

HST-3000

Base Unit

User's Guide

HST-3000

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User's Guide



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About this Guide

This chapter describes how to use this guide. Topics discussed in this chapter include the following:

- “Purpose and scope” on page xiv
- “Assumptions” on page xiv
- “Terminology” on page xiv
- “HST-3000 Base Unit User’s Guide” on page xv
- “Application-orientated user guides” on page xv
- “Safety and compliance information” on page xv
- “Technical assistance” on page xv
- “Conventions” on page xvii

Purpose and scope

The purpose of this guide is to help you successfully use the features and capabilities of the HST-3000.

This guide includes task-based instructions that describe how to configure, use, and troubleshoot the general functions of the HST-3000 base unit. Additionally, this guide provides a complete description of JDSU's warranty, services, and repair information. For terms and conditions of the licensing agreement, go to www.jdsu.com.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the HST-3000 effectively and efficiently. We are assuming that you have basic computer experience and are familiar with basic telecommunication concepts, terminology, and safety.

Terminology

The following terms have a specific meaning when they are used in this guide:

- **HST-3000** — The HST-3000 family of products or the combination of a base unit and a SIM.
- **SIM** — Service Interface Module. Referred to generically as the module. The SIM provides the testing functionality for the HST unit.

HST-3000 Base Unit User's Guide

This is the user's guide for the HST-3000 base unit. It contains overall information relating to device and general functions such as using the unit with a keyboard, peripheral support, battery charging, saving and printing results, and managing files. This guide also contains technical specifications for the base unit and a description of JDSU's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Application-orientated user guides

Separate user's guides are provided to cover each technology application, for example, copper qualification, frame relay testing, and others.

Safety and compliance information

Safety and compliance information are contained in a separate guide and are provided in printed format with the product.

Technical assistance

If you need assistance or have questions related to the use of this product, call or e-mail JDSU's Technical Assistance Center (TAC) for customer support. TAC phone numbers and email addresses are listed in [Table 1 on page xvi](#).

Before contacting TAC, you should have the serial numbers for your HST-3000 unit. The serial number for the SIM is located on the back of the module. You must remove the SIM from the base to view the serial number label. See ["Removing and attaching a SIM" on page 24](#). The serial number for the

base unit is located under the battery. You must remove the battery to view the label. See “[Replacing the battery](#)” on [page 179](#).

[Table 1](#) lists contact information for technical assistance. For the latest TAC information, go to www.jdsu.com or contact your local sales office for assistance. Contact information for regional sales headquarters is listed on the back cover of this guide.

Table 1 Technical assistance centers

| Region | Phone Number | |
|------------------------------|---|--|
| Americas | 1-855-ASK-JDSU 240 404 2999 301-353-1550 | tac@jdsu.com |
| Europe, Africa, and Mid-East | +49 (0) 7121 86 1345 (JDSU Germany) | hotline.europe@jdsu.com |
| Asia and the Pacific | +852 2892 0990 (Hong Kong) +8610 6833 7477 (Beijing-China) | |

During off-hours, you can request assistance by doing one of the following: leave a voice mail message at the Technical Assistance number, e-mail the North American Technical Assistance Center, tac@jdsu.com, or submit your question using our online Technical Assistance Request form at www.jdsu.com.

Conventions

This guide uses conventions and symbols, as described in the following tables.

Table 2 Typographical conventions

| Description | Example |
|---|--|
| User interface actions and buttons or switches you have to press appear in this typeface . | Press the OK key. |
| Code and output messages appear in this <i>typeface</i> . | All <code>results</code> okay |
| Text you must type exactly as shown appears in this <code>typeface</code> . | Type: <code>a:\set.exe</code> in the dialog box. |
| Variables appear in this typeface . | Type the new <i>hostname</i> . |
| Book references appear in this <i>typeface</i> . | Refer to <i>Newton's Telecom Dictionary</i> |

Table 3 Keyboard and menu conventions

| Description | Example |
|---|--|
| A plus sign +indicates simultaneous keystrokes. | Press Ctrl+s |
| A comma indicates consecutive key strokes. | Press Alt+f,s |
| A slanted bracket indicates choosing a submenu from menu. | On the menu bar, click Start > Program Files . |

Table 4 Symbol conventions



This symbol represents a general hazard.



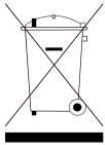
This symbol represents a risk of electrical shock.



This symbol represents a risk of explosion



This symbol represents a Note indicating related information or tip.



This symbol, located on the equipment, battery, or packaging indicates that the equipment or battery must not be disposed of in a land-fill site or as municipal waste, and should be disposed of according to your national regulations.

Table 5 Safety definitions

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

HST-3000 Overview

1

This chapter provides a general description of the HST-3000. Topics discussed in this chapter include the following:

- [“About the HST-3000” on page 2](#)
- [“Base unit features” on page 3](#)
- [“What’s new in this release” on page 4](#)
- [“Options” on page 4](#)

About the HST-3000

The HST-3000 is a multi-technology modular test platform suitable for a wide range of hand portable communications test solutions. It is designed to be a rugged, handheld, battery-operated test solution that allows quick turn-up and troubleshooting of multiple services.



Figure 1 HST-3000

The HST-3000 includes a number of plug-in service interface modules (SIMs), each of which provides the characteristics of a fully-featured test solution. Modules can be changed in the field and are designed for plug-and-test simplicity and ease of use. When a SIM is plugged into the HST-3000 it is ready to use in seconds and contains the setup and results information from the last time that SIM was used.



Figure 2 HST-3000 SIMs

The HST-3000 provides process customization through on-board auto tests and allows workforce automation via connectivity to craft access terminals and back-office systems. The web browser allows viewing a web page to verify internet access. JDSU can be contracted to customize and install scripts as well as other back office interoperability.



CAUTION: BATTERY INTERFERENCE

Do not place a property label on the HST under the battery. The label can interfere with the alignment and seating of the battery to the base unit.

Place labels on the HST base unit under the removable service interface module (SIM). Labels should have a maximum thickness of 0.01inches. Labels that exceed this thickness may interfere with the electrical connections and weather resistance of the unit.

Base unit features

The HST-3000 base unit offers the following features:

- Modular product family: service interface modules attach to the base unit to provide test functionality.
- Compact and rugged design for ease of use in the field
- Battery or adapter operation for flexibility in operating environments
- Ethernet and USB ports
- Headset jack
- Microphone and speaker
- Real-time clock for accurately time stamping test results
- ¼ VGA, outdoor readable LCD screen with backlight and soft key contrast control

What's new in this release

The following features were added in this release.

- Remote Coaching — You can connect a HST to a PC/laptop using Bluetooth® and then emulate the HST screen on the PC. This is similar to Remote Operation, but it uses a Bluetooth interface instead of Ethernet; thus, the data connection is not affected or disrupted. For more information, see [“Remote Coaching” on page 45](#).
- Bluetooth Profiles option — You can transfer files from the HST to another HST. This may be useful for sharing configuration files among HST units. See [“Transferring files over Bluetooth” on page 74](#)

Options

The following sections list the options available for the HST-3000 base unit.

NOTE:

For additional information about HST-3000 options, SIMs, and services, contact your local JDSU representative or contact JDSU through the company web site, www.jdsu.com.

Base unit options The HST-3000 base unit is factory configurable with or without copper testing. [Table 1](#) describes the available base units.

Table 1 Base unit options

| Base Unit Options | Description | Part Number |
|-------------------|---|-------------|
| HST-3000 | Base unit with Ethernet connection, USB serial port, and headset jack. CE compliant. | HST3000-CE |
| HST-3000c | Base unit with Ethernet connection, USB serial port, headset jack, and required hardware to perform copper testing (with a Copper SIM). CE compliant. | HST3000C-CE |

Software options You can order software options to add functionality to the HST-3000. [Table 2](#) lists the available software options and part numbers.

Table 2 Software options

| Option | Description | Part Number |
|---------------------|---|--------------|
| IP Ping | Provides ping capability using the base unit's Ethernet port and provides through mode support for ADSL1/2, G.SHDSL, and VDSL SIMs. | HST3000S-IP |
| Web Browser | Allows you to use the HST to view and navigate web sites using a DSL or Ethernet interface. Requires the IP Ping option. | HST3000S-WEB |
| FTP/HTTP Throughput | Provides file transfer protocol support that allows you to test throughput. | HST3000-FTP |

Table 2 Software options (Continued)

| Option | Description | Part Number |
|--------------------|--|--------------------|
| Remote Operation | Allows you to access the HST-3000 user interface from a PC through a virtual network connection (VNC) over Ethernet. | HST3000-REMOP |
| Scripting | Allows you to run scripts that automate test operations. | HST3000-SCRIPT |
| VT-100 Emulation | Allows you to emulate a VT100 terminal, allowing local access to network elements. | HST3000-VT100 |
| Bluetooth | Allows wireless transfer of files from the HST to a PC. | HST3000-BLUETOOTH |
| IP Video | Allows you to test IP Video services. NOTE: Additional IP Video options are available. For more information, see the <i>HST-3000 IP Video Testing User's Guide</i> . | HST3000S-IP-VIDEO |
| VoIP | Allows you to place and receive calls using internet protocol (IP), and analyze the call quality. NOTE: Additional VoIP options are available. For more information, see the <i>HST-3000 VoIP Testing User's Guide</i> . | HST3000S-VOIP |
| Bluetooth Profiles | Allows wireless transfer of files from the HST to a PC or another HST (includes a file transfer profile). | HST3000-BLUETOOTH1 |
| Remote Coaching | Allows you to access the HST-3000 user interface from a PC through a virtual network connection (VNC) over Bluetooth. | HST3000-RECO |

SIMs When attached to a base unit, service interface modules (SIMs) provide test functionality for the HST-3000. For example, the HST3000-BDCM-WB2 SIM allows you to test a copper wire pair and VDSL services using (Broadcom) modem emulation, or the HST-OPETH SIM allows you to test 10/100 Mbps electrical Ethernet services, and, optionally, 1 GigE or 100 Mbps optical Ethernet services.

JDSU offers a wide variety of SIMS and software options; contact your local JDSU representative for details. The regional sales offices are listed on the back cover of this guide.

NOTE:

For information about CE compliance, see the HST-3000 Declaration of Conformity or contact your local JDSU representative. A copy of the declaration is included in the shipping package.

Quick Tour

2

This chapter introduces the keyboard, LEDs, connectors and graphical user interface. Topics discussed in this chapter include the following:

- [“Using the front panel” on page 10](#)
- [“Using the top panel” on page 14](#)
- [“Using the bottom panel” on page 15](#)
- [“Working with the user interface” on page 18](#)

Using the front panel

The controls and indicators on the HST-3000 front panel, shown in [Figure 3](#), are used to operate the unit, set up tests, and view data.

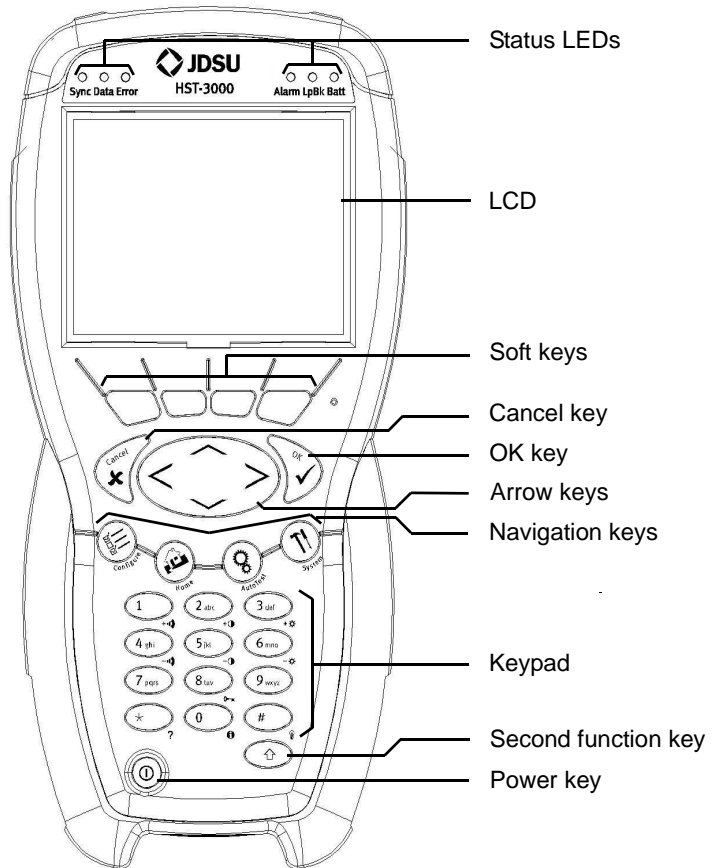


Figure 3 HST-3000 front panel

The following paragraphs describe each of the controls and indicators on the front panel.

Status LEDs These six indicators report the status of the unit. With the exception of the Battery LED, the function of these LED varies depending on the application. For example, the LED changes when performing VoIP tests, so to learn what these LED indicate in that application, refer to the VoIP Testing manual.

The Battery LED is a multi-color LED that indicates the battery status. Solid green indicates that an external source is charging the battery. Solid red indicates a low battery. Flashing red indicates that the battery is very low and the unit will soon shut down. Solid or flashing amber indicates a problem with the battery.

LCD The LCD is a 3.8" 1/4 VGA transfective black and white display with backlight. It can be viewed in direct sunlight. Backlight and contrast control are user-selectable.

Soft keys The four soft keys are used to make menu selections. The label for the keys change depending on the menu currently displayed.

Cancel key The Cancel key is used to exit a menu without making changes and also to step back through menus.

OK key The OK key is used to accept a change or go to the next menu.

Arrow keys The arrow keys are used to navigate the menu selections; for example, to move to a different selection, to scroll to another tab, and so on.

Navigation keys The Navigation keys are used for frequent functions. Each key is described in [Table 3](#).

Table 3 Navigation keys

| Key | Function |
|-----------|--|
| Configure | Used to configure test setups. In some applications, repeated presses cycles through the test functions. For example, if you are using a DSL application, and you are viewing the General modem settings, pressing Config will move to the Data settings, and then VoIP General settings, and then the Video Settings. |
| Home | Typically used to return to the measurements menu. In some applications, repeated presses cycles through the test functions. For example, if you are using a DSL application, and are in the Modem Emulate test function, pressing Home will move to the Data application, and then the VoIP application, and then IP Video. |
| Auto Test | Used for automated testing. |
| System | Used to select system settings, utilities, and tools. |











Keypad The keypad is used to enter numbers, make menu selections, enter alphabetic characters, and so on. Throughout the menus, the numbers associated with each function provide a quick way to perform tests with simple number sequences.

The graphics to the lower-right of the keys indicate the second function of that key.

Second function key The second function key, sometimes called the shift key, is used to give the numeric keys an extra function. An arrow icon appears on the screen when you press the second function key. The icon located under each key indicates the second function for that key. For example, pressing the second func-

tion key and then the # key changes the backlight setting. [Table 4](#) describes the second function keys.

Table 4 Second function keys

| Symbol | Description |
|---|--|
|  | Volume Increase. Found under the 1 key, it adjusts the volume of the internal speaker. |
|  | Volume Decrease. Found under the 4 key, it adjusts the volume of the internal speaker. |
|  | Help. Found under the star (*) key, it displays the Technical Assistance phone number. In a future release, it will display the home screen of the online help system. |
|  | Contrast Increase. Found under the 2 key, it adjusts display contrast by increasing to the next level. |
|  | Contrast Decrease. Found under the 5 key, it adjusts display contrast by decreasing to the next lower level. |
|  | Lock. Found under the 8 key, it is used to lock the keypad. |
|  | Information. Found under the 0 key, it displays context sensitive online help. (Future) |
|  | Backlight Brightness Increase. Found under the 3 key, increases the brightness level by one step. |
|  | Backlight Brightness Decrease. Found under the 6 key, decreases the brightness level by one step. |
|  | Backlight. Found under the pound (#) key, toggles the display backlight on and off. |

Power key The power key turns the unit power on or off. Press and hold for ½ second to turn on or off.

Using the top panel

The HST-3000 top panel is used to connect an audio headset or to connect to an external output device. [Figure 4](#) shows the top panel, with a copper testing SIM attached.

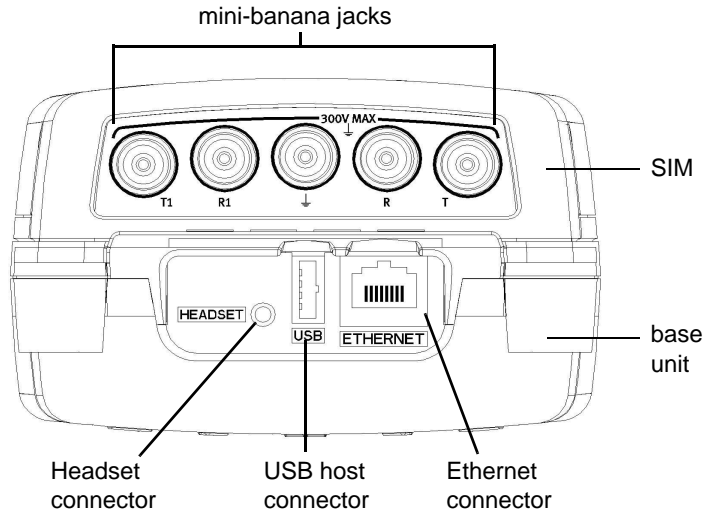


Figure 4 HST-3000 top panel

NOTE:

The physical interfaces for connecting the test leads (for example, the mini-banana jacks in the figure above) are provided on the SIM. These connectors are described in the appropriate application user guide.

The top panel connectors are described in the following paragraphs.

Headset connector The Headset connector is used to connect a 2.54mm microphone/speaker audio headset.

USB connector The USB host connector is used to connect the HST-3000 to a USB keyboard or USB mouse.

Ethernet connector The Ethernet connector is used to connect a 10/100 BaseT Ethernet crossover cable for software upgrades.



NOTE: ELECTROSTATIC DISCHARGE IMMUNITY

When using an Ethernet crossover cable, JDSU recommends using a shielded crossover cable for the best immunity to electrostatic discharge (ESD).



CAUTION: INSTRUMENT DAMAGE

Using a cable that is not specified for the port can damage the port. For example, using a RJ-11 connector in a RJ-45 or RJ-48 port will damage the port. Use only appropriate cables.

Using the bottom panel

The HST-3000's speaker and charger and serial connectors are located on the bottom panel.

The look of the bottom panel changes, depending on which battery you have. The 14pin battery has one connector and no LEDs. The EZ battery has two connectors and two LEDs.

Bottom panel with the EZ battery The bottom panel, shown in [Figure 5](#), includes a speaker, two battery LEDs, and charger and serial connectors.

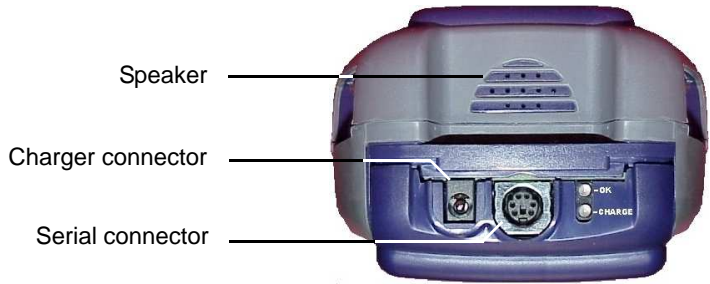


Figure 5 HST-3000 bottom panel with EZ battery

The charger connector is used to connect the AC adapter. You can also connect the optional cigarette lighter adapter.



CAUTION: INSTRUMENT DAMAGE

Using the incorrect adapter can damage the battery. Use only the AC Adapter/Charger supplied with the product.

The serial connector is a 6-pin mini-DIN connector used when establishing serial connections to a printer or for VT100 terminal emulation.

When green, the OK LED indicates that charging is complete.

When red, the CHARGE LED indicates the following:

- If solid, indicates that the battery is being charged.
- If flashing, indicates a charge fault (temperature too high or low, DC too high or low, or an internal fault).

Bottom panel with the 14pin battery If your unit has a 14pin battery, the bottom panel includes the speaker and a charger/serial connector. Unlike the EZ battery, the charger and serial connections are in one connector, as

shown in [Figure 6](#).



Figure 6 HST-3000 bottom panel with 14pin battery

The charger/serial connector is used to connect the following items to the HST:

- AC power adapter
- Cables for use with the optional VT100 feature
- Printer

If you simply want to power the unit, use the standard power adapter shipped with the HST.

If you want to establish a serial connection and power the unit at the same time, begin with the optional charger “brick” with RS-232 connector, then add one of the following.

- AC power cord
- Cigarette lighter adapter

For more information on these connections, see [“Power cables” on page 163](#).

Working with the user interface

The user interface of the HST-3000 is designed to be intuitive and easy to use. Using the LCD and keypad, you can perform tasks such as viewing test results, setting up the unit, and configuring test parameters. This section describes the user interface and how to navigate it.

When you power up the HST-3000, the user interface appears (see [Figure 7](#)).

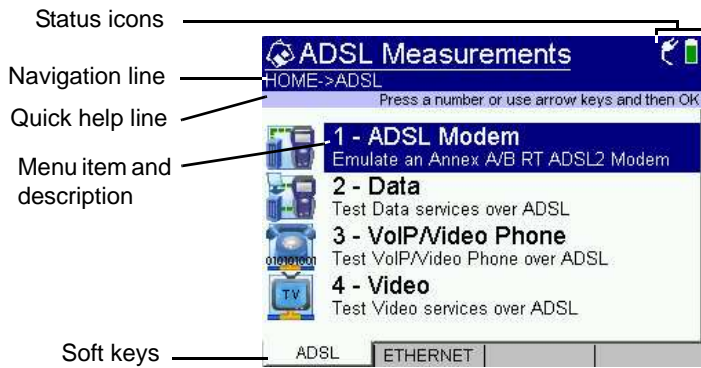








Figure 7 HST-3000 user interface (example)

The user interface is divided into functional areas. These areas are described in the following paragraphs.

Status icons Status icons appear in the upper right corner of the user interface. [Table 5](#) describes each icon.

Table 5 Status icons

| Icon | Function |
|---|--|
|  | Indicates the battery charge level. When the battery is charged, the battery icon is light color; when discharged it is dark. On the color screen, green indicates the charge level and white indicates expended capacity. |
|  | Indicates that the AC adapter is plugged in. |
|  | Indicates a test is in progress. |
|  | Indicates the second function key has been pressed. |
|  | Indicates the viewable area of the VT100 screen for the optional VT100 feature. |
|  | Indicates timed testing is enabled. |

Navigation line The navigation line indicates the current position in the menu tree. This can help you more easily navigate the menu structure.

Quick help line The quick help line gives a short description for navigating the menu or quick instructions for a task.

Menu items and descriptions The menu item and description area present a highlighted menu item and gives a short description of the item.

Soft keys There are four soft keys. The labels for these will change depending on the menu. Use the key directly under the label to select that soft key's function.

Navigating the user interface The following paragraphs describe how to navigate the user interface.

Colors If you have a color screen, the color of the background indicates which menu you are viewing (in addition to the navigation line).

- The main menu and system menus are blue.
- The configuration menus are green.
- The results menus are white.

Inputting information While working with the user interface, you will occasionally need to enter alphanumeric information, such as a user name or password. If a menu requires alphanumeric entry, you can use the keypad to cycle through the letters and number for that key. The third soft key on these screens is labeled **Keypad:XXX**, where XXX changes when you press the soft key. This soft key controls the behavior of repeated key presses, as outlined in [Table 6](#).

Table 6 Keypad soft key behavior

| Soft key label | Function |
|----------------|--|
| Keypad:ABC | Repeated key presses cycle through the number and upper case letters for that key (for example, 2, A, B, C). |
| Keypad:abc | Repeated key presses cycle through the number and lower case letters for that key (for example, 2, a, b, c). |

Table 6 Keypad soft key behavior (Continued)

| Soft key label | Function |
|----------------|--|
| Keypad:123 | Enters numeric only mode. Repeated key presses simply repeat that number (for example, 2, 2, 2). |

Use the star (*), pound (#), or one (1) key to cycle through special characters. For example, when entering data that includes a decimal point, such as an IP address, use the asterisk/star key to enter a decimal point.

Use the left or right arrow key to navigate among the characters.

Entering menus To enter the various menus available on the HST-3000, use the second function keys, navigation keys, arrow keys, or press the corresponding menu item number on the keypad (fastest).

Moving through menus To move through sections of menus, or to display different options on the same menu, use the arrow keys or enter the menu item number on the keypad (fastest).

