LAN User's Guide

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

Agilent Technologies
1660C/CS-Series and
1670A-Series Logic Analyzers

Introducing the LAN Interface

The Logic Analyzer LAN interface lets you connect your logic analyzer to an Ethernet network that uses TCP/IP. With the LAN Interface, you can:

- Set up and run measurements using the logic analyzer's X Window interface.

- Copy measurement data from the logic analyzer to your computer using File Transfer Protocol program (ftp) or Network File System (NFS).

- Save and restore configurations.

- Program the logic analyzer.

Requirements

In order to use your Agilent Technologies logic analyzer on the LAN, you need the following equipment and software:

- Agilent Technologies 1660C/CS-series logic analyzer with LAN option or Agilent Technologies 1670A-series logic analyzer.

- Ethernet local area network using TCP/IP protocol.

- If you are using a PC, NFS program or ftp program.

- If you want to use the logic analyzer's X Window interface, X server program running on your computer.

Characteristics

Physical Connection

    RJ-45 connector for direct connection to 10Base-T ("ethertwist") networks

    BNC connector for direct connection to 10Base2 ("thinlan") networks

Supported Protocols

    Transmission Control Protocol/Internet Protocol (TCP/IP)

    Network File System (NFS)

    File Transfer Protocol (ftp)

    X Window System Version 11, release 5 (X11R5)

    Simple Network Management Protocol (SNMP)

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This book shows you how to connect, use, and troubleshoot your Agilent Technologies logic analyzer via a Local Area Network (LAN) connection. This book contains the following chapters:

- Chapter 1 provides information about connecting the logic analyzer to the network. To effectively use this chapter, you should be familiar with your network setup and operation.

- Chapter 2 shows you how to access the logic analyzer's file system. This is a prerequisite for some of the other things you can do with a logic analyzer on the network.

- Chapter 3 shows you how to display the analyzer interface on an X Window server, and describes the basics of using the interface.

- Chapter 4 shows you how to retrieve measurement data, screen images, and status information from your logic analyzer on the LAN, and how to copy and restore configurations.

- Chapter 5 shows you methods for programming the logic analyzer via the network connection.

- Chapter 6 contains additional information on the logic analyzer's directory structure and dynamic files.

- Chapter 7 describes what to do if you have a problem using the logic analyzer on your network.

See Also   The *Logic Analyzer Training Kit* if you are unfamiliar with the basic operation of the logic analyzer.

The User's Guide for your logic analyzer for information on using the logic analyzer to make measurements.

The Programmer's Guide for your logic analyzer for detailed information on programming the analyzer. The Programmer's Guide can be ordered from your Agilent Technologies Sales Office.

Contents

1

Connecting and Configuring

Connecting and Configuring

In order to use your logic analyzer's network capabilities, you need to connect it to your network and configure the logic analyzer.

The following chart shows an overview of the process.

Connect
> Connect the RJ-45 or BNC connector from your network, then turn on the logic analyzer.

Configure
> Setup the configuration menus.

Ping
> Verify connectivity with the ping utility. Ping OK? — No → Go to chapter 7, "Troubleshooting."

Yes

Mount
> Mount the logic analyzer. Mount OK? — No → Go to chapter 7, "Troubleshooting."

Yes

> Ready to use.
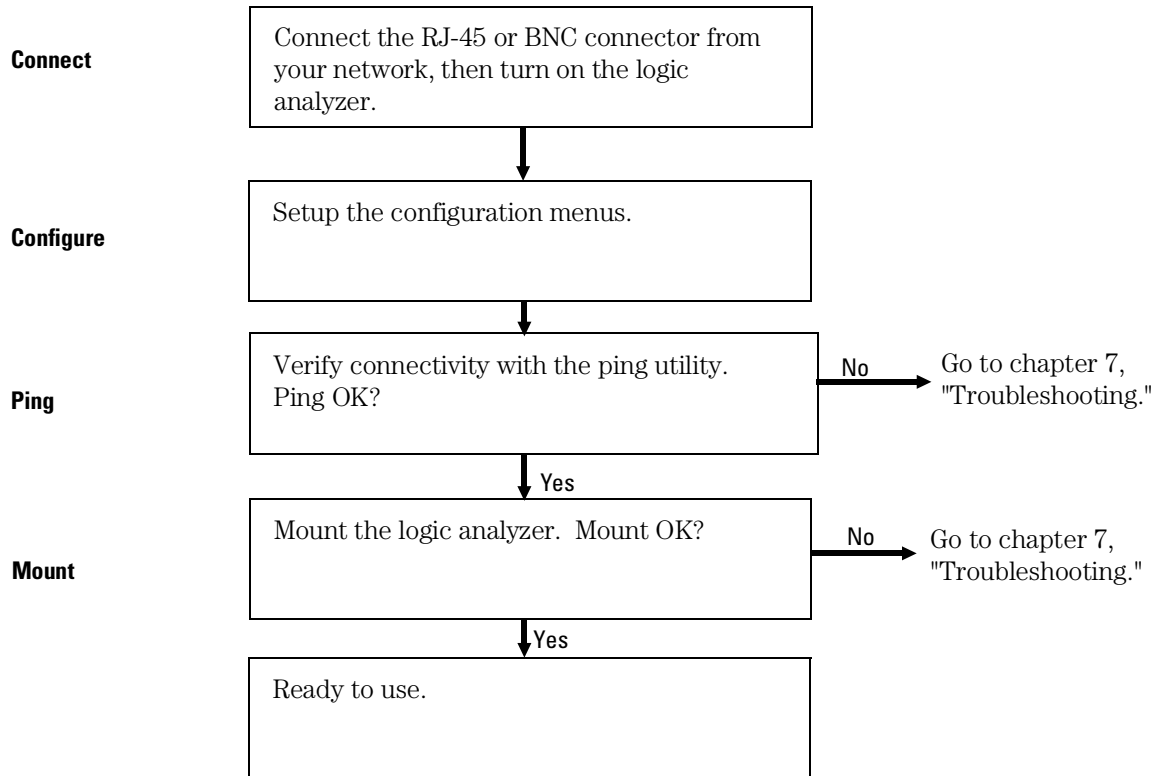
To connect to your network

1 Turn off the logic analyzer.

2 Connect the analyzer to your network using an RJ-45 or BNC connector.

Ethertwist and thinlan are the two most common types of LAN network connection. Ethertwist uses unshielded twisted pair and an RJ-45 connector, and resembles a standard modular phone line. Thinlan uses coaxial cable. If you are unsure what your network uses for its physical connection, contact your local network administrator.

The logic analyzer LAN ports are on the back panel. The RJ-45 connector goes in the port labeled "LAN-TP" and the BNC attaches to the port labeled "LAN-BNC".

3 Turn on the logic analyzer.

To configure the network addresses

You can configure the logic analyzer to work with your network from the front panel. Information entered in the configuration menus will be stored in nonvolatile memory.

1 Go to the System External I/O menu and select LAN Settings.

   a Turn on the analyzer and wait until the power-up tests are complete.

   b Press the System key.

   c In the System External I/O menu, select the LAN Settings box.
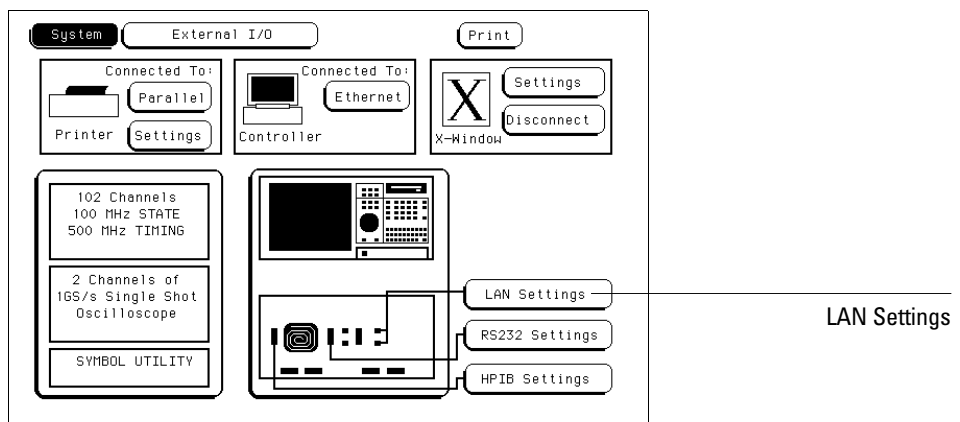
System External I/O menu
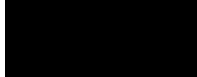
2 Set up the LAN Settings menu.

```
┌─────────────────────────────────────────────────────────────┐
│  ╭─System─╮  ╭──External I/O──╮            ╭─Print─╮          │
│                          Lan Settings                        │
│  ┌                   Internal Settings                       │
│  │                                                           │
│  │ 1. Lan Port:          │      LAN TP      │                │
│  │                                                           │
│  │ 2. Analyzer IP Address:│  15.6.253.113   │  ┌──────────┐  │
│  │                                             │Help With │  │
│  │ 3. Gateway IP Address: │     0.0.0.0     │  │Internal  │  │
│  │                                             │Settings  │  │
│  │ 4. File Timeout:       │      1.5  s     │  └──────────┘  │
│  │                                                           │
│  │ 5. Analyzer name:     │     1661CS      │                │
│  │                                                           │
│  │                   External Settings                       │
│  │ 6. Help with  │ Hosts Table │  and  │ PC Settings │       │
│  │                                                           │
│  │ │Show LAN Connections│ │Ethernet Statistics│ │ Done │    │
│  └                                                           │
└─────────────────────────────────────────────────────────────┘
```

LAN Settings menu

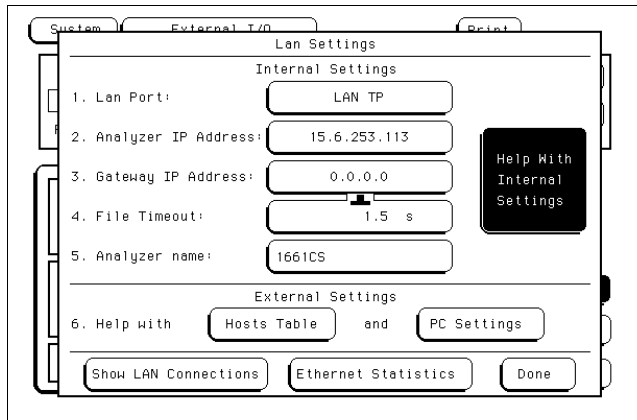|	
Lan Port	The LAN Port toggles between LAN TP and LAN BNC. Set it to whichever type you are using for the connection.
Analyzer IP Address	TCP/IP uses the Internet Protocol (IP) Address for communication between network nodes and requires this entry. Each IP address on a network must be unique - contact your system administrator if you need to have one created for the logic analyzer. The logic analyzer responds to messages sent to this IP address.
Gateway IP Address	Gateways act as connections between different physical subnets. If the logic analyzer is on a different subnet than the computer you wish to use it with, you need to enter a gateway address.
File Timeout	This is not the same as the network timeout, which is set on the computer. The logic analyzer file timeout is how long the analyzer keeps a file in the active portion of memory. For slow network connections, a large file timeout decreases the total time for a file transfer. Too high a file timeout for a fast network connection can actually slow file transfers because too much is in active memory. A good guideline for file timeout is 150% of the average time it takes for packets to go from source to destination.
Analyzer Name	The Analyzer Name is for user reference only. It appears in the status files of the logic analyzer, and in the X Window display. It is not the same as the IP name.

3 If necessary, add the logic analyzer to your local network configuration.

If you are doing a point-to-point connection, this step is unnecessary because the computer and the logic analyzer only communicate with each other.

For UNIX networks and PC networks based on a UNIX model, the network software requires an entry for the logic analyzer before another computer can talk to it. These entries are usually kept in a file named `/etc/hosts`. The `/etc/hosts` file also associates an alias with the IP address so that you can use a meaningful name rather than the IP address.

