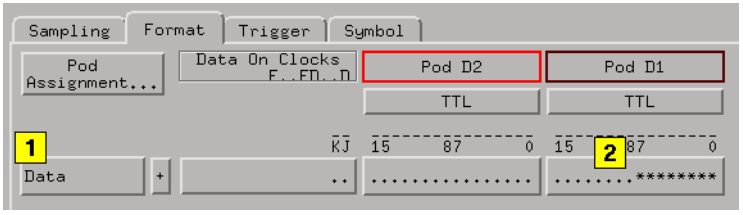
The Sampling Tab

1. Select the Sampling tab and set the analyzer to *Timing Mode*.
2. Set the Timing Mode Controls as shown below.



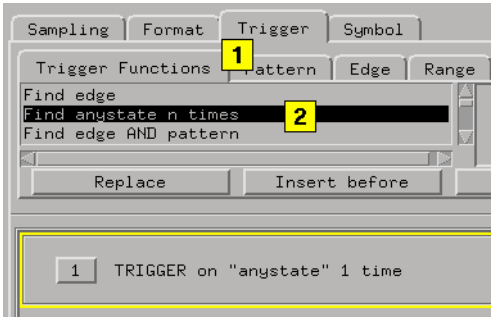
The Format Tab

1. Select the Format tab and rename one label to *Data*.
2. Assign the bits that map to the input probe signals.



The Trigger Tab

1. Select the Trigger tab, then select the Trigger Functions tab.
2. Select the function *Find anystate n times*, then select Replace.
   This will cause the Timing analyzer to trigger and begin running as soon as the arming signal is received from the oscilloscope.

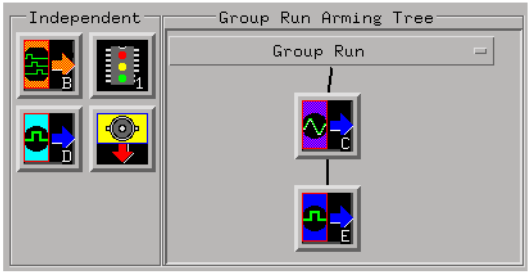


Configure the Group Run Arming Tree

How you configure the Group Run Arming Tree determines if an instrument tool runs as an independent tool or in a group. By default, all instrument tools are *Independent* and in *Single* acquisition mode.

NOTE: All multiple instrument configurations must be part of a Group Run to take advantage of time-correlation and intermodule arming.

- From the Intermodule window, select the oscilloscope icon and set it to be armed by Group Run. Select the Timing analyzer and set it to be armed by the oscilloscope.
  The result is an arming tree that has the scope armed when the Group Run field is selected. Then the timing analyzer is armed when the scope triggers on the glitch. The analyzer is configured to trigger on the first data it finds.



More about Independent and Group Run Configurations

Group Run allows all connected tools which are configured as Group Run, to run when any *Group Run* field is selected. If any connected tools are changed to Independent Run, they will not run with the group.

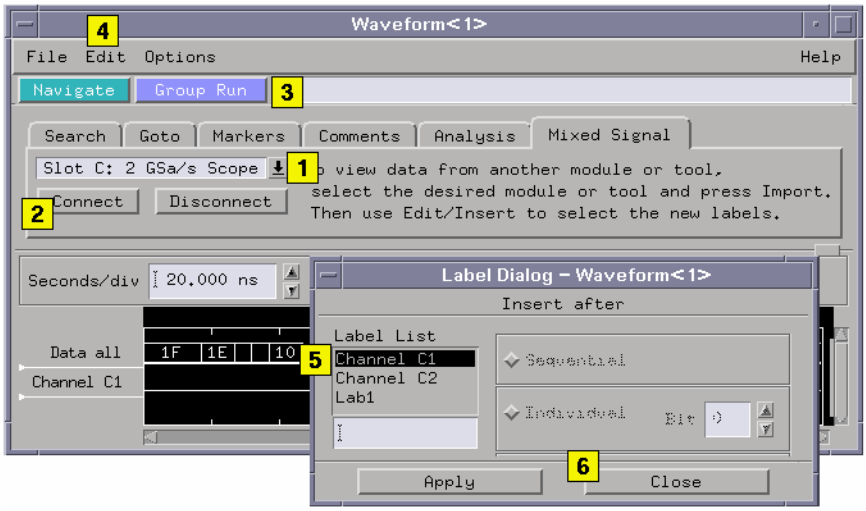
Independent Run allows specific tools to remain in a connected group, but run independently without affecting the run status of the other instrument tools. To independently run an Instrument tool, you must select *Run* from within one of that tool's windows.

If any of the connected instrument tools are changed to Group Run, the Run field for that particular tool, plus all tools connected to its output, will change to Group Run.

Run/Group Run Function (see page 147)

Importing Signals into the Display

1. Select the desired Instrument tool.
2. Select *Connect*.
3. Select *Group Run*. Running the measurement at this point makes the new imported signals available for insertion.
4. From the menu bar in the waveform display dialog, select *Edit*, then select *Insert*.
5. From the Label Dialog that appears, select the desired signal to import, then select *Apply*.
6. Select *Close*.


Waveform<1>
4
File
Edit
Options
Help
Navigate
Group Run
3
Search
Goto
Markers
Comments
Analysis
Mixed Signal
Slot C: 2 GSa/s Scope
1
o view data from another module or tool,
select the desired module or tool and press Import.
Then use Edit/Insert to select the new labels.
Connect
Disconnect
2
Seconds/div
20.000 ns
Data all
Channel C1
1F
1E
10
5
Label Dialog – Waveform<1>
Insert after
Label List
Channel C1
Channel C2
Lab1
Sequential
Individual
Bit
0
6
Apply
Close

Using Both Analyzers

In the following example we use a Timing analyzer to trigger on an address pattern, and a State analyzer to capture the data that appears after the address pattern. Both analyzers are from the same instrument tool, and both the timing and state data sets are time-correlated.

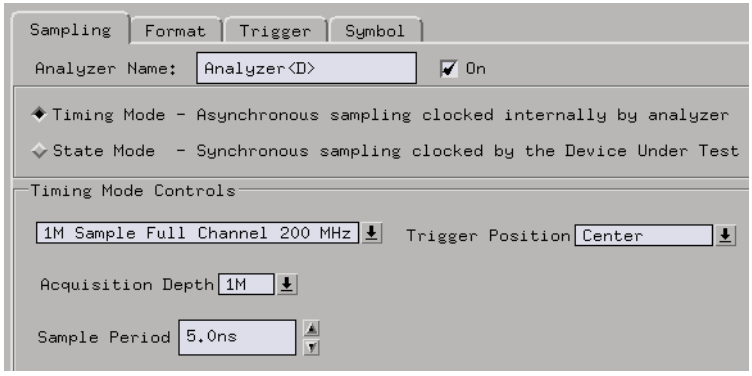
NOTE: Before you begin configuring the measurement, connect the appropriate probing (see page 144) for your measurement.

