Installation/User's Guide

Agilent 4986B LanProbe

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The following warnings and operating information are shown in French followed by the English translation.

MISE ENGARDE Cet appareil répond aux normes de la «Classe de sécurité I» et est muni d'un fil de mise à la terre pour votre protection.

WARNING This product is a Safety Class I instrument with a protective earth terminal.

MISE ENGARDE Pour prévenir les risques de choc électrique, la broche de mise à la terre du cordon d'alimentation ne doit pas être désactivée.

WARNING For protection from electric shock hazard, power cord ground must not be defeated.

Restrictions d'utilisation
L'utilisateur se doit d'observer les mesures de précaution énumérées ci-dessous pour toutes les phases d'utilisation, de service et de réparation de cet appareil. Le fait de ne pas s'y conformer équivaut à ne pas respecter les mises en gardes spécifiques contenues dans ce manuel et constitue une violation des normes de sécurité relatives à la conception, la fabrication et l'utilisation prévue de cet appareil. La société Agilent Technologies, Inc. n'assume aucune responsabilité envers un client qui manquerait de se conformer à ces exigences.

Operating Restrictions
The following general safety precatuions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions with specific warnings in this manual violate safety standards of design, manufacture, and intended use of this instrument.

Mise à la terre
Afin de minimiser les risques de choc électrique, le chÀssis et le cabinet de l'appareil doivent être mis à la terre. L'appareil est équipé d'un cordon d'alimentation muni d'une fiche homoloquée à trois lames, compatible c.a. La prise murale et la prise femelle de la rallonge électrique doivent respecter les normes de sécurité de la «Commision électrotechnique internationale» (IEC).

Grounding
To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The instrument is equipped with a three-conductor AC power cable compatible with an approved three-contact electrical outlet. The power jack and mating plug of the power cord must meet International Electrotechnical Commission (IEC) safety standards.

Environnement

Ne faites pas fonctionner cet appareil en présence de gaz inflammables ou de vapeurs dangereuses. L'utilisation de n'importe quel appareil électrique dans ces conditions constitue un risque élevé pour votre sécurité.

Service et ajustement

Des «tensions dangereuses» résident dans cet appareil. Par conséquent, le service et l'ajustement doivent être effectués uniquement par une personne qualifiée.

Ne remplacez pas de composantes lorsque le cordon d'alimentation est sous tension. Il pourrait y avoir présence de «tensions dangereuses» même lorsque l'appareil est déconnecté.

Ne faites pas de service interne ou d'ajustement sauf en présence d'une autre personne, capable de prodiguer les premiers soins et de pratiquer la réanimation.

Service non autorisé

L'installation de pièces étrangères, ou toute modification apportée à l'appareil sans le consentement de Agilent Technologies, Inc. est formellement interdit. Le fait de procéder à de tels modifications sans autorisation pourrait entraîner l'annulation de la garantie de l'appareil ou de tout contrat de service.

Pour un service et des réparations autorisées, retournez l'appareil à un point de vente et service Agilent Technologies, Inc..

Environment

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

Service and Adjustment

Dangerous voltages exist within this instrument. Service and adjustment of this instrument is to be performed only by trained service personnel.

Do not replace components with the power cable connected. Dangerous voltages may be present even when the power cable is disconnected.

Do not perform internal servicing or adjustment unless another person, capable of rendering first aid and resuscitation is present.

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The installation of substitute parts or the installation of any instrument modification not authorized by Agilent Technologies, Inc. is specifically forbidden. The performance of such unauthorized service can negate the instrument warranty or any maintenance agreements.

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Notice

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Electric Shock Hazard. Do not remove the system covers. To avoid electric shock, use only the supplied power cords and connect only to properly grounded (3-pin) wall outlets.

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Fire Hazard. For continued protection against fire hazard replace only with fuse of same type and rating.

Indoor Use. This instrument is designed for indoor use.

Cleaning. To clean the instrument, use a damp cloth moistened with a mild solution of soap and water. *Do not* use harsh chemicals. *Do not* let water get into the instrument.

Product Damage. Do not use this product when:

- ❍ the product shows visible damage,
- ❍ fails to perform,
- ❍ has been stored in unfavorable conditions, or
- ❍ has been subject to severe transport stresses.

Make the product inoperative and secure it against any unintended operation. Contact your nearest Agilent Sales office for assistance.

Defects and Abnormal Stresses. Whenever this instrument has been damaged or wet, make the product inoperative and secure it against any unintended operation.

Warning Symbols Used in This Book

⚠ Instruction book symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction book in order to protect against damage.

⚡ Indicates potential for electrical shock.

WARNING An operating procedure, practice, etc. which, if not correctly followed could result in personal injury or loss of life.

CAUTION An operating procedure, practice, etc. which, if not strictly observed, could result in damage to, or destruction of, equipment or software.

Conventions Used in this Book

NOTE   An operating procedure, practice, or information of importance, is separated from normal text as shown in this NOTE.

Terminology and conventions in this manual are handled with the following methods:

- Keys on the keyboard such as **PgDn** (page down) or **F1** (function key #1) are printed in the characters you see here.

- Text that you should type is printed in characters such as:
  `Filename.ext`

- In some cases, you must press two keys simultaneously. This is represented as **CTRL + Q**.

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Additional Help

You can obtain additional assistance in the U.S. by calling U.S. Response Center at 888 699 7280, or Internationally by calling your local Agilent Sales Office.

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Introduction

Introduction

This chapter introduces the Agilent 4986B Ethernet LanProbe (shown in Figure 1-1 on page 2), including its installation and configuration options.

You can use your LanProbe with NetMetrix/UX (for HP-UX and Solaris) The term "NetMetrix" is used in this manual to refer to Agilent NetMetrix/UX.

The following sections are included in this chapter:

- "Installation and Configuration Overview" on page 4
- "LanProbe Overview" on page 5

The Agilent 4986B Ethernet LanProbe is a Motorola 68040-based, SNMP-managed segment monitor for distributed Ethernet networks. Its network interface (port) consists of a single RJ-45 connector.
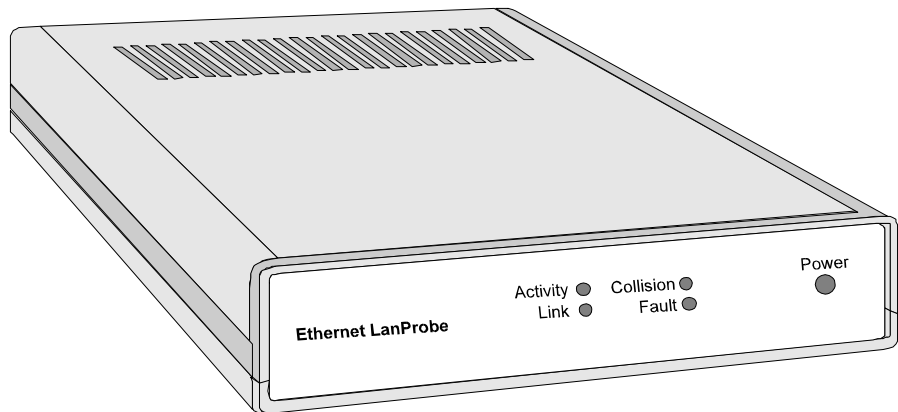
Figure 1-1: LanProbe

The Ethernet LanProbe has 16 MB of memory (optionally 32 MB), and uses FLASH EPROM. Future upgrades to LanProbe's firmware are easily downloaded over the LAN to multiple probes simultaneously. You can also download firmware using LanProbe's serial port.

LanProbe maintains a variety of statistical measurements on network performance, continuously keeping track of traffic levels, errors, and other important trends. Alarm thresholds can be set on any of these parameters, immediately alerting the network manager or initiating a packet trace to capture the details of the event for later analysis. Traffic and error levels are also monitored per node for each station on the segment.

Private MIB extensions give LanProbe additional capabilities beyond RMON. Multiple SNMP trap addresses, or groups of addresses, can be defined for event notification. The probe maps MAC addresses to IP addresses for node identification, and provides duplicate IP address detection. A real time utilization variable has been added, which provides the ability to alarm on instantaneous peaks of network load. An additional Out-of-Band connection to the probe can be established using Serial Link Internet Protocol (SLIP), either directly, using a modem, or by using a data switch.

You can configure the LanProbe to perform Echo Test Monitoring (tests to verify communications) of network nodes from your network management station. LanProbe allows the network manager to select one or several nodes to perform a one-time test or specify an interval for periodic testing. You can view the results of the Echo Test Monitoring from your NetMetrix management console. This can be very useful for monitoring critical nodes to verify connectivity. This test can also be performed from several points on the network (using several LanProbes) to verify connectivity from each point. When a node becomes unreachable an alert can be sent from LanProbe to your management station. To provide testing of a large range of nodes, Echo Test Monitoring supports ICMP, IEEE 802.2, and IEEE 802.3 for Novell IPX. This extension is supported by the NetMetrix software.

Installation and Configuration Overview

To quickly install and configure your LanProbe, it is important for you to understand the available configuration and installation options. Configuration consists of setting the LanProbe parameters (IP address, for example). Installation consists of physically installing the probe and connecting it to the network.

You will reference different chapters of this Installation/User's Guide depending on which of the following installation and configuration options you select:

- "Local Terminal Configuration and Installation" below
- "Installation and Bootp Server Configuration" below

Local Terminal Configuration and Installation

This method of installation and configuration requires that you configure the probe first and then install the probe. These procedures are detailed in Chapter 2 "Local Terminal Configuration" and Chapter 3 "Installation".

Installation and Bootp Server Configuration

This method of installation and configuration requires that you install the probe first and then configure the probe. These procedures are detailed in Chapter 3 "Installation" and in Chapter 4 "Bootp Server Configuration".

LanProbe Overview

This section provides some general information on the Agilent 4986B Ethernet LanProbe.

The LanProbe is a non-intrusive SNMP agent that monitors all packets and network performance. This includes current and historical traffic statistics and snapshots of selected packets.

The following topics are covered:

- "System Overview" below
- "Supported MIBs" on page 7
- "Management Stations" on page 8
- "Access Security" on page 8
- "Status LEDs" on page 10
- "CONFIG Button" on page 11
- "Included Parts" on page 11

System Overview

A typical LanProbe distributed monitoring system consists of the following:

- One or more LanProbes
- One or more NetMetrix management stations, using NetMetrix

Figure 1-2 on page 6 shows a LanProbe system example.
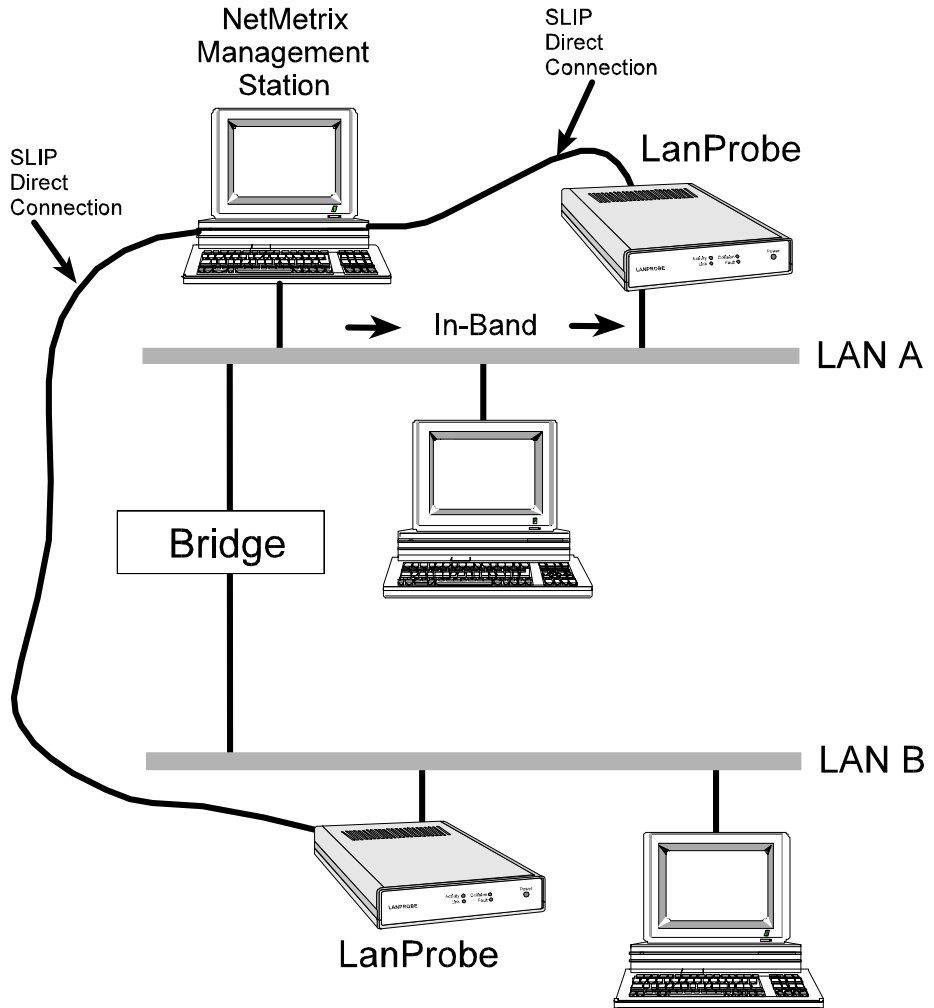
Figure 1-2: LanProbe System Example

Supported MIBs

LanProbe uses the SNMP, RMON-1, and RMON-2 MIB standards together with private MIB extensions to provide the following features:

- Segment Statistics
- History
- Alarms
- Host Table
- Host Top N
- Traffic Matrix
- Filters
- Packet Capture
- Events
- Log
- Trap
- Echo Test
- Protocol Directory
- Protocol Distribution
- Address Map
- Network Layer Host Table
- Network Layer Traffic Matrix
- Application Layer Host Table
- Application Layer Traffic Matrix
- User History
- Probe Configuration
- RMON Conformance

The LanProbe implements groups 1 through 9 of RFC 1757 and groups 11 through 20 of RFC 2021. Refer to RFC 1757 for more information on the Remote Network Monitoring Management Information Base Protocol Identifiers (RMON-1 MIB), to RFC 2021 for information on the RMON-2 MIB, and to RFC 2074 for information on Protocol Identifiers. LanProbe also supports MIB-II.

LanProbe also contains the Agilent Private MIB which allows for configuration and administration of the probe. It provides enhanced authentication features, specification of trap destinations, remote download of new firmware revisions, serial line control, and other features. The Agilent Private MIB is available electronically with NetMetrix.

You can refer to Table B-8 on page 104 for specific information on your probe's protocol directory.

Management Stations

Management stations gather network data collected by Agilent LanProbes. They present this information in easy-to-use and easy-to-understand text and graphic formats. You can use a management station to communicate with your LanProbe after it has been installed and configured.

The LanProbe communicates with the NetMetrix software running on your management station. NetMetrix management applications allow you to review and reconfigure LanProbe parameters (such as IP address, trap destinations, filters, and packet captures), to manage the information collected by LanProbe (including statistics, historical studies, alarms, packet size distribution, and captured packet traces), and to monitor local or remote networks (by gathering network statistics from Agilent LanProbe agents as network monitors).

