

SmartClass

ADSL Tester, Copper Tester, and ADSL/Copper Tester

User's Guide

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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 x](#)
- [“Assumptions” on page x](#)
- [“Safety and compliance information” on page x](#)
- [“Conventions” on page x](#)

Purpose and scope

The purpose of this guide is to help you successfully use the features and capabilities of the SmartClass ADSL Tester.

This guide includes task-based instructions that describe how to configure, use, and troubleshoot the general functions of the SmartClass ADSL Tester. Additionally, this guide provides a description of JDSU's warranty.

Assumptions

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

Safety and compliance information

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

Conventions

This symbols and safety terms used in this guide are described in the following tables.

Table 1 Symbol conventions





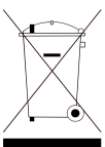
	This symbol represents a general hazard.
	This symbol represents a risk of electrical shock.
	This symbol represents a risk of explosion
	This symbol represents a Note indicating related information or tip.
	This symbol, located on the equipment, battery, or its packaging indicates that the equipment 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 2 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.

Getting Started

1

This chapter provides a general description of the SmartClass ADSL/Copper Tester. Topics discussed in this chapter include the following:

- “Ship list” on page 2
- “Features and capabilities” on page 2
- “Preparation for use” on page 4

Ship list

The ADSL/Copper Tester typically ships in anti-static packing material to stabilize the unit inside the box. The following items typically ship standard with the SmartClass ADSL/Copper Tester, but can vary depending on the configuration:

- SmartClass ADSL/Copper Tester unit.
- Universal Power Adapter — A power adapter designed specifically for the SmartClass Tester is included. When supplying power to the SmartClass Tester using an adapter, you must use this adapter. Additional AC line plug adapters are also included.
- Carrying Bag
- 4 AA Rechargeable NiMH Batteries
- Documentation CD. The User's Guide is included as a PDF on the CD. Safety information is provided separately, in printed format.
- Appropriate cables, depending on the configuration
 - Ethernet Cable (for Ethernet connection, only included with ADSL configurations)
 - RJ11 Phone Cable (for DSL connection, only included with ADSL configurations)
 - Mini-banana to clip cable (for Copper connections, only included with Copper configurations)

When unpacking the unit, verify that each of the standard items, and any optional items you ordered, are included in the package.

Features and capabilities

Features and capabilities of the Tester will vary depending on the unit configuration. (For more information, see [“Configurations” on page 3.](#))

ADSL features include the following:

- Qualification of ADSL2+ access service
- Supports the following standards:
 - G.992.5 Amendment 1
 - G.992.5 Annex M
- Supports INP >2 (Impulse Noise Protection settings greater than 2)
- Compatibility with ADSL1 service
- RE-ADSL support (Reach Extended ADSL2 - “Annex L”)
- IP layer testing over PPPoE, PPPoA, IPoA, IPoE including:
 - IP ping
 - FTP
 - HTTP
- Terminate Mode testing
- Through Mode testing
- Field replaceable batteries

Copper features include the following:

- DVOM testing
 - AC volts
 - DC volts
 - Resistance
 - Leakage
- Voltage and resistance snapshot
- Capacitance testing
 - Opens (length)
 - microFarads
- Longitudinal balance
- DC current
- Load coil detector
- Automated cable check test

Options

The SmartClass ADSL/Copper Tester has factory-configurable options as well as options available for field upgrade. You can expand your testing capability by purchasing optional software or accessories.

Configurations

The SmartClass ADSL/Copper Tester is factory configurable with or without Copper or ADSL. [Table 3](#) describes the available configurations.

Table 3 SmartClass ADSL/Copper Tester configurations

Catalog Number	Option
SC-ADSL-A	SmartClass ADSL2+, Annex A. Allows you to test ADSL2+ services.
SC-ADSL-ACU	SmartClass ADSL2+, Annex A and Copper. Allows you to test ADSL2+ services and Copper services.
SC-COPPER	SmartClass Copper. Allows you to test Copper services

Software options

[Table 4](#) lists the software options offered for the ADSL/Copper Tester. These are only available on the SmartClass ADSL and ADSL/Copper Testers

Table 4 SmartClass ADSL/Copper Tester software options

Catalog Number	Option
SCASWADVIP	Advanced IP option. Allows testing IP data services such as VCC scan, IP Pool test, and Port test
SCASWVIDEO	Video option. Allows testing of the video transmission stream at the packet level.
SCA-PTM	PTM support. Allows packet transfer mode (PTM). Requires software version 3.05.03.

Software versions There are two software versions available for the ADSL/Copper Tester. [Table 5](#) provides descriptions of the software versions.

Table 5 SmartClass ADSL/Copper Tester software versions

Software version	Description
3.04.03	The standard software version.
3.05.03	This version is required to use the PTM option.

Preparation for use

This section explains how to start using your ADSL/Copper Tester.

General preparation When you unpack the ADSL/Copper Tester, do the following:

- Inspect the tester for damage.
- If undamaged, save the box and packing materials in case you need to ship the tester in the future.

Before using the ADSL/Copper Tester for the first time, do the following:

- If you are using alkaline batteries, install fresh batteries in the tester.
- When prompted, specify the type of battery you installed.
- Turn the unit ON, and then verify that it is operating properly by navigating through a few menus.
- If the Batt. LED is red, re-charge or replace the batteries.
- If the unit doesn't power up after installing rechargeable batteries, the batteries have too low of a charge and the charging circuit does not recognize them. Connect the AC Adapter, go to the SYSTEM SETUP > BATTERY menu, and then press the pound/hash (#) key to manually start charging the batteries.



WARNING: DAMAGE TO BATTERIES

Forcing charge on Alkaline batteries may damage the batteries. Only perform the force charge on rechargeable batteries.

Changing the AC line plug fitting

The ADSL/Copper Tester's AC Adapter/Charger allows different AC line plug fittings.

To change the AC line plug fitting

- 1 If an AC line plug fitting is already installed, do the following:
- 2 Press and hold the button just below the fitting.
- 3 Slide the fitting out of the slot.
- 4 Select the appropriate AC line plug adapter.
- 5 Slide the AC line plug adapter into the slot.
You will hear a click when the fitting is fully inserted.

The AC Adapter/Charger is ready for use.

Quick Tour

2

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

- [“Exploring the front panel” on page 6](#)
- [“Exploring the connector panel” on page 7](#)
- [“Exploring the bottom panel” on page 8](#)
- [“Exploring the top panel” on page 8](#)
- [“Navigating the user interface” on page 9](#)
- [“Using the keypad” on page 10](#)

Exploring the front panel

The controls and LEDs on the SmartClass front panel, shown in [Figure 1](#), are used to operate the unit, set up tests, and view data.



Figure 1 SmartClass front panel

The nameplate may say SmartClass ADSL or may say SmartClass Copper, depending on which configuration you purchased.

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

- Status LEDs** These indicators report the status of the unit. The function of each LED is described in [“LEDs” on page 46](#).
- LCD** The LCD is a 240 x 160 pixel transfective black and white display with contrast control and backlight.
- Cancel key** Use the Cancel key to exit a menu without changing your settings, or to return to the previous menu.
- OK key** Use OK to accept a changed setting or to proceed to the next menu.
- Arrow keys** Use the arrow keys to navigate through menu selections.

Keypad Use the keypad 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.

Backlight key Use the backlight key to turn the LCD backlight on or off.

Power key Use the power key to turn the unit power on or off. Press and hold for 1 second to turn on. Press to turn off, and then OK to confirm.

Exploring the connector panel

The SmartClass connector panel is used to connect the ADSL/Copper Tester to the ADSL line under test. If you have a Copper only unit, this panel will be blank. [Figure 2](#) shows the connector panel.

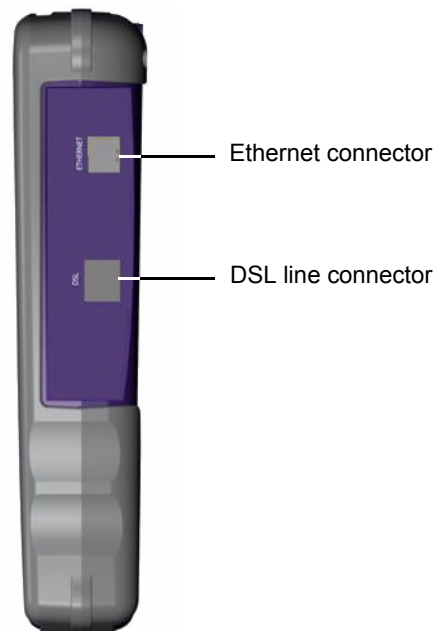


Figure 2 SmartClass connector panel

Use the 6-pin modular **DSL** jack when connecting to ADSL circuits. If you are testing in through mode, connect an Ethernet cable to the **Ethernet** jack.

NOTE:

The Ethernet port is auto configured to accept either a patch or cross-over cable.



WARNING: ELECTRICAL SHOCK

Electrical shock may result in serious injury or death. Use care when connecting to telecommunications circuits, to be sure that you do not come in contact with exposed conductors or power mains. Connect TNV signals to TNV ports only.



CAUTION: FIRE HAZARD

To reduce the risk of fire, use only 26 AWG or larger telecommunications line cord between the DSL jack and the wall.



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).

Exploring the bottom panel

The SmartClass' AC Adapter/charger and USB connector are located on the bottom panel. The USB device port is used to upgrade firmware, configure the instrument, and download test results to a PC.



Figure 3 SmartClass bottom panel

Exploring the top panel

If your SmartClass ADSL/Copper Tester is equipped with copper testing, the connectors are located on the top panel.



Figure 4 SmartClass top panel

The three mini-banana jacks are used to connect to tip (A) and ring (B) pair, and to ground (earth).



CAUTION: INSTRUMENT DAMAGE

Connecting to circuits with voltage higher than 300 V Peak, compared to ground, may damage the internal components. Connect only to circuits with less than 300V. 220V electrical supply is greater than 300V peak: DO NOT TEST 220V or any electrical supplies.