1. From the System window, select the logic analyzer icon, then select *Setup...*. The first analyzer window will appear.
2. From the first analyzer window, configure a Timing analyzer (see page 131) to trigger on the first occurrence of a desired edge and pattern.
3. From the analyzer window, select *Navigate*, then *Activate Modules*, then select the second analyzer from the same slot. This analyzer is marked by an N2, where *N* is the slot the analyzer is installed in, and *2* designates the second analyzer.
   When you activate the second analyzer, a second analyzer window marked *N2* appears.
4. From the Settings tab of the first analyzer, configure the Arming Tree (see page 133) so the Timing analyzer (first analyzer) is armed by Run, and the State analyzer (second analyzer) is armed by the Timing analyzer.
5. From the second analyzer, configure a State analyzer (see page 132) to trigger on the first occurrence of any data.
6. From either analyzer window, select *Navigate*, then Analyzer N, then select *Listing*.
7. From the Listing window, Select *Run* to execute the measurement and display data.

Configure the Timing Analyzer

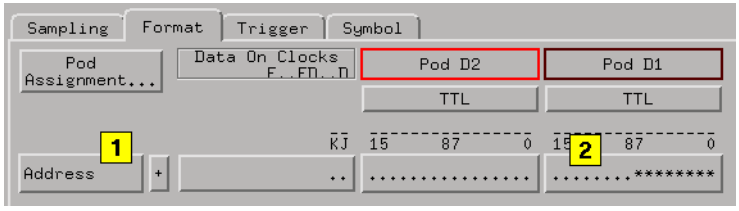
The Sampling Tab

From the Sampling tab, set the analyzer to *Timing Mode*, and configure the Timing Mode Controls as shown below.



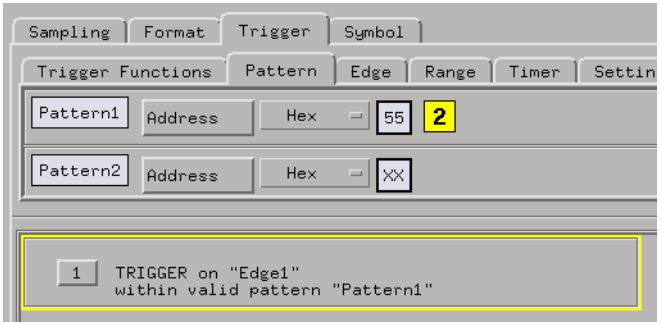
The Format Tab

1. Rename the label to *Address*.
2. Assign the bits that map to the input probe signals.



The Trigger Tab

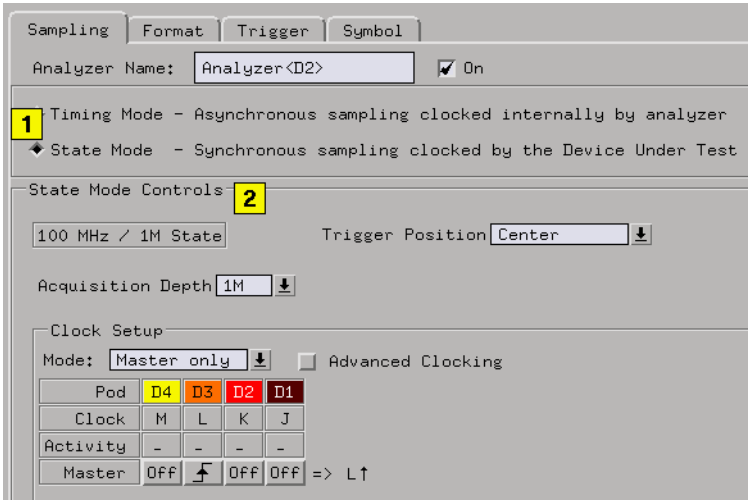
1. From the Trigger Functions tab, select *Find edge AND pattern*, then select *Replace*.
2. From the Pattern tab, assign Pattern1 the desired pattern you want to trigger on. In this example we use the pattern "55" Hex. By default, Edge1 is set to *don't care* which is OK for this example.



Configure the State Analyzer

The Sampling Tab

1. From the second analyzer window, select the Sampling tab, and set the analyzer to *State Mode*.
2. Configure the State Mode Controls as shown below.



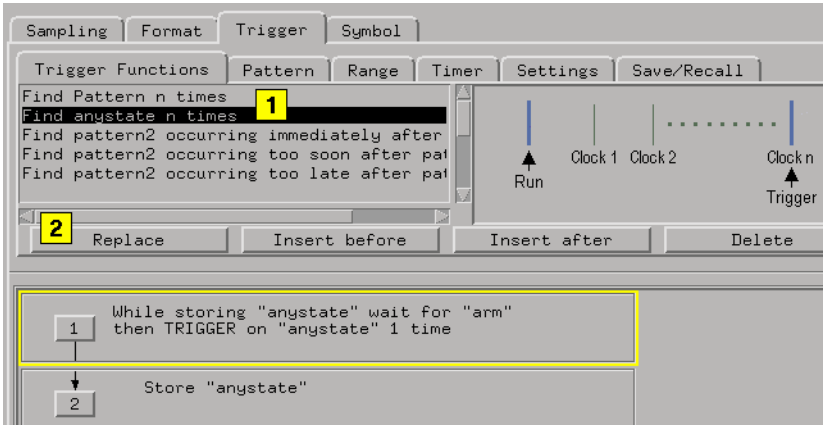
The Format Tab

1. From the Fomat tab, rename the label to *Data*.

2. Assign the bits that map to the input probe signals.

The Trigger Tab

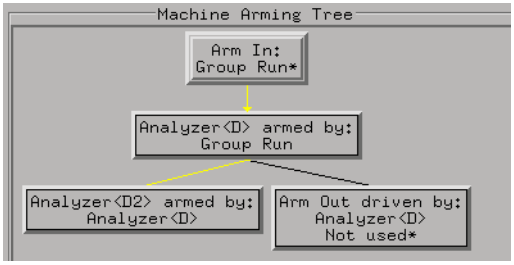
1. From the Trigger Function tab, select *Find anystate n times*.
2. Select *Replace*.
   This will cause the State analyzer to trigger and begin running as soon as the arming signal is received from the Timing analyzer.



Configure the Arming Tree

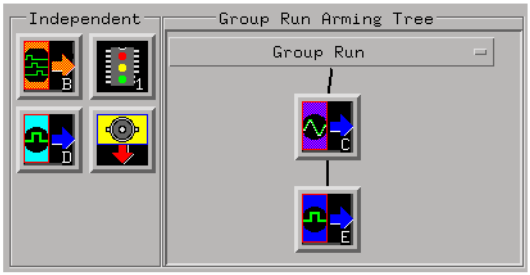
How you configure the Arming Tree determines which analyzer sends the arm signal to the other. By default both analyzers are armed by the Run field.

1. From the Settings tab, select *Arming Control*.
2. From the Arming Tree dialog that appears, set Analyzer N to be armed from Run, and Analyzer N2 to be armed from Analyzer N as shown below.


Machine Arming Tree
Arm In:
Group Run*
Analyzer<D> armed by:
Group Run
Analyzer<D2> armed by:
Analyzer<D>
Arm Out driven by:
Analyzer<D>
Not used*

Group Run Arming Tree

The Group Run Arming Tree is found in the Intermodule window. You access the Intermodule window by clicking the Intermodule icon in the Icon Bar of the System window.