Selecting menu items To select a menu item, select the **OK** key with the item highlighted or press the corresponding number on the keypad (fastest)

Exiting menus To go back one menu level, press the **Cancel** key. Unless otherwise specified in a procedure, press Home to return to the measurements screen.

NOTE:

Since there are multiple ways to enter, move through, and select menu items, the fastest method is used in the procedures throughout this manual.

Getting Started

3

This chapter describes how to setup the base functions of the HST-3000. Topics discussed in this chapter include the following:

- “Safety instructions” on page 24
- “Removing and attaching a SIM” on page 24
- “Turning the unit on and off” on page 28
- “Checking the battery” on page 29

Safety instructions

The HST-3000 should only be used for the purpose and under the conditions for which it is intended. Operation outside these conditions may be dangerous or may damage the instrument. For additional safety information, refer to the printed safety document or the electronic safety document located on the HST user documentation CD-ROM.

Removing and attaching a SIM

When shipped from the factory, the service interface module (SIM) comes attached to the unit. If another module is ordered later, or if you have more than one module, this section describes how to replace the module.

NOTE:

Before removing or attaching a module, the unit must be powered down and all cables must be disconnected.



CAUTION: STATIC SENSITIVE

Static shock may damage the instrument. Observe anti-static precautions when handling the module.

Removing a SIM SIMs can be removed by turning the $\frac{1}{4}$ -turn fastener located on the back of the unit (see [Figure 8](#)).

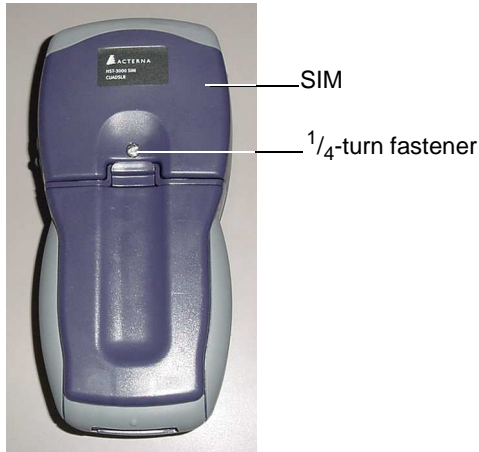


Figure 8 Back of the HST-3000

The following procedure describes how to remove a SIM.

To remove the module

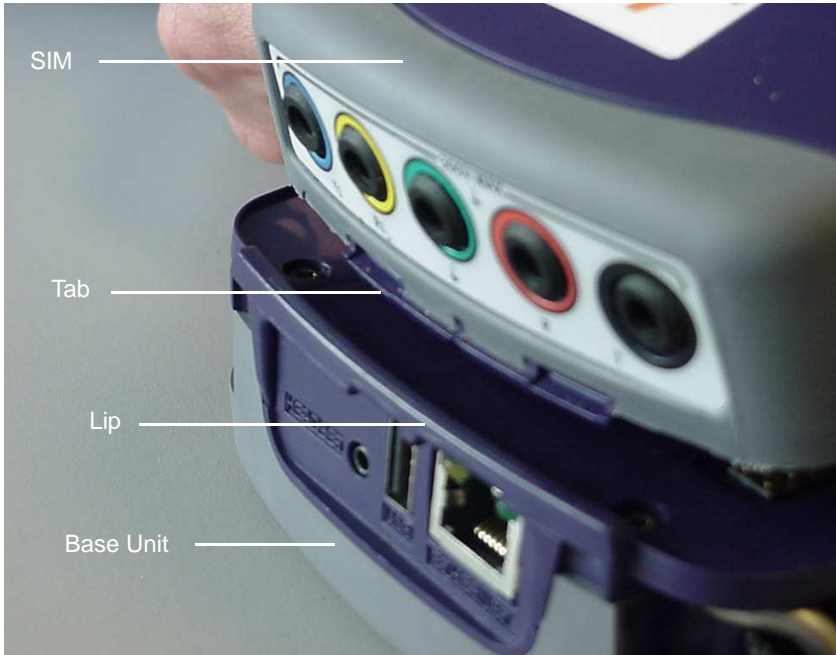
- 1 Loosen the $\frac{1}{4}$ -turn fastener using a screwdriver.
- 2 Carefully lift the SIM to remove.

The module is removed.

Attaching a SIM The following procedure describes how to attach a service interface module (SIM).

To attach a SIM

- 1 Locate the tab on the SIM and the lip on the top of the base unit.



NOTE:

Some SIMs are larger than others. For most SIMs, the tab will be on the top edge of the SIM; for others, it is near the middle of the SIM.

- 2 Turn the base unit so you are looking at it from the side.

- 3 Position the SIM at approximately a 45 degree angle and push the tab under the lip as shown in [Figure 9](#).

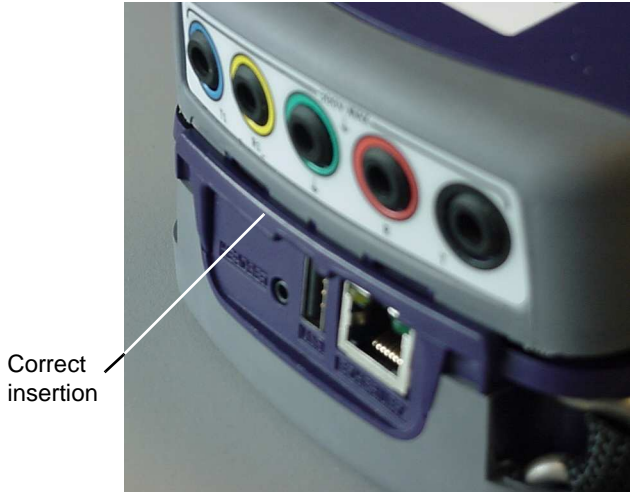


Figure 9 Inserting the SIM tab

You should be able to feel that the SIM tab is inserted correctly, as you cannot push the SIM forward. [Figure 10](#) shows an *incorrect* insertion.

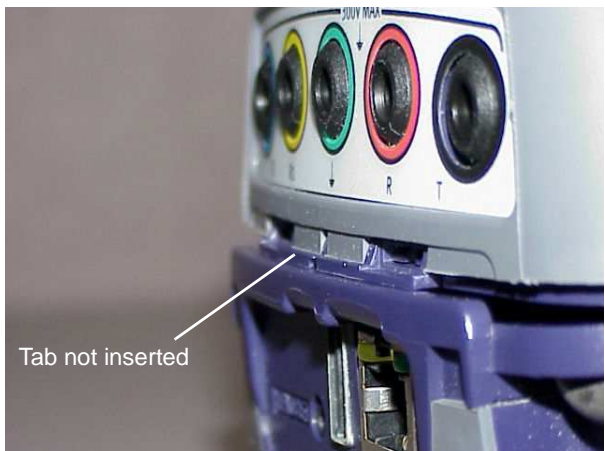


Figure 10 Incorrect SIM attachment

- 4 Carefully press the bottom of the SIM into place.

The SIM should slide into place easily with only a little resistance, and should fit snugly against the base unit.

CAUTION: DAMAGE TO UNIT

Do not force the bottom part of the SIM into place. If you use excessive force, you may damage the unit.

If the SIM does not slide easily into place, reposition the tab to be sure it is beneath the lip, and then carefully press the bottom part of the SIM into place.

- 5 On the SIM, tighten the ¼-turn fastener (see [page 25](#)) using a screwdriver.

The module is connected.

Turning the unit on and off

Before using the HST-3000, you should turn on the unit.

To turn on the HST-3000

- Press and hold the power key for about ½ a second.

The system starts to boot up. When the unit is done turning on, the user interface appears. It may take several seconds for the unit to fully turn on.

You should turn off the HST after you finish testing.

To turn off the HST-3000

- 1 Exit any tests that are currently running.
- 2 Press and hold the power key for about ½ a second.
A shutdown message appears on the screen while the unit turns off.

Checking the battery

You can check the status of the battery in three ways:

- The battery status icon.

This icon appears in the upper right corner of the screen and provides a graphic indication of the approximate battery charge.

- The Batt LED.

The Batt LED is off when the battery has a useful charge. It is green when the AC adapter is plugged in. It is red when the battery is approximately 20 percent or below of full charge. It flashes red when approximately five minutes of use remains. When this happens, the battery should be charged or replaced immediately.

If the LED is solid amber, the battery capacity indicator (“gas gauge”) needs to be reset. See [“Resetting the battery capacity indicator” on page 181](#).

- The Battery Level percentage on the Power Management Settings menu.

To check the battery level

- 1 Press the **System** navigation key.

- 2 Press the **USER** soft key.

The User Preferences menu appears.

- 3 Select **Power Management**.

The Power Management Settings menu appears.

- 4 View the **Battery Level**.

Chapter 3 Getting Started
Checking the battery

Instrument Settings and User Preferences

4

This chapter describes how to configure the basic settings of the instrument. Topics discussed in this chapter include the following:

- “Changing instrument settings” on page 32
- “Setting the date and time” on page 33
- “Changing the date and time format” on page 34
- “Changing port settings” on page 35
- “Viewing USB devices” on page 37
- “Transferring files using Bluetooth” on page 38
- “Specifying FTP settings” on page 40
- “Configuring international settings” on page 40
- “Accessing a remote HST-3000” on page 41
- “Installing X.509 Certificates” on page 53
- “Launching an application automatically” on page 53
- “Cloning a device” on page 53
- “Setting user preferences” on page 55
- “Adjusting the sound” on page 55
- “Changing screen settings” on page 56

- “Changing keypad settings” on page 59
- “Setting auto power down parameters” on page 60
- “Restoring factory defaults” on page 61

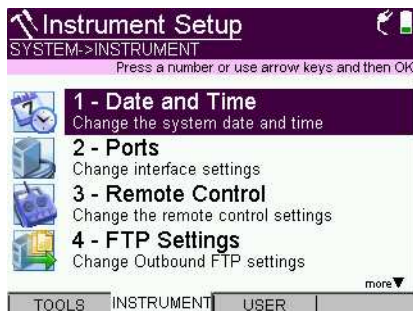
Changing instrument settings

Using the Instrument Setup menu, you can set the date and time, configure port settings, adjust print settings, adjust remote control settings, and configure international settings.

To access the Instrument Setup menu

- 1 Press the **System** navigation key.
- 2 Press the **INSTRUMENT** soft key.

The Instrument Setup menu appears.



Setting the date and time

The first selection on the Instrument Setup menu is Date and Time. The HST-3000 has an internal clock that you can set to provide accurate time stamps for test results.

NOTE:

If you have a previous rev of the processor board (ACE 139), the internal clock has its own battery, so the clock is current whether or not the battery is attached to the unit or the AC Adapter is connected.

If you have a new processor board (ACE 699), the internal clock has a capacitor to maintain the clock for up to 15 minutes when the battery is not attached.

To verify your processor (ACE) board part number, see [“Viewing unit options, revisions, and HST ID”](#)

The following procedure describes how to set the date and time.

To set the date

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 Select **Date and Time**.
The Date And Time Settings menu appears.
- 3 Select **Date**.
- 4 Enter the current month, day, and year in numerical form.
For example, the date April 1, 2004 would be 4/1/2004.
- 5 Press the **OK** key.

The date is set.

The following procedure describes how to set the time.

To set the time

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 Select **Date and Time**.
The Date And Time Settings menu appears.
- 3 Select **Time**.
- 4 Enter the current hour, minutes, and seconds.
- 5 Press the **OK** key.

The time is set.

Changing the date and time format

Using the Date and Time Settings menu, you can change the format of the date and time. For the date, you can specify either North American (MM/DD/YYYY) or European (DD/MM/YYYY) formats. For the time, you can specify either 12 hour or 24 hour format.

To change the date format

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 Select **Date and Time**.
The Date and Time Settings menu appears.
- 3 Select **Date Format**.
- 4 Select one of the following formats:
 - **DD/MM/YYY**
 - **MM/DD/YYY**

The date format is set.

The following procedure describes how to change the time format.

To change the time format

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 Select **Date and Time**.
The Date and Time Settings menu appears.
- 3 Select **Time Format**.
- 4 Select one of the following formats:
 - **12 Hour**
 - **24 Hour**

The time format is set.

Changing port settings

The second selection on the Instrument Setup menu is Ports. This menu allows you to configure the settings for either a serial or ethernet connection, or view any USB devices connected to the HST-3000.

Serial port The following section describes how to change the Serial port settings.

To change the serial port settings

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 To select Ports, press the **2** key.
- 3 Press the **SERIAL** soft key.
The Serial Settings menu appears.
- 4 Press **1** then select the **Serial Speed**.
- 5 Press **2** then select the **Parity**.
- 6 Press **2** then select the **Data Bits**.
- 7 Press **2** then select the **Stop Bits**.

- 8** Press **2** then select the **Flow Control**.
 - 9** To test the serial port, press the **6** key, then the **OK** key.
ASCII characters are sent out the port and you should see them on the printout or in your terminal program.
- The serial port settings are changed.

Ethernet port The following section describes how to change the Ethernet port settings.

To change the ethernet port settings

- 1** Access the Instrument Setup menu (see [page 32](#)).
- 2** To select Ports, press the **2** key.
- 3** Press the **ETHERNET** soft key.
The Ethernet Settings menu appears.

NOTE:

If the State is Unavailable, check the Remote Control settings.

- 4** Press **2** then select the **IP mode**.



CAUTION: CONFLICTING SETTINGS

When using Ethernet TE or VoIP applications, setting the IP mode to DHCP could cause address allocation issues. For these applications, set the IP mode to Static.

- 5** Press **3** then enter the **IP address**.
 - 6** Press **4** then enter the **Net Mask** address.
 - 7** Press **5** then enter the **Gateway** address.
 - 8** Press **6** then enter the address of the **DNS** server.
 - 9** Press **7** then select the **Media Type**.
- The ethernet port settings are changed.

Viewing USB devices

The Ports menu allows you to view any USB devices connected to the HST-3000.

To view USB devices

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 To select Ports, press the **2** key.
- 3 Press the **USB** soft key.

The USB Devices menu appears.



NOTE:

This display shows 122 MB of storage; this actually indicates 128 MB of space. This is due to the math of dividing the available bytes by (1024 x 1024).

Any USB device connected to and recognized by the HST-3000 is listed.

NOTE:

The HST can recognize up to two changes of the USB device. You must turn the unit off then back on for the HST to recognize another change.

Transferring files using Bluetooth

The Bluetooth® wireless option allows wireless transfer of files, within a range of 33 feet (10 meters). To use this feature, your unit must be equipped with the Bluetooth Wireless option.

To use the Bluetooth option, you need a Bluetooth connection. You may need to purchase a Bluetooth USB dongle (available in most electronics stores), or your HST may include an internal Bluetooth device. To verify, view the Bluetooth menu (see [step 4](#)). If the menu appears and you have nothing connected to the USB, your unit has internal Bluetooth.

This process is basically the same as using the File Manager to print the file, except the file is sent out (printed out) the Bluetooth interface.

To transfer files using the Bluetooth interface

- 1 Press the **System** navigation key.
- 2 Press the **INSTRUMENT** soft key.
- 3 Select **Ports**.
- 4 Press the **BLUETOOTH** soft key.

The Bluetooth Settings menu appears.



The **BLUETOOTH** soft key appears only if a Bluetooth interface is found.

- 5 Select **Link State** and specify whether it is **Enabled** or **Disabled**.

This turns the link on (Enabled) or off (Disabled).

- 6 Select **Paired Address** and enter the MAC address.

The HST-3000 will scan for devices. This may take a minute.

If you connect to a system that has a secure connection and requires a password to connect to the HST-3000, use the password "5378" (without the quotes).

- 7 Select an address from the list.

- 8 Select **Print State** and specify whether it is **Enabled** or **Disabled**.

Enabling Print State overrides the serial print found in the File Manager menu. This means that when you print, the file is sent out the Bluetooth interface rather than the serial port.

- 9 Find the file you wish to print.

- 10 Using remote control commands, send the file to print.

The file is transferred.

NOTE:

If your unit has an ACE 139 (processor board), and you are testing ADSL, VDSL, or Ethernet, and you bring up the Data network, the Bluetooth link will be disabled. After the Data network goes down, the Bluetooth link will be brought back up. To verify your ACE version, see ["Viewing unit options, revisions, and HST ID" on page 182](#).

Specifying FTP settings

The FTP Settings menu allows you to specify the outbound FTP parameters: FTP address, user name, and password.

Configuring international settings

The fourth selection on the Instrument Setup menu is Internationalization. This menu is used to select the language, units of measurement, and other international settings. There are two ways to select international settings:

- Selecting a preset country. These selections automatically configure the settings as appropriate for that country.
- Configuring each setting individually. If you are not in one of the preset countries, or if the settings aren't appropriate for your situation, you can configure each setting individually.

These settings are stored when the unit is turned off.

To configure international settings

1 Access the Instrument Setup menu (see [page 32](#)).

2 Select **International Settings**.

The International Settings menu appears.

3 *Optional.* Select **Country** to select a preset country.

Selecting a specific country will automatically change the settings as appropriate for that country. For example, selecting Spain will automatically set the language to Spanish, unit of distance to meters, unit of temperature to celsius, noise filter to CCITT, cable size to millimeters, TDR units to m/us, and numerical separator to a comma.

4 Select **Language**.

The Language menu appears.

5 Select a language from the list.

The language setting applies to both the wording on the user interface and the voice responses, where applicable.

The HST shuts down, and then restarts with the selected language.

- 6 To return to the International Settings menu, press the **System** navigation key, and then select **INSTRUMENT>International Settings**.
- 7 Change the settings as appropriate for unit of distance, temperature, filter type, TDR unit, cable size, and time zone.

The international settings are configured.

Accessing a remote HST-3000

The HST offers three remote access options:

- *Remote control language* - steering the instrument directly using specific commands. This function is used primarily by the factory for troubleshooting and is not documented in this manual.
- *Remote operation mode* - emulating the instrument screen on the desktop, connecting over an Ethernet interface.
- *Remote coaching mode* - emulating the instrument screen on the desktop, connecting over a Bluetooth interface.

Remote Operation The optional Remote Operation features allows you to access the HST-3000 user interface from a PC or laptop computer through a virtual network connection (VNC), connecting over an Ethernet interface.

NOTE:

Remote Operation (VNC) is an optional feature. To use this feature, your unit must be equipped with the HST3000-REMOP option.

To use this feature, you must have the VNC viewer provided on the HST-3000 User's Guide USB; the HST must be connected to the same network as the PC or laptop; and you must know the IP address of the HST-3000.

Establishing a VNC connection involves the following tasks:

- Establishing an Ethernet LAN connection between the HST-3000 and a PC or laptop
- Enabling Remote Operation using VNC
- Control the HST using a PC keyboard

Each of these operations is described in the following sections.

Establishing an Ethernet connection You must have an Ethernet LAN cable to establish an Ethernet connection to the HST.

To establish an Ethernet connection to the HST-3000

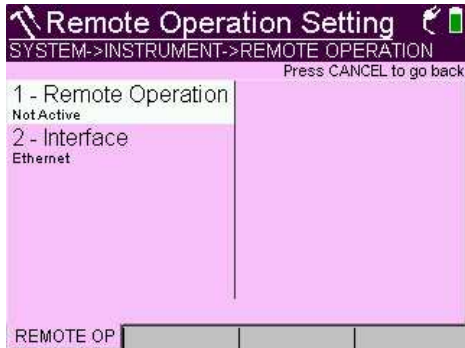
- 1** Using an Ethernet cable, connect the HST to same Ethernet LAN as the PC or laptop you will use for the VNC:
 - a** Connect one end of the Ethernet cable to the HST Ethernet connector located on the top panel (see [Figure 4 on page 14](#)).
 - b** Connect the other end of the Ethernet cable to the LAN.
- 2** Turn the remote control option **On** and set the port interface to **Ethernet** (see ["Configuring international settings" on page 40](#)).
- 3** Configure the Ethernet port settings to match your LAN settings (see ["Changing port settings" on page 35](#)).
The Ethernet connection is established.
- 4** To enable remote operation using a VNC, see ["Enabling remote operation"](#).

Enabling remote operation After you have established an Ethernet connection, you must enable the remote operation feature on the HST.

To enable remote operation

- 1 Access the Instrument Setup menu (see [page 32](#)).
- 2 Select **Remote Operation**.

The Remote Operation Setting menu appears.



- 3 Select **Remote Operation**, and then press **1** to enable remote operation.
- 4 Insert the HST-3000 user's guide USB in the PC or laptop, and then launch the VNC viewer, file name **vnc_viewer.exe**.
- 5 In the viewer's server address field, type the HST's IP address, and then select **OK**.
The HST-3000 user interface appears in the VNC viewer.
- 6 To use a PC or laptop keyboard with the HST's user interface, see ["Using a PC keyboard"](#) on [page 44](#).

- 7 If the message, “Failed to connect to server” appears, the VNC viewer was not able to communicate with the HST. If this happens, try the following solutions:
- Make sure you are using the correct IP address for the HST.
 - From the PC or laptop, ping the HST IP address to verify the network link is working. If the link is not working, restart the HST and repeat [step 1](#) through [step 5](#).

Using a PC keyboard After you have connected to the HST from a laptop or PC using the VNC viewer, you can use the computer’s mouse or keyboard to control the HST. [Table 7](#) shows how the PC/laptop keys map to the HST keypad.

Table 7 PC/laptop to HST key map

| PC/Laptop key | HST Keys |
|---------------|---------------------------------|
| F1 through F4 | Correspond to the HST soft keys |
| F5 | Configure |
| F6 | Home |
| F7 | AutoTest |
| F8 | System |
| Escape | Cancel |
| Enter | OK |

VNC availability The VNC program can control the following functions:

In Ethernet TE, you can do a ping, trace route and similar data tests, but *cannot change* any data settings.

In DSL, you can perform modem emulate tests with Data mode *off*.

Ending a remote operation session Ending a remote operation session involves quitting the session on the PC or laptop and turning the HST-3000 off, and then on again (power cycling).

To end a remote operation session

- 1 On the PC or laptop running the VNC viewer, end the VNC session.
- 2 Power cycle the HST-3000:
 - a Press the green power button to turn the unit off.
Allow the unit to power off. The unit is off when the screen and LEDs are dark.
 - b Press the power button again to turn the unit on.

Remote Coaching The optional Remote Coaching features allows you to access the HST-3000 user interface from a PC or laptop computer through a virtual network connection (VNC), connecting over Bluetooth.

The difference between Remote Operation and Remote Coaching is the interface. Since Remote Coaching uses Bluetooth, the data connection is not affected or disrupted.

Remote Coaching is an optional feature. To use this feature, your unit must be equipped with the following options:

- Remote Operation (HST3000-REMOP)
- Bluetooth Profiles (HST3000-BLUETOOTH1)
- Remote Coaching (HST3000-RECO)

To verify the options installed on your unit, see [“Viewing unit options, revisions, and HST ID” on page 182.](#)

NOTE:

For additional information about HST-3000 options, SIMs, and services, contact your local JDSU representative or contact JDSU through the company web site, www.jdsu.com.

To use this feature, you must have the remote operation software provided on the HST-3000 User's Guide USB.

Launch the remote operation software In order to connect to a HST, the remote operation software must be running.

To launch the remote operation software

- 1 If you haven't previously done so, install the software.
 - a Insert the HST-3000 user's guide USB in the PC or laptop.
 - b Launch the remote operation installation file:
`remoteop-x.x.x.msi`
(where x.x.x is the software version).
A window opens that provides installation progress.
The window closes when finished.
- 2 Launch the *JDSU Remote Operation* software, either from the desktop shortcut or **Start>Programs>JDSU Remote Operation**.
The software will scan for any HST units with Bluetooth interfaces that are in range.
Any HSTs listed are identified by the first six digits of their HSTID (found on the *System>Options/Revisions* screen).

Connecting to a HST After launching the software, you can connect to a specific HST.

To connect to a HST

- On the PC, locate the desired HST in the scan list, and then click **View Unit**.

If the unit is paired, the HST screen appears.

If the unit is not paired, a window opens asking if you would like to pair with the unit. See [“Pairing the HST”](#).

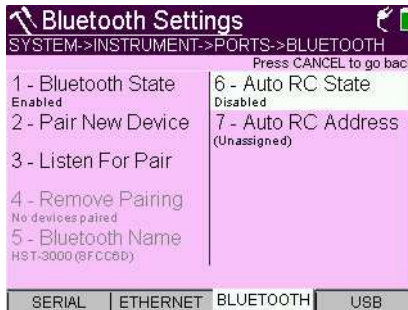
Pairing the HST If your HST has not been used with the software before, it will not appear in the scan list. You must pair the HST with the PC. If you have previously paired your HST to the PC, go to [“Connecting to a HST”](#)

Pairing one device (a PC) to another (the HST) ensures that all communication between the two is encrypted and no unauthorized devices can take control.

