



Broadband Service Analyzer

User's Guide

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Printing history

New editions of this guide are issued to reflect extensive changes made to the software. Revisions may be issued between application releases to correct errors in the manual. There may not be a new edition issued in conjunction with every application release. The application release, at the date of printing, is noted in the following table.

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If test and measurement equipment is operated with unscreened cables and/or used for measurements on open setups, the Buyer has to ensure that under operating conditions the Radio Interference Limits are still met at the border of the Buyer's premises.

Disclaimer

Except where otherwise stated, the parameters described are warranted performance specifications. Parameters described as "typical" or "nominal" are supplemental characteristics that provide a useful indication of typical, but non-warranted, performance.

Warnings

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product.

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Ground the equipment For equipment having a protective ground terminal (Safety Class 1), an uninterruptible safety ground must be provided from the mains power source to the product input wiring terminals or supplied power cable.

DO NOT operate the product in an explosive atmosphere or in the presence of flammable gases or fumes

For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type. DO NOT use repaired fuses or short-circuited fuse holders.

Keep away from live circuits

Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged

equipment Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to a Hewlett-Packard Sales and Service Office for service and repair to ensure the safety features are maintained.

DO NOT substitute parts or modify equipment

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to a Hewlett-Packard Sales and Service Office for service and repair to ensure features are maintained.

DO NOT clean with fluids

Doing so may make the equipment unsafe for use.

Safety Symbols



Instruction manual symbol affixed to product. Indicates that the user must refer to the manual for specific Warning or Caution information to avoid personal injury, or damage to the product.



Protective conductor terminal indicates the field wiring terminal that must be connected to ground before operating the equipment—protects against electrical shock in case of fault.



Frame or chassis ground terminal—typically connects to the equipment's metal frame.



Earth (ground) terminal.



Alternating current (ac).



Direct current (dc).



Indicates hazardous voltages.

Warning

Calls attention to a procedure, practice, or condition that could cause bodily injury or death.

Caution

Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.



Indicates that antistatic precautions should be taken.

Avertissement

Cet appareil répond aux normes de la "Classe de sécurité 1" et est muni d'un fil de mise à la terre pour votre protection.

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

Restrictions d'utilisation

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

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).

Environnement

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

Service et ajustement

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

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

Manipulation du tube cathodique

Une manipulation brusque, ou le fait de secouer l'appareil, peut provoquer le bris du tube cathodique. L'implosion qui s'en suivrait entraînerait la dispersion à grande vitesse d'éclats de verre. Le retrait ou l'installation du tube cathodique ne doit être exécuté que par un technicien qualifié, portant un masque et des gants de sécurité homologués.

Service non autorisé

L'installation de pièces étrangères, ou toute modification apportée à l'appareil sans le consentement de Hewlett-Packard 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 Hewlett-Packard.

Symboles des sécurité



Attention (voir documents d'accompagnement)



Le conducteur protectif indique que la prise de terre doit être connectée avant d'utiliser l'équipement—protège contre le choc électrique en cas de faute.



Borne de terre



Borne de masse, châssis



Courant alternatif



Courant continu



Risque de choc électriques

WARNING

Attire l'attention sur une procédure, une pratique, ou des conditions qui peuvent entraîner des blessures corporelles ou la mort.

CAUTION

Attire l'attention sur une procédure, une pratique, ou des conditions qui peuvent endommager l'équipement.



Signale que des précautions antistatique doivent être prises.

DECLARATION OF CONFORMITY

According to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name Hewlett Packard Australia Ltd.

Manufacturer's Address Australian Telecom Operation
347 Burwood Highway
Burwood East, 3151
Victoria, Australia

declares that the product:

Product Name Broadband Service Analyzer

Model Number HP E5200A

Product Options This declaration covers all options of the above product.

conforms to the following product specifications:

Safety EN 61010-1:1993 / IEC 1010-1:1990 + A1
CSA C22.2 No. 1010-1:1992
UL 3111-1:1994

EMC EN 55011:1991 / CISPR 11:1990 (Group 1, Class A ¹)
EN 50082-1:1992
IEC 801-2:1991 4 kV CD, 8 kV AD
IEC 801-3:1984 3 V/m
IEC 801-4:1988 0.5 kV Signal Lines, 1 kV Power Lines

Supplementary Information This product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.
This product uses high speed digital interfaces which are susceptible to Electrostatic Discharge (ESD). ESD may corrupt received data.
¹The product meets the listed specifications with interface pods installed in both ports.



Melbourne, Australia, December 5, 1995
Issue 1

Graeme Cobb - Quality Manager

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What is the HP Broadband Service Analyzer?

The HP E5200A Broadband Service Analyzer is a portable yet powerful tool designed specifically to test broadband equipment, networks, and services. It can be used by public and private network providers to

- test network equipment
- aid in equipment installation
- test interworking devices
- test end-to-end services

You can use the analyzer to test the physical, ATM, and AAL layers in network traffic.

The analyzer's user interface has four main components that provide most of the tools you need to install, test, and support network equipment and services:

- **Link Monitor and Channel Monitor** continuously measure the key indicators of the health of the link or of a specific channel (VPI/VCI), and display the information in an easy-to-read summary format.
- **SMARTtests and predefined macros** speed up the common and routine tasks you need to perform when installing and testing network equipment and services, and to ensure quality of service.
- **Simulator** gives you all of the tools you need to have manual control of the transmit functions of the analyzer.
- **Capture Viewer** shows you details of captured traffic. You can troubleshoot any fault in any level of the protocol stack, such as LAN emulation, classical IP, and Frame Relay over ATM.

You can use the analyzer as a standalone test solution for dispatched testing in installation, commissioning, or maintenance applications. You can also display the user interface on any HP-UX workstation and connect the instrument to a network for remote monitoring.

Where to Find Information

The HP E5200A Broadband Service Analyzer comes with a comprehensive set of paper and online documentation. Use the following table to determine which documents you should use.

What is it?	What does it do?	Who is it for?
User's Guide Chapter 1 "Setting Up the Analyzer"	contains instructions on how to set up and install the analyzer	users who are responsible for the initial setup and any subsequent relocation of the analyzer
User's Guide Chapter 2 "Using the Analyzer"	provides an outline of the most common analyzer functions	users who want a quick introduction to the analyzer and its main functions
User's Guide Chapter 3 "Using the Online Help"	describes the types of online help available	all users
User's Guide Chapter 4 "System Administration"	provides an outline of the most common system administration functions	all users

What is it?	What does it do?	Who is it for?
User's Guide Chapter 5 "Standards and Specifications"	lists the electrical, mechanical, and environmental specifications	users who are responsible for connecting the analyzer to other equipment
Online Help	three help volumes—User, Macro, and UPE Compatibility—contain information about, and instructions for using, the analyzer	all users
Quick Reference	provides a brief overview of the analyzer's main features and functions	all users
Setting Up the Interface Pod guides	a series of guides that provide descriptions of, and instructions for installing, individual interface pods	all users
Worldwide Support card	provides information about support, service, and warranty	all users
Release Notice (if relevant)	provides information not available when this guide was printed	all users

Where to Find Information

The release 1.7 documentation, in PDF format, is included on the CD ROM that contains the distribution software. This includes the *Release 1.7 Broadband Network Analyzer User's Guide*. The files are in the *manuals* directory on the CD ROM. This directory contains the following files.

File	Manual
5200ug31.pdf	Broadband Network Analyzer User's Guide
5120ig1a.pdf	Setting up the DS1DS3 Interface Pod
5121ig1a.pdf	Setting up the E3 Interface Pod
5122ig1a.pdf	Setting up the OC-3/STM-1 Optical Interface Pod
5123ig1a.pdf	Setting up the STM-1 Electrical Interface Pod
5125ig1.pdf	Setting up the E1 Interface Pod
5126ig1.pdf	Setting up the J2 6.3 Mb/s Electrical Interface Pod

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Setting Up the Analyzer

Introduction

When you receive your HP Broadband Service Analyzer, you must perform the following steps before you can use it:

- Unpack the analyzer.
- Connect the analyzer to a controlling computer.
- Switch on the analyzer.
- Prepare the analyzer for use.
- Insert the interface pods.

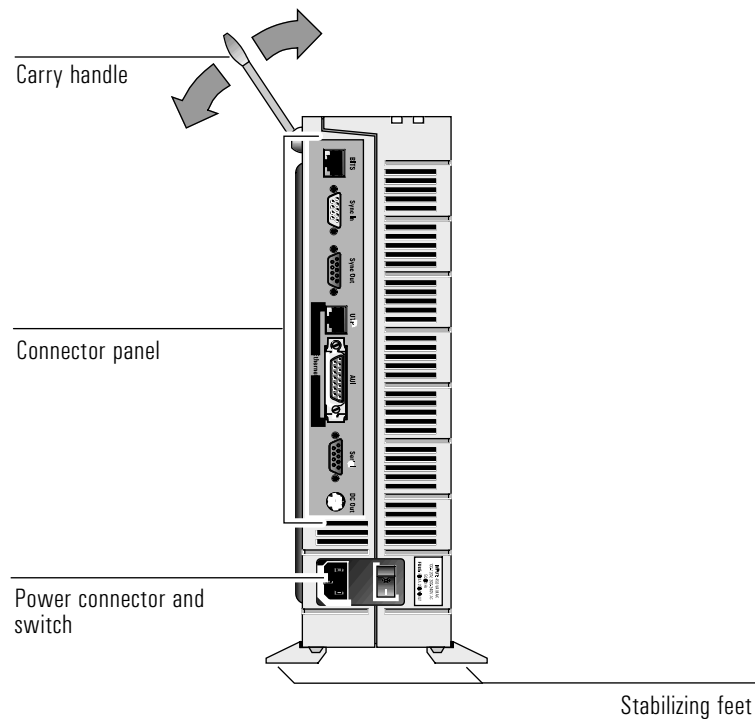
To Unpack the Analyzer

When you receive your HP Broadband Service Analyzer, ensure you have received the correct items by checking the contents of the package against the packing list in each box within the packing carton.

Caution

The external connectors on the analyzer and interface pods are susceptible to electrostatic discharge (ESD). Handle the equipment with the necessary care to avoid ESD damage during unpacking, installation, and operation.

The analyzer can operate either standing up or lying flat. Use the stabilizing feet if you want the unit to stand up.



Analyzer Software

All of the required software is preinstalled. If you have the HP Broadband Service Analyzer (E5200A), the application software is pre-installed on the analyzer.

If you have the HP Broadband Service Analyzer with the notebook PC (E5200A option 050), the application software is pre-installed on the analyzer, and the following software is pre-installed on the notebook PC:

- analyzer software (as backup)
- interface pod software (as backup)
- online help
- MS-DOS (Ver. 6.2)
- Microsoft Windows (Ver. 3.1)
- PC-Xware (Ver. 2.1)
- Acadia/VxD (Ver. 2.2)
- Borland C++ (optional—supplied with the Broadband Series UPE Conversion Toolkit p/n E5190A)

You will also receive a set of diskettes containing the PC based online help, and/or a CD-ROM that contains the

- analyzer software
- notebook PC software
- PC based online help
- UNIX based online help

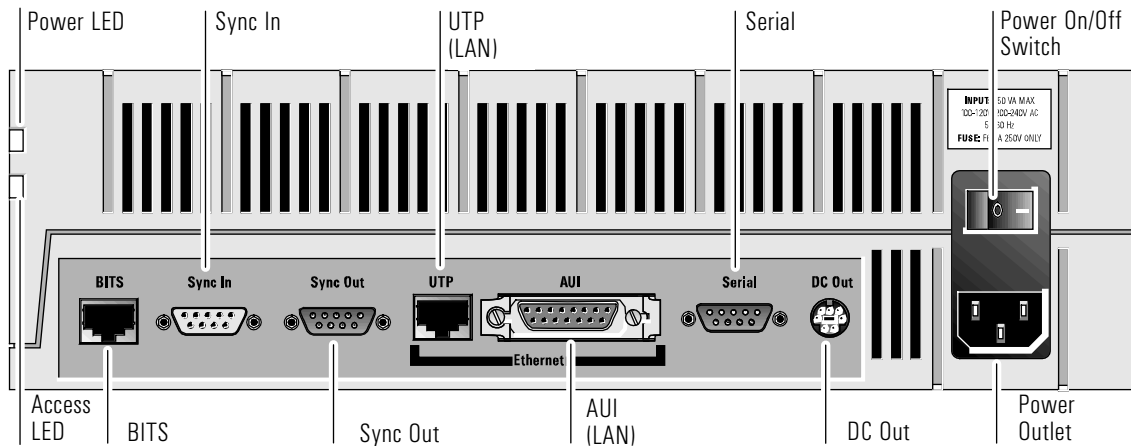
Caution When you receive your analyzer, you should make a complete backup of the notebook PC hard disk. This will save you time in the future if you ever have any problems with the notebook PC hard disk. For backup procedures, refer to “To Back Up Files” on page 1-24.

Caution Do not load any non-analyzer related software on the notebook PC. This may cause damage to the analyzer’s software.

You can also use the analyzer with an HP-UX workstation as the display server.

The HP Broadband Service Analyzer is certified to operate only with the supplied notebook PC or an HP-UX workstation. If you have any problems, contact your local HP representative.

Connector Panel at a Glance



Power LED	Light emitting diode (LED) that indicates when power is supplied to the analyzer.
Access LED	Light emitting Diode (LED) that indicates when the analyzer is accessing information from a network.
BITS	Input for synchronizing the analyzer to a Building Integrated Timing Source (BITS) or to a DS1 or E1 source.
Sync In	Input for synchronizing the analyzer's Data Clocks, Measurement System, or Data Timestamp to external equipment or another analyzer.
Sync Out	Output for synchronizing external equipment, or for synchronizing the Data Clocks, Measurement System, or Data Timestamps of another analyzer to this analyzer.
UTP	Connects the analyzer to a 10BaseT (Ethertwist/TPE) Local Area Network. When the analyzer is supplied with an Omnibook, the UTP port is used for connecting the analyzer to the Omnibook.
AUI	Attachment Unit Interface connector used with an external MAU (Medium Attachment Unit) to allow connection of the analyzer to a variety of different Local Area Networks.
Serial	Port for connecting the analyzer to a Terminal using RS-232C serial communications.
DC Out	This output is not active.

To Connect the Analyzer to a Computer

The analyzer is designed for both onsite and remote broadband testing applications. The way in which you connect the analyzer to a computer depends on whether you want to perform remote or local testing. You can connect the analyzer as a

- standalone system (with a notebook PC)
- networked system
- remote system (using a modem)

Both the HP Broadband Service Analyzer and the supplied notebook PC are pre-configured for all of these connections (except for network specific configuration parameters). For a networked system, you will need to record additional information. See “To Connect the Analyzer as a Networked System” on page 1-10.

The default configuration for the analyzer is as follows:

Boot source	Local Disk
Ethernet IP Address	10.0.0.1
Ethernet IP Netmask	255.255.255.0
Host IP Address	10.0.0.2
Host Gateway IP Address	not used
SLIP IP Address	10.0.1.1

The default configuration for the notebook PC is as follows:

Ethernet IP Address	10.0.0.2
Ethernet IP Netmask	255.255.255.0
SLIP IP Address	10.0.1.2

Warning

For your safety, the power cord supplied with the analyzer has a grounded plug. Always use the power cord with a properly grounded mains power outlet to avoid electrical shock.

If you will be converting data captured by the analyzer into HP Broadband Series Test System (BSTS) captured data files, you must install the Data Conversion Utility (p/n E5200-10010). See the Installing/Upgrading Software section in the *HP BSTS System Installation & Startup Guide*.

After you have prepared the analyzer for use, back up the analyzer's hard disk to the notebook PC or workstation; then archive this data using backup storage media. See "To Back Up and Restore Files" on page 1-23.

To Connect the Analyzer as a Standalone System

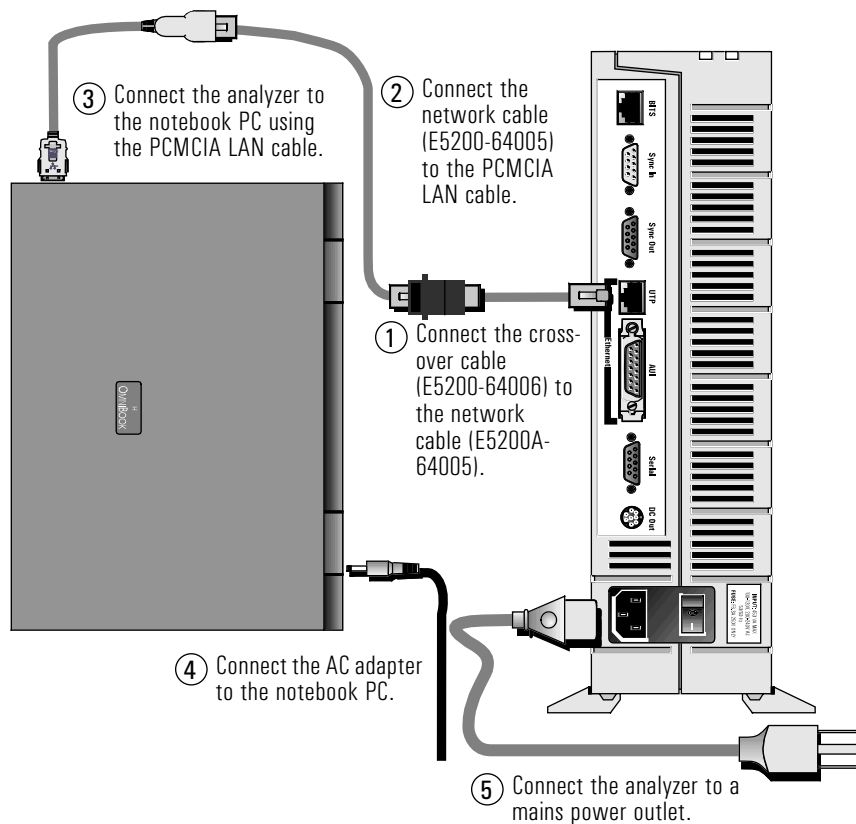
You should connect the analyzer as a standalone system for onsite testing, for example, at an installation site or a monitoring point. There are two ways you can connect the analyzer as a standalone system:

- point-to-point ethernet interface
- point-to-point serial interface

Normally, you would use the point-to-point ethernet interface. You can use the point-to-point serial interface as a backup connection when there is a problem with the ethernet interface, or when you need to set up the configuration parameters for a networked system. See "To Change Configuration Parameters" on page 1-20.

The computer to which you connect your analyzer should only contain the software specified in "Analyzer Software" on page 1-4.