Use the Group Run Arming Tree to configure Instrument tools into a group where all run functions are referenced to an arming signal. If Instrument tools are not included in a Group Run, they are configured as Independent and are not tied to an arming signal. By default, all instrument tools placed on the workspace are configured as Independent Run.

When you select the *Group Run* field, the following sequence of events occur:

1. When the run field is selected, all tools that are not directly armed from the run field or port in signal, begin to evaluate their trigger specification. They step through their trigger sequence until they get to the point where they are waiting for an arm signal.
2. The first tool in the tree begins evaluating its trigger specification and triggers when it is met. At the point of trigger, the arm signal is sent down to the next tool in the tree.
3. From this point, all subordinate tools are ready and waiting in their sequences for the arm signal. When the signal is received, they react immediately with a trigger, store, or what ever remains in their trigger sequence. As each tool triggers, the arm signal is sent down to the next tool.

For more information on the Run/Stop function, refer to Run/Stop (see

page 147).

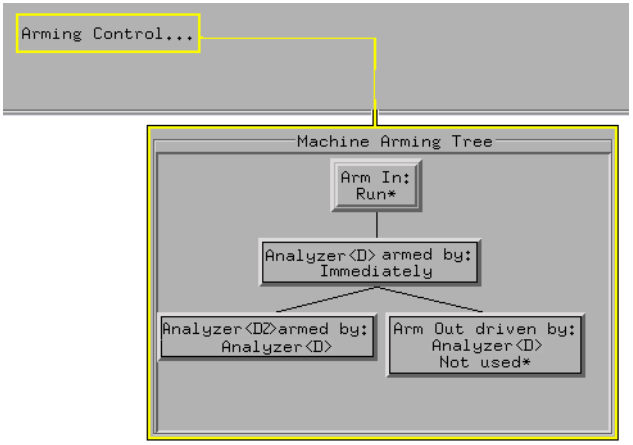
For more information on using the Group Run in measurements, refer to the following examples:

"Using a Timing Analyzer and an Oscilloscope" on page 123

"Using Both Analyzers" on page 130

Arming Tree

The Arming Tree is found under *Arming Control* in the Logic Analyzer's Trigger tab - Settings tab.



Use the Arming Tree to configure the separate analyzers into a group where their run functions are referenced to the arming signal.

The order in which the analyzers appear in the Arming Tree determines the order they receive the arming signal. The arm signal does not automatically start the next analyzer. The arm signal simply tells the next analyzer that it can start evaluating its own trigger specification and run when its trigger conditions are satisfied.

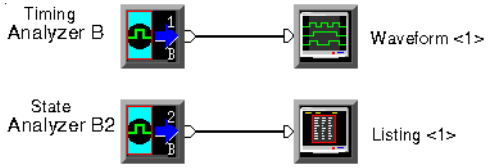
If a trigger specification in an analyzer has multiple sequence levels, you can specify which sequence level to send the arm signal to. This is useful when specifying cross-triggering within a single analyzer tool.

For more information on using two analyzers in a measurement, refer to the following example.

"Using Both Analyzers" on page 130

Overview - Multiple Analyzer Configuration

A multiple analyzer configuration consists of both analyzers from the same logic analyzer instrument tool used together in a measurement. In this type of configuration, each analyzer captures its own *data set*. All data sets are then viewed in one or more display tools.



Configuration Shown in the Workspace Window

Important elements of a multiple analyzer configuration are the *arming control* and the *time correlation* of the separate data sets. There is no analyzer-to-analyzer skew adjustment.

The Arming Control

When using both analyzers in a measurement, you must coordinate the run function of both analyzers. This is done by the Arming Control in the analyzer's Trigger window. By configuring the Machine Arming Tree (see page 137), you route the arming signal through both analyzers.

When the measurement is run, the arming signal notifies each analyzer in the Arming Tree when it's their turn to run. Depending on the purpose of the measurement, all analyzers could trigger immediately when the arm signal is received, or, each analyzer could trigger according to its own trigger specification.

The arming signal can originate either when the measurement is run, (see page 147) or by an external source connected through a Port In connector.

Time Correlation of Data Sets

When multiple analyzers have their arming control coordinated to an

arming signal, they typically are also *time-correlated*. That is, each data set is acquired in reference to a common time base or time reference. A big benefit of time correlation is the ability to display multiple data sets in the same display window with all data time-stamped and aligned relative to each other.

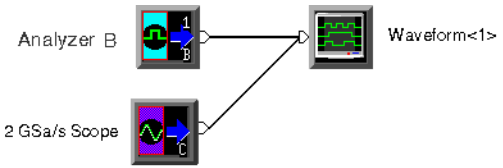
Timing analyzers are always referenced to the time base of the measurement. However, if you are using a State analyzer, you must set its Count field (see page 142) to Time.

See Also

For an example of a multiple analyzer measurement, refer to Using Both Analyzers. (see page 130)

Overview - Multiple Instrument Configuration

A multiple instrument configuration consists of more than one Instrument tool grouped together in a measurement. In this type of configuration, each instrument tool captures its own *data set*. All data sets are then typically viewed in the same Display tool.



Configuration Shown in the Workspace Window

Important elements of a multiple instrument configuration are the *arming signal*, the *time correlation* of the separate data sets, and the *skew adjustment* between instruments.

The Arming Signal

When using multiple instrument tools in a measurement, you must coordinate the run function of all instruments. This is done by the arming signal in the Group Run Arming Tree. (see page 135) When the measurement is run, the arming signal notifies each instrument in the arming tree when its their turn to run. Depending on the purpose of the measurement, all instruments could trigger immediately when the signal is received, or, each instrument could trigger according to its own trigger specification.

The arming signal can originate either when the measurement is run (see page 147) by selecting the *Group Run* field, or by an external source connected through a *Port In* connector.

Time Correlation of Data Sets

When multiple instrument tools have their run control coordinated to an arming signal, they typically are also *time-correlated*. That is, each instrument knows the time relationship between each others trigger,

and also that it knows each sample's time relationship to its own trigger.

A big benefit of time correlation is the ability to display multiple data sets in the same display window with all data time-stamped and aligned relative to each other.

Timing analyzers are always referenced to the time base of the measurement. However, if you are using a State analyzer, you must set its Count field (see page 142) to Time.

Skew Adjustment

Skew is a small timing deviation between the different instruments configured in the same measurement. It is usually due to variances in internal probing delays from one instrument to another. You compensate for any variations using the Intermodule Skew (see page 112) adjustment.

See Also

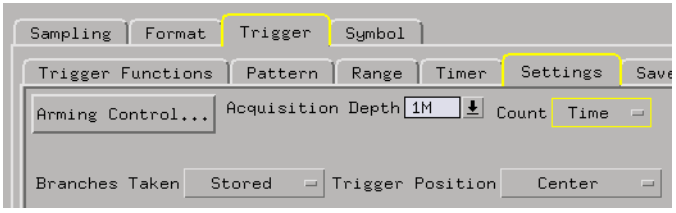
For another example of a multiple instrument measurement, refer to Using a Timing Analyzer and an Oscilloscope. (see page 123)

Count Field

Before the *data set* from a State analyzer can be viewed in reference to other data sets in the same measurement, the data must be acquired as time-correlated data.

