

---

# Installation/User's Guide

---

## **Agilent J3916A HSSI WanProbe**

---

# Consumer Warranty Statement

## AGILENT TECHNOLOGIES, INC. LIMITED WARRANTY STATEMENT

AGILENT PRODUCT	DURATION OF LIMITED WARRANTY
HSSI WanProbe	1 year

Agilent warrants to you, the end-user customer, that Agilent hardware, accessories and supplies will be free from defects in materials and workmanship after the date of purchase, for the period specified above. If Agilent receives notice of such defects during the warranty period, Agilent will, at its option, either repair or replace products which prove to be defective. Replacement products may be either new or like-new.

Agilent warrants to you that Agilent software will not fail to execute its programming instructions after the date of purchase, for the period specified above, due to defects in material and workmanship when properly installed and used. If Agilent receives notice of such defects during the warranty period, Agilent will replace software media which does not execute its programming instructions due to such defects.

Agilent does not warrant that the operation of Agilent products will be uninterrupted or error free. If Agilent is unable, within a reasonable time, to repair or replace any product to a condition as warranted, you will be entitled to a refund of the purchase price upon prompt return of the product.

Agilent products may contain remanufactured parts equivalent to new in performance or may have been subject to incidental use.

Warranty does not apply to defects resulting from (a) improper or inadequate maintenance or calibration, (b) software, interfacing, parts or supplies not supplied by Agilent, (c) unauthorized modification or misuse, (d) operation outside of the published environmental specifications for the product, or (e) improper site preparation or maintenance.

AGILENT MAKES NO OTHER EXPRESS WARRANTY OR CONDITION WHETHER WRITTEN OR ORAL. TO THE EXTENT ALLOWED BY LOCAL LAW, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY SET FORTH ABOVE. Some countries, states or provinces do not allow limitations on the duration of an implied warranty, so the above limitation or exclusion might not apply to you. This warranty gives you specific legal rights and you might also have other rights that vary from country to country, state to state, or province to province.

TO THE EXTENT ALLOWED BY LOCAL LAW, THE REMEDIES IN THIS WARRANTY STATEMENT ARE YOUR SOLE AND EXCLUSIVE REMEDIES. EXCEPT AS INDICATED ABOVE, IN NO EVENT WILL AGILENT OR ITS SUPPLIERS BE LIABLE FOR LOSS OF DATA OR FOR DIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFIT OR DATA), OR OTHER DAMAGE, WHETHER BASED IN CONTRACT, TORT, OR OTHERWISE. Some countries, States or provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

FOR CONSUMER TRANSACTIONS IN AUSTRALIA AND NEW ZEALAND: THE WARRANTY TERMS CONTAINED IN THIS STATEMENT, EXCEPT TO THE EXTENT LAWFULLY PERMITTED, DO NOT EXCLUDE, RESTRICT OR MODIFY AND ARE IN ADDITION TO THE MANDATORY STATUTORY RIGHTS APPLICABLE TO THE SALE OF THIS PRODUCT TO YOU.

---

## Operating Restrictions

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

---

### MISE EN GARDE

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 EN GARDE

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 garde 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 precautions 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 châssis 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 homologuée 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 «Commission 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 composants 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.

**Unauthorized Service**

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.

Return the instrument to a Agilent Technologies, Inc. Sales and Service Office for authorized service and repair.

---

## Notice

© Copyright Agilent Technologies, Inc.

All Rights Reserved

Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

The information contained in this document is subject to change without notice.

**Agilent Technologies, Inc. makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.** Agilent Technologies shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Agilent Technologies assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Agilent Technologies.

This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Agilent Technologies, Inc.

Agilent Technologies, Inc.  
NetMetrix Division  
5070 Centennial Boulevard  
Colorado Springs, Colorado 80919-2497

---

## Safety Information

Before you use this instrument, be sure to pay special attention to the “Safety” and “Warning” topics in this Manual. Failure to comply with the precautions or with specific warnings in this book violates safety standards of design, manufacture, and intended use of this instrument. Agilent assumes no liability for the customer’s failure to comply with these requirements.

**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.

**Explosion Hazard.** Do not operate in the presence of flammable gases.

**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**.

---

## Trademarks

Agilent is a registered trademark and OpenView is a trademark of Hewlett-Packard Company.

Microsoft, LAN Manager, MS-DOS, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

Ethernet is a trademark of Xerox Corporation.

Hayes is a registered trademark of Hayes MicroComputer Products, Inc.

IBM and Token-Ring are trademarks of International Business Machines Corporation.

Sun and Solaris are registered trademarks of Sun Microsystems, Inc.

SPARC is a registered trademark of SPARC International, Inc. Products bearing the SPARC trademark are based on an architecture developed by Sun Microsystems, Inc.

Novell and NetWare are registered trademarks of Novell Inc.

---

## Printing History

New editions are complete revisions of this book. Update packages may contain new or additional material and be released between editions. See the date of the current edition on the back cover of this book.

First Edition . . . . . November 1999 J3916-99501

---

## 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.



---

# Contents

Consumer Warranty Statement . . . . .	ii
Operating Restrictions . . . . .	iv
Notice . . . . .	vi
Safety Information . . . . .	vii
Warning Symbols Used in This Book . . . . .	viii
Conventions Used in this Book . . . . .	ix
Trademarks . . . . .	x
Printing History . . . . .	xi
Additional Help . . . . .	xi
<b>1 Introduction . . . . .</b>	<b>1</b>
Installation and Configuration Overview . . . . .	4
Local Terminal Configuration and Installation . . . . .	4
Installation and Bootp Server Configuration . . . . .	4
Probe Overview . . . . .	5
System Overview . . . . .	5
Supported MIBs . . . . .	7
Management Stations . . . . .	8
Access Security . . . . .	8
Status LEDs . . . . .	10
Front Panel LEDs . . . . .	10
Rear Panel Telemetry LEDs . . . . .	11
10Base-T/100Base-TX Telemetry Interface Status LEDs . . . . .	11
Token-Ring Telemetry Interface Status LED . . . . .	12
HSSI WAN Interface Status LEDs . . . . .	13
CONFIG Button . . . . .	13
Included Parts . . . . .	14
Optional Accessories . . . . .	14
<b>2 Local Terminal Configuration . . . . .</b>	<b>15</b>
Probe Configuration Using a Local Terminal . . . . .	17
Using the Main Menu . . . . .	19
Modify/View Configuration Values . . . . .	22
Modify/View Security Values . . . . .	24

Modify/View Interface Values . . . . .	25
Fast Ethernet Telemetry Interface Configuration . . . . .	25
Token-Ring Telemetry Interface Configuration . . . . .	29
HSSI WAN Interface Configuration . . . . .	33
Display Interface Summary . . . . .	36
Modify/View Serial Port Settings . . . . .	36
Exiting the Main Menu and Restarting the Probe . . . . .	40
<b>3 Installation . . . . .</b>	<b>41</b>
Selecting a Location . . . . .	43
Installing the Probe . . . . .	44
Table Installation . . . . .	45
Rack or Cabinet Installation . . . . .	45
Wall Installation . . . . .	47
Connecting the Probe . . . . .	49
Connecting to the Network (Out-of-Band) . . . . .	49
Connecting to 10MB/s Ethernet Telemetry Networks . . . . .	50
Connecting to 10Base-T/100Base-TX Telemetry Networks . . . . .	51
Connecting to Token-Ring Telemetry Networks . . . . .	53
About the Information in the Following Sections . . . . .	56
Connecting to a HSSI System (In-Band) . . . . .	56
HSSI Monitor Connections . . . . .	56
Connecting to the Serial Port (Out-of-Band) . . . . .	59
Direct Connection . . . . .	59
Modem Connection . . . . .	60
Data Switch Connection . . . . .	65
Starting the Probe . . . . .	67
Verifying the Installation . . . . .	68
Out-of-Band Troubleshooting . . . . .	69
Ethernet Telemetry Interface . . . . .	69
HSSI Troubleshooting . . . . .	70
<b>4 Bootp Server Configuration . . . . .</b>	<b>71</b>
Probe Configuration Using a Bootp Server . . . . .	73
Bootp Server Setup on an HP or Sun System . . . . .	75
Starting the Bootp Server on an HP or Sun System . . . . .	77
Bootp Server Setup on a PC . . . . .	79
Using Microsoft LAN Manager . . . . .	80
Using Novell NetWare . . . . .	82

Starting the PC Bootp Server .....	83
Configuring the Bootptab File .....	85
Example Bootptab File .....	88
<b>5 Probe Operation .....</b>	<b>89</b>
Restarting the Probe .....	91
Warm Start .....	91
Cycling Power .....	93
Selecting the Warm Start Menu Item .....	94
Cold Start .....	95
Pressing the CONFIG Button Twice .....	95
Selecting the Cold Start Menu Item .....	96
<b>6 Download New Firmware .....</b>	<b>97</b>
Downloading Firmware using an HP-UX Workstation and a Terminal	100
Install New Download Firmware on an HP-UX Workstation ...	100
Download Firmware to the Probe .....	101
Downloading Firmware using a Networked PC and a Terminal ...	104
Setup TFTP Server for Downloading .....	104
Download Firmware to the Probe .....	104
Xmodem Download of Firmware .....	108
<b>A Cables and Connectors .....</b>	<b>113</b>
HSSI Connectors and Cables .....	115
HSSI Null Modem Cable .....	116
Token-Ring Cables .....	118
Serial Port Interface Cables .....	119
Cable Connector Pin-Outs .....	120
The Probe's RS-232 Port Pin-Out .....	120
The Probe's RS-232 Modem Cable Connectors .....	121
25-pin Terminal/PC Cable Connectors .....	122
9-pin Terminal/PC Cable Connectors .....	122
UTP Network Connector Pin-Out .....	123
STP Network Connector Pin-Out .....	124

**B Specifications . . . . . 125**

Probe Memory Allocation . . . . . 128

**Glossary**

**Index**

**Agilent Technologies, Inc. Offices**

---

# Figures

Figure 1-1: The Probe.....	3
Figure 1-2: Probe System Example .....	6
Figure 1-3: Front Panel LEDs .....	11
Figure 1-4: Rear Panel LEDs .....	12
Figure 2-1: Probe Rear Panel .....	20
Figure 2-2: Probe Main Menu .....	21
Figure 2-3: Modify/View Configuration Values Menu .....	22
Figure 2-4: Modify/View Security Values Menu .....	24
Figure 2-5: Modify/View Interface Values Menu (Fast Ethernet) ...	26
Figure 2-6: Modify/View Interface Values Menu (Token Ring) .....	30
Figure 2-7: Modify/View Interface Values Menu (HSSI WAN) .....	33
Figure 2-8: Display Interface Summary .....	36
Figure 2-9: Modify/View Serial Port Settings Menu .....	37
Figure 3-1: Install the Probe in a Rack or Cabinet.....	46
Figure 3-2: Install the Probe on a Wall .....	48
Figure 3-3: Probe Rear Panel (Token-Ring Option shown) .....	50
Figure 3-4: Connecting the Probe to a 10MB/s Ethernet Network ...	51
Figure 3-5: Connecting the Probe to a 10Base-T/100Base-T Network	53
Figure 3-6: Connecting the Probe Using RJ-45 Connectors .....	54
Figure 3-7: Connecting the Probe using a Media Filter .....	55
Figure 3-8: Connecting the Probe Using Data & DB-9 Connectors ..	56
Figure 3-9: HSSI System .....	57
Figure 3-10: Close-up of the HSSI Interface .....	57
Figure 3-11: HSSI Monitor In-Line Connection .....	58
Figure 3-12: Probe Direct Connection .....	60
Figure 3-13: Probe Modem Connection .....	61
Figure 3-14: Probe Data Switch Connection .....	66
Figure 5-1: Probe Main Menu .....	94
Figure 6-1: Probe Main Menu (HP-UX Workstation).....	102
Figure 6-2: Probe TFTP Download Menu (HP-UX Workstation) ...	103
Figure 6-3: Probe Main Menu (Networked PC) .....	106
Figure 6-4: Probe TFTP Download Menu (Networked PC) .....	107

Figure 6-5: Probe Main Menu (XMODEM) .....	109
Figure 6-6: Probe XMODEM Download Menu .....	109
Figure A-1: Data Connector Color Coded Connection Points .....	124
Figure B-1: Probe Memory Allocation .....	129

---

## Tables

Table 1-1: Private MIB Access Security Privileges . . . . .	9
Table 4-1: Minimum Requirements for a Bootp Server. . . . .	74
Table 4-2: Bootp Server Bootptab Files . . . . .	85
Table 4-3: Bootptab File Tags . . . . .	86
Table 4-4: Bootp Process Verification . . . . .	87
Table 5-1: Probe Data and Parameters Reset by Warm or Cold Start . .	92
Table A-1: HSSI Interface Cable Pinout . . . . .	115
Table A-2: HSSI Null Modem Cable Pinout . . . . .	116
Table A-3: Token-Ring Cable Type, Vp, and Impedance . . . . .	118
Table A-4: Serial Port Interface Cable . . . . .	119
Table A-5: Probe RS-232 Port Pin-Out . . . . .	120
Table A-6: Probe to Modem Cable Min. Pin-Out (25-Pin to 25-Pin) .	121
Table A-7: Probe to 25-Pin Terminal Cable Min. Pin-Out . . . . .	122
Table A-8: Probe to 9-Pin Terminal Cable Min. Pin-Out . . . . .	122
Table A-9: UTP (Type 3) Network Connector Pin-Outs . . . . .	123
Table A-10: STP (Type 1) Network Connector Pin-Outs . . . . .	124



---

**Introduction**

## Introduction

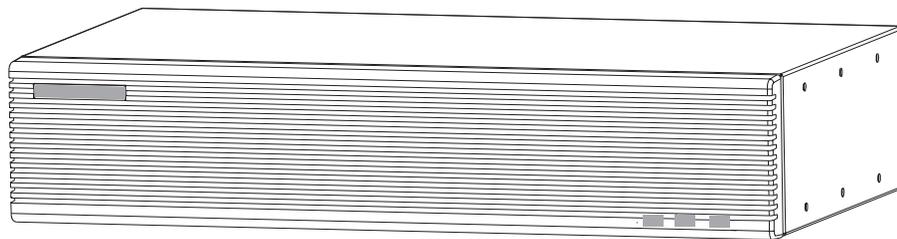
This chapter introduces the Agilent J3916A HSSI WanProbe, shown in Figure 1-1 on page 3, including its installation and configuration options.

You can use your WanProbe with the NetMetrix/UX software, supported by HP-UX and Solaris. The term “NetMetrix” is used in this manual to refer to Agilent NetMetrix/UX.

The Agilent J3916A HSSI WanProbe is a MIPS-based, SNMP-managed WAN interface monitor for HSSI Wide Area Networks (WAN). The WanProbe is an intelligent device that must be physically located at the site where the WAN circuits reside.

The base hardware configuration supports a HSSI WAN interface, a 10Base-T/100Base-TX telemetry interface, and a SLIP connection. The HSSI WanProbe can also be ordered with a Token-Ring telemetry interface. The HSSI WAN interface supports monitoring both directions of a full-duplex circuit simultaneously. Probe data is retrieved using SNMP via a LAN or SLIP connection.

The 10Base-T/100Base-TX telemetry interface uses an RJ-45 connector. The Ethernet telemetry interface uses an AUI connector. The optional Token-Ring telemetry interface uses either an RJ-45 or DB-9 connector. The HSSI WAN interface uses industry-standard connectors.



**Figure 1-1: The Probe**

The HSSI WanProbe has 32 MB of memory (optionally 64 or 128 MB), and uses FLASH EPROM. Probe firmware upgrades are easily downloaded over the LAN to multiple probes simultaneously. You can also download firmware using the probe's serial port.

The WanProbe 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 to a number of parameters to immediately alert the network manager or initiate a packet trace to capture the details of an event for later analysis. Traffic and error levels are monitored for the WAN connection on a per-PCV basis.

In addition to using SNMP and selected RMON MIB groups, the WanProbe uses Agilent private MIB extensions to provide additional capabilities. Multiple SNMP trap addresses, or groups of addresses, can be defined for event notification. A real-time utilization variable provides the alarm capability at 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.

## **Installation and Configuration Overview**

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

---

### **Local Terminal Configuration and Installation**

This method of installation and configuration requires that you first configure the probe and then install the probe. These procedures are detailed in “Local Terminal Configuration and Installation” on page 4 and “Installation” on page 41.

---

### **Installation and Bootp Server Configuration**

This method of installation and configuration requires that you first install the probe and then configure the probe. These procedures are detailed in “Installation” on page 41 and “Bootp Server Configuration” on page 71.

---

## Probe Overview

This section provides some general information on the Agilent J3916A HSSI WanProbe.

---

### **NOTE**

The HSSI WanProbe repeats the received signal. There is a few milliseconds interruption to network traffic if the probe loses power.