Other styles of PC networks have different conventions. Consult your LAN documentation or your local system administrator to see if you need to do anything else.

To verify connectivity with the ping utility

Use the ping utility to verify that the logic analyzer is on your network.
Refer to your network documentation for the exact syntax.

- UNIX

  ```
  ping [IP address|symbolic name]
  ```

- MS-DOS

  ```
  ping [IP address|symbolic name]
  ```

- MS Windows

  For a Windows environment, select the ping icon in your network menu.
  Refer to your network documentation for more information about using the
  ping utility.

To mount the logic analyzer

Before Mounting

You need to wait at least 15 seconds after the Analyzer Configuration menu is displayed before attempting to mount. If you try to mount too soon, you will receive an error message.
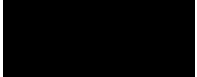

You can mount the logic analyzer on your network for two different levels of use, control or data. The logic analyzer accommodates one control user and multiple data users. Control allows users to read and write files to and from the analyzer, while data allows users to only read files from the file system. Data users can also write files to the disk drives of the logic analyzer.

If you have trouble, refer to chapter 7, "Troubleshooting."

For the exact syntax of the mount command for mount, refer to your network documentation.

Mounting and Unmounting

You must unmount the logic analyzer before turning it off. After unmounting, you can mount the analyzer 15 seconds after the Analyzer Configuration menu is displayed when powering up the instrument.   You can write a network script that executes an unmount and mount procedure.

- UNIX

  For UNIX, use your network's command for an NFS mount.

  For example:

  ```
  mount [analyzer name:]/[control|data][mount point]
  ```

  Some UNIX workstations will not accept a straight IP address. You must add an aliased name for the logic analyzer to the host file, then use that name in your mount command.

  Refer to your network documentation for more information.

- MS-DOS

  For a PC using MS-DOS and running PC-NFS, use a form of the net use command.

  For example, PC-NFS uses:

  ```
  net use [drive specifier][IP address or a named alias]\
  [control|data]
  ```

  Refer to your PC-based NFS documentation for more information.

- MS Windows

  For an MS Windows environment, refer to your Windows-based NFS documentation and File Manager documentation for mounting instructions.

2

Accessing the Logic Analyzer File System

Accessing the Logic Analyzer File System

This chapter shows you how to:

- Mount the file system via NFS.
- Access the file system via ftp.

> This chapter assumes that the logic analyzer is physically connected to your local area network. If it is not connected, refer to Chapter 1 for information on how to connect the system.

Control User vs. Data User

You can access the logic analyzer file system as either the control user or a data user.

Control User

- The control user can send programming commands.
- The control user has read and write access to the file system.
- There can only be one control user at any time.

Data User

- The data user cannot send programming commands.
- The data user has read access to the entire file system, but can only write to `\system\disk\hard` and `\system\disk\flexible` directories (the logic analyzer disk drives).
- Multiple data users can access the logic analyzer simultaneously.

Password and File Protection

There is no password protection built into the logic analyzer. This means that files are not protected against either deletion or being written over.

To mount the file system via NFS

The logic analyzer must be on and completely booted up before you can mount the file system. Once power is applied and the Analyzer Configuration menu is displayed, allow an additional 15 seconds before attempting to mount the system.

Be sure to unmount the logic analyzer's file system before turning off the logic analyzer. If you don't do this, you may get a "stale NFS file handle" error message the next time you try to mount. If you get this message, unmount the file system and try mounting again.

From Computers Running the UNIX Operating System

The syntax of the mount command is typically

```
mount [symbolic name|IP address]:/[control|data] /[directory name]
```

The symbolic name is the host name of the logic analyzer as set up by your system administrator. Typically, this name is found in the `/etc/hosts` file on your computer or returned by a name server. It is equivalent to the logic analyzer's IP (Internet Protocol) address.

The control or data option specifies the type of access you want.

The directory name is the name of an empty directory in your computer's file system to which the logic analyzer's file system will be mounted.

See the example on the next page.

Example   **Mounting the logic analyzer on a UNIX computer**

To mount the analyzer named "1660C_1" as the control user to a directory on your computer named /logic, enter the following command at the UNIX command line:

```
mount 1660C_1:/control /logic
```

After you have entered this command, you will be able to see the logic analyzer's file system under the /logic directory on your computer.

To unmount:

```
umount /logic
```

From Computers Running the MS-DOS Operating System

> To use the logic analyzer interface in an MS-DOS environment, you need to install a program on your PC that allows you to use NFS protocol. One such program is PC-NFS® by SunSoft Inc.

To mount the logic analyzer file system from a PC running MS-DOS, you must create a logical drive that points to it. A typical MS-DOS command to do this would look like one of these two examples:

```
net use [drive name] [host name|IP address]:/[control|data]
```

```
net use [drive name] \\[host name|IP address]\[control|data]
```

The choice of drive name is up to you.

The host name of the logic analyzer is set up by your system administrator. Typically, this name is found in the hosts file on your computer or returned by a name server. It is equivalent to the logic analyzer's IP (Internet Protocol) address.

The control or data option specifies the type of access you want.

Example **Mounting the logic analyzer with MS-DOS**

To mount, as the control user, the logic analyzer whose IP address is "15.6.254.150" to the logical drive "L:", enter the following command at the MS-DOS prompt. In this example, the PC-NFS application is used.

```
net use L: 15.6.254.150:/control
```

After you have entered this command, you will be able to see the analyzer's file system under the "L:" logical drive on your computer.

To unmount:

```
net use L: /d
```

From Computers Running MS Windows

> To use the logic analyzer in an MS Windows environment, you need to install a program on your PC that allows you to use NFS protocol. One such program is PC-NFS by SunSoft Inc.

To mount the logic analyzer's file system from a PC running MS Windows, use the Network Connections menu in the Disk options of File Manager.

To connect to the logic analyzer from the File Manager in MS Windows, Version 3.1, perform the following steps:
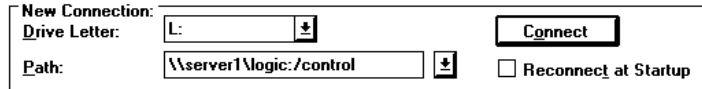
1 Open File Manager and select Disk. Then, select Network Connections.
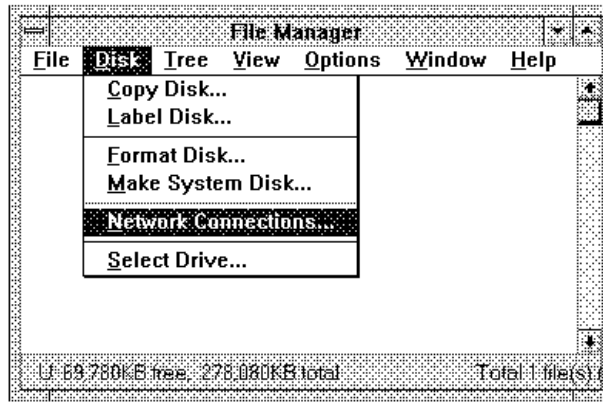
2 In the "New Connection" section of the pop-up menu, click on the Drive Letter selection box and select the drive name you wish to use.
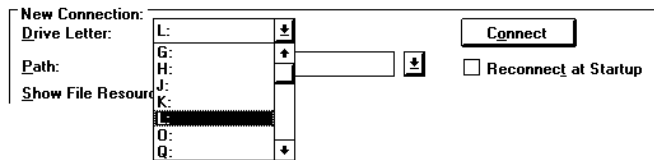
3 In the Path field, type the name of the server that the logic analyzer system is mounted on, followed by the analyzer's name or IP address. At the end of the path, specify which kind of connection you would like to establish, either "control" or "data".

New Connection:
Drive Letter: L:
Path: \\server1\logic:/control   ☐ Reconnect at Startup   Connect

To access the file system via ftp

To access the logic analyzer's file system using ftp, enter the following command on your computer:

```
ftp [symbolic name|IP address]
```

The symbolic name is the host name of the logic analyzer as set up by your system administrator. Typically, this name is found in the hosts file on your computer or returned by a name server. It is equivalent to the analyzer's IP (Internet Protocol) address.

When the connection is made, you will be prompted for a login name. Enter "control" or "data" depending on the type of access you want.

If you are prompted for a password, just press the Return or Enter key. There is no password protection built into Agilent Technologies logic analyzers.

Example   **Using ftp**

To access the file system of the logic analyzer named 1670sys using ftp enter:

```
ftp 1670sys

login name: data
ftp>
```

The exact commands you use within ftp depend on the software. If you are not familiar with your ftp software, type "?" or "help" at the ftp prompt to see a list of commands.

3

Using the X Window Interface

Using the X Window Interface

This chapter shows you how to:

- Start the interface.
- Close the interface.
- Load the custom fonts.

Using the Mouse and Keyboard

Once you have started the X Window interface and are displaying it on your computer running the X server, you can use your computer's keyboard and mouse to control the logic analyzer interface in the same way you use the logic analyzer's keyboard and mouse. Refer to your logic analyzer's User's Guide for a complete description of keyboard and mouse operation.

Duplicating Front-Panel Knob Control

To duplicate turning the knob, hold down the right mouse button, and move the mouse up or to the right for clockwise knob movement; move the mouse down or to the left for counter-clockwise knob movement.

You can also use the keyboard's Shift-up or -right arrow keys to duplicate clockwise knob movement. Use the Shift-down or -left arrow keys to duplicate counter-clockwise knob movement.

To start the interface

From the Logic Analyzer Front Panel

1 Start the X server software on your host computer.

**2** On your X server, enable analyzer-initiated windows.

Most X server packages have a security feature which stops unwanted client-initiated windows from being displayed.

On computers running the UNIX operating system, you can enable the analyzer to initiate windows by entering the `xhost` command:

```
xhost +<analyzer IP address>
```

On computers that aren't running the UNIX operating system, the X server package documentation will explain its security features.

3 In the analyzer's System External I/O menu, select the X-Window Settings field.
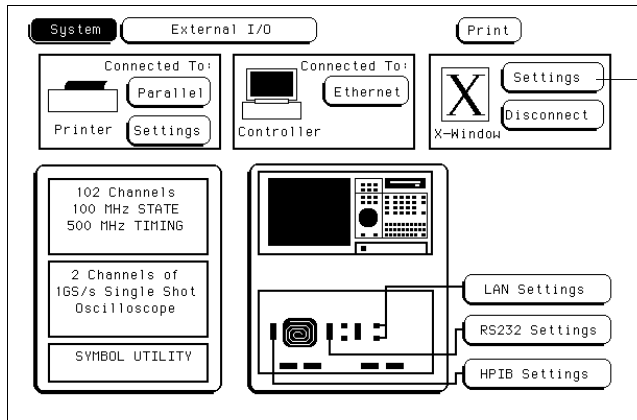
X-Window Settings field

4 In the X-Window Settings menu that pops up, enter the IP address of the X Windows server, the display number, and the screen number.

These values are saved for the next time you initiate an X Window. The display number and the screen number are usually 0. The display number is not zero when you have multiple displays. For some workstations, screen number 1 is a black-and-white screen.
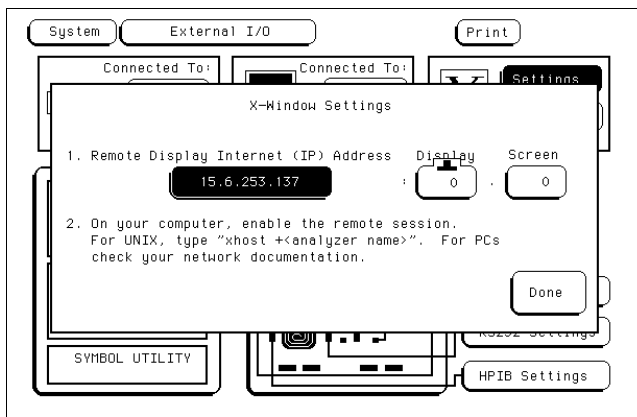
5 Select Done, then select Connect.