Navigating the user interface

The user interface of the SmartClass is designed to be intuitive and easy to use. Using the LCD and keypad, you can view test results, set up the unit, and configure test parameters. This section describes the user interface, and explains how to navigate through the menus and screens.

When you power up the SmartClass ADSL/Copper Tester, the user interface appears (see [Figure 5](#)).

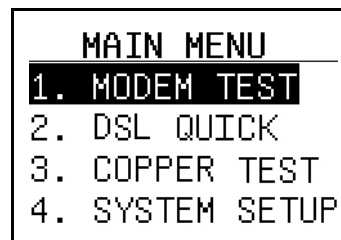


Figure 5 SmartClass user interface (example)

There are 3 types of screens on the user interface:

- Menu screens
- Data entry screens
- Results screens

Menu screens [Figure 7](#) illustrates a typical Menu screen.

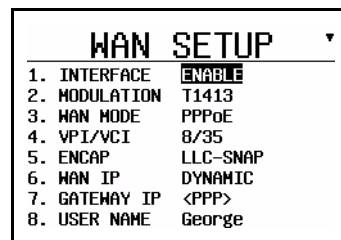


Figure 6 SmartClass Menu screen (example)

Menu screens provide a series of selections that take you to another menu screen, a data entry screen, or a results screen.

Data entry screens Figure 7 illustrates Data entry screens.

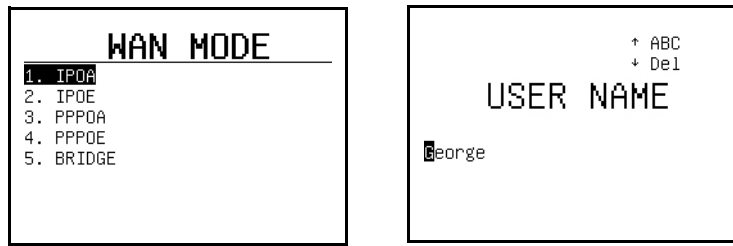


Figure 7 SmartClass Data entry screens (example)

Data entry screens provide you selections to either choose from a list of options (left example), or enter data using the keypad (right example). Use the up arrow to change the entry type (**ABC** is upper case, **abc** is lower case, **123** is numeric), or the down arrow to delete one character to the left.

Result screens Figure 8 illustrates a Result screen.

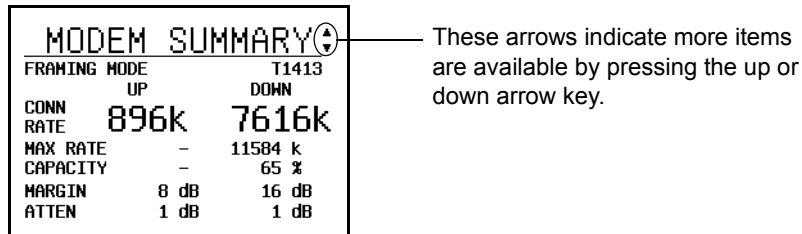


Figure 8 SmartClass Result screen (example)

These screens display error logs or test results. The results are split into categories. Press the arrow keys to navigate among the results categories (screens).

Using the keypad

Use the keypad to enter alpha-numeric values, or to navigate to different screens by specifying the menu number corresponding to the screen.

Selecting a menu option

There are two ways to select a menu option.

- Use the arrow keys to scroll to the desired option then press the OK key.
- Press the number associated with the menu option.

Specifying On/Off or Yes/No values

On a data entry screen you enter data or specify values. There are two ways to specify on/off or yes/no values.

- Use the arrow keys to scroll to the desired option then press the OK key to toggle the value on or off.
- Press the number associated with the menu option to toggle the value on or off.

Entering numeric values

To enter numeric values

- 1 Use the arrow keys to scroll to and highlight the setting you want to specify.
- 2 Press OK.
- 3 Use the up arrow to change the entry type to numeric (**123** in upper right of screen).
- 4 Use the keypad to type the numeric value.
- 5 If you want to move to the next field, either wait one second for the cursor to jump, or use the right arrow key.

Typing text

To type text

- 1 Use the arrow keys to scroll to and highlight the setting you want to specify.
- 2 Press OK.
- 3 Use the keypad to type the text.

Repeated presses scroll through the selections for that key. For example, repeatedly pressing the 2 key will scroll through A, B, C and 2.

To enter special characters, press the asterisk/star (*) or pound/hash (#) key until the desired character appears.

To cycle through upper/lower case and numeric entry, press the up arrow. Use the down arrow to delete one character to the left.

To move to the next field, either wait one second for the cursor to jump, or use the right arrow key.

If you move the cursor between characters, typing characters will insert new characters at that location. To append characters, position the cursor at the end of your text, after the last character.

Instrument Settings

3

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

- [“Viewing software versions” on page 14](#)
- [“Setting the date and time” on page 14](#)
- [“Changing the date format” on page 14](#)
- [“Adjusting the contrast” on page 15](#)
- [“Specifying the auto power down setting” on page 15](#)
- [“Enabling PTM mode” on page 16](#)
- [“Viewing the battery status” on page 16](#)
- [“Setting the language” on page 16](#)
- [“Restoring factory defaults” on page 17](#)

Viewing software versions

The software version screen provides the software version of the internal components such as the boot code and ATM driver. It also reports the modem firmware and annex type (annex A or B).

To view internal software versions

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **SW VERSION**.

The software version of the internal components appear.

Setting the date and time

The ADSL/Copper Tester has an internal clock that you can set to provide accurate time stamps for test results. The clock uses a 24-hour format.

The following procedure describes how to set the time.

To set the time

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **DATE-TIME**.
- 3 Enter the current hour, minutes, and seconds.
Use the arrow keys to move among each field.
- 4 Press the **OK** key.

The time is set.

The following procedure describes how to set the date.

To set the date

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **DATE-TIME**.
- 3 Scroll down to the **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.

Changing the date format

Using the Date and Time menu, you can change the format of the date. You can specify either MM/DD/YYYY or DD/MM/YYYY formats.

To change the date format

- 1 Select **SYSTEM SETUP** from the Main Menu.

- 2 Select **DATE-TIME**.
 - 3 Scroll down to the date format.
 - 4 Press the left or right arrow key to toggle between the two formats.
- The date format is set.

Adjusting the contrast

The following procedure describes how to adjust the contrast.

To adjust the contrast

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **CONTRAST**.
- 3 Change the contrast level using the up or down arrow key.
- 4 Press the **OK** key.

NOTE:

You can also adjust the contrast during upgrades and other “boot” modes by pressing the up or down arrow key.

The contrast is set.

Specifying the auto power down setting

This menu allows you to select whether to automatically power down the unit to conserve battery life, and set the time to wait before power down. The following procedure describes how to control auto power down.

NOTE:

The ADSL/Copper Tester will not automatically power down when a key is pressed, when synchronized on the line, or connected to the charger.

To specify the auto power down setting

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **AUTO POWER**.
- 3 Use the left or right arrow keys to move among the selections:
 - OFF - never automatically power down
 - 5, 10, or 15 Minutes - the amount of time to wait (in minutes) after a keypress or no line activity before power down.
- 4 Press the **OK** key.

The auto power down setting is specified.

Enabling PTM mode

If your unit is equipped with the PTM option, this menu allows you to enable pattern transfer mode (PTM mode).

To enable PTM mode

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **PTM SETUP**.
- 3 Select **ENABLE**.

NOTE:

When PTM is enabled, no data tests can be done (IP Ping, Trace Route, and so on). To run data tests, disable PTM mode.

Viewing the battery status

The battery menu reports the following:

- type of battery
- battery status
- voltage

To view the battery status

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **BATTERY**.
- 3 View the battery status.

NOTE:

You also use this menu to manually start charging the batteries, if necessary (see the last bullet in [“General preparation” on page 4](#)).

- 4 Press the **Cancel** key to exit the menu.

Setting the language

The LANGUAGE menu allows you to change the language of the user interface.

To set the language

- 1 Select **LANGUAGE** from the Main Menu.
- 2 Select the desired language.

The user interface changes to the specified language.

Restoring factory defaults

The following procedure describes how to reset the ADSL/Copper Tester to factory default settings.

NOTE:

Restoring factory defaults will reset test application settings and system settings (such as contrast and language). It does NOT change or delete stored configurations or saved results.

To reset to factory defaults

- 1 Select **SYSTEM SETUP** from the Main Menu.
- 2 Select **FACTORY DEFS**.
You may have to scroll to find the FACTORY DEFS selection.
A confirmation menu appears.
- 3 Press the **OK** key to reset the defaults or **Cancel** to keep the current settings.

ADSL Testing

4

This chapter provides task-based instructions for gathering ADSL2+/2/1 statistics and verifying connectivity. Topics discussed in this chapter include the following:

- [“About ADSL testing” on page 20](#)
- [“Running a DSL QUICK test” on page 20](#)
- [“Ping testing” on page 21](#)
- [“Releasing IP addresses” on page 21](#)
- [“Web testing” on page 22](#)
- [“FTP testing” on page 23](#)
- [“Video testing” on page 24](#)
- [“Traceroute testing” on page 25](#)
- [“ATM OAM loopback testing” on page 25](#)
- [“VCC scan testing” on page 26](#)
- [“IP pool testing” on page 27](#)
- [“Port testing” on page 27](#)

About ADSL testing

The SmartClass ADSL/Copper Tester offers a suite of testing options, including ping, FTP, trace route, VCC scan, and others. All of these testing options are described in this document, but not all options are supported with all versions of the product. All configurations include IP ping, while advanced IP tests and video are optional.

Running a DSL QUICK test

Run a DSL QUICK test when you want to connect to the far end of the circuit and gather statistics, but do not require longer term testing or advanced IP testing.