To Connect the Analyzer to a Point-to-Point Ethernet Interface

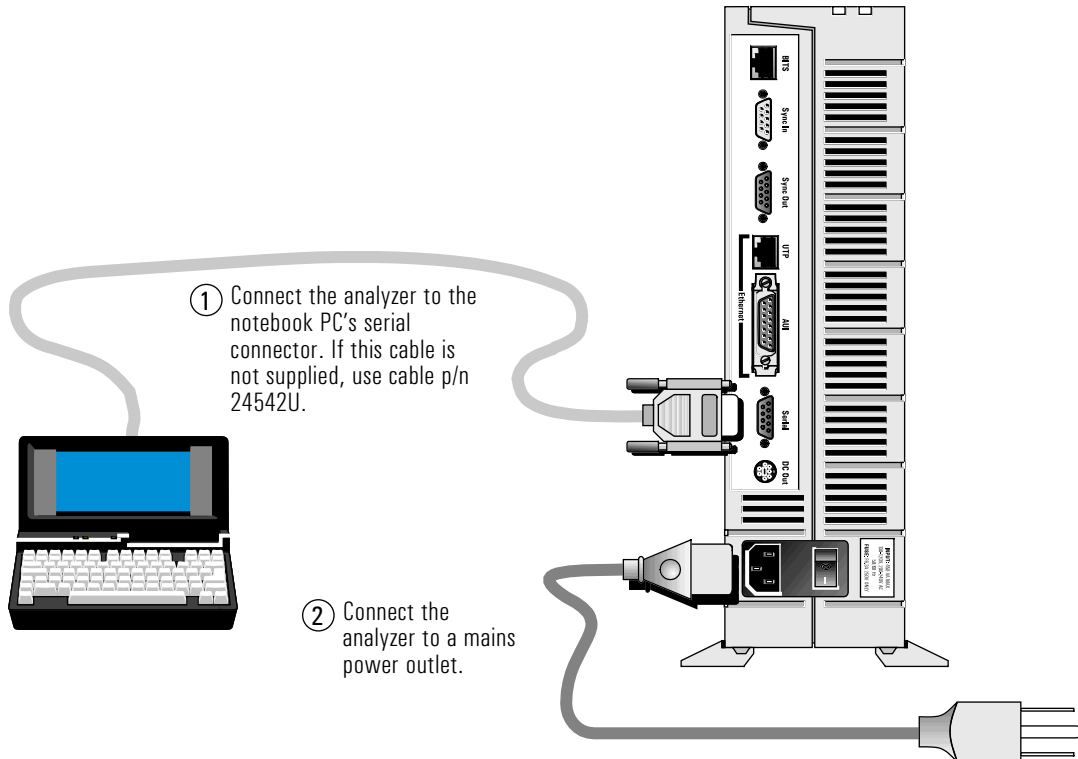


Caution

Make sure at least 3 cm of clear space is left between the analyzer ventilation openings and other objects.

If there is a boot failure, the analyzer attempts to boot from the host computer using the configured boot host, and analyzer IP address.

To Connect the Analyzer to a Point-to-Point Serial Interface



To Record the System Administration Information

After you have connected the analyzer, switch on the analyzer (see “To Switch the Analyzer On and Off” on page 1-22); then use the system administration functions of the analyzer to set the

- system administrator password (see “To Change a Password” on page 4-6)
- required users (see *User Online Help*)
- date, time, and time zone (see “To Set the System Date, Time, and Time Zone” on page 4-7)
- printer (see *User Online Help*)

To Connect the Analyzer as a Networked System

You should connect the analyzer as a networked system when you want to remotely monitor a network. By connecting the analyzer to a networked system, you can use either the supplied notebook PC, or an HP-UX workstation at a remotely controlled monitoring point.

To connect the analyzer as a networked system, you need to perform the following steps:

- 1** Configure the notebook PC or workstation.
- 2** Configure the analyzer.
- 3** Connect the analyzer.
- 4** Test for network connectivity.
- 5** Install the online help (UNIX workstation only).
- 6** Record the system administration information.

To Configure the Notebook PC or Workstation

If you are connecting the analyzer to the notebook PC via your network, use Acadia/Vxd to reconfigure the following parameters (assigned by the system administrator):

- notebook PC hostname
- notebook PC IP address
- notebook netmask
- default router IP address
- analyzer's IP address

If you are connecting the analyzer to a HP-UX workstation via your network, complete the following steps:

- 1** Note down the workstation's hostname and IP address. You will find this information in the `/etc/hosts` file.
- 2** Add the analyzer's hostname and IP address to your workstation's `/etc/hosts` file.

- 3** Note down the workstation's netmask. You will find this information in the `/etc/netlinkrc` file.
- 4** Note down your workstation's default route. You will find this information in the `/etc/netlinkrc` file.

To Configure the Analyzer

Before you connect the analyzer as a networked system, you must set up the following configuration parameters:

	Notebook PC	UNIX Workstation
Boot source	local disk	local disk
Analyzer Ethernet IP Address	This must match the analyzer's IP address that you recorded in <code>Acadia/Vxd</code> .	This must match the analyzer's IP address you added to the <code>/etc/hosts</code> file.
Analyzer Ethernet IP Netmask	This must match the notebook PC's ethernet netmask IP address that you recorded in <code>Acadia/Vxd</code> .	This must match the netmask IP address noted down from your workstation's <code>/etc/netlinkrc</code> file.
Boot Host IP Address	This must match the notebook PC's ethernet IP address that you recorded in <code>Acadia/Vxd</code> .	This must match your workstation's IP address as indicated in the <code>/etc/hosts</code> file.
Boot Host Gateway IP Address	This must match the notebook PC's default router IP address that you recorded in <code>Acadia/Vxd</code> .	This must match your workstation's default router as indicated in the <code>/etc/netlinkrc</code> file.

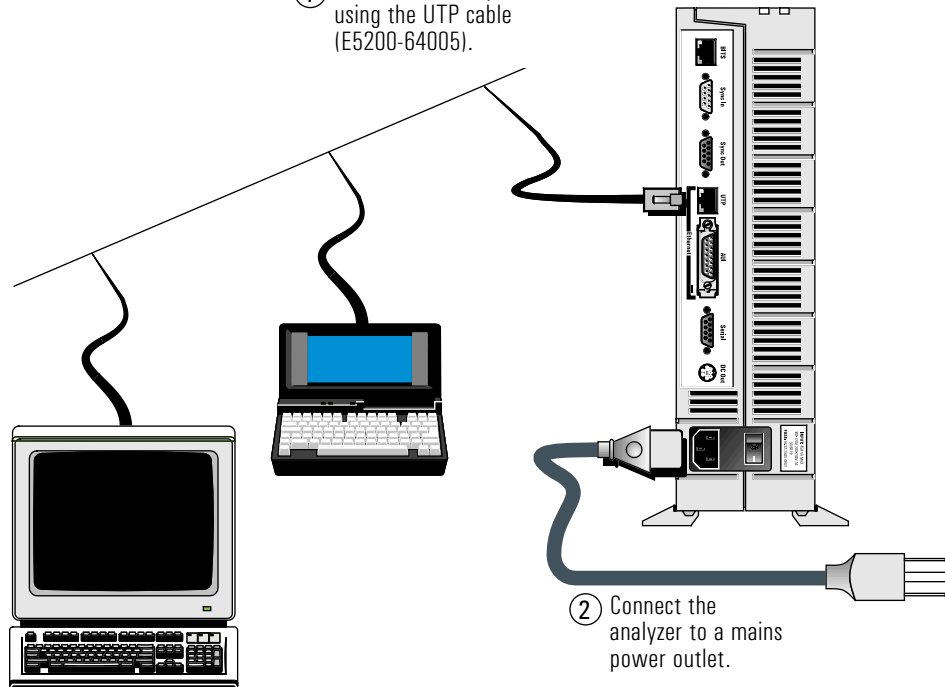
To set up the configuration parameters for a networked system, you can either

- use the Network Configuration utility—see “To Change Configuration Parameters” on page 1-20
- set up the analyzer as a standalone system; then use the system administration functions—see the *User Online Help*

Setting Up the Analyzer
To Connect the Analyzer to a Computer

To Connect the Analyzer

- ① Connect the analyzer to the LAN using the UTP cable (E5200-64005).



- ② Connect the analyzer to a mains power outlet.

Note You can also connect the analyzer to a LAN using a Medium Attachment Unit (MAU). An MAU cable is not provided with the analyzer.

To Test for Network Connectivity

If you have connected the analyzer to a workstation, do the following:

- Use the UNIX *ping* command to verify that the analyzer is up and running on your network. The syntax of the *ping* command may vary from site to site. See your system administrator or the UNIX online man pages for more details. If you cannot *ping* to the analyzer, check all of the cable connections and configuration parameters.
- Check that you have given xhost authority for the analyzer to connect to your X-display. See your system administrator or the UNIX online man pages for more details.

If you are using the notebook PC, click the Ping icon in the Acadia/Vxd program group. Ping the notebook PC and the analyzer separately using their hostnames.

To Install the Online Help

If you have HP-UX superuser permission, you can install the analyzer help on an HP series 700 workstation running HP-UX 9.05.

Note This installation modifies the following files:

- /etc/inetd.conf
- /etc/services

- 1** Mount the CD-ROM onto your file system by typing:

```
/bin/mkdir /cdrom  
/etc/mount <cdrom_device_file> /cdrom
```

See your system administrator if you are unsure of the CD-ROM device file name.

- 2** Run the HP-UX update utility by typing:

```
/etc/update
```

The update utility Main Menu is displayed.

To Connect the Analyzer to a Computer

- 3** Select "Change Source or Destination" by using the arrow keys to highlight the option; then pressing either Enter or F4.

The Change Source or Destination window is displayed.

- 4** Select "From Tape Device to Local System" as the Update from Source to Destination by using the arrow keys to highlight the option; then pressing either Enter or F4.

The From Tape Device to Local System window is displayed.

- 5** In the Source field, type `/cdrom/HELP/HYPHELP/HELP.PKG`

- 6** Press F4.

The Main Menu is redisplayed.

- 7** Select "All Filesets on the Source Media" by using the arrow keys to highlight the option; then pressing either Enter or F4.

The Select All Filesets on the Source Media window is displayed.

- 8** Select "Start Loading Now" by using the arrow keys to highlight the option; then pressing either Enter or F4.

A message window is displayed asking you whether you want to "Start loading filesets now?"

- 9** Type `y`.

The Loading Partitions and Filesets window is displayed. This window indicates the progress of the installation.

The help package is installed in the `/OPT/E5200A/` directory.

- 10** When the installation is complete, you should view the log file to check for errors in the installation. At the `#` prompt type `more /tmp/update.log`.

- 11** Errors are displayed at the end of the file. If there are errors, correct the problem and reinstall the help.

- 12** Unmount the CD-ROM from your file system by typing:

```
cd /  
/etc/unmount /cdrom
```

- 13** To print help topics, set up the current printer for the help viewer using the Printer Setup option in the File menu. For more information see the *How to use Help* option in the Help menu in the help viewer.

To Record the System Administration Information

- 1 Switch on the analyzer (see “To Switch the Analyzer On and Off” on page 1-22).
- 2 Log in to the analyzer using the following user name and password.

Note The HP Broadband Service Analyzer has two sets of default login information:

- User Name—boomer Password—broadband
- User Name—root Password—rootpasswd

See “To Log In to the Analyzer” on page 2-11.

- 3** After you have connected the analyzer, use the system administration functions of the analyzer to set the
- system administrator password (see “To Change a Password” on page 4-6)
 - required users (see *User Online Help*)
 - date, time, and time zone (see “To Set the System Date, Time, and Time Zone” on page 4-7)
 - printer (see *User Online Help*)
 - remote hosts (see *User Online Help*)
 - routing details (see *User Online Help*)
 - remote file systems (see *User Online Help*)

Note You must have the appropriate privileges to perform system administration functions.

To Connect the Analyzer Using a Modem

You can use a modem (configured to no parity, 8 data bits, 1 stop bit) to remotely access the analyzer from the notebook PC. You should use a modem connection only to access the Tcl interface.

You can set up a modem connection using either:

- an external modem
- a PCMCIA internal modem

To connect the analyzer using a modem, complete the following steps:

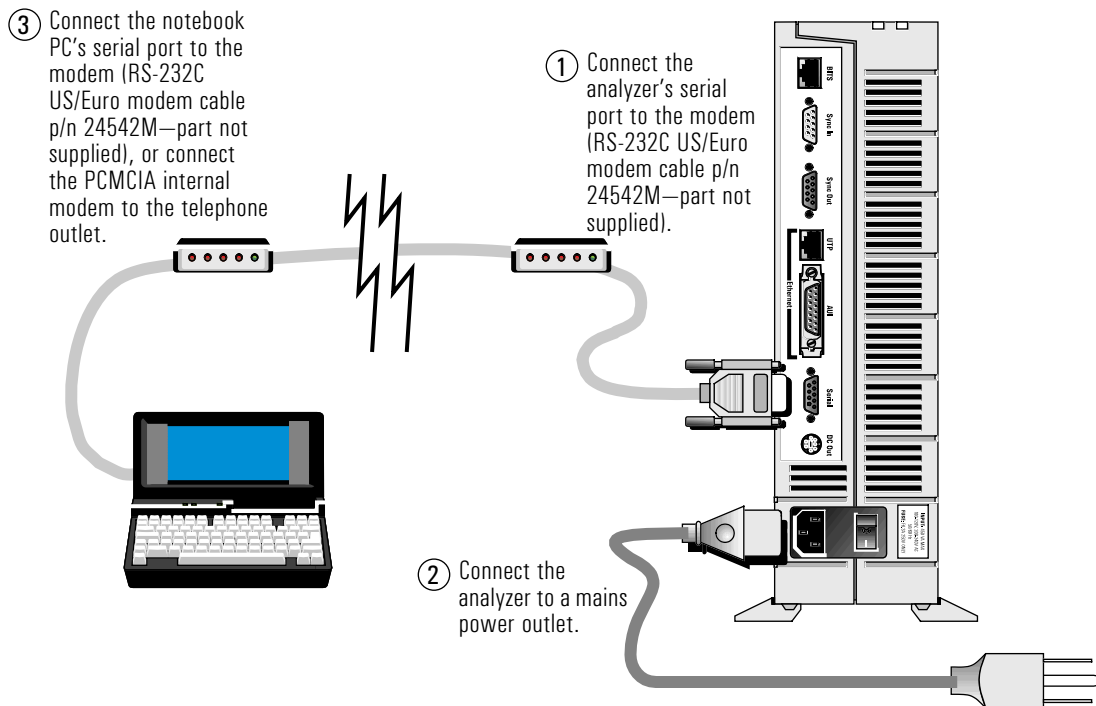
- 1** If you are using the PCMCIA internal modem, change the COM port assignments for the notebook PC.
- 2** Connect the analyzer.
- 3** Set the remote modem to auto answer.
- 4** Set up the modem connection.
- 5** Record the system administration information.

To Change the COM Port Assignment

- 1** From the Main program group, click the Control Panel icon.
- 2** Click the OmniBook icon. The OmniBook Configuration window is displayed.
- 3** Click the Change button in the COM Port Assignments area. The Select COM Port Assignments window is displayed.
- 4** Set the serial port to COM4 by clicking COM4 in the Serial Port column; then click OK.

To Connect the Analyzer

Note You can either connect the notebook PC's serial port to an external modem, or you can connect the PCMCIA internal modem directly to the telephone socket.



To Set the Remote Modem to Auto Answer

Set the remote modem (connected to the analyzer) to auto answer by setting the S parameter zero (SO) to a value greater than zero. See your modem's user's guide.

To Set up the Modem Connection

- 1 Double-click the Dialer icon in the Acadia/VxD program group.



The Ipswitch, Inc. SLIP/PPP Configure & Dial window is displayed.

- 2 Click the phone number (e5200a) in the Phonebook list; then click the Dial button.
- 3 If required, change the baud rate. To change the baud rate, click the Setup button on the Ipswitch, Inc. SLIP/PPP Configure & Dial window; then select the required baud rate from the Speed pull-down list. The analyzer SLIP baud rate must match this baud rate.
- 4 If required, change the remote phone number. To change the remote phone number, select e5200a from the Phonebook on the Ipswitch, Inc. SLIP/PPP Configure & Dial window, click the Setup button, then type the new phone number in the Phone #: field.

To Record the System Administration Information

- 1 Switch on the analyzer (see “To Switch the Analyzer On and Off” on page 1-22).
- 2 Log in to the analyzer via the SLIP connection using the following user name and password.

Note The HP Broadband Service Analyzer has two sets of default login information:

- User Name—boomer Password—broadband
- User Name—root Password—rootpasswd

See “To Log In to the Analyzer” on page 2-11.

- 3** After you have connected the analyzer, use the system administration functions of the analyzer to set the
- system administrator password (see “To Change a Password” on page 4-6)
 - required users (see *User Online Help*)
 - date, time, and time zone (see “To Set the System Date, Time, and Time Zone” on page 4-7)
 - printer (see *User Online Help*)
 - remote hosts (see *User Online Help*)
 - routing details (see *User Online Help*)
 - remote file systems (see *User Online Help*)

Note You must have the appropriate privileges to perform system administration functions.

Note After you have logged out, you must disconnect the modem. To disconnect the modem

- 1** Double-click the Dialer icon in the Acadia/VxD program group. The Ipswitch, Inc. SLIP/PPP Configure & Dial window is displayed.
 - 2** Select e5200a from the Phonebook list.
 - 3** Click the Hangup button.
- The connection is now closed.

To Change Configuration Parameters

You can change the configuration parameters for the analyzer and the controlling computer using either

- the Network Configuration utility. Use this method of changing the configuration parameters when you want to connect the analyzer as a networked system. You must change the configuration parameters before you connect the analyzer.
- the analyzer system administration functions. Use this method when the analyzer is connected as a standalone system.

To Configure the Analyzer Using the Network Configuration Utility

- 1** Double click the HP Analyzer Terminal over SLIP icon in the HP Broadband Analyzer program group.
- 2** Switch on the analyzer and hold down the Enter key on the terminal for five seconds until the HP Broadband Service Analyzer Configuration menu appears. You must press the Enter key immediately after turning on the power switch.

The keyboard on the remote workstation must be configured to auto-repeat.
- 3** Type 2 to change the current boot parameters; then press Enter.
- 4** Record the configuration parameters for the analyzer.
- 5** Close the terminal window by pressing Ctrl-C.
- 6** Switch off the analyzer. You must reboot the analyzer after you have changed the configuration parameters.
- 7** Disconnect the terminal from the serial port.
- 8** Connect the analyzer to the network (see "To Connect the Analyzer as a Networked System" on page 1-10).