Refer to your NetMetrix documentation for more information.

Access Security

The LanProbe configuration menu allows network administrators to disable standard RMON functions which could be considered a security risk. The security menu allows network administrators to disable the RMON-1 packet capture capabilities of LanProbe to prevent network users from viewing network traffic. TFTP firmware downloads can be disabled to prevent users from downloading earlier versions of the LanProbe firmware which did not support these new security features. For more information, refer to "Modify/View Security Values" on page 20.

The LanProbe private MIB uses a four-level access control scheme. An access level is assigned for each community string to be used with LanProbe. The access level is an integer value between one and four, with increasing degrees of authorization granted for higher authorization numbers. Each higher level is granted the rights of all lower levels in addition to the specific privileges of that level. Table 1-1 shows specific access privileges by level.

Table 1-1: Private MIB Access Security Privileges

Default Community Name	Level	Permissions
public	1	Read access to MIB-II objects.
rmon	2	Read access to MIB-II, RMON* MIB, and LanProbe MIB objects, excluding the objects in the accessControl group and in the captureBuffer Table.
rmon_admin	3	Write access to RMON* MIB and LanProbe MIB objects, excluding the objects in the probeAdmin, interface, and accessControl groups. Read access to MIB-II, RMON* MIB (including the captureBuffer Table), and LanProbe MIB objects, excluding those in the accessControl group.
Agilent_admin	4	Read and write access to all MIB-II, RMON* MIB, and LanProbe MIB objects.

* RMON implies RMON-1 and RMON-2.

Status LEDs

The status LEDs are visible on the front of LanProbe. Figure 1-3 shows the orientation of the LEDs on the front of LanProbe.

~ Line On or **Power**. This green LED is turned on when LanProbe is receiving power.

Link. This green LED is turned on when LanProbe is attached to an 10Base-T network.

Collision. This yellow LED is turned on when LanProbe detects collisions on the network.

Activity. This green LED is turned on when data is being received from the network or transmitted by LanProbe. When flashing, the frequency shows the amount of traffic. During periods of steady traffic, it may appear to stay on solid.

Fault. This yellow LED is turned on when LanProbe needs to be reset, repaired, or replaced or when new firmware is downloaded. The Fault LED is normally on during the power-on self-test, but turns off after a successful self-test or when a cold or warm start is completed. The Fault LED will blink when a collision is detected on the network.
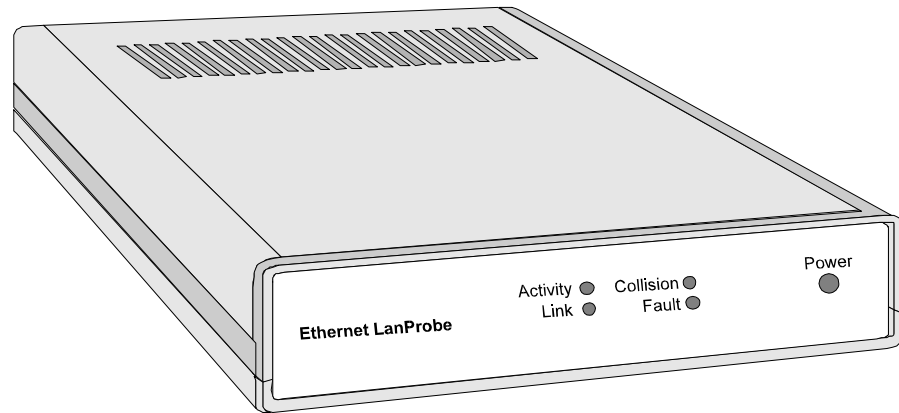
Figure 1-3: Front Panel LEDs

CONFIG Button

The CONFIG button is used to configure LanProbe from a terminal or to restart the probe. The CONFIG button is recessed and located on the back of the probe near the RS-232C connector. You will need to use a narrow, pointed object (like a pen) to press the CONFIG button.

To configure LanProbe using a local terminal (or PC emulating a terminal), connect a terminal to LanProbe using a null modem cable and push the CONFIG button to display LanProbe's Main Menu. This operation is described in Chapter 2 "Local Terminal Configuration".

You can restart the probe (with a warm start or cold start) using the CONFIG button. These functions are described in Chapter 5 "LanProbe Operation".

Included Parts

The following items are included with your :Agilent 4986B Ethernet LanProbe:

- Agilent 4986B Ethernet LanProbe
- Bootp Software 3 1/2-inch Disk, for PCs
- Power Module (0950-2546)
- Power Cord, one of the following:
  - Australian (8120-1369)
  - Danish (8120-2957)
  - European (8120-1689)
  - Japanese (8120-4753)
  - South Africa (8120-4600)
  - Swiss (8120-2104)
  - United Kingdom (8120-1351)
  - United States/Canada 125 V (8120-1378)
  - United States/Canada 250 V (8120-0698)

Optional Accessories

The following Agilent LanProbe accessories can be purchased from Agilent:

- *Agilent 4986B Ethernet LanProbe Installation/User's Guide*—this manual (04986-99505)

- Null Modem Cable—9 pin to 25 pin (24542G)

- Null Modem Cable—9 pin to 9 pin (24542U)

- Rack Mount Kit (J2886-94001)

- Female-Male Power Cable (8120-1575)

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Local Terminal Configuration

Local Terminal Configuration

This chapter describes how to use a local terminal to configure your Agilent 4986B Ethernet LanProbe so that it can communicate over a network. If you plan to use the Bootp server method of configuration, then skip this chapter and continue with Chapter 3 "Installation".

The following sections are covered in this chapter:

- "Probe Configuration Using a Local Terminal" on page 15
- "Using a Local Terminal" on page 16

Probe Configuration Using a Local Terminal

Some initial configuration information must be entered into LanProbe before it can communicate over the network interface or serial port. This initial configuration for network communication consists of the following parameters:

- IP Address (for each Telemetry and Monitor/Transmit port)
- Default Gateway IP Address (if required)
- Subnet Mask (if required)
- Autodiscovery Echo Interval

LanProbe uses the following configuration parameters to display time and date information in the user interface only. LanProbe uses a separate internal clock to time-stamp data collected from the network.

- Date
- Time
- Time Zone

The initial configuration for communication over the serial port consists of the following parameters:

- Serial Port IP Address
- Serial Port Subnet Mask (if required)
- Serial Port Speed
- Serial Port Mode
- Modem Control String (if required)

Using a Local Terminal

You can configure LanProbe by connecting a terminal directly to LanProbe and using the LanProbe's Main Menu. Refer to the following sections for additional information on configuring LanProbe after you access the LanProbe's Main Menu:

- "Modify/View Configuration Values" on page 18
- "Modify/View Security Values" on page 20
- "Modify/View Interface Values" on page 21
- "Display Interface Summary" on page 23
- "Modify/View Serial Port Settings" on page 24

NOTE   The LanProbe is not available to the network when you are in it's configuration menus.

Use the following procedure to access LanProbe's Main Menu:

1. Connect a terminal or a personal computer (PC) emulating a terminal to the LanProbe's RS-232 connector using a null modem cable. For more information on cables, refer to Appendix A "Cables and Connectors".

2. Configure the terminal for 8 bits/character, 1 stop bit, no parity, Xon/Xoff handshaking, and a baud rate of 9600.

3. Connect the Agilent Power Module (0950-2546) to the LanProbe and to a power source (either 100-120/VAC or 220-240/VAC). The LanProbe does not have a power switch, but is turned on by connecting power.

4. Start the configuration by quickly pressing the CONFIG button on the back of LanProbe one time only. After about 10 seconds, LanProbe displays its Main Menu on the terminal. Figure 2-4 on page 17 shows LanProbe's Main Menu. If the Main Menu is not displayed, verify that the previous steps in this procedure have been performed correctly.

```
Main Menu - Revision
1. Modify/View configuration values ->
2. Modify/View security values ->
3. Modify/View interface values ->
4. Display interface summary
5. TFTP Download new firmware ->
6. XMODEM Download new firmware ->
7. Warm start and Exit
8. Cold start and Exit
```

Figure 2-4: LanProbe's Main Menu

NOTE   Item 5 in Figure 2-4 is not displayed if the **Allow TFTP firmware downloads** menu item is not enabled. Refer to "Modify/View Security Values" on page 20 for more information on enabling this menu item.

If item 5 (TFTP Download new firmware) is not displayed, the number used to access items 6, 7, and 8 will be different.
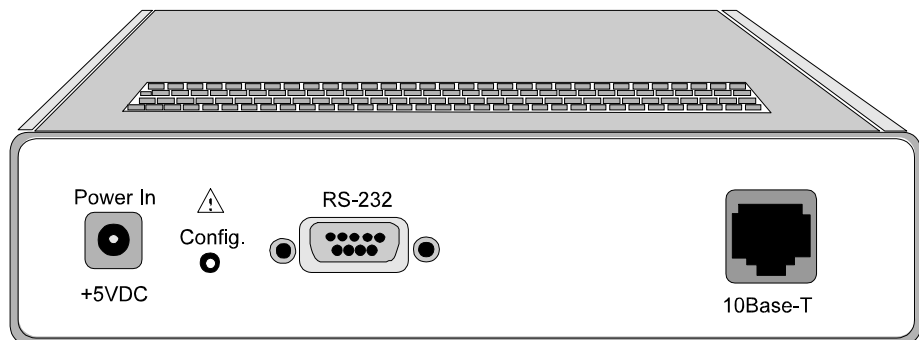
Figure 2-5: LanProbe's Rear Panel

NOTE   The LanProbe CONFIG button is recessed. This requires the use of a narrow, pointed object (like a pen) to press the CONFIG button.

LanProbe executes a cold start if you press the CONFIG button twice within one second. If this happens, wait for the cold start to be completed and press the CONFIG button again to reenter the configuration mode.

A warm start or cold start is completed when the Fault LED goes off. If traffic is present, the Activity LED flashes to show traffic.

Modify/View Configuration Values

Use the following procedure to configure items in the Modify/View Configuration Values menu:

1. Press **1** to access the **Modify/View configuration values** menu item. The Modify/View Configuration Values menu is displayed, as shown in Figure 2-6.

```
Modify/View Configuration Values Menu - Firmware Rev

Memory configuration                      x Mbytes
1. Autodiscovery Echo Interval (sec.)     1800

2. Date                                   Wed 05/05/97
3. Time                                   09:12:00
4. Time zone                              PST8PDT

S. Save changes and exit
0. Cancel changes and exit
```

Figure 2-6: Modify/View Configuration Values Menu

2. Select each field requiring configuration (one at a time) by pressing its corresponding number and then entering the values that are appropriate for your network.

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Autodiscovery Echo Interval	Press **1** and enter the autodiscovery echo interval, in seconds, as desired for your probe (optional). This parameter sets the time interval for the probe to transmit an autodiscovery frame, which is used by HP OpenView NetMetrix to maintain its network map.
	The default value is 30 minutes (1800 seconds). A value of zero results in no transmission of autodiscovery frames.
Date	Press **2** and enter the day of the week and then the date in month/day/year format (*mm/dd/yy*, through 1999 or *mm/dd/yyyy*, starting 2000).
Time	Press **3** and enter the time of day in hours, minutes, seconds (*hh:mm:ss*) format.
Time Zone	Press **4** and enter your time zone in one to 15 characters (optional).
	The Time Zone characters are stored for your convenience and are used only to time-stamp probe information.
	Recommended practice is to use the format of Time Zone, hours from Greenwich mean time, and then Daylight Saving Time, such as PST8PDT for Pacific Standard Time (the default). The probe does not automatically update the Time field when your local time changes from standard time to daylight savings and back.

The values you enter for date and time take effect as soon as you enter them. All other parameters do not take effect until you select the **Save Changes and Exit** menu item.

3. Press **S** to save the configuration changes and return to LanProbe's Main Menu. If you want to cancel your current changes and return to the LanProbe's Main Menu, press **0**.

NOTE   The other Main Menu items are explained in other chapters of this manual. The **TFTP Download new firmware** and **XMODEM Download new firmware** menu item is described in Chapter 6 "Download New Firmware". The **Warm start and Exit** and **Cold start and Exit** menu items are explained in Chapter 5 "LanProbe Operation".

Modify/View Security Values

Use the following procedure to configure items in the Modify/View Security Values menu:

1. If you want to restrict access to the probe press **2** to access the **Modify/View security values** menu item, otherwise skip this section. The Modify/View Security Values menu is displayed, as shown in Figure 2-7.

```
Modify/View Security Values Menu - Firmware Rev


1. Allow packet capture                      Yes
2. Allow TFTP firmware downloads             Yes

S. Save changes and exit
0. Cancel changes and exit
```

Figure 2-7: Modify/View Security Values Menu

2. Select each field requiring configuration (one at a time) by pressing its corresponding number and then entering the values that are appropriate for your network. See "Access Security" on page 8. for more information on security.

Allow Packet Capture	Press **1** and enter Yes to allow or enter No to not allow packet capture.
Allow TFTP	Press **2** and enter Yes to allow or enter No to not allow

Firmware Downloads   TFTP firmware downloading.

3. Press **S** to save the configuration changes and return to LanProbe's Main Menu. If you want to cancel your current changes and return to the LanProbe's Main Menu, press **0**.

Modify/View Interface Values

After you access the Modify/View Interface Values menu, you must first select the port that you want to configure and then configure that port. For example, the possible options for the port parameter could be the following:

- [1] 1.1/Ethernet
- [2] 1.2/Serial

Use the following procedure to configure items in the Modify/View Interface Values menu:

1. Press **3** to access the **Modify/View interface values** menu item. The Modify/View Interface Values menu is displayed, as shown in Figure 2-8 on page 21.

```
Modify/View Interface Values Menu - Firmware Rev

MAC Address                             00 00 C6 XX XX XX
Interface Type                          Ethernet

1. Port                                 1.1/Ethernet
2. Port Type                            Telemetry
3. IP address                           0.0.0.0
4. Default gateway IP address           0.0.0.0
5. Subnet mask                          255.0.0.0

S. Save changes and exit
0. Cancel changes and exit
```

Figure 2-8: Modify/View Interface Values Menu

2. Select each field requiring configuration (one at a time) by pressing its corresponding number and then entering the values that are appropriate for your network.

Port   Press **1** and enter the port number to be configured. Refer to "Display Interface Summary" on page 23 for interface summary information. After you enter a port number, the configuration parameters are shown along with their current settings for the specified port number. You can then view or configure the port's parameters. The following are your port choices:

●[1] 1.1/Ethernet
●[2] 1.2/Serial

Refer to "Modify/View Serial Port Settings" on page 24 for information on configuring the Serial Port settings.

Port Type   Press **2** and select the port type as Telemetry or Serial Port.

IP Address   Press **3** and enter the IP address for the probe. If the IP address is 0.0.0.0, LanProbe will transmit Bootp Requests for configuration information (including IP address) over the network.

Default Gateway   Press **4** and enter the default gateway IP address for the probe
IP Address   (optional).

Subnet Mask   Press **5** and enter the subnet mask for the probe.

Parameters do not take effect until you select the **Save Changes and Exit** menu item.