To run a DSL QUICK test

- 1 If the tester is not on, press the Power key to turn it on.
- 2 Connect a cable from the line to the **DSL** jack on the right side of the ADSL/Copper Tester.
- 3 Select DSL QUICK.
The modem begins to boot.
- 4 If you have previously specified test settings, go to [step 5](#).
To specify test settings, do the following:
 - a Select WAN SETUP and specify WAN settings. (For more information, see [“Specifying WAN settings” on page 36](#).)
 - b Select PING SETUP and specify PING settings. (For more information, see [“Specifying ping settings” on page 38](#).)
 - c Select QUICK TIME and specify the duration of the quick test, between 1 and 15 minutes.
- 5 To begin the test, select DSL QUICK again.
The modem finishes booting and then begins to synchronize. Modem synchronization may take a few minutes.
After the modems have achieved synchronization, the results screen appears and statistics are gathered and displayed.
The modem will automatically disconnect after 2 minutes but the results will be held in view until you exit the test.
You may also save test results from within DSL QUICK Test (see [“Saving results” on page 58](#)).

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Ping testing

Run a ping test when you want to send and receive ping packets to test connectivity.

When running a ping test, the ADSL/Copper Tester sends out a ping request packet to which the destination (target) responds by sending a response packet. Ping tests tell you if the destination is alive and awake, how fast the ping went to the destination and back to the ADSL/Copper Tester, and if ping packets were dropped and lost along the way.

This procedure involves two main steps:

- specifying ping settings
- viewing the results

To run a ping test

- 1 If you haven't already done so, do the following:
 - a If the tester is not on, press the Power key to turn it on.
 - b Connect a cable from the line to the **DSL** jack on the right side of the ADSL/Copper Tester.
 - c Wait for the modems to sync. After synchronization, proceed to [step 2](#).
- 2 Specify the settings on the PING SETUP menu.
See [“Specifying ping settings” on page 38](#).
- 3 View the test results on the PING menu.
 - a Select **MODEM TEST**.
 - b Select **PING**.The PING results appear.
- 4 To view Ping requests sent to the SmartClass ADSL/Copper Tester, press the down arrow.
The PING MONITOR screen appears. This screen reports any ping requests that were sent to you. This counter runs continuously in the background, and shows the last address that sent a PING to the ADSL/Copper Tester, and the number of PINGs received.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Releasing IP addresses

The SmartClass ADSL/Copper Tester allows you to release allocated IP addresses, so it can be used by other equipment. The IP release feature is available when the WAN or LAN mode is set to IPoE (IP over Ethernet), or when the WAN mode is set to PPPoA (Point-to-point Protocol over ATM) or PPPoE (Point-to-point Protocol over Ethernet).

For instructions on setting the WAN mode, see [“Specifying WAN settings” on page 36](#). For instructions on setting the LAN mode, see [“Specifying LAN settings” on page 37](#).

The following procedure describes how to release IP addresses.

To release IP addresses

- 1 If you haven't already done so, do the following:
 - a If the tester is not on, press the Power key to turn it on.
 - b Connect a cable from the line to the **DSL** jack on the right side of the ADSL/Copper Tester.
- 2 After the modem has synchronized, use the arrow keys to navigate to the WAN or LAN STATUS result screen.
- 3 Press the **1** key for IP RELEASE.
This releases the IP address that was dynamically assigned by the network.

The IP address is released and available for use by other equipment.

NOTE:

After releasing the address, you can request a new address by pressing the **1** key for IP RENEW.

The ADSL/Copper Tester also releases the address when you exit the test application or when the power is turned off.

Web testing

Web Test uses HTTP to connect to a remote web site, quickly verifying the responsiveness by downloading a web page.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- specifying the destination address
- run the test

To run a web test

- 1 If you haven't already done so, do the following:
 - a If the tester is not on, press the Power key to turn it on.
 - b Connect a cable from the line to the **DSL** jack on the right side of the ADSL/Copper Tester.
 - c Wait for the modems to sync. After synchronization, proceed to [step 2](#).
- 2 Specify the settings on the WEB TEST SETUP menu.
See "[Specifying web test settings](#)" on page 38.

- 3 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **WEB TEST**.

The Web Test runs automatically and displays connection status, bytes, time, and rate.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

FTP testing

FTP (File Transfer Protocol) is used to transfer a file across a network and measure the transfer time. It is an effective way to evaluate IP-based network performance using a method many customers also use.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- configure the FTP test settings
- run the test

To run a FTP test

- 1 If you haven't already done so, do the following:
 - a If the tester is not on, press the Power key to turn it on.
 - b Connect a cable from the line to the **DSL** jack on the right side of the ADSL/Copper Tester.
 - c Wait for the modems to sync. After synchronization, proceed to [step 2](#).
- 2 Specify the settings on the FTP SETUP menu.
See [“Specifying FTP settings” on page 39](#).
- 3 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **FTP**.

FTP will start automatically and display the destination address, connection status, download file size, download time and rate.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Video testing

The video test option analyzes the video transmission stream QoS at the packet level. Since the initial video quality is established by the source material and encoding process at the head end, and the decoding quality is established by the Set-Top-Box, the effects of the transport and access networks on the video streams are the variables requiring analysis. Actual video content decoding is not performed.

NOTE:

You must have the advanced IP option and the Video option installed to use this feature.

This procedure involves two main steps:

- configure the video settings
- run the test

To run a video test

- 1 Specify the settings on the VIDEO SETUP menu.
See [“Specifying Video settings” on page 39](#).
- 2 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **VIDEO TEST**.

NOTE:

The data connection must be established (indicated by a solid green Frame LED) for video streams to be visible to the SmartClass Tester and the video statistics screens to show activity.

- d To change the video channel, press the right arrow. This returns you to the video setup. After specifying the new channel, press the left arrow to return to the video test. The test restarts.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Traceroute testing

Traceroute testing is used when a connection or PING is slow and you need to locate the network segment which is causing the delay. It transmits a series of ICMP PINGS while changing the TTL (Time to Live) of each request and watches for the response of the upstream routers.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- configure the destination web URL address
- run the test

To run a Traceroute test

- 1 Specify the settings on the TRACEROUTE SETUP menu.
See [“Specifying traceroute settings” on page 40](#).
- 2 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **TRACEROUTE**.

Traceroute will start automatically and display a list of routers, including the IP address, name (if available), and delay.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

ATM OAM loopback testing

ATM loopback testing is used to verify ATM circuit end to end or segment provisioning. This test uses the operations and maintenance (OAM) channel to send F4 and F5 loopback commands. The ADSL/Copper Tester uses the VPI/VCI configured on the WAN SETUP screen for this test.

NOTE:

You must have the advanced IP option installed to use this feature.

To run an OAM loopback test

- 1 Select **MODEM TEST**.
- 2 Select **ADVANCED**.
- 3 Select **OAM LPBK**.
- 4 Use the left or right arrows to select the type of loopback (PING TYPE).
- 5 Specify the number of loopback requests to send (1-20).
- 6 Press the **#** key (or the **OK** key) to transmit the loop command to the applicable device.

The status is displayed at the top of the menu (reply or fail).

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

VCC scan testing

The Virtual Circuit Connections (VCC) scan is designed to look for remote ATM activity on preprogrammed VCs, such as OAM loopback cells from the NOC. The SmartClass ADSL/Copper Tester does not generate this traffic during the test and requires a remote traffic source. VCC (virtual circuit connection) scan helps verify ATM provisioning by checking for ATM cell activity on five ATM VPI/VCI combinations.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- configure the VPI/VCI of five Virtual Circuits you wish to scan
- run the test

To run a VCC scan test

- 1 Specify the settings on the VCC SETUP menu.
See [“Specifying VCC scan settings” on page 41](#).
- 2 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **VCC SCAN**.

VCC Scan will tear down and reset the network connection to perform this test. It will start automatically and display whether the selected VPI/VCI is active or inactive.

NOTE:

If remote traffic is not available for VCC scan, use the OAM Loopback test to verify if the WAN VPI/VCI is provisioned.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

IP pool testing

IP pool Test works only on the Ethernet interface, and verifies that a connection is provisioned to assign multiple IP Addresses to one device such as a multimedia gateway/router/IAD. Run this test only when your network supports multiple IP address assignments to one computer or device. This test will request IP address assignments from the network up to the pool size set under the IP pool configuration.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- configure the IP pool size
- run the test

To run an IP pool test

- 1 Specify the settings on the IP POOL SETUP menu.
See [“Specifying IP pool settings” on page 41](#).
- 2 View the test results.
 - a Select **MODEM TEST**.
 - b Select **ADVANCED**.
 - c Select **IP POOL**.

NOTE:

IP pool test only works via the Ethernet interface.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Port testing

The port test works only on the Ethernet interface and tries to connect and open a specific, configured IP address and port number, to verify the selected port is active. For example, it may be necessary to verify a specific IP address and port number is active in order to process credit card transactions over the network.

NOTE:

You must have the advanced IP option installed to use this feature.

This procedure involves two main steps:

- configure the ports (port numbers) you wish to scan
- run the test

NOTE:

This test is only available if the modem firmware version is higher than 108.96.3a.002.

To run a port test

- 1** Specify the settings on the PORT SETUP menu.
See [“Specifying port settings” on page 41](#).
- 2** View the test results.
 - a** Select **MODEM TEST**.
 - b** Select **ADVANCED**.
 - c** Select **PORT TEST**.

NOTE:

The port test only works via the Ethernet interface.

For more information on the results, see [Chapter 7 “Interpreting Test Results”](#).

Copper Testing

5

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

- [“About copper testing” on page 30](#)
- [“Running a cable check” on page 30](#)
- [“Performing a snapshot test” on page 31](#)
- [“Performing copper measurements” on page 31](#)
- [“Cord compensation” on page 33](#)
- [“Calibrating the unit” on page 33](#)

About copper testing

The SmartClass Tester's optional copper features allow quick turn-up and basic troubleshooting of the copper local loop.