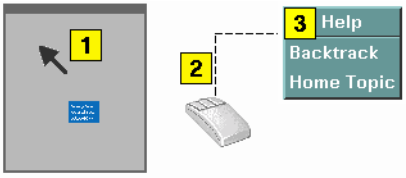
To time-correlate the data of a State analyzer, set the Count field under the Settings tab *Time*.

A benefit of time-correlated data sets is that you can place global markers at data points in one data set and view data from another data set that occurred at the same time.



Help - How to Navigate Quickly

1. Place mouse cursor anywhere in a help window.
2. Press the right mouse button.
3. Select desired destination.



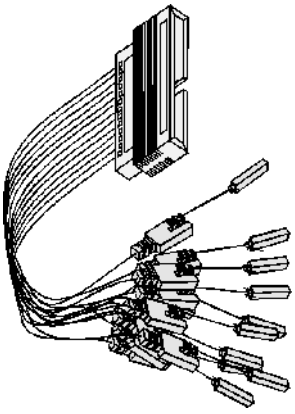
You can also access all navigation and search commands from the help window menu bar.

Analyzer Probing Overview

The figures below shows a variety of simple probing connections. The specific probe type, number of probes, and location on the target circuit depends on your particular measurement.

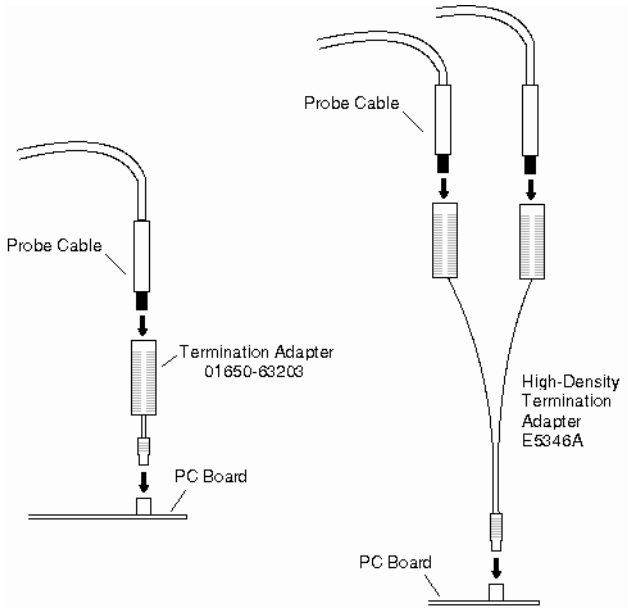
For equivalent circuit diagrams and pinouts, see the description of the probe type in the *Logic Analysis System and Measurement Modules Installation Guide*. If you have misplaced the *Logic Analysis System and Measurement Modules Installation Guide*, you can download the latest version from the Web at <URL: http://www.hp.com/go/LogicAnalyzer-Manuals/ >

Probe Lead-to-Board Connection



The standard lead set plugs directly into any .1-inch grid with 0.026 to 0.033-inch diameter round pins or 0.025-inch square pins. All probe tips work with the HP 5059-4356 surface mount grabbers and the HP 5959-0288 through-hole grabbers.

Adapter-to-Board Connection



Both the 01650-63203 and the E5346A adapters include termination for the logic analyzer. The 01650-63203 termination adapter plugs into a 2 x 10 pin header with 0.1 inch spacing. The E5346A high-density adapter connects to an AMP "Mictor 38" connector. If possible, use support shrouds around the Mictor connector to relieve strain and improve connections.

Direct Pod-to-Board Connection

If you provide proper termination as part of the target board, you can plug the pod directly into the ©3M 2520-series, or similar alternative connector. Suggested termination is shown in the *Logic Analysis System and Measurement Modules Installation Guide*.

Also use this termination with the HP E5351A high-density, non-terminated adapter.

Pod-to-Analysis Probe Connection

Analysis probes (formerly called preprocessors) are microprocessor-specific interfaces that make it easier to probe buses. Generally,

analysis probes consist of a circuit board that attaches to the microprocessor (possibly through an adapter) and a configuration file. The configuration file sets up the logic analyzer's clocks and labels correctly, and may include an inverse assembler. The circuit board provides access to logical groups of pins through headers designed to connect directly to the logic analyzer.

The easiest way to set up a measurement with an analysis probe is the Setup Assistant. (see the *Setup Assistant* help volume) The Setup Assistant asks you questions about your measurement and then shows you just the information you need to set up the probe correctly. It also loads the proper configuration files.

Run/Group Run Function

- Setting a tool for independent or Group Run (see page 148)
- Setting Single or Repetitive Run (see page 149)
- “Checking Run Status” on page 149

Understanding Run/Run All/Group Run

The Run/Run All/Group Run buttons initiate data capture in the instrument tools you have configured. When an instrument tool is connected to analysis or display tools, any of the tools can initiate a run. When two or more instrument tools are configured, you can run them independently or as a group. Two or more instruments running as a group is called an Intermodule measurement.

Use the Intermodule Window (see the *HP 16600A/16700A Logic Analysis System* help volume) to coordinate the run function of multiple instruments as a "Group Run". A common "Group Run" configuration is to run the instrument tools at the same time. A more advanced measurement is to configure one instrument to arm another instrument, each with their own trigger conditions.

- Run appears in the setup dialog and icon menu of an instrument if it is not part of an Intermodule measurement.
- Group Run appears in the setup dialog and icon menu of each tool if two or more instruments are configured for an Intermodule measurement.
- Run All always appears in the System, Workspace and Run Status windows, and initiates a run in all configured instruments, whether they are run independently or are part of a Group Run.

Intermodule measurements are configured between individual instruments. Arming between two machines that belong to one analyzer is configured in the *Arming Info...* dialog found in the *Trigger* window of the analyzer.

Understanding Stop/Stop_All/Cancel

- Stop will terminate an individual instrument measurement that is running.

(perhaps waiting for a trigger condition)

- Stop All, when selected from the Workspace, will terminate running measurements from all instruments currently on the Workspace.
- Cancel will terminate the processing of trace data from an instrument to an analysis or display tool connected to its output.

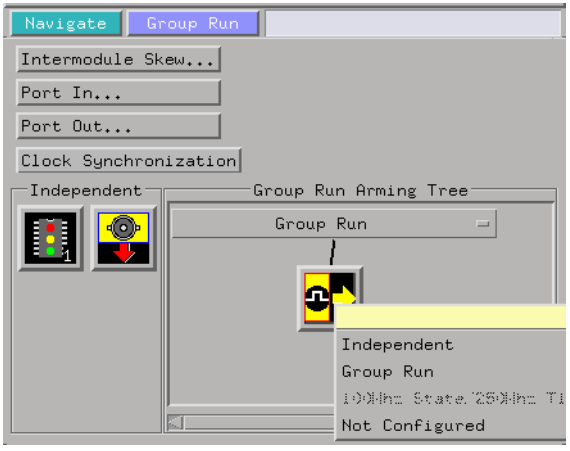
See Also “Demand Driven Data” on page 150

Setting a tool for independent or Group Run

Use the Intermodule Window to change between Group Run and independent Run.

- Click the Intermodule icon in the System Window, OR
- Use Navigate->System->Intermodule

In the Intermodule window, move instruments between independent Run and Group Run by clicking the icon and selecting the desired arming source. All instruments in "Group Run" will run simultaneously.