3. Press **S** to save the configuration changes and return to LanProbe's Main Menu. If you want to cancel your current changes and return to the LanProbe's Main Menu, press **0**.

Display Interface Summary

Use the following procedure to view the Display Interface Summary screen for your LanProbe. Refer to Figure 2-9 on page 24.

1. Press **4**, the **Display Interface Summary** item. The Display Interface Summary item displays the number and type of each interface, the port type, and each port's IP address.

2. Press Enter to continue.

3. From LanProbe's Main Menu, press **7** to execute a warm start or press **8** to execute a cold start. A cold start is required if you change the IP Address, Default Gateway or Subnet Mask. For either menu choice, LanProbe exits the Main Menu and restarts normal operations.

NOTE   A warm start resets all data collected by the probe. A cold start resets all data collected by the probe and also resets any user-configuration information, such as history studies, filters, and alarms to their default values. Refer to Chapter 5 "LanProbe Operation" for more information on what is reset by warm and cold starts.

After the probe restarts (boots), it operates normally using the new configuration information. The warm start or cold start occurs immediately and there is no visual indication of when it finishes.

4. If you are performing the initial probe configuration, prepare LanProbe for installation by disconnecting the power cord. You will not lose your initial configuration information.

```
Display Interface Summary

Interface          Port Type          IP Address
------------       ----------         -----------
1.1/Ethernet       Telemetry          15.6.72.216
1.2/Serial         Not Applicable     0.0.0.0
```

Figure 2-9: Display Interface Summary

Modify/View Serial Port Settings

You can view or modify LanProbe's serial port settings by entering the Serial Port number (port 2) into the Modify/View Interface Values Menu's Port parameter. The Serial Port configuration parameters are then shown along with their current settings. Use the following procedure to configure LanProbe's serial port:

1. Enter the LanProbe's Serial Port number (port 2) into the Modify/View Interface Values Menu's Port parameter as shown in Figure 2-8 on page 21.

```
Modify/View Interface Values Menu - Firmware Rev

Interface Type                        Serial

1. Port                               1.2/Serial
2. Port Type                          Not Applicable
3. Serial port IP address             0.0.0.0
4. Serial port subnet mask            255.255.252.192

5. Serial port speed                  9600
6. Serial port mode                   Direct
7. Serial port hardware flow control  On

8. Modem Init String          ^s^M^d1^sATE0Q0V1X4 S0=1...
9. Modem Hangup String        ^d2^s+++^d2^sATH0^M^d2
10. Modem Connect Responses   /CONNECT/300/CONNECT/1200/...
11. Modem No-Connect Responses  /NO CARRIER/BUSY/NO DIALT...

S. Save Changes and Exit
0. Cancel Changes and Exit
```

Figure 2-10: Modify/View Serial Port Settings Menu

2. Select each field requiring configuration (one at a time) by selecting its corresponding number as shown in Figure 2-10 and then entering the values that are appropriate for your modem's serial port.

Serial port IP address   Press **3** and then enter the serial port IP address for the probe. The default Serial Port IP Address is 0.0.0.0.

Serial port subnet mask   Press **4** and then enter the serial port subnet mask for the probe (optional). It is recommended that you **do not** change the serial port subnet mask unless there is a conflict. The default Serial Port Subnet Mask is 255.255.255.192.

Serial port speed	Press **5** and then enter a serial port speed (300 to 38,400 baud) for LanProbe's SNMP connection. The default is 9600 baud. This speed is used **only** for Out-of-Band access to LanProbe using SNMP. It does not affect the serial connection for the local terminal, which is fixed at 9600 baud.
	Make sure that the serial port speed is set to less than or equal to the maximum speed of the modem to be used.
Serial port mode	Press **6** and then select the serial port mode by pressing **1** for direct connection (the default) or **2** for modem connection.
Serial port hardware flow control	Press **7** and then select hardware flow control Off by pressing **1** or hardware flow control On (the default) by pressing **2**.
Modem Init String	Press **8** to enter the modem initialization string. Only the first 20 characters of the 256 character maximum will be displayed in the Modify/View Serial Port Settings menu. The default is `^s^M^d1^sATEOQOV1X4 S0=1 S2=43^M`.
Modem Hangup String	Press **9** to enter the modem hang-up string. Only the first 20 characters of the 256 character maximum will be displayed in the Modify/View Serial Port Settings menu. The default is `^d2^s+++^d2^sATHO^M^d2`.
Modem Connect Responses	Press **10** to enter the modem connect responses. Only the first 20 characters of the 256 character maximum will be displayed in the Modify/View Serial Port Settings menu. The default is `/CONNECT/300/CONNECT 1200/1200/CONNECT 2400/2400/CONNECT 4800/4800/CONNECT 9600/9600/CONNECT 14400/14400/CONNECT 19200/19200/ CONNECT 38400/38400/`.

Modem No-Connect Responses

Press **11** to enter the modem no-connect responses. Only the first 20 characters of the 256 character maximum will be displayed in the Modify/View Serial Port Settings menu. The default is `/NO CARRIER/ BUSY/NO DIALTONE/NO ANSWER/ERROR/`.

3. Press **S** to save the serial port configuration changes and return to LanProbe's Main Menu. If you want to cancel these changes and return to LanProbe's Main Menu, press **0**.

If you need to configure any other LanProbe parameters, make your selection from LanProbe's Main Menu.

3

Installation

Installation

This chapter describes how to install the Agilent 4986B Ethernet LanProbe
Installing the Agilent LanProbe consists of the following tasks:

If you plan to configure the probe from a local terminal and have not yet done so,
go to Chapter 2 "Local Terminal Configuration", and perform the configuration
now.

Selecting a Location

Select a location for your LanProbe where it will be the most useful. The LanProbe can only monitor traffic that is present on the LAN where it is attached. Because interconnect devices (bridges, for example) filter traffic, a LanProbe may need to be attached on each side of an interconnect device for complete collection of network statistics. In this respect, the placement of LanProbe affects the statistics collected.

Consider the following installation requirements when selecting a location for your probe:

NOTE The Fault and Activity LEDs on the front of LanProbe will light if any of the individual port LEDs on the rear panel light. To determine which port has activity or a fault, you are required to look at the port LEDs on the back panel. This should be considered when selecting a location or LanProbe's orientation in a rack.

- A flat surface that is large enough to support the probe (requires clearance at rear and sides for cooling and rear panel access), adequate wall space, or space in a 19 inch rack or cabinet.

- A grounded power outlet (either 100-120/VAC or 220-240/VAC).

- Access to one or more Ethernet connection taps.

- Access to an RS-232C connection (required only for Out-of-Band communication).

- Access to a phone line and a modem within 50 feet (required only for Out-of-Band communication using a modem connection).

NOTE The MAC address for the probe can be found on the rear label. It is a good idea to make a note of this address *prior* to installing your LanProbe because some installation methods make it difficult to see the rear label without removing the probe.

Installing the Probe

This section describes how to install your LanProbe. First decide which installation method you are going to use and then install the probe using one of the following methods:

- "Table Installation" on page 33
- "Rack or Cabinet Installation" on page 33

CAUTION   Do *not* attach the power cord and Agilent Power Module to LanProbe until the probe is completely installed. If the power cord and Agilent Power Module are already attached to LanProbe, remove them now (you will not lose any configuration parameters). The probe does not have a power switch but becomes operational when the power is attached.

Table Installation

Place the probe on a flat surface or table (refer to the requirements listed in "Selecting a Location" on page 31).

Rack or Cabinet Installation

The LanProbe Rack Mount Kit is optional. The Agilent J2886A Rack Mount Kit provides a support shelf and hardware for mounting LanProbe in a rack or cabinet. The rack mounting kit requires a 3 1/2" slot in your rack and you will need a POZIDRIV® #1 screwdriver. The LanProbe Rack Mount Kit includes the following:

- One Support Shelf
- One TORX,T10 wrench
- Four Clip-on sheet metal nuts
- Four 0.55" (14 mm) 10-32 POZIDRIV®, screws
- Four 0.75" (19 mm) #M4 self-tapping POZIDRIV®, screws
- One LanProbe slot Cover
- Two 0.312" (7.93 mm) #M3 machine screws
- Four Dual Lock Reclosable Fasteners, strips

Optional Accessories

- Support Rail Kit (12679C)
- Female-Male Power Cable, 30" (8120-1575)

Use the following procedure to install LanProbe in a rack or cabinet (refer to the requirements as listed in "Selecting a Location" on page 31 for additional information):

1. Place LanProbe on its top with the front facing you.

2. Remove the two screws that are in the lower right-hand corner and in the upper left-hand corner (looking down on LanProbe).

3. Place LanProbe in the left support shelf slot while aligning the two empty screw holes (from Step 2 on page 33) with the two screw holes in the support shelf. The correct alignment has the front of LanProbe facing out the front of the support shelf, refer to Figure 3-11 on page 35.

4. Attach LanProbe to the support shelf with two 0.75" #M4 self-tapping POZIDRIV® screws. Refer to Figure 3-11 on page 35 for the correct alignment.

5. Attach one Dual Lock Reclosable Fasteners, strip to the top of LanProbe, being careful to place it in a location that will both allow for the alignment of the power module to be inside the support shelf and to not block the LanProbe vent holes, refer to Figure 3-11 on page 35.
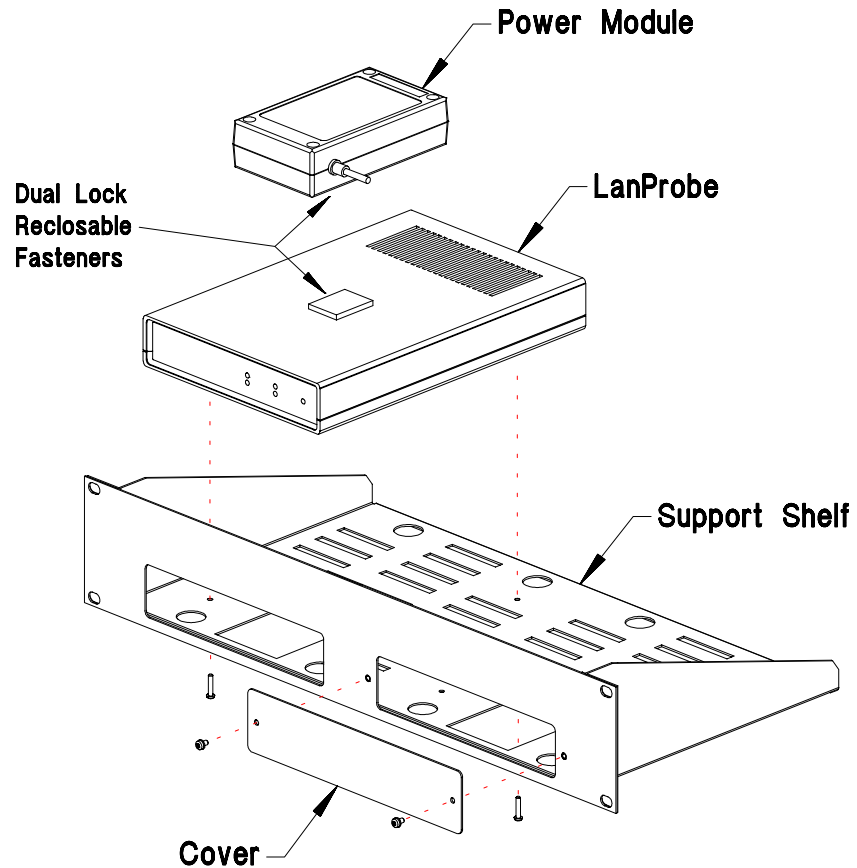
Figure 3-11: Installing LanProbe in the Rack Support Shelf

6. Attach the LanProbe power module to the top of LanProbe by pressing the
    two Dual Lock Reclosable Fasteners® strips together while complying with
    the alignment restrictions as stated in Step 5 on page 34.

7. Attach the power module's power line to LanProbe.

8. Attach the support shelf cover to the right LanProbe slot using two 0.312"
    (7.93 mm) #M3 machine screws, or repeat steps 1 through 9 to install a
    second LanProbe in the support shelf.

9. Insert the support shelf into the rack (or cabinet) and attach it with four clip-
    on sheet metal nuts (use if required) and four 0.55" (14 mm) 10-32
    POZIDRIV® screws. Figure 3-12 shows the completed LanProbe, power
    module, and support shelf.

10. Attach the power cord to the power module and to a power source. If this is
    the second LanProbe installed in the support shelf, you can use the optional
    Female-Male Power Cable (8120-1575) to attach power from one power
    module to the other.

Keep Vent
Holes Clear
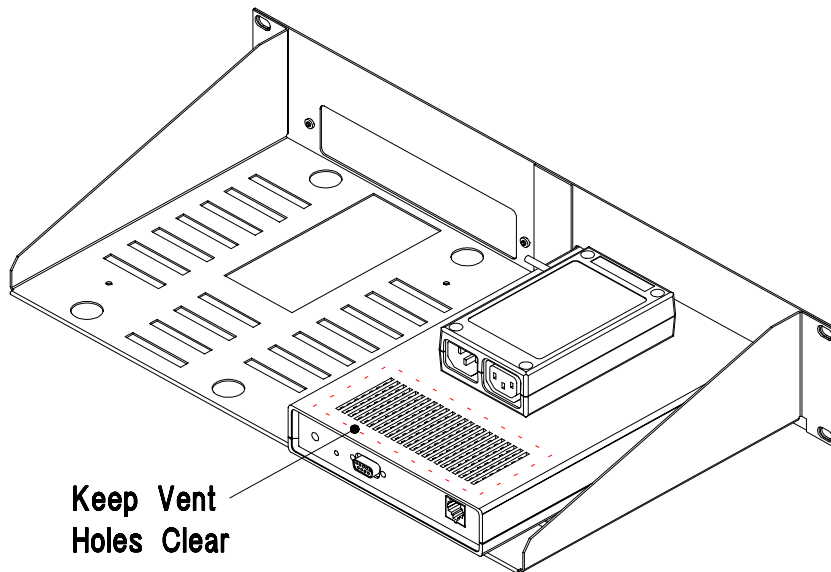
Figure 3-12: LanProbe Installed in the Rack Support Shelf

Connecting the Probe

LanProbe communicates with Agilent NetMetrix either through the In-Band network connection or by using an Out-of-Band serial connection. You can establish both In-Band and Out-of-Band connections to give you the option of communicating with the probe either over the network or over the serial link, respectively.

The In-Band connection adds a slight amount of traffic to the network, but is faster than the Out-of-Band connection. The disadvantage of using only the In-Band connection is that certain network or component failures can result in loss of communication with LanProbe.

The Out-of-Band serial connection can be used as the primary means of communication or as a backup link in case of a network failure. The disadvantage of using only the Out-of-Band connection is that it is a slower means of communications.

Connecting to the Network (In-Band)

You can connect LanProbe to the network by connecting the 10Base-T (RJ-45) port. Figure 3-13 on page 38 shows the rear panel of LanProbe.