The copper features include two quick tests:

- cable check, auto test
- snapshot test

You can also perform specific measurements for the following tests:

- AC volts
- DC volts
- Resistance
- Leakage
- Distance to short
- Opens (distance) and capacitance
- DC current
- Balance
- Load coil detect

Each of these tests is described in the following sections.

Running a cable check

The cable check is an JDSU out-of-service pair quality test. It automatically performs a series of test including: DVOM (AC/DC volts, resistance), Opens/ Capacitance, Balance, and Load Coil Detect. It also compares results to user-defined threshold values and provides a pass/fail indication.

To run a cable check

- 1 Connect the tip (A), ring (B), and ground (earth) leads to the line under test.
- 2 From the main menu, select **COPPER TEST**.
- 3 Press the **1** key to select CABLE CHECK.

The test begins to run.

As each test runs, the test summary is updated. The summary provides a simple pass/fail indication.

NOTE:

You can specify the pass/fail threshold values on the COPPER TEST> SETUP menu.

The test stops automatically when complete.

- 4 To view more detail, use the arrow keys to scroll through the result values. To learn what your results mean, see [Chapter 7 “Interpreting Test Results”](#).

You can save your results, if desired. See [“Saving results” on page 58](#).

Performing a cable check is complete.

Performing a snapshot test

The snapshot feature performs a quick test of AC volts, DC volts, and resistance across all pairs (T-R/T-G/R-G).

To perform a snapshot test

- 1 Connect the tip (A), ring (B), and ground (earth) leads to the line under test.
- 2 From the main menu, select **COPPER TEST**.
- 3 Press the **2** key to select **SNAPSHOT**.
The test begins to run.

■ **NOTE:**

The default volt meter measurement impedance is 1M Ω . To change to 100K Ω , press the asterisk/star (*) key.

The test stops automatically when complete.

To learn what your results mean, see [Chapter 7 "Interpreting Test Results"](#).

Performing copper measurements

Using the MEASURE menu, you can individually perform all of the copper measurements. If you want to skip a measurement, use the down arrow to move to the next test. After a one second pause, the test begins automatically.

To perform copper measurements

- 1 Connect the tip (A), ring (B), and ground (earth) leads to the line under test.
- 2 From the main menu, select **COPPER TEST**.
- 3 Press the **3** key to select **MEASURE**.
The **AC VOLTAGE** menu appears.
The test begins automatically and results appear on the screen.
- 4 Use the left and right arrow keys to change the pair.

■ **NOTE:**

The default volt meter measurement impedance is 1M Ω . To change to 100K Ω , press the asterisk/star (*) key.

- 5 *Optional.* To reset the high and low values, press the pound/hash (#) key.
- 6 Press the down arrow to move to **DC VOLTAGE**.
The test begins automatically and results appear on the screen.

■ **NOTE:**

The default volt meter measurement impedance is 1M Ω . To change to 100K Ω , press the asterisk/star (*) key.

- 7 Use the left and right arrow keys to change the pair.
- 8 *Optional.* To reset the high and low values, press the pound/hash (#) key.

9 Press the down arrow to move to **RESISTANCE**.

The test begins automatically and results appear on the screen.

NOTE:

The unit will check for damaging voltages before performing the resistance test. If detected, the unit will display "WARNING! VOLTAGE DETECTED" and will not perform the test.

10 Use the left and right arrow keys to change the pair.

11 *Optional.* To reset the high and low values, press the pound/hash (#) key.

12 If resistance is 4 k Ω or less, the Distance to Short is displayed.

NOTE:

For the resistive distance to be accurate, it is critical that you enter the correct gauge and temperature on the COPPER SETUP menu. Use the asterisk/star (*) key to go directly to the COPPER SETUP menu.

13 Press the down arrow to move to **LEAKAGE**.

The test begins automatically and results appear on the screen.

14 Use the left and right arrow keys to change the pair.

15 *Optional.* To reset the high and low values, press the pound/hash (#) key.

16 Press the down arrow to move to **OPENS**.

This test measures the total electrical (capacitive) length of a pair.

The test begins automatically and results appear on the screen.

NOTE:

When measuring from Tip or Ring to ground, you should connect the ground lead to the shield (ground), and be sure to enter the fill type (in the COPPER SETUP menu) or the distance will not be accurate. If you connect to some other ground that is not parallel to your pair, and do not enter the appropriate fill type, this measurement will be inaccurate.

17 Use the left and right arrow keys to change the pair.

18 Press the down arrow to move to **DC CURRENT**.

The test begins automatically and results appear on the screen.

19 *Optional.* To reset the high and low values, press the pound/hash (#) key.

20 Press the down arrow to move to **BALANCE**.

Balance is a number representing the quality of the telephone circuit and the degree to which the tip and ring conductors are electrically the same in their ability to cancel noise. The balance measurement is used to identify poor loop quality or cable bonding and grounding issues that allow excessive loop noise.

The test begins automatically and results appear on the screen.

21 *Optional.* To reset the high and low values, press the pound/hash (#) key.

22 Press the down arrow to move to **LOAD COIL**.

The SmartClass ADSL/Copper Tester can detect up to five load coils that may exist on the line, out to 27,000 (8,200 meters) feet. It will also report a short, open, or a high noise condition, if detected. For accurate load coil detection, disconnect the pair from the CO/exchange to remove CO

battery/wetting current. Although the detector will work with voltage on a pair, accuracy will be reduced. In addition, the detector works best when the last coil is followed by at least 1200 feet (336 meters) of cable.

The test begins automatically and results appear on the screen.

To learn what your results mean, see [Chapter 7 “Interpreting Test Results”](#).

You can save your results, if desired. See [“Saving results” on page 58](#).

You are finished performing measurements.

Cord compensation

For greatest accuracy, JDSU recommends that you perform a cord compensation to remove the effects of the test leads from the test measurements. There are two scenarios for compensation: all leads open and all leads shorted.

To compensate for the cords

- 1 From the main menu, select **COPPER TEST**.
- 2 Press the **4** key to select SETUP.
The SETUP menu appears.
- 3 Press the **8** key to select CORD COMP.
- 4 Follow the instructions on the screen to connect the black, red, and green leads to perform test lead compensation.
- 5 Press the **#** key to start.
The compensation stops automatically when finished.

Calibrating the unit

On occasion, your unit may need calibration to maintain accuracy of the copper test functions. This built-in calibration replaces the need for factory calibration.

To calibrate the unit

- 1 From the main menu, select **COPPER TEST**.
- 2 Press the **5** key to select CALIBRATION.
An acknowledgement screen appears.
- 3 Select **OK** to continue the calibration.
The ADSL/Copper Tester performs a self calibration. The self-calibration values are stored in internal memory.
- 4 Press Cancel to return to the **COPPER TEST** menu.

Configuring Tests

6

This chapter provides task-based instructions for configuring tests and for saving the configurations for future testing. Topics discussed in this chapter include the following:

- [“Specifying test configuration settings” on page 36](#)
- [“Saving a test configuration” on page 43](#)
- [“Loading a configuration” on page 43](#)

Specifying test configuration settings

Before you begin testing, make sure the test settings on the ADSL/Copper Tester match the settings of the line and network configuration you are testing. The procedures in this section describe how to specify settings for a test configuration.

Specifying WAN settings

The following procedure describes how to specify settings that characterize the wide area network (WAN) interface you are testing. The WAN interface is the DSL connection to tip and ring.

To specify WAN settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **WAN SETUP**.
- 4 Select whether to enable or disable the **INTERFACE**.
The default is ENABLE.
- 5 Select the **MODULATION**.
Selecting the modulation (framing type) forces the ATU-R to negotiate only the selected framing mode.
The following modulations are available:
 - ADSL2+
 - ADSL2+ DELT (Double Ended Loop Testing)
 - ADSL2
 - ADSL2 DELT
 - G.DMT
 - G.Lite
 - T1.413
 - AUTO
- 6 Select the **WAN MODE**.
 - IPoE is IP over Ethernet
 - IPoA is IP over ATM
 - PPPoA is PPP over ATM
 - PPPoE is PPP over Ethernet
 - Bridge - the ADSL/Copper Tester acts as a layer two bridging device between the WAN and LAN (no routing).
- 7 Enter the **VPI** and **VCI**.
- 8 Select the **ENCAP** (encapsulation) method.
The remaining selections are optional depending on the WAN mode.
- 9 Select whether the **WAN IP** configuration is static or dynamic (DHCP).
- 10 If you are using a static configuration, enter the **WAN IP** address and **WAN NETMASK**.
- 11 Enter the **Gateway IP** address.

- 12** If the WAN MODE is set to PPPoA or PPPoE, additional settings must be specified.
- a** Enter the **User Name**.
This must be a valid user account with an ISP.
 - b** Enter the **Password**.
This must be a valid password that matches the user name above. Passwords are often case-sensitive.
 - c** Select the **AUTH** (authentication) **MODE**.
 - Auto (the ADSL/Copper Tester picks the mode that matches the far end mode)
 - PAP (Password Authentication Protocol)
 - CHAP (Challenge Handshake Authentication Protocol)
- 13** Select the **WAN MAC** type: DEFAULT or USER DEFINED.
If you selected USER DEFINED as the WAN MAC type, enter the WAN MAC address.
- 14** Select **GRAPH** and specify whether to display the graph for NOISE or SNR per bin.
Only two graphs are available at one time: BPT and either SNR or Noise.
- The WAN settings are configured.

Specifying LAN settings

The following procedure describes how to specify settings that characterize the local area network (LAN) interface you are testing.

To specify LAN settings

- 1** Select **MODEM TEST** from the Main Menu.
- 2** Select **SETUP**.
- 3** Select **LAN SETUP**.
- 4** Select whether to enable or disable the **INTERFACE**.
The default is ENABLE.
- 5** Select whether the **LAN IP** configuration is static or dynamic (DHCP).
- 6** If you are using a static configuration, enter the **LAN IP** address and **LAN NETMASK**.