To pair the HST

- 1 Press the **System** soft key and then check the **Instrument>Ports** menu. If the **Bluetooth** soft key does not appear, you need an external Bluetooth dongle. Connect it to the USB connector on the top of the HST-3000.

If the soft key is available, the Bluetooth Settings menu appears.



- Bluetooth State: Enables/disables Bluetooth
 - Pair New Device: Causes the HST to scan for devices and allows the initiation of pairing with another Bluetooth device
 - Listen For Pair: The HST will listen for a pairing request
 - Remove Pairing: Removing a pairing from the HST
 - Bluetooth Name: An indicator of the HST's Bluetooth name
 - Auto RC State: Auto Remote Control State Enable or Disable (must choose the address first)
 - Auto RC Address: Auto Remote Control Address displays the address of the Bluetooth device where a serial port was automatically connected. When you first view the item, a list of available Bluetooth devices appears.
- 2 On the PC, in the Remote Operation software, locate the desired HST and click **View Unit**.
 - 3 When asked whether you wish to pair with the unit, click **Yes**.
 - 4 On the HST, from the Bluetooth Settings screen, select **Listen For Pair** (do not select Pair New Device).

A message appears indicating the HST is waiting for a pair request.

- 5 On the PC, click the **Start Pairing** button.

A window opens that includes the PIN for pairing.

- 6 On the HST, enter the PIN shown on the PC.

A “Pairing Successful” message appears momentarily and then the HST screen appears on the PC or laptop.

Using a PC keyboard After you have connected to the HST from a laptop or PC using the remote operation software, you can use the computer’s mouse or keyboard to control the HST. [Table 7](#) shows how the PC/laptop keys map to the HST keypad.

Table 8 PC/laptop to HST key map

| PC/Laptop key | HST Keys |
|---------------|---------------------------------|
| F1 through F4 | Correspond to the HST soft keys |
| F5 | Configure |
| F6 | Home |
| F7 | AutoTest |
| F8 | System |
| Escape | Cancel |
| Enter | OK |

Troubleshooting This section describes common issues and solutions related to the Remote Operation feature. Please read this section before contacting technical assistance.

Issue

Where do I find the version information for the Remote Operation software?

Resolution

Use the **Help>About** menu to view the version number of the Remote Operation Application.

In addition, you can view the Bluetooth configuration information on the **Help>System Information** menu. There may be an occasion, such as when contacting JDSU technical support, where you need to access detailed information about the PC's Bluetooth configuration.

Issue

I cannot install the Remote Operation software.

Resolution

You may not have administrative privileges on the PC. Contact your IT department.

Verify that your operating system is Windows XP SP2 or later (including Vista and Windows 7)

Downgrading the Remote Operation is not allowed. If you wish to install an older version of the Remote Operation software, you must remove the previous version through Windows Add and Remove programs.

Issue

I get a message "No Bluetooth devices installed or turned on."

Resolution

Some laptops have a master switch for its wireless devices; ensure this switch is turned on.

If your PC uses an external USB dongle, verify that it is plugged in and is getting power.

Verify that the Bluetooth software on your PC is compatible with the Remote Operation software. Supported Bluetooth software includes Widcomm/Broadcom, Toshiba, and the

Bluetooth software included with Windows. Contact your Bluetooth Device or PC manufacturer for more information. The Remote Operation software does not support Widcomm/Broadcom software while running on Windows XP x64 Edition.

Issue

There are no HSTs in the scan list.

Resolution

Verify that the HST is turned on.

Verify that the HST is in range.

Verify that the HST has all needed options.

Issue

I can not view an HST using the View Unit button.

Resolution

Verify that the HST has not powered off. The HST has an Auto Power Down feature that will turn the HST off after a user defined amount of time. This feature can be disabled on the HST if desired (see [“Setting auto power down parameters” on page 60](#)).

Issue

The pairing code window disappears quickly.

Resolution

The HST was not in “Listen for Pairing” mode. Repeat the pairing process.

You selected an HST other than the HST you expected to pair with.

Issue

The HST failed to pair.

Resolution

PIN was mis-typed. Repeat the pairing process.

PIN was entered too slowly and PC timed out the pairing process.

Issue

The HST screen is stuck on Attempting to Pair

Resolution

PIN was mis-typed. Repeat the pairing process.

PIN was entered too slowly and PC timed out the pairing process.

Issue

The Bluetooth software on the PC does not support helpful pairing.

Resolution

You will have to manually pair the HST. Contact your IT department.

Issue

The viewing window disappears suddenly.

Resolution

The HST has moved out of range. Move the HST back in range and reconnect.

Installing X.509 Certificates

Using the Certificate Settings menu, you can install a security key certificate, if your network requires one.

To install a certificate

- 1 Press the **System** navigation key.
- 2 Press the **INSTRUMENT** soft key.
- 3 Select **Certificate Settings**.
- 4 Specify the certificate FTP address and the user name and password.
- 5 Press the **Start** soft key.

The certificate will be retrieved and installed.

Launching an application automatically

The Auto Launch setting lets you specify an application to automatically load when the unit is powered up. After initial boot, the summary results screen for the selected application appears (rather than the application's Measurements screen).

Cloning a device

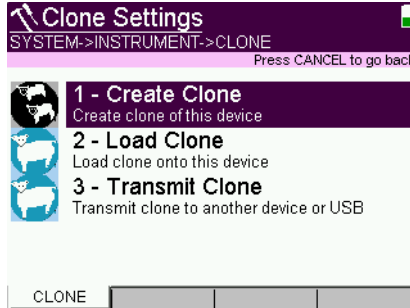
The Clone Device menu allows you to create a clone, load a clone, or transmit a clone. This feature creates a copy (a "clone") of the system configuration as well as any customer configurations and stores it in a file. You can then use that file to load identical settings on another unit by loading it from USB or transferring it over an Ethernet connection.

To clone a device

- 1 Press the **System** navigation key.

- 2 Press the **INSTRUMENT** soft key.
- 3 Select **Clone Device**.

The Clone Settings menu appears.



- 4 To create a clone, select Create Clone, and then enter a file name.

The clone file is saved in the clones folder.

- 5 To load a clone, do the following:

- a Select Load Clone.
- b Choose where to load the clone from:
 - USB or local device
 - connected HST
- c Select the clone file to load.

It will take a few minutes to finish loading.

- 6 To transmit a clone, do the following:

- a Select Transmit Clone.
- b Choose where to send the clone: to USB, or transmit over ethernet.



IMPORTANT:

Choosing **Send via Ethernet** will close all applications. It is recommended that you transmit clone files before running tests.

- c Select the clone file to transmit.

It will take a few minutes to finish loading.

The device is cloned.

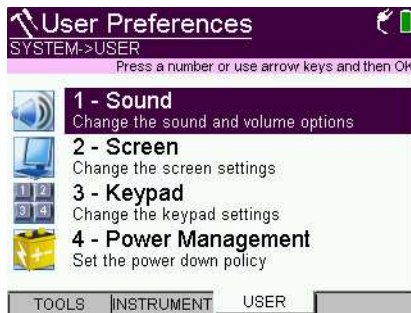
Setting user preferences

The User Preferences menu lets you control the sound, adjust screen settings, and change keypad behavior.

To access the User Preferences menu

- 1 Press the **System** navigation key.
- 2 Press the **USER** soft key.

The User Preferences menu appears.



The following sections describe how to use the User Preferences menu.

Adjusting the sound

The first selection on the User Preferences menu is Sounds. Using the Sound Settings menu, you can adjust the volume level of the internal speaker. The following procedures describe how to adjust the volume.

To adjust the volume

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Sound**.
The Sound Settings menu appears.
- 3 Select **Volume**.
- 4 Use the arrow keys to set the volume, or press a number key on the keypad.

The volume is set.

Changing screen settings

The second selection on the User Preferences menu is Screen. Using the Screen Settings menu, you can adjust the contrast, adjust the brightness of the backlight, set the backlight activation, and set the backlight duration. The following procedures describe how to change the screen settings.

Adjusting the contrast

The following procedure describes how to adjust the contrast.

**NOTE:**

The contrast can only be adjusted for black and white displays. It is not applicable for color displays.

To adjust the contrast

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Screen**.
The Screen Settings menu appears.
- 3 Select **Contrast**.
- 4 Change the contrast level using the left or right arrow key.

5 Press the **OK** key.

The contrast is set.

NOTE:

You can also adjust the contrast by pressing second function, 2, or second function, 5.

Adjusting the backlight brightness

The following procedure describes how to adjust the brightness of the backlight.

To adjust the brightness of the backlight

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Screen**.
The Screen Settings menu appears.
- 3 Select **Brightness**.
- 4 Change the brightness level using the left or right arrow key.

The brightness is set.

NOTE:

You can also adjust the brightness by pressing second function, 3, or second function, 6.

Setting the backlight activation

The following procedure describes how to set the backlight activation.

NOTE:

The backlight activation can only be changed for black and white displays. For color displays, the backlight is always on.

To set the backlight activation

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Screen**.
The Screen Settings menu appears.
- 3 Select **Backlight Act**.
- 4 Select the backlight activation mode:

| To set the backlight to... | Press... |
|-------------------------------|------------------|
| Always on | the 1 key |
| Come on when a key is pressed | the 2 key |
| Always off | the 3 key |

The backlight activation is set.

**Setting the
backlight
duration**

The following procedure describes how to set the backlight duration. This selection applies only if you have selected keypress as the backlight activation mode.

NOTE:

The backlight duration can only be changed for black and white displays. For color displays, the backlight is always on.

To set the backlight duration

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Screen**.
The Screen Settings menu appears.
- 3 Select **Backlight Dur**.
- 4 Enter the desired backlight duration, in seconds, using the keypad. You can set the duration for up to 65 seconds.

- 5 Press the **OK** key.

The backlight duration is set.

Changing keypad settings

The third selection on the User Preferences menu is Keypad. Using the Keypad menu, you can set the repeat delay and repeat rate. The following procedures describe how to change the keypad settings.

Setting the repeat delay The following procedure describes how to set the repeat delay. This setting defines the time to wait after a key is held down until it begins repeat.

To change the repeat delay

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Keypad**.
The Keypad Settings menu appears.
- 3 Select **Auto Repeat Delay**.
- 4 Enter the repeat delay, in seconds, using the keypad. You can set the delay to 0.5 up to 9.0 seconds.
- 5 Press the **OK** key.

The repeat delay is set.

Setting the repeat rate The following procedure describes how to set the repeat rate. This setting defines how many times the character will be repeated per second.

To change the repeat rate

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Keypad**.
The Keypad Settings menu appears.
- 3 Select **Auto Repeat Rate**.
- 4 Use the arrow keys to set the repeat rate.
- 5 Press the **OK** key.

The repeat rate is set.

Setting auto power down parameters

The fourth selection on the User Preferences menu is Power Management. This menu allows you to select whether to automatically turn off the unit to conserve battery life, and set the time to wait before the unit turns off. The following procedure describes how to control auto power down.

NOTE:

The HST-3000 will not automatically power down when connected to a charger.

To set auto power down parameters

- 1 Access the User Preferences menu (see [page 55](#)).
- 2 Select **Power Management**.
The Power Management Settings menu appears.
- 3 Select **Auto Power Off** to turn auto power down on or off.
- 4 Select **Power Off Delay** to set the power off delay.
This is the amount of time to wait (in minutes) after a keypress or no line activity before power down.

The auto power down parameters are set.

Specifying user information

The last selection on the User Preferences menu is User Info. This menu allows you to enter specific information related to the technician using the HST. This includes the technician name, technician ID, location (city, county, state, country, postal code, and garage), and the account ID. This information is used when synchronizing with the StrataSync server.

NOTE:

A valid account ID must be entered in order to synchronize with the StrataSync server.

Restoring factory defaults

The following procedure describes how to reset the HST-3000 to factory default settings.

NOTE:

Restoring factory defaults resets test application settings and system settings (such as brightness, contrast, and volume), and powers down the unit.

To reset to factory defaults

- 1 Press the **System** navigation key.
- 2 Press the **Tools** soft key.
The System Tools menu appears.
- 3 Select **Restore Factory Settings**.
- 4 At the prompt, press the **OK** key to restore the factory default settings. Press the **Cancel** to exit the prompt.

Chapter 4 Instrument Settings and User Preferences
Restoring factory defaults

Managing Files

5

This chapter describes how to save test results and manage the files stored on the HST-3000. Topics discussed in this chapter include the following:

- “Saving test results” on page 66
- “Using the File Manager” on page 68
- “Deleting files” on page 69
- “Renaming files” on page 70
- “Viewing files” on page 70
- “Printing files” on page 71
- “Sorting files” on page 72
- “Transferring files” on page 73

Managing test configurations

The configuration storage feature allows you to save particular test configurations, load a previously saved configuration, and delete saved configurations.

To view the configuration storage feature

- 1 Press the **Configure** navigation key.
- 2 Press the **Storage** soft key.

The Config Store menu appears.



Storing a new configuration After you have finished configuring the HST-3000 for a particular test, you can store the test configuration for future use. The configurations are stored on power down.

To store a test configuration

- 1 Set up the HST-3000 for the test you are performing.
- 2 Press the **Configure** navigation key.
- 3 Press the **Storage** soft key.
- 4 Press the **2** key.
- 5 Enter the file name.
- 6 Press the **OK** key.

The test configuration is stored.

Loading a configuration After a configuration is saved, you can load it. This could save you some time in cases where the majority of settings are the same.

To load a test configuration

- 1 Press the **Configure** navigation key.
- 2 Press the **Storage** soft key.
- 3 Press the **1** key.
- 4 Select the file name to load.
- 5 Press the **OK** key.

The test configuration is loaded.

Overwriting a configuration You can change a saved configuration then overwrite the old version.

To overwrite a configuration

- 1 Press the **Configure** navigation key.
- 2 Press the **Storage** soft key.
- 3 Press the **3** key.
- 4 Select the file name to overwrite.
- 5 Press the **OK** key.

The test configuration is overwritten.

Deleting a configuration If a configuration is no longer needed, you can delete it.

To delete a test configuration

- 1** Press the **Configure** navigation key.
- 2** Press the **Storage** soft key.
- 3** Press the **4** key.
- 4** Select the file name to delete.
- 5** Press the **OK** key.

The test configuration is deleted.

Saving test results

After running a test, you can save the results for future use, such as viewing, printing, or importing into Excel for analysis.

The HST-3000 family of products offers several ways to save data:

- Save (generic save to text file)
- Save Append (save to existing file without overwriting the file)
- Save Screen Shot
- Save Tabular (save to tab separated file)

Save Append, Save Screen Shot, and Save Tabular are only available in certain applications. The User's Guide for those applications describes these additional functions.

Saving results to a text file The following procedure describes how to save test results to a text file.

To save test results

1 At the conclusion of your test, press the **Results** soft key, and then select **Save**.

A message appears prompting you for a file name.

2 Enter a name for the file.

3 Press the **OK** key.

The test results are stored.

See [“Using the File Manager” on page 68](#) for instructions on viewing and printing files.

Save locations In addition, the HST-3000 allows you to save the results in either the internal File Manager or to an external USB drive.

NOTE:

The USB drive must support USB 2.0 and provide access via a standard USB female connector.

If you insert a USB drive into the USB connector, the HST-3000 will recognize it and the USB drive will become the default location where the results will be saved. Otherwise, the results will be saved to a file in the internal File Manager.

For the internal capture, the maximum file size is 1 Mbyte (total internal space is 6 Mbytes); for USB capture, the maximum file size depends on the available space on the USB drive.

NOTE:

With HST software version 3.20.34 or below, you must turn off the HST before inserting the USB drive.



CAUTION: CORRUPTED DATA

Removing the USB drive during a file capture or file save may corrupt the data. Do not remove the drive until all files have been saved or the packet capture is complete.

Using the File Manager

The File Manager enables you to delete, rename, and sort files on the internal filing system, and view and print saved files.

To access the File Management menu

- 1 Press the **System** navigation key.
- 2 Press the **TOOLS** soft key.
- 3 Select **File Manager**.

The screen that appears depends on whether you have a USB drive inserted.

- If you do NOT have a USB drive inserted, a list of directories appears.
- If you have a USB drive inserted, the following screen appears.



- 4 Select which drive to view.

A list of directories appears

The following sections describe how to use the file management menu.

Deleting files

Using the File soft key, you can delete files. The following process describes how to delete files.

To delete a file

- 1 Access the File Management menu (see [page 68](#)).
- 2 Use the arrow keys to highlight a directory, and then press the **OK** key.
A list of files contained in the selected directory appears.
- 3 Use the arrow keys to highlight a file.
- 4 Press the **File** soft key, and then select **Delete**.
A window appears to verify that you want to delete the file. If you don't want to delete the file, press **Cancel**.
- 5 Press the **Ok** key to delete the selected file.

The file is deleted.

Renaming files

Using the File soft key, you can rename files. The following process describes how to rename files.

To rename a file

- 1 Access the File Management menu (see [page 68](#)).
- 2 Use the arrow keys to highlight a directory, and then press the **OK** key.

A list of files contained in the selected directory appears.

- 3 Use the arrow keys to highlight a file.
- 4 Press the **File** soft key, and then select **Rename**.
- 5 Enter the new name.
- 6 Press the **OK** key.

The file is renamed.

Viewing files

Using the Actions soft key, you can view saved files. The following process describes how to view files.

To view saved files

- 1 Access the File Management menu (see [page 68](#)).
- 2 Use the arrow keys to highlight a directory, and then press the **OK** key.

A list of files contained in the selected directory appears.



The file manager shows a letter “R” next to a text results file, a letter “C” next to a file indicates a capture file (a TDR trace or a message dump), and a small graph next to the bitmap of saved screen shots.

- 3 Use the arrow keys to highlight a file.
- 4 Press the **Actions** soft key, and then select **View**.

The contents of the file appear.

Printing files

To print files, you will need a battery-to-DB-9 female cable (part number 1217-50-0295) and a printer.

NOTE:

JDSU recommends using the JDSU PR-40B printer (part number CPR-40B). To do this you will need a null modem adapter (part number 15-018427).

The following procedure describes how to print files from the HST-3000

To print saved files

- 1 Connect a printer to the HST-3000:
 - a Using the battery-to-DB-9 female cable (part number 1217-50-0295), connect one end of the cable to the HST's RS-232 connector.

The RS-232 connector is located on the bottom panel of the base unit (see ["Using the bottom panel" on page 15](#)).
 - b Connect the other end of the cable to the null modem cable (part number 15-018427).
 - c Connect the null modem cable to the printer.
- 2 Access the File Management menu (see [page 68](#)).
- 3 Use the arrow keys to highlight a directory, and then press the **OK** key.
A list of files contained in the selected directory appears.
- 4 Use the arrow keys to highlight a file.
- 5 Press the **Actions** soft key, and then select **Print**.
The contents of the file are sent out the serial port.

Sorting files

Using the View soft key, you can change the viewing order of the files. The following process describes how to sort files.

To sort files

- 1 Access the File Management menu (see [page 68](#)).
- 2 Use the arrow keys to highlight a directory, and then press **OK**.
A list of files contained in the selected directory appears.

- 3 Press the **Sort** soft key.
- 4 Select the sort method:

| To sort by... | Press... |
|---------------|------------------|
| Name | the 1 key |
| Time | the 2 key |

The files are sorted.

Transferring files

There are several ways to transfer files.

- Copy from the HST internal drive to a USB drive (or vice versa).
- Send files over Bluetooth
- Transfer files using FTP.

Transferring files by copying Using the Actions soft key, you can copy files among the internal file system and the USB drive.

To transfer files by copying

- 1 Access the File Management menu (see [page 68](#)).
- 2 Use the arrow keys to find what you wish to copy.
You can copy the entire drive, a specific directory, or a single file.
- 3 Press the **Actions** soft key, and then select the appropriate copy action.

The actual menu item varies depending on what you are copying. For example, if you highlight the HST internal storage drive, the menu item will be **Copy drive contents to USB**; similarly, if you highlight a single file on the USB drive, the menu item will be **Copy to HST**.

The files are copied.

Transferring files over Bluetooth

If your unit is equipped with the Bluetooth Profiles option, you can send an individual file to another HST or PC that you are paired with. This may be useful for sharing configuration files among HST units.

To transfer files over Bluetooth

- 1 Verify you are paired with another HST or a PC (see [“Pairing the HST” on page 47](#)).
- 2 Access the File Management menu (see [page 68](#)).
- 3 Use the arrow keys to find the file you wish to transfer.
- 4 Press the **Actions** soft key, and then select **Send to Bluetooth**, and then choose which paired device to transfer the file to.

The file is sent.



CAUTION: LOSS OF DATA

If the file was sent to another HST, the file appears in the temporary folder “Bluetooth Inbox” (at the same level as the selection for “USB or HST memory”) which clears when the HST is shut down. Any files in this folder should be transferred to internal HST memory or USB flash to avoid loss of data.

Transferring files using FTP There are three ways you can use file transfer protocol (FTP) to obtain files from the HST:

- You can use the HST's internal FTP client to transfer files from the HST to an FTP server.
- You can use a PC or laptop, running an FTP client, to retrieve files from the HST.
- You can use a PC or laptop, running the file transfer utility, to retrieve files from the HST.

Each method of transferring files is described in the following sections.

Using the HST to transfer files Using the HST to transfer files to an FTP server involves the following tasks: using a straight cable to connect the HST to the same LAN as the PC or laptop; configuring outbound FTP settings; locating the file you want to transfer; and then transferring the file. Also, you should know the address, user name, and password for the FTP server. For information about configuring and running an FTP server on a PC or laptop, consult your IT support representative.

To transfer a file from the HST

- 1 Using a straight cable, connect the HST to the same LAN as the PC or laptop:
 - a Connect one end of the cable to the HST's Ethernet port located on the top panel of the unit. See [Figure 4 on page 14](#).
 - b Connect the other end to the network.
- 2 Access the FTP Settings menu:
 - a Press the **System** navigation key.

- b** Press the **INSTRUMENT** soft key.
The Instrument Setup menu appears.
 - c** Press the **4** key.
The FTP Settings menu appears.
 - 3** Press the **1** key, and then enter the address for the FTP server.
 - 4** Press the **OK** key.
 - 5** Press the **2** key, and then enter the user name for the FTP server. The default name is “anonymous.”
 - 6** Press the **OK** key.
 - 7** Press the **3** key, and then enter the password for the FTP server. The default password is “anonymous@jdsu.com.”
 - 8** Press the **OK** key.
 - 9** Press the **Cancel** key to exit the menu.
The Instrument Setup menu appears.
 - 10** Set the IP address mode for the HST to DHCP. See [page 77](#), [step 3](#) through [step 7](#).
 - 11** Press the **TOOLS** soft key, and then press the **1** key.
The File Manager menu appears.
 - 12** Select a folder, and then highlight the file you want to transfer.
 - 13** Press the **Actions** soft key, and then select **FTP Send**.
A confirmation message appears.
 - 14** Press **OK**.
The HST transfers the file to the location specified in [step 3](#).
- You have finished transferring the file.

Using a PC or laptop to transfer files Using a PC or laptop to retrieve files from the HST involves the following tasks: using a straight cable to connect the HST to the same LAN as the PC or laptop; assigning an IP address to the HST; and then using an FTP client to transfer files from the HST to the PC or laptop. The following sections describe these tasks.

Assigning an IP address to the HST-3000 You can use dynamic host configuration protocol (DHCP) to automatically set the IP address and other Ethernet settings on the HST.

To assign an IP address to the HST

- 1 Using a straight cable, connect the HST to the same LAN as the PC or laptop:
 - a Connect one end of the cable to the HST's Ethernet port located on the top panel of the unit. See [Figure 4 on page 14](#).
 - b Connect the other end to the network.
- 2 Access the Instrument Setup menu:
 - a Press the **System** navigation key.
 - b Press the **INSTRUMENT** soft key.
The Instrument Setup menu appears.
- 3 Press the **2** key.
- 4 Press the **ETHERNET** soft key.
The Ethernet Settings menu appears.