Your X server opens an analyzer window like the one below, and the Connect field changes to Disconnect.
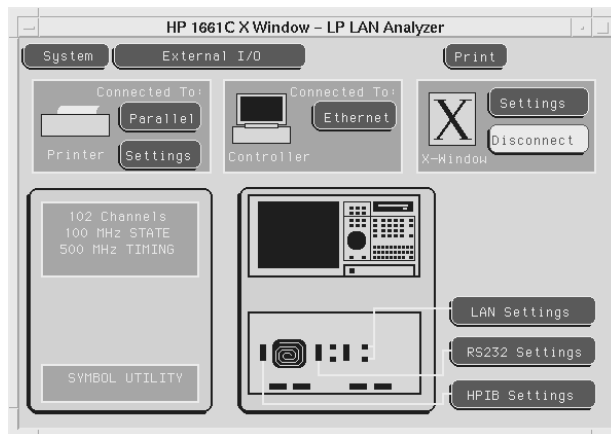
From the Computer

1 On your X server, enable analyzer-initiated windows.

Most X server packages have a security feature which stops unwanted client-initiated windows from being displayed.

On computers running the UNIX operating system, you can enable analyzer-initiated windows by entering the xhost command:

```
xhost +<analyzer IP address>
```

On computers that aren't running the UNIX operating system, the X server package documentation will explain its security features.

2 Send the XWIN ON programming command to the logic analyzer.

The syntax of the XWIN ON command is:

```
xwin on,"<X server IP address>:<display>.<screen>"
```

The IP (Internet Protocol) address is the address of the X Windows server.

There are several methods for sending the XWIN ON command. The easiest is using psuedo-telnet, but it can also be done using ftp or writing to the NFS-mounted logic analyzer. See the following examples.

Example

NFS method using a UNIX computer

To enable windows to be initiated from the logic analyzer named lp1660C, enter the following command on the computer running the X server:

```
xhost +lp1660C
```

If you have NFS mounted the analyzer's file system to a directory named /logic on your computer whose IP address is 15.6.253.146 (and is running the X server), enter the following command to start the X Window interface:

```
echo "xwin on,'15.6.253.146:0.0'" > /logic/system/program
```

Example   **Pseudo–telnet method using a UNIX computer**

To enable windows to be initiated from the logic analyzer named lp1660C, enter the following command on the computer running the X server :

```
xhost +lp1660C
```

To connect to the command parser socket of the logic analyzer named lp1660C, enter:

```
telnet lp1660C 5025
```

> Agilent Technologies logic analyzers are not telnet servers. The UNIX command telnet is used to make a connection to the analyzer command parser, which uses socket number 5025. A telnet server would normally not need to have the socket specified.

To start the X Window interface on the computer whose IP address is 15.6.253.146 (and is running the X server) enter:

```
xwin on,"15.6.253.146:0.0"
```

If you are not planning on sending more commands to the logic analyzer, close the telnet connection by typing the escape character, and then "quit" when the telnet prompt appears. The escape character is often Control-]; your telnet program should tell you when it opens the connection.

Example

NFS method using a PC

To start the logic analyzer's X Window interface and display on a personal computer running X server software, first start the X server software (and enable analyzer-initiated windows, if necessary).

If you have NFS mounted the logic analyzer's file system to the logical drive "L:" on your computer whose IP address is 15.6.253.146 (and is running the X server), enter the following command to start the X Window interface:

```
echo xwin on,"15.6.253.146:0.0" > L:\system\program
```

Example

ftp method using a UNIX computer

File transfer protocol (ftp) can be used to start the X Window interface from either a UNIX computer or a PC. The logic analyzer is named lp1660C in this example. You will need to start the X server software on a PC and may need to enable the analyzer-initiated window. On a UNIX computer, you will need to enable the window initiated by the logic analyzer by entering the following command:

```
xhost +lp1660C
```

Next, create a text file with the following contents (where 15.6.253.146 is the IP address of the X server with display 0 and screen 0 selected):

```
xwin on,'15.6.253.146:0.0'<cr>
```

We will name the text file "startx" for this example. At an ftp command prompt, copy this file from your local directory to a virtual file called "program" in the logic analyzer \system directory as follows:

```
ftp>  cd system
ftp>  put startx program
```

This causes the contents of the file to be executed by the logic analyzer command parser and a window to appear on the X server.

To close the interface

From the X Window Interface or Front Panel

1 Go to the System External I/O menu.

2 Select the Disconnect field.

The interface on your X server closes, and the Disconnect field changes to Connect.

From a Remote Computer

• Send the XWIN OFF programming command to the logic analyzer.

> Note that simply closing the window that the interface is running in may leave the logic analyzer hung up.

Example   **Pseudo–telnet method using a UNIX computer**

If you closed the initial telnet connection, enter the following command to connect to the command parser socket of the analyzer named 1660sys:

```
telnet 1660sys 5025
```

To close the X Window interface, enter:

```
xwin off
```

3-8

Example   **NFS method**

If you have mounted the logic analyzer's file system to a directory named
/logic on your UNIX computer, enter the following command to close the
X Window interface:

```
echo 'xwin off' > /logic/system/program
```

If you are using a PC and the logical drive "L:," enter the following command:

```
echo xwin off > L:\system\program
```

Example   **ftp method**

To end the session using ftp, create a second text file with the following
contents:

```
xwin off<cr>
```

The second text file is named "stopx". At an ftp command prompt, copy this
file from your local directory to a virtual file called "program" in the logic
analyzer \system directory as follows:

```
ftp>  cd system
ftp>  put stopx program
```

To load the custom fonts

1 From the computer running your X server software, access the logic analyzer's file system.

Refer to the "Accessing the Logic Analyzer File System" chapter.

2 Copy the `SM165.BDF` and `LG165.BDF` files from the analyzer's `\system\disk\hard\system` directory to a directory on your computer.

3 Set up the X server so that it can read these fonts.

Refer to your X Windows server documentation for instructions on loading and using custom fonts. Generally, the steps you will take are:

a Compile the .BDF files into the proper format.

b Build the font directory (FONTS.DIR) file.

c If the font directory is not in the current font path, add the new directory to the font path.

The custom fonts make the analyzer's X Window interface look identical to the instrument's display. If the custom fonts are not loaded, you will see odd characters in place of arrow symbols and may see out-of-bounds text in the X Window image.

Example   **Loading the fonts using ftp and UNIX**

Suppose you have a UNIX computer running your X server software. Go to
the directory where you want to install the custom fonts. As the data user,
ftp to the analyzer and copy SM165.BDF and LG165.BDF from the
\system\disk\hard\system directory to your computer.

```
ftp lp1670A
220 1670A V01.00 FUSION FTP server (Version 3.3) ready.
Name (lp1670A:guest): data
230 User DATA logged in.
ftp> cd /system/disk/hard/system
200 Remote Directory changed to "/system/disk/hard/system".
ftp> get lg165.bdf
200 PORT command ok.
150 Opening data connection for lg165.bdf (15.6.253.146,1121)
(20494 bytes).
226 Transfer complete.
23338 bytes received in 0.69 seconds (32.82 Kbytes/s)
ftp> get sm165.bdf
200 PORT command ok.
150 Opening data connection for lg165.bdf (15.6.253.146,1122)
(19595 bytes).
226 Transfer complete.
22311 bytes received in 0.32 seconds (68.04 Kbytes/s)
ftp> quit
```

To create a fonts.dir file in the current directory:

mkfontdir

To prepend the current directory to the font path:

xset +fp /users/guest/165fonts

To reset the font path to its current value:

xset fp rehash

Close the analyzer's X Window interface and re-start it. You should now see
the same fonts that are used on the logic analyzer's front panel display.

The xset commands must either be repeated each time X is restarted or the
fonts must be installed in the default X11 font directory, typically found in
/usr/lib/X11/fonts/misc. This directory is usually protected, so your
system administrator may have to perform the installation.

Additional Information

Color

The X Window that appears on your X Server is in color. If another application such as a Web browser is using many colors, the X Window may be unreadable when it appears. If so, close the X Window, free some colors by closing another application, and restart the X Window. Computers that are configured to support only 16 colors will substitute for some default colors.

Window Dimensions and Content

The dimensions of the logic analyzer window are set at 576 x 378 pixels to match the instrument display. The actual size of the window will vary with the physical and pixel dimensions of your computer display. Re-sizing the window will not add more content.

Retrieving and Restoring Data

Retrieving and Restoring Data

This chapter shows you how to:

- Copy ASCII measurement data.
- Copy raw measurement data.
- Restore raw measurement data.
- Strip LIF structure from raw measurement data.
- Copy screen images from \system\graphics.
- Copy status information from \status.
- Copy configurations from the logic analyzer.
- Restore configurations to the logic analyzer.

Measurement data is available in binary format and also in ASCII format for some measurement modules. Screen images are available in TIFF, PCX, and Encapsulated PostScript™ formats.

To copy ASCII measurement data

1 Set up the measurement you want to make, and run the analyzer to acquire data.

For more information on setting up measurements, see the logic analyzer's User's Guide.

2 Access the logic analyzer's file system.

Refer to the chapter "Accessing the Logic Analyzer File System".

You can do this from the X Window interface, your computer using NFS or ftp, from the front panel, or by programming the logic analyzer.

3 Copy the measurement data from the `\slot_a\data.asc` subdirectory.

In the analyzer's file system, ASCII data files are located in `\slot_a\data.asc\{analyzer name}\{label name}.txt`.

There is an ASCII data file corresponding to each label name you have created in the measurement module. The data files for each label are overwritten by the analyzer each time new data is acquired.
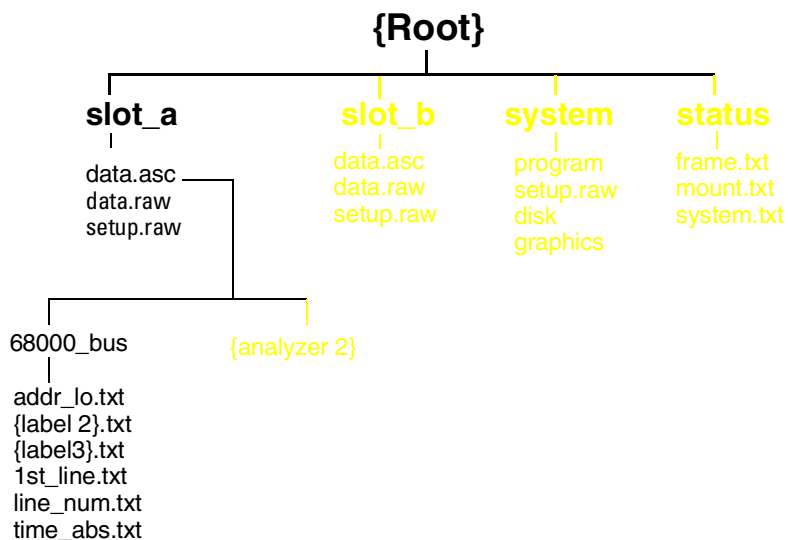

1660CS-Series Only

Oscilloscope data is under `\slot_b\data.asc`. There is no subdirectory matching `{analyzer name}` but there are files for both oscilloscope channels.

See the example on the next page.