NOTE:

When the WAN interface is using DHCP configuration, you can not configure the LAN interface by DHCP. However, the DHCP Server may be used for attached devices on the LAN interface (“through” mode).

- 7** Enter the **DHCP START** address.
If DHCP Server is enabled below, this is the starting IP address for the tester’s DHCP server.
- 8** If using a static configuration, enter the **GATEWAY IP** address.
- 9** Select **DHCP SERVER** and enable or disable the tester’s DHCP server.

When enabled, the ADSL/Copper Tester acts as a router and automatically configures the IP addresses of attached equipment on the LAN interface.

When disabled, the ADSL/Copper Tester operates as a client, which enables automatic IP configuration of the LAN interface.

The LAN settings are configured.

Specifying ping settings

The following procedure describes how to specify ping settings.

To specify ping settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **PING SETUP**.
- 4 Enter the **PING IP**.

This is the destination address (where you will send the pings). You may enter the address as an IP address or the DNS name (such as www.yahoo.com).

- 5 Enter the **TX PINGS**.

This is the number of ping messages to send.

To specify continuous ping, enter zero (0).

- 6 Select **PACKET SIZE** and enter a value between 64 bytes and 65K.
- 7 Select **TIMEOUT(s)** and choose the timeout period, in seconds.

The ping settings are configured.

Specifying web test settings

If your test set includes the Advanced IP option, you can verify web connectivity by downloading a web page. The following procedure describes how to specify web test settings.

To specify web test settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **WEB SETUP**.
- 5 Use the keypad and arrow keys to enter the destination URL.

When you enter a value, the cursor will move to the next position after a one second pause.

The web test settings are configured.

Specifying FTP settings

If your test set includes the Advanced IP option, you can test throughput using the FTP test. The following procedure describes how to specify the settings for the FTP test.

To specify FTP settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **FTP SETUP**.
- 5 Use the keypad and arrow keys to enter the destination FTP address, including the file to download.
When you enter a value, the cursor will move to the next position after a one second pause.
- 6 If a log in is required, enter a Username and Password.
The default anonymous Username and Password are often accepted at public FTP sites.
- 7 Select the direction: upload (UP) or download (DOWN).
- 8 If you selected UP, enter the FILE SIZE, between 1KB to 1MB, in increments of 1KB.

The FTP settings are configured.

Specifying Video settings

If your test set includes the Video option, you can test a video stream using the Video test. The following procedure describes how to specify the settings for the Video test.

To specify Video settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **VIDEO SETUP**.
- 5 Select **STREAM TYPE** and then specify the type of video stream.
- 6 Select **URL** and then use the keypad and arrow keys to enter the URL address or IP address of the video server.
When you enter a value, the cursor will move to the next position after a one second pause.
- 7 Select **PORT NUMBER** and then specify the port number, between 1 and 65535.
- 8 To set thresholds, select **LIMITS** and then specify the following:
 - **IGMP LATENCY**. This is the maximum allowable latency (time to complete a program change, in milliseconds).
 - **MAX PACKET JITTER**. This is the maximum allowable packet jitter (the variance in packet arrival times at an endpoint).
 - **TS SYNC ERRORS**. This is the maximum number of allowable test stream (TS) synchronization errors.

- **TS ERROR INDICATORS.** This is the maximum allowable test stream (TS) bits with the error indicator bit set.
- **TS CONTINUITY ERRORS.** This is the maximum allowable continuity errors.
- **RTP LOST PACKETS.** This is the maximum number of allowable lost packets (continuity errors).
- **RTP ERRORS.** This is the maximum number of allowable packets with errors.

The video settings are configured.

Specifying traceroute settings

If your test set includes the Advanced IP option, you can run a traceroute test to locate the network segment which is causing delay. The following procedure describes how to specify traceroute settings.

To specify traceroute settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **TRACEROUTE**.
- 5 Use the keypad and arrow keys to enter the destination URL or IP address.

When you enter a value the cursor will move to the next position after a one second pause.

The traceroute settings are configured.

Specifying DNS settings

If your test set includes the Advanced IP option, you can specify DNS settings. The following procedure describes how to specify DNS (Domain Name Server) settings.

To specify DNS settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **DNS SETUP**.
- 5 Enter up to three IP addresses of DNS servers for static configurations.

NOTE:

When the LAN or WAN interface is configured using DHCP, the interface will use the DHCP-assigned DNS servers instead of the manually configured server addresses.

The DNS settings are configured.

Specifying VCC scan settings

If your test set includes the Advanced IP option, you can verify ATM provisioning by checking for ATM cell activity using the VCC scan test. The following procedure describes how to specify settings for the VCC (virtual circuit connection) scan tests.

To specify VCC scan settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **VCC SCAN**.
- 5 Enter the desired VPI/VCI combination for up to five VCs.

The VCC settings are configured.

NOTE:

This test does not generate ATM traffic on the selected VCC, but depends on a remote source of ATM traffic, such as ATM OAM from a NOC. Use the OAM loopback function to actively test a VCC.

Specifying IP pool settings

If your test set includes the Advanced IP option, you can verify whether a connection is provisioned to assign multiple IP Addresses to one device by using the IP pool test. The following procedure describes how to specify IP pool settings.

To specify IP pool settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **IP POOL**.
- 5 Select **POOL SIZE**, and then specify how many IP addresses the tester's DHCP server may assign to other computers.
- 6 Select **AUTO RELEASE**, and then specify whether to automatically release the IP addresses.

The IP pool settings are configured.

Specifying port settings

If your test set includes the Advanced IP option, you can verify whether a specific IP address and port are active using the port test. The following procedure describes how to specify port settings.

To specify port settings

- 1 Select **MODEM TEST** from the Main Menu.
- 2 Select **SETUP**.
- 3 Select **ADVANCED**.
- 4 Select **PORT SETUP**.
- 5 Select an address to edit.

- 6 Select **IP ADDRESS**, and then enter the IP address.
 - 7 Select **PORT NUMBER**, and then specify the port number.
- The port settings are configured.

Specifying Copper settings

If you purchased the Copper/ADSL combo version of the tester (the “Gold” package), you will need to specify copper settings. The following procedure describes how to specify the Copper settings.

To specify Copper settings

- 1 Select **COPPER TEST** from the Main Menu.
- 2 Select **SETUP**.
The Setup menu appears.
- 3 Press the **1** key and then specify the **DEFAULT PAIR**.
- 4 Press the **2** key and then specify the **CABLE TYPE**.
- 5 If you selected **CUSTOM** as the cable type, additional settings must be specified.
 - a Specify the mutual values (nF/mile or nF/Km).
 - b Specify the ground values (nF/mile or nF/Km).
- 6 Press the **3** key and then specify the **CABLE GAUGE**.
- 7 Press the **4** key and then specify the **TEMPERATURE**.
- 8 Press the **5** key and then specify the **SYSTEM UNITS**: Metric or US.
- 9 Press the **6** key and then specify the default **TERMINATION**.
- 10 Press the **7** key to view the **LIMITS** screen.
 - a Press the **1** key and then specify the **PASS** and **FAIL** values for **AC VOLTS**.
 - b Press the **2** key and then specify the **PASS** and **FAIL** values for **DC VOLTS**.
 - c Press the **3** key and then specify the **PASS** and **FAIL** values for **RESISTANCE**.
 - d Press the **4** key and then specify the threshold value (length) for **OPEN**.
 - e Press the **5** key and then specify the percent for a **CAP (capacitive) BALANCE**.
 - f Press the **6** key and then specify the threshold value for **longitudinal BALANCE**.

The copper settings are specified.

Saving a test configuration

After you specify settings for a configuration, you can store the configuration, and then run tests in the future using the same, or edited settings. To save time, you can define and store up to 8 configurations using your most common settings, and then load an existing configuration and edit the settings as needed for your current test.

NOTE:

If you change a setting, it is not automatically saved. You must either save the configuration again and overwrite the previous settings, or create a new configuration.

To save a test configuration

- 1 Specify the settings for the configuration.
- 2 Select **MODEM TEST**.
- 3 Select **CONFIG STORE**.
You may have to scroll down to view the CONFIG STORE selection.
- 4 Scroll to the desired location number.
- 5 Press the **1** key.
- 6 Enter the file name.
- 7 Press the **OK** key.

The test configuration is stored.

Loading a configuration

After you save a configuration, you can load it at any time to run a test using the configuration settings.

To load a test configuration

- 1 Select **MODEM TEST**.
- 2 Select **CONFIG STORE**.
- 3 Scroll to the desired file name to load.
- 4 Press the **2** key.
- 5 Press the **OK** key.

The test configuration is loaded.

NOTE:

Configurations can be imported from the Download Manager (versions 2.00.xx or later). Please refer to the Download Manager instructions.

Interpreting Test Results

7

This chapter describes the test results that are gathered when running a test. Topics in this chapter include the following:

- “LEDs” on page 46
- “Modem Summary results” on page 46
- “Fast Errors” on page 48
- “Interleaved Errors” on page 48
- “ATM general results” on page 48
- “ATM results” on page 49
- “Graphs” on page 49
- “Ethernet results” on page 50
- “WAN and LAN status results” on page 51
- “Ping results” on page 51
- “Gateway/DNS results” on page 51
- “Web test results” on page 52
- “FTP results” on page 52
- “Video results” on page 52
- “Traceroute results” on page 53
- “OAM results” on page 53
- “VCC scan results” on page 54
- “IP pool results” on page 54
- “Port results” on page 54
- “Copper results” on page 55
- “Resetting results” on page 58
- “Saving results” on page 58

About ADSL results

After the SmartClass ADSL/Copper Tester synchronizes with the DSLAM, the unit immediately displays results on the LCD. You can view many additional results by pressing the arrow keys.

LEDs

The LEDs on the front panel report the status of the unit. The function of each LED is described in [Table 5](#).