- 5 Locate the first item on the Ethernet Settings menu. This item indicates the state of the Ethernet port:
 - If the Ethernet port is “Available”, Proceed to [step 6](#).
 - If the Ethernet port is “In use by test application” or “In Use by Remote Control”, you must exit the test application or disable remote control before you can continue. To exit the application, press the **Home** navigation key, and then exit the current application. To disable remote control, see [page 40](#).
- 6 Select **IP Mode**, and then select **DHCP**.

The HST automatically configures the IP address and other Ethernet settings. Remember the IP address. You will need it when you transfer files.
- 7 Press the **Cancel** key to exit the Ethernet Settings menu.

You have set the IP address for the HST.

Transferring files using FTP After you have assigned an IP address to the HST, you can begin transferring files.

To transfer files using FTP

- 1 On the PC or laptop, launch a DOS prompt.
- 2 At the command line, type `cd`, and then the name of the directory where you want to save files from the HST.

For example, type `cd temp` to change to the temp directory.
- 3 Type the command, `ftp`, and then the IP address you assigned to the HST.

For example, type `ftp 10.10.123.45` where `10.10.123.45` is the IP address for the HST.

A user name prompt appears.
- 4 In lowercase letters type `acterna`, and then press **Enter**.

A password prompt appears.

- 5 In lowercase letters, type `acterna`, and then press **Enter**.

The FTP utility opens a connection to the HST.

- 6 To view a list of directories and files on the HST, type the command, `ls`, and then press **Enter**.

A list of the directories and files appears.

- 7 To view the contents of a directory, type the command, `cd`, and then the name of a directory on the HST.

For example, type `cd results` where `results` is the name of a directory on the HST.

- 8 To transfer a file, type the command, `get`, and then the file name.

For example, type `get results1.txt` where `results1.txt` is the file name.

The FTP utility transfers the file to your PC or laptop to the directory indicated in step 3.

- 9 To end the FTP session, type `quit`, and then press **Enter**.

The utility closes the FTP session.

You have completed the FTP procedure.

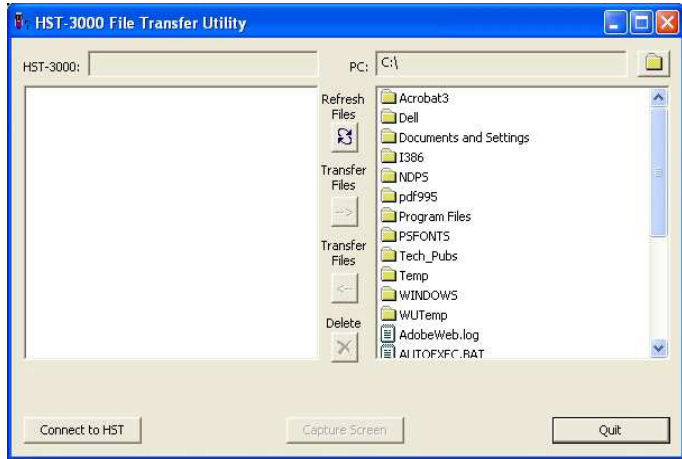
Using a PC or laptop and the file transfer utility

The file transfer utility, found on the User's Guide CD, can be used to retrieve files from the HST.

To transfer files using the transfer utility

- 1 Connect the HST to your PC's serial port using the tester to serial (DB9) cable.
- 2 Run the HST-3000 File Transfer Utility on your PC.




3 Click **Connect to HST** on the bottom left.



A dialogue appears for selection of a COM port. Typically, COM1 is used, but if you know that your serial port uses a different COM, or if using COM1 does not work, use COM2, COM3, or COM4.



After the HST is connected, the left side shows the folders and files on the HST, and the right side shows the folders and files on your PC.

4 Navigate to the folder on your PC where you want to save the file.

| To do this... | Click... |
|---------------------|---|
| select a drive |  |
| go "up" a directory |  |
| open a folder |  or double click on its name |

5 Find the file you would like to transfer on the HST.

6 To transfer the file, do one of the following:

| To do this... | Click... |
|---|---|
| transfer the file from the HST to your PC |  |
| transfer files from your PC to the HST |  |

The program verifies that the transfer was a success.

7 To delete files from the HST or the PC, highlight the file then click the “X” icon.

This cannot be undone.

You have completed the file transfer.

Ethernet TE testing

6

This chapter contains information about testing in Ethernet TE mode. Topics discussed in this chapter include the following:

- “About Ethernet TE mode” on page 84
- “Selecting Ethernet TE mode” on page 84
- “Specifying test settings” on page 85
- “Connecting to the line” on page 96
- “Authenticating on a secured network” on page 96
- “Testing the line quality” on page 98
- “Ping testing” on page 99
- “Tracing the packet route” on page 100
- “Releasing IP addresses” on page 100
- “Throughput testing” on page 101
- “VLAN scan testing” on page 102
- “Measuring throughput using JDSU QoS” on page 102
- “Interpreting test results” on page 106

About Ethernet TE mode

In Ethernet TE mode, you can use the HST-3000 to emulate Ethernet terminal equipment by connecting to an Ethernet LAN or to the Ethernet port on the customer's modem. After connecting to the circuit, you can then use trace route, FTP, the web browser, or IP Ping to test for connectivity.

You can also ping through the modem to a network switch or web address to test for connectivity.

The Ethernet TE test involves the following steps:

- Selecting Ethernet TE mode
- Specifying test settings
- Connecting to the line
- Performing the tests

Selecting Ethernet TE mode

The first step for the test is to select Ethernet terminal equipment (TE) mode.

To select Ethernet TE mode

- 1** Press the **Home** navigation key.
- 2** Press the **ETHERNET** soft key.
- 3** Select **Ethernet TE**.

The Ethernet TE Summary appears.

Specifying test settings

Before you begin testing, make sure the test settings on the HST-3000 match the settings of the line that you are testing.

Specifying data settings The following procedure describes how to specify the data settings.



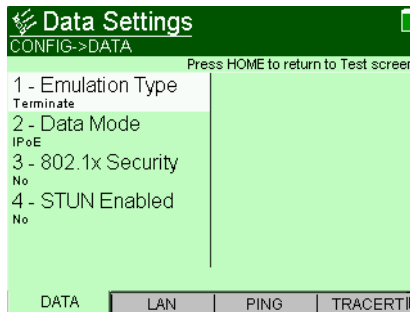
CAUTION: FAULTY RESULTS

Changing these settings during a test may cause errors in the test. Only change them before you begin a test.

To specify the data settings

- 1 Press the **Configure** navigation key.
- 2 Press the **Data** soft key.

The Data Settings menu appears.



- 3 Press the **2** key, and then select the Data Mode:
 - **IPoE** (IP over Ethernet)
 - **PPPoE** (PPP over Ethernet)
 - **Multi-VLAN** - Multiple Virtual LANs are used on this network. In this mode, the HST assumes that the networks that are accessed via each VLAN are unique, and thus provides access to a different range

of IP addresses. A typical scenario would be one VLAN for Internet data, another VLAN for Voice, and another VLAN for Video.

- 4** If you are testing in IPoE data mode, select **802.1x Security**, and then specify whether 802.1x authentication is supported on your network.

This setting is only applicable if you are using IPoE data mode.

- 5** If you are testing in IPoE data mode, select **STUN Enabled**, and then specify whether STUN is enabled.

This setting is only applicable if you are using IPoE data mode.

- 6** If you are testing in Multi-VLAN data mode, select **Interface Count**, and then enter the number of VLANs, between 1 and 3.

Additional setup items appear for each VLAN: Interface Mode and Interface Purpose.

- 7** If you are testing in Multi-VLAN data mode, select **Interface x Mode**, and then specify the data mode for that sub-interface (IPoE or PPPoE).

- 8** If you are testing in Multi-VLAN data mode, select **Interface x Purpose**, and then specify the purpose for that sub-interface (Internet, Video, or Voice).

- 9** Repeat steps **7** and **8** for any remaining interfaces.

The data settings are specified.

Specifying 802.1x security settings

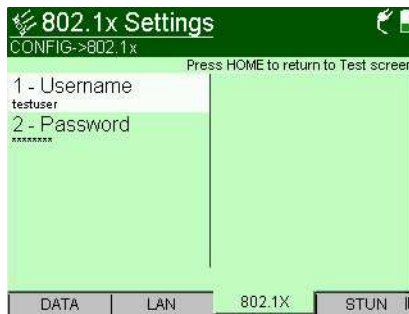
The 802.1x Settings menu appears only if you are using the IPoE data mode and “802.1x Security” is set to “Yes” on the Data Settings menu.

The 802.1x Settings are used to access a secured network. The following procedure describes how to specify the 802.1x settings.

To specify 802.1x settings

- 1 Press the **802.1X** soft key. You may need to scroll left or right to find it.

The 802.1x Settings screen appears.



- 2 Press **2** then enter the User Name.
- 3 Press **3** then enter the Password.

The 802.1x settings are specified.

Specifying STUN settings

This screen is only available if you are using IPoE data mode and “STUN Enabled” is set to “Yes” on the Data Settings menu.

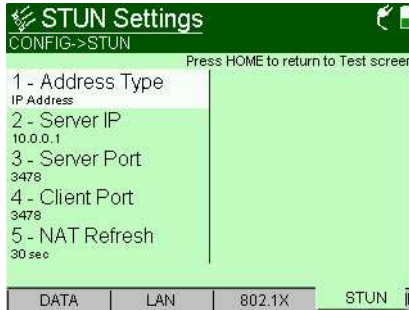
STUN (Simple Transversal of UDP [User Datagram Protocol] Through NATs [Network Address Translators]) allows VoIP calls across a NAT router. These settings should only be changed if necessary.

The following procedure describes how to specify the STUN settings.

To specify the STUN settings

- 1 Press the **STUN** soft key.

The STUN Settings menu appears.



- 2 Select **Address Type**, and then specify whether an **IP Address** or **DNS Name** is used.
- 3 If you selected IP Address in [step 2](#), select **Server IP**, and then enter the IP address of the STUN server.
If you selected DNS Name in [step 2](#), select **Server Name**, and then enter DNS name of the STUN server.
- 4 Select **Server Port**, and then enter the port number for the STUN server.
- 5 Select **Client Port** and then enter the client port number.
- 6 Select **NAT Refresh** and then specify the NAT refresh rate. This is the number of seconds between messages to the STUN server to keep the NAT mapping alive.

The STUN settings are specified.

NOTE:

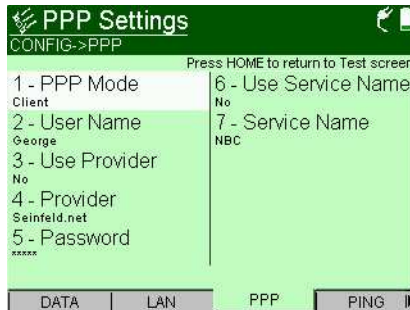
If STUN is enabled, the data layer will not come up until the STUN client on the HST has determined the type of NAT used between the HST and the STUN server.

Specifying PPP settings The following procedure describes how to specify the point-to-point protocol (PPP) settings. If you are using Multi VLAN data mode, you may have more than one PPP screen (for example, PPP2, PPP3).

To specify the PPP settings

- 1 Press the **PPP** soft key.

The PPP Settings menu appears.



- 2 Select **PPP Mode**, and then select either **Client** or **Server**.

Client is normally used. Use Server only when you have a VTU-C. This feature allows a remote VTU-R to establish a PPP session with the HST-3000.

NOTE:

If you selected “Server” as the PPP mode, connect only to other devices with the same service name.

If you are using the Multi VLAN data mode, this selection is found only on the PPP1 Settings page.

- 3 Select **User Name**, and then enter a valid user name.

This must be a valid user account with an ISP.

- 4** Select **Use Provider**, and then select either **Yes** or **No**.
This option indicates whether to append the user name with the service provider domain name (for example, earthlink.net). Select Yes only if user names for the ISP must include the domain name as part of the user name. This setting automatically appends the @ sign for you.
- 5** Select **Provider**, and then enter the provider name.
This is required if you selected Yes for “Use Provider.”
- 6** Select **Password**, and then enter the user password.
This must be a valid password that matches the user name above. Passwords are often case-sensitive.
- 7** Select **Use Service Name**.
- 8** If you selected “Yes” for Use Service Name, enter the **Service Name**.

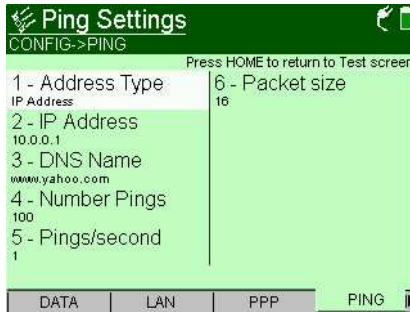
The PPP settings are specified.

Specifying ping settings The following procedure describes how to specify the ping settings.

To specify the ping settings

- 1** Press the **Configure** navigation key.
The parameter soft keys appear.
- 2** Press the **PING** soft key.

The Ping Settings menu appears.



- 3 Press the **1** key, and then set the address type to either **IP address** or **DNS Name** (domain name server name). IP address uses the numeric address. DNS name uses the domain name, such as `www.jdsu.com`. JDSU recommends using the IP address or DNS name of the ISP gateway of the customer's service provider.
- 4 Select one of the following options:
 - If you selected IP address in [step 3](#), press the **2** key, and then enter the IP address. Press **OK**.
 - If you selected DNS name in [step 3](#), press the **3** key, and then enter the DNS name.
- 5 Press the **4** key, and then enter the number of pings to send before stopping.
- 6 Press **OK** to accept the change.
- 7 Press the **5** key, and then specify the number of pings per second.
- 8 Press the **6** key, and then enter the packet size. The default is 16. Change this only if needed.
- 9 Press **OK** to accept the changes.

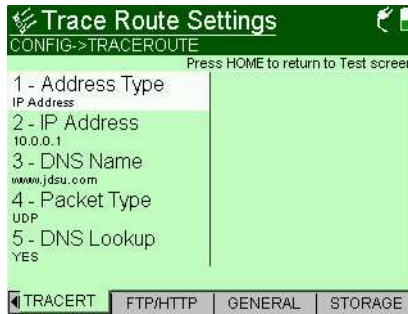
The ping settings are specified.

Specifying trace route settings The following procedure describes how to specify the trace route settings.

To specify the trace route settings

- 1 Press the **TRACERT** soft key.

The Trace Route Settings menu appears.



- 2 Press **1** key, and then specify the address type, either **IP address** or **DNS Name** (domain name server name).
- 3 Press the **2** key, and then enter the IP address.
- 4 Press the **3** key, and then enter the DNS name.
- 5 Press the **4** key, and then set the packet type to one of the following:
 - **ICMP** (Internet Control Message Protocol)
 - **UDP** (User Datagram Packet)
- 6 Press the **5** key, and then indicate whether you want to lookup names for hops.

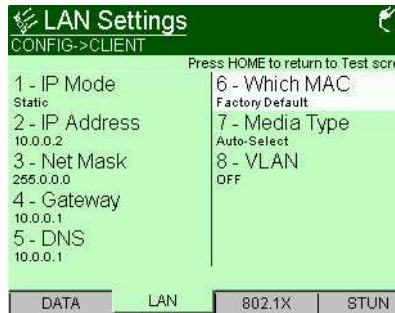
The trace route settings are specified.

Specifying LAN settings The following procedure describes how to specify the LAN settings.

To specify the LAN settings

- 1 Press the **LAN** soft key.

The LAN Settings menu appears.



The menu items vary depending on the Data mode.

NOTE:

If you selected PPPoA or Bridged Ethernet as the Data mode, the WAN settings are not applicable, and thus the WAN tab is not displayed.

- 2 If you are using IPoE or IPoA data mode, select **IP Mode**, then select either **Static** or **DHCP** (dynamic host configuration protocol).

If you selected DHCP, do the following.

- a Select **Use Vendor ID** and specify whether the vendor ID is used.

If you selected Yes, enter the **Vendor ID**.

- b Go to [step 3](#).

If you selected Static, do the following.

- a Select **IP Address**, then enter the IP address.

- b Select **Net Mask**, then enter the net mask address.

- c Select **Gateway**, then enter the gateway address.
 - d Select **DNS**, then enter the address of the DNS server.
If you are using IPoA data mode, proceed to [step 4](#).
 - 3 If you are using PPPoE or IPoE data mode, do the following.
 - a Select **Which MAC**, then specify either **User Defined** or **Factory Default**.
 - b If the Which MAC parameter is set to User Defined, enter the appropriate address.
 - c Select **VLAN**, then set it to **On** or **Off**.
The Virtual LAN (VLAN) setting is only necessary if a VLAN is used to segregate video data flows from other data flows.
If VLAN is on, specify the **VLAN ID** and **VLAN Priority**.
 - 4 Press the **Home** navigation key to return to the Data Summary screen.

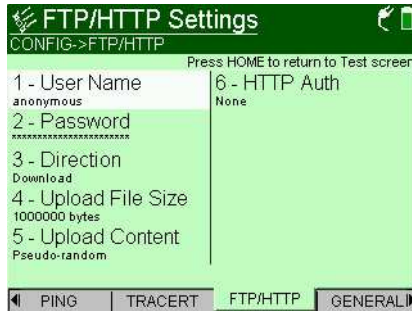
The LAN settings are specified.

Specifying FTP/ HTTP settings The following procedure describes how to specify FTP/HTTP (throughput) settings.

To specify throughput settings

- 1 Press the **FTP/HTTP** soft key.

The FTP/HTTP Settings menu appears.



- 2 Press the **1** key, and then enter a user name. Use the up and down arrows to indicate a letter or number, or use the keyboard keys.
- 3 Press the **2** key, and then enter a password. Use the up and down arrows to indicate a letter or number, or use the keyboard keys.
- 4 Press the **3** key, and then indicate whether you want to download or upload.
- 5 Press the **4** key, and then indicate the upload file size.
- 6 Press the **5** key, and then specify the upload content, either **Pseudo-random** or **Fixed Pattern - AA55**.
- 7 Press the **6** key, and then select an HTTP Authentication configuration.
 - None – no user name/password authentication needed
 - Basic – the client sends the user name and password entered, with no security
 - Digest – the client sends the user name and password in a series of hashes for added security.

The FTP/HTTP (throughput) settings are specified.

Specifying general settings The following procedure describes how to specify the general settings.

To specify the general settings

- 1 Press the **GENERAL** soft key.
The General Settings menu appears.
- 2 Select **Event Log Size** and then specify the size of the event log.

The general settings are specified.

Connecting to the line

After specifying the test settings, you can connect to the line.

To connect to the line

- 1 Connect one end of an Ethernet cable to the Ethernet jack on the top of the unit.
- 2 Connect the other end of the cable to an Ethernet jack. If connecting to a PC, use a cross-over cable.

Ethernet TE testing

After connecting to the circuit, you can then use trace route, FTP, the web browser, or IP Ping to test for connectivity.

Authenticating on a secured network IEEE 802.1x offers a framework for authenticating and controlling user traffic on a protected (secured) wireless network. Authentication involves a supplicant (a client device) attempting to connect with an authenticator (the 802.11 access point), using a certificate. The access point (authenticator) blocks all other traffic until it can verify the client's iden-

tity. After authenticated, the access point opens the client's port for other types of traffic, and the user can log into the network. For this authentication, the HST acts as a supplicant.

The process involves two main steps:

- downloading a certificate
- logging in to the secured network

To authenticate on a secured network

- 1 Press the **System** navigation key, and then press the **INSTRUMENT** soft key.
- 2 Select **Certificate Settings**.
- 3 Select **Cert FTP Addr**, and then enter the FTP address for retrieving a certificate.
- 4 Specify the **User Name** and **Password**.
- 5 Press the **Start** soft key.
The HST downloads a certificate (using FTP).
- 6 Press the **Configure** navigation key, and then press the **DATA** soft key.
- 7 Verify that you are using IPoE **Data Mode**, and then enable **802.1x Security**.
- 8 Press the **802.1X** soft key, and then specify the user name and password.
- 9 Press the **Home** navigation key.

On the main screen, a lock icon indicates whether you are authenticated (indicated by a secured/closed lock) or unauthenticated (an open lock).

Testing the line quality After connected to the line, the HST-3000 gathers statistics for the line. These statistics are used to determine the line quality.

To test line quality

- 1 Connect to the line.

The HST-3000 begins gathering statistics.

| Ethernet TE Ethernet | |
|-----------------------------|-----------------------|
| HOME->ETHERNET->ETHERNET TE | |
| Rx Bytes | 1749 |
| Rx Frames | 8 |
| Rx Errors | 0 |
| Rx Dropped | 0 |
| Tx Bytes | 248 |
| Tx Frames | 2 |
| Tx Errors | 0 |
| Tx Dropped | 0 |
| Tx Collisions | 0 |
| Link Status | Link Up/Full/100 Mbps |
| Display ▲ | Actions ▲ |
| Results ▲ | |

NOTE:

The statistics menu that appears on your unit depends on the last menu viewed. Ethernet statistics is the default.

- 2 Press the **Display** soft key to view different result categories.

NOTE:

You can also use the left or right arrow keys to move to different result categories.

- 3 Press the **Results** soft key to clear or save the results.

Ping testing The following procedure describes how to perform a ping test. The ping test sends a ping packet through the modem to an IP address or DNS name (could be a network switch or web address) to test for connectivity.

NOTE:

You can also check connectivity using the web browser. See “Web browser” in the base manual for more information.

To perform a ping test

- 1 Press the **Display** soft key.
- 2 Press the **1** key to view the ping results.
- 3 Press the **Actions** soft key.
- 4 Select a ping method.

| To select... | Press... |
|---|------------------|
| Start Ping (consecutively sends multiple pings to the network, up to the number of pings configured) | the 1 key |
| Ping Once (sends a single ping to the network) | the 2 key |

Results are updated on the screen.

- 5 Press the **Results** soft key to clear or save the results. See “[Interpreting test results](#)” on page 106 to learn what your results mean.

The ping test is complete.

Tracing the packet route Using the trace route feature, you can trace the IP packet path through the network. The following procedure describes how to trace the packet route.

To trace the packet route

- 1 Press the **2** key to select Ethernet/IP TE mode.
- 2 Press the **Display** soft key.
- 3 Press the **4** key to move to the trace route menu.
- 4 Press the **Start** soft key.
The path hops appear on the screen.
- 5 Press the **Results** soft key to clear or save the results.
The packet route is traced.

Releasing IP addresses The HST allows you to release allocated IP addresses, so it can be used by other equipment. The IP release feature is available when the data mode is set to one of the following data modes:

- IP over Ethernet (IPoE)
- PPP over Ethernet (PPPoE)

For instructions on setting the data mode, see [“Specifying data settings” on page 85](#).

The following procedure describes how to release an IP address.

To release an IP address

- 1 Press the **Home** navigation key.
- 2 Connect the HST to the line. See [“Connecting to the line” on page 96](#).
- 3 Press the **Display** soft key.

- 4 Press the **4** key to select IP Results.

The IP results window appears.

- 5 Press the **Actions** soft key.

- 6 Select either **Log-Off** or **IP-Release**.

The Log-Off or IP-Release options are only available when you view the IP results window.

The IP address is now available for use in other applications.

Throughput testing Using the FTP/HTTP throughput feature, you can perform a file transfer to test the throughput of the circuit.

To test throughput

- 1 Specify the FTP/HTTP settings (see [“Specifying FTP/HTTP settings” on page 94](#)).
- 2 Navigate to the FTP/HTTP results screen.
- 3 Press the **Actions** soft key.
- 4 Select **FTP/HTTP** and then **Enter Address**.
- 5 Enter the address using the keypad, including the prefix (`ftp:` or `http:` or, if applicable, `https:`) and the filename.
For example, `ftp://10.0.0.1/name`
- 6 Press **OK** to begin the file transfer.

The throughput results appear on the screen.

See [“FTP/HTTP results” on page 112](#) for information on interpreting the results.

VLAN scan testing The VLAN scan test scans the current interface for VLAN activity.

To run a VLAN scan test

- 1 Press **Home** to return to the results screens.
- 2 Select the **Display** soft key, and then select **VLAN Scan Results**.
- 3 Press the **Actions** soft key.
- 4 Select **Start VLAN Scan**.
The VLAN Scan results appear on the screen.
See “[VLAN Scan results](#)” on page 109 for information on interpreting the results.
- 5 Press the **Actions** soft key.
- 6 Select **Stop VLAN Scan**.