---

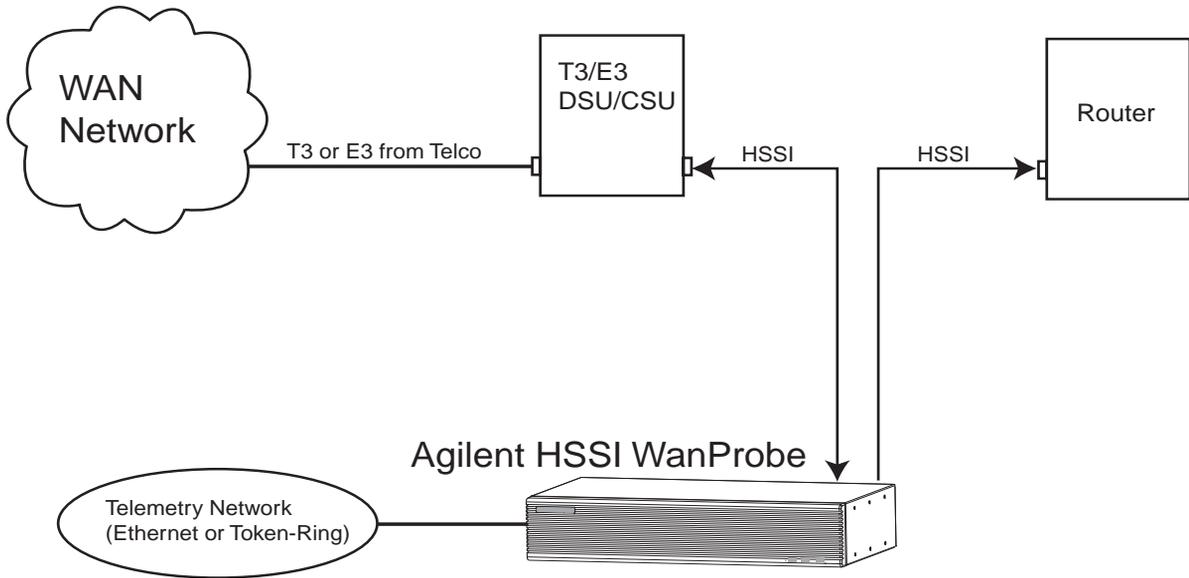
## System Overview

A typical probe distributed monitoring system consists of the following:

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

Figure 1-2 on page 6 shows a WanProbe system example.

Introduction  
**Probe Overview**



**Figure 1-2: Probe System Example**

---

## Supported MIBs

The WanProbe uses SNMP, MIB-II, Agilent private MIB extensions, and selected RMON MIB groups (groups 3,7,8, and 9) to provide the following features:

- Alarms
- Filters
- Packet Capture
- Events
- Log
- Trap
- Signaling Layer Statistics
- Signaling Layer Historical Statistics
- Frame Relay Protocol Statistics
- Frame Relay Historical Protocol Statistics
- PPP\* Protocol Statistics
- PPP\* Historical Protocol Statistics
- Per PVC Frame Relay Protocol Statistics
- Per PVC Frame Relay Historical Protocol Statistics
- Per PVC PPP\* Protocol Statistics
- Per PVC PPP\* Historical Protocol Statistics

\* PPP refers to PPP, HDLC, or SDLC.

The WanProbe implements groups 3, 7, 8, and 9 of RFC 1757, the Remote Network Monitoring Management Information Base (RMON-1 MIB). Refer to the RFC for more information.

The WanProbe also implements the Agilent Private MIB, which contains all WAN statistics and 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.

## **Management Stations**

You can use a management station to communicate with the probe and gather network data. The management station presents information in an easy-to-use and easy-to-understand text and graphic format.

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

Refer to your NetMetrix documentation for more information.

---

## **Access Security**

A network administrator can disable standard RMON functions as a security precaution. A security menu allows the network administrator to disable the RMON-1 packet capture capabilities of the probe to prevent network users from viewing network traffic. TFTP firmware downloads can be disabled to prevent users from downloading earlier versions of the probe firmware. For more information, refer to “Modify/View Security Values” on page 24.

The probe private MIB uses a four-level access control scheme. An access level is assigned for each community string. 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 on page 9 shows specific access privileges by level.

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

**Table 1-1: Private MIB Access Security Privileges**

## Status LEDs

The probe has status LEDs for the base hardware configuration (the 10Base-T/100Base-TX telemetry interface), for the HSSI WAN interface, and for the optional Token-Ring telemetry interface. These LEDs are located on the front and back panels of the probe. (Figure 1-3 on page 11 shows the LEDs on the front of the probe and Figure 1-4 on page 12 shows the LEDs on the back of the probe.)

---

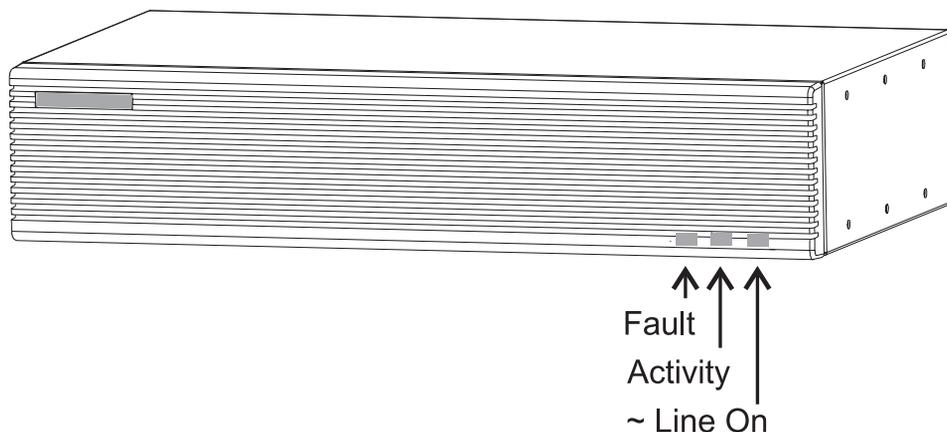
### Front Panel LEDs

The ~ Line On, Activity, and Fault LEDs are on the front of the probe.

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

**Activity.** This green LED is turned on when data is being received from the Ethernet telemetry network or transmitted by the probe. 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 the probe 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.



**Figure 1-3: Front Panel LEDs**

---

## Rear Panel Telemetry LEDs

The telemetry LEDs are located on the back of the probe. (See Figure 1-4.)

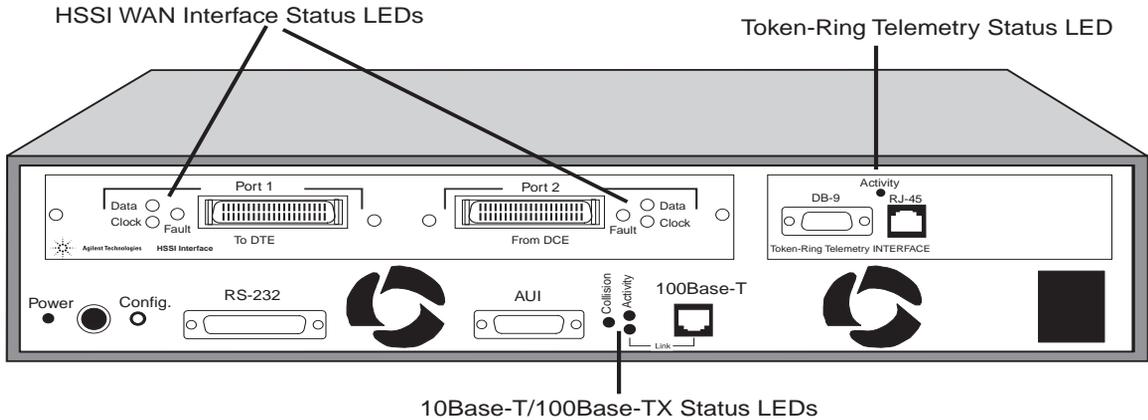
### 10Base-T/100Base-TX Telemetry Interface Status LEDs

On the back of the probe, there are LEDs associated specifically with each interface and a Power LED. The 10Base-T/100Base-TX telemetry interface has LEDs for Activity, Link and Collision.

**Link.** This green LED is turned on when the probe is attached to a 10Base-T/100Base-TX network.

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

## Introduction Status LEDs



**Figure 1-4: Rear Panel LEDs**

### **Token-Ring Telemetry Interface Status LED**

The optional Token-Ring telemetry interface has an LED for **Activity**. This green LED is turned on when data is being received from the network or transmitted by the probe. When flashing, the frequency shows the amount of traffic. During periods of steady traffic, the LED may appear to stay on solid.

## HSSI WAN Interface Status LEDs

The HSSI WAN interface has a pair of In and Out LEDs for Data and Clock functions. It also has a Fault LED for the microprocessor contained on the WAN interface. (See Figure 1-4.)

**Data.** These green LEDs are turned on when valid frames are received from the network by the HSSI interface . When flashing, the frequency shows the amount of traffic. During periods of steady traffic, the LED may appear to stay on solid.

**Clock.** These green LEDs are turned on when the HSSI interface detects a clock signal on the interface.

**Fault.** These yellow LEDs are turned off when the HSSI interface is running. It is normal for these LEDs to flash during initialization or when a network error is detected.

---

## CONFIG Button

The CONFIG button is used to configure the probe 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 the probe using a local terminal (or PC emulating a terminal), connect a terminal to the probe using a null modem cable and push the CONFIG button to display the probe Main Menu. This operation is described in “Local Terminal Configuration” on page 15.

You can restart the probe (with a warm start or cold start) using the CONFIG button. (See “Probe Operation” on page 89.)

## Included Parts

The following items are included with your Agilent J3916A HSSI WanProbe:

- Agilent J3916A HSSI WanProbe
- *Agilent J3916A HSSI WanProbe Installation/User's Guide*—this manual (J3916-99501)
- Bootp Software 3.5-inch Disk, for PCs
- Hardware Kit (5064-0339)
  - Two Mounting Brackets for the Agilent Probe
  - Four 10-mm #M4 Mounting Screws
  - Four 5/8-in #12-24 Mounting Screws
  - Four Self-Adhesive rubber feet
- 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 Probe accessories can be purchased from Agilent :

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

---

## **Local Terminal Configuration**

---

## Local Terminal Configuration

This chapter describes how to use a local terminal to configure your Agilent J3916A HSSI WanProbe so that it can communicate via a network. If you plan to use the Bootp server method of configuration, skip to “HSSI WAN Interface Configuration” on page 33 and then continue with “Installation” on page 41.

---

## Probe Configuration Using a Local Terminal

An initial configuration of the probe is necessary before it can communicate over the LAN telemetry network interface or serial port. The WAN interface must be configured before monitoring can occur. You perform the configuration by using a series of configuration menus that provide a number of options (fields) to choose from.

---

### NOTE

This chapter covers all the information you will need to perform the initial configuration of the probe with the exception of, the **TFTP Download new firmware** and **XMODEM Download new firmware** menu items and the **Warm start and Exit** and **Cold start and Exit** menu items. These topics are explained in Chapter 6 “Download New Firmware” and Chapter 5 “Probe Operation”, respectively.

The initial configuration for the Ethernet LAN Telemetry network (10Base-T or 100Base-TX) communication includes:

- IP Address
- Default Gateway IP Address (if required)
- Subnet Mask (if required)
- Autodiscovery Echo Interval

The initial configuration for the optional Token-Ring LAN Telemetry interface includes:

- Ring Speed
- Ring Number

The following configuration parameters are used to display time and date information in the user interface only. A separate internal clock is used to time-stamp data collected from the network.

- Date
- Time
- Time Zone

## Local Terminal Configuration

### **Probe Configuration Using a Local Terminal**

The initial configuration for communication over the serial port includes:

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

The initial configuration for the HSSI WAN interface parameters includes:

- Data Sense
- Link Type
- Clock Speed

(Refer to “HSSI WAN Interface Configuration” on page 33 for additional information.)

---

## Using the Main Menu

To configure the probe, connect a terminal directly to the probe and use the probe Main Menu.

---

### **NOTE**

---

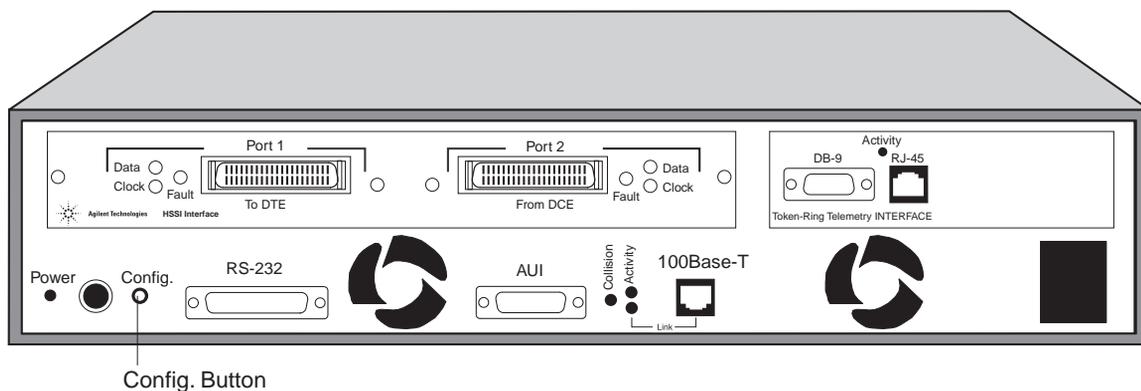
The probe is not available to the network when you are using the configuration menus.

To view the probe Main Menu:

1. Connect a terminal or a personal computer (PC) emulating a terminal to the probe RS-232 connector using a null modem cable. Refer to Appendix A, “Cables and Connectors” on page 113 for more information on cables.
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 power cord to the probe and to a power source (either 100-120/VAC or 220-240/VAC). The probe does not have a power switch, but is turned on by connecting to a power source.

## Local Terminal Configuration Using the Main Menu

4. Start the configuration by quickly pressing the CONFIG button on the back of the probe one time only. After about 10 seconds, the probe displays its Main Menu on the terminal. Figure 2-1 shows the location of the CONFIG button and Figure 2-2 on page 21 shows the probe's Main Menu. If the Main Menu is not displayed, verify that the previous steps in this procedure have been performed correctly.



**Figure 2-1: Probe Rear Panel**

---

### NOTE

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

The probe 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 enter 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.

---

```
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 2-2: Probe Main Menu**

---

**NOTE**

Item 5 (**TFTP Download new firmware**) is not displayed if the **Allow TFTP firmware downloads** menu item is not enabled. Refer to “Modify/View Security Values” on page 24 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.

---

## Modify/View Configuration Values

To configure items in the Modify/View Configuration Values menu:

1. On the Main Menu, Press **1**, **Modify/View configuration values**. You see the Modify/View Configuration Values menu.

```
Modify/View Configuration Values Menu - Firmware Rev
Memory configuration                x Mbytes
[1]Autodiscovery Echo Interval (sec.) 1800
[2]Date                             Wed 05/05/98
[3]Time                              09:12:00
[4]Time zone                         PST8PDT
S.Save changes and exit
0.Cancel changes and exit
```

**Figure 2-3: Modify/View Configuration Values Menu**

2. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network.

**Autodiscovery Echo Interval**      Press **1** and then type the autodiscovery echo interval, in seconds (optional). This parameter sets the time interval the probe uses to transmit the autodiscovery frame used by HP OpenView to maintain the network map.

The default value is 30 minutes (1800 seconds). A value of zero results in no autodiscovery frame transmission.

Date	Press <b>2</b> and then type the day of the week and then the date in month/day/year format ( <i>mm/dd/yy</i> , through 1999 or <i>mm/dd/yyyy</i> , starting 2000).
Time	Press <b>3</b> and then type the time of day in hours, minutes, seconds ( <i>hh:mm:ss</i> ) format.
Time Zone	Press <b>4</b> and then type your time zone in one to 15 characters (optional).

The Time Zone characters are stored for your convenience and are used to time-stamp probe information.

---

**NOTE**

The 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 between standard time to daylight savings time.

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**.

3. Press **S** to save the configuration changes and return to the Main Menu.
4. Press **0** to cancel your current changes and return to the Main Menu.

## Modify/View Security Values

To configure security values for probe access, you use the Modify/View Security Values menu.

1. On the Main Menu, press **2**, **Modify/View security values**. You see the Modify/View Security Values menu (Figure 2-4).

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

[1]Allow packet capture                Yes
[2]Allow TFTP firmware downloads       Yes
[3]Allow Packet Generation             Yes
[4]Allow duplicate and changed IP checking  Yes
S.Save changes and exit
0.Cancel changes and exit
```

**Figure 2-4: Modify/View Security Values Menu**

2. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network. See “Access Security” on page 8 for more information on security.

Allow Packet Capture                      Press **1** and then type Yes to allow or No to not allow packet capture.

Allow TFTP Firmware Downloads              Press **2** and then type Yes to allow or No to not allow TFTP firmware downloading.

Allow Packet Generation                      Press **3** and then type Yes to allow or No to not allow packet generation.

Allow duplicate and changed IP checking      Press **4** and then type Yes to allow or No to not allow checking of duplicate and changed IP addresses.

3. Press **S** to save your changes and return to the Main Menu.
4. Press **0** to cancel your current changes and return to the Main Menu.

---

## Modify/View Interface Values

Use the Modify/View interface Values menu to configure the probe port interface settings. This procedure involves two steps—selecting the port and then setting the configuration. For example, the options for the port configuration are:

- [1] 1.1/Ethernet
- [2] 1.2/Serial
- [3] 3.1/Frame\_Relay
- [4] 3.1/HSSI

---

### NOTE

Refer to “Display Interface Summary” on page 36 for information on port types and port numbers for the installed interfaces.

---

### NOTE

Port 1 is always the Ethernet telemetry interface (the 10Base-T/100Base-TX with RJ-45 and AUI connectors).

## Fast Ethernet Telemetry Interface Configuration

Use the following procedure to configure the Fast Ethernet Telemetry Interface:

1. On the Main Menu, Press **3, Modify/View interface values**. You see the Modify/View Interface Values menu (Figure 2-5).

## Local Terminal Configuration Using the Main Menu

```
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
[6]Physical Connector      RJ-45
[7]Link Speed              Auto Negotiate
S.Save changes and exit
0.Cancel changes and exit
```

**Figure 2-5: Modify/View Interface Values Menu (Fast Ethernet)**

2. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network.

Port Press **1** and then press **1** again to display the current Ethernet port configuration parameters and current settings.

---

**NOTE**

If the optional Token-Ring telemetry interface is **not** installed, the probe will not allow you to change the Fast Ethernet interface's port type from telemetry.

If the Token-Ring telemetry interface is installed, you can configure either the Fast Ethernet interface or the Token-Ring interface as the telemetry interface. The Fast Ethernet interface comes from the factory configured as Telemetry and the Token-Ring interface comes configured as Monitor/Transmit and is disabled. "Disabled" in this case means that the interface does not function at all, not as a Telemetry port nor as a Monitor/Transmit port. If you configure the Token-Ring interface as Telemetry, the Fast Ethernet interface automatically becomes configured as Monitor/Transmit and is disabled.