CAUTION   Do not touch the probe connector pins or the cable connector pins. Static discharge may damage equipment.
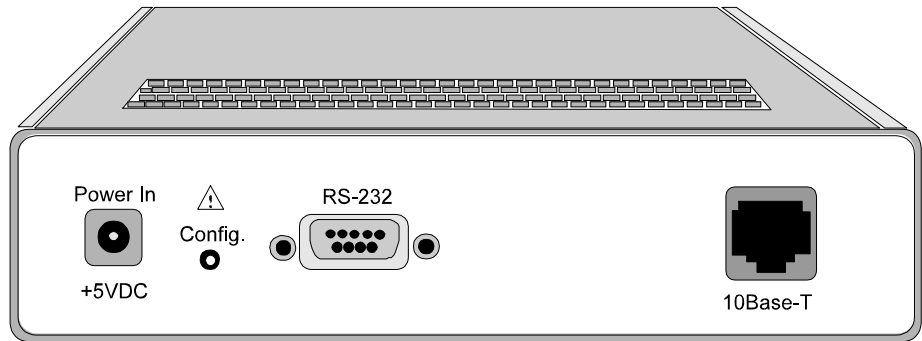
Figure 3-13: Ethernet LanProbe Rear Panel

Connecting to 10Base-T Networks

Connect LanProbe's 10Base-T (RJ-45) port, located on the rear panel, to the network by using a UTP cable. Figure 3-14 on page 39 shows how to connect LanProbe to a 10Base-T network.
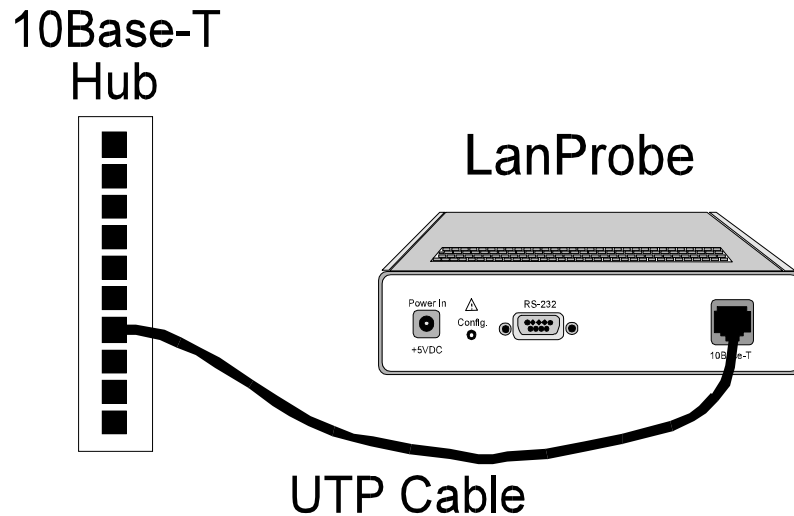
Figure 3-14: Connecting LanProbe to 10Base-T Networks

Connecting Out-of-Band

Out-of-Band communications with LanProbe are conducted through the serial port, not over the network. This mode of communications is optional.

The following methods are available for Out-of-Band connections:

- "Direct Connection", below
- "Modem Connection" on page 40
- "Data Switch Connection" on page 45

Direct Connection

To make a direct connection to LanProbe, connect the NetMetrix management station's serial port to LanProbe's RS-232C port using a null modem cable (Agilent part number 24542G—9-to-25 pin, 24542U—9-to-9 pin, or equivalent). Figure 3-15 on page 40 shows the direct connection to the probe.
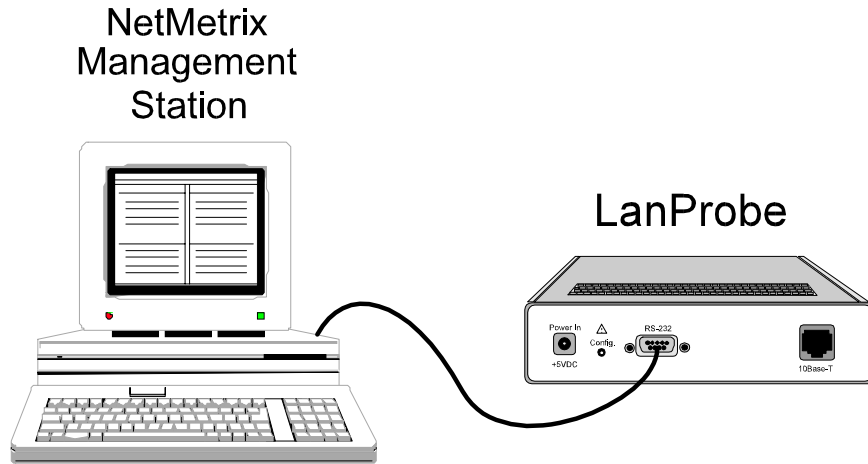
Figure 3-15: LanProbe Direct Connection

Modem Connection

You can use a modem connection to increase the distance between the probe and the NetMetrix management station. Perform the following tasks to make a modem connection between a NetMetrix management station and LanProbe. Figure 3-16 on page 41 shows the modem connection to the probe.

- "Install the Management Station Modem" on page 41
- "Install the LanProbe Modem" on page 42
- "Configure the Management Station and LanProbe" on page 42
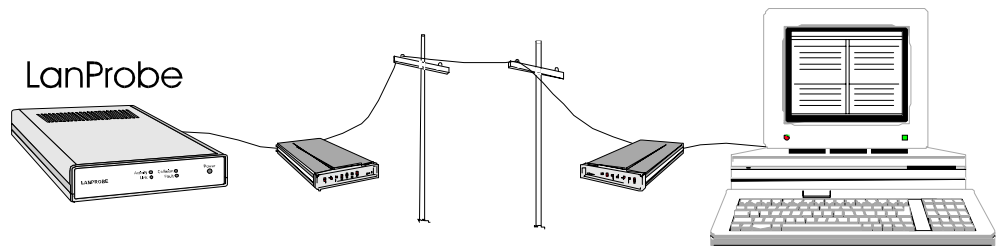
LanProbe

Figure 3-16: LanProbe Modem Connection

Install the Management Station Modem

You need the following list of equipment to install the management station's modem:

- Hayes-compatible 300 to 38.4 K baud modem
- RS-232C (straight through) modem cable
- Modular phone cable with RJ-11 connectors or equivalent

Use the following procedure to install the management station's modem:

CAUTION   Turn off all equipment prior to making cable connections.

1. Place the modem close enough to the management station to not violate the 50-foot RS-232C distance limitation.

2. Connect the RS-232C cable from the modem's RS-232C port to the management station's serial port. Take care in selecting the appropriate serial port on the management station (COM1 or COM2, for example).

3. Connect the RJ-11 modular phone cable from the modem **To Line** port to the telephone jack.

4. Connect power to the modem and turn on the modem power switch (not required for a PC internal modem).

5. Perform any other instructions as required by the modem manufacturer. If you have any problems with the modem, contact the modem manufacturer for assistance.

Install the LanProbe Modem

You need the following list of equipment to install the LanProbe modem:

- Hayes-compatible 300 to 38.4 K baud modem
- RS-232C (straight through) modem cable
- Modular phone cable with RJ-11 connectors or equivalent

Use the following procedure to install the LanProbe modem:

1. Place the modem close enough to the probe to not violate the 50-foot RS-232C distance limitation.

2. Connect an RS-232C cable from the modem's RS-232C port to the LanProbe's RS-232 port.   A null modem cable **cannot** be used for this connection.

3. Connect the RJ-11 modular phone cable from the modem **To Line** port to the telephone jack.

4. Connect power to the modem and place the modem power switch to on.

5. Perform any other instructions as required by the modem manufacturer. If you have any problems with the modem, contact the modem manufacturer for assistance.

Configure the Management Station and LanProbe

Refer to your NetMetrix documentation for information on configuring the management station for use with a modem. Verify that the packet retransmission timeout is set appropriately. For example, a 1500-byte SNMP packet requires about one second to transmit over a 9600 baud connection, with another one second for the reply. A packet retransmission timeout of three to five seconds is appropriate for this example.

The LanProbe can be configured for Serial Line Internet Protocol (SLIP) link communications either by using a local terminal through the serial port or by using a NetMetrix management station over the network.

If you use the network to configure LanProbe, make the network connection (refer to "Connecting to the Network (In-Band)" on page 37) and then refer to your NetMetrix documentation to configure the following LanProbe parameters:

- Serial Port IP Address
- Serial Port Subnet Mask
- Serial Port Speed
- Hardware Flow Control (if unsure, consult your modem's documentation)
- Modem Init String

If you use an ASCII terminal to configure LanProbe as described in Chapter 2 "Local Terminal Configuration", attach the terminal and configure the following LanProbe parameters:

- Serial Port IP Address
- Serial Port Subnet Mask
- Serial Port Speed
- Hardware Flow Control (if unsure, ask your local network administrator)
- Modem Init String

The **Serial Port IP Address** must be on the same IP subnet as the management station's serial IP address.

Normally, each company has one subnet mask that is used for all machines on their network. Enter this subnet mask value into the **Serial Port Subnet Mask** field. The Serial Subnet Mask used for the probe should match the subnet mask used for the SLIP port on the management station.

Set the **Serial Port Speed** to a value that is less than or equal to the maximum speed at which your modem can operate.

Set the **Hardware Flow Control** to Off (On is the default), unless you are using high speed modems (14.4K baud or faster) with advanced features, such as error correction and data compression. If the Hardware Flow Control is set to On, you can set it to Off by using LanProbe's menu or over the network from a NetMetrix management station (refer to your NetMetrix documentation for details).

Verify that the **Modem Init String** is properly initialized for the attached modem by referencing the modem's documentation. The probe's default modem initialization string is configured to work with low-speed and medium-speed Hayes compatible modems. The following modem settings are recommended for low-speed to medium-speed modem connections:

Modem Flow Control:	Off
Data Compression (if applicable):	Off
Error Correction (if applicable):	Off

Not all Hayes commands are the same for all Hayes-compatible modems. Refer to your modem's documentation to determine the commands required for each of the above settings and append these commands to the end of the default **Modem Init String**.

NOTE   Your modem's documentation discusses the features that are relevant to your modem. If your modem does not support a feature (data compression, for example), you do not need to turn it off in the **Modem Init String**.

Some modems require you to set register values explicitly, rather than sending Hayes style commands. In this case, follow your modem's documentation to set these registers.

If you are using a high-speed modem, you probably need to modify the default modem initialization string. The following modem settings are recommended for high-speed modem connections:

Modem Flow Control:	Hardware Flow Control (RTS/CTS signaling)
Carrier Detect:	Always On
Data Compression:	Enabled
Error Correction:	Enabled

After appending the appropriate commands to the modem initialization string, warm start your LanProbe.

Refer to your NetMetrix documentation for information on how to establish communications with LanProbe over the SLIP link.

Data Switch Connection

Use the data switch connection to provide the flexibility of using more than one management station to communicate with more than one LanProbe.

To make a data switch connection to LanProbe, connect a NetMetrix management station to LanProbe's RS-232C port through a data switch. Set the Serial Port Mode to Direct, if your probe is directly connected to the data switch, or set it to Modem, if your probe must dial through a modem to another modem that is attached to the data switch.

To allow traps to be sent from the probe to your management station, specify a Serial Trap Destination of type Switch or Modem Switch, using NetMetrix.

Refer to your data switch documentation for information on setting up your data switch. There are many variations available for this connection method. Figure 3-17 on page 46 shows a possible data switch connection scheme.
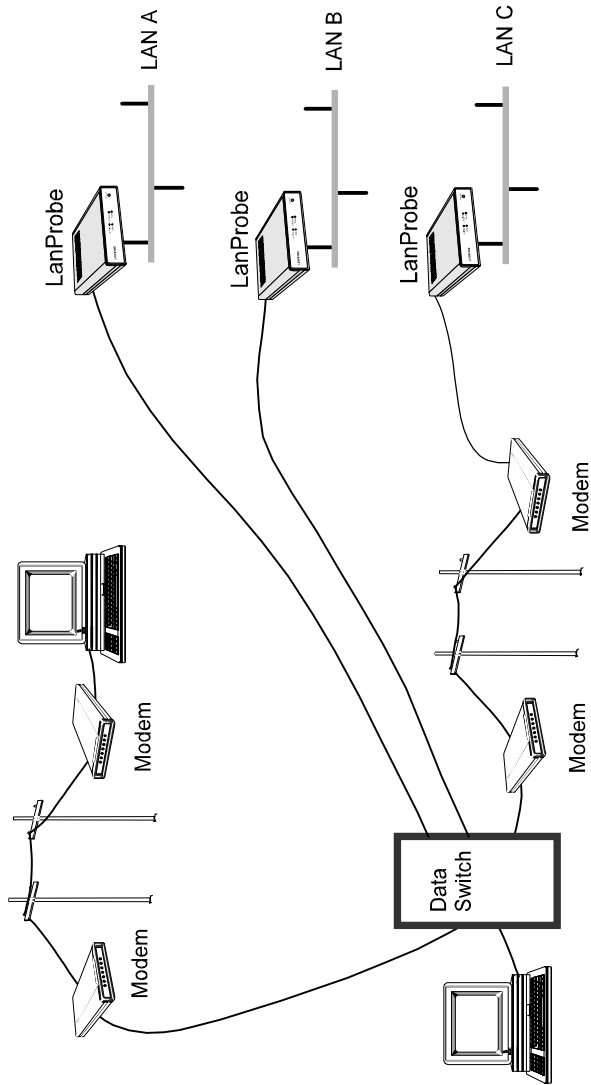
Figure 3-17: LanProbe Data Switch Connection

Starting the Probe

NOTE   If you are using the Bootp server method of configuration, do not attach the power cord and Agilent Power Module (0950-2546) to the probe until told to do so in Chapter 4 "Bootp Server Configuration".

If you used the local terminal method of configuration, attach the power cord and Agilent Power Module to LanProbe. The probe does not have a power switch, but is powered on when power is attached. When powered on or reset, LanProbe runs self-tests and transmits ICMP echo frames to the default gateway for the purpose of allowing the probe to be discovered by the routers (ARP cache). The probe transmits four ICMP echo request packets about 10 seconds after booting and again every autodiscovery echo interval. Refer to Chapter 5 "LanProbe Operation" for more information on resetting the probe.

Verifying the Installation

You can verify the LanProbe installation by looking at the status LEDs on the front of the probe. After the LanProbe restarts (boots), it runs a power-on self-test (POST) and then starts normal operations.

The Fault LED is briefly turned on (about three seconds) during the POST. After LanProbe passes the POST, the Fault LED turns off. The Activity LED flashes during network activity. The ~Line On or Power LED should be on to indicate that power is applied to the probe.

After LanProbe has passed its self-tests, look at the status LEDs to verify your installation. The status LEDs should be in the following states:

LED	**State**
Activity	Flashing, if connected to a network with traffic, or may appear to stay on solid during periods of steady traffic.
~ Line On or Power	On solid
Fault	Off
Link	On when attached to a 10Base-T network
Collision	Off (or flashing if connected to a network with collisions)

You can use NetMetrix to verify that LanProbe can be reached (refer to your NetMetrix documentation).

Troubleshooting the Installation

If the Activity LED is off, verify that LanProbe is properly connected to the network and that there is traffic on the network.