Example   **Copying ASCII data over an NFS mount**

Suppose you are using an Agilent Technologies 1661CS logic analyzer and it is NFS-mounted on your network. The name of analyzer 1 is 68000_BUS. You have created some labels under analyzer 1, including one called "addr_lo." The directory structure of the 1661CS logic analyzer looks like this:

```
                        {Root}

    slot_a          slot_b      system      status

  data.asc          data.asc    program     frame.txt
  data.raw          data.raw    setup.raw   mount.txt
  setup.raw         setup.raw   disk        system.txt
                                graphics

  68000_bus       {analyzer 2}

  addr_lo.txt
  {label 2}.txt
  {label3}.txt
  1st_line.txt
  line_num.txt
  time_abs.txt
```

After setting up a measurement and acquiring data, you want to analyze the data for label addr_lo on your PC. To copy the ASCII data to your local computer, at the MS-DOS prompt enter:

```
copy L:\slot_a\data.asc\68000_BUS\addr_lo {local path name}
```

If your computer is running the UNIX operating system, you might use the cp or dd command. In an MS Windows environment, you can use File Manager.

To copy raw measurement data

1 Set up the measurement you want to make, and run the analyzer to acquire data.

For more information on setting up measurements, see the logic analyzer's User's Guide. You can set up and run the measurement from the analyzer's X Window interface or front panel, or by programming the analyzer.

2 Access the logic analyzer's file system.

Refer to the chapter "Accessing the Logic Analyzer File System".

3 Copy the `data.raw` file from the `\slot_a` directory for analyzer data, or `\slot_b` directory for oscilloscope data.

Raw measurement data files are binary format files that can be transferred to your computer and then reloaded into the logic analyzer later. Because they are binary files, if you are using ftp to upload or download them, set the type to binary by typing "bin" at the ftp prompt.

The `data.raw` file is overwritten each time new data is acquired.

To restore raw measurement data

1 Access the analyzer's file system as the control user.

Refer to the chapter "Accessing the Logic Analyzer File System".

2 Copy the `data.raw` file to the appropriate `\slot_{x}` directory.

For analyzer data, this would be the `\slot_a` directory. For oscilloscope data, it would be `\slot_b`. If you copy the raw data to a different directory than you originally got it from, the logic analyzer won't know how to interpret it.

Raw measurement data files are binary format files. Because they are binary files, if you are using ftp to upload or download them, set the type to binary by typing "bin" at the ftp prompt.

The `data.raw` file is overwritten each time new data is acquired.

To strip LIF structure from raw measurement data

- Write a program that strips LIF structure from raw data files.

  You may want to convert the `data.raw` file into a format that is consistent with the file format transmitted from the logic analyzer via GPIB. The example program on the next page will perform this conversion.

The `data.raw` File Format

The format of the `data.raw` file is similar to the file format described in the logic analyzer Programmer's Guide.

The `data.raw` file consists of a 512-byte header, followed by one or more 256-byte records. The first 36 bytes of the first record are reserved. The remaining 220 bytes of the first record contain data. The first 2 bytes of each additional record are reserved. The remaining 254 bytes of each record contain data.

Example

This C program strips the LIF structure from the data.raw file.

```c
#include <stdio.h>

main(int argc, char *argv[] )
{
  char buffer[256] ;
  int len ;
  int count = 0 ;

  while (( len =  read( 0, buffer, 256 ))>0 ) {
   count++ ;
   switch ( count ) {
    case 1:
    case 2:
      /* do nothing -- just throw away */
      break;
    case 3:
      /*
      ** throw away the first two bytes ( record size )
      **    the next four bytes ( file type ? )
      **    the next 32 bytes ( file description )
      */
      if ( len - 38 > 0 )
        write( 1, &buffer[38], len-38 ) ;
      break;
    default:
      /* throw away the first two bytes ( record size ) */
      len = (unsigned char)buffer[1] ;
      if ( len > 0 )
        write( 1, &buffer[2], len ) ;
      break;
  }
 }
}
```

To copy screen images from \system\graphics

1 Access the logic analyzer's file system.

Refer to the chapter "Accessing the Logic Analyzer File System".

2 Set up the screen you want to copy.

3 Copy the screen image file from the \system\graphics directory.

The \system\graphics directory contains the following files:

- screen.tif - a grayscale TIFF file, in TIFF version 5.0 format.

- screenbw.tif - a black-and-white TIFF file in TIFF version 5.0 format.

- screen.pcx - a grayscale PCX file.

- screenbw.epi - a black-and-white Encapsulated PostScript file in EPS version 3.0 format.

These graphics files contain the current display on the logic analyzer screen. The contents of the files change whenever you change the display. When you copy one of the graphics files, the display will freeze for a few moments to make a copy of the current display.

Example

Copying screen images using NFS

You have the logic analyzer NFS-mounted to your UNIX workstation. To copy the current screen image in PCX format, enter:

```
cp /logic/system/graphics/screen.pcx {local path name}
```

If your computer is running the MS-DOS operating system, you might use the copy command.

To copy status information from \status

1 Access the logic analyzer's file system.

Refer to the chapter "Accessing the Logic Analyzer File System".

2 Copy the appropriate file from the \status directory.

The \status directory contains the following ASCII files:

- system.txt - shows whether the analyzer is running or stopped. It also includes information about the Group Run and the relative trigger times of each module if applicable.

- frame.txt - shows what is mapped to each slot and the operating system version.

- mount.txt - lists all connections to the logic analyzer. The connection information includes the IP address and user type. This information is also available in the External I/O LAN Settings menu, under Show LAN Connections.

Example An example system.txt file:

```
Analyzer name: LP LAN Analyzer


Execution Status:
   slot_a - stopped
```

4-10

Example   An example `frame.txt` file:

```
Analyzer name: LP LAN Analyzer

Slot        Module Name          Code Version  Card ID Code
======      ===========          ============  ============
CPU         System               V01.00
slot_a      Analyzer             V01.00        032
```

Example   An example `mount.txt` file:

```
Analyzer name: LP LAN Analyzer

Hostname                         UID     GID      Directory
========                         ======  ======   =========
FTP:(15.6.253.137,2710)          00000   00000    /data
```

To copy configurations from setup.raw

1 Set up the configuration.

You can do this from the X Window interface or from the front panel.

2 Access the logic analyzer's file system.

Refer to the chapter "Accessing the Logic Analyzer File System".

3 Copy the setup.raw file from the appropriate directory.

For system configurations, the appropriate directory is \system . For analyzer configurations, the appropriate directory is \slot_a . For oscilloscope configurations, the appropriate directory is \slot_b .

Raw configuration files are binary format files that can be transferred to your computer and then reloaded into the logic analyzer later. Raw configuration files are not transferrable between logic analyzer models.

The setup.raw file is overwritten whenever you change the configuration.

Dynamic Configuration Files

Configuration files are dynamic files. When you look at the logic analyzer file system, dynamic files show a file size of 1 or 0. 0 means there isn't anything available and 1 means there is. When you request the dynamic file, the logic analyzer creates it. While the analyzer is creating the file, it will not respond to other requests.

Because the analyzer does not know the file size until it is created, some NFS systems have trouble copying dynamic files. If the cp command does not appear to work, try using dd.

To restore configurations

1 Access the logic analyzer's file system as the control user.

Refer to the chapter "Accessing the Logic Analyzer File System".

2 Copy the `setup.raw` file to the appropriate directory.

For system configurations, this would be the `\system` directory. For analyzer configurations, this would be the `\slot_a` directory. For oscilloscope configurations, it would be the `\slot_b` directory. If you copy a configuration file to a different directory than it came from, the analyzer will not know how to interpret it.

Example   **Restoring an analyzer configuration**

Suppose you want to load a configuration file called "486_bus" from your local computer into the logic analyzer's analyzer. The analyzer is always in slot A. The logic analyzer is mounted on your network as disk drive `L:`.

To load the configuration file, at the MS-DOS prompt enter:

```
copy 486_bus L:\slot_a\setup.raw
```

If your computer is running the UNIX operating system, you might use the `cp` command. In an MS Windows environment, you can use File Manager.

Programming the Logic Analyzer

Programming the Logic Analyzer

You can program the logic analyzer over the Local Area Network (LAN) by sending commands to the \system\program file or by sending commands to the command parser socket.

This chapter shows you how to:

- Set up for Ethernet programming.
- Enter commands directly using telnet.
- Copy commands to \system\program.
- Write programs that open \system\program.
- Write programs that open the command parser socket.

The logic analyzer does not provide real-time programming control. Due to the message handling protocol of the Ethernet LAN, messages take varying, indeterminate amounts of time to reach their destinations. There can be no guarantee that commands sent from your computer will reach the logic analyzer in a timely way.

For information on your logic analyzer's programming commands, refer to the appropriate Programmer's Guide.

The \system\program File

Once you have accessed the logic analyzer's file system as the control user, you can send programming commands by copying text strings to the \system\program file. You can do this in the same way that any text string is copied to a file (for example, by re-directing the output of an echo command, by copying a file, by writing a program that opens the file and outputs strings, etc.).

The \system\program file provides a connection to the logic analyzer's command parser.

The Command Parser Socket

You can telnet to the logic analyzer's command parser socket and send programming commands directly, or you can write a program that opens the socket and sends commands to it.

Connection to the command parser socket is, by definition, a control user connection. Because only one control user connection is allowed, you will not be able to connect to the command parser socket if someone else is accessing the logic analyzer's file system as the control user.

To set up for Ethernet LAN programming

Before you can send programming commands to the logic analyzer via the LAN, you must set the controller to Ethernet.

1 In the System External I/O menu, select the Connected To: field in the Controller box.

Select this field
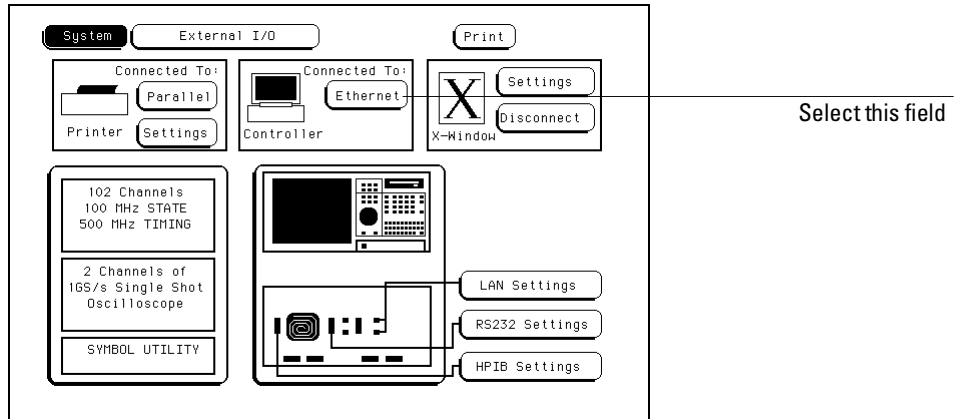
2 Select Ethernet from the pop-up menu.

To enter commands directly using telnet

The syntax of the telnet command is:

```
telnet [symbolic name|IP address] 5025
```

The symbolic name is the host name of the logic analyzer as set up by your system administrator. Typically, this name is found in the hosts file or returned by a name server. It is equivalent to the logic analyzer's IP address.

5025 is the port identification number of the logic analyzer's command parser socket . It must be specified because the logic analyzer is not a fully functional telnet server. If you forget to specify the port, you will get a connection refused message:

```
$  telnet 1660sys
Trying...
telnet: Unable to connect to remote host: Connection refused
```

To enter commands directly using telnet, first open a telnet connection using port 5025. A brief message appears confirming the connection, and telling you how to break the telnet connection:

```
$  telnet 1660sys 5025
Trying...
Connected to 1660sys.col.hp.com
Escape character is '^]'.
```

When you connect to the logic analyzer, there is no prompt. Type logic analyzer commands; query results appear on the next line. When you are done, break the telnet connection using the escape character, and type "quit".

See the detailed example on the next page.