---

Port Type The Fast Ethernet interface is always a Telemetry port. The telemetry port does not maintain network statistics for the Fast Ethernet interface. The telemetry interface only allows the retrieval of WAN network statistics. Port 1 is the Fast Ethernet interface and it is the telemetry port by default. If the Token-Ring interface is also installed, you can select either the Fast Ethernet or the Token-Ring interface (but not both) as the telemetry port. Refer to "Token-Ring Telemetry Interface Configuration" on page 29 for information on configuring the Token-Ring interface. The probe must be configured with exactly one telemetry port.

## Local Terminal Configuration Using the Main Menu

The *Telemetry* port only receives packets destined to the telemetry port's IP address, can transmit packets onto the network, and is used for SNMP communications to the probe. It requires the IP Address, Subnet Mask, and Default Gateway IP Address fields. The following apply to Telemetry ports:

- HP OpenView can discover the interface
- The interface is IP addressable
- The interface responds to RMON-1
- The interface will transmit all traps from the probe
- The interface will transmit all extended RMON packets sample from Monitor-only ports, Monitor/Transmit ports.

IP Address	Press <b>3</b> and then type the IP address for the probe. If the IP address is 0 . 0 . 0 . 0, the probe will transmit Bootp Requests for configuration information (including IP address) over the network. (This does not apply to ports configured as Monitor-Only.)
Default Gateway	Press <b>4</b> and then type the default gateway IP address for the probe
IP Address	Optional
Subnet Mask	Press <b>5</b> and then type the subnet mask for the probe.
Physical Connector	Press <b>6</b> and choose a physical connector. The menu displays the physical connectors that are available. You can use the RJ-45 or AUI connector. If you select AUI, items 7 and 8 (Link Speed and Full/Half Duplex) are not available. AUI is 10MB/s half-duplex.

---

### CAUTION

---

If you manually select the Link Speed, be careful to configure it correctly. If you configure the Link Speed for 100 MB/s and you connect the probe to a 10MB/s network, the probe will generate 100% utilization for that segment.

Link Speed            Press **7** and select the Link Speed as Auto Negotiate, 10MB/s, or 100MB/s.

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

3. Press **S** to save your configuration changes and return to the Main Menu.
4. Press **0** to cancel your changes and return to the Main Menu.

### **Token-Ring Telemetry Interface Configuration**

If the optional Token-Ring telemetry interface is not installed, skip this section and continue with “HSSI WAN Interface Configuration” on page 33. Otherwise, use the following procedure to configure items in the Modify/View Interface Values menu for the Token-Ring Telemetry Interface:

1. On the Main Menu, Press **3, Modify/View Interface Values**. You see the Modify/View Interface Values menu (Figure 2-6).

## Local Terminal Configuration Using the Main Menu

```
Modify/View Interface Values Menu - Firmware Rev
MAC Address                00 00 C6 XX XX XX
Interface Type              Token Ring
[1]Port                    3
[2]Port Type                Telemetry
[3]IP address               0.0.0.0
[4]Default gateway IP address 0.0.0.0
[5]Subnet mask              0.0.0.0
[6]Token Ring Speed (Mbps) 16
[7]Ring Number              -1
S.Save changes and exit
0.Cancel changes and exit
```

**Figure 2-6: Modify/View Interface Values Menu (Token Ring)**

2. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network.

Port

Press **1** and then press the number of the Token-Ring port to display the Token-Ring port configuration parameters along with the current settings. The port number for the Token-Ring interface (if installed) depends on where it is installed. Refer to “Display Interface Summary” on page 36 for information on port types and port numbers for the installed interfaces. You can then view or configure the Token-Ring port configuration parameters.

---

**NOTE**

---

If the Token-Ring telemetry interface is installed, you can configure either the Fast Ethernet interface or the Token-Ring interface as the telemetry interface. The Fast Ethernet interface comes from the factory configured as Telemetry and the Token-Ring interface comes configured as Monitor/Transmit and is disabled. “Disabled” in this case means that the interface does not function at all, not as a Telemetry port nor as a Monitor/Transmit port. If you configure the Token-Ring interface as Telemetry, the Fast Ethernet interface automatically becomes configured as Monitor/Transmit and is disabled.

Port Type	Press <b>2</b> and select the port type as Telemetry. Making this configuration change will disable the Ethernet telemetry port (port 1). You can select either the Token-Ring or the Fast Ethernet interface (but not both) as the telemetry port. The telemetry port does not maintain network statistics for the Token-Ring interface. The telemetry interface only allows the retrieval of WAN ATM network statistics. Refer to “Fast Ethernet Telemetry Interface Configuration” on page 25 for information on configuring the Fast Ethernet interface. The probe must be configured with exactly one telemetry port.
IP Address	Press <b>3</b> and then type the IP address for the probe. If the IP address is 0 . 0 . 0 . 0, the probe will transmit Bootp Requests for configuration information (including IP address) over the network. This does not apply to ports configured as Monitor-Only.
Default Gateway	Press <b>4</b> and then type the default gateway IP address for the probe
IP Address	(optional).
Subnet Mask	Press <b>5</b> and then type the subnet mask for the probe.
Token-Ring Speed	Press <b>6</b> to modify or view the network speed setting. The default configuration is set to 16 Mbps network speed. You can enter values of 4 or 16 for 4 Mbps or 16 Mbps respectively or enter Auto to automatically sense the ring speed.

## Local Terminal Configuration Using the Main Menu

---

### NOTE

---

Selecting Auto to automatically sense the ring speed does not function in all network installations. If the probe fails to insert into the ring with the Token-Ring Speed set to Auto, select a fixed speed of 4 or 16 to match your network.

Ring Number      Press **7** and then type the local ring number (in decimal) for your network. Set to -1 for use with ring parameter servers for automatic setting of the ring number, and set to <x> to explicitly set the ring number, where x is the ring number in decimal.

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 the Main Menu.
4. Press **0** to cancel your current changes and return to the Main Menu.

## HSSI WAN Interface Configuration

Use the following procedure to configure the HSSI WAN Interface:

1. On the Main Menu, Press **3, Modify/View Interface Values**. You see the Modify/View Interface Values menu (Figure 2-7).

```
Modify/View Interface Values Menu - Firmware Rev
Interface Type                               HSSI
[1]Port                                       3.1 HSSI
[2]Port Type                                 Monitor-only
[3]Data Sense                                 Normal
[4]Link Type                                 Frame Relay
[5]Clock Speed                               52 Mb
S.Save changes and exit
0.Cancel changes and exit
```

**Figure 2-7: Modify/View Interface Values Menu (HSSI WAN)**

2. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network.

## Local Terminal Configuration Using the Main Menu

Port	<p>Press <b>1</b> and then type the HSSI WAN interface port number to display the HSSI WAN port configuration parameters along with their current settings. Refer to “Display Interface Summary” on page 36 for information on port types and port numbers for the installed interfaces. You can then view or configure the HSSI WAN port’s configuration parameters. The following are your HSSI port choices:</p> <ul style="list-style-type: none"><li>•[3] 3.1/Frame_Relay</li><li>•[4] 3.1/HSSI</li></ul>
Port Type	<p>The port type is set to Monitor-only.</p>
Data Sense	<p>Press <b>3</b> and then select the format of the bit stream (the Data Sense type) as Normal, Inverted, or NRZI (Non-Return to Zero Invert, on zeros).</p> <p>Normal means that the data bits are not inverted or, in other words, that a Mark represents a binary 1. Inverted means that the data bits are inverted or, in other words, that a Mark represents a binary 0. NRZI means that bit timing is determined from the clocking signals present on the HSSI interface and successive Marks or Spaces represent a binary 1 and changes from Mark to Space or from Space to Mark represent a binary 0.</p>
Link Type	<p>Press <b>4</b> and then select the link layer analysis type as Frame Relay, HDLC, SDLC, or PPP.</p>

Clock Speed      Press **5** and then select one of the following Clock Speeds:

[1]1Mb	[2]1.5Mb	[3]2Mb	[4]2.5Mb	[5]3Mb
[6]3.5Mb	[7]4Mb	[8]4.5Mb	[9]5Mb	[10]5.5Mb
[11]6Mb	[12]6.5Mb	[13]7Mb	[14]7.5Mb	[15]8Mb
[16]8.5Mb	[17]9Mb	[18]9.5Mb	[19]10Mb	[20]10.5Mb
[21]11Mb	[22]11.5Mb	[23]12Mb	[24]12.5Mb	[25]13Mb
[26]13.5Mb	[27]14Mb	[28]14.5Mb	[29]15Mb	[30]15.5Mb
[31]16Mb	[32]16.5Mb	[33]17Mb	[34]17.5Mb	[35]18Mb
[36]18.5Mb	[37]19Mb	[38]19.5Mb	[39]20Mb	[40]20.5Mb
[41]21Mb	[42]21.5Mb	[43]22Mb	[44]22.5Mb	[45]23Mb
[46]23.5Mb	[47]24Mb	[48]24.5Mb	[49]25Mb	[50]25.5Mb
[51]26Mb	[52]26.5Mb	[53]27Mb	[54]27.5Mb	[55]28Mb
[56]28.5Mb	[57]29Mb	[58]29.5Mb	[59]30Mb	[60]30.5Mb
[61]31Mb	[62]31.5Mb	[63]32Mb	[64]32.5Mb	[65]33Mb
[66]33.5Mb	[67]34Mb	[68]34.1Mb	[69]34.5Mb	[70]35Mb
[71]35.5Mb	[72]36Mb	[73]36.5Mb	[74]37Mb	[75]37.5Mb
[76]38Mb	[77]38.5Mb	[78]39Mb	[79]39.5Mb	[80]40Mb
[81]40.5Mb	[82]41Mb	[83]41.5Mb	[84]42Mb	[85]42.5Mb
[86]43Mb	[87]43.5Mb	[88]44Mb	[89]44.21Mb	[90]44.5Mb
[91]45Mb	[92]45.5Mb	[93]46Mb	[94]46.5Mb	[95]47Mb
[96]47.5Mb	[97]48Mb	[98]48.5Mb	[99]49Mb	[100]49.5Mb
[101]50Mb	[102]50.5Mb	[103]51Mb	[104]51.5Mb	[105]52Mb

## Display Interface Summary

Use the following procedure to display the Interface Summary screen (Figure 2-8). This screen lists the Interface, Port Type, and IP Address.

1. On the Main Menu, press **4, Display Interface Summary**. You see the Display Interface Summary listing Interface, the Port Type, and Port IP Address.

Interface	Port Type	IP Address
1.1/Ethernet	Telemetry	15.6.72.216
1.2/Serial	NA	0.0.0.0
3.1/Frame_Relay	Monitor-only	NA
3.1/HSSI	Monitor-only	NA

**Figure 2-8: Display Interface Summary**

2. Press Enter to return to the Main Menu.

---

## Modify/View Serial Port Settings

You use the Modify/View Interface Values Menu to view or modify the serial port settings. Use the following procedure to configure the probe serial port:

1. On the Main Menu, **Press 3, Modify/View Interface Values**. You see the Modify/View Interface Values Menu.

```
Modify/View Interface Values Menu - Firmware Rev
Interface Type                               Serial
[1]Port                                     1.2 Serial
[2]Port Type                               NA
[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 2-9: Modify/View Serial Port Settings Menu**

2. Select **Interface Type** and then type Serial.
3. Press 1, **Port** and then type the Serial Port Number. You see the current serial port settings (Figure 2-9).

## Local Terminal Configuration Using the Main Menu

4. Press a number to select a field and then type the corresponding values necessary to configure the probe to operate on your network.

Serial port IP address    Press **3** and then type 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 type 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 type a serial port speed (300 to 38,400 baud) for the probe's SNMP connection. The default is 9600 baud. This speed is used **only** for Out-of-Band access to the probe 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** and then type 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** and then type 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/.

5. Press **S** to save the configuration changes and return to the Main Menu.
6. Press **0** to cancel your current changes and return to the Main Menu.

---

## Exiting the Main Menu and Restarting the Probe

1. On the 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, the probe exits the Main Menu and restarts normal operations.

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

---

### **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 “Probe Operation” on page 89 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.

---

3

---

**Installation**

## Installation

This chapter describes how to install the Agilent J3916A HSSI WanProbe. Installing an Agilent probe consists of the following tasks:

- “Selecting a Location” on page 43
- “Installing the Probe” on page 44
- “Connecting the Probe” on page 49
- “Starting the Probe” on page 67
- “Verifying the Installation” on page 68

If you plan to configure the probe from a local terminal and have not yet done so, go to “Probe Configuration Using a Local Terminal” on page 17, and perform the configuration now.

---

## Selecting a Location

Select a location for your probe where it will be the most useful. The probe must be connected to a LAN to retrieve data. The data that can be retrieved was previously monitored from traffic present on the WAN where it is attached.

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

- 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 double high space in a 19 inch rack or cabinet.
- A grounded power outlet (either 100-120/VAC or 220-240/VAC).
- Access to a Fast Ethernet connection tap or to a Token-Ring network MsAU connection (if the Token-Ring Telemetry option is installed).
- Access to the WAN connection to monitor.
- 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 addresses for the probe can be found on the rear panel. It is a good idea to make a note of the interface and its address *prior* to installing your probe because some installation methods make it difficult to see the rear panel without removing the probe.

---

## Installing the Probe

This section describes how to install your probe. 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 45
- “Rack or Cabinet Installation” on page 45
- “Wall Installation” on page 47

---

### **CAUTION**

Do *not* attach the power cord to the probe until the probe is completely installed. If the power cord is already attached to the probe, remove it 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**

Use the following procedure to install the probe on a table:

1. Attach the self-adhesive rubber feet to the bottom of the probe as marked in each corner.
2. Place the probe on a flat surface (refer to the requirements as listed in “Selecting a Location” on page 43).

---

## **Rack or Cabinet Installation**

You can install the probe in a rack or cabinet with either the front or rear panel facing out. You may want the rear panel facing out so that you can see the status LEDs for each port. (The front panel Fault and Activity LEDs indicate when the 10Base-T/100Base-TX telemetry interface LEDs are lit.)

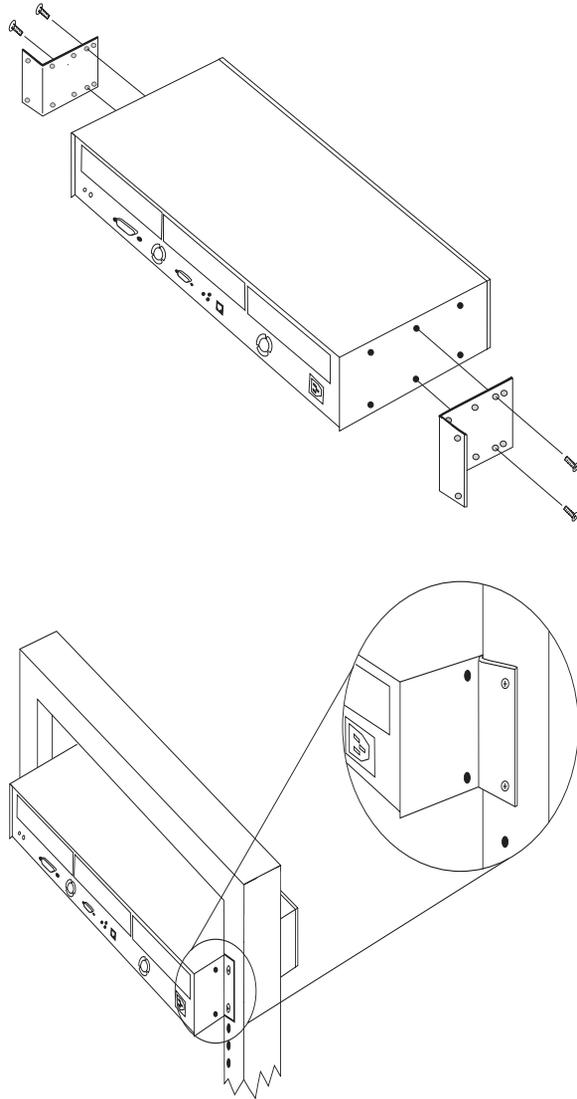
Make sure you have screws that fit your rack (or cabinet) before installing the probe as noted in Step 3 below.

Use the following procedure to install the probe in a rack or cabinet:

1. Attach the installation brackets to the probe with the 10-mm #M4 screws (included), using a POZIDRIV® #2 or cross-head screwdriver. See Figure 3-1.
2. Position the probe in the rack (or cabinet) and slide it up or down until the rack holes line up with the holes in the brackets.
3. Attach the probe to the rack with the 5/8-in. #12-24 screws (included). Some cabinets require 5/8-in. #10-32 screws (available as Agilent part number 2680-0302) instead of the 5/8-in. #12-24 screws.

Figure 3-1 shows a rack or cabinet installation.

Installation  
**Installing the Probe**



**Figure 3-1: Install the Probe in a Rack or Cabinet**

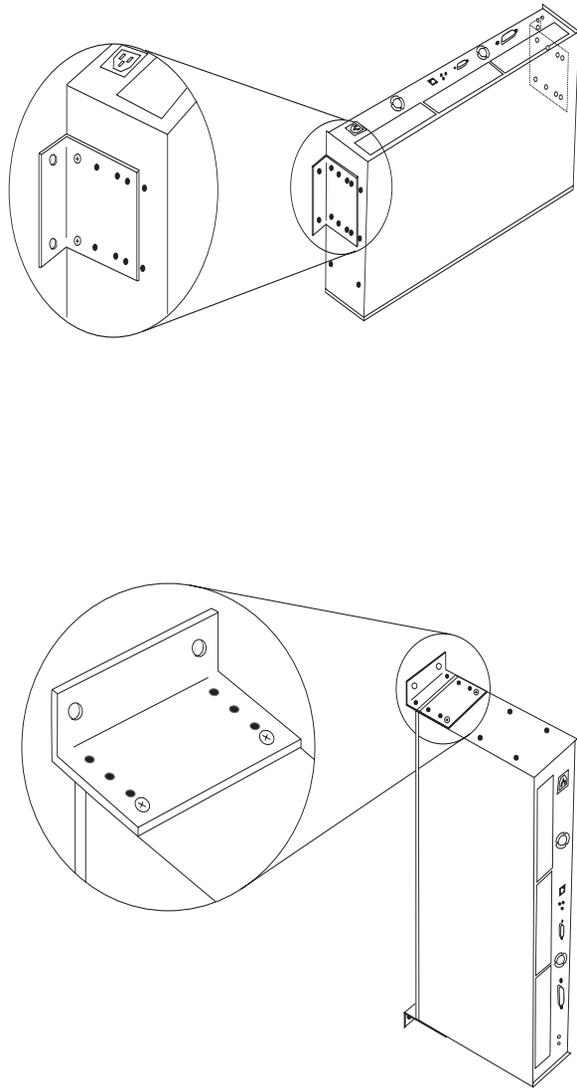
## **Wall Installation**

Use the following procedure to install the probe on a wall:

1. Attach the installation brackets to the probe with the 10-mm #M4 screws (included), using a POZIDRIV® #2 or cross-head screwdriver. See Figure 3-2.
2. Attach the probe to a wood surface (minimum 1/2-in. plywood or equivalent) on a wall with 5/8-in. #12 wood screws or equivalent (not included).

Figure 3-2 shows a wall installation.

Installation  
**Installing the Probe**



**Figure 3-2: Install the Probe on a Wall**

---

## Connecting the Probe

The probe communicates with Agilent NetMetrix through Out-of-Band connections using the 10Base-T/100Base-TX or Token-Ring (optional) telemetry interfaces or by using a serial connection.

You can establish both telemetry and serial Out-of-Band connections to give you the option of communicating with the probe either over the telemetry network or over the serial link, respectively. The telemetry connection has the advantage of being faster than the serial connection. The disadvantage of using only the telemetry connection is that certain network or component failures can result in a loss of communications with the probe.

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

Refer to one of the following sections in this chapter for specific information on connecting the probe:

- “Connecting to the Network (Out-of-Band)”
- “Connecting to a HSSI System (In-Band)” on page 56
- “Connecting to the Serial Port (Out-of-Band)” on page 59

---

### Connecting to the Network (Out-of-Band)

You can connect the probe to an Out-of-Band telemetry network as described in one of the following topics.

- “Connecting to 10MB/s Ethernet Telemetry Networks” below
- “Connecting to 10Base-T/100Base-TX Telemetry Networks” on page 51
- “Connecting to Token-Ring Telemetry Networks” on page 53

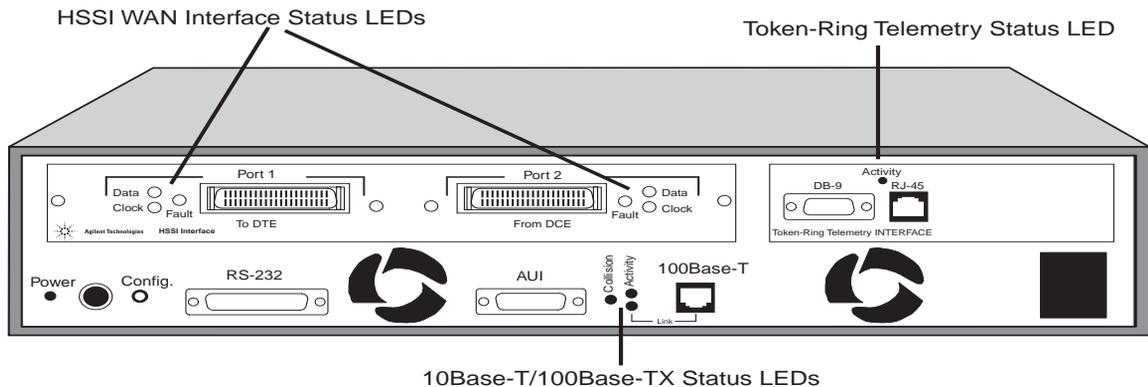
Figure 3-3 shows the probe rear panel with the Token-Ring option installed.

## Installation

### Connecting the Probe

#### CAUTION

Do not touch the probe connector pins or the cable connector pins. Static discharge may damage equipment.

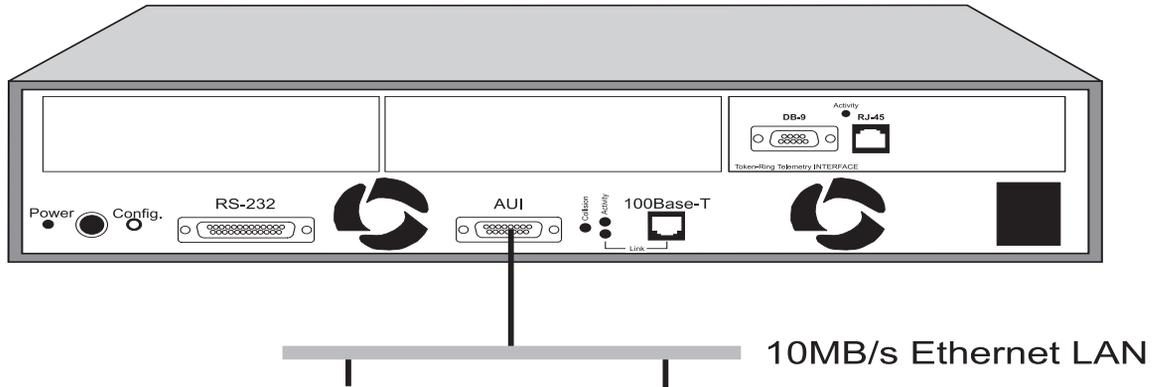


**Figure 3-3: Probe Rear Panel (Token-Ring Option shown)**

### Connecting to 10MB/s Ethernet Telemetry Networks

You can connect the probe to the network either by connecting the RJ-45 connector to a 10Base-T/100Base-TX half-duplex network or by connecting the AUI connector to a 10MB/s Ethernet network. Use the following procedures to connect the probe's AUI connector to a 10MB/s Ethernet network for telemetry communications. Never use both the AUI and RJ-45 connectors.

1. Connect the probe's AUI port, located on the rear panel, to the network with an AUI cable. Figure 3-4 shows how to connect the probe to a 10MB/s Ethernet network using the AUI connector.
2. Select **AUI** as the Physical Connector parameter from the Modify/View Interface Values menu. Refer to Step 1 on page 25 for information on configuring the Physical Connector parameter.



**Figure 3-4: Connecting the Probe to a 10MB/s Ethernet Network**

The following types of network-specific MAUs are available for connecting to the AUI port:

- Fiber-Optic MAU (Agilent 28683A) - for fiber-optic cabling
- 10Base-2 MAU (Agilent 28641B) - for ThinLAN cabling

---

**NOTE**

---

If the SQE test is available on the MAU, disable it.

### Connecting to 10Base-T/100Base-TX Telemetry Networks

You can connect the probe to the network either by connecting the RJ-45 connector to a 10Base-T/100Base-TX half-duplex or full-duplex network or by connecting the AUI connector to a 10MB/s Ethernet network.

Use the following procedures to connect the probe's RJ-45 connector to a 10MB/s or 100MB/s Ethernet network for telemetry communications. Never use both the AUI and RJ-45 connectors.

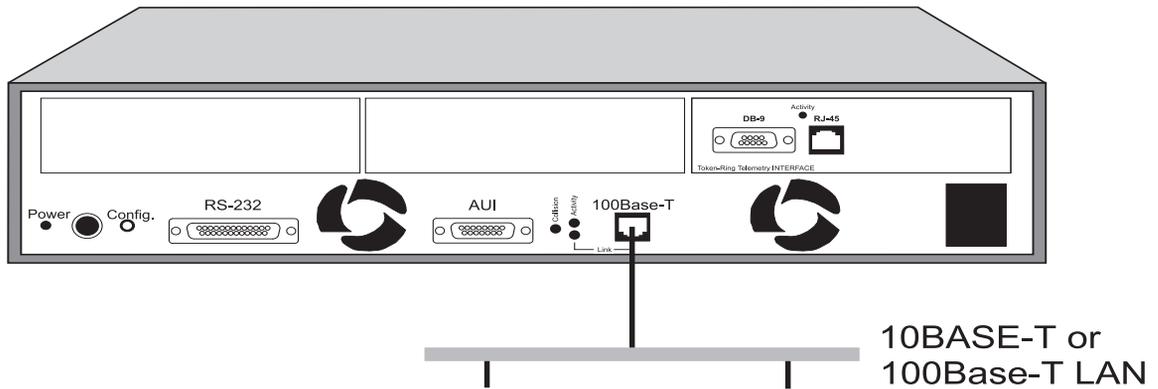
## Installation

### Connecting the Probe

1. Connect the probe's 10Base-T/100Base-TX (RJ-45) port, located on the rear panel, to the network using a category 5 cable. Figure 3-5 shows how to connect the probe to a 10Base-T or 100Base-TX network.
2. Select **RJ-45** as the Physical Connector parameter from the Modify/View Interface Values menu. Refer to Step 1 on page 25 for information on configuring the Physical Connector parameter.
3. If you are connecting to a device that supports the auto-negotiation protocol, select **Auto Negotiate** for the Link Speed parameter from the Modify/View Interface Values menu. Otherwise, select **10MB/s** (for 10MB/s Ethernet) or **100MB/s** (for 100MB/s Ethernet). Refer to Step 1 on page 25 for information on configuring the Link Speed parameter.

The probe will automatically negotiate the speed of the interface if the Link Speed parameter is set to **Auto Negotiate** and if the connected device supports the auto-negotiation protocol.

4. If you selected **10MB/s** or **100MB/s** for the Link Speed parameter, you must also select **Half-Duplex** for the Full/Half Duplex parameter from the Modify/View Interface Values menu. Refer to Step 1 on page 25 for information on configuring the Full/Half Duplex parameter.



**Figure 3-5: Connecting the Probe to a 10Base-T/100Base-T Network**

## Connecting to Token-Ring Telemetry Networks

The Token-Ring option must be installed to connect the probe to a Token-Ring telemetry network.

---

### CAUTION

Connecting the Token-Ring interface to your network when the interface is configured to the wrong network speed (4Mb/16Mb) can cause **disruption of all traffic on your network** and it will prevent the probe from properly inserting into the ring.

You can configure the Token-Ring Speed from the Modify/View Configuration Values Menu. The probe is configured with a default setting for 16Mbps networks. Refer to “Token-Ring Telemetry Interface Configuration” on page 29 for information on changing this parameter.

You connect the Token-Ring interface to your network by using the appropriate cables. The probe has both RJ-45 and DB-9 connectors on the rear panel for connecting to Token-Ring networks. Figure 3-6 shows the back panel with the Token-Ring option installed.

## Installation

### Connecting the Probe

**Do not** attach cables to both the Token-Ring DB-9 and RJ-45 connectors simultaneously. This causes the probe to malfunction, and can disrupt your network. You must use only one network connector at a time for correct probe operation.

---

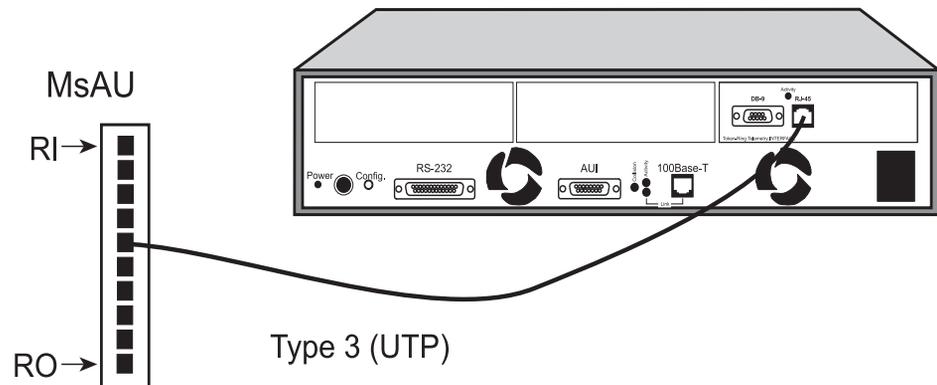
### CAUTION

The Token-Ring interface is **not compatible** with Token-Ring expansion modules (Local Ringhub from Madge and other vendors, for example) which require power from the Token-Ring interface. The Token-Ring interface **must** be connected directly to the MsAU.

---

Token-Ring networks typically use Type 3 (Unshielded Twisted Pair (UTP)) cable or Type 1 (Shielded Twisted Pair (STP)) cable. Networks using UTP cable typically use the RJ-45 type connectors and networks using STP cable typically use Token-Ring Data Connectors or DB-9 type connectors.

If your network uses RJ-45 connectors, you will need the standard cable with RJ-45 connectors on both ends to connect the probe to the ring. Connect one end of this cable to any open port of a Media Station Access Unit (MsAU) and connect the other end to the RJ-45 connector on the probe. Figure 3-6 shows the Token-Ring interface connected to a Type 3 MsAU.



**Figure 3-6: Connecting the Probe Using RJ-45 Connectors**

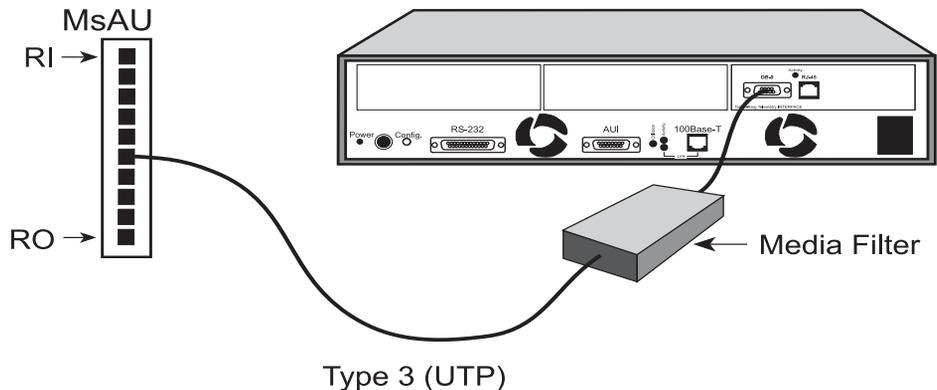
---

**NOTE**

---

Do not connect the probe to either the ring-in (RI) or ring-out (RO) connection port.

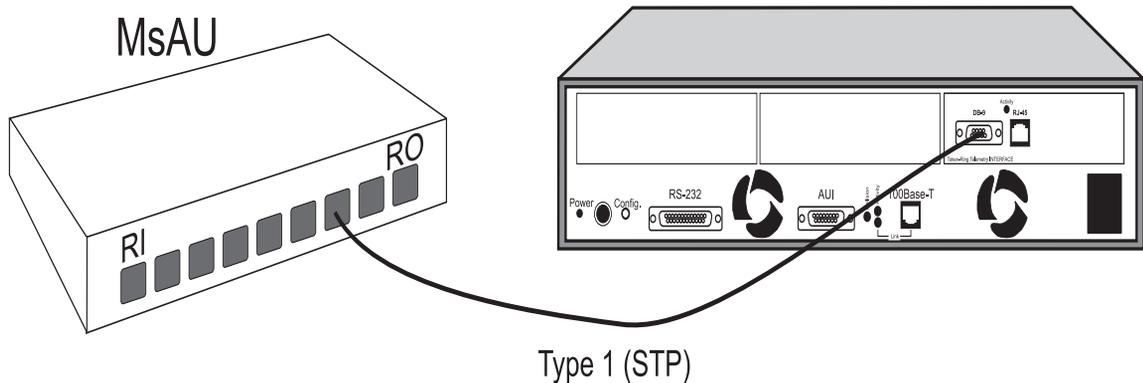
The Token-Ring interface can also be connected to a Type 3 MsAU using a Media Filter. The Media Filter is used to connect from STP (DB-9) to UTP (RJ-45). Figure 3-7 shows the Token-Ring interface connected to a MsAU using a Media Filter.