If the ~ Line On or Power LED is off, verify that power is properly connected to LanProbe and to the correct power source.

If the Fault LED is on, the probe failed the self-test. Repeat the installation procedures and verification of installation.

If you are still having difficulty, call your local Agilent service representative.

4

Bootp Server Configuration

Bootp Server Configuration

This chapter describes how to use the Bootp server method to configure the Agilent 4986B Ethernet LanProbe so that it can communicate over the network. This chapter assumes that you have already installed LanProbe, but have not attached the power cord and Agilent Power Module (0950-2546). If you plan to use the local terminal method of configuration, skip this chapter and refer to Chapter 2 "Local Terminal Configuration".

The following sections are covered in this chapter:

Probe Configuration Using a Bootp Server

You can use a Bootstrap Protocol (Bootp*) server to load LanProbe's IP configuration. This method requires that a Bootp server maintains a file containing client configuration information, maps from MAC addresses to IP addresses, and responds to requests from clients. You can configure the probe from an HP-UX, Solaris, or MS-DOS system acting as a Bootp server. The system that is operating as the Bootp server must be connected to your network. Table 4-2 on page 54 shows the minimum requirements for a Bootp server operating on HP 9000, Sun SPARC, and PC systems.

Before you can use the Bootp server, you must edit the bootptab file to configure the required LanProbe parameters. Refer to "Configuring the Bootptab File" on page 65 for more information.

LanProbe's MAC address is twelve characters long and is printed on a tag on the back of the probe. You must determine the IP Address, Default Gateway IP Address, and Subnet Mask from the network.

To allow LanProbe to use a Bootp server that is not on the same subnet, the router involved must support Bootp Relay (the transfer of a Bootp request). For example, if you have multiple LanProbes that you want to configure from a single Bootp server, be sure that the routers in the path between your Bootp server and the LanProbes support Bootp Relay. Otherwise, you will need to operate the Bootp server on the same subnet as your LanProbes. You can configure multiple LanProbes on one subnet and then place them on their respective segments.

Table 4-2: Minimum Requirements for a Bootp Server

Item	Bootp Server type		
	HP	**Sun**	**PC**
Model or Processor	HP 9000 Model 700 or 800	Sun SPARC Model 1, 1+, 2, IPC, 5, 10, 20	286 or above
Operating System	HP-UX 9.x or later	Solaris 2.1 or later	DOS 3.0 or later
Network Operating System/Subsystem	ARPA Berkeley Services	Sun Networking Services (Ethernet and TCP/IP)	Microsoft LAN Manager 1.0 or later *-or-* Novell NetWare environment, including LSL.COM v1.2, IPXODI.COM v1.2, NETX.COM v3.1 or later
Floppy Drive	Not Applicable	Not Applicable	3.5" Floppy Disk Drive
System Memory	Not Applicable	Not Applicable	10KB of free memory to run the installation process. 100 KB of free memory to run BOOTPD.

Bootp Server Setup on an HP or Sun System

If your Bootp server is an HP-UX or Solaris system, use the following instructions to configure LanProbe:

1. Determine the IP address to be used for LanProbe.

2. Determine the name to be used as LanProbe's Domain Name Services (refer to the HP ARPA Services manual) or configure an IP address and name for LanProbe in your local /etc/hosts file.

3. Make sure that the Bootp server can communicate with LanProbe (if they are separated by a router, the router must support Bootp Relay).

4. From the Bootp server, edit the client configuration file and enter the following parameters to be used for LanProbe (do not specify any other parameters):

    - MAC Address
    - IP Address
    - Default Gateway IP Address (if available)
    - Subnet Mask

NOTE   The Bootp server must support the vendor specific subnet mask field and the default gateway field.

5. Start the Bootp daemon as described in "Starting the Bootp Server on an HP or Sun System" on page 57.

6. Connect the power cord and Agilent Power Module (0950-2546) to LanProbe and to a power source (either 100-120/VAC or 220-240/VAC). LanProbe does not have a power switch but becomes operational when power is attached.

The probe automatically broadcasts Bootp requestswhen its IP address is
`0.0.0.0` (the default). The probe broadcasts Bootp requests to signal its
need to be configured.

7. For HP-UX systems: Log in as root, then use SAM to follow the instructions
   presented on the screen.

   For HP-UX 9.x, choose:

   > **Networking/Communications -> Service:Enable/Disable**

   For HP-UX 10.x and 11.x, choose:

   > **Networking and Communications -> Network Services**

NOTE   If the last screen presented in Step 7 displays `bootp server enabled`, (for
either HP-UX 9.x, HP-UX 10.x, or HP-UX 11.x) then your machine is already set
up as a bootp server.

8. Edit the `/etc/bootptab` file to configure the probe and add descriptive
   comments to the file for reference. Refer to "Configuring the Bootptab File"
   on page 65, the `bootpd(1M)` man page or the HP ARPA Services manual
   for more information on configuring the `/etc/bootptab file`.

9. Use `tail -f` to check the system log file to ensure that the Bootp server
   responded correctly to the Bootp request. The log file is `/var/adm/`
   `messages` (Solaris), `/usr/adm/syslog` (HP-UX 9.x), or `/usr/`
   `adm/syslog/syslog.log` (HP-UX 10.x and 11.x).

10. If you are using HP OpenView, you can verify that LanProbe has been
    assigned the correct IP address and shows up on the management station
    map as a network analyzer. The discovery process that places LanProbe in
    the management station map can take several minutes to complete.

NOTE   You may be able to decrease the required time for discovery of LanProbe by
pinging it continuously from your Agilent NetMetrix management station. You
can also ping LanProbe to verify that it responds to the new IP address.

Starting the Bootp Server on an HP or Sun System

You can start the Bootp server on an HP or Sun system in one of the following ways. Refer to "Configuring the Bootptab File" on page 65 if you need to configure the bootptab file.

Bootp for Solaris is shipped on the NetMetrix CD-ROM but it is not part of the operating system.

standalone. Become superuser and give one of the following commands:

- **/etc/bootpd -s**   for HP-UX v. 9.x
- **/usr/lbin/bootpd -s**   for HP-UX v. 10.x & 11.x

- **/usr/netm/sun4s/bootpd -s** for Solaris

inetd. Become superuser and use the following procedure:

1. Edit the file /etc/inetd.conf. Search for a line like the following and ensure that the line is uncommented (does not contain a # character). If necessary, add the line to the file.

       bootps dgram udp wait root path**/bootpd bootpd**

    Where path is one of the following:

    /etc   for HP-UX v. 9.x
    /usr/lbin   for HP-UX v. 10.x & 11.x

    /usr/netm/sun4s   for Solaris

2. **For HP-UX**, give one of the following commands to force inetd to re-read the inetd.conf file that you modified in Step 1 on page 57:

    /etc/inetd -c   for HP-UX v. 9.x
    /usr/sbin/inetd -c   for HP-UX v. 10.x & 11.x

3. **For Solaris**, determine the process ID for inetd by entering the following command:

   ps -ef | grep inetd

   Then force inetd to re-read the inetd.conf file that you modified in Step 1 on page 57 by giving the following command:

   kill -HUP process_id

For additional information, refer to the man pages for bootpd(1M), inetd(1M), inetd.conf(4M), ps(1M) and kill.

Bootp Server Setup on a PC

Bootp software for a PC is included (on a 3.5" floppy disk) with your Agilent LanProbe. Bootp software implements an internet Bootstrap Protocol (Bootp) server as defined in RFC 951 and RFC 1048. It is run from the DOS prompt either as a standalone executable or as a terminate-and-stay-resident (TSR) program and communicates to a network interface card using the Microsoft NDIS (LAN Manager), or Novell ODI (NetWare), network stack. Bootp software does not support Microsoft Windows.

Refer to "Configuring the Bootptab File" on page 65 if you need to configure the bootptab configuration file.

Use the following procedure to setup the Bootp server software on a PC:

1. Insert the 3.5" floppy disk into your disk drive.

2. Change the prompt to indicate your floppy disk drive volume and enter setup. The following screen is displayed:

```
Bootp Setup
 ===========
 Setup helps you install the Bootp server software for
 use with either Microsoft LAN Manager or Novell ODI
 version 3.1 software by:
 - copying to your setup drive software for interfacing
   the Bootp program to your networking software.
 - modifying your CONFIG.SYS, AUTOEXEC.BAT, and
   PROTOCOL.INI or NET.CFG files.  (A copy of these files
   are saved in CONFIG.BTP, AUTOEXEC.BTP, PROTOCOL.BTP
   and NET.BTP, respectively.)
 - copying the Bootp software to BOOTPD directory on your
   startup drive.
 - providing a README file that contains more information.

(Press return to continue or press 'E' to exit.)
```

3. Press Return to continue. The following screen is then displayed:

```
Please specify startup drive to install Bootp on  [C:\]:
```

4. Specify the drive where you want to install the Bootp software and press
   Return. The default is to install the Bootp software in C:\. The following
   screen is then displayed:

```
Install Bootp Software for use with:
    0:  Microsoft LAN Manager 1.0 or later
    1:  Novell NetWare v3.1 or later
    2:  Exit this setup program
Enter choice [0 - 2]:
```

5. Specify the Network Operating System that you are using and then refer to
   either "Using Microsoft LAN Manager" below or "Using Novell NetWare"
   on page 62.

   There will be different setup screens displayed depending on the Network
   Operating System that you are using (Microsoft LAN Manager or Novell
   NetWare).

Using Microsoft LAN Manager

If you have selected **Novell NetWare v3.1 or later**, skip to "Using Novell
NetWare" on page 62.

If you have selected **Microsoft LAN Manager 1.0 or later** from the setup menu,
use the following procedure to setup your Bootp installation.

1. Skip this step if you only have one LAN interface in your system (the following screen will not be displayed.) Specify the driver that will be used for the Bootp server. This is an example; your driver may be different.

```
Bootp Installation for Microsoft LAN Manager:
 ===========================================
 Setup has found multiple drivers that it can bind the
 bootp software to.
 Choose one of the following:
      0:   HPLAN
      1:   HPLANB
      2:   Exit this setup program
 Enter number [0 - 2]:
```

2. The final screen looks like the following:

```
The following file has been copied to the directory
 C:\LANMAN.DOS\:
 - DISPKT10.DOS

 The CONFIG.SYS and the PROTOCOL.INI files have been
 modified. Unmodified backups have been saved as
 C:\CONFIG.BTP and C:\LANMAN.DOS\PROTOCOL.BTP.

 The following files have been copied to the directory
 C:\BOOTPD:
 - BOOTPD.EXE
 - BOOTPTAB
 - README.TXT
 BOOTPTAB is a sample configuration file which you must
 modify before executing BOOTPD.EXE.

 Bootp Setup is complete.
 Please read the README.TXT file for additional
 information. You will need to restart your computer
 before running the Bootp software.
```

3. Modify the sample bootptab configuration file and restart your computer before running the Bootp software.

Using Novell NetWare

If you have selected **Microsoft LAN Manager 1.0 or later**, go back to "Using Microsoft LAN Manager" on page 60.

If you have selected **Novell NetWare v3.1 or later** from the setup menu, use the following procedure to setup your Bootp installation.

1. Press return to continue from the following screen.

```
Bootp Installation for Novell networks:
=======================================
In order to use this product using the NetWare protocols,
you need to be running client versions of NetWare that
include:
- LSL.COM      v1.20 or later

Your NET.CFG file must specify a FRAME type of
ETHERNET_II. For example, your NET.CFG should include
something like:
            LINK DRIVER HPWDSA8
                      FRAME ETHERNET_II

Bootp also requires that you do not have Novell TCP/IP
software (LAN Workplace for DOS) installed.

(Press return to continue or 'E' to Exit.)
```

2. Specify the location of the NET.CFG file. The default is for the NET.CFG
   file to be located at C:\NOVELL\NET.CFG.

```
Setup could not find the NET.CFG file.
Please specify a full path and filename
(e.g. C:\NOVELL\NET.CFG):
```

3. The final screen looks like the following:

```
The following file has been copied to the directory C:\:
- ODIPKT13.COM

The AUTOEXEC.BAT and the NET.CFG files have been modified.
A copy of the original files have been saved as
C:\AUTOEXEC.BTP and C:\NETWARE\NET.BTP.

The following files have been copied to the directory
C:\BOOTPD:
- BOOTPD.EXE
- BOOTPTAB
- README.TXT

BOOTPTAB is a sample configuration file which you must
modify before executing BOOTP.EXE

Bootp Setup is compete.
Please read the README.TXT file for additional
information. You will need to restart your computer before
running the Bootp software.
```

Starting the PC Bootp Server

You can start the PC Bootp server in one of the following ways:

● As a standalone executable program by entering the following:

   bootpd -a IP address -s

● As a TSR (terminate-and-stay-resident) program by entering the following:

   bootpd -a IP address

Where:

> **-a IP address** is required and specifies the IP address of the PC where you are running bootpd.
>
> **-s** specifies that you are running bootpd as a standalone executable (not as a TSR). You may want to use the **-s** option if you do not need the Bootp daemon to continually service bootp requests. This is preferable, since the Bootpd TSR may consume a large amount of memory (depending on the size of your bootptab file).

Upon startup, Bootpd reads the bootptab file and then listens for bootp request packets from the network. Bootpd re-reads the bootptab file when it receives a bootp request packet and detects that the file has been updated. If hosts are added, deleted, or modified, their entries in Bootpd's internal database are also updated when the bootptab file is re-read. All Bootp status messages are logged to the BOOTPD.LOG file.

You can now attach the power cord and Agilent Power Module (0950-2546) to LanProbe and to a power source (either 100-120/VAC or 220-240/VAC). LanProbe does not have a power switch but becomes operational when power is attached. When powered on and when its IP address is 0.0.0.0 (the default), LanProbe automatically broadcasts Bootp requests that trigger the Bootp server to provide its configuration parameters.

Configuring the Bootptab File

Configure the bootptab file by using the following procedure and any ASCII text editor to edit one of the files from Table 4-3.

Table 4-3: Bootp Server bootptab Files

Bootp Server:	**Bootptab File Location**
HP 9000 System	/etc/bootptab
Sun SPARC system	/usr/netm/config/bootptab
PC	C:\bootpd\bootptab

1. Enter your IP parameters into the bootptab file for each LanProbe that you want to configure.

   Use this format.

   ```
   nodename:\
               tag=value:\
               tag=value:\
               ...
               tag=value
   ```

   The **nodename** is the host name of the LanProbe. The nodename can be up to 40 characters long using alpha-numerics, dashes, and dots. *Do not use spaces or underscores in the nodename.*

   Each **tag** and its associated value is an IP parameter configured for a LanProbe. Valid tags are listed in Table 4-4 on page 66. You *must* provide a set of these tags for each LanProbe that you want to configure (some tags are optional).

Blank lines and lines beginning with # in the bootptab file are ignored. You must include a colon and a backslash to continue a line. The **ht** tag must precede the **ha** tag.

An example bootptab file is shown at the end of this procedure.