Example

Programming the logic analyzer over a telnet connection

To connect to the logic analyzer named 1660sys, enter:

```
$ telnet 1660sys 5025
```

The computer responds with:

```
Trying...
Connected to 1660sys.col.hp.com.
Escape character is '^]'.
```

The connection was successful. Because the analyzer does not provide a
prompt, start entering programming commands. Typical commands might be:

```
:system:header on
:system:longform on
:select 1
:menu?
MENU 1,3
:system:dsp 'Triggering on memory violation'
:system:print screen
```

The small program above turns on the header and longform for query
responses, selects the analyzer, checks which menu it is on, creates a title for
that screen, and then prints it to the default printer.

When you are done, close the telnet connection. Enter the escape character
to get the telnet prompt. The escape character (Control and "]" in this
example) does not print.

```
telnet> quit
```

The telnet connection closes and you see your regular prompt.

```
Connection closed.
$
```

To copy commands to \system\program

1 Access the logic analyzer's file system as the control user.

Refer to the chapter "Accessing the Logic Analyzer File System".

2 Copy program command text to the logic analyer's \system\program file.

When the file system is NFS-mounted to your computer's file system, you can:

- Re-direct the output of an echo command to the \system\program file.

- Copy a text file containing a series of commands to the \system\program file.

When accessing the file system via ftp, you can:

- Use ftp's put command to copy a text file containing a series of commands to the \system\program file.

Example   **Programming the logic analyzer over an NFS mount line-by-line**

Suppose machine 1 is configured as a state analyzer. To clear its trigger set-up, enter the following echo commands at the MS-DOS prompt:

```
echo :SELECT 1 > L:\system\program
```

```
echo :MACHINE1:STRIGGER:CLEAR ALL > L:\system\program
```

The first command selects the analyzer. The second command clears the trigger for machine 1.

If your computer runs the UNIX operating system, you can use the UNIX echo command.

Example

Programming the logic analyzer over an NFS mount with a file

Suppose machine 1 is configured as a state analyzer. To clear the format and trigger set-ups of machine 1, first create the following command file.

File clear.txt:

```
:SELECT 1
:MACHINE1:SFORMAT:REMOVE ALL
:MACHINE1:STRIGGER:CLEAR ALL
```

The first command selects the analyzer to receive programming commands. The second command clears the format set-up. The third command clears the trigger set-up.

Now copy the file to the logic analyzer. At the MS-DOS prompt, enter:

```
copy clear.txt L:\system\program
```

If your computer runs the UNIX operating system, you might use the cp command. In an MS Windows environment, you can use File Manager.

See Also

The Programmer's Guide for your logic analyzer for a detailed description of the commands. The Programmer's Guide can be ordered from your Agilent Technologies Sales Office.

To write programs that open \system\program

1 Using NFS, mount the logic analyzer's file system as the control user.

Refer to the chapter "Accessing the Logic Analyzer File System."

2 From within your controlling program, open the logic analyzer file {NFS mount path}\system\program and send text strings to the file using "write" or "output" commands.

In C, you can use the write or putstr functions to write text strings to the \system\program file.

Your operating system may buffer the commands before sending them to the logic analyzer. To prevent this, you may need to empty the buffer after each command. In C, you can use the flush function to empty the buffer.

Queries

Responses to queries appear as text strings in the \system\program file.

To retrieve information from queries, create a text buffer, open the \system\program file and read the contents of the file into the buffer. In C, you can use read or getstr to read the contents of the file into the buffer.

Whenever you send queries to the logic analyzer, you need to pause your program for a short time to allow the system to process the query before you attempt to read the response. A time equal to or slightly greater than the file timeout is sufficient.

Resetting the File Pointer

Whenever you change from reading the \system\program file to writing the \system\program file, or from writing to reading, you need to reset the file pointer to the beginning of the file. In C, you can use the rewind function to reset the pointer, or you can close the program file, then immediately re-open it.

Example

Programming the logic analyer within a C program

The following example in C opens the \system\program file and sends
several commands and queries.

```c
#include <stdio.h>
#include <unistd.h>

#define STR_LEN 80

void putstr(FILE *file, char *str)
{
    fwrite(str, strlen(str), 1, file);
}


int getstr(FILE *file, char *str)
{
    return(fread(str, 1, STR_LEN, file));
}


void main()
{
    FILE *file;
    int num;
    char receive_str[STR_LEN];

/* Send a query and retrieve and print the response */
    file = fopen("/logic/system/program", "r");
    while (getstr(file, receive_str) == 0);
    fclose(file);
    file = fopen("/logic/system/program", "w");
    putstr(file, "*idn?\n");
    fclose(file);
    sleep(1);
    file = fopen("/logic/system/program", "r");
    while (getstr(file, receive_str) == 0);
    fclose(file);
    printf("%s\n", receive_str);

/* Send command strings to the logic analyzer */
    file = fopen("/logic/system/program", "w");
    putstr(file, "*rst\n");
    putstr(file, ":sel 1\n");
```

```
        putstr(file, ":mach1:twav:range 1 s\n");
        putstr(file, ":start\n");
        putstr(file, ":mach1:twav:range 100 ns\n");
        fclose(file);
        sleep(2);
        file = fopen("/logic/system/program", "r");
        while (getstr(file, receive_str) == 0);
        fclose(file);
        printf("%s\n", receive_str);
}
```

To write programs that open the command parser socket

The command parser socket of the logic analyzer is 5025.

Connection to the command parser socket is, by definition, a control user connection. Because only one control user connection is allowed, you will not be able to open the command parser socket if someone else is accessing the logic analyzer's file system as the control user.

Example

The following C program opens a socket and sends the *IDN query command to request the instrument's identity.

```c
#include <stdio.h>
#include <sys/types.h>
#include <sys/socket.h>
#include <netinet/in.h>

typedef struct sockaddr_in tdSOCKET_ADDR;

#define PARSER_PORT         5025
#define SERV_HOST_ADDR      "15.10.96.12"
#define PARSER_BUFFER_SIZE  100

char  receiveBuffer[PARSER_BUFFER_SIZE],
      *cmdString = { "*IDN?\r\n" };


main ()
{
   int    sockfd, port;
   tdSOCKET_ADDR   serv_addr;
   char   *addr;

   /* Initialize a server socket */
   port = PARSER_PORT;
   addr = SERV_HOST_ADDR ;
   serv_addr.sin_family = AF_INET;
   serv_addr.sin_addr.s_addr = inet_addr ( addr );
   serv_addr.sin_port = htons ( port );
```

```
    /* Create an endpoint for communication */
    sockfd = socket( AF_INET, SOCK_STREAM, 0 );
    /* Initiate a connection on the created socket */
    connect( sockfd, ( tdSOCKET_ADDR * )&serv_addr, sizeof ( serv_addr ) );
    /* Send a message from the created socket */
    send ( sockfd, cmdString, strlen ( cmdString ), 0 );
    /* Receive a message from the 16500B socket */
    recv ( sockfd, receiveBuffer, sizeof ( receiveBuffer ), 0 );
    printf ( "%s\n", receiveBuffer );
    close ( sockfd );
}
```

6

Concepts

Concepts

This chapter describes:

- Directory structure of the logic analyzer's file system
- Dynamic files
- New fields in the logic analyzer's system menus

Directory structure of the logic analyzer's file system

```
                        {ROOT}
         ┌────────────────┼─────────────────┐
    slot_x ─ data.raw   system ─ setup.raw   status ─ frame.txt
             setup.raw            program             mount.txt
      ┊                                                system.txt
      ┊         ┌──────────────┴──────────┐
              disk                      graphics ─ screen.tif
                                                   screenbw.tif
         ┌──────┴──────┐                           screen.pcx
       hard         flexible                       screenbw.epl
```
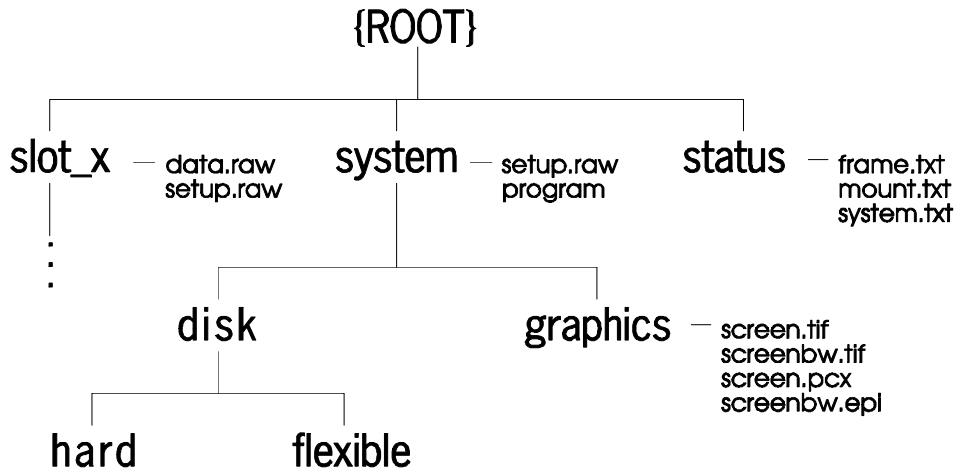
Logic Analyzer Directory Structure

setup.raw Binary configuration files. You can save and restore configurations by copying these files.

\system\program Port for sending programming commands to the command parser.

\slot_x Analyzer and oscilloscope subdirectories. All benchtop logic analyzers have a \slot_a directory for the state/timing analyzer. The Agilent Technologies 1660CS-series also have a \slot_b directory for the oscilloscope.

\slot_x\data.raw Binary measurement data files. You can save and restore measurement data by copying these files.

\system\disk\hard Same directory structure as System Hard Disk menu.

\system\disk\flexible Same directory structure as System Flexible Disk menu.

\system\graphics Image files for the current screen in TIFF, PCX, and Encapsulated PostScript formats.

\status Status information.

The directory structure of the logic analyzer is fixed. You cannot create or delete directories or files except under the local hard and flexible disk directories.

Analyzer (\slot_a) Subdirectories and Files

The slot_a directory contains a subdirectory called data.asc that contains ASCII measurement data.

There are two subdirectories attached to the data.asc directory, one for each of the two analyzers in the logic analyzer (if they are turned on in the Configuration Menu). The default names of these subdirectories are machine1 and machine2, but they will change whenever the analyzer names are changed in the Configuration Menu.

{Root}

system

slot_a   **status**

data.asc

program   frame.txt
setup.raw   mount.txt
disk   system.txt
graphics

{analyzer 1}   {analyzer 2}

{label 1}.txt   {label 1}.txt
{label 2}.txt   {label 2}.txt
{label 3}.txt   {label 3}.txt
   .   .
   .   .
   .   .
1st_line.txt   1st_line.txt
line_num.txt   line_num.txt
time_abs.txt   state_abs.txt
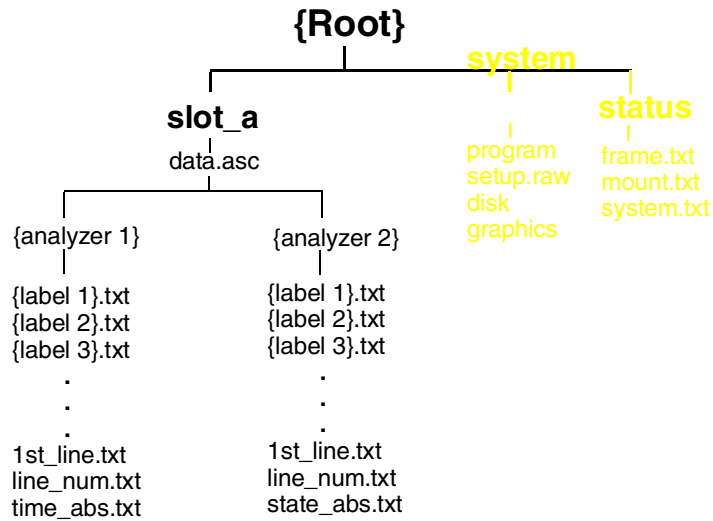
Analyzer Directory Structure

Label Data Files: \slot_a\data.asc\{analyzer name}\{label}.txt Both analyzer subdirectories contain files corresponding to the labels you have set up in that analyzer's Format Menu. These files contain the current measurement data for the channels assigned to each label.