**Figure 3-7: Connecting the Probe using a Media Filter**

If your network uses the Token-Ring Data Connectors, you need a Type 1 cable with a Token-Ring Data Connector on one end and a DB-9 connector on the other end to connect the probe to the ring. Connect the Token-Ring Data Connector plug to any open port (excluding the RI or RO ports) of a MsAU and connect the DB-9 connector to the probe's DB-9 connector. Figure 3-8 on page 56 shows the Token-Ring interface connected to a Type 1 MsAU using Token-Ring Data and DB-9 connectors.

## Installation Connecting the Probe



**Figure 3-8: Connecting the Probe Using Data & DB-9 Connectors**

---

### About the Information in the Following Sections

It is assumed that you understand the basic terminology and concepts of WAN network test interfaces.

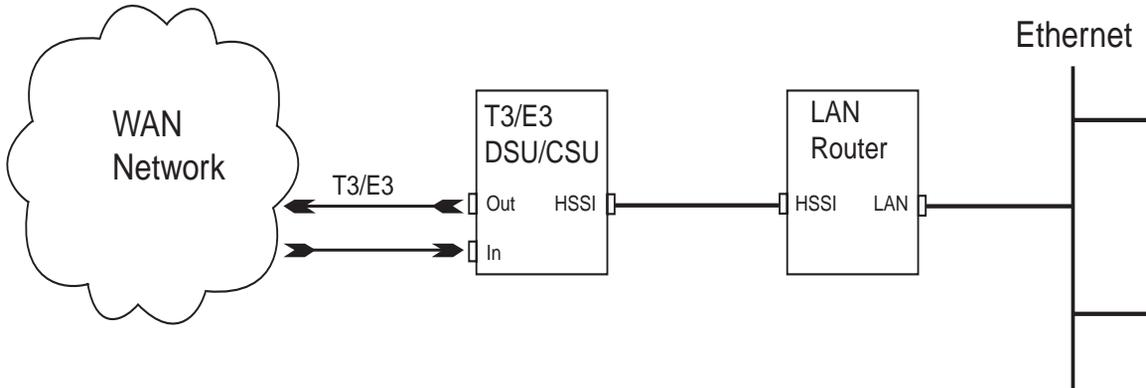
Comprehensive coverage of network test connections and physical layer testing is beyond the scope of this Installation/User's Guide. Consequently, the information provided here covers only the basics, and only very common or generic connection schemes are shown.

---

### Connecting to a HSSI System (In-Band)

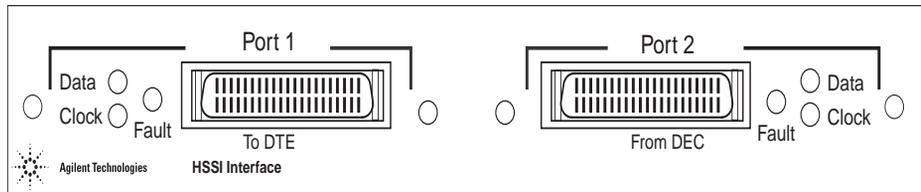
#### HSSI Monitor Connections

This section describes the basic connection method used to monitor the network using the HSSI interface. Figure 3-9 on page 57 shows the HSSI system prior to connecting the WanProbe.



**Figure 3-9: HSSI System**

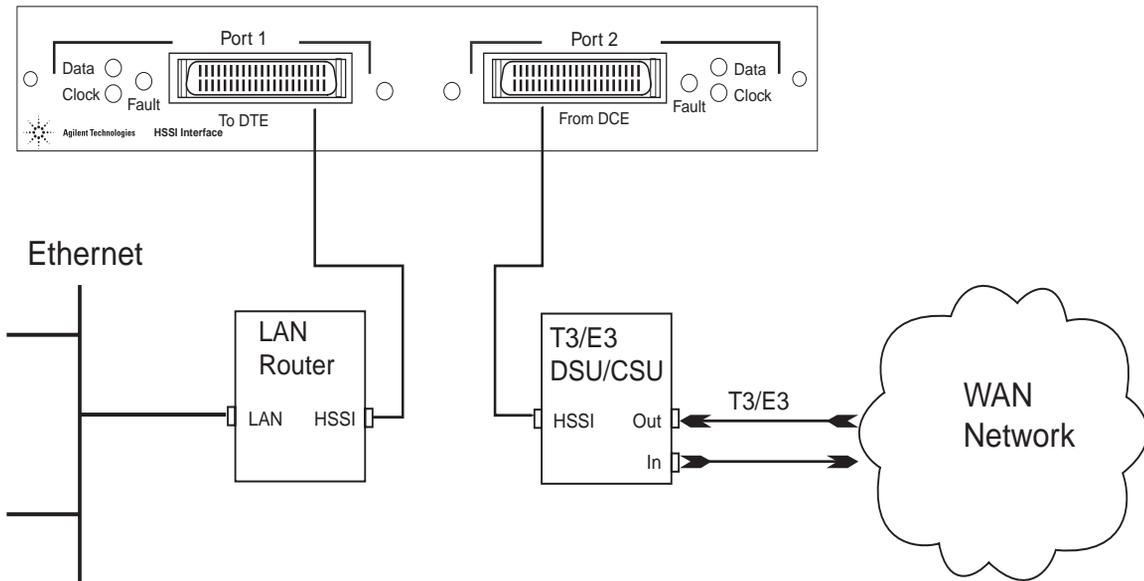
Figure 3-10 presents the details of the Agilent HSSI interface.



**Figure 3-10: Close-up of the HSSI Interface**

### **In-Line HSSI Connection**

Connecting the probe in-line requires that the connection between the Data Terminating Equipment (DTE) and the Data Circuit-terminating Equipment (DCE) be momentarily broken. Installation requires the addition of a new HSSI cable to the network configuration.



**Figure 3-11: HSSI Monitor In-Line Connection**

Use the following procedure to connect the HSSI WanProbe to monitor a HSSI system with a momentary interruption to service:

1. Disconnect, at the DSU/CSU, the HSSI cable between the T3/ES DSU/CSU and the LAN router.

2. Connect the HSSI cable to the left-most HSSI connector on the HSSI WanProbe.
3. Connect the new HSSI cable between the DSU/CSU and the right-most connector on the HSSI WanProbe.

---

**NOTE**

---

The HSSI cable should be a straight-through cable. Part numbers: Cisco Systems CAB-HSI1 or ADC/Kentrox 96010011—10ft. HSSI cables.

In this connection scheme, the probe monitors network traffic as if the signal between the DTE and DCE is sent straight-through the probe.

---

## **Connecting to the Serial Port (Out-of-Band)**

Out-of-Band communications with the probe 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:

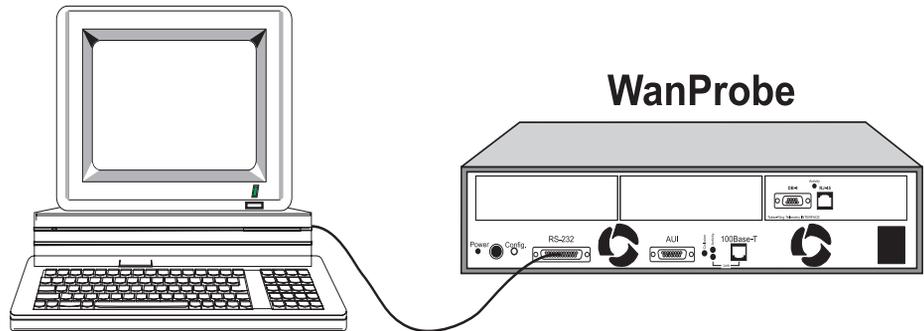
- “Direct Connection”
- “Modem Connection” on page 60
- “Data Switch Connection” on page 65

### **Direct Connection**

To make a direct connection to the probe, connect the NetMetrix management station’s serial port to the probe’s RS-232C port using a null modem cable (Agilent part number 24542G—9-to-25 pin, or equivalent). Figure 3-12 shows the direct connection to the probe.

## Installation

### Connecting the Probe

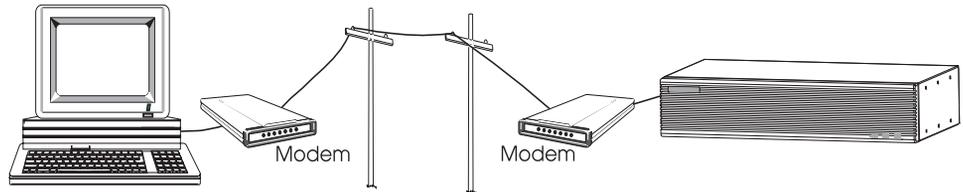


**Figure 3-12: Probe Direct Connection**

### 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 the probe. Figure 3-13 shows the modem connection to the probe.

- “Install the Management Station Modem”
- “Install the Probe’s Modem” on page 62
- “Configure the Management Station and the Probe” on page 62



**Figure 3-13: Probe 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).

## Installation

### Connecting the Probe

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 Probe's Modem

You need the following list of equipment to install the probe'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 probe's 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 probe'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 the Probe

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 probe 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 the probe, make the network connection (refer to “Connecting to the Network (Out-of-Band)” on page 49) and then refer to your NetMetrix documentation to configure the following probe 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 the probe as described in “Probe Configuration Using a Local Terminal” on page 17, attach the terminal and configure the following probe 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 the probe’s menu or over the network from a NetMetrix management station (refer to your NetMetrix documentation for details).

## Installation

### Connecting the Probe

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 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 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 probe.

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

## **Data Switch Connection**

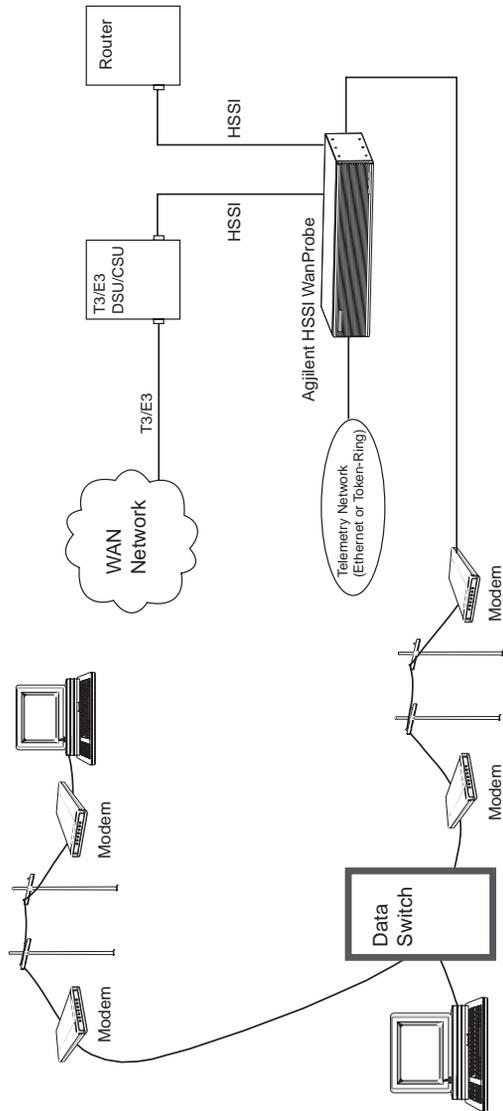
Use the data switch connection to provide the flexibility of using more than one management station to communicate with more than one probe.

To make a data switch connection to the probe, connect a NetMetrix management station to the probe'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 3-14 shows a possible data switch connection scheme.

Installation  
**Connecting the Probe**



**Figure 3-14: Probe Data Switch Connection**

---

## Starting the Probe

---

### **NOTE**

---

If you are using the Bootp server method of configuration, do not attach the power cord to the probe until told to do so in “Bootp Server Configuration” on page 71.

If you used the local terminal method of configuration, attach the power cord to the probe. The probe does not have a power switch, but is powered on when power is attached. When powered on or reset, the probe 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.

## Verifying the Installation

You can verify the probe's installation by looking at the status LEDs on the front or back of the probe. LEDs on the back of the probe show the status of each port and the LEDs on the front of the probe indicate the status of the 10Base-T/100Base-TX telemetry interface. After the probe 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 the probe 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 the probe has passed its self-tests, look at the status LEDs to verify your installation. The status LEDs should be in the following states:

<b>LED</b>	<b>State</b>
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

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

---

## Out-of-Band Troubleshooting

For the Ethernet or Token-Ring telemetry interface, if the Activity LED is off, verify that the probe is properly connected to the telemetry network and that there is traffic on the network. Also, verify that you have the correct Physical Connector selected from the Modify/View Interface Values menu.

If the ~ Line On or Power LED is off, verify that power is properly connected to the probe 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 have an option installed, you can look at each port's Fault LED to see which port is generating the fault condition.

For the Token-Ring telemetry interface, if you are still having difficulty, call your local Agilent service representative. For the Ethernet telemetry interface, continue with the following "Ethernet Telemetry Interface" section.

## Ethernet Telemetry Interface

If you selected **Auto Negotiate** for the Link Speed parameter, verify that the connected Hub or switch supports this mode of operation. If you are not sure, configure the link speed and full-duplex or half-duplex manually.

---

### CAUTION

---

If you manually selected the Link Speed, be careful to configure it correctly. If you configure the Link Speed for 100 MB/s and you connect the probe to a 10MB/s network, the probe will generate 100% utilization for that segment.

If you manually selected the link speed, verify that you are using the correct speed. Also, if you manually selected the link speed, verify that you are using the correct mode of operation (full-duplex or half-duplex). 10MB/s Ethernet is always half-duplex.

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

## **HSSI Troubleshooting**

Before monitoring any data, the connection between the network and the probe must be verified as reliable. The physical medium between network devices should also be checked. Simple problems with the connection or the physical layer configuration can prevent or skew more sophisticated traffic monitoring. Refer to the following tips to help you prevent these problems:

- Learn about the format of the bit stream before you configure the probe. For example, are binary ones represented as marks or spaces or is the data inverted?
- Cable length can affect the ability of the probe to maintain clock synchronization. Verify that the cables are not too long.
- Is the DCE connected to the port 2 connector? If the cables are reversed, the probe will not function.

If the Clock LED does not turn on, verify that the cables are connect correctly as described in “Connecting to a HSSI System (In-Band)” on page 56 and verify that all of the equipment is functioning properly.

The most common cause for failure is a bad connection at the probe. The red fault LED should not be on while the probe is operational.

---

## **Bootp Server Configuration**

## Bootp Server Configuration

This chapter describes how to use the Bootp server method to configure the Agilent J3916A HSSI WanProbe so that it can communicate over the network. This chapter assumes that you have already installed the probe, but have not attached the power cord. If you plan to use the local terminal method of configuration, skip this chapter and refer to “Local Terminal Configuration and Installation” on page 4.

The following sections are covered in this chapter:

- “Probe Configuration Using a Bootp Server” on page 73
- “Bootp Server Setup on an HP or Sun System” on page 75
- “Bootp Server Setup on a PC” on page 79
- “Configuring the Bootptab File” on page 85

## Probe Configuration Using a Bootp Server

You can use a Bootstrap Protocol (Bootp\*) server to load the probe'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 4-1 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 probe parameters. Refer to "Configuring the Bootptab File" on page 85 for more information.

The probe'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 the probe 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 probes that you want to configure from a single Bootp server, be sure that the routers in the path between your Bootp server and the probes support Bootp Relay. Otherwise, you will need to operate the Bootp server on the same subnet as your probes. You can configure multiple probes on one subnet and then place them on their respective segments.

\*BOOTP, RFC 951, RFC 1084 phase I only

Bootp Server Configuration  
**Probe Configuration Using 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 <i>-or-</i> 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-inch 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.

**Table 4-1: Minimum Requirements for a Bootp Server**

- \* Although bootp is supported on many versions of HP-UX and Solaris, the NetMetrix application is only supported on specific operating system releases. Refer to your NetMetrix documentation for the list of supported operating system releases.

---

## 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 the probe:

1. Determine the IP address to be used for the probe.
2. Determine the name to be used as the probe's Domain Name Services (refer to the HP ARPA Services manual) or configure an IP address and name for the probe in your local `/etc/hosts` file.
3. Make sure that the Bootp server can communicate with the probe (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 the probe (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 77.
6. Connect the power cord to the probe and to a power source (either 100-120/VAC or 220-240/VAC). The probe does not have a power switch but becomes operational when power is attached.

## Bootp Server Configuration

### Bootp Server Setup on an HP or Sun System

The probe automatically broadcasts Bootp requests when 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 85, 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 the probe has been assigned the correct IP address and shows up on the management station map as a network analyzer. The discovery process that places the probe in the management station map can take several minutes to complete.

---

#### NOTE

---

You may be able to decrease the required time for discovery of the probe by pinging it continuously from your Agilent NetMetrix management station. You can also ping the probe 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 85 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:

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

## Bootp Server Configuration

### Bootp Server Setup on an HP or Sun System

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 77 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-inch floppy disk) with your Agilent probe. 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 85 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-inch 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.)
```