Table 5 Status LEDs

LED	Function
Sync	Reports the status of modem synchronization. <ul style="list-style-type: none">– Flashing green indicates that the modems are training.– Solid green indicates that the modems are synchronized.
Frame	Reports the status of the data connection. Solid green indicates that a data connection has been established with the network (so that the ADSL/Copper Tester may send and receive data on the network).
Error	Reports error and alarm conditions. Solid red indicates: <ul style="list-style-type: none">– LOS (Loss of Signal)– LOF (Loss of Frame)– LOP (Loss of Power)– CRC (Cyclical Redundancy Check) Upstream or Downstream– HEC (Header error correction) Upstream or Downstream
Batt	A multi-color LED that indicates the battery status. <ul style="list-style-type: none">– Solid green indicates that an external source is powering the unit.– Solid red indicates a low battery.– Solid amber indicates the battery is charging.– Flashing amber indicates that the battery type must be specified.

Modem Summary results

This category provides a summary of the most frequently used test results. [Table 6](#) describes the Modem Summary results.

Table 6 Modem Summary results

Result	Description	Range
Modem state	The current operational state for the modem. (only shown when modems are <i>not</i> synchronized.)	BOOTING, CONFIG, INIT, IDLE
FRAMING MODE	The current ADSL line format. If your unit has the PTM option, it will also display whether ATM or PTM is in use.	G.DMT, G.Lite, T1.413, ADSL2, ADSL2+, ADSL2(M), ADSL2+(M)

Table 6 Modem Summary results (Continued)

Result	Description	Range
CONN RATE	Current upstream and downstream connection rates	32–1024 kbps ¹ (Up) 32–8160 kbps ¹ (Dn) 32–1200 kbps ² (Up) 32–2500 kbps ² (Dn)
MAX RATE	Maximum upstream and downstream connection rates	32–1024 kbps ¹ (Up) 32–8160 kbps ¹ (Dn) 32–1200 kbps ² (Up) 32–2500 kbps ² (Dn)
CAPACITY	The percentage of total bandwidth currently used by the actual connect rate upstream and downstream.	0–100%
MARGIN	SNR margin upstream and downstream	0–63.5 dB
ATTEN	The degradation of signal strength in dB upstream and downstream. It is the difference in Tx power from the transmitter to receiver ¹ .	0–63.5 dB
RESYNC COUNT	The cumulative number of synchronization cycles until manually reset.	N/A
LOS ERRORS	Loss of Signal Errors. Number of errors due to loss of signal.	N/A
LOF ERRORS	Loss of Frame Errors. Number of errors due to loss of framing.	N/A
LOP ERRORS	Loss of Power Errors. Number of errors due to loss of power.	N/A
LOSS OF MARGIN	Number of bins that indicate a loss of margin.	0–511
ATUC CODE	The identification code of the ATUC vendor. Indicates the manufacturer of the ATUC card in the DSLAM.	N/A
ATUC REVISION	The software revision of the ATUC.	N/A
TX POWER	Power level, in dB, of the ADSL signal, downstream (from the DSLAM) and upstream (transmitted by the ADSL/Copper Tester).	

1. These are ADSL1 rates. Some manufacturers allow higher ADSL1 rates.

2. These are ADSL2 rates.

Fast Errors

Table 7 describes the Fast Error results.

Table 7 Fast Errors

Result	Description
TRAINED PATH	Whether the modems trained with the FAST or INTLV (interleaved) path.
FAST CRC	Fast Cyclical redundancy check upstream and downstream
FAST FEC	Fast Forward Error Correction upstream and downstream
FAST HEC	Fast Header Error Correction upstream and downstream

Interleaved Errors

Table 8 describes the Interleaved Error results.

Table 8 Interleaved Errors

Result	Description
TRAINED PATH	Whether the modems trained with the FAST or INTLV (interleaved) path.
INTLV CRC	Interleaved Cyclical redundancy check upstream and downstream
INTLV FEC	Interleaved Forward Error Correction upstream and downstream
INTLV HEC	Interleaved Header Error Correction upstream and downstream

ATM general results

ADSL typically transports data over ATM (Asynchronous Transfer Mode) circuits. (Some systems transmit over packet mode circuits.) The ATM category provides results that help you troubleshoot ADSL network connections. These results are helpful if IP pings are not working, but your tester is still sending and receiving ATM cells.

Table 9 describes the ATM general test results.

Table 9 ATM general results

Result	Definition
GOOD CELL CNT	Total number of cells that contain data and reached the other end error free.
IDLE CELL CNT	Total number of idle cells.
BAD HEC CELL CNT	Total number of cells that were bad due to HEC errors.

Table 9 ATM general results (Continued)

Result	Definition
DROPPED CELL CNT	Total number of dropped cells. The ATM network will discard or “drop” erred cells which must then be retransmitted (this is done automatically). The SmartClass counts the number of ATM cells and how many were dropped, giving an indication of service quality.

ATM results

Table 10 describes the ATM test results.

Table 10 ATM results

Result	Definition
TX/RX PDU	The PDU upon which cells are being transmitted or received.
TX/RX AAL5 BYTES	Number of ATM Adaptation Layer 5 bytes transmitted or received. Since ATM can carry different types of user data (such as web pages or voice), ATM layers are defined to carry the different types of data effectively. For normal, non-time sensitive data, such as e-mail and user files, AAL5 is used. Multiple ATM cells are grouped together in frames to carry large amounts of user data over the network.
TOTAL ERROR CNT	Total number of ATM errors, including bad HEC and dropped cells.

Graphs

The graphs provide a graphical representation of the bits per tone (BPT), signal to noise ratio (SNR), and noise per tone. Only two graphs are available at one time: BPT and either SNR or Noise (depending on your selection for GRAPH on the WAN SETUP menu).

SNR indicates line quality. The BPT graph indicates the total bit rate and is a useful tool for finding disturbers.

Figure 9 illustrates a BPT graph.

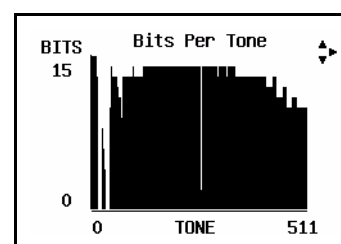


Figure 9 Bits per tone graph (example)

Bits per tone is defined as bits assigned per DMT tone (256 tones for ADSL). Examine the portions of the graphs where there are dips or breaks. These dips represent areas where interference is degrading the ADSL signal.

Use the right arrow to view the graph table.

Table 11 lists common noise sources and the corresponding frequencies and tones.

Table 11 Noise sources and tones

Noise Source	Noise Frequency (kHz)	Tone #	Tone Frequency (kHz)
ISDN BRI	40	9	38.8125
HDSL passband center	196	45	194.0625
HDSL passband max	392	91	392.4375
HDSL2	274	64	276
T1 passband center	772	179	772
E1 passband center	1024	237	1022

NOTE:

Due to screen resolution, the graph is compressed (256 tones displayed in a 240 x 160 area). For more detail, view the BPT table.

Ethernet results

The ethernet category provides statistics on ethernet frames when the ADSL/Copper Tester's 10/100BT Ethernet interface is used in TE or ADSL thru-modes. Table 12 describes the Ethernet results.

Table 12 Ethernet results

Result	Definition
ENET STATE	Status of the connection.
ENET TX BYTES	Total bytes transmitted
ENET TX FRAMES	Total frames transmitted
ENET 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.
ENET TX ERRORS	Total errors transmitted
ENET RX BYTES	Total bytes received
ENET RX FRAMES	Total frames received
ENET RX CRC ERRORS	Total CRC errors received

WAN and LAN status results

The WAN status result screen reports the current status of the WAN.

- Configuring
- Starting
- PPP connecting (only if using a PPP mode)
- Network status (Up or Down)
- IP type (Static or Dynamic)
- IP address
- MAC address

Ping results

Table 13 describes the ping results.

Table 13 Ping results

Result	Definition
DEST	Destination address where the ping is being sent.
SENT	The number of ping messages sent.
RECEIVED	The number of ping messages sent to the ADSL/Copper Tester from other devices on the network.
DELAY	The current time in milliseconds it has taken one transmitted ping to reach its destination and receive a reply back to the ADSL/Copper Tester.
MIN DELAY	The shortest time in milliseconds it has taken any one transmitted ping to reach its destination and receive a reply back to the ADSL/Copper Tester.
MAX DELAY	The longest time in milliseconds it has taken any one transmitted ping to reach its destination and receive a reply back to the ADSL/Copper Tester.
AVG DELAY	The average time in milliseconds it has taken any one transmitted ping to reach its destination and receive a reply back to the ADSL/Copper Tester.

Gateway/DNS results

Table 14 describes the gateway/DNS results.

Table 14 Gateway/DNS results

Result	Definition
GATEWAY TYPE	Whether the gateway configuration is static or dynamic.
GATEWAY IP	The IP address of the gateway.
DNS TYPE	Whether the DNS configuration is static or dynamic.
DNS 1, 2, 3	The IP addresses of up to three DNS servers.

Web test results

Table 15 describes the web test results.

Table 15 Web test results

Result	Description
Connection status	The current connection status.
File size	The size of the web page that was transferred.
Time	The length of time for the file transfer.
Rate	The speed at which the file was downloaded.

FTP results

Table 16 describes the FTP results.

Table 16 FTP results

Result	Description
File	Address of the file to download
Status	Connection status
TX/RX Bytes	Number of bytes received or transmitted.
Duration	The time it took for the entire download
Data Rate	The download rate, in KBs
Blocks	Number of blocks transmitted or received.

Video results

Table 17 describes the video results.