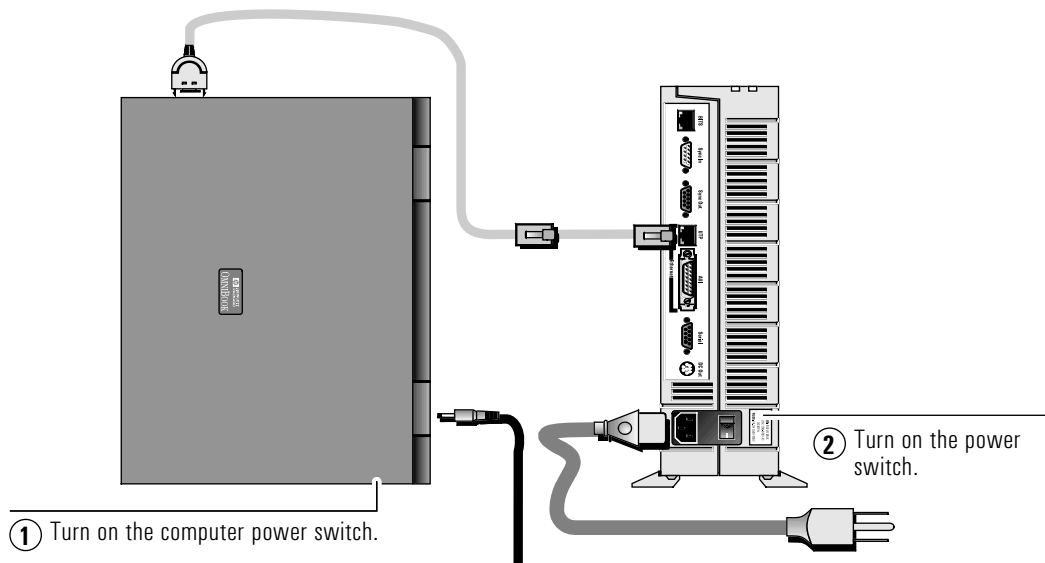
To Connect a Printer to the Analyzer

You can print from the analyzer if a printer is connected to your computer. The printer must be compatible with PCL 5. If the analyzer is connected to a network, you can also print using a LAN printer (using PCL 5).

Refer to the computer's user's guide for information on how to connect the printer. See the system administration functions in the *User Online Help* to set the current printer.

To Switch the Analyzer On and Off

After you connect the analyzer to the computer, you can switch on the equipment.



The analyzer takes approximately two minutes to run its self-tests and switch on. While it is switching on, the Power LED flashes green, and if the analyzer is booting from a PC or LAN, the Access LED flashes orange. When the analyzer is on, the Power LED remains green and the Access LED flashes orange intermittently. If the Power LED stays red, contact your HP support representative.

To switch off the analyzer, switch off the power to the computer and the analyzer. When you switch off, the analyzer performs a shutdown under software control which makes sure all files are properly closed.

When you switch off the analyzer, the Power LED flashes green during shutdown and then goes off.

Caution

Make sure shutdown is complete before unplugging or removing the power cables, or switching off power at the AC wall outlet.

To Back Up and Restore Files

When you use the HP Broadband Service Analyzer, you create files that are stored on the analyzer's hard disk. You should back up these files

- after you connect and change the configuration of the analyzer
- on a regular basis to safeguard against data loss

See the *Acadia/VxD Installation, Overview and Command Reference* for more detailed information about how to NFS mount a file system.

When you first start the notebook PC, you should create a bootable diskette in case there is a complete hard disk crash (see "To Create a Bootable Diskette" on page 1-23). You should also backup the notebook PC hard disk (see "To Back Up Files" on page 1-24).

To Create a Bootable Diskette

- 1 Place a formatted diskette in drive A.
- 2 At the `C:\>` prompt, type `sys A:`
- 3 Copy the following files from the `C:\DOS` directory onto the diskette:
 - format.com
 - msbackdb.ovl
 - msbackdr.ovl
 - msbackfb.ovl
 - msbackfr.ovl
 - msbackup.exe
 - msbackup.hlp
 - msbackup.ovl
 - msbconfig.hlp
 - msbconfig.ovl

To Back Up Files

You should perform regular backups to ensure minimal loss of data if a problem arises with the analyzer's hard disk. You should back up the analyzer's hard disk to the controlling computer's hard disk, then archive the data to backup storage media. The backup storage media may be either diskettes, tape, or a network storage device.

To Back Up Files from the Analyzer to a Notebook PC

- 1 Open the HP Broadband Analyzer program group within the Windows Program Manager.
- 2 Open the NFS Client icon within the HP Broadband Analyzer program group.
- 3 Set the Network Path to `E5200A:\IDE`
- 4 Set the Drive to G or any unused drive designator.
- 5 Click the Connect button. The current drive connection information should now display `E5200A:\IDE` on G.
- 6 Click the Close button to close NFS Client.
- 7 Open the Windows File Manager.
- 8 Back up drive G to drive C by dragging and dropping the `G:\usr` directory to the `C:\` directory.
- 9 Rename `C:\usr` to `C:\usr_old`.
- 10 Copy `G:\usr` to `C:\usr`. This process will take approximately 1 hour.

See the *MS-DOS User's Guide* and the *Microsoft Windows User's Guide* for more information.

To Back Up Files from a Notebook PC to Backup Storage Media

Use the Microsoft Backup Utility in the Microsoft Utilities program group. See the *Microsoft Windows (Ver. 3.1) User's Guide*.

To Back Up Files from the Analyzer to an HP-UX Workstation

- 1 On the networked HP-UX workstation, NFS mount the analyzer file system under the local workstation file system, using the following command:

```
/etc/mount <E5200A IP address>:/IDE /<mount point>
```

- 2 Copy all files and directories under /<mount point>/ to your workstation file system or a backup device.

To Restore Files

If any data is damaged or lost from the analyzer's hard disk, you should restore the latest version of the files that you have backed up.

To Restore Files from Backup Storage Media to a Notebook PC

If the notebook PC boots, restore the files using the Microsoft Restore Utility in the Microsoft Utilities program group. See the *Microsoft Windows (Ver. 3.1) User's Guide*.

If the Notebook PC Does Not Boot

- 1 Press F2 then F8.
- 2 Set the Boot From parameter to FDD. This allows the notebook PC to boot from drive A.
- 3 Press F3 and insert the bootable diskette (see "To Create a Bootable Diskette" on page 1-23) in drive A.
- 4 Switch the notebook PC off and then on again so that it can boot from drive A.

To Back Up and Restore Files

- 5 At the `A:\>` prompt, type

```
format/s C:\
```

This command formats drive C as a system disk.

Caution

All information on drive C is lost.

- 6 At the `C:\>` prompt, type

```
mkdir C:\dos
```

This command creates a DOS directory on drive C.

- 7 At the `A:\>` prompt, type

```
copy msb*. * C:\dos
```

This command copies all of the MS backup program files to the `C:\DOS` directory.

- 8 Type `cd C:\dos` and press Enter.

- 9 Type `msbackup` to start the backup/recovery program.

- 10 Follow the instructions on the screen to restore files from the backup storage media.

To Restore Files from a Notebook PC to the Analyzer

- 1 Open the HP Broadband Analyzer program group within the Windows Program Manager.
- 2 Open the NFS Client icon within the HP Broadband Analyzer program group.
- 3 Set the Network Path to `E5200A:\IDE`
- 4 Set the Drive to G or any unused drive designator.
- 5 Click the Connect button. The current drive connection information should now display `E5200A:\IDE` on G:
- 6 Click the Close button to close NFS Client.
- 7 Open the Windows File Manager.
- 8 Restore drive C to drive G by dragging and dropping the `C:\usr` directory to the `G:\` directory.

- 9 Switch the analyzer power off for 5 seconds.

See the *MS-DOS User's Guide* and the *Microsoft Windows User's Guide* for more information.

To Restore Files from an HP-UX Workstation to the Analyzer

- 1 On the networked HP-UX workstation, NFS mount the analyzer file system under the local workstation file system, using the following command:

```
/etc/mount<E5200A IP address>:/IDE /<mount point>
```

- 2 Restore all files and directories from the workstation file system or the backup device to /<mount point>/.

To Reset the Notebook PC

To reset the notebook PC to the default configuration

- 1 Exit Windows.
- 2 At the DOS prompt, type `cd \resetpc;` then press Enter.
- 3 At the `c:\resetpc` prompt, type `resetpc;` then press Enter.

This utility resets the analyzer and the Windows configuration to the default values. If the notebook PC had non-analyzer related software loaded on it, the relevant program groups will not be displayed. The software files, however, will remain on the notebook PC. The network configuration for the analyzer also returns to the default values.

If the utility is corrupt or fails to restore the notebook PC to its factory defaults restore the notebook PC hard disk backup (see "To Restore Files from Backup Storage Media to a Notebook PC" on page 1-25).

To Insert or Remove an Interface Pod

Interface pods can be inserted or removed from the analyzer at any time. The power does not need to be switched off. You insert an interface pod when you initially set up the analyzer, and subsequently when you change the type of line to be monitored.

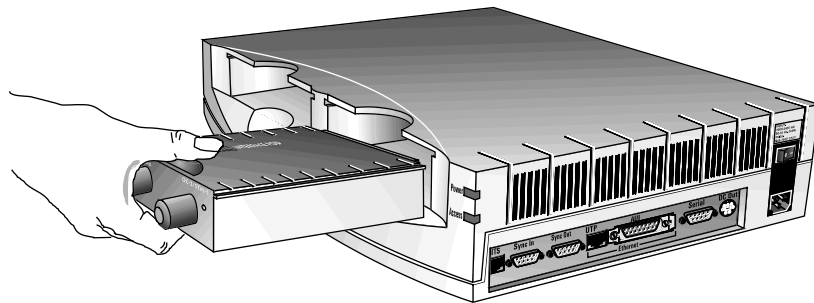
Caution

Handle the interface pod with extreme care to avoid electrostatic discharge (ESD) damage during unpacking, installation, and operation. The connectors on the front and back of the interface pod are susceptible to ESD.

The analyzer uses high speed digital interfaces which are susceptible to ESD. ESD may cause received data to be corrupted.

To Insert an Interface Pod into the Analyzer

- 1 Hold the interface pod with the front-panel connectors facing toward you and the Hewlett-Packard logo facing upwards.
- 2 Insert the interface pod into Port 1 or Port 2 of the analyzer.



- 3 Push the interface pod firmly into the analyzer until the connectors are properly seated. The clip on the base of the interface pod clicks into place when the interface pod is fully inserted.

The analyzer automatically sets the transmit and receive parameters according to the signal it receives from the interface pod. The port is automatically configured for full duplex mode.

Caution

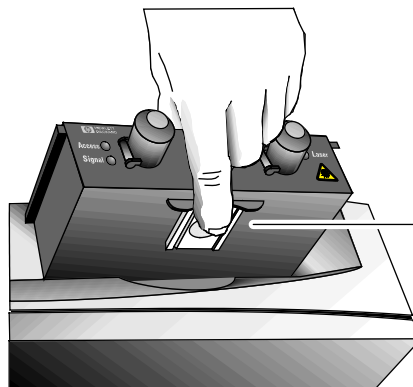
You must always have two interface pods inserted in the analyzer while it is operating. If your operations require only a single interface pod, insert the blank interface pod (provided with the analyzer) into the other port.

The two interface pods are necessary to maintain a balanced airflow for cooling of internal components and to comply with EMC emission standards.

Note Before you use an optical interface pod, you should clean the optical connectors and test cables. See the appropriate *Setting Up the Interface Pod* guide.

Note To avoid any possibility of eye damage, the laser is automatically turned off when you insert or remove an optical interface pod.

To Remove an Interface Pod



Press on the clip underneath the interface pod and firmly pull the interface pod out of the analyzer.

When you remove an interface pod, make sure you store it in a dust-free location that meets the environmental requirements listed in the *Setting Up the Interface Pod* guide. An electrostatic bag has been supplied for storing each interface pod.

To Troubleshoot the Analyzer

If the Power LED is Not On

- ❑ Check that the analyzer's power switch is on.
- ❑ Check that the analyzer's power cable is connected to the analyzer and plugged in to the power outlet, and the mains power is on.

If the Power LED is Red When You Switch On the Analyzer

If the Power LED flashes red, there is a hardware fault. The analyzer may still start, however, it will not work properly (for example, you may only be able to use one port). Return the analyzer to Hewlett-Packard at your convenience.

If the Power LED is continuously red, there is a serious hardware fault. Return the analyzer to Hewlett-Packard.

If the Analyzer Switches on Normally, but You Cannot Display the User Interface

- ❑ Check that the LAN cable between the analyzer and the notebook PC or workstation is properly connected.
- ❑ Check that the analyzer is correctly configured for the network.
- ❑ Check that the computer has only the software specified in "Analyzer Software" on page 1-4 loaded. Other software may interfere with the computer configuration. Restore the hard disk by either
 - restoring the backup (see "To Restore Files from Backup Storage Media to a Notebook PC" on page 1-25)
 - using the reset facility (see "To Reset the Notebook PC" on page 1-27)

If the Controlling Computer has No Display

- Check that the controlling computer power switch is on.
- Check that the power cable is properly connected to the controlling computer.
- Check that the brightness and contrast controls are correctly set.
- Check that the computer has only the software specified in “Analyzer Software” on page 1-4 loaded. Other software may interfere with the computer configuration. Restore the hard disk by either
 - restoring the backup (see “To Restore Files from Backup Storage Media to a Notebook PC” on page 1-25)
 - using the reset facility (see “To Reset the Notebook PC” on page 1-27)

If You Cannot NFS Mount the Analyzer File System

- Check that Nfsdw and Inetdw are running on the notebook PC. If they are running, the icons will be displayed on the screen.

If You Cannot Print to the Connected Printer

- Check that the PC-Xware LPD is running on the notebook PC.
- Check that all printer cables are connected correctly.

If the Cables Do Not Fit the Sockets

- Check the *Box Contents* lists to confirm that you have the correct equipment.
- Check that you are using the correct cables for each connection. Check the part numbers on the cables against the part numbers in the diagrams in this *User's Guide*.

If the System Failure Window is Displayed

- Contact HP Customer Support. Print the window and fax it to HP Customer Support. See “To Print a Window” on page 1-33.

Note If you cannot access the analyzer after performing the required checks, refer to the *Worldwide Support* card for information on how to obtain customer support.

To Print a Window

To Print a Window from the Notebook PC

- 1 Ensure that the printer is connected.
- 2 Make sure the window you want to print has the keyboard focus.
- 3 Press Alt-PrtSc.
- 4 From the Accessories program group, click the Paintbrush icon to open Paintbrush.
- 5 From the Edit menu, select Paste to copy the captured screen into Paintbrush.
- 6 From the File menu, select Print; then click OK. If you want, you can save the file using the Save option on the File menu.

The captured window will print on your default printer.

To Print a Window from an HP-UX Workstation

- 1 Make sure the window you want to print does not have any other window in front of it.
- 2 In a shell window, type

```
xwd -out <file_name>
```

You must save and name the captured window file in order to print it.
The cursor turns into a cross hair.
- 3 Move the cursor over the window you want to save; then click the left mouse button. The keyboard bell will sound three times.
- 4 Print the file using the `xpr` command. For example, to print to the default LaserJet (PCL) printer, type the following in a shell window:

```
xpr <filename> | lp
```

If you want to specify a printer, add the `-d<printer_name>` command to the end of the above string. See your HP-UX user's guide for more information.

Setting Up the Analyzer
To Troubleshoot the Analyzer

2

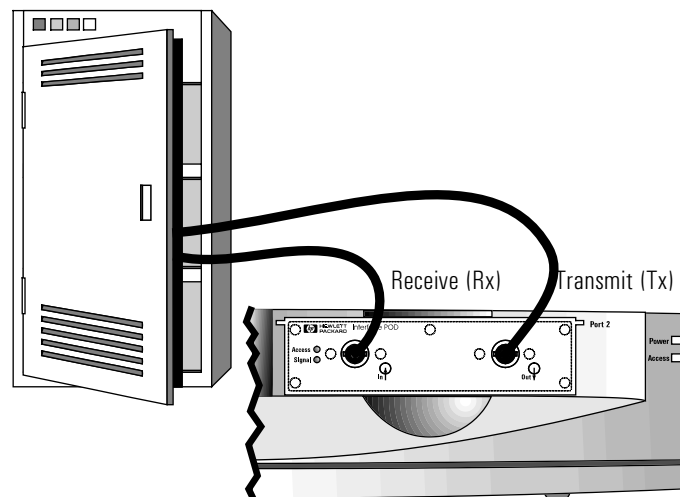
- To Connect to the System Under Test 2-2
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- To Configure the Analyzer and Ports 2-18
- To Monitor the Link (Network) 2-20
- To Monitor a Channel (VPI/VCI) 2-26
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- To Capture and View Data 2-38
- To Simulate Traffic 2-44
- To Inject Alarms and Errors 2-48
- To Use Macros 2-54

Using the Analyzer

To Connect to the System Under Test

- 1 Before you connect to the system under test (SUT), ensure that
 - the analyzer is connected to the controlling computer (workstation or notebook PC)
 - two interface pods are inserted in the analyzer, one of which may be a blank pod
- 2 Connect the interface pod(s) to the SUT. Each interface pod has a transmit and receive connector on its front panel that you use to connect to the SUT. See the *Setting Up the Interface Pod* guides for specific details relating to your interface pods.

Note If you are using an optical interface pod, ensure that the connectors on the front panel and the test cables are clean. Refer to the appropriate *Setting Up the Interface Pod* guide for more information.



There are three system connection options:

- intrusive
- non-intrusive
- diagnostic

Intrusive System Connection

When you install or remove an intrusive system connection, it affects the traffic on the link to which the analyzer is connected. Either you need to take the link offline to make the connection, or you need to interrupt traffic.

The test connections available for intrusive system are

- network element
- remote loopback
- in-line

The interface configuration options for an intrusive connection are

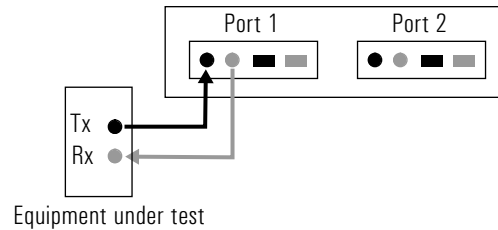
- full duplex
- receive loopback
- regenerator
- loop through

Network Element Test Connection

You can use the analyzer to transmit test traffic that passes through the network element, then returns to the analyzer for analysis and comparison with the originally transmitted test traffic.

A typical application for this type of connection is installing and troubleshooting a single network element, for example, checking whether the network element is performing according to its specifications. Use this connection to monitor, capture, and transmit traffic.

To Connect to the System Under Test



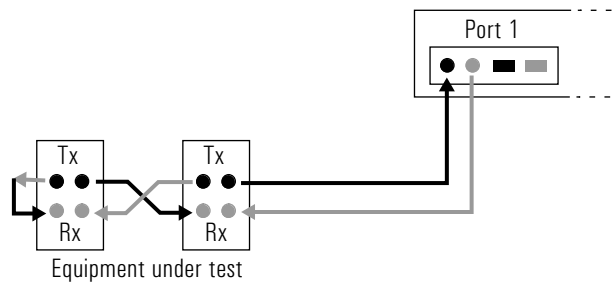
The network element connection is an out-of-service test, that is, the system is not live. Use this connection to check things such as

- protocol transfer and conversion
- connection verification
- quality of service parameters
- policing mechanisms

Configure the affected port(s) for full duplex for the network element connection. If you use the receive loopback configuration or the recovered clock timing source, make sure the network element transmitter is synchronized to an independent timing reference (to avoid problems that may be caused by possible clock failure).

Remote Loopback Test Connection

The remote loopback test connection is an out-of-service test, that is, the network is not live. The analyzer generates and receives all system traffic.