Both state and timing data are available, and both kinds of data are represented as a column of values. The numeric base – hex, binary, etc. – in these files is the same as the base that is currently set in the Listing Menu.

The 1st_line.txt File The `1st_line.txt` file lists the number of the first line of the most recent data acquisition.

This file shows the number of states that occur before the trigger state, which is always state zero (at line number 0). You can use this information to align data from different measurements.

Time Tag and State Tag Data If time tags have been turned on, the `time_abs.txt` file contains a column of time values for the most current state or timing measurement. Timing analyzers always have a `time_abs.txt` file.

If state tags have been turned on, the `state_abs.txt` file contains a column of state count values for the most current state measurement.

Line Numbers The `line_num.txt` file contains line numbers corresponding to the lines of data in a state listing.
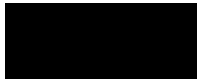
Dynamic files

The logic analyzer's file system uses dynamic files for configuration information and data. This means that applications such as File Manager or a spreadsheet cannot determine the size of the files until they are retrieved.

When you view the file statistics for these files, you will see file sizes of 0 bytes or 1 byte. The 0-byte size indicates that the file is empty. The 1-byte size indicates that there is information in the file. If you transfer the file of interest to your PC or workstation, you will be able to see the actual file size.

Known Incompatibilities

Some operating systems and applications may exhibit unexpected behavior when working with the dynamic files from the logic analyzer. The "% complete" display may appear incorrect during file transfers. This does not affect the transfer or the contents of the file. Once you have saved the file in your local environment, the correct "% complete" will be displayed during future retrievals.

Your applications might only retrieve one or two characters from a file that you believe has many more characters in it. To work around this problem, copy the file that you want to work with from the logic analyzer to your local computer. Use the local copy as your working copy.

SUN Operating Systems

The file copy commands in the SUN workstation and Solaris operating systems will not work with the dynamic files like those used in the logic analyzer. You can use the `dd` command instead of using the `cp` or `cat` commands.

LAN-related fields in the logic analyzer's menus

When your logic analyzer has LAN, several additional menu choices are available. These fields allow you to set up your LAN port and configure the logic analyzer.

Controller Connection

You can set your logic analyzer to be controlled over the network. In the System External I/O menu, when you select the Connected To: field in the controller box the choices are now GPIB, RS-232C, and Ethernet.

X-Window Box

LAN adds an X-Window box to the System External I/O menu. The X-Window box has two fields for configuring an X connection. Chapter 3, "Using the X Window Interface," explains how to set up an X Window connection.

LAN Settings

LAN adds a LAN Settings box to the System External I/O menu so that you can configure the logic analyzer to work with your network. The LAN Settings menu is explained in Chapter 1, "Connecting and Configuring."

Time Zone Field

With LAN, a field labeled "Time Zone" appears in the Real Time Clock setup menu. The Real Time Clock setup menu is accessed by selecting the Real Time Clock Adjustments field in the System Utilities menu.

This field enables you to specify the time difference between your local time and Greenwich Mean Time (Universal Coordinated Time) for network operations. The Time Zone value can be varied from -12 to +12. The number represents the number of hours difference between your local time zone and Greenwich Mean Time. The time value is used to timestamp files when they are stored to disk or transferred to your computer, and to correctly display the time data of the logic analyzer files when you NFS-mount the logic analyzer.

7

Troubleshooting

Troubleshooting

This chapter provides troubleshooting information for the LAN interface. It is arranged in three sections:

- Troubleshooting the initial connection

- Solutions to common problems

- Getting service support

Troubleshooting the Initial Connection

Getting the logic analyzer to work with your network often requires detailed knowledge of your local network software. This section attempts to help you with some common problems, but because of the wide variety of network software available it cannot cover all problems you may encounter.

Assess the problem

The LAN interface does not need or include any utilities or proprietary driver software. The logic analyzer LAN interface was designed to operate with common network utilities and drivers.

Either a hardware problem or a software problem can prevent the logic analyzer's remote file server from communicating over the LAN.

Single server/single client network (point-to-point)

You can connect the logic analyzer to a single server/single client network. In this configuration, the client is running an NFS application program. If you have difficulties, check the troubleshooting procedures included with the documentation for both the NFS application program and the communications controller first. If the NFS application program is running in an MS Windows environment, then also check the MS Windows documentation.

Timeout errors

Error messages such as "Device Timeout," "File Timeout," "Operation Timeout," or other similar messages from workstations or PCs indicate timeout problems with the computer. To increase your timeout period, refer to your computer documentation for instructions.

Packets routinely lost

If packets are routinely lost, proceed to the troubleshooting section in this chapter relating to your network.

Problems transferring or copying files

Copying files out of the logic analyzer

- If you have problems copying files out of the logic analyzer, you might be experiencing timeout problems. See the timeout section on the previous page.

- If you only receive 1 byte back when copying files, refer to "Dynamic Files" later in this chapter.

Copying files into the logic analyzer

- If you have problems copying files into the logic analyzer, such as copying setup or data to change a configuration, then check the File Timeout setting in the LAN Settings menu. Refer to "Configure the network addresses" in Chapter 1 for more information.

Communications not established

If you have just installed and configured the LAN interface and you have never been able to read the logic analyzer remote file server directory, go directly to the troubleshooting section relating to your network in this chapter.

If you have been able to read the logic analyzer remote file server directory and now cannot do so, check the following:

- Has any hardware been added or moved on your network? This includes adding or removing any workstations or peripherals, or changing any cabling.

- Have software applications been added to the network?

- Have any configuration files been modified?

- Have any of the following files been deleted or overwritten?

    UNIX:

        /etc/hosts
        /etc/inetd.conf
        /etc/services

    PCs:

        dependent network files

If you know or suspect that something has changed on your network, check the changes and adjust the configuration for the LAN interface using the procedures in Chapter 1. Otherwise, proceed to the troubleshooting section in this chapter relating to your network.

7–4

Troubleshooting in a workstation environment

1 Verify the communications link.

Verify the communications link between the computer and the logic analyzer remote file server using the ping utility.

```
ping [hostname|IP Address] 64 10
```

Hostname is the name assigned to the logic analyzer remote file server in the node names database (usually /etc/hosts). Most workstation platforms permit an IP address to be used in place of hostname. In the example above, packet size is 64 and 10 packets are transmitted.

To aid in troubleshooting, go to the LAN Settings Ethernet Statistics menu on the logic analyzer. You can view transmit and receive activity on this menu. If needed, refer to "Network Status Information" in this section for more information about the Ethernet Statistics menu.

● Normal Response

A normal response to the ping will be a total of 9, 10, or possibly 11 packets received with a minimal average of round-trip time. The minimal average will be different from network to network. LAN traffic will cause the round-trip time to vary widely.

Because the number of packets received depends on your network traffic and integrity, the normal number might be different for your network.

For every packet transmitted and received because of the ping command, the Transmit Successful and Receive Successful fields in the logic analyzer Ethernet Statistics menu increases by 1.

Go to step 2, "Attempt a remote NFS mount."

● Error Messages

If error messages appear, then check the command syntax before continuing with the troubleshooting. If the syntax is correct, then resolve the error messages using your network documentation.

If an unknown host error message appears, then check the node names database (usually /etc/hosts) to see that the hostname and IP address are correctly entered.

- No response

  No packets received indicates no response from a ping.

  If there is no response, type in the IP address with the ping command. Check that the typed address matches the IP address assigned in the LAN Settings menu, then check the other addresses in the menu.

  Check that the hostname and IP address are correctly entered in the node names database on your workstation (usually `/etc/hosts`).

  Ping each node along the route between your workstation and the logic analyzer, starting with the your workstation. Ping each gateway, then attempt a ping of the remote file server.

  If the logic analyzer still does not respond to ping, then you should suspect a hardware problem with the logic analyzer. To check the logic analyzer performance, refer to "Verify the logic analyzer performance" in this section.

- Intermittent Response

  If you received 1 to 8 packets back, there is probably a problem with the network. Because the number of packets received depends on your network traffic and integrity, the number might be different for your network.

  Use a LAN analyzer or LAN management software to monitor activity and determine where bottlenecks or other problems are occurring. The logic analyzer will still function, but communications over the LAN will be slower.

2 Attempt a remote NFS mount.

Attempt a remote NFS mount of the logic analyzer file server using the appropriate command syntax for your NFS software. Refer to your computer documentation for the specific command syntax. The command usually includes the remote NFS directory (hostname and either the /control or /data directory) and the mount point (the directory the remote file server will be attached to).

For example:

```
mount logic4:/control/nfs/logic4
```

- Normal Response

    The UNIX command line prompt reappears. To verify that the remote NFS mount was successful, type `$ mount` to view the mount table (usually `/etc/mnttab`). The remote file server should appear on the table of mounted devices.

- Error Messages

    If error messages appear, then check the command syntax before continuing with the troubleshooting. If the syntax is correct, then resolve the error messages using your network documentation.

    Verify that all of the mounting rules are being followed. Refer to the documentation of your network platform for the mounting rules.

    A Device Busy error message appears when you try to mount control if someone else has already mounted control. Also, the Device Busy error message appears when an unmount is attempted and a user's present working directory is a directory on the remote file server. If the Device Busy message appears, then cycle power on the logic analyzer and attempt the remote NFS mount again.

    You will also receive an error message if you try to mount too soon after power-up. You need to wait at least 15 seconds after the Analyzer Configuration menu is displayed before attempting to mount.

Troubleshooting in an MS-DOS environment

1 Verify the communications link.

Verify the communications link between the PC and the logic analyzer using the ping utility or other similar echo request utility.

To aid in troubleshooting, go to the Ethernet Statistics menu under LAN Settings on the logic analyzer. You can view transmit and receive activity on this menu. If needed, refer to "Network Status Information" in this chapter for more information about the Ethernet Statistics menu.

If the ping utility is not available on the PC, then this is an indication that the PC-based NFS software is not properly installed. Reinstall the PC-based NFS software and attempt to verify the communications link.

The syntax of the ping command varies with the NFS software used. Usually, the command requires at least the IP address. If the syntax permits a specified number of echo requests, then specify 10 as the number of echo requests. Refer to the NFS software documentation for more information.

```
ping [IP address] 10
```

- Normal Response

  A normal response to the ping will be a total of 9, 10, or possibly 11 packets received if 10 echo requests were specified. Because the number of packets received depends on your network traffic and integrity, the normal number might be different for your network.

  For every packet transmitted and received because of the ping command, the Transmit Successful and Receive Successful fields in the Ethernet Statistics menu increases by 1.

  Go to step 2, "Attempt a remote NFS mount."

- Error Messages

  If error messages appear, then check the command syntax before continuing with the troubleshooting. If the syntax is correct, then resolve the error messages using your NFS documentation.

  Certain PC-based NFS software packages permit the use of hostname in place of the IP address. In this case, if an unknown host error message appears, then check the node names database to see that the hostname and IP address are correctly entered.

  Refer to the NFS software documentation for specific information on any error messages.

7–8

- No response

  No packets received indicates no response from a ping.

  If there is no response, type in the IP address with the ping command. Check that the typed address matches the IP address assigned in the LAN Settings menu, then check the other addresses in the menu.

  Check that the hostname and IP address are correctly entered in the node names database and that the IP address matches the IP address assigned in the LAN Settings menu.

  If the logic analyzer still does not respond to ping, then the problem is possibly in the logic analyzer hardware. To check the logic analyzer, refer to "Verify the logic analyzer performance" in this chapter.

- Intermittent Response

  On a multiclient network, receiving 1 to 8 packets indicates a problem with the network. Because the number of packets received depends on your network traffic and integrity, the number might be different for your network.