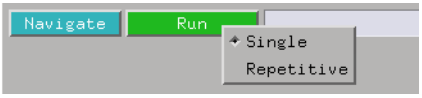


Setting Single or Repetitive Run

A single measurement will stop after memory is full or a store qualification is met. A repetitive measurement executes successive Single measurements until Stop is selected.

When a single or repetitive measurement is stopped, only data that has been captured to that point is available for viewing.

Select single or repetitive by right-clicking on the Run button in the tool's setup window.



If you have problems displaying trace data when running Repetitive measurements, see "Demand Driven Data" on page 150.

Checking Run Status

The *Run Status* dialog provides status information about the currently configured instruments, and the status of the run with respect to the trigger specification.

To access the *Run Status* dialog:

- The Run Status icon in the System Window, OR
- Navigate->System->Run Status

Demand Driven Data

When an analyzer measurement occurs, acquisition memory is filled with data that is then transferred to the display memory of the analysis or display tools you are using, as needed by those tools. In normal use, this *demand driven data* approach saves time by not transferring unnecessary data.

Since acquisition memory is cleared at the beginning of a measurement, stopping a run may create a discrepancy between acquisition memory and the memory buffer of connected tools. Without a complete trace of acquisition memory, the display memory will appear to have 'holes' in it which appear as filtered data.

This situation will occur in these cases:

- If you stop a repetitive measurement after analyzer data has been cleared and before the measurement is complete.
- If a trigger is not found by the analyzer and the run must be stopped to regain control.

To make sure all of the data in a repetitive run is available for viewing:

- In the workspace, attach a Filter tool to the output of the analyzer.
- In the Filter, select "Pass Matching Data"
- In the filter terms, assure the default pattern of all "Don't Cares" (Xs).

This configuration will always transfer all data from acquisition memory. While this configuration will increase the time of each run, it will guarantee that repetitive run data is available regardless of when it is stopped.

The Symbols Tab

The Symbols tab offers control of the *symbols* capabilities. Symbols represent patterns and ranges of values found on labeled sets of bits. Two kinds of symbols are available:

- Object File Symbols. These are symbols from your source code and symbols generated by your compiler.
- User-Defined Symbols. These are symbols you create.

To load symbols, click one of the following:

- "To Load Object File Symbols" on page 154
- "To Load User-Defined Symbols" on page 171

Symbols are available for all state and timing analyzers. Each label listed in the Format menu can have its own group of symbols associated with it.

- "User-Defined Symbols" on page 170
- "Setting Up Object File Symbols" on page 154
- "Using Symbols In The Logic Analyzer" on page 165
- "Displaying Data in Symbolic Form" on page 153

Displaying Data in Symbolic Form

You can display data in symbolic form in some of the display tools, such as the Listing display and the Waveform display.

To View Symbolic Values in a Waveform Display

1. Right-click the label name where you want to display symbolic values.
2. Select *Change attributes...*.
3. In the Attribute Dialog:
   - Set ShowValue to *On*.
   - Set Base to *Symbols* or *Line#*.
   - Click *OK*.

   The symbolic names for the values now appear in the overlayed bus waveform.

To View Symbolic Values in a Listing Display

1. Right-click the numeric base of the label where you want to display symbolic values.
2. Set the numeric base to *Symbols* or *Line#*.
   The symbolic names for the values now appear instead of numeric data.

Setting Up Object File Symbols

Object file symbols can include variable names, procedure or function names, and source file names with line numbers. The linkage between symbol names and address or data values comes from one of two sources:

- Object files that are created by your compiler/linker.
- ASCII symbol files you create with a text editor.

To use object file symbols

1. Generate an object file with symbolic information using your software development tools.
2. If your language tools cannot generate object file formats that are supported by the logic analyzer, create an ASCII symbol file (see page 158).
3. Load the object file (see page 154) or ASCII symbol file into the logic analyzer.
4. If necessary, relocate sections of your code (see page 156).

See Also

"Using Symbols In The Logic Analyzer" on page 165

"Symbol File Formats" on page 157

To Load Object File Symbols

1. Select the *Symbol* tab and then the *Object File* tab.
2. Select the label name you want to load object file symbols for.
   In most cases you will select the label representing the address bus of the processor you are analyzing.
3. Specify the directory to contain the symbol database file (*.ns*) in the field under, *Create Symbol File (.ns) in This Directory*. Click *Browse...* if you wish to find an existing directory name.

4. In the *Load This Object/Symbol File For Label* field, enter the object file name containing the symbols. Click *Browse...* to find the object file and click *Load* in the Browser dialog.
   If your logic analyzer is NFS mounted to a network, you can select object files from other servers.

To reload object file symbols

1. Select the object file/symbol file to reload from the *Object Files with Symbols Loaded For Label* field.
2. Click the *Reload* button.

Value update

The values of the object file symbols being used as terms or as SPA state-interval ranges will be updated automatically each time the object file symbols are reloaded.

Configuration file save

The name of the current object file is saved when a configuration file is saved. The object file will be reloaded when the configuration is loaded.

Multiple files

You can load the same symbol file into several different analyzers, and you can load multiple symbol files into one analyzer. Symbols from all the files you load will appear together in the object file symbol selector that you use to set up resource terms.

Object file versions

During the load process, a symbol database file with a *.ns* extension will be created by the system. One *.ns* database file will be created for each symbol file you load. Once the *.ns* file is created, the Symbol Utility will use this file as its working symbol database. The next time you need to load symbols into the system, you can load the *.ns* file explicitly, by placing the *.ns* file name in the *Load This Object/Symbol File For Label* field.

If you load an object file that has been loaded previously, the system will compare the time stamps on the *.ns* file and the object file. If the

object file is newer, the *.ns* file will be created. If the object file has not been updated since it was last loaded, the existing *.ns* file will be used.

See Also

"Using Symbols In The Logic Analyzer" on page 165

"Symbol File Formats" on page 157

Relocating Sections of Code

Use this option to add offset values to the symbols in an object file. You will need this if some of the sections or segments of your code are relocated in memory at run-time. This can occur if your system dynamically loads parts of your code so that the memory addresses that the code is loaded into are not fixed.

To Relocate a Single Section of Code

1. Click the *Symbol* tab and then the *Object File* tab.
2. In the *Object Files with Symbols Loaded For Label* list, select the file whose symbols you wish to relocate.
3. Select the *Relocate Sections...* button.
4. In the *Section Relocation* dialog, click the field you wish to edit in the section list.
5. Type in the new value for that field and press Enter on your keyboard.
6. Repeat steps 4 through 6 above for any other sections to be relocated.
7. Click *Close*.

To Relocate All Sections of Code

1. Click the *Symbol* tab and then the *Object File* tab.
2. In the *Object Files with Symbols Loaded For Label* list, select the file whose symbols you wish to relocate.
3. Select the *Relocate Sections...* button.
4. Type the desired offset in the *Offset all sections by* field. The offset is

applied from the linked address or segment.

5. Click *Apply Offset*.
6. Click *Close*.

To Delete Object File Symbol Files

1. Click the *Symbol* tab, and then the *Object File* tab.
2. Select the file name you want to delete in the text box labeled, *Object Files with Symbols Loaded For Label*.
3. Click *Unload*.