Table 4-4: Bootptab File Tags

Tag	Description
hn	send nodename (Boolean flag, no "=value" is needed)
ht	hardware type (ether); must precede ha tag
vm	vendor magic cookie selector (must comply with RFC 1048)
ha	hardware address (link-level or MAC address expressed in hexadecimal); the LanProbe's hardware address is printed on a label located on the Probe's back panel.
ip	Internet Protocol (IP) address for the Probe
sm	subnet mask; this is required only if subnetting is being used
gw	IP address of the gateway used when sending packets off the local subnet; one default gateway may be configured

2. Save the bootptab file after you have entered parameters for all of your LanProbes.

3. Verify the bootp process by performing one of the items in Table 4-5 on page 67.

Table 4-5: Bootp Process Verification

Server	Verification Process
HP-UX Bootp Server	Test the Bootp process by entering one of the following: For HP-UX 9.x: **/etc/bootpquery** *<hardware address>* For HP-UX 10.x and 11.x: **/usr/sbin/bootpquery** *<hardware address>* Where *<hardware address>* is the MAC address of the HP-UX workstation's LAN interface.
Solaris Bootp Server	If available, test the Bootp process by entering: **/etc/bootpquery** *<hardware address>* where *<hardware address>* is the MAC address of the Solaris workstation's LAN interface.
PC Bootp Server	Check the **C:\bootpd\bootpd.log** file for the entry "Starting bootpd..."

NOTE   Only bootpquery with bootptab entries include the **ba** tag.

Example Bootptab File

The following is an example of the `C:\bootpd\bootptab` file provided with the PC Bootp software. At the end of this bootptab file, there are example IP configuration entries for a LanProbe.

```
# Example bootptab: database for bootp server.
#
# Format:
# nodename: tag=value: ... : tag=value
#
# first field - nodename (hostname) of terminal followed by colon
# (should be full domain name)
#
# Blank lines and lines beginning with '#' are ignored.
# Make sure you include a colon and a backslash to continue a line.
# Don't put any spaces in the tag=value string.
# The ht tag MUST precede the ha tag.
#
# The options listed below are useful for Agilent LanProbes.
# They are specified as tag=value and delimited by colons.
# For a list of all possible options, see the
# C:\BOOTPD\README.TXT file.
#
# ba - broadcast bootp reply for testing with bootpquery
# hn - send nodename (Boolean flag, no "=value" needed)
# ht - hardware type (ether) (must precede the ha tag)
# ha - hardware address (link level address) (hex)
# vm - vendor magic cookie selector (should be rfc1048)
# ip - LanProbe IP address
# sm - network subnet mask
# gw - gateway IP address
#
# LanProbe example
#
# lanprobe1:\
# ba:\
# hn:\
# ht=ether:\
# vm=rfc1048:\
# ha=080009123456:\
# ip=15.6.72.210:\
# sm=255.255.248.0:\
# gw=15.6.72.1
```

5

LanProbe Operation

LanProbe Operation

The Agilent 4986B Ethernet LanProbe is designed to operate unattended once it has been configured and successfully completes its self-tests. This chapter describes how to reset the probe and the effect that different restarts have on probe data and measurement configuration settings.

Restarting the Probe

The LanProbe can be restarted by performing a *warm start* or a *cold start*. In either case, the probe executes self-tests and re-initializes. There are differences in the effects of each type of restart.

- A warm start resets LanProbe's measurement data only.

- A cold start resets all of LanProbe's measurement data, filters, alarms, and user-defined statistics studies (excluding communications configuration parameters) back to default values.

Warm Start

A warm start resets LanProbe's measurement data only. You can warm start LanProbe by doing one of the following:

- Cycling power (or a power outage).

- Selecting the menu item **Warm start and Exit** from LanProbe's Main Menu when you have a local terminal connected to the probe, as described in Step 3 on page 74.

- Using Agilent NetMetrix to execute a LanProbe warm start. Refer to your NetMetrix documentation for details.

Table 5-6 on page 72 shows which data and parameters are reset during a warm start and during a cold start of a LanProbe.

Table 5-6: Probe Data and Parameters Reset by Warm or Cold Start

Category	LanProbe Memory Contents	Warm Start Status	Cold Start Status
Measurement Data	Captured frames	Reset	Reset
	Counted frames	Reset	Reset
	Historical Ethernet statistics	Reset	Reset
	Current Ethernet statistics	Reset	Reset
	Host tables (RMON-1 & RMON-2)	Reset	Reset
	Matrix tables (RMON-1 & RMON-2)	Reset	Reset
	Host Top N statistics	Reset	Reset
	Protocol distribution	Reset	Reset
	Address map	Reset	Reset
	User history	Reset	Reset
	Logs	Reset	Reset
	Echo Test counters	Reset	Reset
Measurement Configuration Parameters	Alarm table	Saved	Reset
	Filter table	Saved	Reset
	Channel table	Saved	Reset
	Buffer control table	Saved	Reset
	Event table	Saved	Reset
	Protocol directory	Saved	Reset
	Community access table	Saved	Reset
	Client tables	Saved	Reset
	Historical study configuration	Saved	Reset
	Echo Test table	Saved	Reset
LanProbe Configuration Parameters	Trap destination table	Saved	Reset
	Serial connection table	Saved	Reset
	Serial configuration information for outgoing connections, such as: dial strings	Saved	Reset
	Time period for utilization calculations	Saved	Saved
	Other Serial configuration information, such as: SLIP address and subnet mask serial port speed modem initialization strings Flow Control	Saved	Saved
	Probe configuration information, such as: IP address default gateway subnet mask	Saved	Saved
	TFTP server address	Saved	Saved
	Download filename	Saved	Saved
	Time zone	Saved	Saved
	Security Settings	Saved	Saved
	Interface Status	Saved	Saved
	Crash data (used by Agilent support)	Saved	Saved

Cycling Power

A power outage or cycling power to LanProbe causes a warm start. LanProbe does not have a power switch; therefore, cycling the power consists of disconnecting and reconnecting the power cord.

Selecting the Warm Start Menu Item

Use the following procedure to warm start the probe using LanProbe's Main Menu:

1. Connect a local terminal (or a PC emulating a terminal) to LanProbe. Refer to Chapter 2 "Local Terminal Configuration" for information on connecting a local terminal.

2. Press the CONFIG button once (on the back of the probe) to place LanProbe into the configuration mode. Use a narrow, pointed object (like a pen) to press the recessed CONFIG button. LanProbe then displays its Main Menu on the terminal. Figure 5-18 shows LanProbe's Main Menu.

```
Main Menu - Revision
1. Modify/View configuration values ->
2. Modify/View security values ->
3. Modify/View interface values ->
4. Display interface summary
5. TFTP Download new firmware ->
6. XMODEM Download new firmware ->
7. Warm start and Exit
8. Cold start and Exit
```

Figure 5-18: LanProbe's Main Menu

3. Press **7** to execute a warm start and exit LanProbe's Main Menu. The warm start occurs immediately. The Activity and Fault LEDs are turned on during a warm start. When the warm start completes, the Activity LED flashes to indicate traffic (if present), the Fault LED turns off, and the ~Line On (or Power) LED is on.

Cold Start

A cold start resets all of LanProbe's measurement data as well as all alarm, event, filter, and user-defined statistics configuration to their default values. Basic communications configuration parameters (IP address, default gateway IP address, and subnet mask) are not reset.

You can cold start LanProbe by doing one of the following:

- Pressing the CONFIG Button twice within one second.

- Selecting the menu item **Cold start and Exit** from LanProbe's Main Menu when you have a local terminal connected to the probe, as described on page 75.

- Using Agilent NetMetrix to execute a LanProbe cold start. Refer to your NetMetrix documentation for details.

Table 5-6 on page 72 shows which data and parameters are reset during a cold start or warm start of LanProbe.

Pressing the CONFIG Button Twice
Pressing the CONFIG button twice within one second causes the probe to cold start.

Selecting the Cold Start Menu Item

Use the following procedure to cold start the probe using LanProbe's Main Menu:

1. Connect a local terminal (or a PC emulation a terminal) to LanProbe. Refer to "LanProbe Operation" on page 69 for information on connecting a local terminal.

2. Press the CONFIG button once (on the back of the probe) to place LanProbe into the configuration mode. Use a narrow, pointed object (like a pen) to press the recessed CONFIG button. LanProbe then displays its Main Menu on the terminal. Figure 5-18 on page 73 shows LanProbe's Main Menu.

3. Press **8** to execute a cold start and to exit LanProbe's Main Menu. The cold start occurs immediately. The Activity and Fault LEDs are turned on during a cold start. When the cold start completes, the Activity LED flashes to indicate traffic (if present), the Fault LED turns off, and the ~Line On (or Power) LED is on.

6

Download New Firmware

Download New Firmware

The instructions in this chapter describe how to download new firmware to the Agilent 4986B Ethernet LanProbe.

This download procedure is only necessary to upgrade your LanProbe firmware to a new firmware release.

New firmware for the LanProbe comes in the form of a binary file. This binary file can be received in the following ways:

- Sent to you by an Agilent Support Representative, on 3.5" floppy disk.

- Sent to you by an Agilent Support Representative via electronic means.

- Included with Agilent NetMetrix.

- Obtained via anonymous ftp from col.hp.com (15.255.240.16). The `/dist/netmetrix/lpfirmware` directory contains the latest version of LanProbe firmware. A README file found in this directory provides more details about the files contained in the `lpfirmware` directory.

CAUTION Downloading new LanProbe firmware resets stored probe data and some probe configuration information (like filters, traps, and channels). It can affect the IP address, subnet mask, or default gateway IP address in some situations. Refer to the Readme file on the new firmware media for more information.

The available procedures for downloading new firmware to LanProbe are documented in this chapter. You should first select a procedure and then go to that section in this chapter and execute that procedure.

The following download procedures are covered in this chapter:

- "Downloading Firmware using an HP-UX Workstation and a Terminal" on page 80

- "Downloading Firmware using a Networked PC and a Terminal" on page 84

- "Xmodem Download of Firmware" on page 88

You can also download firmware using NetMetrix. Refer to your NetMetrix documentation for details.

Downloading Firmware using an HP-UX Workstation and a Terminal

The following instructions assume you are using HP-UX 9.0, or later. Before upgrading firmware, you must first establish an IP connection between your HP-UX workstation and LanProbe.

The following steps are required to download firmware to your LanProbe:

Install New Download Firmware on an HP-UX Workstation

To download a new firmware file to LanProbe using an HP-UX workstation and a terminal, the new firmware file must be copied into the **~tftp** directory on your HP-UX workstation, and the file must be readable by **tftp**. Typically, the **~tftp** directory is **/usr/tftpdir**.

For more information on configuration and usage of **tftp**, refer to your HP-UX **tftp** documentation (typically found in an ARPA Services manual).

Download Firmware to LanProbe

Once the new firmware is installed on the HP-UX workstation, you can download it to LanProbe.

Verify the following before you start the download procedure:

- LanProbe is connected to the network.

- The IP address, subnet mask, and default gateway of LanProbe are configured correctly.

- A terminal (or a PC running terminal emulator software) is attached to the probe's RS-232 port (using a null modem cable). Configure the communication link for 8 bits per character, 1 stop bit, no parity, Xon/Xoff handshaking, and a baud rate of 9600.

- You will also need the IP address of the HP-UX workstation.

Use the following procedure to download firmware to your LanProbe from the HP-UX workstation using a terminal:

CAUTION LanProbe executes a cold start if you press the CONFIG button twice within one second. If this happens, wait for the cold start to be completed (about 45 seconds) and then press the CONFIG button again to re-enter the configuration mode.

1. Press the CONFIG button on the back of LanProbe once. The LanProbe's Main Menu, as shown in Figure 6-19 on page 82, is displayed on the console.

NOTE The LanProbe CONFIG button is recessed. This requires the use of a narrow, pointed object (like a pen) to press the CONFIG button.

A warm start or cold start is completed when the Fault LED goes off. If traffic is present, the Activity LED flashes to show traffic.

```
Main Menu - Revision
1. Modify/View configuration values ->
2. Modify/View security values ->
3. Modify/View interface values ->
4. Display interface summary
5. TFTP Download new firmware ->
6. XMODEM Download new firmware ->
7. Warm start and Exit
8. Cold start and Exit
```

Figure 6-19: LanProbe Main Menu (HP-UX Workstation)

NOTE   Item 5 in Figure 6-19 is not displayed if the **Allow TFTP firmware downloads**
menu item is not enabled. Refer to "Modify/View Security Values" on page 20 for
more information on enabling this menu item.

If item 5 (TFTP Download new firmware) is not displayed, the number used to
access items 6, 7, and 8 will be different.

2. Press **5** to display the Download Menu as shown in Figure 6-20.

```
TFTP Download Menu -- Firmware Rev.

1. Filename to download          ethsnmp.lp
2. tftp server IP address        X.X.X.X
3. Download firmware

0. Return to previous menu

LanProbe IP address:             0.0.0.0
Subnet mask:                     0.0.0.0
Default gateway IP address:      0.0.0.0
```

Figure 6-20: LanProbe TFTP Download Menu (HP-UX Workstation)

3. Verify that LanProbe's IP address, subnet mask, and default gateway address, as displayed at the bottom of the Download Menu screen, are correct. If you need to change the configuration information, press **0** to return to the main menu and then press **1** to modify configuration options.

4. Press **1** from the Download Menu screen, and enter the filename to download.

5. Press **2** and enter the IP address of the HP-UX workstation which is acting as the tftp server.

6. Press **3** to download new LanProbe firmware and wait for LanProbe to reboot automatically. It should take about 90 seconds to transfer the firmware to LanProbe and for the automatic reboot to take place. The probe relays will click at the end of the reboot process.

CAUTION   Do not reset, power-cycle, or reboot LanProbe immediately after the download process. Doing this may cause your probe to be damaged. After the firmware file has been downloaded to the probe, there will be a brief period (approximately 1 minute) while the probe is copying the firmware to the flash EPROM.

After the download process is complete, LanProbe reboots and starts running the new firmware.

If an error occurs during the download process, LanProbe returns to the Main Menu without storing the new firmware to memory.

Downloading Firmware using a Networked PC and a Terminal

You can download new firmware to your LanProbe using a networked personal computer (PC) and a dumb terminal. Before upgrading firmware, you must first establish an IP connection between your networked PC and LanProbe.

The following steps are required to download firmware to LanProbe:

1. "Setup TFTP Server for Downloading" below
2. "Download Firmware to LanProbe" below

Setup TFTP Server for Downloading

Refer to your TFTP application manuals for information on how to setup your server for downloading a file.

Download Firmware to LanProbe

Once your TFTP server is setup for downloading a file, you can download the new firmware file to LanProbe.

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Verify the following before you start the download procedure.

- The probe is connected to the network.

- The IP address, subnet mask, and default gateway of LanProbe are configured correctly.

- A terminal (or a PC running terminal emulator software) is attached to the probe's RS-232 port (using a null modem cable). Configure the communication link for 8 bits per character, 1 stop bit, no parity, Xon/Xoff handshaking, and a baud rate of 9600.

- You will also need the IP address of the networked PC.

Use the following procedure to download firmware to LanProbe from the networked PC using a terminal:

CAUTION LanProbe executes a cold start if you press the CONFIG button twice within one second. If this happens, wait for the cold start to be completed (about 45 seconds) and then press the CONFIG button again to re-enter the configuration mode.