A typical application for this type of test connection is testing the integrity of the system under test. The remote loopback test connection is similar to the network element test connection in its uses. However, while the network element connection tests a single element at a time, the remote loopback connection tests all network elements in the loop. Use this connection to monitor, capture, and transmit traffic.

The main uses for this type of connection are to test

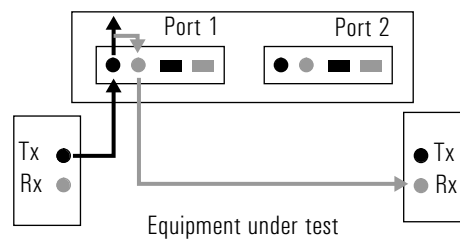
- continuity
- mean cell delay
- loop cell loss

Typically, you use a network element test connection to test any new element you add to the network. When the element passes all relevant tests, you change to the remote loopback test connection, and test to see what effect the new element is having on the other network elements in the loop. You can also use this test to identify a problem with a system that is offline.

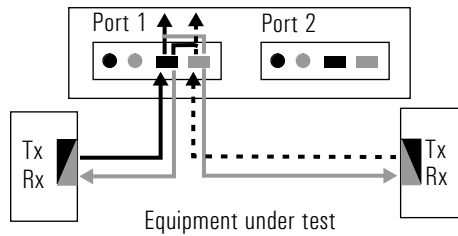
Configure the affected port(s) for full duplex for this type of test connection.

In-line Test Connection

The in-line test connection is an intrusive system connection. A typical application for the in-line test connection is testing equipment when it is being installed. Using this connection, you don't need to complicate your test with optical or electrical splitters and T-pieces.



The loop through interface configuration is another type of in-line test connection.



When using an in-line test connection, configure the affected port(s) for a full duplex, regenerator, or loopthrough interface configuration (according to the type of interface pod installed).

The disadvantage of the in-line test connection is that you need to break the link to install and remove the connection. Therefore, for networks that are already running live traffic, it is better to use a non-intrusive system connection, such as passive and T-piece test connections.

Non-Intrusive System Connection

A non-intrusive system connection does not affect the traffic on the link to which the analyzer is connected. A non-intrusive system connection is most useful because you can run in-service tests without interfering with the live system traffic.

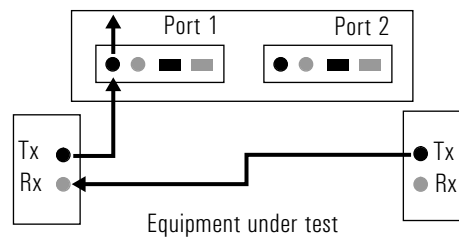
There are two test connections available for the non-intrusive system connection:

- passive
- T-piece

The analyzer interface configuration options for a non-intrusive system connection are full duplex and receive loopback.

Passive Test Connection

Some ATM switches have dedicated test access ports. All traffic from the switch is transmitted through both the regular port and the dedicated test port. Connecting the analyzer to the dedicated test port is completely non-intrusive. This type of connection never interferes with live traffic, even during set up.



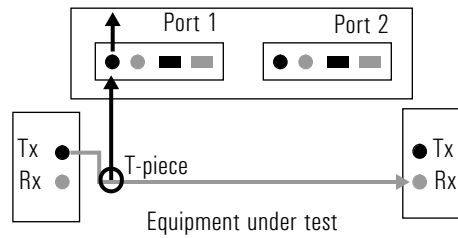
When using a non-intrusive, passive connection, the interface configuration of the analyzer is not important. The analyzer's default interface configuration is full duplex.

T-piece Test Connection

This is a type of non-intrusive test connection that requires a T-piece or splitter already present at a cross-connect. However, it does steal some power from the traffic being transmitted over the network, so the T-piece or splitter should be as close as possible to the transmit source (where the power is at its strongest).

- For electrical networks, using a T-piece or splitter is common practice.
- For optical networks, special optical splitters are available. Using a T-piece is possible only if your switch or network supports it. (The splitter can draw up to 10% of the transmitted power, which affects the transmission distance.)

To Connect to the System Under Test



When using a non intrusive, T-piece connection, the interface configuration of the analyzer is not important. The analyzer's default configuration is full duplex.

Diagnostic System Connection

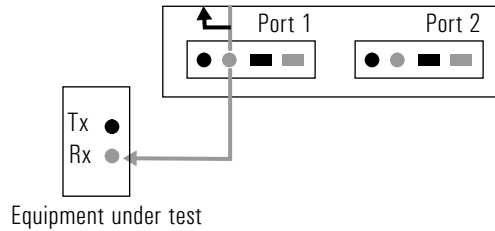
A diagnostic connection does not affect the traffic on the link to which the analyzer is connected. Use this connection when you want to test the analyzer.

There are two diagnostic test connections available for the diagnostic system connection:

- transmit loopback
- external loopback

You can connect any of the interface pods available with the analyzer in a diagnostic system connection.

Transmit Loopback Test Connection



Transmit loopback is both an interface configuration option and a test connection.

Transmitted data is directed both out of the transmit connector and internally (within the interface pod) to the measurement system.

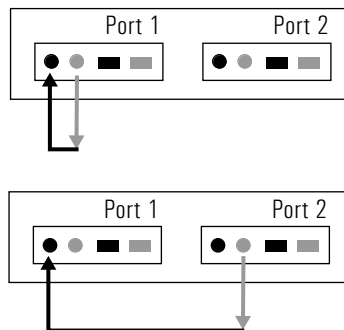
The analyzer ignores external connections to the receive connector.

For E1 interface pods set for the transmit loopback interface configuration, you can select either the BNC or RJ-48 (equipment, or line connector) as the transmitting connector. For all other interface pods, you can only transmit using the connector labeled Out.

External Loopback Test Connection

Typical applications for this type of connection include calibration, self-testing, troubleshooting, and demonstrations. This is an out-of-service test that runs independently of a network. The analyzer acts as both the transmitter and receiver.

Using the Analyzer
To Connect to the System Under Test



You can perform this test using either a single port with a single interface, or across two ports using two interfaces of the same line rate and configuration. For example, you can make an external loopback connection across two ports, between two OC-3/STM-1 interfaces.

Use the external loopback connection to monitor, capture, and transmit traffic.

Configure the affected ports for full duplex interface configuration for the external loopback test connections.

To Log In to the Analyzer

To start up the HP Broadband Service Analyzer from the notebook PC, you must double-click the appropriate icon in the HP Broadband Analyzer program group. You can display either the analyzer Graphical User Interface, or the analyzer Command Line Interface.

If at any time you cannot log in to the analyzer, reboot the notebook PC by pressing Ctrl-Alt-Del.

If you still cannot log in, refer to the *Worldwide Support* card for information about how to obtain customer support.

To Log In to the Analyzer Graphical User Interface

Double-click one of the following icons in the HP Broadband Analyzer program group:



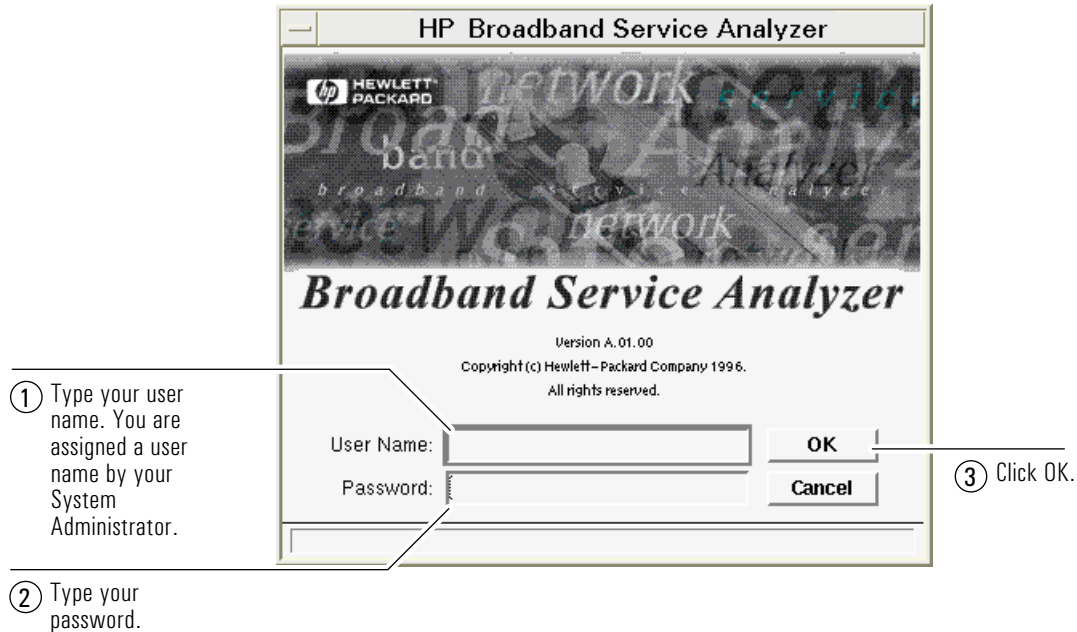
Use this icon to start the HP Broadband Service Analyzer with a PC connected through a Local Area Network (LAN).



Use this icon to start the HP Broadband Service Analyzer with a PC connected through the serial port.

Using the Analyzer
To Log In to the Analyzer

The HP Broadband Service Analyzer Login window is displayed after you double-click an icon.



- Note** The HP Broadband Service Analyzer has two sets of default login information:
- User Name—boomer Password—broadband
 - User Name—root Password—rootpasswd

The analyzer checks the information that you entered. If your user name and password are correct, it starts a new session using the default configuration and displays the analyzer's main screen and Link Monitor. If any of the information you entered is incorrect, the analyzer displays an error message and prompts you to try again.

If at any time you cannot log in to the analyzer, reboot the notebook PC in one of the following ways:

- Press the Reset button underneath the PC.
- Press Ctrl-Alt-Del.

If you still cannot log in, refer to the *Worldwide Support* card for information about how to obtain customer support.

To Log In to the Analyzer's Graphical User Interface on an HP-UX Workstation

- 1 Type `xhost +<analyzer hostname>`
- 2 Type `telnet <analyzer hostname> 5200`

The analyzer hostname is assigned by your system administrator.

The HP Broadband Service Analyzer Login window displays.

To Log In to the Command Line Interface

Double-click one of the following icons:



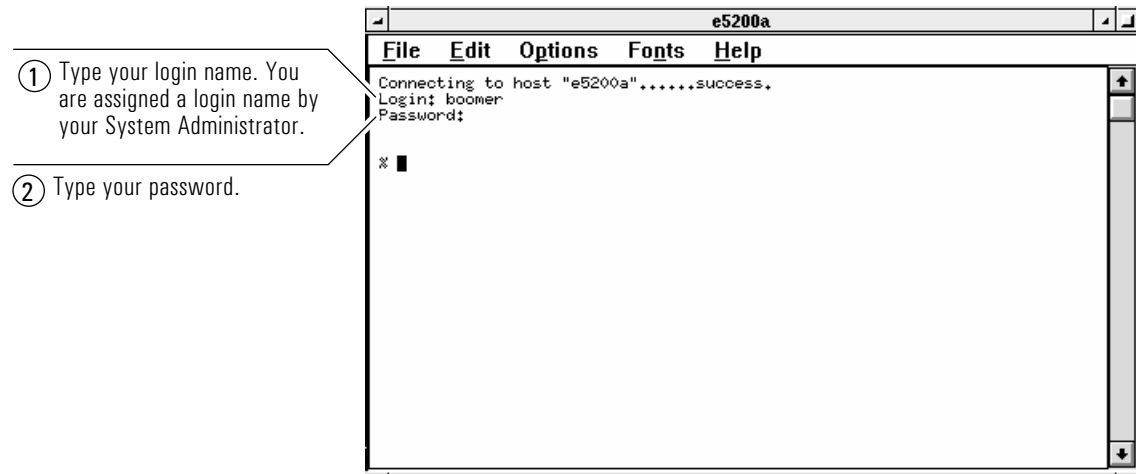
Use this icon to start the Command Line Interface to the HP Broadband Service Analyzer (see the *Macro Online Help*). The terminal is connected through a Local Area Network (LAN).



Use this icon to start the Command Line Interface to the HP Broadband Service Analyzer (see the *Macro Online Help*). The terminal is connected through the serial port.

Using the Analyzer
To Log In to the Analyzer

The Command Line Interface Login window is displayed.



The CLI (Command Line Interface) accepts Tcl (Tool Command Language) commands, **not** UNIX commands. Tcl is the scripting language used in macros. Some commands you can use at the Tcl prompt (%) are

- help—show CLI information
- version—show the software version
- saf—start the System Administration functions
- reboot—reboot the analyzer
- exit—exit the CLI

See the *Macro Online Help* for information about how to use the Command Line Interface.

To Read the Analyzer's Main Screen

The analyzer's main screen is the first screen displayed after you log in. Link Monitor is shown for each active port. You can view either Link Monitor or the Simulator for each port by clicking the appropriate tab.

A port is active as soon as an interface pod is inserted. The left side of the screen displays information about port 1, and the right side of the screen displays information about port 2.

The screenshot shows the HP Broadband Service Analyzer interface. The menu bar includes File, Configure, Monitor, Simulate, Macro, and Help. The Test dropdown is set to CellLoss SMARTtest, with Start, Stop, and Reset buttons and a timer at 00:37:40. The interface is split into two main sections for Port 1 and Port 2, each with tabs for OC-3, ATM, AAL, and OAM. Port 1 is currently selected. The left side of the Port 1 section shows '10 Highest Mb/s' (a bar chart), 'AAL Usage' (a pie chart showing 3/4), and 'Total Mb/s' (128,968 Mb/s). Below this is a table of 'Active Channels' with columns for VPI, VCI, Peak Mb/s, and AAL. The right side of the Port 1 section has 'Monitor Link' and 'Simulate' buttons. The Port 2 section has similar buttons and a 'Transmit Loopback' checkbox. A 'Measurement Controls' section at the top right includes Start, Stop, and Reset buttons. A 'Traffic from:' dropdown is set to 'Traffic Generator', showing VPI 100, VCI 100, Mb/s 20,352, and Total of All: 40,702. Below this are 'Protocol Alarms/Errors' and 'Physical Alarms/Errors' sections. A 'Monitor Channel' button is also present. A 'Help Bar' is at the bottom.

Menu Bar.

Tests. See "To Run SMARTtests and Predefined Macros" on page 2-36.

Link Monitor. See "To Monitor the Link (Network)" on page 2-20 and "To Monitor a Channel (VPI/VCI)" on page 2-26.

Measurement Controls. Start, stop, or reset the measurement system and analyzer configuration. See "To Configure the Analyzer and Ports" on page 2-18.

Alarm and Error Indicators. See "To Monitor Alarms and Errors" on page 2-28.

Simulator. See "To Simulate Traffic" on page 2-44 and "To Inject Alarms and Errors" on page 2-48.

Help hints. See "Help Hint Bar" on page 3-7.

The 10 channels using the largest amount of bandwidth

2 Using the Analyzer

The analyzer automatically configures itself when you first log in and when you change an interface pod. You can change the configuration settings if required. See "To Configure the Analyzer and Ports" on page 2-18.

If you want to use the same configuration in the future but do not want to re-enter all the session details, from the File menu choose Save Session.

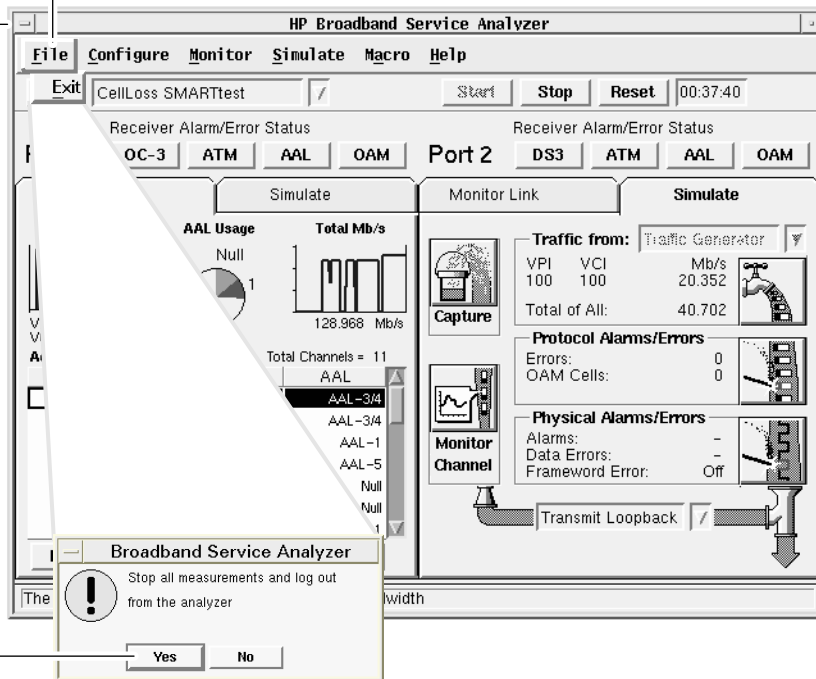
To load a saved system configuration into the analyzer, from the File menu select Restore Session.

To Log Out from the Analyzer

① From the File menu, select Exit.

or

① Double-click the Control-menu box.



② Click Yes.

If you are logging alarms and errors when you log out, the analyzer displays a message reminding you that you are still logging. When you exit the analyzer, logging stops.

If you are using a modem connection, you must disconnect the modem.

- 1** Double-click on the Dialer icon in the Acadia/VxD program group. The Ipswitch, Inc. SLIP/PPP Configure & Dial window displays.
- 2** Select e5200a from the Phonebook list.
- 3** Click the Hangup button. The connection closes.

After you have logged out, switch off the analyzer. See “To Switch the Analyzer On and Off” on page 1-22.

To Configure the Analyzer and Ports

After you log in you must configure the analyzer for the type of test you want to perform, then specify the ATM and physical layer configuration for each port.

To Configure the Analyzer

- 1** From the Configure menu, select the appropriate port.
- 2** Select the required configuration option:
 - Select full duplex for intrusive tests.
 - Select transmit loopback for diagnostic tests.
 - Select receive loopback for non-intrusive tests.
 - Select regenerator for intrusive tests for optical interface pods.

The default configuration option is full duplex. These options are also available from the Simulator.

To set the measurement system and the reference clock, see the *User Online Help*.

To Configure a Port

The analyzer auto-configures each port after you switch on the power and insert an interface pod, and when you click the Reset button on the main screen. When you configure a port, the analyzer changes the reference clock to match the configuration. You can configure the analyzer manually to override the automatic settings.

Caution

You should reconfigure the ports only when the measurement system is stopped. Reconfiguring the ports causes the measurements and some data to be lost. A warning message appears when this occurs.