  Use a LAN analyzer or LAN management software to monitor activity and determine where bottlenecks or other problems are occurring. The logic analyzer still functions, but communications over the LAN will be slower.

  On a single-client/single-server network, the most likely cause of intermittent response to an echo request is a hardware problem with the LAN module installed in the PC, the cable, or the logic analyzer. To check the logic analyzer, refer to "Verify the logic analyzer performance" in this chapter.

2 Attempt a remote NFS mount.

Attempt a remote NFS mount of the logic analyzer using the appropriate command syntax for your NFS software. Refer to the NFS software documentation for the specific command syntax. The command usually includes the remote NFS directory (hostname and either the /control or /data directory) and a disk drive designation.

- Normal Response

  The DOS command line prompt should reappear. To verify that the remote NFS mount was successful, type `net use` to view the mounted drives.

- Error Messages

  If an error message appears, check the command syntax before continuing with the troubleshooting. If the syntax is correct, then resolve the error message using your network documentation.

  Verify that all of the mounting rules are being followed. Refer to the documentation of your network platform for the mounting rules.

  A Device Busy error message appears when you try to mount as control if someone else has already mounted as control.

  Also, if a Device Busy (or similar) error message appears, check the CONFIG.SYS file for the LASTDRIVE= command. The LASTDRIVE= command should be set to a drive letter that would make a disk drive designation available to use as a drive for the remote file server while still allowing the last three disk drive designations to be available for printers. For more information, refer to the documentation for MS-DOS.

  An error message is also received if you try to mount too soon after power-up. You need to wait at least 15 seconds after the Analyzer Configuration menu is displayed before attempting to mount.

Troubleshooting in an MS Windows environment

1 Verify the communications link.

Verify the communications link between the PC and the logic analyzer using the ping utility or other similar echo request utility.

To aid in troubleshooting, go to the Ethernet Statistics menu under LAN Settings on the logic analyzer. You can view transmit and receive activity on this menu. If needed, refer to "Network Status Information" in this chapter for more information about the Ethernet Statistics menu.

If the ping utility is not available on the PC (the icon does not appear), then this is an indication that the NFS software is not properly installed. Reinstall the NFS software and attempt to verify the communications link.

The syntax of the ping command varies with the NFS software used. Usually, the command requires at least the IP address. If the syntax permits a specified number of echo requests, then specify 10 as the number of echo requests. Refer to your NFS software documentation for more information.

- Normal Response

  A normal response to the ping will be a total of 9, 10, or possibly 11 packets received if 10 echo requests were specified. Because the number of packets received depends on your network traffic and integrity, the normal number might be different for your network.

  For every packet transmitted and received because of the ping command, the Transmit Successful and Receive Successful fields in the Ethernet Statistics menu increases by 1.

  Go to step 2, "Attempt a remote NFS mount."

- Error Messages

  If error messages appear, then check the command syntax before continuing with the troubleshooting. If the syntax is correct, then resolve the error messages using your NFS documentation.

  Certain NFS software packages permit the use of hostname in place of the IP address. In this case, if an unknown host error message appears, then check the node names database to see that the hostname and IP address are correctly entered.

  Refer to your NFS documentation for specific information on any error messages.

- No response

  No packets received indicates no response from a ping.

  If there is no response, type in the IP address with the ping command. Check that the typed address matches the IP address assigned in the LAN Settings menu, then check the other addresses in the menu.

  Check that the hostname and IP address are correctly entered in the node names database and that the IP address matches the IP address assigned in the LAN Settings menu.

  If the logic analyzer still does not respond to ping, then the problem is possibly in the logic analyzer hardware. To check the logic analyzer, refer to "Verify the logic analyzer performance" in this chapter.

- Intermittent Response

  On a multiclient network, receiving 1 to 8 packets indicates a problem with the network. Because the number of packets received depends on your network traffic and integrity, the number might be different for your network.

  Use a LAN analyzer or LAN management software to monitor activity and determine where bottlenecks or other problems are occurring. The logic analyzer still functions, but communications over the LAN will be slower.

  On a single-client/single-server network, the most likely cause of intermittent response to an echo request is a hardware problem with the LAN module installed in the PC, the cable, or the logic analyzer. To check the logic analyzer, refer to "Verify the logic analyzer performance" in this chapter.

2 Attempt a remote NFS mount.

Attempt a remote NFS mount of the logic analyzer using File Manager. In the Disk menu of File Manager, the Network Connections field should appear. If this field does not appear, this indicates that the MS Windows–based NFS software was not properly installed.

Select a Drive Letter under New Connection. If a drive letter does not appear, then check the LASTDRIVE= command in the CONFIG.SYS file. The LASTDRIVE= command should be set to a drive letter that would make a disk drive designation available to use as a drive for the remote file server while still allowing the last three disk drive designations to be available for printers. For more information about the CONFIG.SYS file, refer to the documentation for MS-DOS.

● Normal Response

When Connect is selected, the drive letter and the mounted remote file server should appear under the Network Drive Connections window.

● Error Messages

If error messages appear, then resolve the error messages using your NFS documentation.

Check to make sure all of the appropriate fields in the Network Connections menu have the correct information. If all of the fields have correct information, then refer to your documentation for NFS and for File Manager for more information.

A Device Busy error message appears when you try to mount as control if someone else has already mounted as control.

An error message is also received if you try to mount too soon after power-up. You need to wait at least 15 seconds after the Analyzer Configuration menu is displayed before attempting to mount.

Verify the logic analyzer performance

The logic analyzer performance verification (self-test) is divided into two sections. The first section tests the physical connections such as the cable and termination. The second section tests the internal functions of the LAN interface. When both sections of the self-test have finished, a status message appears in the LAN Test field. The status message indicates whether the test passed, if a failure occurred, and which section failed.

The physical connection test depends on the LAN topology used. If ThinLAN is used, then a test transmission signal is transmitted over the LAN. If a reply is received, then the physical connection is considered good. If EtherTwist (10Base–T) is used, then the logic analyzer will listen for the heartbeat signal from the LAN. If a heartbeat is received, then the physical connection is considered good.

The second section is tested using internal loopback features of the LAN hardware. Transmitted packets are looped back to the receive circuit of the LAN board. When the looped-back packets are received, they are processed like a packet received from a remote client or server. If the looped-back packet is recognized and processed, then the LAN board and the LAN software are considered good.

Perform the following check before beginning the procedure.

☐ Check all network cables and connectors. Verify that all cables are properly connected.

Procedure

This procedure verifies the performance of the LAN interface. To check logic analyzer performance, refer to the logic analyzer's Service Guide.

1 Go to the System External I/O menu.

2 Verify that the LAN Settings box and the X-Window box are available.

If these boxes appear, go to the next step. If the boxes are not there, then the LAN interface is not properly installed. If the screen is completely blank, then there might be loose cables.

3 Go to the System Test menu.

4 Select Load Test System.

If you do not have a copy of the performance verification files on the hard disk, you need to insert the disk containing the performance verification files into the flexible disk drive.

5 Select Analy PV, and then select Sys PV from the pop up.

6 Select External I/O, and then select System Test from the pop up.

7 Select LAN Test, then select Run.

8 Verify that the tests pass.

If all of the tests pass, then go to the next step. If any of the tests fail, then the LAN hardware is suspect.

The status number in the LAN Test field indicates whether the LAN hardware or software caused the failure.

- To troubleshoot the failure using the status number, note the number, then compare it with the status number descriptions and perform the recommended action. Refer to "Status Number" on the next few pages for status number descriptions and recommended actions.

- To verify the LAN hardware, check that the LAN cable is good and that all signal lines in the cable have electrical integrity.

9 Exit the Test System.

  a Select System Test, then select Exit Test from the pop up.

  b Select Exit Test System.

Status Number

When you run the LAN Test, the test menu reports a status number. The following figure shows the bit positions of the hexidecimal status word.

A "1" in a bit position signifies that the bit is set and the test failed.

A "0" in a bit position signifies that the bit is not set and the test passed.
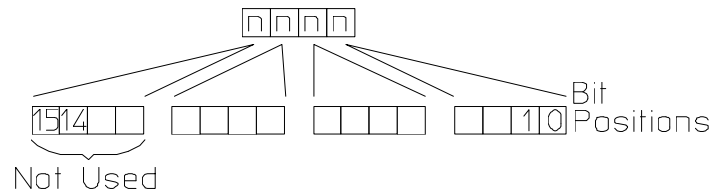
16500m05

Status Word

The following table describes each bit in the status number.

Status Bits

Bit 0   The internal registers of the LAN IC are loaded with known test values and then are read. If this bit is not set, it implies that the LAN IC is operating properly and that the microprocessor can communicate with the LAN IC. If this bit is set, then the LAN module is not operational and must be replaced.

Bit 1   The CAM (Content Addressable Memory) bit reports whether the LAN address can be written from the LAN module Static RAM (SRAM) to the internal memory of the LAN IC. Also, the CAM bit reports whether the LAN address can be written to SRAM from the LAN IC. If this bit is not set, it implies that both the SRAM and the LAN IC internal memory are able to recognize and store the LAN address. If this bit is set, then the LAN module is not operational and must be replaced.

Bit 2   If this bit is not set, then the self-test has detected that the LAN cable is properly connected to the LAN board. If this bit is set, then the physical connection of the LAN cable must be checked.

Bit 3   If the Termination bit is set, then the self-test has detected an excessive number of collisions. The most probable cause of excessive collisions is an improperly terminated LAN cable. Provide a proper termination of the LAN cable according to the LAN topology being used.

Bit 4   The MAC (Media Access Control) bit indicates whether the Media Access Control unit on the LAN IC is functioning. If this bit is not set, it implies that both the transmit functions and receive functions of the LAN IC are operating properly. If this bit is set, then the LAN module is not able to properly transmit and receive packets and must be replaced.

Bit 5   The ENDEC (Encoder/Decoder) bit indicates whether the encoder/decoder internal to the LAN IC is functioning. The encoder/decoder is the interface between the MAC and the Ethernet transceiver. If this bit is set, then the ENDEC is not operating properly and the LAN module must be replaced.

Status Bits (continued)

Bit 6	The TRANS (Transceiver, such as Ethernet transceiver) bit indicates whether the circuitry between the LAN IC and the LAN cable is functioning. If this bit is not set, then the path between the LAN cable and the LAN IC is operating properly. If this bit is set, then either the CPU board or the I/O board must be replaced.
Bit 7	Timeout bit. If the Timeout bit is set, then bits 4, 5, or 6 will also be set. Refer to the appropriate bit for a suggested course of action.
Bit 8	The Tx bit indicates whether the transmission portion of the MAC, ENDEC, or TRANS test failed. Therefore, the Tx bit is used in conjunction with bits 4, 5, and 6. Refer to the appropriate bit for the suggested course of action.
Bit 9	The Rx bit indicates whether the receive portion of the MAC, ENDEC, or TRANS test failed. The Rx bit is used in conjunction with bits 4, 5, and 6. Refer to the appropriate bit for the suggested course of action.
Bit 10	The Parameters bit indicates the integrity of the LAN module self-test parameters. If this bit is not set, then the parameters sent to the self-test routine are correct. If this bit is set, then contact your nearest Agilent Technologies Sales and Service Office.
Bit 11	The EPROM that is used to hold the Ethernet address, IP address, and gateway address has been corrupted. If this bit is set, the LAN board must be replaced.
Bits 12–15	Not Used

Network Status Information

The Ethernet Statistics menu supports network troubleshooting through the front-panel. To access the Ethernet Statistics menu:

1 Go to the System External I/O menu.

2 Select LAN Settings
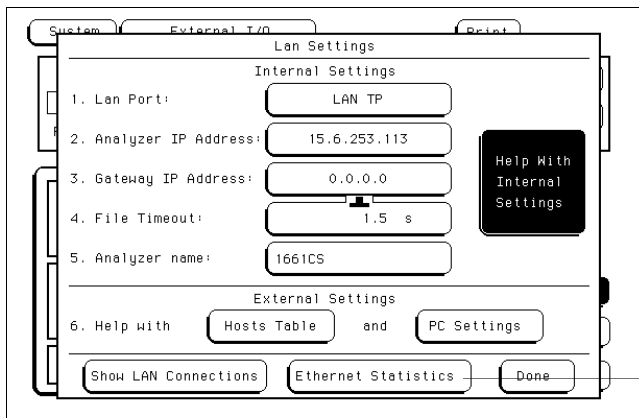
Select Ethernet Statistics

3 Select Ethernet Statistics from the bottom of the pop-up menu.

See the Ethernet Statistics information on the next page for the meaning of the various fields.
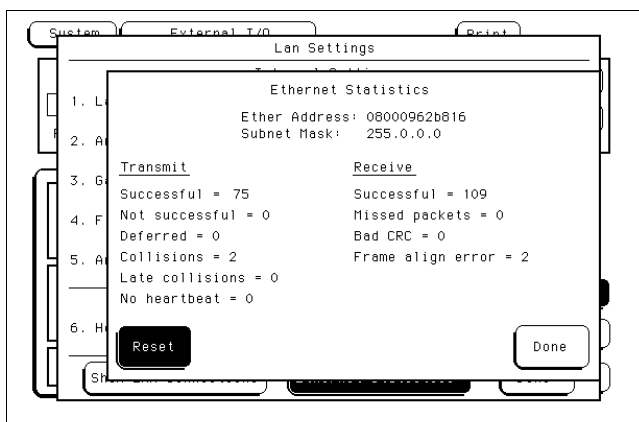
Ethernet Statistics menu

Information on the Ethernet Statistics menu

Ether Address	The logic analyzer's Ethernet address. This value is set by the factory and cannot be changed.
Subnet Mask	The subnet mask being used by the logic analyzer. The logic analyzer queries the network for this value when it is turned on. The value cannot be changed.
Transmit	
Successful	Number of successfully transmitted packets.
Not successful	Number of packets not transmitted due to errors. The transmit not successful field is tied primarily to transmit deferrals and possible hardware problems. If a packet is deferred (not because of a collision), then the packet is given a delay and retransmission is attempted. After 15 deferrals, the not successful field is incremented.
Deferred	Number of packets deferred due to network traffic. After 15 deferrals, the not successful field is incremented.
Collisions	Number of packets that had to be retransmitted due to network traffic.
Late collisions	Number of illegal collisions that have occurred after $51.2\,\mu s$ from either the first bit of preamble or from SFD (Start of Frame Delimiter).
No heartbeat	Number of packets where the transceiver fails to provide a collision pulse.
Receive	
Successful	Number of successfully received packets.
Missed packets	Number of packets that were dropped for lack of resources in the logic analyzer.
Bad CRC	Number of corrupt packets.
Frame align error	Number of packets with frame alignment error.

Solutions to Common Problems

This section describes common problems you may encounter when using the logic analyzer LAN. It assumes you have been able to connect to the logic analyzer in the past. If this is not so, refer to the previous section first.

If you cannot connect to the logic analyzer

If you suspect a bad LAN connection between your computer and the logic analyzer, you can verify the network connection by using the ping command or another similar echo request utility.

If a bad connection is revealed:

☐ Make sure the logic analyzer is on.

☐ Check the physical connection to the LAN.

☐ Make sure the Internet (IP) Address of the logic analyzer is set up correctly in the LAN Settings menu under System External I/O.

☐ If the logic analyzer and the computer are on different networks or subnets, make sure the Gateway Address in the LAN Settings menu is set to the address of the gateway machine. Get the address of gateway machine from your system administrator.

If you cannot mount the logic analyzer file system

If you get a "device busy" message:

☐ Make sure that another user is not already accessing the file system as the control user or connected to the command parser socket.

If you get a "stale NFS file handle" message:

☐ Unmount the file system and try mounting again. The likely cause of this error is turning off power to the logic analyzer before unmounting.

If you get a "server not responding" message:

☐ If the power to the logic analyzer was just turned on, make sure that you wait 15 seconds after the Analyzer Configuration menu is displayed before attempting the mount.

☐ Verify the LAN connection between your computer and the logic analyzer. Refer to "If you cannot connect to the logic analyzer" earlier in this section.

If you cannot access the file system via ftp

If you get a "connection refused" message:

☐ If the power to the logic analyzer was just turned on, make sure that you wait 15 seconds after the Analyzer Configuration menu is displayed before attempting the connection.

If you get a "connection timed out" message:

☐ Verify the LAN connection between your computer and the logic analyzer. Refer to "If you cannot connect to the logic analyzer" earlier in this section.

If you get an "already mounted" or "no more mounts available" message:

☐ If you are trying to access the file system as the control user, try accessing the file system as the data user instead. If another user is currently accessing the logic analyzer file system as the control user, you will not be able to access the file system as the control user.

If you cannot start the X Window interface

If you get an "Unable to open window on <IP address>.<display>.<screen>" message:

☐ Make sure that the logic analyzer has permission to open a window on the X server. For example, you may have to enter an "`xhost +<IP address>`" command on your X server machine.

If your X Window looks odd

If certain of the symbols, such as the activity indicators, look odd:

☐ Load the X Window fonts. See "To load custom fonts" in Chapter 3.

If the X Window is only using two or three colors:

☐ Release colors by closing down some applications, and restart your X Windows session.

If you cannot copy files from the logic analyzer

If you can only copy a few bytes of a file:

☐ Copy the file of interest to your PC or workstation, and use the new, local copy as your working copy. Some applications cannot work directly with the dynamic files from the logic analyzer.

☐ If you are on a UNIX workstation, try using `dd` instead of `cp`.

If you cannot restore raw files

If the `setup.raw` and `data.raw` files seem to be ignored when you copy them to the logic analyzer:

☐ Verify the LAN connection between your computer and the logic analyzer. Refer to "If you cannot connect to the logic analyzer" earlier in this section.

☐ Change the file time-out. To change the time-out:

1 Go to the logic analyzer System External I/O menu.

2 Select the LAN Settings field.

3 Set the file time out.

A value of about 1.5 seconds should be sufficient. Set the time out to the minimum value that will allow network operations to work reliably.

If you cannot telnet to the command parser socket

If you get a "connection refused" message:

☐ Verify that you included the telnet port number (5025) in the command.

If you get a "connection timed out" or "no response from host" message:

☐ Verify the LAN connection between your computer and the logic analyzer. Refer to "If you cannot connect to the logic analyzer" earlier in this section.

If you get a "connection refused" or "no response from host" message:

☐ If the logic analyzer was just turned on, make sure that you wait 15 seconds after the Analyzer Configuration menu is displayed before attempting the connection.

☐ Make sure that another user is not already accessing the file system as the control user or connected to the command parser socket.

If you get an "operation timed-out" message

☐ Check the LAN connection between the computer andlogic analyzer. Refer to "If you cannot connect to the logic analyzer" in this section.

☐ Increase the file time-out value on your PC or workstation.

If the logic analyzer begins to operate slowly

The logic analyzer may operate more slowly if multiple users are trying to use the system at the same time.

☐ Check the number of network connections. Either copy the file `\system\mount.txt` to your local computer and view it with a text editor, or on the analyzer go to the LAN Settings menu and select Show LAN Connections. Check to see if many other users are currently connected to the system.

If the logic analyzer does not respond

☐ When the logic analyzer is transmitting a large file such as a deep-memory acquisition or a screen image, or when it is transmitting a dynamic file, it does not respond. Please be patient.

☐ If the analyzer does not respond after several minutes, cycle the power. For Agilent Technologies 1670-series logic analyzers with 512K memory depth, data may take up to ten minutes to transmit. For most other situations, three to five minutes is definitely long enough.

If all else fails

☐ Contact your system administrator.

☐ If you still cannot solve the problem, contact an Agilent Technologies Service Center for repair information.

Getting Service Support

This section provides information about support services.

Agilent Technologies on-site service

With Agilent Technologies on-site service, Agilent pays for parts, labor, and travel to have an Agilent Technologies service representative visit your site for repairing equipment under warranty.

You can purchase on-site service for the logic analyzer. Support contracts are also available for either 4 hour response or next day response. The support contracts are available for economical support beyond the 90-day warranty period. Contact your nearest Agilent Technologies Sales Office for information regarding support contracts.

Return to Agilent Technologies service

The benchtop logic analyzers default to return to Agilent Technologies service. With return to Agilent Technologies service, you return the equipment to your nearest Agilent Technologies service center for repair. During the warranty period, Agilent Technologies pays for parts and labor needed for repair. After the warranty period, you are billed for the parts and labor.

Glossary

benchtop logic analyzer A small, standalone logic analyzer that is not part of the Agilent Technologies 16500 logic analysis system.

client A computer or program that is configured to use services provided by another computer on a network. Agilent Technologies logic analyzers do not have client capabilities.

Ethernet A network that adheres to the IEEE 802.3 Local Area Network standard.

Ethernet Address A hexadecimal number which is used to identify a machine on a network. Each logic analyzer is assigned a unique Ethernet address.

ftp (File Transfer Protocol) A service that allows you to remotely transfer files among different operating systems.

host A computer on a network. When controlling the logic analyzer, your computer is considered the host.

host name A unique name that is used to identify each host machine on a network. The host name is created by the user or system administrator.

IP Address (Internet Protocol Address) A unique number that is assigned to a each device which is to be connected to a TCP/IP network. Before using your logic analyzer on a network, you or your system administrator will need to assign an IP address.

mount The method used in NFS and other network protocols to gain access to a network's resources. UNIX systems use a "mount" command. DOS systems typically use a "net use" command.

NFS (Network File System) A distributed file system that allows data to be shared by computers on a network, regardless of operating system, network architecture, or protocol. The NFS protocol also allows you to move files between networks and operating systems.

ping A utility that allows you to determine the status of the connections between devices and a network. The ping utility is usually included with software packages that provide NFS services.

protocol A set of conventions that specify how information will be formatted and transmitted on a network, and how machines on a network will communicate.

server   A device that is configured to provide a service to other devices on network, such as shared access to a file system or printer. The logic analyzer acts like a server on your network.

system administrator   A person who manages systems and machines on a network. The system administrator is responsible for installing software and hardware on the network and assigning addresses and names to machines.

TCP/IP   (Transmission Control Protocol/Internet Protocol) A set of standards for communications between computers and between networks.

telnet   A protocol that allows users to create a session to run programs on or transfer information to and from a remote computer.

time out   A period of system inactivity during which the system awaits user or network response. If there is no response by the end of the period, the system takes an action. In the benchtop logic analyzers, the file timeout is set in the LAN Settings menu under the System I/O menu.

X Window System   An open system technology that uses a windows environment and makes possible the distribution of graphical applications across networks. X is a network graphics protocol which is hardware independent, operating system independent, network transparent, portable and extensible.

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This apparatus has been designed and tested in accordance with IEC Publication 348, Safety Requirements for Measuring Apparatus, and has been supplied in a safe condition. This is a Safety Class I instrument (provided with terminal for protective earthing). Before applying power, verify that the correct safety precautions are taken (see the following warnings). In addition, note the external markings on the instrument that are described under "Safety Symbols."

Warning

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

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

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

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

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

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

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

Safety Symbols

⚠

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

⚡

Hazardous voltage symbol.

⏚

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

WARNING

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

CAUTION

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

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About this edition

This is the *Agilent Technologies 1660C/CS-Series and 1670A-Series Logic Analyzers LAN User's Guide.*

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by you. The dates on the title page change only when a new edition is published.

A software or firmware code may be printed before the date. This code indicates the version level of the software or firmware of this product at the time the manual or update was issued. Many product updates do not require manual changes; and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one-to-one correspondence between product updates and manual updates.

The following list of pages gives the date of the current edition and of any changed pages to that edition.

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