Measuring throughput using JDSU QoS

JDSU QoS (also called *lperf*) is a method of qualifying copper lines to verify the throughput supported for the copper wire for voice and video traffic. This is a network testing tool that can create TCP and UDP data streams and measure the throughput of the network carrying them. It allows the user to set various parameters in order to tune the test for the service that they are investigating. For example, to test video the user shall be able to set the transmission type to UDP and set the packet size to 1400 or whatever is appropriate for their network. The test statistics help determine if the service being deployed can be supported on the network. This test operates over a PPPoA, PPPoE or I PoE connection, using the Ethernet TE, ADSL, or VDSL link.

JDSU QoS is an optional feature. The setup and test items described below will appear only if your unit is equipped with the option.

Step 1: specifying test settings There are three setup pages for JDSU QoS: Test Settings, Server Settings, and QoS Threshold Settings. Before using JDSU QoS to measure throughput, all settings must be specified.

To specify test settings

- 1 If you haven't already done so, launch the Ethernet TE application.
- 2 Press the **Configure** navigation key.
- 3 Press the **QOS TEST** soft key and then specify the test settings. You may have to scroll right or left to find the soft key.

| Setting | Description |
|-------------------|---|
| Test Type | Specify whether the test will Download, Upload, or both. |
| Test Port | Specify the port used for the QoS test. |
| Protocol | Specify whether UDP or TCP protocol is used for the test. |
| Test Duration | Specify the test duration in number of seconds, between 5 and 300 seconds (5 minutes). |
| IP TOS Field | Specify the Type of Service (TOS) byte. This is a whole number between 0 and 255. |
| Upload Rate/Size | If the Protocol is set to UDP and the Test Type is Upload (or Download/Upload), this specifies the upload rate in kbps and the packet size (size of the payload). |
| Upload Pkt Size | If the Protocol is set to TCP and the Test Type is Upload (or Download/Upload), this specifies the size of the packet that is received. |
| Dnload Rate/Size | If the Protocol is set to UDP and the Test Type is Download (or Download/Upload), this specifies the download rate in kbps and the packet size (size of the payload). |
| Download Pkt Size | If the Protocol is set to TCP and the Test Type is Download (or Download/Upload), this specifies the size of the packet that is received. |

4 Press the **QOS SRVR** soft key, and then specify the server settings.

| Setting | Description |
|-----------------|--|
| Address Type | Specify whether the server address uses an IP address or DNS name. |
| Server IP | If the Address Type is IP Address, specify the IP address for the QoS server. |
| Server Name | If the Address Type is DNS Name, specify the DNS name for the QoS server. |
| Management Port | Specify the port number used for management messages. |
| Username | Specify the test duration in number of seconds, between 5 and 300 seconds (5 minutes). |
| Password | Specify the Type of Service (TOS) byte. This is a whole number between 0 and 255. |

5 Press the **QOS THLD** soft key, and then specify the threshold settings.

| Setting | Description |
|----------------|---|
| Delay | Specify the maximum allowed delay to the server, in milliseconds. |
| Upload Rate | Specify the threshold for the upload rate to the server when running a TCP upload test. |
| Upload Loss | Specify the threshold for the loss ratio for a UDP upload test to the server. |
| Upload Jitter | Specify the threshold for the jitter for a UDP upload test to the server. |
| Download Rate | Specify the threshold for the download rate from the server when running a TCP download test. |

| Setting | Description |
|-----------------|---|
| Download Loss | Specify the threshold for the loss ratio for a UDP download test from the server. |
| Download Jitter | Specify the threshold for the jitter for a UDP download test from the server. |

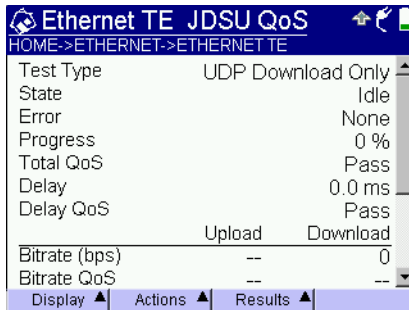
You have specified the settings.

Step 2: measuring throughput After specifying settings and connecting to the circuit, use the JDSU QoS results to measure throughput.

To measure throughput

- 1 If you haven't already done so, connect the HST-3000 to the circuit under test.
- 2 Press the **Display** soft key and then select **JDSU QoS Results**.

The JDSU QoS result screen appears.



- 3 Press the **Start** soft key.

The test begins running and statistics begin counting.

- 4 After the test completes, observe the results.

See “[JDSU QoS results](#)” on page 112 for information on interpreting the results. To clear or save the results, use the **Results** soft key.

- 5 To clear or save the results, use the **Results** soft key.
You have measured throughput using JDSU QoS.

Interpreting test results

This section describes the test results that are gathered when running a test. You can view different result categories by pressing the **DISPLAY** soft key and then selecting the desired results.

Ethernet Summary results This category provides statistics on Ethernet frames when the HST-3000's 10/100BT Ethernet interface is used in TE mode. [Table 9](#) describes the Ethernet Summary results.

Table 9 Ethernet Summary results

| Result | Definition |
|------------|-------------------------|
| RX Bytes | Total bytes received |
| RX Errors | Total errors received |
| RX Dropped | Total dropped frames |
| TX Bytes | Total bytes transmitted |
| TX Errors | Total errors received |
| TX Dropped | Total dropped frames |

STUN results [Table 10](#) describes the STUN results.

Table 10 Summary results

| Result | Definition |
|--|---|
| Server IP 1 and 2 Server Port 1 and 2 | The IP addresses and ports of the STUN server (typically on a single STUN server) |

Table 10 Summary results (Continued)

| Result | Definition |
|-----------------------------------|--|
| Client IP address and Client Port | the STUN Client's IP address and Port on the private side of the NAT |
| Public IP address and Public Port | the STUN Client's IP address and port on the public side of the NAT. |
| State | State of the STUN connection: <ul style="list-style-type: none"> - UDP Blocked - Open Internet - Symmetric Firewall - Full Cone NAT - Restricted Cone NAT - Restricted Port NAT - Symmetric NAT |

Ping results Think of ping (packet internet groper) as sonar on a network. The HST-3000 sends out IP packets (Internet Control Messaging Protocol [ICMP] "echo" requests) to which the destination (target) automatically responds. Ping tells you if the destination is alive and awake, how fast the ping went to the destination and back to the HST-3000, and if ping packets were dropped and lost along the way. [Table 11](#) describes the ping results.

Table 11 Ping results

| Result | Definition |
|-------------|---|
| Destination | Network address (IP address or URL) to which the echo messages (that is, ping messages) will be sent. This should be within the provider network, but can also prove connectivity to the ISP (for example, www.earthlink.net) or to the internet. |
| Echos sent | The number of ping messages sent. |

Table 11 Ping results (Continued)

| Result | Definition |
|----------------|--|
| Echos returned | The number of echo reply messages returned to the HST-3000 from the destination. |
| Lost/Lost% | The number of pings that did not return to the HST-3000. This could be caused by an unresponsive target (destination) or by heavy congestion on the network; the more packets lost the more congested the network, indicating slow or poor throughput. |
| Echos received | The number of ping messages sent to the HST-3000 from other devices on the network. |
| Delay Current | The time in milliseconds that it took the last transmitted ping to reach the destination and receive a reply back to the HST-3000. This varies depending on the network and the traffic load on the network, but in general, pings taking longer than 500ms should be noted, and if persistent over several days, reported to network support engineers. |
| Delay Ave | Delay average. The average time in milliseconds it has taken all transmitted pings to reach their destinations and receive replies back to the HST-3000. |
| Delay Max | The longest time in milliseconds it has taken any one transmitted ping to reach its destination and receive a reply back to the HST-3000. |
| Delay Min | Delay minimum. The shortest time in milliseconds it has taken any one transmitted ping to reach its destination and receive a reply back to the HST-3000. |
| Message | Any ICMP error and delay messages about the pings |

VLAN Scan results This lists any active VLANs (up to 16) on the current interface, displayed by VLAN ID and priority.

Trace route results [Table 12](#) describes the trace route results.

Table 12 Trace route results

| Result | Definition |
|----------------|---|
| Destination | Network address (IP address or URL) to which the echo messages will be sent |
| State | Current state of the trace |
| Active | Whether there is a trace route currently active |
| Number of hops | The number of points crossed from the source to the destination |

IP results [Table 13](#) describes the IP results.

Table 13 IP results

| Result | Definition |
|----------------|--|
| WAN IP Address | The HST-3000's IP address to the access or provider network. NOTE: If using Multi VLAN data mode, this result will be the address for the specific VLAN (for example, WAN2 IP Address). |
| WAN Net Mask | The HST-3000's netmask address. IP devices use a netmask IP address to determine if IP packets are to be routed to other networks or sub-networks. NOTE: If using Multi VLAN data mode, this result will display the netmask for each VLAN (for example, WAN2 Net Mask and WAN3 Net Mask). |

Table 13 IP results (Continued)

| Result | Definition |
|---------------|---|
| Gateway | The HST-3000's gateway address. When an IP device has determined that a packet is not addressed to it or devices on the same sub-network (subnet), it sends all such packets to the gateway address for further routing to the correct address. |
| DNS | Domain Name Services. When using internet addresses such as www.jdsu.com, the HST-3000 (and all IP devices) must translate to an IP address (such as 157.234.12.20) in order to route the packets or data. To do so, it first requests a DNS server to translate an internet address into an IP address; then the HST-3000 can correctly route IP pings or other data. The DNS address must be that of a real DNS server, preferably in the provider network. |
| MAC address | Medium access control address. The physical address of the device on the medium. An example of a MAC address is the 48 bit address of a device on the Ethernet. |
| State | Status of the IP connection. (Inactive, Active, Network Up, and so on.) If in Multi VLAN data mode, this result is based on the WAN x State results. If any interface is in a failure mode, "Test Failed" is displayed. If any interface is in negotiation mode, "Test Active" is displayed. If all of the interfaces indicate Network Up, "Network Up" is displayed. |
| LAN x State | The status of each VLAN. Only appears when using Multi VLAN data mode. |

Ethernet results The Ethernet category provides statistics on Ethernet frames when the HST-3000's 10/100BT Ethernet interface is used in TE or ADSL through-modes. [Table 14](#) describes the Ethernet results.

Table 14 Ethernet results

| Result | Definition |
|-------------------|--|
| RX Bytes | Total bytes received |
| RX Frames | Total frames received |
| RX Errors | Total errors received |
| RX Dropped Frames | Total dropped frames |
| TX Bytes | Total bytes transmitted |
| TX Frames | Total frames received |
| TX Errors | Total errors received |
| TX Dropped Frames | Total dropped frames |
| TX collisions | Ethernet frames are transmitted "space-available" when there is a break on the signal on the cable; sometimes frames are transmitted at the same time as another transmitter, causing a "collision" of frames. |
| Link Status | Status of the connection. |

Event log This category provides a running log of significant events and errors.

FTP/HTTP results Table 15 describes the FTP/HTTP results.

Table 15 FTP/HTTP results

| Result | Description |
|------------------|--|
| Transfer Count | The number of bytes transferred. |
| Upload Rate | The speed that the file was uploaded. |
| Download Rate | The speed that the file was downloaded. |
| Total Time | The total time it took for the entire transfer, from beginning to end. |
| Pretransfer Time | The number of seconds of processing elapsed before the transfer began. |
| Name Lookup Time | The number of seconds it took to lookup the name. |
| Start Time | The time that the transfer began. |
| Redirect count | The number of times the client was redirected. |
| Message | Status message. |

JDSU QoS results Table 16 describes the JDSU QoS results.

Table 16 JDSU QoS results

| Result | Description |
|-----------|---|
| Test Type | Describes the type of test, for example, UDP Download Only, or TCP Upload/Download. |

Table 16 JDSU QoS results (Continued)

| Result | Description |
|---------------|---|
| State | <p>Reports the current test state:</p> <ul style="list-style-type: none"> – Disabled — test cannot be run because the network is down. – Idle — not currently running. – Initializing — in the process of connecting to the server and setting up the test. – Upload active — running an upload test (from the HST to the server). – Download active — running a download test (from the server to the HST). – Delay active — running a delay measurement. – Stopping — displays only when stopped by the user. – Error — the test has encountered an error and is unable to complete the test. |
| Error | If the test encounters an error, the error code is reported. |
| Progress | Reports the percent complete. |
| Total QoS | Reports Pass/Fail for the entire test. |
| Delay | Reports the delay. |
| Delay QoS | Reports Pass/Fail for the Delay test. |
| Bitrate (bps) | The bitrate of packets received (download) or transmitted (upload) if running a TCP test. For a UDP test, displays dashes. |
| Bitrate QoS | Reports Pass/Fail for the Bitrate test. |
| Packets | The number of packets received (download) or transmitted (upload). |
| Packets Lost | The number of packets lost. |
| Loss Ratio | Ratio of the number of lost packets to the total number of packets, if running a UDP test. For a TCP test, displays dashes. |

Table 16 JDSU QoS results (Continued)

| Result | Description |
|---------------|--|
| Loss QoS | Reports Pass/Fail for the Loss test. |
| Jitter (ms) | Reports the jitter if running a UDP test. For a TCP test, displays dashes. |
| Jitter QoS | Reports the jitter QoS. |

802.11 Wireless Testing

7

This chapter provides task-based instructions for using the optional 802.11 wireless testing features. Topics discussed in this chapter include the following:

- [“About 802.11 testing” on page 116](#)
- [“Wireless testing” on page 117](#)

About 802.11 testing

In 802.11 mode, you can use the HST-3000 to emulate a wireless PC or laptop and connect to a wireless network. After connecting to the network, you can then use the data tests as well as the VoIP and Video features.



IMPORTANT!

To use the wireless features, you must have an external 802.11 adapter (“dongle”).



IMPORTANT!

When using the 802.11 adapter with some older black and white display HST-3000s, the 802.11 functionality will not extend to VoIP, IPTV/Video, or FTP/HTTP file transfer testing.

Whereas all HST-3000s with color displays support full 802.11 functionality, not all HST-3000s with black and white screens will be subject to 802.11 feature restrictions. To determine if your HST-3000 will support full 802.11 functionality, view the unit revisions screen (System > Options/Revs/ Copyright > Revisions).

If the part number HST-000-699-xx Rev xxx is listed under the Unit Revisions screen, then your unit will support full 802.11 test capability. If the part number HST-000-139-xx Rev xxx is listed, then the limitations described above apply.

To select 802.11 mode

- 1 Press the **Home** navigation key.
- 2 Press the **802.11** soft key.

The 802.11 Measurements menu appears.



3 Select 802.11 Station.

The 802.11 Station Summary appears.

NOTE:

The 802.11 wireless feature is an option. If the 802.11 tab does not appear, even after plugging in the wireless adapter, your unit may not be equipped with the option. To verify your options, see [“Viewing unit options, revisions, and HST ID” on page 182.](#)

Wireless testing

The wireless test involves the following steps:

- Specifying test settings
- Joining a network
- Performing tests
- Viewing results

To run a wireless test

- 1 To specify test settings, do the following:
 - a From the 802.11 Station Summary menu, press the **Configure** navigation key.

The 802.11 Settings menu appears.

b Specify the 802.11 settings.

The following table describes the settings.

| Setting | Description |
|---------------------|--|
| SSID | Press the OK key to scan for service set identifiers (SSIDs) in the area. If found, select the desired network to connect to. To enter a custom SSID, press the Custom soft key and use the keypad to enter the SSID name. |
| Encryption Type | Select the type of encryption. None, WEP40, WEP104, WPA/WPA2 (Auto), WPA1 Only, WPA2 Only WPA/WPA2 (Auto) will cause the unit to use WPA2 if available and then fall back to WPA |
| WPA1/2 PSK | Enter the pre-shared key (PSK) to use for WPA or WPA2. |
| WEP40 or WEP104 Key | Enter the static WEP key to use. |

- 2** Press the **GENERAL** soft key, and then specify the Event Log Size on the General Settings menu.
- 3** Press the Home navigation key to return to the 802.11 Summary screen.
The HST-3000 will scan for the SSID that you specified, and attempt to connect to it.
- 4** To view another result category, do one of the following:
 - a** Press the right or left arrow to cycle through the menus.
 - b** Press the **Display** soft key, and then select a category.

- 5 After successfully connecting to the wireless network, run your test.

For Data tests, see [“Ping testing” on page 99](#), [“Tracing the packet route” on page 100](#), [“Throughput testing” on page 101](#), and other tests in [Chapter 6 “Ethernet TE testing”](#).

To use the Browser, see [“Web browser” on page 151](#).

For VoIP tests, see the *HST-3000 VoIP Testing User Guide*.

For IPVideo tests, see the *HST-3000 VoIP Testing User Guide*.

Interpreting test results

The following result categories are available in the 802.11 application:

- Station Summary
- BSS Properties
- Encryption
- Errors
- 802.11 Frames
- Networks In Range
- Event Log

You can view many additional results by pressing the arrow keys or use the **Display** soft key and then select another category.

The following sections describe the results in each category.

802.11 Station Summary results This default results screen provides a summary of the most frequently used test results. [Table 17](#) describes the 802.11 summary results.

Table 17 802.11 summary results

| Result | Definition |
|-----------------|--|
| Circuit diagram | Located in the top left area of the screen, shows a graphic indication of the circuit, including the link status. |
| Link status | Located in the upper right of the screen, indicates the link status. Idle – 802.11 stopped, unit may be scanning depending on Idle Scan option in networks screen Scanning – Scanning for the SSID configured in setup Associating – associating to a BSS Associated – Associated to a BSS. However, the link is not fully up yet. WPA Handshake – Completing the WPA handshake to set up encryption Link up – Link is fully up. |
| SSID | The SSID selected in the Setup menu. This is the network that we are connected to (or attempting to connect to). |
| Channel | The 802.11b/g channel the particular BSS is operating in. |
| Rx Frames | Total frames received. |
| Tx Frames | Total frames transmitted. |
| Last Rx Rate | The data rate most recently achieved. |
| Last Tx Rate | The data rate most recently achieved. |

802.11 BSS Details This screen reports the properties of the basic service set (BSS). [Table 18](#) describes the BSS Properties results.

Table 18 BSS Properties results

| Result | Definition |
|------------|--|
| SSID | The SSID selected in the Setup menu. This is the network that we are connected to (or attempting to connect to). |
| BSSID | The Basic Service Set Identifier is an identifier that represents a single 802.11 cell (similar to a MAC address). |
| Channel | The 802.11b/g channel the particular BSS is operating in. |
| Frequency | The frequency of the 802.11b/g channel in use. |
| Mode | The 802.11 mode - whether it is managed or not. |
| Slot Time | The slot time in use for this BSS - short or long. Short slot times typically provide better performance. |
| Preamble | The preamble type in use by this BSS - short & long or long only. Short preambles can increase performance but can reduce frame detection in noisy environments. |
| QoS BSS | Whether the BSS supports any quality of service controls. A BSS with QoS will generally handle tasks such as VoIP better. |
| APSD | Whether the BSS supports Automatic Power Save Delivery. APSD is a method to allow 802.11 devices to consume very little power. |
| Protection | Whether the BSS requires CTS protection when transmitting. CTS-to-self is a mechanism used to protect 802.11b devices operating on 802.11g networks. |

Table 18 BSS Properties results (Continued)

| Result | Definition |
|--------|---|
| AID | The association identifier of the HST-3000 in this BSS. |

Encryption This screen reports encryption statistics. [Table 19](#) describes the Encryption results.

Table 19 Encryption results

| Result | Definition |
|------------------|---|
| Pairwise Cipher | The cipher (encryption method) used for frames sent between the HST-3000 and the access point. |
| Groupwise Cipher | The cipher (encryption method) used for frames sent from the access point to all devices associated with it. |
| Protocol | The security key protocol in use. This is N/A when using no security or WEP. For WPA modes, it will be either WPA or WPA2 depending on what was negotiated. |
| Key Mgmt | The key management system used by the key protocol. For WPA/WPA2, it will be PSK; for non-WPA encryption modes, it will be None. |

Errors This screen reports 802.11 Station Error statistics. [Table 20](#) describes the Errors.

Table 20 Error results

| Result | Definition |
|------------------|---|
| FCS Errors | Count of frame check sequence (FCS) errors received in the last second and total received. Frames with FCS errors have corrupted payload so they are dropped. |
| PLCP Errors | Count of physical layer convergence procedure (PLCP) errors received in the last second and total received. Frames with PLCP errors have a corrupted header so they are dropped. |
| RX False Alarms | Count of false alarms received in the last second and total received. A false alarm is when the radio is triggered to enter the receive state by RF energy but then realizes that there is no 802.11 traffic. This result is indicative of non-802.11 interference or severely corrupted 802.11 frames. |
| Long RX FAs | Count of long false alarms (FAs) received in the last second and total received. These are false alarms that last an unusually long time. Long RX False Alarms are not included in the RX False Alarm result. |
| TX No Retries | Count of bits that transmitted successfully with no TX retries. |
| TX One Retry | Count of bits that transmitted successfully with only one retry. |
| TX Multi Retries | Count of bits that transmitted successfully with multiple TX retries. |
| Tx Failed | Count of bits that were attempted to be transmitted but failed. This doesn't always mean the frame was lost, but the HST-3000 did not receive an acknowledgement. |

802.11 Frames This screen reports frame statistics. [Table 20](#) describes the 802.11 Frame statistics.

Table 21 802.11 Frame results

| Result | Definition |
|-------------------|--|
| RX Unicast Data | Number of data frames or bytes received whose payload is unicast and the last rate for this frame type. If no frames have been received of this type, it will say "waiting". |
| RX Multicast Data | Number of data frames or bytes received whose payload is multicast and the last rate for this frame type. |
| RX Unicast Mgmt | Number of management frames or bytes received whose payload is unicast and the last rate for this frame type. |
| RX Multicast Mgmt | Number of management frames or bytes received whose payload is multicast and the last rate for this frame type. |
| Tx Unicast Data | Number of data frames or bytes sent with unicast payloads and the last rate for this frame type. |
| TX Multicast Data | Number of data frames or bytes sent with multicast payloads and the last rate for this frame type. |
| Tx Mgmt | Number of management frames or bytes sent and the last rate for this frame type. |

Networks in Range This screen reports any 802.11 networks within range. The SSID, BSSID, signal strength, channel number and frequency, and the encryption in use are listed. The list can be sorted by SSID or signal strength.

Event log This category provides a running log of significant wireless events and errors.

StrataSync

8

This chapter provides task-based instructions for synchronizing the HST-3000 with a StrataSync server. Topics discussed in this chapter include the following:

- [“About StrataSync” on page 126](#)
- [“Synchronizing to the StrataSync server” on page 127](#)

About StrataSync

StrataSync® is a hosted, cloud-based software application that provides JDSU instrument asset, configuration, and test-date management. StrataSync manages inventory, test results, and performance data anywhere with browser-based ease and improves technician and instrument efficiency.

Features include the following:

- Pushing certain configuration settings to the HST
- Adding and/or removing software options on the HST
- Updating the software on the HST
- Updating the software on the TI, Aware, Capri, and Broadcom modems
- Receiving certain configuration setting from the HST
- Tracking ownership of the HST

To access the StrataSync menu

- 1 Press the **System** navigation key, and then the **TOOLS** soft key.
- 2 Select **StrataSync**.

The StrataSync menu appears.



The last sync date and time are shown in the lower left; the server name or IP and port are shown in the lower right.

Synchronizing to the StrataSync server

To obtain the latest configuration settings, software options and updates, and ownership registration information, the HST-3000 can synchronize with a JDSU server via the internet. The synchronization also stores any user files saved on the unit to the StrataSync server. This procedure should be undertaken immediately upon receipt of the unit and on a regular (daily) basis thereafter to ensure that the unit is as up-to-date as possible and to allow all user information to be backed up. Before attempting to synchronize with StrataSync, please confirm your server settings with your manger or your company's IT organization.

To sync with StrataSync

- 1 If you haven't already done so, specify the user information on the User Info menu (see ["Specifying user information" on page 61](#)). A valid account ID must be entered in order to synchronize with the StrataSync server.
- 2 Press the **Configs** soft key and then specify additional connection and server settings.

| Setting | Description |
|-----------------|--|
| Connection Type | <p>Specify how to connect to the server.</p> <ul style="list-style-type: none">– Lookup – Use an intermediate server that will automatically identify ("lookup") the specific StrataSync server to be addressed. The lookup server connection type is typically used when there are multiple StrataSync servers in the user's corporate footprint.)– Direct – Use a direct reference to a specific StrataSync server) <p>NOTE: The HST-3000 uses HTTPS (secure HTTP) to connect to the server.</p> |
| Server Method | <p>Specify how to refer to the server (this applies for both connection types)</p> <ul style="list-style-type: none">– Address Server by IP (192.168.0.1)– Address Server by Name (myServer) |

| Setting | Description |
|----------------|-------------------------------|
| Server Port | Enter the server port number. |
| Server Name | Enter the server name. |

- 3 Specify the interface to use for the connection:
 - a Press the **Connect** soft key.
 - b Select either **10/100** or **xDSL**.
 - c Press the **Home** key.
 - d Do one of the following:
 - If you selected a 10/100 connection, select the ETHTE tab, and then launch the Ethernet TE application (highlight Ethernet TE and then press OK).
 - If you selected a xDSL connection
 - Select the XDSL tab and then launch the XDSL application (highlight XDSL and then press OK).
 - Press the Home key and then launch the Data application (highlight XDSL and then press OK).
- 4 On the StrataSync screen, press the **Start Sync** soft key.