To Manually Configure Each Port

The image shows a screenshot of the HP Broadband Service Analyzer software interface. The main window has a menu bar (File, Configure, Monitor, Simulate, Macro, Help) and a toolbar with buttons for Start, Stop, and Reset. Below the toolbar, there are sections for Port 1 and Port 2 configuration. The Port 1 section includes a dropdown menu for Test (Port 1, Port 2), a Monitor Link button, and a Set Up... button. The Port 2 section includes a Receiver Alarm/Error Status section with buttons for DS3, ATM, AAL, and OAM, and a Simulate button. A callout box labeled 'Configure: Port 1' is shown, which has tabs for E1, ATM, and Signaling. The E1 tab is selected, showing parameters for Signal Format (E1), Connector Type (BNC), Transmit Parameters (Clock Source: reference/recovered, Output Level: 0 dB/-4 dB), and Receive Parameters (Input Gain: 0 dB/20 dB). Three numbered callouts provide instructions: 1. Click the physical layer tab; then specify the physical layer configuration parameters for the port. 2. Click the ATM tab; then specify the ATM configuration parameters for the port. 3. Click the Signaling tab; then specify the signaling configuration parameters for the port.

① Click the physical layer tab; then specify the physical layer configuration parameters for the port.

② Click the ATM tab; then specify the ATM configuration parameters for the port.

③ Click the Signaling tab; then specify the signaling configuration parameters for the port.

2 Using the Analyzer

If you want to reset the configuration parameters to the default values after you have changed them, click the Auto button. Clicking the Reset button on the main screen also resets the port configuration parameters to their default values.

To Monitor the Link (Network)

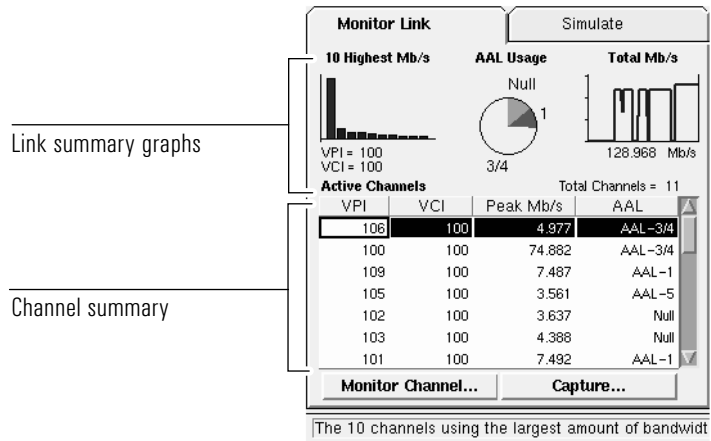
While the measurement system is on, the analyzer continuously measures the key indicators of the health of the link, and displays that information in an easy-to-read summary format. To start the measurement system, click the Start button on the main screen.

Use Link Monitor to see overall trend information. It provides an overview of what is happening in the link and highlights any abnormalities.

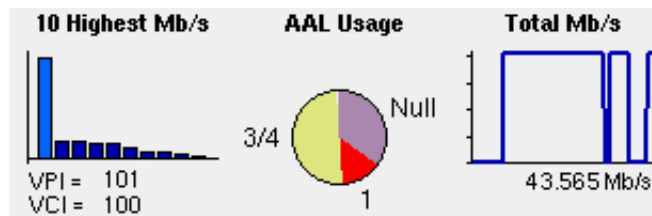
Information relating to the interface pod and the link for port 1 is shown on the left side of the screen; information relating to the interface pod and link for port 2 is shown on the right side of the screen. When one of the ports is empty, the analyzer displays a message telling you that there is no interface pod inserted in that port.

All measurements shown on Link Monitor are current. The analyzer collects measurements every 100 ms. At the end of a sampling period of 3 to 5 seconds, it uses these measurements to calculate statistics; then displays the statistics on the screen (set the update period on the Set Measurement Period window).

Link Monitor is divided into two main areas.



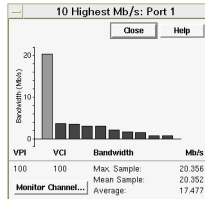
Link Summary



These graphs show you a summary of the condition of the link. You can double-click each graph to enlarge it and see detailed information.

These measurements are current, and the values are updated in real-time while you view the graph.

10 Highest Mb/s Graph



Enlarged 10 Highest Mb/s graph

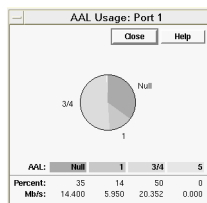
The first link summary graph shows the ten channels in the link that are using the largest amounts of bandwidth. When you click a bar in the graph, the VPI and VCI are shown under the graph and the channel is highlighted in the channel summary. When you double-click the graph to enlarge it, the analyzer displays the following information:

- mean sample bandwidth
- maximum sample bandwidth
- long term average bandwidth

These measurements are updated at the end of the update period (as set on the Set Measurement Period window). The top ten channels might change at the end of an update period.

You can go to Channel Monitor from the enlarged graph by clicking a bar in the graph to select a channel; then clicking the Monitor Channel button.

AAL Usage Graph



Enlarged AAL Usage graph

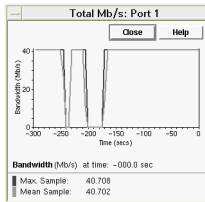
The second link summary graph shows what percentage of the traffic is made up of each AAL type. This is based on the mean sample bandwidths of all channels in the link. When you double-click the graph to enlarge it, you get detailed information about each AAL type, including the usage ratio and bandwidths.

The detailed AAL Usage graph shows the

- percentage of bandwidth used by each AAL type
- amount of bandwidth (in Mb/s) used by each AAL type

Null refers to channels of unknown AAL type.

Total Mb/s Graph



Enlarged Total Mb/s graph

The third link summary graph shows the maximum sample bandwidth usage over time. There is a vertical indicator on the right side of the graph. You can click the graph to move the vertical indicator to different positions and see what the bandwidth usage was at any time during the previous 300 seconds (5 minutes). The bandwidth usage is shown under the graph in Mb/s.

When you double-click the graph to enlarge it, the analyzer displays the following information:

- maximum bandwidth available for the port (which is the maximum value on the bandwidth axis for the graph)
- maximum sample bandwidth over the past 300 seconds (dark blue line)
- mean sample bandwidth over the past 300 seconds (light blue line)

The gap between the maximum and mean sample lines is an indication of how bursty the traffic is. The further apart the lines are the more bursty is the traffic on the link.

At the start of each new update period (as set on the Set Measurement Period window), the vertical indicator returns to the right side of the graph.

Channel Summary

Virtual Channel Identifier (VCI) in decimal.

Maximum sample bandwidth.

Virtual Path Identifier (VPI) in decimal.

AAL type.

Active Channel		Total Channels = 11	
VPI	VCI	Mb/s	AAL
101	100	3.561	Null
100	100	20.352	AAL-3/4
102	100	2.984	AAL-1
103	100	3.637	Null
106	100	3.103	Null
107	100	2.047	Null
110	100	0.695	Null

Display Channel Monitor for the selected channel.

Capture data.

The table at the bottom of Link Monitor is a summary of the first 1023 active channels (VPI/VCI) that the analyzer reads for each port (shown in the order in which they were detected) and one user-selected channel (selected through Channel Monitor). Above the table is the total number of channels for each port that have been active during the current measurement period.

To go to Channel Monitor and see detailed information about a specific channel, select a channel by clicking on the row for that channel; then click the Monitor Channel button.

The analyzer can monitor up to 1024 channels at a time. Any channels over the 1024 limit are not shown in the channel summary. You can select a specific channel on Channel Monitor that will display on the channel summary as the 1024th channel.

To select a specific channel

- 1** Start Channel Monitor.
- 2** Click the Set Up button.
- 3** Type the VPI and VCI to set up a new channel.
- 4** Select either automatic decode or manual decode to set the PRBS pattern or AAL type.
- 5** Click OK.

See also

“To Monitor a Channel (VPI/VCI)” on page 2-26.

To Monitor a Channel (VPI/VCI)

Channel Monitor displays a summary of bandwidth usage, alarms, and errors over the past 300 seconds (5 minutes) for *individual* channels within the link. It works together with Link Monitor, which gives you a summary of up to 1024 active channels in the link. When you find a channel of interest, or an error or abnormality in Link Monitor, you can use Channel Monitor to look at specific channels in greater detail. Channel Monitor is particularly helpful for solving protocol problems.

Channel Monitor analyzes the protocol stack running on the channel. It shows the links between the layers, and what effects alarms or errors in one layer have on other (higher) layers. It also provides graphs that show the way the channel is working, which help to highlight any abnormalities.

All measurements shown on Channel Monitor are current. The analyzer updates the measurements at the end of the update period (as set on the Set Measurement Period window).

Note If the analyzer receives a large number of errors for a channel, it detects that channel's AAL type as Null. If you want to monitor AAL statistics for that channel, you need to set up the channel and set the AAL type manually.

Start the Channel Monitor in one of the following ways:

- Select one of the channels shown in the channel summary in Link Monitor; then click the Monitor Channel button.
- From the Monitor menu, select the required port; then select the Channel option and enter the required VPI/VCI.
- Click the Monitor Channel button from the
 - Simulator
 - 10 Highest Mb/s graph
 - AAL error summary
 - OAM F5 flow alarm summary

Select the VPI/VCI and MID (for AAL-3/4) of the channel you want to view.

If required, select the AAL type for the channel. The analyzer automatically detects the AAL type.

The maximum sample bandwidth during the past 300 seconds.

Alarms and errors that occurred during the past 300 seconds for each protocol layer.

Capture data from the current channel.

If required, select the PRBS type for the channel.

To display more detailed information about a particular layer, click one of the protocol tabs. See "To Monitor Alarms and Errors on a Channel" on page 2-31.

Channel Monitor collects and displays statistics after a channel is selected using Link Monitor, or after a channel is specified on the Monitor Channel window. When the statistics are available, Channel Monitor shows them for the past 300 seconds. The analyzer starts collecting statistics as soon as you select a channel, even if Channel Monitor is not displayed.

Note For AAL-3/4 SAR, ATM statistics for the entire channel are displayed; however, AAL statistics are displayed only for the selected MID.

For AAL-3/4 channels with more than one MID, Channel Monitor AAL measurements are available only after you select a specific MID. You can select a MID in the Channel Monitor window only if you select to decode the channel manually as AAL-3/4 in the Set Up Channel window.

To Monitor Alarms and Errors

The analyzer can display a summary of the alarms and errors at both the link and channel level.

You can select the way you want to view the error statistics using the pull-down lists on the status screens. Select from the following options:

- Count—the number of times the error occurred
- Ratio—the number of errored cells or frames received as a ratio of all cells or frames received
- Seconds—the number of one-second intervals that contain the error

For AAL-3/4 you can choose to view either SAR or CPCS statistics.

See the *User Online Help* (look up details of the individual alarms and errors) to find out what the relationships between the different alarms or errors mean. This tells you the probable cause for an alarm or error, which can help you resolve network problems.

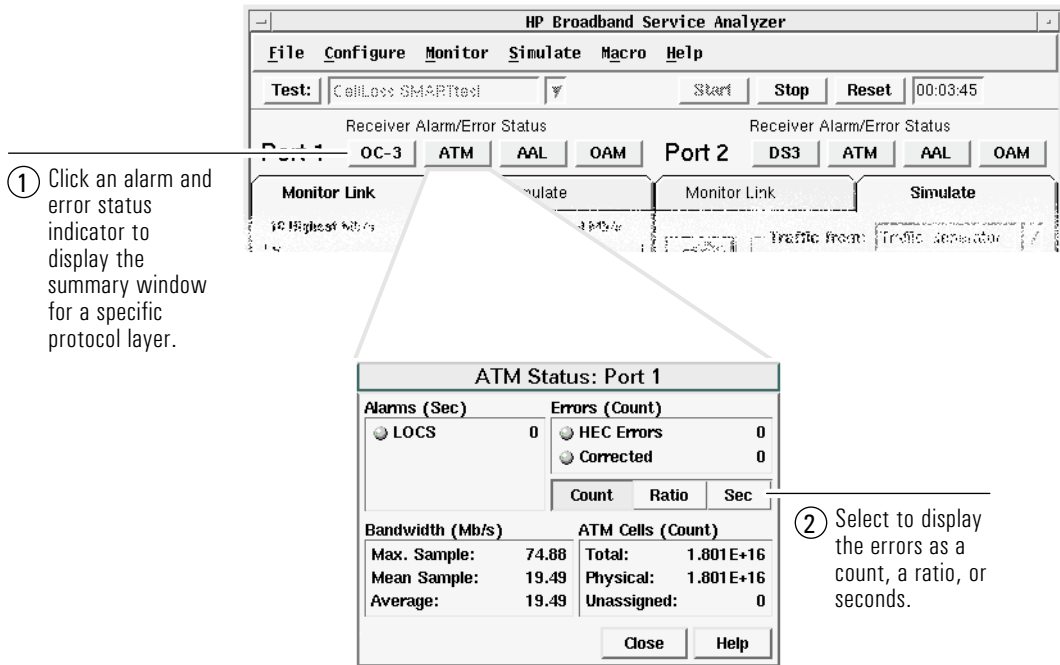
To Monitor Alarms and Errors on the Link

A row of indicators at the top of Link Monitor warns you when alarms and errors occur within the link at the physical, ATM, AAL, and OAM levels. The color of the indicator shows the status of the level.

An indicator can be either

- green to indicate that there have been no alarms or errors since the start of the current measurement period
- red to indicate a current alarm or error
- orange to indicate that an alarm or error has occurred since the start of the current measurement period but is now clear

You can click each indicator to go to a summary window to see information about the alarms, errors, and measurements.



The color assignments are the same as for the higher level (summary) indicators.

Alarms of similar durations or errors with similar counts are usually related.

Note If unexpected alarms and errors occur while you are using an optical interface pod, run an external loopback test on the port to determine whether there is a problem with the network, or with the test cables or connectors. If the problem is not in the network, clean the optical connectors and cable connectors. See the appropriate *Setting Up the Interface Pod* guide for instructions.

The status windows display the following information:

- Physical Layer
 - types of alarms and the number of one-second intervals that contain each alarm (this is called “errored seconds”)
 - a summary of errors displayed as seconds, count, or ratio
- ATM Layer
 - types of alarms and the number of one-second intervals that contain each alarm
 - count and bandwidth of ATM cells
 - a summary of errors displayed as seconds, count, or ratio
- ATM Adaptation Layer (AAL)
 - affected channel (VPI/VCI) for each AAL type
 - Sequence Number and Cell Loss errors for AAL-1
 - CRC errors for AAL-3/4 and AAL-5
 - number of affected channels
- OAM
 - affected channel or path
 - flow type (segment or end-to-end)
 - the number of one-second intervals that contain AIS or RDI alarms
 - number of affected F4 and F5 flows

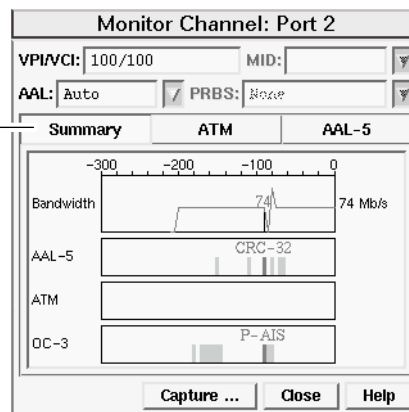
To Monitor Alarms and Errors on a Channel

Alarms and errors on a channel are displayed in Channel Monitor. To start Channel Monitor see “To Monitor a Channel (VPI/VCI)” on page 2-26.

The summary shows details of the alarms and errors that occurred at each layer. Click a tab for more information about ATM and AAL alarms and errors.

Note If the analyzer receives a large number of errors for a channel, it detects that channel's AAL type as Null. If you want to monitor AAL statistics for that channel, you need to set up the channel and set the AAL type manually.

Ensure you select the Summary tab. Use Channel Monitor to interpret the effects of the alarms and errors.



Monitor Channel: Port 2			
VPI/VCI:	100/100	MID:	
AAL:	Auto	PRBS:	None
Summary		ATM	
Bandwidth (Mb/s)		F4 OAM Flows (Sec)	
Max. Sample:	74.882	AIS:	1
Mean Sample:	74.880	RDI:	8
Average:	71.655	CRC10:	0
ATM Cell Count		F5 OAM Flows (Sec)	
High Priority:	3.677E+07	AIS:	0
Total:	3.677E+07	RDI:	33
		CRC10:	0
Capture ...		Close Help	

Click a protocol tab to view detailed information about the alarms, errors, and other statistics for a specific protocol.

Note All alarms and errors that occur at the physical layer affect the ATM layer, and might render all ATM statistics invalid.

On the summary Channel Monitor, look for

- alarms and errors in the lower protocol layers and see what effects they had on the higher layers
- the bandwidth during the periods that alarms and errors occurred to see whether the bandwidth was affected

On the protocol specific Channel Monitor, look for

- alarms of similar duration
- errors with similar counts

See also

User Online Help

To Log Statistics

④ Turn logging on/off.

③ Specify whether you want to log predefined statistics, user-defined statistics, or both.

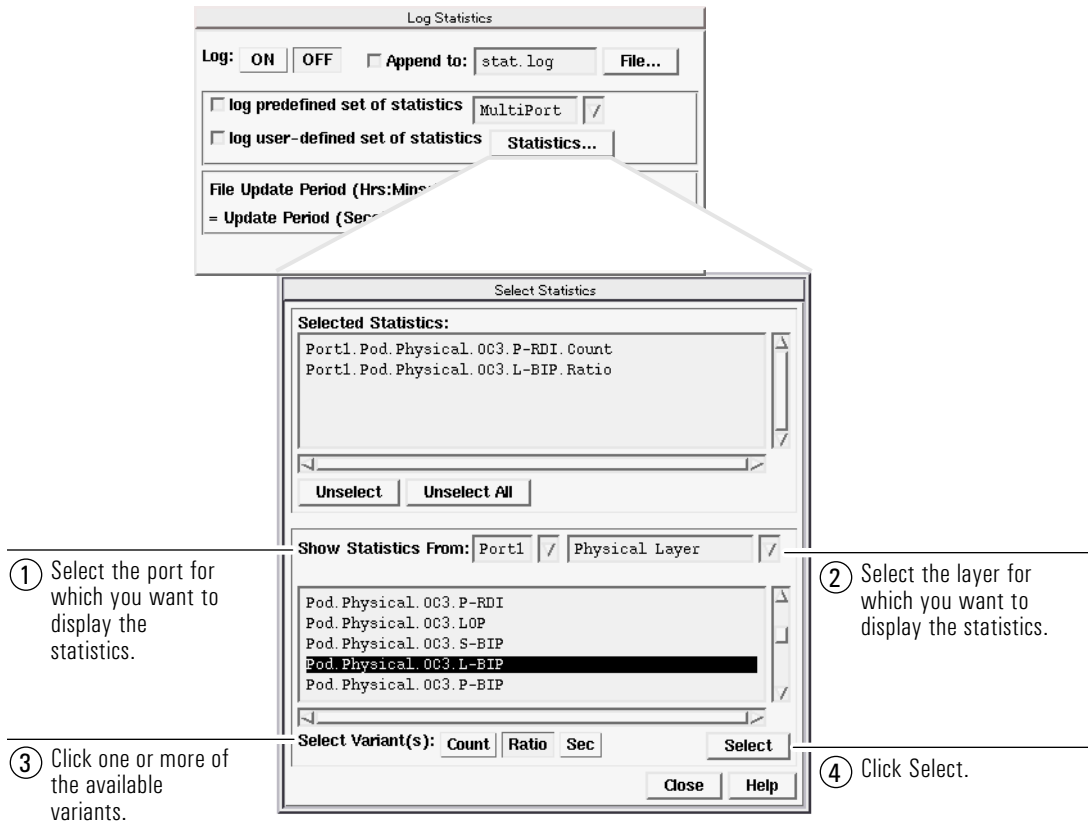
② If required, append the new statistics to the end of an existing log file.