## Bootp Server Configuration

### Bootp Server Setup on a PC

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 82.

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 82.

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 80.

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 complete.  
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
```

## Bootp Server Configuration

### Bootp Server Setup on a PC

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 to the probe and to a power source (either 100-120/VAC or 220-240/VAC). The probe 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), the probe 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 4-2.

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

**Table 4-2: Bootp Server Bootptab Files**

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

Use this format.

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

The **nodename** is the host name of the probe. The nodename can be up to 40 characters long using alpha-numeric, 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 probe. Valid tags are listed in Table 4-3. You *must* provide a set of these tags for each probe that you want to configure (some tags are optional).

## Bootp Server Configuration Configuring the Bootptab File

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.

<b>Tag</b>	<b>Description</b>
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 probe’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

**Table 4-3: Bootptab File Tags**

2. Save the bootptab file after you have entered parameters for all of your probes.
3. Verify the bootp process by performing one of the items in Table 4-4.

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

**Table 4-4: Bootp Process Verification**

---

**NOTE**

---

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

## Bootp Server Configuration Configuring the Bootptab File

### 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 probe.

```
# 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
#
# lanprobel:\
# ba:\
# hn:\
# ht=ether:\
# vm=rfc1048:\
# ha=080009123456:\
# ip=15.6.72.210:\
# sm=255.255.248.0:\
# gw=15.6.72.1
```

---

**Probe Operation**

---

## Probe Operation

The Agilent J3916A HSSI WanProbe is designed to operate unattended once it has been installed and configured and it 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 probe 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 the probe's measurement data only.
- A cold start resets all of the probe's measurement data, filters, alarms, and user-defined statistics studies (excluding communications configuration parameters) back to default values.

---

### Warm Start

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

- Cycling power (or a power outage).
- Selecting the menu item **Warm start and Exit** from the probe's Main Menu when you have a local terminal connected to the probe, as described in Step 3 on page 94.
- Using NetMetrix to execute a probe warm start. Refer to your NetMetrix documentation for details.

Table 5-1 shows which data and parameters are reset during a warm start and during a cold start of a probe.

Probe Operation  
**Restarting the Probe**

Category	Probe Memory Contents	Warm Start Status	Cold Start Status
<b>Measurement Data</b>	Captured frames	Reset	Reset
	Counted frames	Reset	Reset
	Current signaling statistics	Reset	Reset
	Historical signaling statistics	Reset	Reset
	Frame Relay Protocol Statistics	Reset	Reset
	Frame Relay Historical Protocol Statistics	Reset	Reset
	PPP* Protocol Statistics	Reset	Reset
	PPP* Historical Protocol Statistics	Reset	Reset
	Per PVC Frame Relay Protocol Statistics	Reset	Reset
	Per PVC Frame Relay Historical Protocol Statistics	Reset	Reset
	Per PVC PPP* Protocol Statistics	Reset	Reset
	Per PVC PPP* Historical Protocol Statistics	Reset	Reset
	Logs	Reset	Reset
<b>Measurement Configuration Parameters</b>	Alarm table	Saved	Reset
	Filter table	Saved	Reset
	Channel table	Saved	Reset
	Buffer control table	Saved	Reset
	Event table	Saved	Reset
	Community access table	Saved	Reset
	Client tables	Saved	Reset
	Historical study configuration	Saved	Reset
	PVC configuration table	Saved	Reset

**Table 5-1: Probe Data and Parameters Reset by Warm or Cold Start**

Category	Probe Memory Contents	Warm Start Status	Cold Start Status
<b>Probe Configuration Parameters</b>	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, and Flow Control.	Saved	Saved
	Probe configuration information, such as: IP address, default gateway, and 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

**Table 5-1: Probe Data and Parameters Reset by Warm or Cold Start (Continued)**

\*PPP refers to PPP, HDLC, or SDLC.

## Cycling Power

A power outage or cycling power to the probe causes a warm start. The probe 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 the probe's Main Menu:

1. Connect a local terminal (or a PC emulating a terminal) to the probe. Refer to "Local Terminal Configuration and Installation" on page 4 for information on connecting a local terminal.
2. Press the CONFIG button once (on the back of the probe) to place the probe into the configuration mode. Use a narrow, pointed object (like a pen) to press the recessed CONFIG button. The probe then displays its Main Menu on the terminal. Figure 5-1 shows the probe'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 5-1: Probe Main Menu**

3. Press **7** to execute a warm start and exit the probe'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 the probe'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 the probe by doing one of the following:

- Pressing the CONFIG Button twice within one second.
- Selecting the menu item **Cold start and Exit** from the probe's Main Menu when you have a local terminal connected to the probe, as described on page 96.
- Using Agilent NetMetrix to execute a probe cold start. Refer to your NetMetrix documentation for details.

Table 5-1 on page 92 shows which data and parameters are reset during a cold start or warm start of the probe.

## **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 the probe's Main Menu:

1. Connect a local terminal (or a PC emulation a terminal) to the probe. Refer to "Probe Operation" on page 89 for information on connecting a local terminal.
2. Press the CONFIG button once (on the back of the probe) to place the probe into the configuration mode. Use a narrow, pointed object (like a pen) to press the recessed CONFIG button. The probe then displays its Main Menu on the terminal. Figure 5-1 on page 94 shows the probe's Main Menu.
3. Press **8** to execute a cold start and to exit the probe'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 J3916A HSSI WanProbe.

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

New firmware for the probe 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-inch 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/firmware` directory contains the latest firmware versions for Agilent probes. A README file in this directory provides more details about the files contained in the `firmware` directory.

---

### CAUTION

---

Downloading new probe 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 the probe 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 100
- “Downloading Firmware using a Networked PC and a Terminal” on page 104
- “Xmodem Download of Firmware” on page 108

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 the probe.

---

### **NOTE**

---

The download workstation can be an HP-UX 9.x or later, but the NetMetrix/UX application is only supported on HP-UX 10.20 and 11.0, or later.

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

1. “Install New Download Firmware on an HP-UX Workstation” below
2. “Download Firmware to the Probe” on page 101

---

## **Install New Download Firmware on an HP-UX Workstation**

To download a new firmware file to the probe 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 `/home/tftpd`.

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 the Probe

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

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 the probe 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 probe from the HP-UX workstation using a terminal:

---

### CAUTION

---

The probe 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 enter the configuration mode.

1. Press the CONFIG button on the back of the probe once. The probe's Main Menu, as shown in Figure 6-1 on page 102, is displayed on the console.

---

### NOTE

---

The probe's 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.

---

## Download New Firmware Downloading Firmware using an HP-UX Workstation and a Terminal

```
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 6-1: Probe Main Menu (HP-UX Workstation)**

---

### NOTE

Item 5 in Figure 6-1 is not displayed if the **Allow TFTP firmware downloads** menu item is disabled. Refer to “Modify/View Security Values” on page 24 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 6-2.

```
TFTP Download Menu -- Firmware Rev.  
1. Filename to download      firmware  
2. tftp server IP address   X.X.X.X  
3. Download firmware  
0. Return to previous menu
```

**Figure 6-2: Probe TFTP Download Menu (HP-UX Workstation)**

3. Verify that the probe'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 probe firmware and wait for the probe to reboot automatically. It should take about 90 seconds to transfer the firmware to the probe 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 the probe 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, the probe reboots and starts running the new firmware.

If an error occurs during the download process, the probe 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 probe 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 the probe.

The following steps are required to download firmware to the probe:

1. “Setup TFTP Server for Downloading”
2. “Download Firmware to the Probe”

---

### **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 the Probe**

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

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 the probe 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 the probe from the networked PC using a terminal:

---

**CAUTION**

---

The probe 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 enter the configuration mode.

1. Press the CONFIG button on the back of the probe once. The probe's Main Menu, as shown in Figure 6-3, is displayed on the console.

---

**NOTE**

---

The probe's 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.

---

## Download New Firmware Downloading Firmware using a Networked PC and a Terminal

```
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 6-3: Probe Main Menu (Networked PC)**

---

### NOTE

Item 5 in Figure 6-3 is not displayed if the **Allow TFTP firmware downloads** menu item is not enabled. Refer to “Modify/View Security Values” on page 24 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 6-4.

```
TFTP Download Menu -- Firmware Rev.  
1. Filename to download      firmware  
2. tftp server IP address    X.X.X.X  
3. Download firmware  
0. Return to previous menu
```

**Figure 6-4: Probe TFTP Download Menu (Networked PC)**

3. Verify that the probe'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 probe firmware and wait for the probe to reboot automatically. It should take about 90 seconds to transfer the firmware to the probe 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 the probe 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, the probe reboots and starts running the new firmware.

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

## Xmodem Download of Firmware

You can download firmware from your PC to the probe 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 the probe's RS-232 connector using a null modem cable. Refer to Appendix A, "Cables and Connectors" 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 the probe and to a power source (either 100-120/VAC or 220-240/VAC). The probe 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 the probe one time only. After about 10 seconds, the probe displays its Main Menu on the terminal, as shown in Figure 6-5.

```
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 6-5: Probe Main Menu (XMODEM)**

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

```
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 6-6: Probe XMODEM Download Menu**

## Download New Firmware

### Xmodem Download of Firmware

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 must 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, the probe reboots and starts running the new firmware.

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

If you are using an HP workstation and the probe 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 workstation.

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