As the process runs, the sync state is displayed in the lower left.

- 5 Upon synchronization with the StrataSync server, the unit will send to the server the following information:
 - The unit’s serial number.
 - The unit’s hardware information - constituent assemblies and their revision levels.
 - The unit’s MAC address.
 - The unit’s User settings - name (user/technician) and ID.

If the configuration information contained on the server is newer than that on the unit, the server will be considered to be the most up-to-date.

- 6 The server will then send any files to the unit being synchronized that it determines are newer than those on the unit.
- 7 The unit will then send any Reports, Configuration profiles, screen shots, etc. that have been saved on the unit since the last configuration.
- 8 The server then applies any applicable Options to the unit.

NOTE:

If an Option Code was entered as a part of synchronization, power must be cycled to the unit to complete the process and initialize the option.

- 9 Lastly, if any upgrades are available, the user will be informed of their availability and asked to verify their desire to receive the upgrade.
- 10 When synchronization is complete, the Status will indicate “Sync Complete”. The unit may be disconnected from the server.

The unit has been synchronized to the StrataSync Server.

Optical Tools

9

This chapter provides task-based instructions for using the optional USB accessories. Topics discussed in this chapter include the following:

- [“Inspecting fiber” on page 132](#)
- [“Measuring optical power” on page 136](#)

About the optical tools

The following USB optical accessories can be used with the HST-3000.

- Fiber Microscope
 - Inspect both the bulkhead (female) and patch cord (male) sides of fiber interconnect as well as optical devices located in hard-to-reach places (transceivers).
 - Inspect both simplex connectors.
 - Use with a comprehensive selection of precision FBPT tips.
- Optical Power Meter
 - Takes power measurements for all single-mode and multimode connectors via USB 2.0 connection.
 - Measures optical power with multiple pre-calibrated wavelengths (850, 980, 1300, 1310, 1490, 1550 and 1625 nm).
 - Integrates digital power measurements, fiber inspection, and analysis into a single, unified work sequence.

Inspecting fiber

The JDSU fiber microscope accessory is used to view a live video of a simplex fiber to determine if the fiber is clean. It can also capture a snapshot and provide pass/fail analysis.

NOTE:

The microscope application is available on ACE2 units only. To verify your ACE version, go to the System>Tools>Options/Revs/Copyright screen and then select the REVISIONS soft key (should see HST-3000 ACE2 BIZ).

To inspect fiber

- 1 Connect the fiber microscope to the USB connector on the top of the instrument.
- 2 Connect the microscope to the optical patch cord or bulk-head.

NOTE:

Although some microscopes can inspect multi-fiber or ribbon fiber (depending on the microscope and the tip used) the HST-3000's microscope application supports simplex fiber only.

- 3 Press the **SCOPE** soft key.
You may have to scroll right or left to find the soft key. In order for the SCOPE soft key to appear, a Fiber Microscope must be plugged into the USB connector.
The Fiber Microscope screen appears.
- 4 Select **Fiber Microscope**.
The video of the fiber appears.
- 5 Press the **Configure** navigation key.
- 6 Press the **MICROSCOPE** soft key and then specify the Fiber Microscope Settings.

Table 22 Fiber microscope settings

| Setting | Description |
|---------------|---|
| Profile | Select the inspection profile. |
| Tip | Specify which tip is being used on the microscope. |
| Filename Base | Specify the base used for the filename. Each result file will include this as the base plus a number. For example, fiber001, fiber002, and so on. |

Table 22 Fiber microscope settings

| Setting | Description |
|------------------|---|
| Focus Meter | Specify whether to show the focus meter (the blue and white bar that appears on the right side of the screen). |
| Auto-center live | When set to Yes, the live picture automatically centers on the fiber center. If set to No, the picture will center at the last location of a fiber center following an analysis. High magnification is always automatically centered. |
| Button Action | Specify whether the left soft key is used to perform an analysis on the fiber (Test Fiber) or simply take a snapshot without an analysis (Capture Only). This setting also affects the button action on the microscope. |

- 7 Press the **PDF** soft key, and then, if desired, specify the job ticket details such as the company name, technician, location, and job number. If the fields are left blank, they will not be included in the PDF report.
- 8 To view details about the microscope, such as the firmware version and serial number, press the **ABOUT** soft key.
- 9 Press the **Home** navigation key.
The video of the fiber appears.



10 Do one of the following:

- Manually inspect the fiber.
- Press the **CAP** soft key to freeze the live video. The CAP soft key appears if you specified Capture Only for the “Button Action” setting in the Fiber microscope setup. To save the snapshot as a .jpg, press the **SAVE** soft key.
- Press the **TEST** soft key to automatically center the view (if specified to do so), capture an image, and then analyze it. The test result will show zones (circles) and highlight particles (spots where defects are present). The TEST soft key appears if you specified Test for the “Button Action” setting in the Fiber microscope setup.

11 If you pressed TEST, do the following:

a Use the **ZONES** soft key to:

- show detail of the zones (show which zones contain scratches or defects).
- remove the zone circles and particle highlights.
- add the zone circles and particle highlights.

The zones typically go from inner to outer (innermost circle is zone A, and so on), but are based on the profile specified on the Fiber microscope setup page.

If you have a custom profile, you can use it on the HST-3000 by putting the file into the `configs/Microscope` folder. For more information on copying or transferring files using the file manager, refer to the *HST Base Unit User’s Guide*.

b To magnify the image, press the **MAG** soft key.

- c To save a report, press the **SAVE** soft key. A PDF report is saved.

NOTE:

If you have not yet moved the report file, you can view the screen capture portion of the the result file using the File Manager. If the file has been moved — even if it was put back in the original spot on the HST — you can no longer view the file because there is a temporary capture file included with the save that goes away when the file is moved.

Press the **LIVE** soft key to exit the test and view the live video.

Measuring optical power

The Optical Power Meter is a JDSU accessory used to measure optical power.

- The MP-60 meter measures 850, 1300, 1310,1490, and 1550 nm wavelengths
- The MP-80 meter measures 980, 1310,1480, and 1550 nm wavelengths

To measure optical power

- 1 Connect the Optical Power Meter to the USB connector on the top of the instrument.
- 2 Connect the optical patch cord to the power meter.
- 3 Press the **PWR METER** soft key.

You may have to scroll right or left to find the soft key. In order for the PWR METER soft key to appear, an Optical Power Meter must be plugged into the USB connector.

The Power Meter Measurements screen appears.

- 4 Select **Optical Power Meter**.

The Optical Power Meter Summary screen appears.

- Press the **Configure** navigation key to display the Power Meter Settings, and then specify the settings.

Table 23 Optical Power Meter Settings

| Setting | Description |
|-------------------|---|
| Wavelength | To measure a specific wavelength, choose the wavelength. |
| Auto Detect | Use Auto-Detect to automatically detect the wavelength. NOTE: Auto-Detect requires a JDSU optical source. |
| LED Threshold | Specify the LED threshold (in dBm). This specifies the threshold for the power LED on the Optical Power Meter. Solid indicates the power is below the threshold (low power), flashing indicates the power is above the threshold. |
| Pass/Fail Thresh. | Specify the pass/fail threshold (in dBm) for the test. If the measured power is below the threshold, it fails. |
| Pass/Fail Enable | Specify whether to run the pass/fail test. |
| Meter FW Rev | Reports the firmware rev of the attached power meter. |

- Press the **ACCEPT** soft key to save the settings and return to the result screen.



The measurement begins as soon as the test is launched.

- 7 To change the measurement mode, press the **Mode** soft key.

| Setting | Description |
|---------|--|
| dBm | Absolute mode, displayed as dBm. The default setting. |
| mW | Absolute mode, displayed as mW. |
| dB | Relative measurement mode. The received signal is compared to the reference value, and displays the <i>difference</i> in dB. NOTE: If no reference value has been stored, 0.00 dBm will be used as reference value. |
| SET REF | Used in relative measurement mode (dB), to set the reference value. When selected, the current absolute power level is stored as new reference value. |

- 8 To add an entry in the Event Log, press the **Add Log** soft key.
An entry including the current power measurement is added to the log.
- 9 To save results, press the **Results** soft key and select whether to **Save Results** or **Save Results with Notes** (add a text string up to 100 characters to the result file).
- 10 To view the dB result as a graph, press the **Display** soft key and then select **Graph**.
NOTE: The graph shows the dB result only (not available for dBm or mW).

Automated Testing

10

This chapter contains information about the HST-3000 automated testing feature. Topics discussed in this chapter include the following:

- “Standard test scripts” on page 140
- “Custom test scripts” on page 140
- “Running a test script” on page 141
- “Managing test records” on page 143

Standard test scripts

JDSU provides standard test scripts with the T1 and copper SIMs that allow you to quickly configure and run test operations. You can create and save multiple test configurations. This allows you to store pre-configured tests for specific jobs.

If you use the HST-3000c with a copper SIM (see [Table 1 on page 5](#)), you get the following standard scripts:

- POTS Close Out Test
- Good Pair Check
- Wideband Auto Test

If you use the HST-3000 with a T1 SIM, you get a standard T1 BERT script.

Both the T1 and copper auto test options include a test record feature. This feature allows you to save work order information (circuit ID, technician ID, location, and other data) and associate it with test results. For more information about test records, see [“Managing test records” on page 143](#).

For more information about standard scripts, see the *HST-3000 T1 Testing User’s Guide* and the *HST-3000 Copper Testing User’s Guide*.

Custom test scripts

JDSU can customize test scripts for your particular solution, and provide training on the use of scripts. For information about purchasing customized test scripts, contact your JDSU sales representative.

If you purchased the UFEDIIB accessory, JDSU provides additional custom scripts designed to work with the UFEDIIB. refer to the *Copper Testing User’s Guide*.

To access custom scripts

- 1 Press the **AutoTest** navigation key.
- 2 Press the **Custom** soft key.
The available custom scripts appear.
- 3 To run a custom script, see [“Running a test script” on page 141](#).

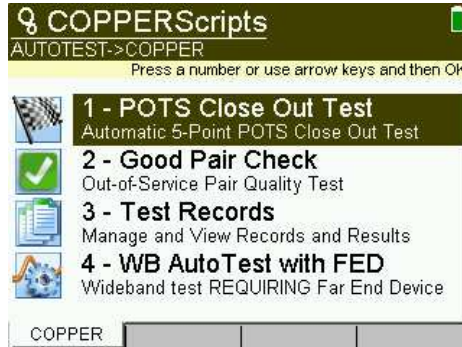
Running a test script

The following procedure describes how to run automated tests using the HST.

To run a test script

- 1 Connect the HST to the line. See the *Copper Testing User’s Guide* or the *T1 Testing User’s Guide*.
- 2 If the HST 3000 is off, press the green power button to power on the unit.
It may take 30 to 40 seconds for the unit to fully power on. When a menu appears, you can begin using the unit.
- 3 Press the **AutoTest** navigation key.

The available test scripts appear. The scripts available on your unit will vary depending on the application(s) you purchased, and whether you purchased any custom scripts from JDSU.



- 4 Press the soft key that corresponds to the type of test you want to run. The available soft keys are as follows:
 - **Custom** — Shows the available custom scripts. If you did not purchase custom scripts from JDSU, this option will not be available.
 - **Copper** — Shows the available Copper test scripts. This option is only available if you are using an HST-3000c with a Copper SIM attached.
 - **T1** — Shows the available T1 test scripts. This option is only available if you are using an HST-3000 or HST-3000c with a T1 SIM attached.

A list of available test scripts appears.

- 5 Press the soft key that corresponds to the script you want to run.

The Choose Config menu appears showing the available test configurations.
- 6 Select a test configuration.
- 7 Select **Run test**.

The script runs the test configuration.

For more information about running test scripts, see the *HST-3000 T1 Testing User's Guide* or the *HST-3000 Copper Testing User's Guide*.

Managing test records

The HST-3000 allows you to save work order information, such as work order number, technician name and ID, and circuit ID and location to a test record.

To access test record options

- 1 Press the **AutoTest** navigation key.
- 2 Press the soft key that corresponds to the type of test you want to run. The available soft keys are as follows:
 - **Custom** — Shows the available custom scripts. If you did not purchase custom scripts from JDSU, this option will not be available.
 - **Copper** — Shows the available Copper test scripts. This option is only available if you are using an HST-3000c with a Copper SIM attached.
 - **T1** — Shows the available T1 test scripts. This option is only available if you are using an HST-3000 or HST-3000c with a T1 SIM attached.

A list of available test configurations appears.

- 3 Select **Test Records**.

The Manage Test Records menu appears.



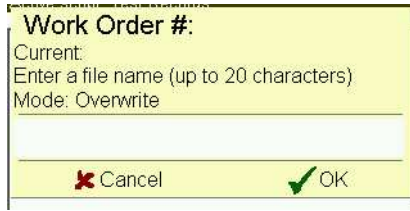
- 4 For instructions on managing test records, see the following sections:
 - [“Creating a new test record” on page 144](#)
 - [“Editing and viewing test records” on page 147](#)
 - [“Associating a test record with test results” on page 147](#)
 - [“Deleting a test record” on page 149](#)
 - [“Printing test records” on page 149](#)

Creating a new test record When you create a test record, you can leave items in the record blank (for example, Tech ID). This gives you the option to print the record and hand-write missing information at a later time. The following procedure describes how to create a new test record.

To create a new test record

- 1 Access the Manage Test Records menu. See [“Managing test records” on page 143](#).
- 2 Select **Add New Record**.

A work order number prompt appears.

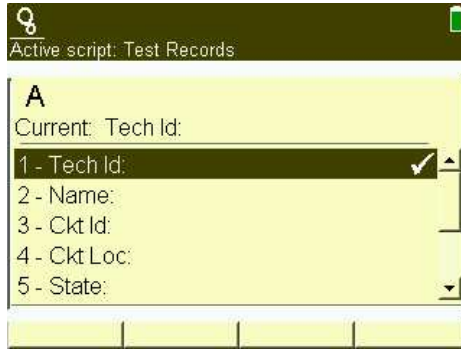


- 3 Using the key pad, enter a work order number. The following table describes how the keys function.

| Keys | Function |
|--|--|
| 1 through 9 | Allow you to enter letters and numbers. Press a key repeatedly to enter different characters. |
| *, #, 1 | Allow you to enter symbols. |
| Soft Keys | |
| Delete | Deletes a single character. |
| Clear | Clears the entire field. |
| Keypad:ABC Keypad:abc Keypad:123 | Changes the behavior of repeated key presses: alphanumeric (ABC or abc) or numeric (123). See “Inputting information” on page 20 . |
| Overwrite | Lets you type over characters that have already been entered. |
| Insert | Lets you insert a character between existing characters. |

- 4 After you enter the work order number, press the **OK** key.

A prompt for the work order information appears.



- 5 Press a number key to select a record item, and then enter the information. The following table describes the record information.

| Record Item | Description |
|-------------|---|
| Tech ID | Technician's identification number. |
| Name | Technician's name. |
| Ckt ID | Circuit identification number. |
| Ckt Loc | Location of the circuit. |
| State | The state where the circuit is located. |
| Tel # | Relevant telephone number. |
| Fax # | Relevant fax number. |

- 6 Repeat [step 5](#) for each record item.
- 7 When you have finished entering record information, select **Exit** (option number 8).
A save test record prompt appears.
- 8 Select **Save**.
The record is saved to a file using the work order number as the file name.

You have completed the procedure.

Editing and viewing test records

The following procedure describes how to edit or view an existing test record.

To edit or view an existing test record

- 1 Access the Manage Test Records menu. See [“Managing test records” on page 143](#).
- 2 Select **Edit/View Record**.
A list of existing records appears.
- 3 Select a record.
- 4 Select **Edit/View Record Info**.
The information contained in the record appears.
- 5 Press the number key that corresponds to the item you want to edit. For example, press the **3** key to change the circuit ID.
- 6 Use the keypad to edit the record information, and then press the **OK** key.
- 7 Repeat [step 5](#) and [step 6](#) for each item you want to edit.
- 8 When you are done editing the record, select **Exit**.
- 9 To save the modified record, select **Save**.

You have completed the procedure.

Associating a test record with test results

To associate a test results with a test record, the results must be saved on the HST.

To associate a test record with a result

- 1 Access the Manage Test Records menu. See [“Managing test records” on page 143](#).

Select **Edit/View Record**.

NOTE:

This selection only appears if test records are saved.

A list of available test records appears.

- 2 Select one of the following options (options vary depending on what test results have been saved):
 - **Associate GPC Test Files**
 - **Associate T1 Auto Test Results**
 - **Associate Closeout Test Results**
 - **Associate WB Auto Test Results**

NOTE:

For T1 auto tests, you can associate only one result file with one test record. For copper auto tests (Closeout, Good Pair Check, and Wideband Auto Test), you can associate up to two result files with one test record. If no result files are available, the option to associate a record with a result file will not be available.

A list of result files appears.

- 3 Select a test result file.

The HST associates the test record with the selected result file.

You have completed the procedure.

Deleting a test record The following procedure describes how to delete a test record.

To delete a test record

- 1 Access the Manage Test Records menu. See [“Managing test records” on page 143](#).
 - 2 Select **Delete Record**.
A list of existing records appears.
 - 3 Press the number key that corresponds to the record you want to delete, or highlight the record, and then press the **OK** key.
A confirmation message appears.
 - 4 Press the **OK** key to delete the record.
- You have completed the procedure.

Printing test records The HST allows you to print auto test results.

To print test records and results

- 1 Connect the HST to a printer:

NOTE:

JDSU recommends using the JDSU PR-40B printer. To do this you will need a gender changer and null modem adapter.

- a Using the battery-to-DB-9 cable (part number 1217-50-0295), connect one end of the cable to the HST's RS-232 connector.
The RS-232 connector is located on the bottom panel of the base unit (see [“Using the bottom panel” on page 15](#)).
- b Connect the other end of the cable to the null modem cable (part number 15-018427).
- c Connect the null modem cable to the printer.

- 2** If the HST is off, power on the unit.
When a menu appears, you can begin using the unit.
 - 3** Access the Manage Test Records menu. See [“Managing test records” on page 143](#).
 - 4** Select **Edit/View Record**.
A list of existing records appears.
 - 5** Select a record.
 - 6** Select **Print**.
The file information is sent to the printer.
- You have completed the procedure.

Web browser

11

This chapter describes the HST-3000's optional web browser. Topics discussed in this chapter include the following:

- “About the web browser” on page 152
- “Accessing the web browser” on page 153
- “Navigating the browser” on page 154
- “Opening a web page” on page 155
- “Adding and deleting bookmarks” on page 156
- “Exiting the browser” on page 157

About the web browser

With the web browser feature, you can provide visual proof to customers that a circuit is correctly provisioned all the way to the Internet. The browser works over both DSL and Ethernet interfaces, allowing you to surf the web from the customer's NID or demarcation point using only the HST. For DSL applications, the browser is a separate mode that allows you to connect to any public web site on the Internet through an internet service provider. The browser can also be purchased as a general global application for use with the Ethernet port.

Because the browser's primary purpose is to demonstrate connectivity, it does not have all the capabilities of typical web browsers, such as Internet Explorer or Netscape Navigator. The HST's web browser has the following limitations:

- The browser does not cache web pages. The HST does not have sufficient memory to cache web pages. Each time a page is selected, the HST re-loads the page.
- The browser does not currently support data entry through the browser. For example, you cannot log into a web mail account.
- The browser does not currently support Java applets, and will not display web pages written in Java. Sites optimized for quick downloads, such as DSLReports.com, are not supported because they are based on Java.

The following sections in this chapter describe how to access and use the web browser.

Accessing the web browser

Like IP ping, you must have an established underlying network connection, such as PPP over Ethernet, before you can use the browser. After you have a successful network connection, the HST's Data LED illuminates green. If the Data LED is red, the underlying connection is not ready, and the web browser (and IP ping) will not work.

To access the web browser

- 1 Make sure that you have a network connection, such as PPP over Ethernet.
- 2 Press the **System** navigation key.
- 3 Press the **TOOLS** soft key.
The System Tools menu appears.

- 4 Select **Web Browser**.

The browser display appears.



Navigating the browser

You can connect a USB mouse or a USB keyboard/mouse combination to the HST-3000 to navigate the web browser as you would with a desktop computer. If you don't use a mouse, you can use the HST keypad. The following sections describe how to use keypad to navigate the web browser.

Scrolling the view Because the HST's screen is $\frac{1}{4}$ VGA, where most public web sites are full VGA, the unit initially displays only the top left quarter of a full VGA page. To view other areas of a web page, use the HST arrow keys to scroll the page view.

Moving the pointer When you access the web browser, the number keys on the HST keypad (numbers 1 -9) act as directional keys. Using the number keys you can move the pointer to different areas of the web page. To center the pointer to the middle of the HST's display, press the 5 key.

When the mouse pointer passes over a link, it changes to a pointing finger. You can then press of the OK key to select the link. [Table 24](#) describes how to use the HST number keys to move the pointer.

Table 24 Web browser navigation keys

| To... | Press... |
|---------------------|------------------------------|
| move down | the 8 key |
| move up | the 2 key |
| move left | the 4 key |
| move right | the 6 key |
| move diagonally | the 7, 9, 1, or 3 key |
| repeat the move | hold down the key |
| recenter the cursor | the 5 key |

Selecting links The following procedure describes how to select a link on a web page.

To select a link

- 1 Navigate to the link using the keypad.
When the pointer passes over the link, it changes to a pointing finger.
- 2 Press the **OK** key.
The screen changes as appropriate.

Going back or forward one page If you want to go back to the previous page, press the **BACK-PAGE** soft key.

If you want to go forward a page, press the **NEXT PAGE** soft key.

Opening a web page

There are three ways to open a web page.

- Enter the address
- Select an address from the last five previously visited pages.
- Use a bookmark. See [“Adding and deleting bookmarks” on page 156](#) for more information.

Typing in an address The following procedure describes how to type in an address.

To type in an address

- 1 Press the **GO** soft key.
- 2 Select **Enter Address**.

- 3 Enter the URL.
To enter a dot (.), use the **1** key.
- 4 Press the **OK** key.

Selecting a previous address The following procedure describes how to select a previously visited address.

To select a previous address

- 1 Press the **GO** soft key.
The last five visited sites are listed at the bottom of the selection list.
- 2 Select the address you want to go to.

Selecting a bookmark **To select a bookmarked site**

- 1 Press the **GO** soft key.
- 2 Select **Bookmarks**.
- 3 Choose the option, **Select Bookmark**.
A window appears with the bookmark list.
- 4 Press the appropriate key to select the desired bookmark.

Adding and deleting bookmarks

If there is a specific page that you would like to view or if you visit a site frequently, you can bookmark it. The following procedure describes how to add and delete bookmarks.

To add or delete bookmarks

- 1 When on a web page, press the **GO** soft key.
- 2 Select **Bookmarks**.

3 Do one of the following:

| To... | Do the following |
|--|---|
| Add the current URL to the list of saved bookmarks | Select Add Bookmark . The address will show up in the bookmark list the next time it is viewed. |
| To delete a bookmark | Select Delete Bookmark . A list of saved bookmarks appears. Use the arrow keys to select a bookmark from the list, and then press the OK key. The bookmark is deleted. |

The address is removed from the bookmark list.

Exiting the browser

When you are finished demonstrating internet access to the user, you should exit the browser.

To exit the browser

1 Press the **GO** soft key.

2 Select **Exit Browser**.

The browser closes then the last viewed results screen.

VT100 Terminal Emulation

12

This chapter contains information about using the HST-3000 to emulate a VT100 terminal. Topics discussed in this chapter include the following:

- [“About VT100” on page 160](#)
- [“VT100 cabling” on page 160](#)
- [“Emulating a VT100 terminal” on page 165](#)

About VT100

The optional VT100 feature lets you use the HST-3000 to emulate a VT100 terminal, allowing local access to network elements. During a VT100 session, you can retrieve circuit and service performance information, such as loss, margin, synchronization, performance (such as SES, ES, and UAS), and alarm information from network elements such as HTU-R, HTU-C, HRE, and SmartJack (NIU). Data from the network element appears on the HST's screen. You can save this information to an ASCII file, print it, or export it.