Symbol File Formats

The logic analysis system can read symbol files in the following formats:

- OMF96
- OMFx86
- IEEE-695
- ELF/DWARF
- ELF/stabs
- TI COFF

For ELF/DWARF1, ELF/stabs, and ELF/stabs/Mdebug files, C++ symbols are demangled so that they can be displayed in the original C++ notation. To improve performance for these ELF symbol files, type information is not associated with variables. Hence, some variables (typically a few local static variables) may not have the proper size associated with them. They may show a size of 1 byte and not the correct size of 4 bytes or even more. All other information function ranges, line numbers, global variables and filenames will be accurate. These behaviors may be changed by creating a readers.ini (see

page 163) file.

See Also

"Creating ASCII Symbol Files" on page 158Creating ASCII Symbol Files

"Creating a readers.ini File" on page 163Creating a readers.ini File

Creating ASCII Symbol Files

If your language tool chain does not produce object files in a supported format, you can create an ASCII symbol file to define symbols. You can also use an ASCII symbol file to define symbols that are not included in your object file.

You can create an ASCII symbol file using any text editor that supports ASCII format text. Each entry in the file you create must be a string of ASCII characters consisting of a symbol name followed by an address or address range. The address or address range must be a hexadecimal number. It must appear on the same line of the text file as the symbol name and it must be separated from the symbol name by one or more blank spaces or tabs. Address ranges must be in the following format:

```
beginning address..ending address
```

Two formats are available for creating ASCII symbol files:

"Simple Format" on page 158

"Record Header Format" on page 159

NOTE: It is possible to generate ASCII symbol files from the symbol or load map output of most language tools.

Simple Format

An ASCII symbol file can be a simple list of name/address pairs.

Example

```
main     00001000..00001009
test     00001010..0000101F
var1     00001E22     #this is a variable
```

This example defines two symbols that correspond to address ranges and one point symbol that corresponds to a single address.

Record Header Format

An ASCII symbol file can be divided into records using key words, called *record headers*. The different records allow you to specify different kinds of symbols, with differing characteristics. An ASCII symbol file can contain any of the following kinds of records:

"Start Address" on page 160

"Sections" on page 160

"Functions" on page 160

"Variables" on page 162

"Source Line Numbers" on page 161

"Comments" on page 162

The record headers must be enclosed in square brackets, like this: [HEADER]. If no record header is specified, the lines following are assumed to be symbol definitions in one of the VARIABLES formats:

```
variable   address
variable   start..end
variable   start address   size
```

Example

Here is an ASCII symbol file that contains several different kinds of records.

```
[SECTIONS]
prog     00001000..0000101F
data     40002000..40009FFF
common   FFFF0000..FFFF1000

[FUNCTIONS]
main     00001000..00001009
test     00001010..0000101F

[VARIABLES]
total    40002000  4
value    40008000  4
```

```
[SOURCE LINES]
File: main.c
10       00001000
11       00001002
14       0000100A
22       0000101E

File: test.c
 5       00001010
 7       00001012
11       0000101A
```

Start Address . Format

```
[START ADDRESS]
address
```

address - The address of the program entry point, in hexadecimal.

Example

```
[START ADDRESS]
00001000
```

Functions . Use FUNCTIONS to define symbols for program functions, procedures or subroutines.

Format

```
[FUNCTIONS]
func_name  start..end
```

func_name - A symbol representing the function name.

start - The first address of the function, in hexadecimal.

end - The last address of the function, in hexadecimal.

Example

```
[FUNCTIONS]
main     00001000..00001009
test     00001010..0000101F
```

Sections . Use SECTIONS to define symbols for regions of memory,

such as sections, segments, or classes.

Format

```
[SECTIONS]
section_name  start..end  attribute
```

section_name - A symbol representing the name of the section.

start - The first address of the section, in hexadecimal.

end - The last address of the section, in hexadecimal.

attribute - (optional) Attribute may be one of the following:

NORMAL (default) - The section is a normal, relocatable section, such as code or data.

NONRELOC - The section contains variables or code that cannot be relocated. In other words, this is an absolute segment.

Example

```
[SECTIONS]
prog           00001000..00001FFF
data           00002000..00003FFF
display_io     00008000..0000801F  NONRELOC
```

NOTE: If Section definitions are used in an ASCII symbol file, any subsequent Function or Variable definitions must fall within the address ranges of one of the defined Sections. Those Functions and Variables that do not will be ignored by the Symbol Utility.

Source Line Numbers . Use SOURCE LINES to associate addresses with lines in your source files.

Format

```
[SOURCE LINES]
File: file_name
line#  address
```

file_name - The name of a file.

line# - The number of a line in the file, in decimal.

address - The address of the source line, in hexadecimal.

Example

```
[SOURCE LINES]
File: main.c
10       00001000
11       00001002
14       0000100A
22       0000101E
```

See Also Using the Source Viewer (see the *Listing Display Tool* help volume)

Variables. You can specify symbols for variables using:

- The address of the variable.
- The address and the size of the variable.
- The range of addresses occupied by the variable.

If you give only the address of a variable, the size is assumed to be 1 byte.

Format

```
[VARIABLES]
var_name   start [size]
var_name   start..end
```

var_name - A symbol representing the variable name.

start - The first address of the variable, in hexadecimal.

end - The last address of the variable, in hexadecimal.

size - (optional) The size of the variable, in bytes, in decimal.

Example

```
[VARIABLES]
subtotal     40002000   4
total        40002004   4
data_array   40003000..4000302F
status_char  40002345
```

Comments . Any text following a # character is ignored by the Symbol

Utility. The # can be used to comment a file. Comments can appear on a line by themselves, or on the same line, following a symbol entry.

Format

```
#comment text
```

Example

```
#This is a comment
```

Creating a readers.ini File

You can change how an ELF/Dwarf or ELF/stabs symbol file is processed by creating a reader.ini file.

1. Create the reader.ini file on your workstation or PC.
2. Copy the file to /hplogic/symbols/readers.ini on the logic analysis system.

Reader options

C++Demangle

```
1= Turn on C++ Demangling (Default)
0= Turn off C++ Demangling
```

C++DemOptions

```
803= Standard Demangling (Default Elf/Dwarf)
203= GNU Demangling      (Default Elf/Stabs)
403= Lucid Demangling
800= Standard Demangling without function parameters
200= GNU Demangling without function parameters
400= Lucid Demangling without function parameters
```

MaxSymbolWidth

```
80= Column width max of a function or variable symbol
    Wider symbols names will be truncated. (Default 80 columns)
```

ReadElfSection

```
2= Process all globals from ELF section (Default)
   Get size information of local variables
1= Get size information of global and local variables
   Symbols for functions will not be read, and
   only supplemental information for those symbols in the Dwarf
   or stabs section will be read.
0= Do not read the Elf Section
```

If a file only has an ELF section this will have no effect and the ELF section will be read completely. This can occur if the file was created without a "generate debugger information" flag (usually -g). Using the -g will create a Dwarf or Stabs debug section in addition to the ELF section.

Dwarf1NoType

```
1= Use the new fast symbol reader for Dwarf1 (Default)
0= Use the previous version of the symbol reader
```

This symbol reader will be slow and may not be able to process all files. In addition the older symbol reader does not do C++ demangling. This symbol reader does process type information, so the sizes of local static and global variables will be processed.