① Specify the file to which you want to log statistics.

2 Using the Analyzer

When you click the On button, the statistics you define are logged to the specified file. Logging continues until you click the Stop button.

Using the Analyzer To Log Statistics



To Print the Log File

Click the Stop button to stop logging statistics; then click the Print button to send the contents of the log file to the default printer. You cannot print the log file while you are still logging statistics.

To View the Log File

Log files are formatted as straight text. You can view log files up to 32,000 bytes in size using the macro editor.

- 1** Click the Stop button in the Log window to stop logging statistics.
- 2** From the Macro menu, select Edit to display the macro editor.
- 3** Specify the name of the log file you want to view. The analyzer displays the named log file in the editor window.

To Run SMARTtests and Predefined Macros

The analyzer provides a number of SMARTtests and predefined macros to help you perform routine tasks.

SMARTtests

Simply select a SMARTtest from the Test pull-down list at the top of the main screen, change any default values you require, and click the Start button. It's as easy as 1, 2, 3; the analyzer does the rest.

If you are not sure which SMARTtest to run, see the *User Online Help*. Help is available for all SMARTtests describing what each one does, who should run it, and why and when to run it.

Make sure the analyzer is connected to the system under test, and the port is configured for full duplex mode. Refer to "To Connect to the System Under Test" on page 2-2.

The screenshot shows the 'Cell Loss: Test' dialog box with three numbered steps explaining the interface elements:

- ① Select the transmit and receive connection for the SMARTtest. This step points to the '1. Connect' section, which shows two OC-3 ports connected to a central switch. Each port has 'Transmit' and 'Receive' buttons.
- ② Change the default values to run the SMARTtest in the way you want. You can change the criteria and traffic profile; then re-run the SMARTtest any number of times. This step points to the '2. Enter' section, which contains input fields for VPI and VCI (Transmit Channel: 100, Receive Channel: 100), and buttons for 'Criteria...' and 'Traffic...'. It also shows 'Cell Loss Ratio: 0' and 'Mean Bandwidth (Mb/S): 74.9'.
- ③ Click the Start button. This step points to the '3. Run' section, which contains a 'Start' button and a 'Stop' button. Below these buttons are several status indicators: Cell Loss Count: 0, Cell Misinsertion Count: 0, Cell Error Count: 0, Cells Received: 0, Elapsed Time: 00:00:00, Cell Loss Ratio: 0, Cell Misinsertion Rate: 0, Cell Error Ratio: 0, and Cells Transmitted: 0.

At the bottom right of the dialog box are 'Close' and 'Help' buttons.

Before the SMARTtest starts to run, the analyzer checks to make sure the affected ports are configured in full duplex mode and that there are no alarms present. If either of these conditions is not met, an error message appears and the SMARTtest does not run.

The figure at the bottom of the window starts running to indicate that the SMARTtest has started, and relevant details are shown on the window as the SMARTtest runs. The SMARTtest continues to run until it completes or fails, as specified by the pass criteria. To stop the SMARTtest before completion, click the Stop button.

When the SMARTtest completes, the figure jumps up if the SMARTtest passes, or falls down if it fails. The SMARTtest Results window also appears indicating whether the SMARTtest passed or failed, and if relevant, why it failed.

The analyzer automatically captures data for each SMARTtest. If the SMARTtest fails, you might find this captured information useful for diagnostic purposes.

Note When you start and stop a SMARTtest, you also start and stop Link Monitor and the analyzer's measurement system.

Predefined Macros

Select the predefined macro you want to run from the Test pull-down list at the top of the main screen, then click the Test button to play the macro. The predefined macro window is displayed; showing any results or output that the predefined macro produces.

If you are not sure which predefined macro to run, see the *User Online Help*.

To Capture and View Data

You can capture real data from the link at any time and use it for testing and analysis. The analyzer captures incoming data from one or more ports at full line rates up to 155 Mb/s. Capture data when you want to analyze a fault condition or see what the data actually looks like. For example, you can capture data to

- look for protocol errors
- look at pre-trigger and post-trigger data to determine the possible causes of a fault
- produce reports from captured, logged, and monitored data
- look for patterns in protocols not currently supported by the analyzer
- store data for offline analysis at another time

The analyzer's data capture options let you choose

- the source of the data to capture, for example, data for a specific channel or set of channels
- the IP address or subnet of the data to capture (if there is IP traffic on the link)
- whether to capture from one or both ports
- the start/stop criteria for the capture

After capturing data, you can view it using the View Captured Data window.

To Capture Data

Display the View Captured Data window for a single port in one of the following ways:

- From the Monitor menu, select the required port; then select the Capture option.
- From Link Monitor, click a channel in the channel summary; then click the Capture button.
- From Channel Monitor, click the Capture button.
- From the AAL error or OAM alarm summary, click the Capture button.
- From the Simulator, click the Capture icon.

To display the View Captured Data window for a multipoint capture, from the Monitor menu, select Multipoint; then select the Capture option.

Using the Analyzer
To Capture and View Data

⑤ Start the capture.

① Select whether you want to capture cells or AAL-5 frames.

② Select the type of data you want to capture.

③ If required, select the events to start and stop the capture.

④ If required, select to capture cells that match a specific pattern only.

Click the Patterns button if you want to define a capture pattern.

Click the Triggers button if you want to select interface pod capture events to trigger the capture.

If you are performing a multiport capture, repeat steps 2 to 5 for the second port. For more detailed information, see the *User Online Help*.

To View Captured Data

After you capture or load data, it is displayed on the View Captured Data window. You can use this window to view different portions of the data, and save it to a file using the Save option on the File menu.

Save your captured data files in the following directory:

/USR/E5200A/HOME/[USERNAME]/PDU

You can also use this window to load and view previously captured data.

The screenshot shows the 'View Captured Data: Multi Port' window. It has a menu bar with 'File', 'Capture', 'View', and 'Help'. Below the menu bar are buttons for 'Start', 'Stop', 'Configure', and 'Set Up...'. A status bar at the top indicates 'Buffer: 247 of 229376 cells', 'Capture Filter: All ATM Cells', and 'Reference Port: 1'. The main area displays a list of captured data items with their details.

Callouts in the image:

- 'Stop capturing data.' points to the 'Stop' button.
- 'Start capturing data.' points to the 'Start' button.
- 'Indicates the capture memory capacity and current level.' points to the 'Buffer: 247 of 229376 cells' status bar.
- 'Continue capturing data after you have stopped a capture.' points to the 'Set Up...' button.
- 'Set up the data to capture.' points to the 'Capture Filter: All ATM Cells' and 'Reference Port: 1' settings.
- 'Indicates the PDU/cell you are currently viewing in capture memory.' points to the list of captured data items.

Protocol	Time	Address	Details
ATM	[11:24:25.259470600]		VPI = 0 VCI = 5
AAL5SCP	[11:24:25.259470600]		Length = 8
SSCOP	[11:24:25.259470600]		BGN - Begin
ATM	[11:24:25.260183700]		VPI = 0 VCI = 5
AAL5SCP	[11:24:25.260183700]		Length = 8
SSCOP	[11:24:25.260183700]		BGAK - Begin Acknowledge
ATM	[11:24:25.875173100]		VPI = 0 VCI = 5
AAL5SCP	[11:24:25.875173100]		Length = 8
SSCOP	[11:24:25.875173100]		POLL - Poll
ATM	[11:24:25.875669100]		VPI = 0 VCI = 5
AAL5SCP	[11:24:25.875669100]		Length = 12
SSCOP	[11:24:25.875669100]		STAT - Solicited Status
ATM	[11:24:25.903627200]		VPI = 0 VCI = 5
AAL5SCP	[11:24:25.903627200]		Length = 8
SSCOP	[11:24:25.903627200]		POLL - Poll

Use the Hexadecimal to ASCII conversion table when analyzing PDUs and byte values. See "Hexadecimal to ASCII Conversion" on page A-2.

To use Data Captured by the Analyzer on a BSTS

If you are using the analyzer on a series 400 or series 700 HP-UX workstation, you can convert the Broadband Service Analyzer captured data files into Broadband Series Test System (BSTS) data files.

Ensure that the Data Conversion Utility (p/n E5200-10010) is installed. See the Installing/Upgrading Software section in the *HP BSTS System Installation & Startup Guide*.

To convert the analyzer captured data files to BSTS data files

- 1** In a terminal window, type

```
cap2bsts [-in analyzer_file_name] -out BSTS_file_name
```

If the complete in or out file path is not specified, the default directory `$HOME/broadband/recordings` is used.

If you only type `cap2bsts`, information about converting data is displayed. This information provides details of the conversion utility, such as version number.

As the conversion progresses, messages are displayed indicating the number of cells that have been converted. When all of the cells have been converted, a message is displayed indicating that the file was successfully converted.

When you convert data captured by the analyzer to BSTS format, the data is converted to a stream of ATM cells.

- 2** Type `bisdn_playback` to display the BSTS Playback Recording window.

<p>Note If you use the <code>bisdn_test</code> command, you cannot select the Open option from the File menu in BSTS.</p>
--

- 3** From the File menu, select Open to display the Load Data window.

- 4 Click the converted data file in the list; then click OK. The captured data file is displayed on the BSTS Playback Recording window.

Note When you convert data captured by the analyzer to BSTS, you will lose the dates in the timestamps

To Simulate Traffic

The Simulator is like a toolbox, filled with all of the tools you need for manual control of the transmit functions of the analyzer. Use the Simulator to customize traffic and simulate actual traffic conditions; then transmit the traffic into the system under test.

The types of traffic you can transmit include

- captured data
- Protocol Data Units (PDUs) and sequences
- predefined patterns
- timestamped data
- user-defined byte values (see “Hexadecimal to ASCII Conversion” on page A-2)

Using the Simulator you can also simulate controlled alarms and errors and inject them into the transmitted traffic, which lets you further test your network. After transmitting the traffic, you can monitor its effect using Link Monitor and Channel Monitor.

Note When the port from which you’re transmitting is configured in full duplex mode with a recovered clock, clock errors may occur if the receiver signal is poor. To avoid errors, change the clock to internal, or monitor the link and make sure you have a healthy input signal.

Display the Simulator by clicking the Simulate tab for the required port from the main screen.

Note For optical interface pods, the laser is automatically switched off when you log in to the analyzer. You must turn the laser on when you are ready to transmit traffic and inject alarms or errors. When you are not simulating traffic, alarms, or errors, make sure the laser is off.

To turn the laser on or off, either

- click the Laser On or Off button on the Simulator
- from the Simulate menu, select the required port; then select Laser On or Off

The screenshot shows the 'Monitor Link' and 'Simulate' tabs. The 'Simulate' tab is active, showing a traffic table with VPI, VCI, and Mb/s columns. Below the table are sections for 'Protocol Alarms/Errors' and 'Physical Alarms/Errors'. At the bottom, there are 'Transmit Loopback' and 'Laser' controls.

Callout 1: Display the View Captured Data window to capture data. See "To View Captured Data" on page 2-41.

Callout 2: Display Channel Monitor. See "To Monitor a Channel (VPI/VCI)" on page 2-26.

Callout 3: Select the configuration for the port. See "To Configure the Analyzer and Ports" on page 2-18.

Callout 4: Turn the laser on or off for optical interface pods.

Callout 5: Select to generate traffic or replay captured data.

Callout 6: Display the Simulate Traffic window to select the traffic to transmit.

Callout 7: Display the Protocol Alarms/ Errors window to simulate AAL or ATM errors, or OAM alarms or cell losses. See "To Inject Protocol Layer Alarms and Errors" on page 2-48.

Callout 8: Display the Physical Alarms/ Errors window to simulate physical layer alarms, errors, or PLCP framework errors. See "To Inject Physical Layer Alarms and Errors" on page 2-51.

2 Using the Analyzer

Use the Simulate Traffic from Traffic Generator window or the Simulate Traffic from Capture Memory window (shown on the following pages) to simulate and transmit traffic. You display these windows in either of the following ways:

- From the Simulate menu, select the required port; then select Traffic; then select Traffic Generator or Capture Memory.
- From the main screen, click the Simulate tab for the required port to display the Simulator; then use the pull-down list to select Traffic Generator or Capture Memory; then click the Traffic icon.

Use Traffic Generator to transmit traffic, such as predefined patterns, Protocol Data Units (PDUs), or sequences. Use Capture Memory to transmit captured data that is currently in the capture memory. At the top of both Simulate Traffic windows are On/Off buttons to turn traffic transmission on and off.

To Simulate Traffic from the Traffic Generator

The screenshot shows the 'Simulate Traffic: Port' dialog box. At the top, there is a 'Transmit' button set to 'On' and a 'Close' button. Below this, a status bar indicates 'Total used: 99% (40.702 Mb/s of 40.704 Mb/s)'. The main area is a table with columns: ID, VPI, VCI, Options, Profile, Mb/s, and Payload. Channel 0 is highlighted as the foreground channel.

ID	VPI	VCI	Options	Profile	Mb/s	Payload
0	100	100	More ...	C	20.352	ATM3/4 SAR Pattern: Alternating
1	101	100	More ...	Constant/Continuous	0.56	ATM Single Cell PRBS9
2	102	100	More ...	Constant/Continuous	0.98	AAL1 Pattern: AA55
3	103	100	More ...	Constant/Continuous	0.637	ATM Pattern: Incrementing
4	104	100	More ...	Constant/Continuous	0.56	ATM Pattern: Alternating
5	105	100	More ...	Constant/Continuous	1.56	AAL1 Byte Value
6	106	100	More ...	Constant/Continuous	0.1	ATM Byte Value
7	107	100	More ...	Constant/Continuous	0.045	ATM Byte Value
8	108	100	More ...	Constant/Continuous	0.72	AAL1 Pattern: Incrementing
9	109	100	More ...	Constant/Continuous	1.5	ATM Byte Value
10	110	100	More ...	Constant/Continuous	0.69	AAL1 Byte Value

1 Select the channels on which you want to transmit data. Channel 0 is the foreground channel, and channels 1–10 are background channels.

2 Enter the VPI/VCI for each channel.

3 Edit the encode options for each channel if required.

4 Set the traffic profile and bandwidth for the foreground channel.

5 Select to transmit data continuously or as single cells for the foreground channel.

6 Set the bandwidth for the background channels.

7 Specify the type of payload for each channel.

Note If you select single cells, when you click the Transmit On button a Transmit button appears. Click the Transmit button to transmit a single cell.

Use the Hexadecimal to ASCII conversion table when editing PDUs and transmitting byte values. See “Hexadecimal to ASCII Conversion” on page A-2.

To Simulate Traffic from Capture Memory

The screenshot shows a dialog box titled "Simulate Traffic: Port 1". It contains the following controls:

- Transmit:** Two buttons, "On" and "Off".
- Playback Mode:** A dropdown menu currently set to "Continuous", with a "Transmit" button to its right.
- Playback Profile:** A dropdown menu with "as captured" selected, and a "use profile" button to its right. Below this is a small icon and the text "at 74.88 Mb/s".
- Buttons:** "Close", "Help", and "View Capture..." are located on the right side of the dialog.

Callouts provide the following instructions:

- ① Select to transmit continuously or as single cells. If you select single cells, click the Transmit button to transmit.
- ② Select the traffic profile you want to use. The currently selected profile is shown on the button.
- Click this button to change the profile (distribution and bandwidth).
- View the contents of the capture memory or capture new data from the link.

To Inject Alarms and Errors

The analyzer can generate the following types of alarms and errors:

- protocol layer alarms and errors
- physical layer alarms and errors
- frameword errors

You must be transmitting traffic to be able to inject alarms or errors.

For more details about simulating and injecting alarms and errors, see the *User Online Help*.

To Inject Protocol Layer Alarms and Errors

The analyzer can generate the following protocol layer alarms and errors:

- ATM and AAL errors
- OAM alarms
- cell losses

Display the Protocol Alarms/Errors window in either of the following ways:

- From the Simulate menu, select the required port; then select Protocol Alarms/Errors.
- Click the Simulate tab for the required port to display the Simulator; then click the Protocol Alarms/Errors button.

Note For optical interface pods, the laser is automatically switched off when you log in to the analyzer. You must turn the laser on when you are ready to simulate traffic, alarms, or errors. When you are not simulating traffic, alarms, or errors, make sure the laser is off.

To turn the laser on or off, either

- Click the Laser On or Off button on the Simulator.
- From the Simulate menu, select the required port; then select Laser On or Off.

To Inject OAM Alarms

The screenshot shows the HP Broadband Service Analyzer interface. The main window is titled "HP Broadband Service A" and has a menu bar with "File", "Configure", "Monitor", "Simulate", "Macro", and "Help". The "Test" field is set to "CellLoss SMARTTest". Below the menu bar, there are tabs for "Port 1", "OC-3", "ATM", "AAL", "OAM", and "Po". The "OAM" tab is selected. The interface is divided into several sections: "Monitor Link", "Simulate", "Capture", "Monitor Channel", "Protocol Alarms/Errors", and "Physical Alarms/Errors". The "Simulate" section shows "Traffic from: Traffic Generator" with VPI 100, VCI 100, and Mb/s 74.88. The "Protocol Alarms/Errors" section shows "Errors: 24110271" and "OAM Cells: 0". The "Physical Alarms/Errors" section shows "Alarms: -", "Data Errors: -", and "Framework Error: Off". A "Full Duplex" checkbox is checked. A "Laser" section has "On" and "Off" buttons. A "Protocol Alarms/Errors: Port 1" dialog box is open, showing "Errors:" and "OAM Cells:" buttons. The "OAM Alarms" tab is selected. The "Continuous" section has "OAM Cells: On" and "Off" buttons. The "Manual" section has an "Inject" button and a spinner for "OAM cells" set to 1. The "Delay between cells:" is set to 0.1 Secs. The "Cell Type:" is set to "F4 OAM End To End". The "VPI:" is set to 100 and the "Alarm:" is set to AIS. Three numbered callouts are present: 1. "Click the OAM Alarms tab." 2. "Enter details about the type of alarm you want to simulate (either F4 or F5)." 3. "Click the On button to start injecting OAM cells, or click the Inject button to inject a specified number of OAM cells."

To Inject ATM and AAL errors

1 Click the Errors tab.

2 Select the channel(s) on which to simulate

3 Select the type of error.

4 If required, select the part of the cell to error.

5 Click the bits you want to error.

6 Click the On button to start injecting errors, or click the Error On For or the Error Off For button to transmit errors for a specified number of cells.