During a VT100 session, you can also configure and provision the accessed network element from the HST. Optionally, you can connect a USB keyboard to the HST to help configure or provision a network element.

For information about emulating a VT100 session using the HST-3000, see [“Emulating a VT100 terminal” on page 165](#).

NOTE:

For more information about the VT100 option and HST-3000 training, contact your JDSU sales representative.

VT100 cabling

The optional VT100 emulation feature allows you to attach the HST-3000 to a network element.

There are two cabling configurations: standard and power. Each option is described in the following sections.

Standard cables This option allows you to attach the HST-3000 to a network element. The standard cable option includes the following:

- JDSU custom serial cable
 - If you have the EZ battery, this will be a custom 6-pin DIN serial-to-DB-9 cable.
 - If you have the 14pin battery, this will be a custom serial to DB-9 cable
- DB-9 male to male null modem adapter for connecting to network elements
- Tether

The tether keeps the null adapter attached to the connector cable (see [Figure 11](#)).

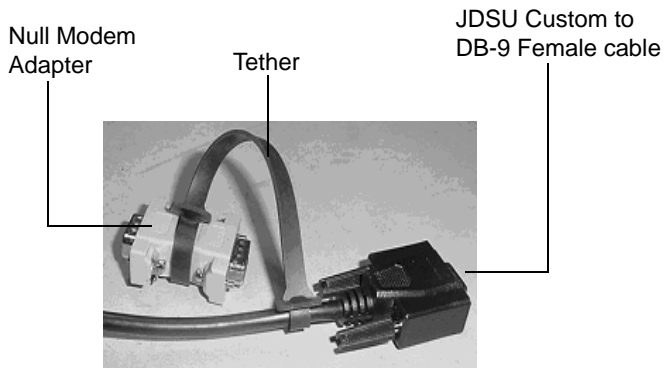


Figure 11 VT100 standard cabling

[Figure 12 on page 162](#) shows the how to attach the standard VT100 cables.

Figure 12 shows the VT100 standard cable connections. For instructions on starting a VT100 session, see “[Emulating a VT100 terminal](#)” on page 165.

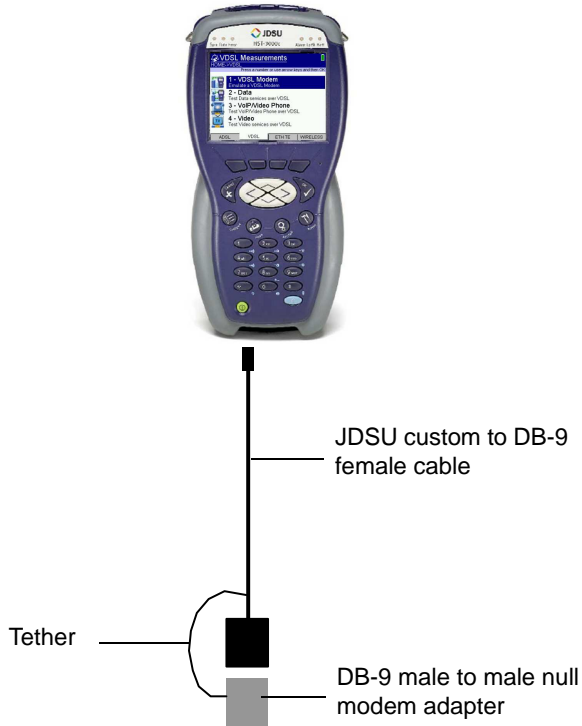


Figure 12 VT100 standard cabling option

NOTE:

If you have a 14pin battery, you cannot use the AC adapter or cigarette lighter adapter while the standard cables are connected. To use the adapter, you must have the power cabling option (see “[Power cables](#)” on page 163).

Power cables This option allows you to connect the HST-3000 to a network element and use an AC power adapter (or cigarette lighter adapter) simultaneously.

If you have an EZ battery, there are no custom cables. Simply attach a power cable: either the standard AC adapter or the optional cigarette lighter adapter.

If you have a 14pin battery, you need custom cables. The power cable option includes the following items:

- JDSU custom to DB-9 female cable
- Null modem serial Y-cable
- HST-3000 brick
- AC Adapter
- Cigarette lighter adapter

Figure 13 shows the VT100 power cable connections if you have a 14pin battery. For instructions on starting a VT100 session, see “Emulating a VT100 terminal” on page 165.

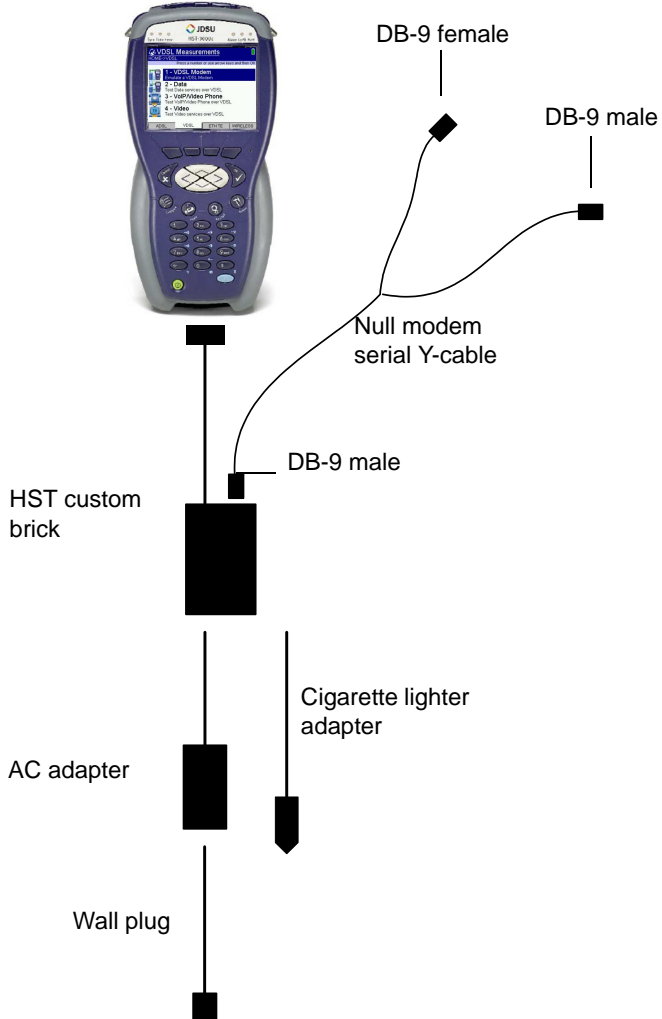


Figure 13 VT100 power cabling option with a 14pin battery

Emulating a VT100 terminal

The following procedure describes how to run a VT100 session on the HST-3000.

To emulate a VT100 terminal

- 1 If the HST is off, press the green power button to power on the HST.

It may take several seconds for the HST to fully power on. When a menu appears, you can begin using the HST.

- 2 Using either the standard or power cable options, connect the HST-3000 to the network element:

| Cable Option | Connection |
|-----------------------|---|
| Standard cable option | <ul style="list-style-type: none">– Connect one end of the cable (JDSU custom to DB-9 female) to the HST's RS-232 connector located on the bottom panel (see page 17).– If necessary, connect the other end of the cable to the null modem adapter (DB-9 male to male).– Connect the cable to a network element. <p>For an illustration of the standard cable connections, see Figure 12 on page 162.</p> |

| Cable Option | Connection |
|---------------------|--|
| Power cable option | <p>If using an EZ battery</p> <ul style="list-style-type: none">– Connect the AC adapter to the HST, and then plug into the power outlet. If you are using the cigarette lighter adapter, plug it into the HST (instead of the AC adapter), and then plug the charger into a cigarette lighter jack. <p>If using the 14pin battery</p> <ul style="list-style-type: none">– Attach the brick to the HST's RS-232 connector located on the bottom panel (see page 17).– Using the null modem serial Y-cable, connect the long side DB-9 male end to brick.– Connect the other DB-9 male end to a network element. You can connect the DB-9 female to a PC or laptop.– Connect the AC adapter to the brick, and then connect the wall plug to the AC adapter. If you are using the cigarette lighter charger, plug it into the brick (instead of the AC adapter), and then plug the charger into a cigarette lighter jack. <p>For an illustration of the power cable connections, see Figure 13 on page 164.</p> |

- 3** *Optional.* If you are using a USB keyboard, connect the keyboard to the HST's USB host connector located on the top panel (see [page 14](#)).
- 4** Press the **System** navigation key.
The System Tools menu appears.
- 5** Press the **TOOLS** soft key.
- 6** Select **VT100 Emulation**.
The VT100 Emulation menu appears.

7 Press the **Settings** soft key.

The communication parameters appear.

NOTE:

These parameters are independent of port settings available when you select the **System** navigation key, and then select **Instrument>Ports**.

The following table lists the communication parameters.

| Parameter | Option |
|--------------|--|
| Serial Speed | Select a baud rate: <ul style="list-style-type: none">– 1200– 2400– 9600– 19200– 38400 (default)– 57600– 115200 |
| Data Bits | Select a data bit setting: <ul style="list-style-type: none">– 7– 8 (default) |
| Flow Control | Specify the flow control: <ul style="list-style-type: none">– XON/XOFF– NONE (default) |
| Parity | Select the parity: <ul style="list-style-type: none">– NONE (default)– ODD– EVEN |
| Stop Bits | Select a stop bits setting: <ul style="list-style-type: none">– 1 (default)– 2 |

8 Press the **File** soft key, and then select **Connect**.

- 9** If the VT100 session does not start after a few seconds, select the **File** soft key, and then select **10 Spaces**.

A VT100 session screen appears. The menu for the network element appears after a few seconds.

- 10** To view different parts of the screen:

- If you are using a mini USB keyboard, use the arrow keys to view different parts of the screen. If you are using a full-sized USB keyboard, press the Page Up/Down, Home, and End keys to view different areas of the screen.
- If you are using the HST keypad, you can view the screen using the following keys:

| HST Key | Function |
|---------------------|--|
| White arrow keys | Press the white arrow keys on the HST keypad to view different parts of the HST's display. |
| Second function key | Press and hold down the second function key, then press an arrow key (while the second function key is still pressed) to page up/down/left/right. The second function key is the blue key (labeled with an arrow) in the lower right corner of the HST keypad. |

- 11 To send commands using the HST keypad, use the following keys:

| HST Key | Function |
|--|--|
| Spcl Keys | To send commands, such as back-space, delete, tab, and return, press the Spcl Keys soft key. A list of special key functions appears, including an option for function keys (F-keys). To send commands, such as home, end, break, insert, and page up/page down, press Spcl Keys soft key, then select Operator , and then select a command. |
| Keypad:ABC Keypad:123 Keypad:abc | Changes the behavior of repeated key presses: alphanumeric (ABC or abc) or numeric (123). See “Inputting information” on page 20 . |
| Keys 0 through 9, *, and # | Press a key on the keypad to send a character. Press the key several times to view all the characters you can send with that key. The characters appear in the upper left corner of the HST display. For example, the # key lets you send the following characters: #, space, _, &, \$, %, <, >, +, and -. |

- 12 If you want to transmit a single space, or multiple space characters, press the **File** soft key and then select the number of spaces.
- 13 To capture on-screen information to a file:
- Press the **File** soft key.
 - Select **Capture**.

c Enter a file name, and then press **OK**.

The file is saved to the following directory:
/results/VT100.

14 To rename, print, or delete a file, see [“Managing Files” on page 63](#).

Maintenance and Troubleshooting

13

This chapter describes how to maintain your unit and identify and correct problems related to the HST-3000. Topics discussed in this chapter include the following:

- [“Maintaining the battery” on page 172](#)
- [“Viewing unit options, revisions, and HST ID” on page 182](#)
- [“Adding options” on page 183](#)
- [“Updating the software” on page 184](#)
- [“Locating the serial number” on page 190](#)
- [“Troubleshooting” on page 190](#)

Maintaining the battery

This section discusses troubleshooting and maintenance information related to the HST-3000's rechargeable lithium-ion battery.

To prolong the life span of the battery, follow the guidelines below:

- Do not keep the AC adapter connected continuously. Disconnect the charger about once a week and operate the HST using battery power for a period of time (two or three hours is recommended). If you have another HST and battery, rotate the HST and battery so that the battery gets off of the charger and gets used for some period of time about once a week, or as often as possible.
- When not connected to the unit, store the battery in a cool, dry, and clean environment. Do not leave the battery in a car or truck, particularly during extremely hot or cold weather.
- Do not place a property label on the HST under the battery. The label can interfere with the alignment and seating of the battery to the base unit.

Place labels on the HST base unit under the removable service interface module (SIM). Labels should have a maximum thickness of 0.01 inches. Labels that exceed this thickness may interfere with the electrical connections and weather resistance of the unit.

- Use the AC adapter to power up the HST-3000 the first time you use it or after prolonged storage.
- If the battery capacity is depleted or if the battery has been stored for a prolonged period, use the JDSU battery charger to charge the battery. Do not use an un-approved charger.
- The charger will not charge the battery when it is extremely hot or cold.
- Always carry a fully charged spare battery.



CAUTION: BATTERY MAY RESET

If you have the battery with the 14-pin connector, do not allow any type of metal to come in contact with the battery terminals, as the battery recharge memory will reset. Plugging in the AC adapter will temporarily fix the battery, but it will need to go through three discharge/charge cycles to fully recover. See also [“Resetting the battery capacity indicator” on page 181](#).

See [“Checking the battery” on page 29](#) for information on checking the battery status.

Conditioning the battery

When you first receive your HST you do not need to do anything special before using it. The battery is shipped with less than a full charge for maximum shelf life. There is no need to “condition” the Lilon battery. However, you may want to charge the battery fully so that you get the maximum run time for your first use.

NOTE:

When the battery is fully charged, the battery icon is light color; when discharged it is dark. It is also dark when the unit is unable to get battery data (not talking to the fuel gauge — flashing amber Batt LED) or when the capacity in error flag is set in the fuel gauge (solid amber LED).

Battery protection

The HST battery pack has several built-in protection mechanisms.

- There is a thermal fuse on the 6 cell (series / parallel) pack
- There is a protection IC on the flex circuit inside the pack that will disconnect the pack for the following conditions: overcharge, overdischarge, or overcurrent.

- The charger is a smart charger that monitors the charge cycle and reduces the current as the pack reaches full charge. It also has a fail-safe timer that will stop the charge cycle if the charger has been charging the pack for an abnormal amount of time.

Recharging the battery The HST will typically run for 8 hours on a fully charged battery. Some applications or modes require more power than others, so run time will vary based on the mode.

When the battery level is at 25 percent or less, the battery should be recharged.

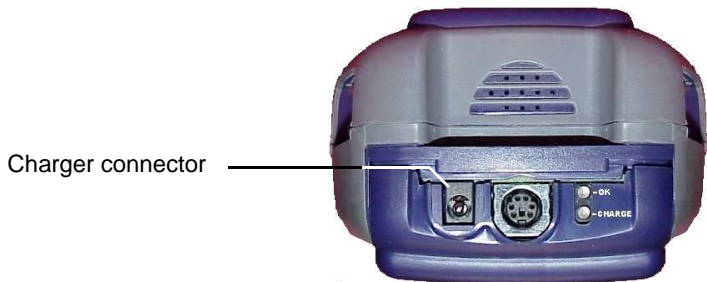
NOTE:

You can test a circuit and recharge the battery at the same time. If you do not want to interrupt the current test, you may leave the power on and connect the AC power adapter. You can also charge the battery while it is removed from the HST-3000.

To charge the battery

- 1 Connect one end of the AC adapter to the connector on the battery.

The HST's battery connector is located on the unit's bottom panel.



- 2 Connect the other end of the AC adapter to an AC power supply.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Be sure the AC Adapter is connected to the correct voltage mains. Do not use outdoors or in wet locations. Use only the AC Adapter supplied with the test set.

- 3 Let the HST-3000 charge for up to 7 hours depending on the voltage level.

The charging time will be the same whether the power is on or off.

The **Batt** LED (on the HST front panel) is green when the unit is powered up and the battery is charging.

The **CHARGE** LED on the battery is red while charging the battery. (If you have an EZ battery, the LED is on the battery; if you have a 14pin battery, it is on the charger.)

The **CHARGE** LED is the only indication that the HST battery is actually taking a charge. The HST can give an indication, if powered on, that the charger is plugged in, but cannot see if the battery is actually taking a charge.

- 4 After the charge is complete, the appropriate LED lights green.
 - If you have an EZ battery, verify that the **OK** LED on the battery is green.
 - If you have a 14pin battery, verify that the **CHARGE** LED on the charger is green.

Charging the battery is complete.

LED troubleshooting The following section describes the function of the **Batt** (battery) LED on the HST, the LEDs on the EZ battery, and the **POWER** and **CHARGE** LEDs on the charger for the 14pin battery.

HST Batt LED The HST's Batt LED is a tri-color LED. [Table 25](#) describes the LED indications.

Table 25 Batt LED indications

| Condition | Indication |
|---|-------------------------------------|
| Low battery (about 8% left) | Solid Red |
| Very low battery (about 4% left) | Flashing Red about once a second |
| Unit will turn off (about 2% left) | Flashing Red several times a second |
| NOTE: After the low battery indication appears, there is about 20 minutes (depending on the application) until you will see the very low battery indication. After this, there is about 10 minutes before the HST turns off. This is a total of about 30 minutes from low battery to power down. | |
| Charging | Solid Green |
| HST unable to get battery data | Flashing Amber |
| Battery capacity inaccurate | Solid Amber |

A solid amber Batt light or LED on the HST does not mean there are battery problems that need immediate attention. The battery is fully functional and can still be used, but understand that the fuel or gas gauge (also called battery capacity indicator) on the HST is not going to give an indication of the remaining capacity of the battery pack.

The Batt LED is lit amber (solid, not flashing) to show that the fuel gauge chip or IC inside the pack is telling the HST it's capacity reading may be inaccurate. The main reason for this is that the IC that protects the battery cells has removed the connections from the battery to all other circuitry inside the pack including the fuel gauge chip.

The protection chip looks at the batteries themselves to make sure the voltage does not get too low and that a large amount of current is not drawn from the battery in a short period of time. This would normally indicate an external short of the pack.

There are a few reasons why the protection chip would disconnect the battery cells in normal use:

- If the external + and - contacts on the battery pack are accidentally shorted.
- If an HST is stored for several months with a low charge, self discharge of the battery pack lowers the cell voltage and is not seen by the fuel gauge chip.
- If an HST is used until it's battery is so low that it shuts itself off and it is continued to be turned on in an attempt to use it, the battery cell voltage will get too low.
- If the resetting / re-calibrating of the fuel gauge chip (holding the AutoTest key down on power up) is done when the battery is not fully charged, the fuel gauge will assume 100% capacity when it is not. The HST will continue to run, thinking there is more capacity in the battery than there is, and possibly run the battery down until the protection chip cuts the battery off.
- Another reason the HST Batt light would light amber is if you connect a charger to the pack more than 255 times without letting it fully charge the pack. This sets the CI (capacity inaccurate) flag in the fuel gauge chip which will cause the HST's Batt LED to be lit amber. The reason for this is that the fuel gauge keeps track of energy going in and out of the battery. It expects to see a full charge on the battery periodically, as a reference point to verify the capacity is accurate. If this does not happen, it will give an indication that the capacity may be inaccurate.

Battery LEDs If you have an EZ battery, there are two LEDs on the battery: OK and CHARGE. Their function is described below.

OK

The OK light is lit green when charging is complete.

CHARGE

The CHARGE light is a red LED that indicates the following:

- Solid red indicates that the battery is being charged.
- Flashing red indicates a charge fault (temperature too high or low, DC too high or low, or an internal fault).

Adapter LEDs If you have a 14pin battery, there are two LEDs on the adapter: POWER and CHARGE. Their function is described below.

POWER

The POWER light is green when the HST charger is getting power from the AC mains.

CHARGE

The CHARGE light is a dual colored LED that can be red or green. [Table 26](#) lists the conditions and explanations for the CHARGE light.

Table 26 Charge LED indications

| Condition | Indication |
|--|--|
| Charging | Solid Red |
| Ready / charge cycle is complete | Solid Green |
| Error / defect | Flashing Red |
| This is an indication that there is a problem associated with the battery pack. The temperature of the battery pack may be out of range. The temperature of the pack must be from 0 to 60 C +/- 5C. The minimum or maximum cell voltage is out of range. This would indicate a bad pack. | |
| Bad battery pack | Off. Charger cannot detect the battery pack. |

Replacing the battery The HST-3000's battery is user replaceable.

On the back of the unit, there is a quick-release button that releases the battery (see [Figure 14](#)).



Figure 14 Back of HST-3000

The following procedure describes how to replace the battery.



WARNING: EXPLOSION

There is danger of extreme heat, fire, or explosion if battery is incorrectly replaced or if it is tampered with. Replace only with an JDSU recommended battery. Follow the battery replacement procedure exactly and do not tamper with the battery case.

To replace the battery

- 1 Turn the power off.



CAUTION: INSTRUMENT DAMAGE

Failure to turn the power off before removing the battery from the HST-3000 could damage internal components and/or corrupt the software. Always turn off the unit before removing the battery.

- 2 Push the quick-release button up (toward the SIM) and lift the battery out.
- 3 Insert the bottom of the new battery into the bottom of the unit.



CAUTION: CLOCK MAY RESET

The real-time clock will reset if you do not replace the battery within 15 minutes of removing the old battery.

- 4 Press the battery into the compartment until it clicks into place.



CAUTION: BATTERY INTERFERENCE

Do not place a property label on the HST under the battery. The label can interfere with the alignment and seating of the battery to the base unit.

Place labels on the HST base unit under the removable service interface module (SIM). Labels should have a maximum thickness of 0.01 inches. Labels that exceed this thickness may interfere with the electrical connections and weather resistance of the unit.

Replacing the battery is complete.

The expected life of the battery pack is 2 to 3 years. The pack should maintain at least 70% of its original capacity after 300 charge cycles. This is not to say the battery is useless after that but that the capacity will start diminishing over time.

Resetting the battery capacity indicator

If the Batt LED is solid amber, the battery capacity indicator (the “gas gauge”) needs to be reset. In addition, on power up, the message “Please Reset Battery Gauge in System:User:Pwr Mgmt.” may appear.

There are two ways to reset the battery capacity indicator:

- Pressing the **AutoTest** button while powering up
- Selecting **Reset Batt. Gauge** from the Power Management menu.

To reset the battery capacity indicator using the Auto Test button

- 1 Recharge the battery (see [“Recharging the battery” on page 174](#)).



CAUTION: INACCURATE READINGS

Performing this initialization when the battery is not at full charge will cause the battery capacity indicator reading to be inaccurate. Always perform this initialization following a full charging cycle.

- 2 Turn off the HST.
- 3 Leave the charger connected to the unit.
- 4 Verify that the HST-3000 is off (powered down).
- 5 Press and hold the **Auto Test** navigation button while turning the power on.

The Batt LED turns green.

NOTE:

Steps 6 and 7 are only necessary if your unit has keypad code revision 1.9 or earlier. To verify your keypad code revision, see [“Viewing unit options, revisions, and HST ID”](#).

- 6 Remove the charger, and then allow the unit to run off of the battery for 5 minutes.
- 7 Reconnect the charger, and then verify that the RED CHARGE LED illuminates briefly.

The battery capacity indicator is reset.

To reset the battery capacity indicator using the Power Management menu

- 1 Verify that the charger is attached to the unit.
- 2 Access the User Preferences menu (see [page 55](#)).
- 3 Select **Power Management**.

The Power Management Settings menu appears.

NOTE:

The HST-3000 should have a full battery charge when you perform this operation.

- 4 Select **Reset Batt. Gauge**.

The battery capacity indicator is reset.

Viewing unit options, revisions, and HST ID

The following procedure describes how to view unit options and revisions, and the HST ID number.

To view unit revisions and options

- 1 Press the **System** navigation key.
- 2 Press the **TOOLS** soft key.

The System Tools menu appears.

- 3 Select **Options/Revs/Copyright**.

The Unit Options menu appears. If the option is installed, a check mark appears next to it.

The unit's unique HST ID number also appears on this screen. You will need HST ID if you are adding options to the unit.