Do not use this option unless you are having trouble reading the symbol file. This option will most likely be deleted in the future.

Example

```
[ReadersElf]
C
C
ReadElfSection=1
Dwarf1NoType=1
MaxSymbolWidth=60
```

Using Symbols In The Logic Analyzer

The ways symbols can be used in the logic analyzer are listed below:

Using Symbols As Trigger Terms

You can use either one or both types of symbols as terms within your trigger sequence:

- *Object File Symbols*.
- *User-Defined Symbols*.

1. At the bottom of the analyzer Trigger window, click the label button next to one of the resource terms, and select *Replace*.
2. In the Resource selection dialog, select a label to be used in your trigger sequence.
   Use a label that has *symbols* loaded.
3. Set the numeric base of the trigger term to *Symbols* or *Line #s*.
4. Click the button to the right of the numeric base field.
5. In the *Symbol Selector* (see page 167) dialog, select the symbol you want to use.

NOTE: The values of object file symbols used as trigger terms are automatically updated when the object file symbols are reloaded (see page 154).

See Also Setting Up a Trigger (see the *HP 16600A-Series 100 MHz State/250 MHz Timing Logic Analyzer* help volume)

Using Symbols as Search Patterns in Listing Displays

1. Under the *Search* tab in the Listing display, click *Advanced searching*.
2. In the Goto Pattern dialog, click *Define*.
3. In the Search Pattern dialog, select the *Symbols* numeric base.
4. Select *Pattern*, *Range*, *Not Pattern*, or *Not Range*.
5. Click the button to the right of the numeric base field.
6. In the *Symbol Selector* (see page 167) dialog, select the symbol you want to use.

See Also Go to an Exact Pattern. (see the *Listing Display Tool* help volume)

Using Symbols as Trigger Terms in the Source Viewer

1. In the Source Viewer menu bar, click *Trace*, and select *Trace Setup*.
2. In the Source Line Trigger dialog, select *Symbols* or *Line #s* in the numeric base field.
3. Select *Pattern*, *Range*, *Not Pattern*, or *Not Range*.
4. Click the button to the right of the numeric base field.
5. In the *Symbol Selector* (see page 167) dialog, select the symbol you want to use.

See Also To modify the trace setup. (see the *Listing Display Tool* help volume)

Using Symbols as Pattern Filter Terms

1. Click the numeric base field beside the selected filter term, and select *Symbols* or *Line #s*.
2. Select *Pattern*, *Range*, *Not Pattern*, or *Not Range*.
3. Select *Remove Matching Data* or *Pass Matching Data*, as desired.
4. Click the button to the right of the numeric base field.
5. In the *Symbol Selector* (see page 167) dialog, select the symbol you want to use.

Using Symbols as Ranges in the Software Performance Analyzer

1. In the SPA tool, click *Symbols* in the Define Ranges dialog.
2. In the Symbol Selector (see page 168) dialog, select the symbol or group of symbols you want to use as ranges in your measurement.

See Also

Defining State Interval Ranges. (see the *System Performance Analyzer* help volume)

Using the Symbol Selector Dialog

1. In the *Symbol Selector* dialog, select the symbol you want to use. All of your symbols for the current label, regardless of type, will be available in the dialog.
   - Use the Search Pattern (see page 168) field to filter the list of symbols by name. You can use the Recall button to recall a desired Search Pattern.
   - Use the Find Symbols of Type selections to filter the symbols by type.
2. Click the symbol you want to use in the list of *Matching Symbols*.
3. If you are using object file symbols, you may need to:
   - Set *Offset By* (see page 169) to compensate for microprocessor

prefetches.

- Set Align to x Byte (see page 169) to trigger on odd-byte boundaries.

4. Select the Beginning, End, or Range of the symbol.
5. Click *OK*.
   The name of your symbol now appears as the value of the resource term.
6. Click *Cancel* to exit the *Symbol Selector* dialog without selecting a symbol.

Using the Symbol Selector Dialog

1. In the *Symbol Selector* dialog, select the symbol you want to use. All of your symbols, regardless of type, will be available in the dialog.
   - Use the Search Pattern (see page 168) field to filter the list of symbols by name. You can use the Recall button to recall a desired Search Pattern.
   - Use the Find Symbols of Type selections to filter the symbols by type.
2. Click and drag to select the symbols you want to use in the list of *Matching Symbols*.
   - Click *Select All* to select all symbols in the list.
   - Click *Unselect All* to unselect all symbols in the list.
3. Click *Add Selected Symbols To Range List* to place the selected symbols into the *Current ranges* list in the Define Ranges dialog.
4. Click *Close* to exit the *Symbol Selector* dialog.

Search Pattern

Use this field to locate particular symbols in the symbol databases. To use this field, type in the name of a file or symbol. The system searches the symbol database for symbols that match this name. Symbols that match appear in the list of *Matching Symbols*. You can also use wildcard characters to find symbols.

Asterisk wildcard (*)

The asterisk wildcard represents "any characters." When you perform a

search on the symbol database using just the asterisk, you will see a list of all symbols contained in the database. The asterisk can also be added to a search word to find all symbols that begin or end with the same letters. For example, to find all of the symbols that begin with the letters "st", select the Search Pattern field and type "st*".

Align to x Byte Option

Most processors do not fetch instructions from memory on byte boundaries. In order to trigger a logic analyzer on a symbol at an odd-numbered address, the address must be masked off. The "Align to x Byte" option allows you to mask off an address.

Example

Assume the symbol "main" occurs at address 100F. The processor being probed is a 68040, which fetches instructions on long-word (4-byte) boundaries. In order to trigger on address 100F, the Align to x Byte option sets the two least-significant address bits to "don't cares". This qualifies any address from 100C through 100F.

Offset By Option

The Offset By option allows you to add an offset value to the starting point of the symbol that you want to use as a term. You might do this in order to trigger on a point in a function that is beyond the preamble of the function, or to trigger on a point that is past the prefetch depth of the processor. Setting an offset helps to avoid false triggers in these situations. The offset specified in the Offset By field is applied before the address masking is done by the "Align to x Byte" option.

Example

An 80386 processor has a prefetch depth of 16 bytes. Assume functions *func1* and *func2* are adjacent to each other in physical memory, with *func2* following *func1*. In order to trigger on *func2* without getting a false trigger from a prefetch beyond the end of *func1*, you need to add an offset value to your trigger term. The offset value must be equal to or greater than the prefetch depth of the processor. In this case, you would add an offset of 16 bytes to your trigger term. You would set the value of the "Offset By" field to 10 hex. Now, when you specify *func2* as your trigger term, the logic analyzer will trigger on address *func2+10*.

User-Defined Symbols

To Create User-Defined Symbols

1. Under the *Symbol* tab, select the *User Defined* tab.
2. Select the label name you want to define symbols for.
3. At the bottom of the *User Defined* tab, type a symbol name in the entry field.
4. Select a numeric base.
5. Select *Pattern* or *Range* type for the symbol.
6. Enter values for the pattern or range the symbol will represent.
7. Click *Add*.
8. Repeat steps 3 through 7 for additional symbols.
9. You can edit your list of symbols by using Replace (see page 170) and Delete (see page 171), if desired.