Watch the results of the injected alarms or errors. The numbers of errors and OAM cells injected is shown at the top of the Protocol Alarms/Errors window. If you are using an external loopback or transmit loopback mode, you can also monitor the errors and alarms by watching the Alarm and Error indicators at the top of the main screen.

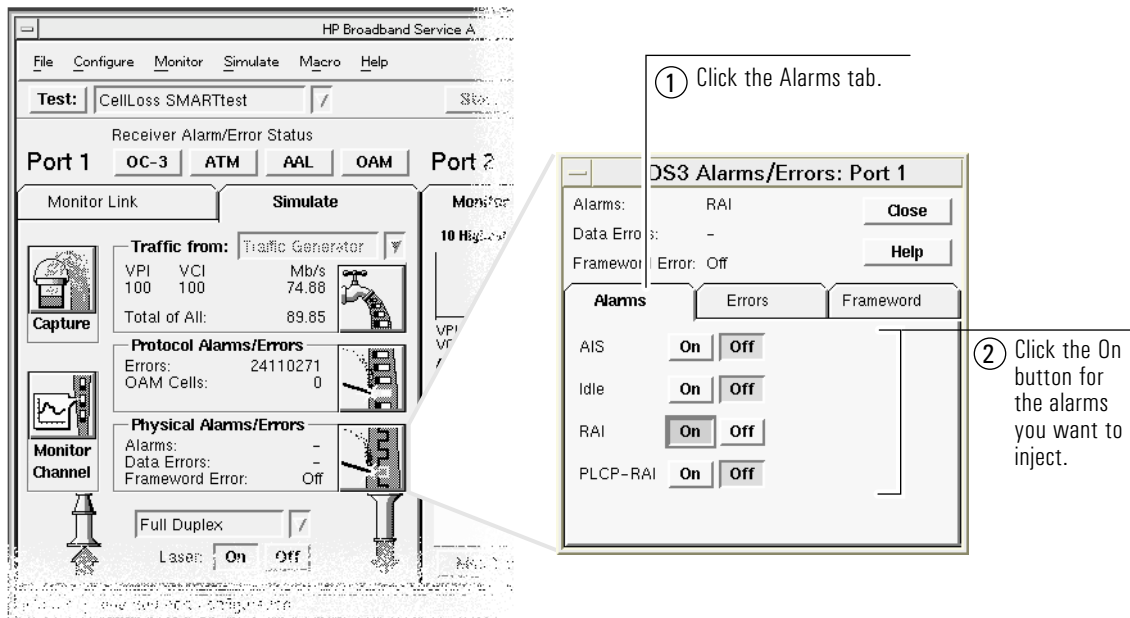
To Inject Physical Layer Alarms and Errors

The analyzer can generate physical layer alarms and errors, and frameword errors.

Display the Protocol Alarms/Errors window in either of the following ways:

- From the Simulate menu, select the required port; then select Physical Alarms/Errors.
- Click the Simulate tab for the required port to display the Simulator; then click the Physical Alarms/Errors button.

To Inject Physical Alarms



The number of alarms you can select at one time depends on the interface pod installed.

To Inject Physical Errors

① Click the Errors tab.

② Select the type of error to inject.

③ Enter the rate at which you want to inject errors; then click the On button to start injecting errors.

or

③ Click the Inject button each time you want to inject a single error.

The type of errors you can inject depends on the interface pods installed.

Watch the results of the injected alarms or errors. The number of alarm or error cells injected is shown at the top of the Physical Alarms/Errors window. If you are using an external loopback or transmit loopback mode, you can also monitor the errors and alarms by watching the Alarm and Error indicators at the top of the main screen.

To Inject Framework Errors

The screenshot shows the HP Broadband Service Analyzer interface. The main window displays 'Receiver Alarm/Error Status' for 'Port 1' with tabs for OC-3, ATM, AAL, OAM, and Port 2. The 'Simulate' section is active, showing traffic from a 'Traffic Generator' with VPI 100, VCI 100, and a rate of 74.88 Mb/s. Below this, 'Protocol Alarms/Errors' shows 24110271 errors and 0 OAM cells, while 'Physical Alarms/Errors' shows 0 errors. A 'DS3 Alarms/Errors: Port 1' dialog box is open, showing 'Alarms: RAI', 'Data Errors: -', and 'Framework Error: Off'. The 'Inject Errors' section has 'On' and 'Off' buttons. Below are two rows of bit selection boxes labeled 'A1: Bits to Error' and 'A2: Bits to Error', each with boxes for bits 1 through 8. Three numbered callouts point to the 'Framework' tab, the 'On' button, and the bit selection boxes.

① Click the Framework tab.

② Click the bits you want to error.

③ Click the On button.

2 Using the Analyzer

You simulate framework errors to stress the framing mechanisms of network elements and ensure that they react correctly to the errors.

To Use Macros

You can use the Broadband Service Analyzer to create macros. A macro is a file that contains a list of actions required to perform a task. After you create a macro, you can repeat the actions as many times as you want simply by playing the macro. Macros are particularly useful for repetitive tasks such as running a series of tests.

The analyzer also provides a number of predefined macros that you can run to perform common tasks.

The macros you create can be used by others. For example, you can create a macro that contains a complete network test plan, then distribute the macro to technicians to ensure that they all use the same test plan.

The Broadband Service Analyzer macro environment includes the Tcl scripting language. You can use this scripting language to enhance your macro, for example, to add looping and program control instructions.

To Create a Macro

1 Type a name for your macro file; then click OK.

Click the Open File button to display the Select File window.

2 Click the Record button and perform the actions that you want to record.

3 Click the Stop button to stop recording the macro.

Click the Save Session button if you want to save your session.

Click the Pause button to pause the recording.
Any actions you make while the macro is paused are not recorded.
Click the Record button to continue recording the macro.

To Edit a Macro

- 1** From the Macro menu, select Edit to display the Select File window.
- 2** Type the name of the macro that you want to edit, or select the file from the list. The macro is shown in the Edit window.
- 3** Edit the macro to add functions, such as looping and procedure control. See the *Macro Online Help* for information on macro commands and functions.
- 4** From the Macro Editor's File menu, select Save to save your changes.
- 5** Test your changes by playing the macro.

To Play a Macro

- 1** From the Macro menu, select Play to display the Select File window.
If you have recorded, edited, or played a macro since the last time you logged in to the analyzer, the Play Macro window appears with the last macro you accessed as the active macro. In this case, click the File Open icon to display the Select File window.
- 2** Type the name of the macro file that you want to play, or select the file from the list.
- 3** On the Play Macro window, click the Play button to start the macro.

If you want to pause execution of the macro, click the Pause button. To resume playing the macro from where you stopped it, click the Start button.

If you want to stop the macro before it finishes, click the Stop button. Click the Play button to replay the macro from the start.

3

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To Display the Online Help 3-5

Using the Online Help

To Install the Online Help

You should install the online help when you receive a new version of the analyzer software, or if you are setting up the analyzer to use on a networked system (see “To Connect the Analyzer as a Networked System” on page 1-10).

To Install the Online Help on a PC

You can install the analyzer online help on any PC with Windows 3.1 or higher.

- 1** Insert the Help for Windows diskette 1 (p/n E5200-10017) in drive A. If you have a CD-ROM drive attached to the notebook PC, use the supplied CD-ROM.
- 2** From the File menu, select Run.
- 3** Type `a:\setup` to install the help files from the diskettes. Type `d:\help\win\setup` to install the help files from the CD-ROM.
- 4** Click OK.

Follow the instructions on the screen. After you restart Windows, three help icons (one for each help volume), and a readme file icon appear in the HP Broadband Analyzer program group.

To Install the Online Help on a Workstation

If you have HP-UX superuser permission, you can install the analyzer help on an HP series 700 workstation running HP-UX 9.05.

Note This installation modifies the following files:

- /etc/inetd.conf
- /etc/services

- 1** Mount the CD-ROM onto your file system by typing:

```
/bin/mkdir /cdrom  
/etc/mount <cdrom_device_file> /cdrom
```

See your system administrator if you are unsure of the CD-ROM device file name.

- 2** Run the HP-UX update utility by typing:

```
/etc/update
```

The update utility Main Menu is displayed.

- 3** Select "Change Source or Destination" by using the arrow keys to highlight the option; then pressing either Enter or F4.

The Change Source or Destination window is displayed.

- 4** Select "From Tape Device to Local System" as the Update from Source to Destination by using the arrow keys to highlight the option; then pressing either Enter or F4.

The From Tape Device to Local System window is displayed.

- 5** In the Source field, type `/cdrom/HELP/HYPHELP/HELP.PKG`

- 6** Press F4.

The Main Menu is redisplayed.

Using the Online Help
To Install the Online Help

- 7** Select “All Filesets on the Source Media” by using the arrow keys to highlight the option; then pressing either Enter or F4.

The Select All Filesets on the Source Media window is displayed.

- 8** Select “Start Loading Now” by using the arrow keys to highlight the option; then pressing either Enter or F4.

A message window is displayed asking you whether you want to “Start loading filesets now?”

- 9** Type *y*.

The Loading Partitions and Filesets window is displayed. This window indicates the progress of the installation.

The help package is installed in the `/OPT/E5200A/` directory.

- 10** When the installation is complete, you should view the log file to check for errors in the installation. At the `#` prompt type `more /tmp/update.log`.

- 11** Errors are displayed at the end of the file. If there are errors, correct the problem, type `rmfn` in a terminal window, then reinstall the help.

- 12** Unmount the CD-ROM from your file system by typing:

```
cd /  
/etc/unmount /cdrom
```

- 13** To print help topics, set up the current printer for the help viewer using the Printer Setup option in the File menu. For more information see the *How to use Help* option in the Help menu in the help viewer.

To Display the Online Help

The analyzer's online help consists of three volumes:

- *User Online Help* which contains
 - instructions for the most common tasks
 - reference topics that provide background information for those tasks
 - a glossary
 - descriptions of all screens, windows, fields, icons, buttons and messages (context-sensitive help)
- *Macro Online Help* which contains all of the information you need to record, edit, and run your own macros
- *UPE Compatibility Online Help* which contains all of the information you need to convert your HP Broadband Series Test System UPE programs for use with the HP Broadband Service Analyzer

To display instructions on how to use the help system, select Using Help from the Help menu on the main screen.

You can access help in a number of ways depending on the type of help you require.

To Display Help Topics

Topics within help are organized into help folders. The Help Contents list displays a menu of all help folders. Each help folder contains a number of subtopics.

To display the Help Contents list, select either User, Macro, or UPE Compatibility from the Help menu.

If you are using the notebook PC, you can also run the help viewer independently of the analyzer. The HP Broadband Analyzer program group contains three help icons—one for each help volume. To display a help volume, double-click the appropriate icon.

To Display the Help Version Details

Make sure that the version number of the help you are currently viewing matches the version number of your HP Broadband Service Analyzer.

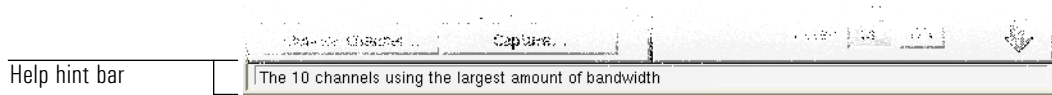
- 1** From the analyzer main screen Help menu, select the About the Analyzer option to find the version number of your HP Broadband Service Analyzer.
- 2** From within any of the help contents screens, click the book icon in the top left corner to find the help version.
- 3** If the version numbers do not match, contact your HP representative and arrange to get the version of the help that matches your analyzer.

To Display Context-Sensitive Help

Context-sensitive help describes the currently selected screen, window, field, icon, or button. You can display context-sensitive help in the following ways:

- Click the Help button that appears on many screens and windows to get information about that screen or window.
- Press F1. If the cursor is on an entry field, you get help for that field, otherwise you get the User Contents list.
- Press Shift+F1, or from the main screen Help menu, select Help on Item to change the cursor into a question mark (?). Move the question mark around the screen and place it on the item for which you want help; then click the mouse. Use the Help on Item option to display context-sensitive help for non-input fields.

Help Hint Bar



The help hint bar at the bottom of the main screen displays a brief description of the field, icon, button, or menu option over which the cursor is currently positioned. Help hint information is available for both entry and non-entry fields.

Using the Online Help
To Display the Online Help

4

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System Administration

To Use the System Administration Functions

You can perform the following system administration functions:

- change a password
- set the system date and time
- upgrade software

If you have the required privileges, you can also perform one or more of the following system administration functions:

- set LAN and bootstrap parameters
- manage remote host details
- re-initialize the hard disk
- manage routing details
- manage remote file systems
- manage printer information
- manage user details
- manage host details

These functions are, however, usually restricted to the system administrator.

By default, the user name *boomer* and password *broadband* has full access to all of the system administration functions. You can use the manage user details option in the system administration functions to restrict the access privileges for any user except *root*.

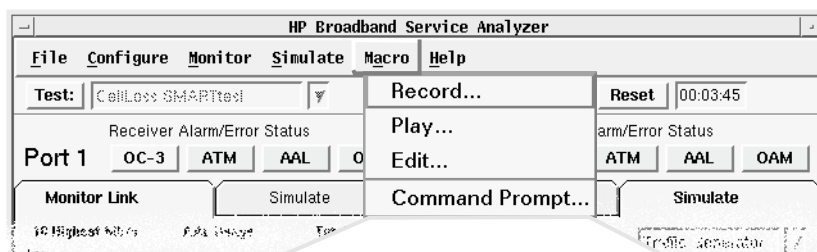
For more information about these functions, refer to the *User Online Help*.

To Start the System Administration Functions

The system administration functions are started from the Command Line Interface. You can access the Command Line Interface in the following ways

- click the HP Analyzer Terminal icon or the HP Analyzer Terminal Over SLIP icon in the HP Broadband Service Analyzer program group
- remotely log in through a Telnet session (see the *User Online Help*)
- use the analyzer Graphical User Interface

To Start the System Administration Functions Using the Graphical User Interface.



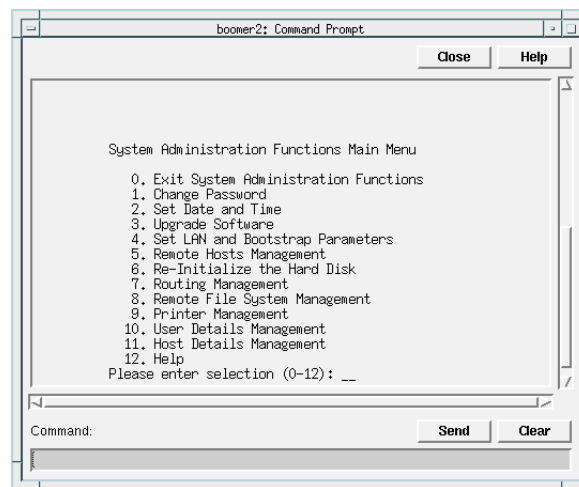
① Type saf.

② Click Send.

See the *User Online Help* for more information about logging into the system administration functions.

To Move Around in the System Administration Functions

The first screen displayed in the system administration functions is the System Administration Functions Main Menu. This menu displays a list of all of the functions you have authorization to perform.



To select a function, type the number corresponding to the required function; then press Enter.

All screens have an Exit option (0 on menus or ^ on screens). This option takes you to the System Administration Functions Main Menu, or if you are at the main menu, it takes you back to the Command Prompt window. A Help option (?) is also available on all screens. This option gives information about the task you are currently performing.

All screens, except menus, display the message **Press Enter to confirm details** when you have completed all of the required information.

Many screens have a Cancel option (!) which you can use to clear a screen when you make a mistake. The information that you entered is not processed.

If a screen has multiple entry fields, the fields are displayed one at a time. You must complete one field and then press Enter to display the next field. You cannot go back to a completed field after you press Enter; if you need to change a field you must complete all fields again.

To Change a Completed Field

- 1** Type !
- 2** Press Enter to cancel the change and return to the previous menu.
- 3** Start again.

You must use a keyboard in the system administration functions, that is, you cannot use a mouse to navigate.

To Change a Password

Your password must be a minimum of 8 characters and no more than 40 characters. At least one of the characters must *not* be alphanumeric.

Follow your standard business practices for changing passwords. Make sure your password is not easily recognizable, such as your name.

To select the Change Password option from the System Administration Functions Main Menu, type 1; then press Enter to display the Change Password screen.

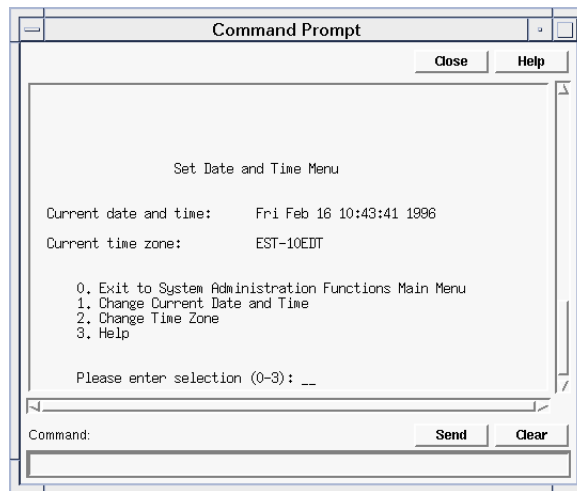
The screenshot shows a 'Command Prompt' window titled 'Change Password'. The text inside the window reads: 'Type the following then press Enter at any time: ^ to Exit to System Administration Functions Main Menu ! to Cancel and return to Change Password ? for Help'. Below this are three prompts: 'Current Password: _____', 'New Password: _____', and 'Re-enter Password: _____'. Each prompt has a cursor and a series of asterisks for input. At the bottom, it says 'Please Enter to confirm details.' and 'Command: _____' with 'Send' and 'Clear' buttons.

- 1 Type your current password; then press Enter.
- 2 Type your new password; then press Enter.
- 3 Type your new password again; then press Enter.
- 4 Press Enter.

To Set the System Date, Time, and Time Zone

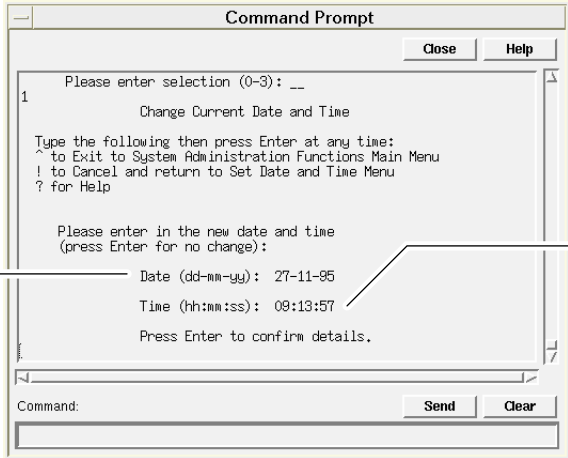
When you first install the analyzer, the time and date are set to GMT. You should change the time, date, and time zone to that of your location. If you move the analyzer to a different time zone, reset only the time zone. The analyzer automatically resets the time and date. You should, however, check that the time and date have been set correctly.