```
# cd /tmp
tftp 127.0.0.1
get firmware
quit
```

2. If the previous step fails, the problem is due to the tftp configuration on the workstation.
-



---

A

---

**Cables and Connectors**

## Cables and Connectors

This appendix lists cables for use with the Agilent J3916A HSSI WanProbe. The minimum connector pin-out is 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:

- “HSSI Connectors and Cables”
- “Token-Ring Cables” on page 118
- “Serial Port Interface Cables” on page 119
- “Cable Connector Pin-Outs” on page 120

## HSSI Connectors and Cables

The HSSI cables for connecting to the HSSI WanProbe are industry standard cables. The following table shows the HSSI pinout.

Signal Name	+ Side Pin No.	- Side Pin No.	Direction <sup>a</sup> Router	DSU
SG (Signal Ground)	1	26	—	
RT (Receive Timing)	2	27	←	
CA (DCE Available)	3	28	←	
RD (Receive Data reserved)	4	29	←	
LC (Loopback circuit C)	5	30	←	
ST (Send Timing)	6	31	←	
SG (Signal Ground)	7	32	—	
TA (DTE Available)	8	33	→	
TT (Terminal Timing)	9	34	→	
LA (Loopback circuit A)	10	35	→	
SD (Send Data)	11	36	→	
LB (Loopback circuit B)	12	37	→	
SG (Signal Ground)	13	38	—	
5 (Ancillary to DCE)	14-18	39-43	→	
SG (Signal Ground)	19	44	—	
5 (Ancillary from DCE)	20-24	45-49	←	
SG (Signal Ground)	25	50	—	

**Table A-1: HSSI Interface Cable Pinout**

a. Router is + side (DTE). DSU is - side (DCE).

---

## HSSI Null Modem Cable

The following table shows the HSSI Null Modem pinout.

Signal Name	From Pins	Direction	To Pins	Signal Name
RT (Receive Timing)	2, 27	—>	9, 34	TT (Terminal Timing)
CA (DCE Available)	3, 28	—>	8, 33	TA (DTE Available)
RD (Receive Data)	4, 29	—>	11,36	SD (Send Data)
LC (Loopback C)	5, 30	—>	10, 35	LA (Loopback A)
ST (Send Timing)	6, 31	—>	6, 31	ST (Send Timing)
TA (DTE Available)	8, 33	—>	3, 28	CA (DCE Available)
TT (Terminal Timing)	9, 34	—>	2, 27	RT (Receive Timing)
LA (Loopback A)	10, 35	—>	5, 30	LC (Loopback C)
SD (Send Data)	11, 36	—>	4, 29	RD (Receive Data)
GND (Ground)	1, 26, 7, 32, 13, 38, 19, 44, 25, 50		1, 26, 7, 32, 13, 38, 19, 44, 25, 50	GND (Ground)
Loopback (Not Connected)	12, 37		12, 37	Loopback (Not Connected)
Not Used	14–18, 20–24, 39–43, 45–49		14–18, 20–24, 39–43, 45–49	Not Used

**Table A-2: HSSI Null Modem Cable Pinout**

---

**CAUTION**

---

Although the HSSI connector and the HSSI cable are similar to the SCSI-II format, they are not identical. The HSSI cable specification is more stringent than that for the SCSI-II. If a SCSI-II cable is used instead of a HSSI cable, proper operation cannot be guaranteed.

---

## Token-Ring Cables

The following table shows the most commonly used Token-Ring cable. Use this table to verify that you are using compatible Token-Ring cabling throughout your network. The cable designation is generally stamped on the cable jacket.

---

**NOTE**

---

Make sure that all of your cables have the same Velocity of Propagation (Vp).

<b>Cable Type</b>	<b>VP</b>	<b>Impedance</b>
Type 1 (STP)	78	150
Type 3 (UTP) level 3	60	100
Type 3 (UTP) level 4	69	100
Type 3 (UTP) level 5	78	100

**Table A-3: Token-Ring Cable Type, Vp, and Impedance**

---

## Serial Port Interface Cables

The following table shows the recommended cables for connecting the probe's serial port interface to a terminal or modem.

<b>Cable Function</b>	<b>Cable Type</b>	<b>Connectors</b>	<b>Agilent Product Number</b>
Connect a terminal or PC to the probe port for configuring the probe.	RS-232 "Crossover" or "null modem" cable	25-pin male to 25-pin male	13242G
		25-pin male to 25-pin female	13242H
		9-pin female to 25-pin male	24542G
Connect a modem to the probe port for SLIP communications.	"Straight-through" RS-232 modem cable	25-pin male to 25-pin male	13242M, 13242N, or 17355M
		25-pin male to 25-pin female	31391A

**Table A-4: Serial Port Interface Cable**

---

## Cable Connector Pin-Outs

### The Probe's RS-232 Port Pin-Out

The following table shows the pin-out for the Probe's 25-Pin RS-232 port (connector), which is used to connect to a terminal or modem using the appropriate cable.

<b>PIN</b>	<b>US</b>	<b>CCOTT</b>	<b>DIN</b>
1	CHS GND	101	
2	Tx	103	D1
3	Rx	104	D2
4	RTS	105	S2
5	CTS	106	M2
6	DSR	107	M1
7	SIG GND	102	
8	DCD	109	M5
20	DTR	108	S1

**Table A-5: Probe RS-232 Port Pin-Out**

---

**NOTE**

---

The probe asserts pins 20 and 4, pins 13, 14,16, and 19 are reserved, and all other pins are not connected.

### The Probe's RS-232 Modem Cable Connectors

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

<b>Modem End 25-pin Male</b>		<b>Probe End 25-pin Male</b>
2	<--	2
3	-->	3
4	<--	4
5	-->	5
6	-->	6
7	---	7
8	-->	8
20	<--	20

**Table A-6: Probe to Modem Cable Min. Pin-Out (25-Pin to 25-Pin)**

## 25-pin Terminal/PC Cable Connectors

The following table shows the minimum pin-out for connecting the Probe's RS-232 port to a 25-pin terminal (or PC) connector (also known as an RS-232 "Crossover" cable).

<b>Terminal/ PC</b>		<b>Probe</b>
2	-->	3
3	<--	2
7	---	7

**Table A-7: Probe to 25-Pin Terminal Cable Min. Pin-Out**

## 9-pin Terminal/PC Cable Connectors

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

<b>Terminal/ PC</b>		<b>Probe</b>
2	<--	2
3	-->	3
5	---	7

**Table A-8: Probe to 9-Pin Terminal Cable Min. Pin-Out**

### **UTP Network Connector Pin-Out**

The following table shows the RJ-45 (UTP) to RJ-45 connector pin-outs.

<b>MsAU End RJ-45</b>		<b>Probe End RJ-45</b>
3	<--	3
4	-->	4
5	-->	5

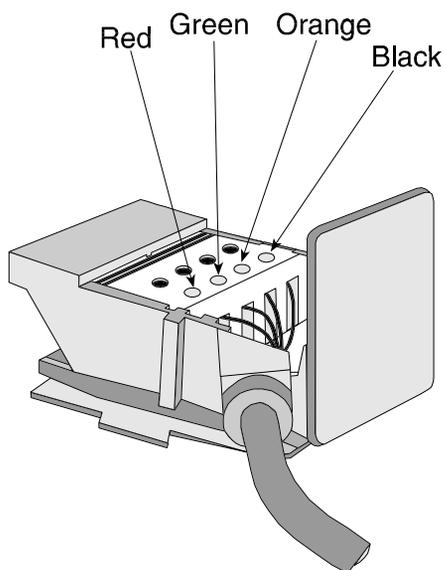
**Table A-9: UTP (Type 3) Network Connector Pin-Outs**

### **STP Network Connector Pin-Out**

The following table shows the DB-9 (STP) to data connector pin-out. Refer to Figure A-1 for the color coded connection points.

<b>MsaU End Data Connector</b>		<b>Probe End DB-9</b>
Red	-->	1
Black	<--	5
Green	-->	6
Orange	<--	9

**Table A-10: STP (Type 1) Network Connector Pin-Outs**



**Figure A-1: Data Connector Color Coded Connection Points**

---

B

---

**Specifications**

## Specifications

This appendix lists the specifications for the Agilent J3916A HSSI WanProbe.

### **Network Compatibility**

#### Agilent J3916A

Base

Hardware: 10Base-T/100Base-TX RJ-45 and AUI, Telemetry Interface.

The probe can use either a Fast Ethernet network connection, an optional Token-Ring network connection, or the SLIP link to communicate with a management station.

### **Network Connection**

The network connection is made using the standard AUI for 10 MB/s Ethernet. 10Base-T or 100Base-TX half-duplex connections are made using the standard RJ-45 connector.

The HSSI WAN network connection is made using industry standard connectors.

You can use the optional Token-Ring telemetry interface to connect to the network Media Station Access Unit interface (MsAU) by using the DB-9 connector and STP (shielded twisted pair) cable, or by using the RJ-45 connector and UTP (unshielded twisted pair) cable. The Token-Ring telemetry interface configuration defaults to 16Mbps networks. Simultaneous network connections on both the DB-9 and RJ-45 connectors will result in a fault condition without damage to the Token-Ring interface.

### **Software Standards**

Remote Network Monitoring Management Information Base (RFC 1757), SNMP MIB-II (RFC 1213 and 2233), SNMP (RFC 1157), and Agilent probe private MIBs.

### **Modem**

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

**Dimensions**

H x W x D: 8.9 x 42.5 x 23.5 cm (3.5 x 16.8 x 9.3 in)

**Weight**

5.9 kg (13.8 lbs) without options

**Power Requirements**

120 VAC, 50/60 Hz, 1.5 Amps; 240 VAC, 50/60 Hz, 0.75 Amps  
Range: 100 VAC to 240 VAC +/- 10%

**Environment**

	<b>Operating</b>	<b>Non-Operating</b>
Temperature	0°C to 45°C (32°F to 113°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)

**General**

**This is a Pollution Degree 2 product.**

**This is an Installation Category II product.**

## **Probe Memory Allocation**

The memory allocated to each parameter depends on how much memory is installed in the probe. 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-1 shows the memory allocated to each parameter for the available probe memory configurations. The memory allocation shown for each memory amount column assumes that all of the available memory within the probe is allocated to the identified parameter.

---

### **NOTE**

The parameter values shown in Table B-1 are approximate and subject to change without notice.

Network Statistics and Trace buffers (packet capture buffers) are allocated dynamically from the same memory allocation. The values shown for Network Statistics assume that no Trace buffers are configured. If Trace buffers are configured, the number of Network Statistics are reduced.

---

<b>Parameter</b>	<b>32MB</b>	<b>64MB</b>	<b>128MB</b>
Total number of history buckets for all studies (Frame Relay)	169,000	345,000	698,000
Total number of history buckets for all studies (PPP)	151,000	309,000	625,000
Total number of history buckets for all studies (X.25)	1,150,000	2,350,000	4,750,000
Total number of history buckets for all studies	99,000	202,000	409,000
Maximum number of alarms	24,000	50,000	102,000
Maximum number of events	155,000	317,000	641,000
Log table entries	1,024	1,024	1,024
Maximum number of filters	32*	32*	32*
Maximum number of channels	32*	32*	32*
Maximum number of packet capture buffers	32*	32*	32*
Trace buffer packet capacity	N/A	N/A	N/A
Trace buffer octet capacity	8-30MB	16-62MB	32-126MB
Maximum number of community names in Community Access Table	20*	20*	20*
Maximum number of IP address entries in Client Table	20*	20*	20*
Maximum number of trap destination entries (Agilent private MIB)	30*	30*	30*
Maximum SLIP connection entries	20*	20*	20*

**Figure B-1: Probe Memory Allocation**

\* These numbers indicate that the probe will reserve memory for the minimum number shown in the table. If memory available, these numbers can be higher.





## **Glossary**

---

# Glossary

This glossary contains definitions of terms, abbreviations, and acronyms that are used in this manual. The terms are not necessarily Agilent specific, but are for data communications in general.

## **10Base-T**

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

## **100Base-FX**

100Base-FX uses multimode fiber-optic cable to carry traffic ten times faster than 10Base-T. It is used primarily to connect Hubs and switches together on Fast Ethernet networks.

## **100Base-TX**

100 Mbps, BASEband operation, unshielded Twisted-pair wiring used for Fast Ethernet networks. 100Base-TX is ten times faster than 10Base-T.

## **ADCCP (Advanced Data Communication Control Procedure)**

This level 2 protocol was developed by ANSI (American National Standards Institute). All data transmissions are in frames, and the starting flag, address, and control fields are known as Header information and the FCS and ending flags are known as Trailer information.

## **Address Resolution Protocol (ARP)**

The Address Resolution Protocol is at the Network Layer in the OSI model. ARP provides a mechanism for finding the physical address (Internet Address) of a target host on the same physical network, given only the target's Internet address.

## **Advanced Data Communication Control Procedure (ADCCP)**

This level 2 protocol was developed by ANSI (American National Standards Institute). All data transmissions are in frames, and the starting flag, address, and control fields are known as Header information and the FCS and ending flags are known as Trailer information.

**Agent**

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

**ANSI (American National Standards Institute)**

The United States coordinating organization for voluntary standards.

**ASCII (American Standard Code for Information Interchange)**

Seven bit code providing a total of 128 upper and lower case letters, numerals, punctuation marks, and control characters. Also referred to as CCITT Alphabet Number 5.

**AT&T**

American Telephone and Telegraph Company.

**Auto-Negotiation**

The process by which a probe determines the network speed and automatically sets its own configuration to match that speed.

**Bandwidth**

The range of frequencies within which transmission equipment (such as electric cable or fibre-optic waveguide) can transmit data.

**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.

**BECN (Backward Explicit Notification Bit)**

Frame Relay flow control mechanism used to notify the sending node (or source end) that there is network congestion on the outbound path. The suggested response is to reduce the frame rate into the network.

## Glossary

### **BCC (Block Check Characters)**

The original level 2 error checking scheme for character-oriented, link protocols. The most common implementations utilized a two byte, algorithmically derived character pair. BCC is equivalent to the CRC-derived FCS in bit-oriented link protocols.

### **Bit Error Rate**

The number of bit errors divided by the number of bits received.

### **Bit Rate**

The speed at which bits are transmitted, usually expressed in bits per second (bps).

### **Block Error Rate**

The number of block errors divided by the number of blocks received. Whether there is one error or ten errors in a block, it is still counted as one block error.

### **Block Errors**

Tells how many blocks had at least one error.

### **Block Sizes**

The Bell system uses a block size of 1000 bits. CCITT, the world-wide standard, uses a block size equal to the pattern size. For example, if the PRBS pattern is 511 bits, then the block size would also be 511 bits.

### **BOPs (Bit Oriented Protocols)**

Bit Oriented protocols are level 2 protocols developed for a variety of system requirements. Some of the more common BOPs are HDLC, SDLC, ADCCP, and LAPB.

### **bps**

Bits per second.

**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 FFFFFFFF-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.

**CBR (Constant Bit Rate Service)**

A type of telecommunication service characterized by a service bit rate of a constant value. Used for services requiring a constant, repetitive, or uniform transfer of information.

**CCITT**

International Consultative Committee on Telegraphy and Telephony. (French acronym.) Standards group responsible for V, X, and other recommendations concerning voice and data communications.

**Collision**

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

**Combined LCN (Combined Logical Channel Number)**

The combination of the 4 LGCN and 8 LCN bits into a 12 bit virtual circuit identifier field. The range is 0 to 4095.

**Concentrator**

An FDDI or Token-Ring network device that connects as a Dual Attachment Station and has connections for additional devices (such as; stations, concentrators, or bridges).

**Congestion**

Exceeding the bandwidth of a virtual path or network capacity.

**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.

**Control field**

Field used to identify an I-frame, S-frame, and U-frame and control the behavior of the frame.

**COP (Character-oriented protocol)**

A link protocol utilizing control characters imbedded in the data flow.

**CRC (Cyclic Redundancy Check)**

A mathematical algorithm to derive the frame check sequence (FCS) in bit-oriented link protocols or the block check characters in character-oriented protocols.

**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.

**CSU (Channel Service Unit)**

A T1 digital signal regenerator straddling the boundary between outside (the line to/from the central office) and the inside (the DSX-1 signal distribution within the customer premises.) CSUs generally interface to DSUs or Multiplexors on the inside.

**Customer Premises Equipment (CPE)**

Customer owned equipment used to terminate or process information from the public network. For example, a T1 multiplexer or a PBX.

**Data Link Layer**

Level 2 of the seven level OSI reference model defined by ISO. This layer provides the link access control and reliability to networks.

**Default Gateway Address**

The address of the gateway which is closest to the probe.

**Discard Eligibility Bit (D/E)**

Frame Relay mechanism to allow the source of a data stream to prioritize frames indicating those preferred to be discarded in the case of network congestion. If the D/E bit of a frame is set to 1, the frame is a preferred candidate to be discarded.

**DLCI (Data Link Connection Identifier)**

The Data Link Connection Identifier (DLCI) is made up of six bits in a frame relay frame. All DLCIs are listed in a table. A DLCI checks the integrity of the frame using a Frame Check Sequence (FCS). If an error is found, the frame is deleted.

**DCE (Data Circuit-terminating Equipment)**

Modems, line drivers, DSUs, ISDN NT1s and NT2s.

**DRAM**

Dynamic Random Access Memory, which is the main memory of a probe.

**DSU/CSU (Data Service Unit/Channel Service Unit)**

DSU/CSU is a term commonly applied to equipment at the customer premises (equipment) side or the company (line) side of a network.

**DTE (Data Terminal Equipment)**

The device at the end of the link. The source or sink of the digital data. DTEs may be CRTs, printers, plotters, PC's, mini-computers, main-frames, or any other device which makes use of a DCE.

**EIA-232D**

The Electronic Industries Association successor to RS-232. Common, inexpensive level 1 interface with a specified 20 kbps top speed and 50 feet maximum distance. EIA-232D formalizes the 25 pin and 9 pin implementations.

**Encapsulation**

The processing of wrapping data with a new protocol header for transmission over the network.

**Equipment**

T1 and E1 equivalent of DTE. Also, the data signal generated by the user.

**Equipment Build Out**

This is an option used to set the transmitter signal level and pulse shape to match the length of cable to the first repeater on the network.

**Errored Seconds**

Tells how many of the elapsed seconds had errors.

**ESF (Extended Superframe Format)**

An Extended Superframe consists of 24 frames with 193 bits each. One of the 193 bits is used for framing and called the framing bit. In ESF, not all of the framing bits (24) are needed. Six of these framing bits are used for framing, six are used for a CRC, and the remaining 12 bits make up a data link for control and maintenance.

**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.

**EtherTwist**

The Hewlett-Packard Company's version of 10Base-T.

**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.

**FCS (Frame Check Sequence)**

An algorithmically derived representation of a frame. (Typically 16 bits.) The FCS provides error-checking capability. It is computed and appended at the time of transmission and regenerated and compared upon reception.

**Flash EPROM**

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

**Forward Explicit Notification Bit (FECN)**

In Frame Relay, the FECN bit notifies the sending node (or source end) that there is congestion in the direction of the data flow.

**Frame**

A frame is a unit of information transferred on a network which contains control and data information.

**Frame Check Sequence (FCS)**

An error checking character that is appended to a bit-oriented protocol by the transmitter.

**Frame Relay**

A streamlined public network technology well suited to burst traffic typical of LAN interconnection.

**Fs (Signal Framing)**

The framing bit (f) identifies frames 6 and 12 in which signaling states, A and B are transmitted when traffic on a network is channelized voice service.

**Ft (Terminal Framing)**

The framing bit (F bit) identifies the frame boundaries in a Frame Relay frame.

**Full-duplex**

A form of communication between two devices where packets flow in both directions simultaneously. See also Half-duplex.

**Gateway**

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

**Half-duplex**

A form of communication where information can only travel one direction at a time. See also Full-duplex.

**HDLC (High Level Data Link Control)**

Level 2 link protocol developed by ISO (International Standards Organization). Transmissions are frame oriented; starting flag, address field, control field, optional information field, frame check sequence, and trailing flag. Some specialized derivatives of HDLC give broader definition to the address field, and some omit the control field. HDLC is the most general definition of the bit oriented link protocols. See also SDLC.

**Header**

Information at the beginning of a cell, frame or packet normally used for alignment, routing, operations or similar purposes.

**I-frame**

Information frame (level 2) used to carry user data.

**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.

**IEEE 802.5 Standard**

Part of the Institute of Electrical and Electronics Engineers 802 family of LAN standards. The 802.5 standard defines the physical layer (layer 1) and part of the data link layer (layer 2) of the ISO OSI reference model for a Token-Ring LAN.

**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**

A short distance network (up to a few thousand meters) used to connect many network devices using a communication standard. 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.

**LAP-F (Link Access Procedure, Frame-Relay)**

HDLC derivative level 2 link protocol required by Frame Relay.

**Layer**

A level in the hierarchy of telecommunications protocols. Protocols in the higher layers inter-operate with those in the lower layers.

**LCI (Logical Channel Identifier) also called Combined LCN**

The combination of the 4 LGCN and 8 LCN bits into a 12 bit virtual circuit identifier field. The range is 0 to 4095

**Leased Line**

Permanent link in a data communication network provided by a commercial communications supplier.

**Leased Line**

Permanent connection for private use within a data communication network independent of the public switching and signalling equipment.

**Line**

T1 and E1 equivalent of DCE. The signal from the Central Office to the User.

**Line Build Out**

This is an option used to set the transmitter signal level and pulse shape to match the length of cable to the first repeater on the network.

**LMI (Local Management Interface)**

Frame Relay management protocol controlling the configuration of permanent virtual circuits.

**Longitudinal Redundancy Check (LRC)**

A technique for error checking in the data stream where each character plus parity is used to calculate errors.

**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.

**Mark**

An electrical pulse on the cable which reflects a state of "1".

**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.)

**Mbps**

Megabits per second.

**Media Filter**

A device used to convert Token-Ring adapter board output signal to function with a particular type of wiring. Media Filters are required for 16 Mbps networks and recommended for 4 Mbps networks using Type 3 (UTP) cable.

**Metropolitan Area Network (MAN)**

A network linking together LANs and other networks at many sites within a city area.

**MIB (Management Information Base)**

A data structure used for communication and control of the probe.

**Monitor**

Passive data capture of both sides of a digital communication.

**MsAU (Media station Access Unit)**

The attachment unit used to provide the physical connection and access to a Token-Ring network.

**N(R)**

Receive sequence number in HDLC based level 2 link protocols.