1. Press the CONFIG button on the back of the probe once. The LanProbe's Main Menu, as shown in Figure 6-21 on page 86, is displayed on the console.

NOTE The LanProbe CONFIG button is recessed. This requires the use of a narrow, pointed object (like a pen) to press the CONFIG button.

A warm start or cold start is completed when the Fault LED goes off. If traffic is present, the Activity LED flashes to show traffic.

```
Main Menu - Revision
1. Modify/View configuration values ->
2. Modify/View security values ->
3. Modify/View interface values ->
4. Display interface summary
5. TFTP Download new firmware ->
6. XMODEM Download new firmware ->
7. Warm start and Exit
8. Cold start and Exit
```

Figure 6-21: LanProbe Main Menu (Networked PC)

NOTE   Item 5 in Figure 6-21 is not displayed if the **Allow TFTP firmware downloads** menu item is not enabled. Refer to "Modify/View Security Values" on page 22 for more information on enabling this menu item.

Is item 5 (TFTP Download new firmware) is not displayed, the number used to access items 6, 7, and 8 will be different.

2. Press **5** to display the Download menu as shown in Figure 6-22 on page 86.

```
TFTP Download Menu -- Firmware Rev.

1. Filename to download          ethsnmp.lp
2. tftp server IP address        X.X.X.X
3. Download firmware

0. Return to previous menu

LanProbe IP address:             0.0.0.0
Subnet mask:                     0.0.0.0
Default gateway IP address:      0.0.0.0
```

Figure 6-22: LanProbe TFTP Download Menu (Networked PC)

3. Verify that LanProbe's IP address, subnet mask, and default gateway address, as displayed at the bottom of the Download Menu screen, are correct. If you need to change the configuration information, press **0** to return to the main menu and then press **1** to modify configuration options.

4. Press **1**, from the Download Menu screen, and enter the filename to download.

5. Press **2** and enter the IP address of the networked PC which is acting as the tftp server.

6. Press **3** to download new LanProbe firmware and wait for LanProbe to reboot automatically. It should take about 90 seconds to transfer the firmware to LanProbe and for the automatic reboot to take place. The probe relays will click at the end of the reboot process.

CAUTION   Do not reset, power-cycle, or reboot LanProbe immediately after the download process. Doing this may cause your probe to be damaged. After the firmware file has been downloaded to the probe, there will be a brief period (approximately 1 minute) while the probe is copying the firmware to the flash EPROM.

After the download process is complete, LanProbe reboots and starts running the new firmware.

If an error occurs during the download process, LanProbe returns to the Main Menu without storing the new firmware to memory.

Xmodem Download of Firmware

You can download firmware from your PC to LanProbe via Xmodem by using the following procedure:

1. Access the HyperTerminal Windows 95 application or a similar communications program which supports Xmodem file transfer.

2. Connect your PC to LanProbe's RS-232 connector using a null modem cable. Refer to "Cables and Connectors" on page 95, for more information on cables.

3. Configure the terminal emulator for 8 bits/character, 1 stop bit, no parity, no flow control, and a baud rate of 9600.

4. Connect the power cord to LanProbe and to a power source (either 100-120/VAC or 220-240/VAC). LanProbe does not have a power switch, but is turned on by connecting power.

5. Start the configuration by quickly pressing the CONFIG button on the back of LanProbe one time only. After about 10 seconds, LanProbe displays its Main Menu on the terminal, as shown in Figure 6-23.

```
Main Menu - Revision
1. Modify/View configuration values ->
2. Modify/View security values ->
3. Modify/View interface values ->
4. Display interface summary
5. TFTP Download new firmware ->
6. XMODEM Download new firmware ->
7. Warm start and Exit
8. Cold start and Exit
```

Figure 6-23: LanProbe Main Menu (XMODEM)

6. Press **6** to display the XMODEM download menu shown in Figure 6-24.

```
XMODEM Download Menu -- Firmware Rev.

1. Download at 38400 baud
2. Download at 19200 baud
3. Download at 9600 baud

0. Return to previous menu
```

Figure 6-24: LanProbe XMODEM Download Menu (Networked PC)

7. Press **1**, **2**, or **3** to select the download baud rate. You receive the following message on your PC:

   Downloading to Flash: Receiving File. . .

   This and all of the messages are transmitted at 9600 baud. If you selected a different baud rate, the messages will not be displayed correctly. However, the download will work correctly.

8. If you select a baud rate other than 9600, you will need to change the baud rate of your terminal emulator to match the download speed that you selected. If you are using the HyperTerminal application, select File -> Properties -> Configure. You <u>must</u> select the **Disconnect** icon followed by the **Connect** icon to get the baud rate changes to take effect.

9. Select **Transfer** and then **Send File** menu items from your PC's Windows application. You will be prompted to select the file to download.

   The HyperTerminal application is configured for Zmodem by default. You need to make sure that you select Xmodem from the **Send File** dialog box.

CAUTION   If you selected a baud rate other than 9600, the message following the successful download will not be displayed correctly. In this case, wait approximately 2 minutes before power cycling the probe to ensure that the new firmware is written to FLASH memory correctly.

If your download was not successful, it is recommended that you repeat the process using 9600 baud so that all error message will be displayed correctly.

After the download process is complete, LanProbe reboots and starts running the new firmware.

If an error occurs during the download process, LanProbe returns to the Main Menu without storing the new firmware to memory.

If you are using an HP workstation and LanProbe takes more than 90 seconds to download new firmware and to restart (boot), verify that the workstation is setup correctly, and restart inetd by entering and running the following commands at the workstation:

```
ps -ef | grep inetd
/etc/inetd -k
/etc/inetd
```

NOTE   If you are experiencing tftp transfer timeouts or read errors, use the following procedure to verify that tftp is configured correctly on your unix workstation.

1. Verify tftpd functionality by copying the firmware file to another directory using the tftp command.

   a. cd/tmp
   b. tftp 127.0.0.1
   c. get ethsnmp.lp
   d. quit

2. If the previous step fails, the problem is due to the tftpd configuration on the unix server.

A

Cables and Connectors

Cables and Connectors

This appendix lists cables for use with the Agilent 4986B Ethernet LanProbe. The minimum connector pin-out are shown if you wish to use an unlisted cable. Note that each connector pin-out does not necessarily match the pin-out for the corresponding Agilent cable, but cables manufactured using at least the minimum pin-out will function correctly.

This appendix covers the following sections:

- "Serial Port Interface Cables" on page 93
- "Cable Connector Pin-Outs" on page 94

Serial Port Interface Cables

The following table shows the recommended cables for connecting LanProbe's serial port interface to a terminal or modem. Use the Agilent 24542G cable and a 25-pin to 9-pin straight-through adapter (if required) with the Agilent 4986B Ethernet LanProbe.

Table A-1: Serial Port Interface Cable

Cable Function	Cable Type	Connectors	HP Product Number
Connect a terminal or PC to the probe port for configuring the probe.	RS-232 "Crossover" or "null modem" cable	9-pin female to 25-pin male	24542G
		9-pin female to 25-pin female	24542H
		9-pin female to 25-pin male and "null modem adapter" to 9-pin female to 25-pin male	24542M non-HP 24542M
Connect a modem to the probe port for SLIP communications.	"Straight-through" RS-232 modem cable	9-pin female to 25-pin male	24542M

Cable Connector Pin-Outs

LanProbe's RS-232 Port Pin-Out

The following table shows the pin-out for LanProbe's 9-Pin RS-232 port (connector), which is used to connect to a terminal or modem using the appropriate cable.

Table A-2: LanProbe RS-232 Port Pin-Out

PIN	US	CCITT	DIN
1	DCD	109	M5
2	Rx	104	D2
3	Tx	103	D1
4	DTR	108	S1
5	SIG GND	102	
6	DSR	107	M1
7	RTS	105	S2
8	CTS	106	M2
9	unused		

LanProbe RS-232 Modem Cable Connectors

The following table shows the minimum pin-out for connecting LanProbe's RS-232 port to a modem using a 9-pin male to 9-pin male cable.

Table A-3: LanProbe to Modem Cable Min. Pin-Out (9-Pin to 9-Pin)

Modem End 9-pin Male		Probe End 9-pin Male
1	-->	1
2	-->	2
3	<--	3
4	-->	4
5	---	5
6	-->	6
7	<--	7
8	-->	8

The following table shows the minimum pin-out for connecting LanProbe's
RS-232 port to a modem using a 25-pin male to 9-pin female cable.

Table A-4: LanProbe to Modem Cable Min. Pin-Out (25-Pin to 9-Pin)

Modem End 25-pin Male		Probe End 9-pin Female
2	<--	2
3	-->	3
4	<--	7
5	---	8
6	-->	6
7	<--	5
8	-->	1
20	<--	4

9-pin Terminal/PC Cable Connectors

The following table shows the minimum pin-out for connecting LanProbe's
RS-232 port to a 9-pin terminal (or PC) connector (also known as an RS-232
"Crossover" cable).

Table A-5: LanProbe to 9-Pin Terminal Cable Min. Pin-Out

Terminal/PC		LanProbe
2	<--	2
3	-->	3
5	---	7

10Base-T Network Connector Pin-Out

The following table shows the 10Base-T to 10Base-T connector pin-outs.

Table A-6: 10Base-T Network Connector Pin-Outs

MAU End 10Base-T		Probe End 10Base-T
1	<--	1
2	-->	2
3	-->	3
6	<--	6

B

LanProbe Specifications

LanProbe Specifications

This appendix lists the specifications for the Agilent 4986B Ethernet LanProbe.

Network Compatibility

LanProbe monitors Ethernet version 2.0, IEEE 802.3.

LanProbe can use either the network or the SLIP link to communicate with a management station.

Network Connection

The network connection is made using the standard 10Base-T (also known as RJ-45) connector.

Software Standards

Remote Network Monitoring Management Information Base (RFC 1757), SNMP MIB-II (RFC 1213), SNMP (RFC 1157), RMON-2 (RFC 2021), Remote Network Monitoring MIB Protocol Identifiers (RFC 2074), and Agilent LanProbe Private MIB.

Modem

Supports external Hayes-compatible modems from 300 to 38.4 K baud.

Dimensions

H x W x D   1.5 x 6.25 x 9.5 inches (3.81 x 15.88 x 24.13 cm)

Weight

Probe: 0.68 kg (1.5 lbs)

Power Supply: 0.23 kg (0.5 lbs)

Power Requirements

Power Module (0950-2546)
Input:100 to 240 VAC, 50/60 Hz, 9.75 Amps
Output:5 V, 2 Amps
Accessory:100 to 240 VAC, 50/60 Hz, 9.5 Amps

Range: 100 VAC to 240 VAC +/- 10%

Environment

	Operating	**Non-Operating**
Temperature	0°C to 55°C (32°F to 131°F)	-40°C to 70°C (-40°F to 158°F)
Relative Humidity (non-condensing)	15% to 95% at 40°C (104°F)	15% to 90% at 65°C (149°F)
Maximum Altitude	4.6 km (15,000 ft)	4.6 km (15,000 ft)

Storage Temperature

-40°C to 70°C (-40°F to 158°F)

Probe Memory Allocation

The memory allocated to each parameter depends on how much memory is installed in LanProbe. The memory parameter values relate to the various items in the RMON or the Agilent private MIBs. These parameters were valid at the time of publication.

Table B-7 on page 103 shows the memory allocated to each parameter for the available LanProbe memory configurations. The memory allocation shown for each table assumes that all of the available memory within the probe is allocated to the identified table.

NOTE   The parameter values shown in Table B-7 on page 103 are approximate and subject to change without notice. The values assume that RMON-2 tables have not been created.

Host Table entries, Matrix Table entries, TopN entries, History buckets and Trace buffers (packet capture buffers) are allocated dynamically from the same memory allocation. The values shown for History buckets assume that no Trace buffers are configured. If Trace buffers are configured, the number of History buckets are reduced. The value for host and matrix table sizes assume that both tables are the same size.

The value shown for Trace buffer octet capacity assumes that only the default history studies are set up.

Table B-7: LanProbe Memory Allocation

Parameter	16MB	32MB
Host table size	49,000	102,000
Maximum number of RMON MIB TopN studies	12	12
Maximum entries per TopN study (e.g., top 50 nodes)	11,000	25,000
Maximum traffic matrix table size	80,000	169,000
Maximum number of history studies	12	12
Total number of history buckets for all studies	76,000	159,000
Network layer host table size	68,000	143,000
Network layer traffic matrix table size	29,000	62,500
Application layer host table size	119,000	250,000
Application layer traffic matrix table size	61,000	127,000
Maximum entries per RMON-2 TopN Study	105,000	221,000
Maximum entries per RMON-2 address map	105,000	221,000
Maximum number of alarms	11,000	24,000
Maximum number of events	74,000	155,000
Log table entries	1,024	1,024
Maximum number of filters	32	32
Maximum number of channels	32	32
Maximum number of packet capture buffers	32	32
Trace buffer packet capacity	N/A	N/A
Trace buffer octet capacity	4-14MB	8-30MB
Maximum number of community names in Community Access Table	20	20
Maximum number of IP address entries in Client Table	20	20
Maximum number of trap destination entries (Agilent private MIB)	30	30
Maximum SLIP connection entries	20	20
Maximum single shot ping	20	20
Maximum list pings	100	100

RMON-2 Protocol Directory

Table B-8 shows the RMON-2 protocol directory in your probe.

NOTE The parameter values shown in Table B-8 were accurate at the time of printing and are subject to change without notice.