To select the Set Date and Time option from the System Administration Functions Main Menu, type 2; then press Enter to display the Set Date and Time Menu. Use this menu to select how you want to set the time and date.



To Change the System Date and Time

If you need to change the system time and date, type 1 on the Change Current Date and Time screen; then press Enter to go to the Change Current Date and Time screen.



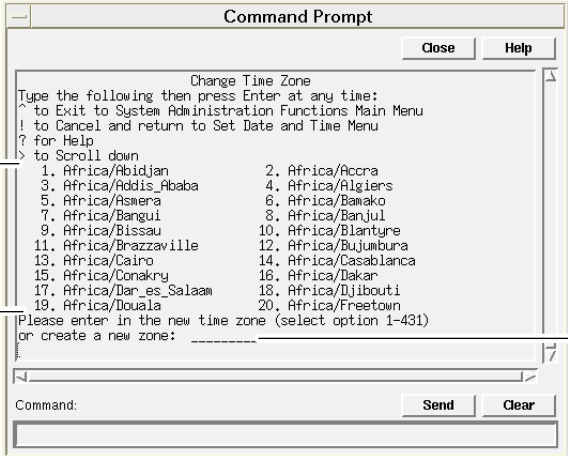
1 Type the date in the format dd-mm-yy; then press Enter.

2 Type the time in the format hh:mm:ss; then press Enter.

3 Press Enter.

To Change the System Time Zone

To change the system time zone, type 2 on the Change Current Date and Time screen; then press Enter to go to the Change Time Zone screen.



① Scroll through the list to find the required time zone location.

② Type the number corresponding to the location for which you want to set the time; then press Enter.

③ Press Enter.

If the time zone you require is not on the list, you can create a new time zone by typing a numerical offset from the standard time zone in the form `std +/- hh:mm:ss`. Enter the offset in the form

std +/- hh:mm:ss.

You can also specify the daylight saving time. See the *User Online Help* for more information about creating a time zone.

To Upgrade the Analyzer Software

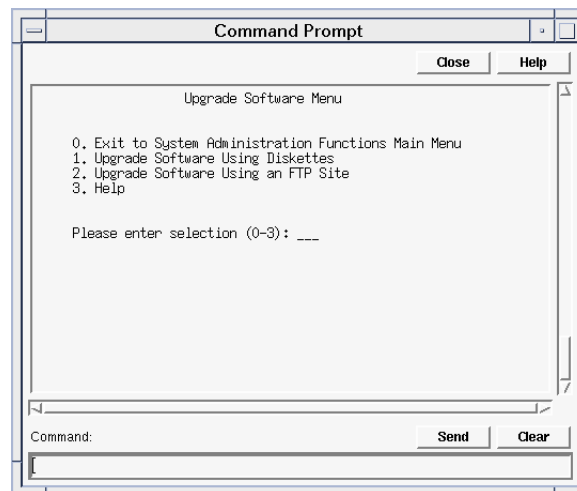
There are two ways to upgrade the analyzer software when a new version of the software is released:

- diskettes
- File Transfer Protocol (FTP) from a remote host using either floppy diskettes or a CD-ROM

Before you upgrade the analyzer software, you should back up all of the files on the analyzer hard disk. See “To Back Up and Restore Files” on page 1-23.

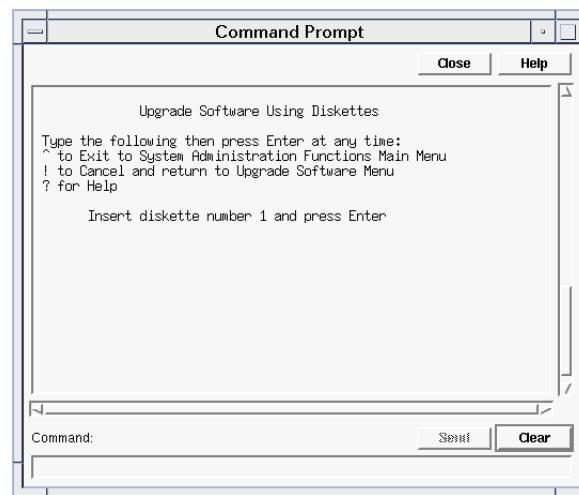
After you have upgraded the analyzer software, you should upgrade the analyzer online help (see “To Install the Online Help” on page 3-2).

To select the Upgrade Software option from the System Administration Functions Main Menu, type 3; then press Enter to display the Upgrade Software Menu.



To Upgrade Software Using Diskettes

From the Upgrade Software Menu, type 1; then press Enter to display the Upgrade Software Using Diskettes screen.



① Insert each diskette provided into drive A on the PC according to the instructions on the screen.

② Press Enter.

Press Enter. When you have correctly installed the software, the message, `Upgrade complete` appears.

If the upgrade does not work, the message `Upgrade failed` appears. If you cannot reboot the system, that is, you cannot even access the previous version of the software, restore the latest version of the software from a backup. See “To Restore Files” on page 1-25.

Switch off the analyzer power for five seconds (see “To Switch the Analyzer On and Off” on page 1-22).

Caution

The upgrade does not take place until after you reboot the analyzer.

Log in to the analyzer (see “To Log In to the Analyzer” on page 2-11); then back up the analyzer to the notebook PC to the `c:\usr` directory (see “To Back Up Files from the Analyzer to a Notebook PC” on page 1-24).

To Upgrade Software Using FTP

If you are using the Upgrade floppy diskettes

- 1 Create a directory on your notebook PC or workstation called `FTPIMAGE`.
- 2 Copy the contents of the `\E5200A\` directory from each Upgrade diskette to the new `FTPIMAGE` directory.

From the Upgrade Software Menu, type 2; then press Enter to display the Upgrade Software Using an FTP Site screen.

1 Type the hostname of your FTP site; then press Enter.

2 Type your user name on the remote FTP site; then press Enter.

3 Type your password on the FTP site; then press Enter.

4 Type the path for the installation software (for example, `FTPIMAGE`); then press Enter.

5 Press Enter.

When you have correctly installed the software, the message `Upgrade complete` appears.

If the upgrade does not work, the message `Upgrade failed` appears. If you cannot reboot the system, that is, you cannot even access the previous version of the software, restore the latest version of the software from a backup. See “To Restore Files” on page 1-25.

Switch off the analyzer power for five seconds (see “To Switch the Analyzer On and Off” on page 1-22).

Caution The upgrade does not take place until after you reboot the analyzer.

Log in to the analyzer (see “To Log In to the Analyzer” on page 2-11); then back up the analyzer to the notebook PC to the `c:\usr` directory (see “To Back Up Files from the Analyzer to a Notebook PC” on page 1-24), or to an HP-UX workstation (see “To Back Up Files from the Analyzer to an HP-UX Workstation” on page 1-25).

System Administration
To Upgrade the Analyzer Software

5

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Standards and Specifications

Standards

Communications Standards

ITU Rec. G.703	General Aspects of Digital Transmission Systems—Terminal Equipment Physical/Electrical Characteristics of Hierarchical Digital Interfaces
IEEE 802.3 (1993)	Information Technology—Local and Metropolitan Networks
ANSI/EIA/TIA-232-E (1991)	Interface between Data Terminal Equipment and Data Circuit— Terminating Equipment Employing Serial Binary Data Interchange
Bellcore TA-TSY-000378	Timing Signal Generator (TSG) Requirements and Objectives
ITU-T I.356	B-ISDN ATM Layer Cell Transfer Performance
ITU-T I.361	B-ISDN ATM Layer Specification
ITU-T I.363	B-ISDN ATM Adaptation Layer (AAL) Specification
ITU-T I.371	Traffic Control and Congestion Control in B-ISDN
ATM Forum UNI 3.1	ATM User-Network Interface Specification—Version 3.1
ANSI T1.102	Digital Hierarchy—Electrical Interfaces

Electrical Specifications

Power Requirements (Mains)

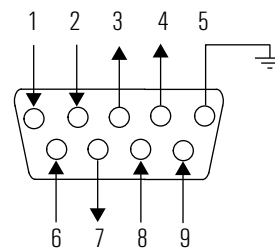
Parameter	Nominal	Minimum	Maximum	Notes
Power			450 VA	
AC Voltage—low range	100-120 V	-15%	+10%	auto voltage selection
AC Voltage—high range	200-240 V	-15%	+10%	auto voltage selection
Frequency		47 Hz	63 Hz	

External Connectors

RS-232 Serial Port

Conforms to ANSI/EIA/TIA-232-E (1991).

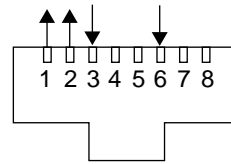
Pin Number	Function
1	DCD
2	RXD
3	TXD
4	DTR
5	Ground
6	DSR
7	RTS
8	CTS
9	R1



Ethertwist LAN (RJ-45) UTP Connector

Conforms to ANSI/IEEE 802.3-1993.

Pin Number	Function
1	TD+
2	TD-
3	RD+
4	Not used
5	Not used
6	RD-
7	Not used
8	Not used

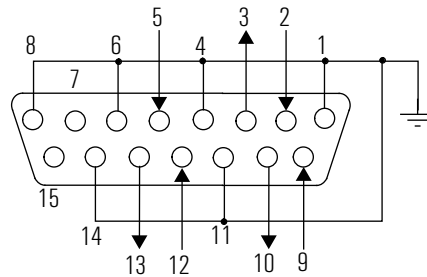


AUI LAN (AUI DB-15F) Connector

Conforms to ANSI/IEEE 802.3-1993.

Parameter	Nominal	Minimum	Maximum
DC output—voltage rating	12 V	11.7 V	12.6 V
DC output—current rating			0.5 A

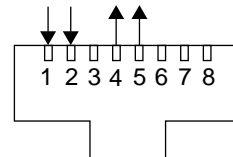
Pin Number	Function
1	Ground
2	Control in +
3	Data out +
4	Ground
5	Data in +
6	Ground
7	Not used
8	Ground
9	Control in -
10	Data out -
11	Ground
12	Data in -
13	+12Vout
14	Ground
15	Not used



BITS Input (RJ-45) Connector

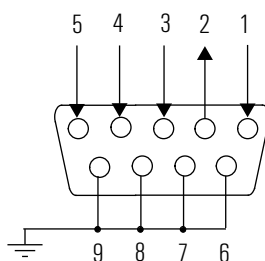
Parameter	Nominal	Minimum	Maximum	Notes
T1 signal stream	1.544 MHz	-25 ppm	+25 ppm	conforms to ANSI T1.102
E1 signal stream	2.048 MHz	-25 ppm	+25 ppm	conforms to ITU G.703
8/64 kHz composite clock	64 kHz	-25 ppm	+25 ppm	conforms to Bellcore TA-TSY-000378
Transmit clock	1.544 MHz	-25 ppm	+25 ppm	all 1's signal stream when locked to reference
Transmit clock	1.544 MHz	-150 ppm	+150 ppm	out-of-lock condition
Maximum voltage; any pin relative to pin 7			50 V	

Pin Number	Function
1	Receive A
2	Receive B
3	No connection
4	Transmit A
5	Transmit B
6	No connection
7	Ground
8	4.7 nF to Ground



Sync In Connector (DE9P)

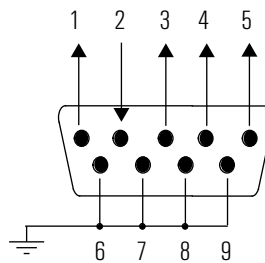
Parameter	Nominal	Minimum	Maximum	Notes
Reference frequency	1 MHz	-25 Hz	+25 Hz	
Input duty cycle		45%	55%	
Input voltage (Logic-0)		0 V	1.5 V	
Input voltage (Logic-1)		3.5 V	5 V	
Input current (Logic-0)			2 mA	$V_{in} < 0.5 V$



Pin Number	Signal Type	Function
1	CMOS input	Reserved
2	RS232 Output	Reserved
3	RS232 Input	Reserved
4	CMOS input	1 MHz clock input
5	CMOS input	Reserved
6	Ground	Ground
7	Ground	Ground
8	Ground	Ground
9	Ground	Ground

Sync Out Connector (DE9S)

Parameter	Nominal	Minimum	Maximum	Notes
Reference frequency	1 MHz	-25 Hz	+25 Hz	
Output duty cycle		45%	55%	
Output voltage (Logic-0)		0 V	0.8 V	$I_{OH} \geq -5 \text{ mA}$
Output voltage (Logic-1)		4 V	5 V	$I_{OL} \leq 5 \text{ mA}$



Pin Number	Signal Type	Function
1	CMOS Output	Reserved
2	RS232 Input	Reserved
3	RS232 Output	Reserved
4	CMOS Output	1 MHz clock output
5	CMOS Output	Reserved
6	Ground	Ground
7	Ground	Ground
8	Ground	Ground
9	Ground	Ground

Timing and Frequency References

Parameter	Nominal	Minimum	Maximum	Notes
Internal reference frequency	19.44 MHz	-4.6 ppm	+4.6 ppm	stratum 3 source
External reference frequency	1 MHz	-25 Hz	+25 Hz	
Recovered clock frequency	f_0	-25 Hz	+25 Hz	f_0 = port 1 or 2 interface pod rate
BITS-T1 reference	1.544 MHz	-25 ppm	+25 ppm	applied to BITS input connector
BITS-8/64 kHz composite clock reference	64 kHz	-25 ppm	+25 ppm	applied to BITS input connector
E1 reference	2.048 MHz	-25 ppm	+25 ppm	applied to BITS input connector

Foreground Traffic Generation

Parameter	Nominal	Minimum	Maximum	Notes
Frequency Range		10 b/s	149.76 Mb/s	maximum for OC3/STM-1 optical interface pod
Step size		50 b/s		
Accuracy			±15 b/s	relative to line rate
Sequence length		1 cell	1500 cells	
Distribution accuracy—poisson				approximates a poisson distribution for bandwidths of less than 10% maximum
Distribution accuracy—sawtooth			5%	$BW_{max}/BW_{min} = 10$, Sequence length ≥ 500 cells
Distribution jitter—constant or burst		-1 cell	+2 cells	offset from nominal inter-departure time

Traffic Loading

Parameter	Nominal	Minimum	Maximum	Notes
Frequency range		5 kb/s	149.76 Mb/s	maximum for OC3/STM-1 optical interface pod
Step size		5 kb/s		
Accuracy			2 kb/s	relative to line rate
Sequence length			1 cell	fixed

Error Generation

Parameter	Nominal	Minimum	Maximum	Notes
ATM PDU error—burst length		1 PDU	63 PDUs	Number of consecutive errored PDUs. Applied to a single VPI/VCI or all cells.

Measurement System

Parameter	Nominal	Minimum	Maximum	Notes
Measurement duration		3 sec	72 hours (3 days)	
Sample period	100 ms	-4.6 ppm	+4.6 ppm	locked to internal reference
Timestamp accuracy		-4.6 ppm	+4.6 ppm	locked to internal reference
Timestamp resolution	100 ns			
Timestamp rollover period	20 days			44-bit timestamp counter

Capture and Playback System

Capacity

Parameter	Nominal	Minimum	Maximum	Notes
Capture memory per port		1 MB	7 MB	1 MB reserved for foreground traffic generation
Playback memory per port		1 MB	8 MB	

Playback

Parameter	Nominal	Minimum	Maximum	Notes
Frequency range		100 b/s	149.76 Mb/s	maximum for OC3/STM-1 optical interface pod
Step size		100 b/s		
Accuracy			25 b/s	relative to line rate
Sequence length		1 cell	131072 cells	length as captured
Distribution accuracy—poisson				approximates a poisson distribution for bandwidths of less than 10% maximum
Distribution accuracy—sawtooth			±5%	$BW_{max}/BW_{min} = 10$, Sequence length ≥ 500 cells
Distribution jitter—sawtooth		-1 cell	+2 cells	offset from nominal inter-departure time

Mechanical and Environmental Specifications

Physical

Size	335 mm x 440 mm x 100 mm (13.19 in x 17.32 in x 3.93 in)
Weight	6 kg nominal (13.2 lb)

Temperature

Parameter	Nominal	Minimum	Maximum	Notes
Operating Temperature		5°C (41°F)	45°C (113°F)	with two interface pods installed
Storage Temperature		-40°C (-40°F)	70°C (158°F)	

For operating and storage temperature of the analyzer with a controlling computer, refer to the specifications of the controlling computer.

Humidity

Analyzer with or without notebook	Operating Humidity	15 to 90% relative humidity at 40°C maximum
	Storage Humidity	90% relative humidity at 65°C maximum

Altitude

Parameter	Maximum
Operating	4.6 km
Storage	4.6 km

Standards and Specifications
Mechanical and Environmental Specifications

A

Hexadecimal to ASCII Conversion A-2

A Hexadecimal to
ASCII Conversion

Hexadecimal to ASCII Conversion

Hexadecimal to ASCII Conversion

The following table shows hexadecimal codes and their ASCII equivalents. Use this table when editing PDUs and transmitting byte values.

Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII
20	[space]	38	8	50	P	68	h
21	!	39	9	51	Q	69	i
22	"	3A	:	52	R	6A	j
23	#	3B	;	53	S	6B	k
24	\$	3C	<	54	T	6C	l
25	%	3D	=	55	U	6D	m
26	&	3E	>	56	V	6E	n
27	'	3F	?	57	W	6F	o
28	(	40	@	58	X	70	p
29	)	41	A	59	Y	71	q
2A	*	42	B	5A	Z	72	r
2B	+	43	C	5B	[	73	s
2C	,	44	D	5C	\	74	t
2D	-	45	E	5D	]	75	u
2E	.	46	F	5E	^	76	v
2F	/	47	G	5F	_	77	w
30	0	48	H	60	`	78	x
31	1	49	I	61	a	79	y
32	2	4A	J	62	b	7A	z
33	3	4B	K	63	c	7B	{
34	4	4C	L	64	d	7C	|
35	5	4D	M	65	e	7D	}
36	6	4E	N	66	f	7E	~
37	7	4F	O	67	g	7F	Δ

- Hex Code 27 is an apostrophe
- Hex Code 2C is a comma

B

Default Acadia Configuration B-2

**B Default Acadia
Configuration**

Default Acadia Configuration

Default Acadia Configuration

Acadia/Vxd has the following default configuration values.

Host table

127.0.0.1	localhost
10.0.0.2	e5200apc
10.0.0.1	15200a
10.0.1.1	e5200a_slip
10.0.1.2	e5200apc_slip

Domain name information

no default configuration

IP address

IP address	10.0.0.2
Netmask	255.255.255.0
Default Router	

NFS Services

c:\usr\e5200a

c:\e5200a

a:\e5200a

TCP/IP Services

File Transfer (FTP)

Finger

Printing (LPD)

Remote Command (REXEC)

Remote shell (RSH)

Telnet

Trivial File Transfer (TFTP)

User Authorization

no default configuration

Category Environment

etc	c:\acadia\etc
_hostname	e5200apc
term	ibmpc
users	guest
vt100cmap	c:\acadia\etc\telnet.att
vt100kmap	c:\acadia\etc\vtket.map

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