**N(S)**

Send sequence number in HDLC based level 2 link protocols.

**NetMetrix**

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

**Network Element (NE)**

A hardware device for handling signals. See also Multiplexer.

**Network Equipment**

A collection of bridges, routers and switches which comprise the network infrastructure.

**Network Layer**

Level 3 of the seven level OSI reference model defined by ISO. This layer provides the routing of data through the network based on global addresses. Typical examples are IP and X.25.

**Nibble**

A nibble is four bits.

**NRZI (Non-Return to Zero Invert)**

Level 1 encoding mechanism in which a binary state is represented by a change of the level 1 signal condition. The other binary state is represented by a continuation of the level 1 signal. In wide area networking, the most common implementation of NRZI encoding is an option in IBM's SDLC. In this case, a 0 is represented by a change in the level 1 signal. A binary 1 is represented by a continuation of the signal. In conjunction with a bit oriented level 2 link protocol, proper clocking may be derived by the receiver independent of DCE clocking.

**Object**

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

**Octet**

8 bits considered as a transmission element. Octets in general are not equivalent to user's data bytes. "Octet" is more general than "Byte," allowing for smaller elements to be contained (1 bit fields, 2 bit fields, and so forth.)

**Octet**

The common term used for a collection of 8 bits is a byte. In some cases, the term used is an octet. Although many people use these terms interchangeably, there are a few differences. The bits of a byte are normally numbered from 0 to 7. The bits of an octet are generally numbered from 1 to 8. While the 4th bit of both a byte and an octet are the same, bit 4 of each is a different bit.

**OSI**

Open Systems Interconnect. The 7 level communications structure promoted by ISO.

**P/F (Poll/Final bit)**

One of the bits of a control octet in HDLC derivative level 2 link protocols. In commands it is called the Poll bit. In responses, the Final. Setting this bit to binary 1 in a command requires an immediate response. In a response, it indicates compliance with the command.

**P(R)**

Receive packet number in X.25 packet headers.

**P(S)**

Send packet number in X.25 packet headers.

**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.

**Packet Switching**

A network technology in which data transfers are “packetized” and sent through the network one packet at a time. The network assumes responsibility for routing the packets.

**Permanent Virtual circuit**

A permanent virtual circuit is a permanent association between two DDS, established by the user when subscribing to a packet-switched network and is similar to a leased line.

**Physical Layer (PL)**

Level 1 of the seven level OSI reference model defined by ISO. The physical layer provides for the physical transportation of cells across the network. It consists of physical medium dependent (PMD) and transmission convergence (TC) sublayers. Important categories are PDH, SDH and the physical media used on local premises for LANs.

**Point-to-point configuration**

A remote configuration that has two Advisors connected to each end.

**PPP (Point to Point Protocol)**

HDLC derivative level 2 link protocol common in LAN to LAN connections.

**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.

**PVC (Permanent Virtual Circuit)**

A virtual circuit which is permanently maintained to reduce network overhead.

**Ring**

See Token-Ring.

**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, Token-Ring RMON Extensions, and Agilent probe private MIB that are used for network monitoring.

**S-frame**

Supervisory frame (level 2) used to acknowledge or reject frames.

**SAM (System Administration Manager)**

A configuration tool provided by HP-UX for managing system resources and changing configuration parameters.

**SDLC (Synchronous Data Link Control)**

This level 2 protocol was developed by IBM. While it is not actually a standard (as being defined by a standards organization) it is commonly used. All data transmissions are in frames, and the starting flag, address, and control fields are known as Header information and the FCS and ending flags are known as Trailer information. See also HDLC.

**Server**

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

**Signal Framing (Fs)**

The framing bit (f) identifies frames 6 and 12 in which signaling states, A and B are transmitted when traffic on a network is channelized voice service.

**SIMM (Single Inline Memory Module)**

DRAM that is mounted on a small printed circuit board that can be installed in an Agilent probe. Also see DRAM.

**Simple Network Management Protocol (SNMP)**

The Simple Network Management Protocol provides requests and responses between SNMP managers and SNMP agents. These transactions work with network management information from Management Information Bases (MIBs)

**SLIP (Serial Line Internet Protocol)**

A protocol used for serial communications.

**Station**

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

**STP (Shielded Twisted Pair)**

LAN cable that is both twisted, in pairs, and shielded. Pair twisting and shielding reduces crosstalk to a greater degree than UTP cable, especially at high transmission rates.

**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.

**SVC (Switched Virtual Circuit)**

A virtual circuit which is dynamically created and torn down when no longer active.

**Synchronous Data Link Control (SDLC)**

This level 2 protocol was developed by IBM. While it is not actually a standard (as being defined by a standards organization) it is commonly used. All data transmissions are in frames, and the starting flag, address, and control fields are known as Header information and the FCS and ending flags are known as Trailer information.

**TE**

Terminal Equipment.

**Telemetry Port**

The Telemetry port only receives packets destined for the port's IP address, can transmit packets onto the network, and is used for SNMP communications to the probe. It requires the IP Address, Subnet Mask, and Default Gateway IP Address fields. The following apply to Monitor/Transmit ports:

- HP OpenView can discover the interface
- The interface is IP addressable
- The interface responds to RMON groups 1 through 9 queries
- The interface will transmit all traps from the probe
- The interface will transmit all extended RMON packet samples from Monitor-only ports, Monitor/Transmit ports, and itself.

**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.

**ThickLAN**

A local area network (LAN) operating over 10-mm diameter coaxial LAN cable. Agilent ThickLAN networks are compatible with the IEEE 802.3 Type 10Base5 standard.

**Token**

A short frame that circulates over the ring until captured by a station that wants to transmit a message. Tokens have a specific format as defined by the Token-Ring standard.

**Token-Ring**

A LAN developed by IBM Corporation. Token-Ring transmits at 4 Mbit or 16 Mbit per second.

**Token-Ring Cable**

The MsAU cable used to connect devices to the Token-Ring network. This cable connects a MsAU network port to either the RJ-45 or DB-9 probe port.

**Topology**

The organization of network devices in a network. FDDI uses a ring topology, Ethernet uses a bus Topology, and Token-Ring uses a ring 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.

**Vertical Redundancy Check (VRC)**

A technique for error checking in the data stream where each character plus parity is used to calculate for errors (similar to LRC).

**Virtual Circuit**

An end-to-end logical connection of users without specific paths defined. It is not a direct connection, but a logical communication path. The Frame Relay and X.25 technique of routing user data through the network.

**Vp (nominal Velocity of Propagation)**

The speed that a pulse travels along a given cable. Vp is expressed as a percentage of the speed of light in a vacuum.

**WAN (Wide Area Network)**

A data network engineered for relatively lower speed data transfers over unlimited distances. Often the links in a WAN are provided by a third party.

**WanProbe**

See probe.

**Wide Area Network (WAN)**

A communications network that uses public and/or private telecommunications facilities to link computing devices that are spread over a wide geographic area.

# Index

## Symbols

- ~ Line On LED 10, 69
  - Verifying the Installation 68

## Numerics

- 100Base-TX Networks 52
- 10Base-2
  - MAU 51
- 10Base-T Networks 52
- 10Base-T/100/Base-TX Networks
  - Connecting 51
- 10MB/s Ethernet Networks
  - Connecting 50
- 9000 System, Minimum Bootp Server Requirements 73

## A

- Access Security 8
- Accessories, Optional 14
- Activity LED
  - Ethernet 10
  - Telemetry Port 69
  - Token-Ring 12
  - Verifying the Installation 68
- Agilent Assistance Phone Number xi
- Agilent Private MIB 7
- Alarms
  - RMON-1 MIB 7

- Autodiscovery Echo Interval 22
- Ethernet Interface
  - Initial Configuration 17

## B

- Back Panel, Probe 53
- Bootp
  - Daemon 75
  - Process Verification 87
  - Relay 73
  - Server
    - Configuration and Installation 4
    - Minimum Requirements 74
    - Probe Configuration 73
    - Setup on a PC 79
    - Setup on HP or Sun System 75
    - Starting on a PC System 83
    - Starting on HP or Sun System 77
- Bootptab File
  - Configuring 85
  - Example 88
- Button
  - CONFIG 13, 20, 101, 105
- Button, CONFIG 95

## C

- Cable
  - Media Filter 55
  - Type 1 (STP) 54
- Cables
  - Connector Pin-Outs 120
  - HUSSI
    - Null Modem 116
  - Serial Port Interface 119

- Token-Ring 118
- Cables and Connectors 113, 114
- Clock LED
  - V-Series WAN Interface 13
- Clock Speed
  - V-Series WAN Interface 35
  - WAN Interface
    - Initial Configuration 18
- Cold Start 95
  - Information Reset 91, 95
  - Menu Item 96
- Collision LED
  - Ethernet 11
- CONFIG Button 20, 95, 101, 105
- Config Button 13
- Configuration
  - and Installation Overview 4
  - Bootptab File 85
  - Management Station and Probe, for Modem 62
  - Modify/View Menu 22
  - Options, Probe 2
  - Probe, Bootp Server 73
  - Using a Local Terminal 17
- Connection
  - Data Switch 65
  - Local/Direct, Probe 59
  - Modem 60
  - Out-of-Band, Serial 49
  - Probe to the Network
    - 10Base-T/100Base-TX Networks 51
    - 10MB/s Ethernet Networks 50
    - Token-Ring Networks 53
  - Probe to the Network (Out-of-Band) 49
  - Ring-in (RI) 55
  - Ring-out (RO) 55
  - Serial, Out-of-Band 59
- Connector
  - Cable Pin-Outs 120
  - DB-9 53
  - DB-9 to Data Connector Cable Pin-Outs 124
  - RJ-11 61, 62
  - RJ-45 53

- RS-232 Modem Pin-Out, 25 to 25-Pin 121
- RS-232 Pin-Out, 25-Pin 120
- RS-232, Terminal Connection 19
- Terminal Cable Pin-Out, 25-Pin 122
- Terminal Cable Pin-Out, 9-Pin 122
- Token-Ring Data 55
- Connectors and Cables 113, 114
- Cycling Power, Probe Warm Start 93

## D

- Data Connector 124
- Data Connector, Token-Ring 55
- Data LED
  - V-Series WAN Interface 13
- Data Sense
  - V-Series WAN Interface 34
  - WAN Interface
    - Initial Configuration 18
- Data Switch Connection 65
- Date 23
  - 2000 23
  - Probe
    - Initial Configuration 17
- DB-9 53
  - to Data Connector Cable Pin-Outs 124
- Default Gateway IP Address 75
  - Ethernet Interface 28
    - Initial Configuration 17
  - Token-Ring Interface 31
- Direct Connection, Probe 59
- Display Interface Summary
  - Menu 36
- Download
  - Firmware
    - Using a Networked PC and a Terminal 104
    - Using Networked HP-UX Workstation and Terminal 100
    - Using XMODEM 108
  - New Probe Firmware 98

## E

### Ethernet Interface

- Autodiscovery Echo Interval
- Initial Configuration 17
- Default Gateway IP Address 28
- Initial Configuration 17
- IP Address 28
- Initial Configuration 17
- Link Speed 29
- Physical Connector 28
- Port Number 27
- Port Type 27
- Subnet Mask 28
- Initial Configuration 17
- Telemetry Port 27, 31

### Events

- RMON-1 MIB 7

### Exit

- and Save Changes Menu 29, 32

### Expansion Modules, Token-Ring 54

## F

### Fast Ethernet Interface

- Telemetry Port 27

### Fault LED

- Ethernet 10
- Telemetry Port 69
- Verifying the Installation 68

### Fiber-Optic

- MAU 51

### Filter, Media 55

### Filters

- RMON-1 MIB 7

### Firmware Download

- Allow (Enable) 24
- TFTP, Enable 8

### Frame Relay

- Historical Protocol Statistics
- MIB 7
- Protocol Statistics
- MIB 7

## H

### Hardware Kit, Probe 14

### Hayes-Compatible Modems 126

### Help

- Agilent Assistance Phone Number xi

### HP 9000 System, Minimum Bootp Server

- Requirements 73

### HP OpenView NetMatrix/UX (for HP-UX or Solaris)

- 2

### HP-UX Workstation, Using to Download new

- Firmware 100

### HSSI Connectors and Cables 115

### HUSSI

- Cables
- Null Modem 116

## I

### In-Band

- and Out-of-Band Probe Connection 49
- Troubleshooting the V-Series Installation 70

### Included Parts, Probe 14

### Installation 44

- and Bootp Server Configuration 4

- and Configuration 4

- Probe 2, 42, 44

- Rack or Cabinet 45

- Table 45

- Probe, Wall 47

- Selecting a Location 43

- Verifying Probe 68

- Verifying the

- ~ Line On 68

- Activity LED 68

- Fault LED 68

- Power On 68
- Interface Cables, Serial Port 119
- Interface Summary
  - Display, Menu 36
- Interface Values
  - Modify/View Menu 25, 29
  - E1 WAN Interface 33
- Introduction 2
- IP Address 75
  - Ethernet Interface 28
    - Initial Configuration 17
  - Token-Ring Interface 31
- IP Checking, Allow (Enable) 25

## L

- LAN Manager
  - Using 80
- LanProbe
  - Warm Start Menu Item 94
- LED
  - ~ Line On 10, 69
  - ~ Line On, Verifying the Installation 68
  - Activity 69
  - Activity, Ethernet 10
  - Activity, Telemetry Port 69
  - Activity, Token-Ring 12
  - Activity, Verifying the Installation 68
  - Clock, V-Series WAN Interface 13
  - Collision, Ethernet 11
  - Data V-Series WAN Interface 13
  - Fault, Ethernet 10
  - Fault, Telemetry Port 69
  - Fault, Verifying the Installation 68
  - Link, Ethernet 11
  - Power On 10, 69
  - Power On, Verifying the Installation 68
  - Status 10
  - Status, Verifying the Installation 68
- Line On LED 69

- Link LED
  - Ethernet 11
- Link Speed
  - Ethernet Interface 29
- Link Type
  - V-Series WAN Interface 34
  - WAN Interface
    - Initial Configuration 18
- Local Ringhub 54
- Local Terminal
  - Configuration 13
  - and Installation Overview 4
- Local Terminal Configuration 16
- Log
  - RMON-1 MIB 7

## M

- MAC Address 75
- Main Menu 19
- Management Station 8
  - Modem Installation 61
- MAU
  - 10Base-2 51
  - Fiber-Optic 51
- Media Filter 55
- Media Station Access Unit (MsAU) 54
- Memory Allocation, Probe 128
- MIB
  - Agilent Private 7
  - Frame Relay Historical Protocol Statistics 7
  - Frame Relay Protocol Statistics 7
  - Per PVC Frame Relay Historical Protocol Statistics 7
  - Per PVC Frame Relay Protocol Statistics 7
  - Per PVC PPP Historical Protocol Statistics 7
  - Per PVC PPP Protocol Statistics 7
  - PPP Historical Protocol Statistics 7
  - PPP Protocol Statistics 7
  - Signaling Layer Historical Statistics 7
  - Signaling Layer Statistics 7
  - Supported 7

- MIB-II
  - Supported 7
- Microsoft LAN Manager
  - Using 80
- Modem
  - Carrier Detect 64
  - Connect Responses 39
  - Connection 60
  - Control String
    - Initial Configuration 18
  - Data Compression 64
  - Error Correction 64
  - Hardware Flow Control 63
  - Initialization String 38, 64
  - Management Station Installation 61
  - No-Connect Responses 39
  - Probe Installation 62
  - RS-232 Connector Pin-Out, 25 to 25-Pin 121
  - Serial Port
    - IP Address 63
    - Speed 63
    - Subnet Mask 63
- Modify/View Configuration Values Menu 22
- Modify/View Interface Values Menu 25, 29
  - E1 WAN Interface 33
- Modify/View Security Values Menu 24
- MsAU (Media Station Access Unit) 54

## N

- NetMetrix/UX (for UNIX)
  - HP OpenView 2
- Novell NetWare
  - Using 82

## O

- on 68
- OpenView NetMetrix/UX 2
- Operation, Probe 90
- Optional Accessories 14
- Out-of-Band

- Probe to the Network Connection 49
  - Serial Connection 49, 59
  - Trouble-shooting the Installation 69
- Overview
  - Installation and Configuration 4
  - Probe 5
  - System 5

## P

- Packet Capture
  - Enable 8
  - RMON-1 MIB 7
- Packet Capture, Allow (Enable) 24
- Packet Generation, Allow (Enable) 25
- Parts Included, Probe 14
- PC Station, Using to Download new Firmware 104
- PC System, Minimum Bootp Server Requirements 73
- PC, Emulating a Terminal 13
- Per PVC Frame Relay
  - Historical Protocol Statistics
    - MIB 7
  - Protocol Statistics
    - MIB 7
- Per PVC PPP
  - Historical Protocol Statistics
    - MIB 7
  - Protocol Statistics
    - MIB 7
- Physical Connector
  - Ethernet Interface 28
- Port Number
  - Ethernet Interface 27
  - Token-Ring Interface 30
  - V-Series WAN Interface 34
- Port Type
  - Ethernet Interface 27
  - Token-Ring Interface 31
  - V-Series WAN Interface 34

- POST
  - Power-On Self-Tests 68
- Power
  - Cord 14
  - Switch 67
- Power On LED 10, 69
  - Verifying the Installation 68
- PPP
  - Historical Protocol Statistics
    - MIB 7
  - Protocol Statistics
    - MIB 7
- Private MIB, Agilent 7
- Probe 44
  - Back Panel 53
  - Cold Start 95
    - Menu Item 96
  - CONFIG Button 95
  - Configuration, Bootp Server 73
  - Connecting In-Band and Out-of-Band 49
  - Cycling Power, Warm Start 93
  - Date
    - Initial Configuration 17
  - Download New Firmware 98
  - Hardware Kit 14
  - Included Parts 14
  - Installation 42
  - Introduction 2
  - Memory Allocation 128
  - Modem Installation 62
  - Operation 90
  - Optional Accessories 14
  - Overview 5
  - Power Cord 14
  - Rack or Cabinet Installation 45
  - Rear Panel 20, 53
  - Restarting 91
  - Self-Tests 68
  - Specifications 126
  - Starting 67
  - Table Installation 45
  - Time
    - Initial Configuration 17
  - Time Zone
    - Initial Configuration 17
  - Wall Installation 47
- Protocol Statistics, Frame Relay 7
- Protocol Statistics, Frame Relay Historical 7
- Protocol Statistics, Per PVC Frame Relay 7
- Protocol Statistics, Per PVC Frame Relay Historical 7
- Protocol Statistics, Per PVC PPP 7
- Protocol Statistics, Per PVC PPP Historical 7
- Protocol Statistics, PPP 7
- Protocol Statistics, PPP Historical 7

**R**

- Rack or Cabinet Installation, Probe 45
- Rear Panel, Probe 53
- Restarting Probe 91
- Ring Number
  - Token-Ring Interface 32
    - Initial Configuration 17
- Ring Speed
  - Token-Ring Interface
    - Initial Configuration 17
- Ring-in (RI) 55
- Ring-out (RO) 55
- RJ-11 Connector 61, 62
- RJ-45 53
- RMON
  - MIB 7
- RMON-1 MIB
  - Alarms 7
  - Events 7
  - Filters 7
  - Log 7
  - Packet Capture 7
  - Trap 7
- RS-232 Connector
  - (Port) Pin-Out, 25-Pin 120
  - Terminal Connection 19

## S

SAM 76

Save Changes and Exit Menu 29, 32

Security

Access 8

Firmware Download 8

Configure 24

IP Checking

Configure 25

Modify/View Security Values Menu 24

Packet Capture 8

Configure 24

Packet Generation

Configure 25

Selecting a Location

for Probe 43

Self-Tests, Probe 68

Serial Communications

SLIP Link 3, 62

Serial Connection 59

Serial Port

Hardware Flow Control 38

Interface Cables 119

IP Address 38

Initial Configuration 18

Mode 38

Initial Configuration 18

Modem Control String 18

Modify/View Settings 36

Speed 38

Initial Configuration 18

Subnet Mask 38

Initial Configuration 18

Server

Bootp

Minimum Requirements 74

Starting the HP or Sun 77

Starting the PC 83

Setup

Bootp Server

on a PC 79

on HP or Sun System 75

Signaling Layer Historical Statistics

MIB 7

Signaling Layer Statistics

MIB 7

SLIP

Link Communications 3, 62

SNMP

Supported 7

Specifications, Probe 126

Start

Cold 95

Warm 91

Starting

Bootp Server, on a PC System 83

Bootp Server, on HP or Sun System 77

Probe 67

Station

Management 8

Status LEDs 10

Verifying the Installation 68

Subnet Mask 75

Ethernet Interface 28

Initial Configuration 17

Serial Port 38

Token-Ring Interface 31

Summary

Display Interface Summary Menu 36

Sun SPARC System, Minimum Bootp Server

Requirements 73

Supported MIBs 7

System

HP 9000, Minimum Bootp Server Requirements  
73

PC, Minimum Bootp Server Requirements 73

Sun SPARC, Minimum Bootp Server  
Requirements 73

System Overview 5

- T**
  - Table Installation, Probe 45
  - Telemetry Port
    - Activity LED 69
    - Fast Ethernet Interface 27
    - Fault LED 69
    - Token-Ring Interface 31
  - Terminal
    - Local, Configuration 13
    - PC, Emulating a 13
    - Probe Configuration (Local) 17
  - Terminal Cable Connector Pin-Out
    - 25-Pin 122
    - 9-Pin 122
  - Time 23
    - Probe
      - Initial Configuration 17
  - Time Zone 23
    - Probe
      - Initial Configuration 17
  - Token-Ring
    - Cable
      - Velocity of Propagation 118
    - Cables 118
    - Data Connector 55
  - Token-Ring Interface
    - Default Gateway IP Address 31
    - IP Address 31
    - Port Number 30
    - Port Type 31
    - Ring Number 32
      - Initial Configuration 17
    - Ring Speed
      - Initial Configuration 17
    - Subnet Mask 31
    - Token-Ring Speed 31
  - Token-Ring Networks
    - Connecting 53
  - Token-Ring Speed
    - Token-Ring Interface 31
  - Trap
    - RMON-1 MIB 7
  - Trouble-shooting
    - Out-of-Band Installation 69
  - Troubleshooting
    - V-Series Installation 70
  - Type 1 (STP) cable 54
  - Type 3 (UTP) cable 54
  - V**
  - Velocity of Propagation, Token-Ring cable 118
  - Verifying the Probe's Installation 68
  - V-Series
    - Troubleshooting the Installation 70
  - V-Series WAN Interface
    - Clock Speed 35
    - Data Sense 34
    - Link Type 34
    - Port Number 34
    - Port Type 34
  - W**
  - Wall Installation, Probe 47
  - WAN Interface
    - Clock Speed
      - Initial Configuration 18
    - Data Sense
      - Initial Configuration 18
    - Link Type
      - Initial Configuration 18
  - Warm Start 91
    - Cycling Power 93
    - Information Reset 91, 95
    - Menu Item 94
  - X**
  - XMODEM Download of Firmware 108
-

---

# Agilent Technologies, Inc. Offices

## Asia-Pacific

Agilent Technologies, Inc.  
24/F, Cityplaza One, 1111 King's Road,  
Taikoo Shing, Hong Kong, SAR  
Tel: (852) 3197-7777  
Fax: (852) 2506-9284

## Australia/New Zealand

Agilent Technologies Australia Pty. Ltd.  
347 Burwood Highway  
Forest Hill, Victoria 3131  
Tel: 1 800 629 485 (Australia)  
Fax: (61 3) 9272 0749  
Tel: 0 800 738 378 (New Zealand)  
Fax: (64 4) 802 6881

## Canada

Agilent Technologies Canada Inc.  
5150 Spectrum Way  
Mississauga, Ontario L4W 5G1  
Tel: 1 877 894 4414

## Europe

Agilent Technologies, Inc.  
Test and Measurement  
European Marketing Organisation  
P.O. Box 999  
1180 AZ Amstelveen  
The Netherlands  
(31 20) 547 9999

## Japan

Agilent Technologies Japan Ltd.  
Measurement Assistance Center  
9-1, Takakura-Cho, Hachioji-Shi,  
Tokyo 192-8510, Japan  
Tel: (81) 426 56 7832  
Fax: (81) 426 56 7840

## Latin America

Agilent Technologies, Inc.  
Latin American Region Headquarters  
5200 Blue Lagoon Drive, Suite #950  
Miami, Florida, USA 33126  
Tel: (305) 267-4245  
Fax: (305) 267-4286

## United States

Agilent Technologies, Inc.  
Test and Measurement Call Center  
P.O. Box 4026  
Englewood, CO 80155-4026  
1 800 452 4844