Table B-8: RMON-2 Protocol Directory

Description	Local Index	ID	Parameters
ethernet	1	0.0.0.1	0
llc (802.2)	2	0.0.0.2	0
snap	3	0.0.0.3	0
ianaAssigned	4	0.0.0.5	0
ethernet.ip	5	0.0.0.1.0.0.8.0	0.0
llc.ip	6	0.0.0.2.0.0.0.6	0.0
snap.ip	7	0.0.0.3.0.0.8.0	0.0
wildcard.ip	8	1.0.0.1.0.0.8.0	0.0
ethernet.arp	9	0.0.0.1.0.0.8.6	0.0
snap.arp	10	0.0.0.3.0.0.8.6	0.0
wildcard.arp	11	1.0.0.1.0.0.8.6	0.0
ethernet.ipx	12	0.0.0.1.0.0.129.55	0.0
llc.ipx	13	0.0.0.2.0.0.0.224	0.0
snap.ipx	14	0.0.0.3.0.0.129.55	0.0
ianaAssigned.ipxOverRaw8023	15	0.0.0.5.0.0.0.1	0.0
wildcard.ipx	16	1.0.0.1.0.0.129.55	0.0
ethernet.appletalk	17	0.0.0.1.0.0.128.155	0.0
snap.appletalk	18	0.0.0.3.0.0.128.155	0.0
wildcard.appletalk	19	1.0.0.1.0.0.128.155	0.0
ethernet.chaosnet	20	0.0.0.1.0.0.8.4	0.0
snap.chaosnet	21	0.0.0.3.0.0.8.4	0.0

Table B-8: RMON-2 Protocol Directory (Continued)

Description	Local Index	ID	Parameters
wildcard.chaosnet	22	1.0.0.1.0.0.8.4	0.0
ethernet.decnet unassigned	23	0.0.0.1.0.0.96.0	0.0
snap.decnet unassigned	24	0.0.0.3.0.0.96.0	0.0
wildcard.decnet unassigned	25	1.0.0.1.0.0.96.0	0.0
ethernet.decmop dump/load assistance	26	0.0.0.1.0.0.96.1	0.0
ethernet.decmop remote console	27	0.0.0.1.0.0.96.2	0.0
ethernet.decnet phaseIV	28	0.0.0.1.0.0.96.3	0.0
ethernet.dec-lat	29	0.0.0.1.0.0.96.4	0.0
ethernet.decnet diagnostics	30	0.0.0.1.0.0.96.5	0.0
ethernet.decnet customer use	31	0.0.0.1.0.0.96.6	0.0
ethernet.decnet lavc, sca	32	0.0.0.1.0.0.96.7	0.0
ethernet.sna	33	0.0.0.1.0.0.128.213	0.0
llc.sna	34	0.0.0.2.0.0.0.4	0.0
snap.sna	35	0.0.0.3.0.0.128.213	0.0
wildcard.sna	36	1.0.0.1.0.0.128.213	0.0
ethernet.vines	37	0.0.0.1.0.0.11.173	0.0
snap.vines	38	0.0.0.3.0.0.11.173	0.0
wildcard.vines	39	1.0.0.1.0.0.11.173	0.0
ethernet.xns	40	0.0.0.1.0.0.6.0	0.0
llc.xns	41	0.0.0.2.0.0.0.128	0.0
snap.xns	42	0.0.0.3.0.0.6.0	0.0
wildcard.xns	43	1.0.0.1.0.0.6.0	0.0
wildcard.ip.icmp	44	1.0.0.1.0.0.8.0.0.0.0.1	0.0.0
wildcard.ip.tcp	45	1.0.0.1.0.0.8.0.0.0.0.6	0.0.0
wildcard.ip.udp	46	1.0.0.1.0.0.8.0.0.0.0.17	0.0.0
wildcard.ip.xns	47	1.0.0.1.0.0.8.0.0.0.0.22	0.0.0
wildcard.ip.iso-tp4	48	1.0.0.1.0.0.8.0.0.0.0.29	0.0.0
wildcard.ip.vines	49	1.0.0.1.0.0.8.0.0.0.0.83	0.0.0

Table B-8: RMON-2 Protocol Directory (Continued)

Description	Local Index	ID	Parameters
wildcard.ip.igrp	50	1.0.0.1.0.0.8.0.0.0.0.88	0.0.0
wildcard.ip.ospfigp	51	1.0.0.1.0.0.8.0.0.0.0.89	0.0.0
wildcard.ip.mtp	52	1.0.0.1.0.0.8.0.0.0.0.92	0.0.0
wildcard.ipx.ncp	53	1.0.0.1.0.0.129.55.0.0.0.17	0.0.0
wildcard.ipx.sap	54	1.0.0.1.0.0.129.55.0.0.4.82	0.0.0
wildcard.ipx.rip	55	1.0.0.1.0.0.129.55.0.0.4.83	0.0.0
wildcard.ipx.netbios	56	1.0.0.1.0.0.129.55.0.0.4.85	0.0.0
wildcard.xns.netbios	57	1.0.0.1.0.0.6.0.0.0.0.1	0.0.0
wildcard.ip.tcp.ftp-d	58	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.20	0.0.0.0
wildcard.ip.tcp.ftp-c	59	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.21	0.0.0.0
wildcard.ip.tcp.telnet	60	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.23	0.0.0.0
wildcard.ip.tcp.smtp	61	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.25	0.0.0.0
wildcard.ip.tcp.nicname	62	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.43	0.0.0.0
wildcard.ip.tcp.xns	63	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.52	0.0.0.0
wildcard.ip.tcp.dns	64	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.53	0.0.0.0
wildcard.ip.tcp.gopher	65	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.70	0.0.0.0
wildcard.ip.tcp.finger	66	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.79	0.0.0.0
wildcard.ip.tcp.http	67	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.80	0.0.0.0
wildcard.ip.tcp.npp	68	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.92	0.0.0.0
wildcard.ip.tcp.hostname	69	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.101	0.0.0.0
wildcard.ip.tcp.iso_tsap	70	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.102	0.0.0.0
wildcard.ip.tcp.pop2	71	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.109	0.0.0.0
wildcard.ip.tcp.pop3	72	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.110	0.0.0.0
wildcard.ip.tcp.sunrpc	73	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.111	0.0.0.0
wildcard.ip.tcp.nntp	74	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.119	0.0.0.0
wildcard.ip.tcp.ntp	75	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.123	0.0.0.0
wildcard.ip.tcp.netbios-ns	76	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.137	0.0.0.0

Table B-8: RMON-2 Protocol Directory (Continued)

Description	Local Index	ID	Parameters
wildcard.ip.tcp.netbios-dgm	77	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.138	0.0.0.0
wildcard.ip.tcp.netbios-ssn	78	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.139	0.0.0.0
wildcard.ip.tcp.news	79	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.144	0.0.0.0
wildcard.ip.tcp.irc	80	1.0.0.1.0.0.8.0.0.0.0.6.0.0.0.194	0.0.0.0
wildcard.ip.tcp.netware-ip	81	1.0.0.1.0.0.8.0.0.0.0.6.0.0.1.140	0.0.0.0
wildcard.ip.tcp.exec	82	1.0.0.1.0.0.8.0.0.0.0.6.0.0.2.0	0.0.0.0
wildcard.ip.tcp.login	83	1.0.0.1.0.0.8.0.0.0.0.6.0.0.2.1	0.0.0.0
wildcard.ip.tcp.printer	84	1.0.0.1.0.0.8.0.0.0.0.6.0.0.2.3	0.0.0.0
wildcard.ip.tcp.lotusnote	85	1.0.0.1.0.0.8.0.0.0.0.6.0.0.5.72	0.0.0.0
wildcard.ip.tcp.ccmail	86	1.0.0.1.0.0.8.0.0.0.0.6.0.0.12.192	0.0.0.0
wildcard.ip.tcp.x11	87	1.0.0.1.0.0.8.0.0.0.0.6.0.0.23.112	0.0.0.0
wildcard.ip.udp.nicname	88	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.43	0.0.0.0
wildcard.ip.udp.xns	89	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.52	0.0.0.0
wildcard.ip.udp.dns	90	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.53	0.0.0.0
wildcard.ip.udp.bootp-server	91	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.67	0.0.0.0
wildcard.ip.udp.bootp-client	92	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.68	0.0.0.0
wildcard.ip.udp.tftp	93	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.69	0.0.0.0
wildcard.ip.udp.gopher	94	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.70	0.0.0.0
wildcard.ip.udp.finger	95	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.79	0.0.0.0
wildcard.ip.udp.http	96	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.80	0.0.0.0
wildcard.ip.udp.npp	97	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.92	0.0.0.0
wildcard.ip.udp.hostname	98	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.101	0.0.0.0
wildcard.ip.udp.sunrpc	99	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.111	0.0.0.0
wildcard.ip.udp.ntp	100	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.123	0.0.0.0
wildcard.ip.udp.netbios-ns	101	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.137	0.0.0.0
wildcard.ip.udp.netbios-dgm	102	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.138	0.0.0.0
wildcard.ip.udp.netbios-ssn	103	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.139	0.0.0.0
wildcard.ip.udp.news	104	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.144	0.0.0.0
wildcard.ip.udp.snmp	105	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.161	0.0.0.0

Table B-8: RMON-2 Protocol Directory (Continued)

Description	Local Index	ID	Parameters
wildcard.ip.udp.snmptrap	106	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.162	0.0.0.0
wildcard.ip.udp.irc	107	1.0.0.1.0.0.8.0.0.0.0.17.0.0.0.194	0.0.0.0
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[1]Wildcard.ipx includes ianaAssigned.ipxOverRaw8023 as a wildcard. It is used to aggregate counters by using a single protocol value to indicate potentially many base layer encapsulations of a network layer protocol.

Glossary

Glossary

10Base-T
10 Mbps, BASEband operation, unshielded Twisted-pair wiring used for Ethernet networks.

Agent
A node (or software/hardware on a node) that supplies network management information.

Battery-backed RAM
The probe's memory that contains a copy of the probe configuration. If power is removed from the probe (either by unplugging the power cord or from a power outage), this memory is preserved by power provided by the probe's internal battery.

Bridge
A device providing an intelligent connection between two otherwise independent LANs. Bridges operate at layer 2 of the ISO OSI reference model. A bridge inspects every packet originating on either LAN and creates a table of nodes and their locations. It isolates the LANs from each other, allowing both sides to pass traffic internally. If a transmission from one LAN is addressed to a node on the other LAN, the bridge transmits it onto the other LAN for the destination node.

Broadcast address
The station address FFFFFF-FFFFFF. Packets intended for all nodes on a LAN use this address as the destination address.

Broadcast packet
A packet sent to all nodes on a LAN.

Collision
The result of two or more nodes on a LAN transmitting at the same time, producing a garbled transmission.

Console
The ASCII terminal, or PC emulating an ASCII terminal that is connected to the probe and used to configure, monitor, and troubleshoot the probe.

CRC (cyclic redundancy check)
An error detection scheme used by the probe to ensure that packets received by the probe have not been corrupted during transmission from the source node.

CSMA/CD (Carrier Sense Multiple Access/Collision Detection)
The network access-control mechanism that is based on collisions and utilized by Ethernet networks. On contention-based networks, like Ethernet networks, each station must detect an idle network prior to transmitting. If more than one station transmits simultaneously, a collision occurs, all stations are notified, and the colliding stations try retransmitting after waiting a random amount of time.

Default Gateway Address
The address of the gateway which is closest to the probe.

DRAM
Dynamic Random Access Memory, which is the main memory of LanProbe.

Ethernet
A LAN developed by Xerox Corp., Digital Equipment Corp., and Intel Corp. It uses the CSMA/CD method of access and transmits at 10 Mbit/s on a bus topology. The IEEE 802.3 standard evolved from Ethernet, but they are not exactly the same. Network devices based on both standards can co-exist on the same medium, but they cannot exchange data directly without special, "bilingual", software that can decode packets of both types.

Extended LAN
A network consisting of two or more LANs that are connected by bridges, routers, or other similar devices. Resources on the LANs can be accessed by users on any of the LANs. See also LAN.

Flash EPROM
EPROM that can be erased and reprogrammed while installed in a circuit.

Gateway
A dedicated computer that is used to route frames from one dissimilar network to another.

IEEE 802.3 standard
Part of the Institute of Electrical and Electronics Engineers 802 family of LAN standards. The 802.3 standard defines the physical layer (layer 1) and part of the data link layer (layer 2) of the ISO OSI reference model for a CSMA/CD LAN. The IEEE 802.3 standard evolved from Ethernet, but the two networks are not fully compatible with each other.

IP Address (Internet Protocol Address)
A 32-bit address that is divided into network-identifier and host-identifier fields, which are used to identify a particular physical network or a particular device attached to that physical network (respectively).

LAN (local area network)
A general-purpose communications network that interconnects a variety of devices within a limited geographical area. Two common LANs, IEEE 802.3 and Ethernet, have compatible cabling requirements, and can co-exist on a common installation, but have different protocols.A LAN might connect computers on adjacent desks, within a building, or within several buildings of a campus. **See also** extended LAN.

LAN cable
The medium through which data moves in a LAN. LAN cables come in many types. For example, thick (10 mm) coaxial cable, thin (5 mm) coaxial cable, fiber-optic cable, and twisted-pair cable.

LanProbe
See probe.

MAC address
A 12-digit (48 bit) hexadecimal number that identifies a specific network station and allows messages to be directed to that station only. Because the IEEE has assigned identifiers for each hardware manufacturer, no two pieces of equipment have the same address. The address assigned according to the IEEE plan is referred to as a device's globally-administered station address. Some devices provide an option for the user to assign a different station address that will override the original. This type of address is referred to as a locally-administered station address. The station address is also commonly called a MAC address, Ethernet address, Token-Ring address, or physical address.

Manager
A node that collects network management information from agents.

Management station
A station that collects network management information from probes.

MAU (Medium Attachment Unit)
The assembly used to provide the physical connection and access to a LAN. It is the device on the LAN that detects collisions. (A transceiver is also called a MAU in the IEEE 802.3 standard.)

MIB (Management Information Base)
A data structure used for communication and control of the probe.

NetMetrix
NetMetrix refers to the HP OpenView NetMetrix/UX software suite for HP-UX and Solaris.

Node
A computer or other addressable device on a network, including PCs, terminals, probes, routers, and mainframes. Usually, a node has a station address.

Object
Any device that can be monitored or controlled by use of the SNMP protocol.

Packet
A bit stream consisting of predefined fields that contain data, addresses, and control information. In the IEEE 802.3 environment, this structure is often referred to as the **MAC frame**. Packet is used in the Ethernet environment and is used in this guide because it is the more commonly understood term. Different protocols have different packet and frame specifications.

Private MIB
A proprietary MIB that has variables which are used for probe configuration and control options.

Probe
A device on the LAN that monitors all frames and produces network management information including current and historical traffic statistics and snapshots of selected frames. Probes are also known as monitors.

Protocol
A set of rules that governs data transfer among devices on a network. A protocol identifies the handshake type, frame size and format, timing, error recovery scheme, word size or other characteristics of each transfer, depending on the system.

RMON MIB (Remote Network Monitoring MIB)
The collection of objects defined by the Internet Engineering Task Force in RFC 1757, RFC 1213, RFC 1157, RFC 2021, RFC 2074, and Agilent LanProbe private MIB that are used for network monitoring.

RS-232 port
A serial interface connector on a computer or peripheral that adheres to the current RS-232 standard. The LanProbe RS-232 port adheres to this standard.

SAM (System Administration Manager)
A configuration tool provided by HP-UX for managing system resources and changing configuration parameters.

Server
A device on the network that is dedicated to specific functions.

SIMM (Single Inline Memory Module)
DRAM that is mounted on a small printed circuit board that can be installed in the Agilent LanProbe. Also see DRAM.

SLIP (Serial Line Internet Protocol)
A protocol used for serial communications.

SNMP (Simple Network Management Protocol)
A network management protocol used for communicating between network managers and network objects.

Station
A computer or other addressable device on a network, including PCs, terminals, probes, routers, and mainframes. A station must have an IP address.

Subnet Mask
Identifies the subnet field of a network address and is a 32-bit Internet address written in dotted-decimal notation. A subnet mask is used to divide a network into sub networks.

Terminal
An input/output device that permits interaction with a probe or computer. The device can be a display and keyboard, or a personal computer. An ASCII terminal, or PC emulating an ASCII terminal, can be connected to the probe for configuration, monitoring, and troubleshooting the probe.

Topology
The organization of network devices in a network. Ethernet uses a bus Topology.

UTP (Unshielded Twisted Pair)
A cable that is twisted in pairs. Pair twisting reduces crosstalk by canceling the magnetic fields generated in each of the twisted wires.

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