See Also

"Using Symbols In The Logic Analyzer" on page 165

To Replace User-Defined Symbols

1. Under the *Symbol* tab, select the *User Defined* tab.
2. Select the label you want to replace symbols for.

3. Select the symbol to replace.
4. At the bottom of the *User Defined* tab, modify the symbol name, numberic base, Pattern/Range type, and value, as desired.
5. Click the *Replace* button.
6. Repeat steps 3 through 5 to replace other symbols, if desired.

To Delete User-Defined Symbols

1. Under the *Symbol* tab, select the *User Defined* tab.
2. Select the label you want to delete symbols from.
3. Select the symbol to delete.
4. Click the *Delete* button.
5. Repeat steps 3 and 4 to delete other symbols, if desired.

To Load User-Defined Symbols

If you have already saved a configuration file, and the configuration included user-defined symbols, load the file with its symbols, as follows:

1. In the menu bar of your analyzer window, click *File* and then *Load Configuration...*.
2. In the Load Configuration dialog, select the directory and filename to be loaded.
3. Select the target of the load operation.
4. *Click Load*.
   User-defined symbols that were resident in the logic analyzer when the configuration was saved are now loaded and ready to use.

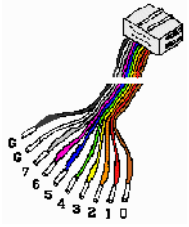
See Also

"Using Symbols In The Logic Analyzer" on page 165

Using the Target Control Port

The Target Control Port is an 8-bit, TTL port that you can use to send signals to your target system. It does not function like a pattern generator, but more like a remote control for the target's switches.

Connecting the Target Control



The target control cable is keyed, so it can be inserted only one way. Plug it into the target control port with the key up and the cable hanging down.

The lines are color-coded. Bit 0 is brown, bit 1 is red, bit 2 is orange, and so on up to bit 7 (grey). The black and white lines are both ground. Pins 0, 2, 4, and 6 are on the top of the connector and arranged in the same order as the lines.

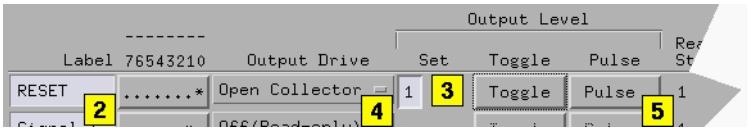
If you plan on using *Open Collector*, remember to install pull-up resistors. The minimum pull-up resistor is 350 * and the maximum sink current into the Target Control Port is 12 mA.

Resetting Your Target System

This example also applies to other types of signals you may want to send to your target system. The reset line in this case is active low. Open collector is specified so the line is only pulled low when you activate the signal.

1. Attach the target control cable to the reset line, using proper termination.
2. Set up a label, RESET.
3. Set the value to 1, for high impedance.

4. Set Output Drive to *Open Collector*.
5. When the target needs to be reset manually, click *Pulse*.



About *Open Collector* and *Active Drive*

Open Collector functions as a tri-state, with a logic "1" being high-impedance, and a logic "0" sinking a current of up to 12 milliamps.

Active Drive puts out a standard TTL signal with 1 high and 0 low.

Both of these signal types must be properly terminated to function properly. This is especially important for edge-sensitive circuitry.

About *Toggle* and *Pulse*

Toggle will flip the settings of the signal and leave them that way. For example, if your signal is set to 1 and you click *Toggle*, the setting changes to 0.

Pulse flips the settings for one clock cycle, at least 16 ms. The pulse may last longer. You cannot specify the duration of the pulse.

Adding and Deleting Tools

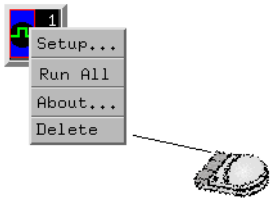
NOTE: The add operation is also done for you automatically when you select an Instrument Icon (see the *HP 16600A/16700A Logic Analysis System* help volume) from the System window. For an overview on the automatic configuration of measurements, refer to Overview - Starting a New Measurement (see the *HP 16600A/16700A Logic Analysis System* help volume).

To Add a Tool

1. *Point* to the new tool in the toolbox, then *drag and drop* the new tool on top of any current tool in the measurement setup.
   New tools that are dropped on top of a current tool are automatically connected to the measurement.

To Delete a Tool

1. Point to the tool you want to delete.
2. Right-click the mouse and select *Delete*.



See Also

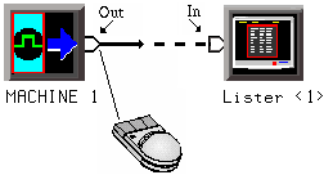
"Clearing the Workspace" on page 176

"Connecting Tools Together" on page 175

"Repositioning Tools in the Workspace" on page 177

Connecting Tools Together

If you *drag and drop* tools into open space in the workspace, you must create a data path between the tools by connecting their output and input ports.



To Connect Output and Input Ports

1. *Point* to the tool output port.
2. Press and hold the *left mouse button*, then move the cursor over to a tool input port.
3. Release the left button.
   You should now have a line, representing a data path, drawn between tool data ports.

Clearing the Workspace

Use the *Clear Workspace* option to remove all Instrument, Display, Analysis, and Utility tools from the workspace.

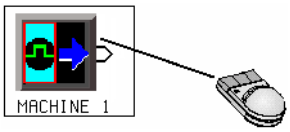
1. In the main window menu bar, click *File*, then select *Clear Workspace*.

NOTE: The *Clear Workspace* option does not clear parameter settings within the tools. To clear the Workspace and reset all parameters within the tools back to the defaults, exit out of the system and start a new session.

Repositioning Tools in the Workspace

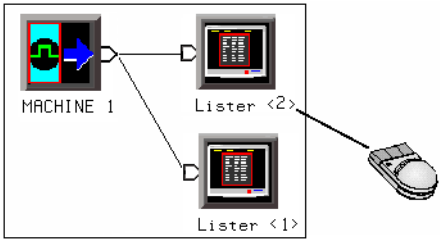
Once tools are placed on the workspace (see the *HP 16600A/16700A Logic Analysis System* help volume), you can reposition them to help you visualize your measurement, or to reveal their input and output ports for connection into the measurement.

To Reposition a Single Tool



1. *Point* to the tool to move.
2. *Drag and drop* the tool on its new location.

To Reposition Multiple Tools



1. Press and hold the *Shift* key, then point and click on all tools to move.
2. Press and hold the *Shift* key, then drag and drop the group of tools to their new location.

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 the target microprocessor. It provides an interface between the signals of the target microprocessor 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 HP 16600A-series or HP 16700A mainframe. 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 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 HP 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. Click *Help* 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.

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 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 To drag and drop an item, 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.

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 HP 16600A-series or HP 16700A 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 HP 16715A, 16716A, and 16717A 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 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.

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.

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 HP 16600A-series or HP 16700A mainframe, 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 HP 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 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*.

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.

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 See *pod pair*

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 avalaible is determined by the channel width of the instrument.

point To point to an item, move the mouse cursor 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 HP 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 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.

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.

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

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.

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.

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.

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.

trace See *acquisition*.

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.

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.

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.

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