Table 17 Video results

Result	Description
Channel	Address of the video stream being analyzed
Status	Status of the stream
Stream Rate	Number of bytes received or transmitted
Video Rate	The time it took for the entire download
Audio Rate	The download rate, in KBs
Data Rate	Number of blocks transmitted or received
Zap Time	Time from the channel change request to receiving the video channel
IP Packets RX	Number of IP packets received
Packet Jitter	Average packet jitter
Max Packet Jitter	The highest packet jitter measured

Table 17 Video results (Continued)

Result	Description
TS Sync Errors	Test stream sync errors
TS ErrorInd Errors	Number of MPEG2 bits with the error indicator bit set
TS Continuity Errors	MPEG2 Continuity Errors or lost packets, in percent
TS PCR Jitter	MPEG2 Program Clock Reference jitter, in milliseconds
RTP Lost Packets	Percentage of Real Time Protocol packets that were lost
RTP Oos Packets	Number of RTP packets received out of sequence
RTP Errors	Total RTP errors
PID mapping	Provides the PID (program ID) numbers for the parts of the stream: video, audio, PAT, and PMT. NOTE: There could be multiple audio and video streams.

Traceroute results

[Table 18](#) describes the trace route results.

Table 18 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

OAM results

While a number of different test cells are identified to help in the administration and maintenance of ATM networks, the ADSL/Copper Tester supports the F4 and F5 loopback function to verify ATM level connectivity. Since ATM can carry different types of user data (such as web pages or voice), ATM layers are defined to carry the different types of data effectively. For normal, non-time sensitive data, such as e-mail and user files, AAL5 is used.

You can view different OAM results in two places: on the OAM test screen, and in the group of ADSL results.

[Table 19](#) describes the OAM results found on the OAM test screen.

Table 19 OAM test results

Result	Definition
	The large number at the top of the screen is the number of loopback messages processed.

Table 19 OAM test results

Result	Definition
REPLY	Number of loopback messages for which we received a reply.
FAIL	Number of messages that failed (usually because we did not receive a reply).
DELAY	The delay measured at this moment.
MIN DELAY	The minimum delay measured since the beginning of the test.
MAX DELAY	The maximum delay measured since the beginning of the test.
AVG DELAY	The average delay measured since the beginning of the test.

Table 20 describes the OAM results found as part of the ADSL results.

Table 20 OAM ADSL results

Result	Definition
F5 LB CNT	The number of ATM F5 Loopback requests on the near end and far end.
F4 LB CNT	The number of ATM F4 Loopback requests on the near end and far end.
ATM RDI	Number of test seconds during which the RDI condition has been detected.

VCC scan results

The VCC scan results screen provides the VPI/VCI designation and activity status for up to five (5) virtual circuit connections.

NOTE:

This test requires a remote source generating the ATM traffic.

IP pool results

The IP pool test results screen displays the test pool size, the number of addresses tested, and the number failed.

Port results

The port test results screen shows if each port tested is active or inactive, for up to eight configured ports.

Copper results

The copper results are described in the tables below.

AC voltage You measure AC volts to:

- detect the presence of hazardous voltage.
- measure stray or foreign voltages.
- measure ringer voltage level.

AC voltage results on tip to ring should be 0.0 volts. Tip to ground and ring to ground should be equal to each other. Anything else indicates AC signal interference and/or an unbalanced line.

Table 21 describes the AC voltage result.

Table 21 AC Voltage result specifications

Range (VAC)	Resolution (V)	Accuracy
Peak voltage \leq 300	1	2% \pm 1.0V



WARNING: HAZARDOUS VOLTAGE

Hazardous voltages may be on the line. 220 mains (RMS) are equivalent to 308 peak. Connecting to these circuits may result in damage to equipment or serious injury. Do not connect to these circuits.

DC voltage You measure DC volts to:

- detect and measure CO/exchange battery voltage.
- detect crossed battery conditions.

To measure DC volts, remove the line battery and measure tip and ring to ground. It should be < 3.0 volts; anything else indicates crossed battery that inhibits digital signals.

Table 22 describes the DC voltage result.

Table 22 DC voltage result specifications

Range (VDC)	Resolution (V)	Accuracy
AC peak + [VDC] \leq 300	1	2% \pm 1.0V

Resistance You measure resistance to test line continuity and quality, and to detect corrosion, shorts, opens, and faults.

The SmartClass ADSL/Copper Tester is able to measure resistance in the presence of noise and foreign voltage, but the accuracy may be reduced, depending on the noise level.

Resistance should be measured with the line disconnected, so that the battery voltage and CO/Exchange termination don't affect the measurement.

Normal resistance should be at least 5 M Ω ; lower values indicate the presence of faults.

Table 23 describes the resistance result.

Table 23 Resistance result specifications (no ambient)

Range (Ω)	Resolution (Ω)	Accuracy
0 to 999	1	2% \pm 2.5 Ω
1.0K to 9.99K	10	2%
10.0K to 99.9K	100	2%
100.0K to 999K	1K	2%
1.0M to 9.9M	10K	6.5%
10.0M to 100M	100K	6.5%

Distance to short

This result measure the distance to the short. A resistance measurement of 4 k Ω or less typically indicates a short. For values greater than 4 k Ω , this function is disabled.

Table 24 describes the distance to short result.

Table 24 Distance to short result specifications

Range (feet)	Resolution	Range (meters)	Resolution
0 to 3000	1 foot	0 to 999	3 meters
3000 to 30,000	100 feet	1000 to 10,000	30.5 meters

Leakage

Leakage is a resistance measurement using higher voltage.

Table 25 describes the leakage result.

Table 25 Leakage result specifications (no ambient)

Range (Ω)	Resolution (Ω)	Accuracy
0 to 999	1	2% \pm 2.5 Ω
1.0K to 9.99K	10	2%
10.0K to 99.9K	100	2%
100.0K to 999K	1K	2%
1.0M to 9.9M	10K	6.5%
10.0M to 100M	100K	6.5%

Opens/Capacitance

You measure opens/capacitance to:

- measure total electrical loop length (includes length of bridged taps).
- find wet sections, bridged taps or open faults.

Opens/Capacitance: < 3% difference between tip and ring values indicate an acceptably balanced loop. Anything greater indicates an unbalanced line or open fault, which inhibit digital signals.

Table 26 describes the opens/capacitance result.

Table 26 Opens/Capacitance result specifications

Range (feet)	Resolution (feet)	Range (meters)	Resolution (meters)	Range (capacitance)	Accuracy (applies to capacitance only)
0 to 2,999	1 foot	0 to 999	0.1 meter	0 to 44.9 nF	2.5% ± 45 pF
3000 to 66000	1 foot	1,000 to 20,000	0.1 meter	45 nF to 1.04 µF	2.5%

DC current You measure DC current to verify if enough current is present to operate equipment including the phone or caller ID boxes.

DC current on tip to ring should be ≥ 23 mA at the NID. Anything less will not allow for differences in temperature and phone equipment will not operate during extremes.

Table 27 describes the DC current result.

Table 27 DC current result specifications

Range	Resolution	Accuracy
0 to 110 ma	1ma	2% ± 1ma

Longitudinal balance You measure longitudinal balance to:

- measure the quality of the pair: a measurement of the degree to which the tip lead is electrically the same as the ring lead.

The more each lead is electrically identical (capacitance, inductance, impedance), the better the pair will resist induced noise.

The balance result should be >60 dB. Anything less indicates electrical differences between tip and ring that can lead to noise and other signal problems.

Table 28 describes the DC current result.

Table 28 Balance result specifications

Range	Resolution	Accuracy
35 to70 dB	1 dB	2 dB

Load coil You check for load coils to ensure there are no load coils present on a digital line (such as ADSL or ISDN). Load coil detection and elimination is essential in the installation of an xDSL circuit

Table 27 describes the load coil result.

Table 29 Load coil result specifications

Range	Resolution	Accuracy
Up to 27,000 ft (8229.6 m)	up to 5	± 1

Resetting results

After gaining initial synchronization, you may wish to manually reset the result counters before running your test.

To reset the error counters

- 1 Scroll to a screen that displays “#-RESET COUNTERS”.
- 2 Press the # (hash) key.



IMPORTANT: COUNTERS RESET ONLY FOR THAT INTERFACE

A reset on a WAN screen will only reset WAN counters.

NOTE:

All counters will automatically reset upon synchronization, except that the ERROR LED will remain RED if there was a LOS (loss of signal), until you reset the counters.

Saving results

After running an ADSL test, you can save the results, and then view, print, or import them into Excel at a later time.

There are two ways you can save ADSL results. On most results screens, press the 1 key to save the results (this saves the entire set of results, not just the results displayed on that screen).

You can store up to 16 sets of ADSL results. You can also save up to 15 sets of results for the copper cable check.

To save test results

- 1 After your test is finished, press the **Cancel** key to exit the result menu.
- 2 Select **RESULT STORE**.
For the copper cable check, you are finished saving results.
For ADSL test results, continue with [step 3](#).
- 3 Scroll to the desired location number.
- 4 Press the **1** key.
- 5 Enter the file name.
- 6 Press the **OK** key.

The test results are stored.

For more information on downloading the results to Excel, see the instructions provided with the Download Manager utility.

Maintaining the Batteries

8

This chapter describes how to maintain the ADSL/Copper Tester's batteries. Topics discussed in this chapter include the following:

- [“Prolonging battery life” on page 62](#)
- [“Recharging the batteries” on page 62](#)
- [“Replacing the batteries” on page 63](#)

Prolonging battery life

The SmartClass Tester uses four (4) AA batteries. Either alkaline or rechargeable NiMH batteries can be used. To prolong the life span of any batteries, follow the guidelines below:

- Do not mix battery types (do not use Alkaline and rechargeable at the same time).
- Do not mix old batteries and new batteries.
- When not connected to the unit, store the batteries in a cool, dry, and clean environment. Do not leave the batteries in a car or truck, particularly during extremely hot or cold weather.
- The first time you use the SmartClass Tester, or after prolonged storage, use the AC adapter to power the unit.
- If the battery capacity is depleted or if the batteries have been stored for a prolonged period, charge the batteries before use.
- If charging the batteries while they are in the unit, use the JDSU AC adapter to charge the batteries. Do not use an un-approved charger.
- The charger will not charge the batteries when it is extremely hot or cold.
- Always carry fully charged spare batteries.
- Always dispose of batteries properly.