4 Press the **Revisions** soft key.

The revisions of the internal components and the software version appear.

Viewing revisions and options is complete.

Adding options

The HST-3000 software allows you to add new options to your unit in the field by entering a unique number key that will unlock the new feature. Contact your sales representative or call JDSU customer service to order your new feature and obtain the unique key for your unit. This will be a 12 byte (24-digit) number. To generate this key the JDSU customer service representative will need the following information:

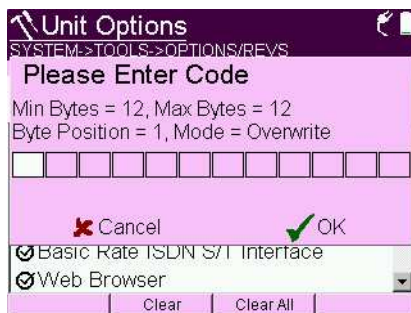
- The serial number of your unit (see [“Locating the serial number” on page 190](#))
- The unique HST 3000 ID number (see [“Viewing unit options, revisions, and HST ID” on page 182](#))

The following procedure describes how to add options.

To add options

- 1** Contact your JDSU representative to obtain the number key that will enable the option you want to add.
- 2** Press the **System** navigation key.
- 3** Press the **TOOLS** soft key.
- 4** Select **Options/Revs/Copyright**.
- 5** Press the **ADD** soft key.

A prompt appears to enter the code for the option.



- 6 Enter the code obtained in [step 1](#), then press the **OK** key.
- 7 Restart the HST-3000.

When the menu is viewed again, a check mark appears next to the option indicating it is available for use.

Updating the software

The HST software can be upgraded in the field using either the HST Ethernet port or the USB port on the top panel of the instrument.

The process for updating varies depending on the way the update is performed.

Updating from a PC or laptop The following process describes how to update the software from a PC or laptop.

To update from a PC or laptop

- 1 Install the HST Updater program (provided with software updates) on a PC or laptop running one of the following operating systems: Windows 98, Windows 2000, Windows XP, or Windows NT.

- 2 Connect the HST to the AC adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Be sure the AC adapter is connected to the correct voltage mains. Do not use outdoors or in wet locations. Use only the AC adapter supplied with the tester.

- 3 From a PC or laptop, start the JDSU updater program.
- 4 Press and hold the **System** navigation key while powering up the HST-3000.
The HST-3000 enters the software update mode.
- 5 Use a shielded Ethernet crossover cable to connect the HST-3000 to a PC or laptop.



NOTE: ELECTROSTATIC DISCHARGE

JDSU recommends using a shielded crossover cable to help prevent electrostatic discharge (ESD).

- 6 To update the software, follow the JDSU updater program instructions on screen.

Updating over an intranet or network

The following process describes how to update the software over an intranet or network

To update over an intranet or network

- 1 Obtain the IP address of the JDSU HST updater program from your supervisor/manager, or IT department (the program could reside on another PC that is connected to your LAN, or another computer somewhere else in the network).
- 2 Verify that the updater is in fact running before attempting an HST software update.

- 3 Connect the HST-3000 to the AC charger adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Be sure the AC adapter is connected to the correct voltage mains. Do not use outdoors or in wet locations. Use only the AC adapter supplied with the tester.

- 4 Press and hold the **System** navigation key while powering up the HST-3000.
The HST-3000 enters the software update mode.
- 5 Connect a straight (“patch”) Ethernet cable from the LAN to the HST-3000.
This is the same kind of cable connecting your PC or laptop to the network.
- 6 To update the software, follow the JDSU updater program instructions on screen.

Updating over a WAN

The following process describes how to update the software over a WAN.

To update over a WAN

- 1 Obtain the FTP address where the software file is located, as well as the User Name and Password.
- 2 Connect the HST-3000 to the AC charger adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

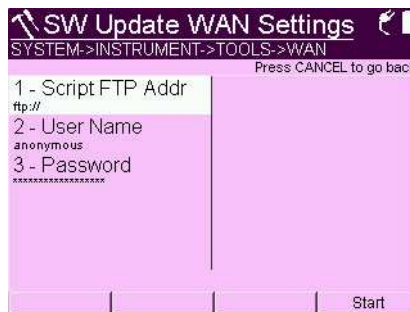
Electrical shock may result in serious injury or death. Be sure the AC adapter is connected to the correct voltage mains. Do not use outdoors or in wet locations. Use only the AC adapter supplied with the tester.

- 3 Press the **System** navigation key.

- 4 Press the **INSTRUMENT** soft key.
- 5 Press the **2** key.
The Port Settings menu appears.
- 6 Press the **ETHERNET** soft key.
- 7 Configure the Ethernet settings
For more information, see [“Changing port settings” on page 35](#).
- 8 Press the **Cancel** key to return to the Instrument Settings menu.
- 9 Press the **7** key.
The Software Update screen appears.



- 10 Press the **1** key to select WAN.
The SW Update WAN Settings screen appears.



- 11 Press **1** and then enter the complete FTP address where the file is located.

NOTE

In order for the update to work, you must enter the **complete** FTP address, including the server and directory. For example, ftp://ftp.<your company>.com/<directory name>

- 12 Press **2** and enter the User Name for the FTP address.

- 13 Press **3** and enter the Password for the FTP address.

- 14 Press the **Start** soft key.

The update status is displayed on the screen.

NOTE:

The update will take several minutes.

The unit powers down when done.

Updating using USB Flash

To update over USB

- 1 Connect the HST-3000 to the AC charger adapter to ensure an uninterrupted supply of power during the update.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Be sure the AC adapter is connected to the correct voltage mains. Do not use outdoors or in wet locations. Use only the AC adapter supplied with the tester.

- 2 Connect a USB flash drive to the USB connector on the top panel.

The HST-3000 will auto-detect the USB drive.

- 3 Press the **System** navigation key.
- 4 Press the **INSTRUMENT** soft key.

- 5 Press the **7** key.
The Software Update screen appears.
- 6 Press the **2** key to select USB then **OK** to start the update.
The update status is displayed on the screen.

NOTE:

The update will take several minutes.

The unit powers down when done.

Rotating the LCD If your screen is upside-down after updating the software, perform the following procedure.

To rotate the LCD

- 1 Turn off the unit.
- 2 Press and hold the **System** navigation key while powering up the HST-3000.
The HST-3000 enters the software update mode.
- 3 Select item **7 - Rotate LCD**.
- 4 Turn off the HST.

When you turn on the HST, the screen is in the correct orientation.

Locating the serial number

Before you call Customer Service or the technical assistance center for help, you should know your unit's serial numbers. There is one serial number for the base unit and one for the service interface module (SIM).

The serial number for the SIM is located on the back of the module. You must remove the module from the base to expose the serial number label. For instructions on removing and attaching the SIM, see ["Removing and attaching a SIM" on page 24](#).

The serial number for the base unit is located under the battery. You must remove the battery to expose the label. For instructions on removing and replacing the battery, see ["Replacing the battery" on page 179](#).

Troubleshooting

This section describes common problems and solutions for operating the HST. Please read this section before contacting technical assistance.

Installation and setup This section addresses questions that may be asked about preparing the HST-3000 for use.

Issue The unit will not power up.

Resolution Check the power source and restart the unit.

If the unit is running on the AC power adapter, verify that the power source is adequate.

If the unit is running on the battery, verify that there is enough battery capacity.

Operation This section addresses operating and performing basic functions with the HST.

Issue I cannot print out statistics.

Resolution Verify that the printer cable is connected correctly.

Verify that your terminal program is configured and working correctly.

Verify your printer is working properly.

Issue The microphone does not work.

Resolution Check the headset connection.

Ensure you are in the correct mode (used for POTS and VoIP calls).

Issue When I attempt to charge the battery, I get a flashing red CHARGE LED.

Resolution The battery temperature is either too high or too low. Let the battery reach room temperature then try again.

Issue The battery LED is amber (either solid or flashing).

Resolution The battery memory has been reset. See [“Resetting the battery capacity indicator” on page 181](#). If the problem persists, contact Customer Service.

Issue When I try to change the contrast, nothing happens.

Resolution The contrast control, along with the backlight activation and backlight duration, is not applicable to the color display. However, you can control the brightness of the backlight, which may help with the contrast.

Specifications

A

This appendix describes the HST-3000 specifications. Topics discussed in this appendix include the following:

- “Physical specifications” on page 194
- “Environmental specifications” on page 194
- “Power specifications” on page 195

Physical specifications

Table 27 provides the physical specifications for the HST.

Table 27 Physical specifications¹

| Parameter | Specification |
|-----------|------------------|
| Height | 9.5" (24.2cm) |
| Width | 4.5" (11.4 cm) |
| Depth | 2.8" (7.2 cm) |
| Weight | 2.7 lb. (1.3 kg) |

1. with SIM attached

Environmental specifications

Table 28 provides the environmental specifications.

Table 28 Environmental specifications

| Parameter | Specification |
|----------------------------|--------------------------------|
| Unit Operating Temperature | 23° F to 122° F (-5°C to 50°C) |
| Storage Temperature | -40° to 140° F (-40° to 60° C) |
| Operating Humidity | 10% to 90% RH non-condensing |
| Storage Humidity | 10% to 90% RH non-condensing |
| Vibration | 3 axis random vibration |
| Shock | 3 foot drop onto concrete |

Power specifications

Table 29 provides the power specifications for the HST.

Table 29 Power specifications

| Parameter | Specification |
|----------------------------|---|
| Battery type | Lithium Ion |
| Battery life | |
| Operating time | Under typical conditions, should get 8 hours continuous use |
| Battery pack | The expected life of the battery pack is 2 to 3 years. The pack should maintain at least 70% of it's original capacity after 300 charge cycles. |
| Battery recharge time | Up to 7 hours |
| Power supply input | 100 to 240 VAC, 50/60 Hz, autosensing |
| Power supply input current | 5 A @ 115 VAC, 3 A @ 230 VAC |

Customer Services

B

This appendix describes the customer services available through JDSU's Communications Test and Measurement division (Acterna). Topics discussed in this appendix include the following:

- [“About our services” on page 198](#)
- [“Customer care” on page 198](#)
- [“Global services and solutions” on page 203](#)

About our services

JDSU offers an unmatched portfolio of services to deploy, support and innovate purchased equipment through its Customer Care and Global Services and Solutions organizations. Customer Care is standard with every product sale and consists of business hours technical assistance, in-warranty repair, calibration, and upgrade services. Global Services and Solutions provides professional services to optimize product capabilities and maximize efficiencies, including field engineering and deployment, technical training, product support, consulting and custom software development. Together these organizations supply the services necessary successfully utilize purchased equipment.

Customer care

Customer Care is accompanied with the sale of every JDSU product. Customer Care services include:

- Needs Analysis on Products and Services
- Comprehensive Product and Service Literature
- Pre-Sales Consulting
- Technical Assistance (Business Hours)
- Instrument Repair (Under Warranty Repair and Calibration Services)
- Immediate Return Authorizations

Contact a Customer Care representative through your local distributor or by accessing www.jdsu.com for information on upgrades, calibration, warranty policies or any of Global Services and Solutions offerings. Representatives also provide assistance with product repairs and returns.

Technical assistance (business hours) Expert business hours technical support, including help with product configuration, circuit qualification, and complete network trouble sectionalization is provided with your product (see [“Technical assistance” on page xv](#)). For around-the-clock support, 7x24 technical assistance may be purchased through Global Services and Solutions FleetCare program (see [“Product support” on page 206](#)).

Instrument repair Our service centers provide repair, calibration and upgrade services for under warranty equipment. JDSU understands the impact of equipment down time on operations and is staffed to ensure a quick turnaround. Available services include the following:

Product Repair — All equipment returned for service is tested to the same rigorous standards as newly manufactured equipment. This ensures products meet all published specifications, including any applicable product updates.

Calibration — JDSU’s calibration methods are ISO 9001 approved and based on NIST standards.

Factory Upgrades — Any unit returned for a hardware feature enhancement will also receive applicable product updates and will be thoroughly tested, ensuring peak performance of the complete feature set.

Additional repair, calibration and upgrade services are available for purchase through Global Services and Solutions (see [“Product support” on page 206](#)).

Equipment return instructions Please contact your local Customer Care location via telephone or web site for Return or Reference Authorization to accompany your equipment. For each piece of equipment returned for repair, attach a tag that includes the following information:

- Owner’s name, address, and telephone number.
- The serial number, product type, and model.
- Warranty status. (If you are unsure of the warranty status of your instrument, contact JDSU Customer Care.)
- A detailed description of the problem or service requested.
- The name and telephone number of the person to contact regarding questions about the repair.
- The return authorization (RA) number (US customers), or reference number (European Customers).

If possible, return the equipment using the original shipping container and material. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit; when needed, appropriate packing materials can be obtained by contacting JDSU Customer Care. JDSU is not liable for any damage that may occur during shipping. The customer should clearly mark the JDSU-issued RA or reference number on the outside of the package and ship it prepaid and insured to JDSU.

Warranty information

The warranties described herein shall apply to all commercially available JDSU products. Any additional or different warranties shall apply only if agreed to by JDSU in writing. These warranties are not transferable without the express written consent of JDSU.

Hardware Warranty — JDSU warrants that Hardware Product sold to customer shall, under normal use and service, be free from defects in materials and workmanship. Information regarding the specific warranty period for this product can be obtained by contacting your local JDSU Customer Service Representative, or at our web site www.jdsu.com. If installation services have been ordered, the warranty period shall begin on the earlier of (1) completion of installation, or (2) thirty (30) days after shipment to Customer. If Installation Services have not

been ordered, the warranty period shall begin upon shipment to Customer. Hereafter these periods of time shall be collectively referred to as the “Initial Warranty Period.”

JDSU’s obligation and customer’s sole remedy under this Hardware Warranty is limited to the repair or replacement, at JDSU’s option, of the defective product. JDSU shall have no obligation to remedy any such defect if it can be shown: (a) that the Product was altered, repaired, or reworked by any party other than JDSU without JDSU’s written consent; (b) that such defects were the result of customer’s improper storage, mishandling, abuse, or misuse of Product; (c) that such defects were the result of customer’s use of Product in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) that the defect was the result of damage by fire, explosion, power failure, or any act of nature.

JDSU performed repairs shall be warranted from defective material and workmanship for a period of ninety (90) days, or until the end of the Initial Warranty Period, whichever is longer. Risk of loss or damage to Product returned to JDSU for repair or replacement shall be borne by customer until delivery to JDSU. Upon delivery of such product, JDSU shall assume the risk of loss or damage until that time that the product being repaired or replaced is returned and delivered to customer. Customer shall pay all transportation costs for equipment or software shipped to JDSU for repair or replacement. JDSU shall pay all transportation costs associated with returning repaired or replaced product to customer.

Software Warranty — JDSU warrants that Software Products licensed to Customer shall, under normal use and service, and for a period of ninety (90) days from the date of shipment of the Software to Licensee (the “Warranty Period”), perform in all material respects in accordance with the published specifications for such Software as established by JDSU. However, JDSU does not warrant that the Software will operate uninterrupted or

error free, operate in the combination with other software, meet Customer's requirements, or that its use will be uninterrupted.

JDSU's obligation and Customer's sole and exclusive remedy under this Software Warranty is limited to, at JDSU's option, either (i) correcting the material errors reported to JDSU in writing by Customer during the Warranty Period and which JDSU is able to reproduce, (ii) replacing such defective Software, provided that JDSU received written notice of such defect within the Warranty Period, or (iii) provided that JDSU received written notice of such defect within the Warranty Period, terminating the License and, upon return to JDSU of the Software, Documentation and all other materials provided by JDSU under the applicable License, providing Customer with a refund of all charges paid with respect thereto. JDSU shall have no warranty obligations hereunder if (a) the Software is altered or modified or is merged with other software by Customer or any third party or (b) all or any part of the Software is installed on any computer equipment other than the Designated Server or used with any operating system for which the Software is not designed.

Customer acknowledges that the Software Products provided by JDSU hereunder may contain third party software not produced by JDSU (a "Third Party Supplier Product"), and may be made available under the software license(s) specific to that Third Party Supplier Product. To the extent a Third Party Supplier Product is made available under the GNU General Public License, such license shall govern the use of such Third Party Supplier Product, and the following notice shall apply:

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See the GNU General Public License for more details. If you would like to receive further details concerning the use of such General Public License Software or would like to receive a copy of the GNU General Public License, please make a written request to JDSU, One Milestone Center Ct., Germantown, Maryland 20876-4023 or write to the Free Software Foundation, Inc., 59 Temple Place - Suite 330, Boston, MA 02111-1307, USA.”

Services Warranty — JDSU warrants that the Services provided by JDSU, if any, shall be performed promptly, diligently and in a professional manner in accordance with the commercial standards of the industry. JDSU shall not, however, be responsible for any delays that are not due to JDSU’s fault or negligence or that could not have reasonably been foreseen or provided against.

WARRANTY DISCLAIMER — FOR HARDWARE, SOFTWARE, AND/OR SERVICES FURNISHED BY JDSU, THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED. JDSU SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, ON ANY HARDWARE, SOFTWARE, DOCUMENTATION OR SERVICES INCLUDING BUT NOT LIMITED TO WARRANTIES RELATING TO QUALITY, PERFORMANCE, NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AS WELL AS THOSE ARISING FROM ANY COURSE OF DEALING, USAGE OR TRADE PRACTICE. UNDER NO CIRCUMSTANCES WILL JDSU BE LIABLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES RELATED TO BREACH OF THIS WARRANTY.

Global services and solutions

Global Services and Solutions markets a broad portfolio of services to enable customers to aggressively build their competitive advantage within the markets they serve. Global Services and Solutions innovative offerings respond to our customers’ dynamic needs:

- System deployment and field engineering services
- Technical training
- Product support
- Consulting
- Custom software development
- Integrated service programs

Additional information can also be found on our web site under Services.

System deployment and field engineering

JDSU offers a range of support services for our centralized test systems, designed around the needs of the customer's network. Field engineering and deployment services provide a variety of options for implementing the test system into the network.

Deployment — Thorough deployment process covers the initial site survey through hardware and software installation, allowing rapid integration of systems product into customers' environment without the use of their own resources. Deployment includes survey, configuration, installation of hardware and software, site planning, cabling, acceptance testing, staging, certification and system documentation.

Basic Service for Systems — In today's fast-paced world of communications, network operators are deploying increasingly complex communications test and management systems. JDSU's Basic Service for Systems is designed to provide the system experts, support and methodologies to facilitate the integration of systems products into customers' environments. Basic Service for Systems encompasses system deployment, training, software upgrades, technical assistance and repair. This service is subject to availability, please visit www.jdsu.com or contact Customer Care for additional information.

Training JDSU delivers training in instructor-led or alternative learning formats that are flexible, convenient, and timely. Our training solutions portfolio consists of network-specific test and management tools for optical transport, cable, access, data, and wireless environments.

Instructor-led training **Public courses (JDSU sites)**

Public courses help participants quickly acquire fundamental skills or broaden their communications knowledge with advanced instruction. Our courses deliver the ideal mix of theory and practice.

On-site training (Customer site)

JDSU provides practical, customized instruction at the customer's designated site. Whether your goal is to shorten turn-up times or increase operation-wide efficiency, on-site training can be a cost-effective way to train from one to 10 participants. Prior to training, the instructor contacts the customer to ensure the course content is aligned with the organization's training needs. We conduct step-by-step reviews of current technologies and products to help both new and experienced technicians translate theory into practical, hands-on expertise.

When scheduling an on-site course, please note that JDSU requires a minimum commitment of two consecutive days of training. Courses that are only one day in duration may either be paired with another course for a minimum total of two training days, or presented on two consecutive days to different groups of participants.

Alternative learning **Courseware licensing program and train-the-trainer**

Recommended for customers with internal training departments, JDSU's Courseware Licensing Program is a fast, affordable alternative that allows our customers to train their own staff using JDSU's courseware. Each course provides comprehensive instructor and participant materials to ensure

consistent content delivery for the length of the agreement. A critical part of Courseware Licensing is the Train-the-Trainer program, which prepares the organization's own instructors to deliver JDSU training courses. Courseware Licensing is sold in increments of one, two, or three years.

Computer-based training (CBT)

By blending learning with technology, JDSU's CBT program provides our customers with a cost-effective way to learn technology fundamentals and product applications. Topics include ATM, Frame Relay, ISDN, LAN Basics, Fiber Optics, and more. CBTs are designed to complement both public and on-site training; they can serve to prepare students for classroom JDSU courses or be used after instructor-led training to reinforce learning. In addition to our pre-packaged CBTs, JDSU custom-develops CBTs to meet your organization's training needs.

To enroll in a course or for more information on the variety of JDSU training programs available, call 1-800-638-2049 or visit www.jdsu.com and complete the Training Requirement Form.

Product support To continue repair, maintenance and upgrades after a product's warranty expires, JDSU offers a variety of product support plans.

FleetCare — Designed for customers with ten or more JDSU products, FleetCare extends each product's initial factory warranty to include repair parts, labor and one-way shipping. FleetCare allows customers to upgrade the base package with a variety of options, including Calibration Plans, Calibration Plan with Manager, Loaners, 7x24 Technical Assistance and Software Enhancement Agreements.

Software Enhancement Agreements — In response to new developments in technology, JDSU continually upgrades and revises the software that drives many of its products. Software

Enhancement Agreements automatically ships the latest software revisions, releases and upgrades to ensure products are operating at the most technologically advanced level.

Product Maintenance Agreements — Yearly repair and calibration maintenance agreements simplify billing and help ensure equipment is always operating at optimum levels. Product maintenance agreements can be used to extend a current warranty or provide protection for out-of-warranty units.

Repair Pricing Options — For out-of-warranty repairs, JDSU offers two additional pricing options: time and material pricing and flat rate pricing. Under time and material pricing, customers are billed for the actual cost of the repair, making this a cost-effective method for minor repairs. Under flat rate pricing, customers pay a fixed service charge to repair unit failures (excluding damage or abuse).

Consulting services To quickly improve our customer's efficiency and productivity, JDSU offers personalized consulting programs designed to meet specific client needs. Our consulting staff will work as part of your team, providing a valuable blend of subject matter proficiency, an in-depth test and measurement systems perspective, and trusted telecommunications industry vision.

Methods and Procedure Development — JDSU's Methods and Procedure Development services include consulting with your staff and assessing your network plant's current test and turn-up procedures. After evaluating the skill level of your workforce in specific technologies and procedures, an JDSU team of experts identifies potential areas of improvement and makes appropriate recommendations in a formal implementation plan. Depending on your staff 's level of expertise, test procedures can be written to any level of detail, from general methods and procedures to detailed “button-by-button” test and network equipment-specific procedures. In addition, JDSU's experts offer hands-on training for your field technicians and can resolve specific problems at the central office.

JDSU develops test plans and procedures for Service Providers, End-users and Manufacturers of Network Equipment.

Test Automation — With JDSU's Test Automation Development, a team of experts can develop customized automated and remote testing solutions so that you can keep your network functioning at peak levels. After consulting with you, the JDSU team can determine which of JDSU's test and analysis equipment and automation platforms can best streamline your testing processes, data analysis, and test result storage methods. The consulting team can develop and integrate automated testing applications on customers' currently installed computer platforms that match existing methods and procedures. An JDSU team of consultants can assist customers throughout every stage of the development and implementation of automated and remote testing solutions. Services range from developing automated scripts to integrating customized software applications to developing drivers to automated manufacturing tests.

On-site Test and Measurement Service — JDSU On-site Test and Measurement Service provides testing expertise to expedite the implementation, turn-up, and provisioning of network services. Applying their knowledge to your specific network requirements, JDSU's network consultants can quickly verify transmission systems' implementation, assess a fiber plant's suitability for advanced services, future-proof your system. Because incomplete testing often results in crippling losses of revenue, carriers and providers must operate their networks with a very low margin of error. Difficulties in ensuring network performance are further compounded when technicians must employ unfamiliar yet critical test and measurement processes. But with JDSU's dedicated, highly skilled team of professionals providing communications test and measurement solutions, your staff can concentrate on performing value-added services that will maximize your profitability.

Integrated service programs **Service Dollars (North America only)** — To deliver the highest level of support with your product purchase, JDSU offers Service Dollars. Services Dollars can be purchased at anytime, for each JDSU instrument. If purchased at the same time as your product, Service Dollars are discounted 20 percent. This is a significant savings, as Service Dollars can be used towards the purchase of any of Global Services and Solutions offerings. Service Dollars are also flexible in the fact that they can be purchased at anytime and then used later towards the specific service that best fits your support needs.

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