The following section describes how to recharge and replace the batteries

Recharging the batteries

When the Battery LED lights red, the batteries should be charged or replaced.

NOTE:

You can test a circuit and recharge the batteries 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 adaptor.

If you have an external battery charger, follow the instructions for that charger. If charging the batteries in the unit, follow the procedure outlined below.

To charge the batteries

- 1 Connect one end of the AC adapter to the connector on the bottom of the ADSL/Copper Tester.
- 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.

If the batteries have extremely low charge, the charging circuit may not recognize them. To manually detect the batteries, go to the SYSTEM SETUP > BATTERY menu, and then press the pound/hash (#) key to manually detect the batteries and begin charging.



WARNING: DAMAGE TO BATTERIES

Forcing charge on Alkaline batteries may damage the batteries. Only perform the force charge on rechargeable batteries.

- 3 Let the SmartClass charge for 2 to 4 hours for a fast charge; for maximum capacity, allow the SmartClass to (trickle) charge overnight.

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

The **Batt** LED is amber when the unit is fast charging. The SmartClass will trickle charge at other times when the charger is connected and the Batt LED is green.

After the Batt LED turns green (fast charge is complete), allow the unit to trickle charge overnight for maximum performance.

Charging the batteries is complete.



CAUTION: BATTERY LIFE MAY VARY

Short charge–discharge cycles can occur with brand new batteries or batteries that have exceeded their useful life. If this occurs with new batteries, try charging again. If the batteries have exceeded their useful life, try another set of batteries.

Replacing the batteries

The battery compartment is located on the back of the unit, as shown in [Figure 10](#).



Figure 10 Back of SmartClass

The following procedure describes how to replace the batteries.

To replace the batteries

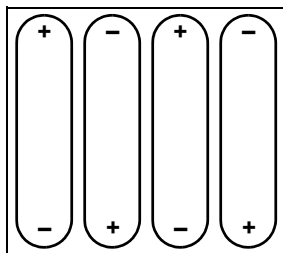
- 1 Turn the power off.



CAUTION: INSTRUMENT DAMAGE

Failure to turn the power off before removing the batteries from the ADSL/Copper Tester could damage internal components and/or corrupt the software. Always power down the unit before removing the batteries.

- 2 Using a phillips screw driver, remove the screw from the battery compartment door.
- 3 Remove the door by pressing down and pushing toward the bottom end.
- 4 Replace the batteries, with polarities oriented as shown.



We recommend either *Energizer* or *Sanyo* 2500 mA rechargeable batteries.

- 5 Replace the battery compartment door.
- 6 Replace the screw in the door.
- 7 Specify the type of battery you inserted.

If the AC Adapter is connected, you will be prompted for the battery type immediately. If the adapter is not connected, the prompt appears when you power up the unit.

Replacing the batteries is complete.

Troubleshooting

9

This chapter describes how to identify and correct problems related to the SmartClass ADSL/Copper Tester. Topics discussed in this chapter include the following:

- [“Getting Technical Assistance” on page 66](#)
- [“Additional information” on page 66](#)
- [“Resolving problems” on page 66](#)

Getting Technical Assistance

If you need assistance or have questions related to the use of this product, use the information in [Table 30](#) to contact JDSU's Technical Assistance Center (TAC) for customer support. For the latest TAC contact information, go to www.jdsu.com or contact your local sales office for assistance. The regional sales office phone numbers are listed on the back of this manual.

Table 30 Technical assistance centers

Region	Phone Number	
Americas	1-866-ACTERNA 1-866-228-3762 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 message at the TAC for your region; email the North American TAC (tac@jdsu.com); submit your question using our online Technical Assistance request form at www.jdsu.com.

Additional information

For additional information, visit the SmartClass ADSL web page:

http://www.jdsu.com/test_and_measurement/products/descriptions/SmartClass_ADSL/index.html

Resolving problems

If you are having trouble with the ADSL/Copper Tester, the following sections describe common problems and solutions. You should verify whether your problem is listed here before contacting technical assistance.

The following section addresses questions that may be asked about completing tests with the SmartClass. There are two sections included:

- General
- ADSL tests
- Copper tests

General testing The following section addresses questions about testing in general using SmartClass Testers.

Issue

Inconsistent test results.

Resolution

Verify that your test leads are good and are connected properly for the test you are performing.

Turn the unit off then back on, and then try again.

ADSL testing The following section addresses questions about ADSL testing.

Issue

The modem cannot achieve synchronization with the Central Office (CO).

Resolution

Inability to sync can have many causes. Perform the following steps to troubleshoot:

Disconnect the customer's ADSL modem.

Verify you are connected to the correct pair.

Make sure that you are connected on pins 3 and 4 instead of 2 and 5.

Isolate the premise wiring.

Check for a premise alarm system.

Verify that the copper pair is provisioned for ADSL at the CO.

Try testing at the CO/Exchange on the customer pair.

Check the DSLAM modem vendor and software version to verify compatibility with the ADSL/Copper Tester.

Issue

The modem gets sync with the CO, but the rate is lower than expected.

Resolution

Verify that you are on an ADSL2 or ADSL2+ line.

Check the Bits per Tone (BPT) and the Signal to Noise Ratio (SNR) per tone graphs for areas of the spectrum with low throughput. This could be caused by bridged taps, cable crosstalk, or AM radio.

Check whether the max rate on the DSLAM is limited.

Check for a premise alarm system on the same pair.

Check the attenuation.

Verify the noise margin.

Run the copper cable check to look for metallic faults.

Issue

The ping menu says pings are being sent, but the network statistics are not incrementing.

Resolution

The ping function only *attempts* to send a ping every second. Depending on certain conditions, a physical ping packet may not be sent.

Check that the unit has not lost sync.

If the Ethernet interface is being used, make sure that the cabling is correct. If the Ethernet cable is not hooked up, or is hooked up incorrectly, a packet will not be sent. Thus the Ethernet statistics will not increment.

Verify the LAN IP address is not on the same subnet as the WAN IP or IP being pinged.

Issue

I cannot connect using PPP.

Resolution

Verify that the VPI and VCI are correct.

Verify that the encapsulation is correct.

Verify that the addressing mode is set correctly (Dynamic/Static).

Verify that the username and password are correct.

Issue

I have a green Frame LED, but pings are not working.

Resolution

A green Frame LED does not guarantee a ping (or any routed/bridged packet) will be treated properly once it leaves the unit. In an Ethernet bridged or IP over ATM environment with static addressing, there is no initial communication with the far end, so as soon as ATM sync occurs the interface is deemed active to pass user data.

Make sure that the VPI and VCI is correct.

Make sure that the encapsulation is correct.

Try pinging a different host.

Make sure the DNS server is active with another PC.

Set the PING packet size to a lower number.

Make sure the ADSL/Copper Tester's WAN mode is set correctly for the type of circuit under test (such as PPPoE versus IPoE).

Make sure you are not behind a firewall; they can block ping responses from reaching the host.

Issue

The upstream SNR is not reported or shown in the graphs.

Resolution

In some instances, the ATU-C does not properly exchange this information with the ATU-R (it is reported in the EOC).

Copper test problems

The following section addresses questions about Copper testing.

Issue

The Tip-Ring voltage is reading negative.

Resolution

The Tip and Ring test leads may be swapped. Check your test leads to verify that they are hooked up properly.

Issue

I am performing an opens/capacitance test. The mutual value looks good, but the tip and ring values are really short.

Resolution

Verify the ground. The module must be grounded to the same ground as the pair under test.

Specifications

A

This appendix contains specifications for the ADSL/Copper Tester. Topics discussed in this appendix include the following:

- “Connector specifications” on page 72
- “Environmental specifications” on page 72
- “Power specifications” on page 72
- “Calibration” on page 73
- “Warranty information” on page 73

Connector specifications

Table 31 provides the connector specifications.

Table 31 Connector specifications

Connector	Specification
DSL	6-pin modular (RJ-11)
Ethernet	8-pin modular (RJ-45)
USB	USB 2.0
T/A, R/B, Ground	2 mm recessed banana

Environmental specifications

Table 32 provides the environmental specifications.

Table 32 Environmental specifications

Parameter	Specification
Operating Temperature	-5° to +50° C (23° to +120° F)
Storage Temperature	-30° to 60° C (-22° to 140° F)
Humidity	10% to 80% RHNC

Power specifications

Although battery life varies, depending on the type of battery and the type of test, Table 33 provides specifications for the battery life of the recommended Energizer® or Sanyo® 2500 mA NiMH rechargeable batteries, and the specifications for the AC adapter.

Table 33 Power specifications

Parameter	Specification
Operating time	Approximately 20 on/off cycles and tests on a full charge, depending on usage and conditions.
Charging time	Internal: 3 to 4 hours for a fast charge; for a full charge, allow to trickle charge overnight
Power supply input	100 to 240 VAC, 50/60 Hz, autosensing
Power supply output	12 V, 1.25 Amp

Alkaline batteries may be used when rechargeable batteries are not available. However, the operating time will be limited.

Calibration

The following section discusses calibrating the SmartClass ADSL/Copper Tester.

Self calibration The SmartClass ADSL/Copper Tester includes built-in self calibration routines, such that the instrument's Copper measurement circuits maintain specification for more than 5 years. Perform the procedure "[Calibrating the unit](#)" on page 33.

Factory calibration JDSU recommends that you return your SmartClass ADSL/Copper Tester to the factory every 3 years for complete inspection and calibration. For additional information about options, services, and factory calibration, contact your local JDSU representative or contact JDSU through the company web site, www.jdsu.com.

Warranty information

The warranties described herein shall apply to all commercially available JDSU Communications Test and Measurement 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. 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.

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