

JDSU LanScaperPRO Network Tester

Release 1.0

User's Guide



LanScaperPRO Network Tester

Release 1.0

User's Guide



Notice Every effort was made to ensure that the information in this document was accurate at the time of printing. However, information is subject to change without notice, and JDSU reserves the right to provide an addendum to this document with information not available at the time that this document was created.

Copyright © Copyright 2008 JDS Uniphase Corporation. All rights reserved. JDSU, Enabling Broadband & Optical Innovation, and the JDSU logo are trademarks of JDS Uniphase Corporation (“JDS Uniphase”). All other trademarks and registered trademarks are the property of their respective owners. No part of this guide may be reproduced or transmitted electronically or otherwise without written permission of the publisher.

Trademarks JDS Uniphase, JDSU, and Test-Um are trademarks or registered trademarks of JDS Uniphase Corporation in the United States and/or other countries.

LanScaperPRO is a trademark or registered trademark of JDS Uniphase Corporation in the United States and/or other countries.

Cisco is a trademark or registered trademark of Cisco Systems, Inc. in the United States and/or other countries.

Specifications, terms, and conditions are subject to change without notice. All trademarks and registered trademarks are the property of their respective companies.

Federal Communications Commission (FCC) Notice This product was tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. (Note that this device is exempt from FCC Rules since it is a Test and Measurement device.)

The authority to operate this product is conditioned by the requirements that no modifications be made to the equipment unless the changes or modifications are expressly approved by JDSU.

Industry Canada Requirements This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

EMC Directive Compliance This product was tested and conforms to the EMC Directive 2004/108/EC for electromagnetic compatibility and Standards EN61326: 2002 for emissions and immunity tests.

Low Voltage Directive Compliance This product was found to comply with the requirements of European Community standard, EN 61010-1:2001 – Safety requirements for electrical equipment for Measuring, Control, and Laboratory use – Part 1: General requirements (IEC 61010-1:2001).

WEEE Directive Compliance JDSU has established processes in compliance with the Waste Electrical and Electronic Equipment (WEEE) Directive, 2002/96/EC.

This product should not be disposed of as unsorted municipal waste and should be collected separately and disposed of according to your national regulations. In the European Union, all equipment purchased from JDSU after 2005-08-13 can be returned for disposal at the end of its useful life. JDSU will ensure that all waste equipment returned is reused, recycled, or disposed of in an environmentally friendly manner, and in compliance with all applicable national and international waste legislation.

It is the responsibility of the equipment owner to return the equipment to JDSU for appropriate disposal. If the equipment was imported by a reseller whose name or logo is marked on the equipment, then the owner should return the equipment directly to the reseller.

Instructions for returning waste equipment to JDSU can be found in the Environmental section of JDSU's web site at www.jdsu.com. If you have questions concerning disposal of your equipment, contact JDSU's WEEE Program Management team at WEEE.EMEA@jdsu.com.

Table of Contents

About This Guide		ix
	Purpose and Scope	x
	Assumptions	x
	Technical Assistance	x
	Conventions	xi
	Guide conventions	xi
	Hardware packaging and labeling conventions . . .	xii

Chapter 1	Product Overview	1
	About the LanScaperPRO Network Tester	2
	Features and Capabilities	3
	Applications	4
	Product Parts and Ordering Information	5
	Accessories	6
	Specifications	7

Chapter 2	Operation	9
	Physical Features of the Test Device	10

	LanScaperPRO Network Tester User's Guide	v
--	---	----------

Front panel	10
Feature descriptions	11
Connector (top) panel	12
Back panel	12
Installing or Replacing the Batteries	13
Safety Warnings and Cautions	14
Powering the Unit On and Off	15
Turning the unit on	15
Turning the unit off	15
Turning the Backlight On and Off	15
Overview of Modes and Functions	16
Network Test modes	16
Cable Test modes	17
Properties functions	17
Setup modes	18
Navigating in the User Interface	18
Network Connectivity	20
Notes About Voltage Checking	20

Chapter 3	Performing Network Tests	21
	Network Testing Overview	22
	Accessing the Network Test Menu	22
	Performing Port Discovery Tests	23
	Performing Ping Tests	25
	Understanding DHCP ON/ DHCP OFF modes	32
	Performing Hub Flash Tests	33
	Performing Cisco Discovery Protocol Tests	35
	Performing PoE Tests	36

Chapter 4	Performing Cabling Tests	39
	Cable Testing Overview	40
	Special notes and cautions	40

	Accessing the Cable Test Menu	41
	Performing Cable Tests.	41
	Performing Remote Mapping Tests	45
	Performing Cable Length Tests	47
	Performing Tone Generator Tests	49
<hr/>		
Chapter 5	Viewing Properties and Modifying Settings	53
	Viewing Unit Properties	54
	Accessing the Properties menu.	54
	Viewing last DHCP values.	55
	Viewing the unit MAC address	56
	Viewing the product version	57
	Viewing the battery charge remaining	58
	Modifying Unit Settings	59
	Accessing the Setup menu	59
	Changing the display language	60
	Calibrating cable length.	61
	Finding a length constant	62
<hr/>		
Chapter 6	Interpreting Test Results	65
	Status and Error Messages for Network Tests	66
	Interpreting Cable Test Results	70
	Definition of Errors.	70
<hr/>		
Appendix A	Glossary of Network Terms and Internet Protocols	73
	Network Terms and Definitions	74
	Internet Protocol Definitions	80

Appendix B	Customer Services	85
	Customer Service (Standard Services)	86
	Technical Assistance (Business Hour)	86
	Instrument Repair	86
	Equipment Return Instructions	87
	Warranty Information	88

About This Guide

- “Purpose and Scope” on page x
- “Assumptions” on page x
- “Technical Assistance” on page x
- “Conventions” on page xi

Purpose and Scope

The purpose of this guide is to help you successfully use the features and capabilities of the LanScaperPRO™ Network Tester. Additionally, this guide provides a complete description of JDSU's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the LanScaperPRO Network Tester effectively and efficiently. We are assuming that you are familiar with basic telecommunication concepts and network and Internet terminology. For more information on network and Internet terminology used in this guide, read over the [“Glossary of Network Terms and Internet Protocols”](#) on page 73.

Technical Assistance

If you need assistance or have questions related to the use of this product, call or e-mail JDSU's Technical Assistance Center (TAC) in your region. For a current listing of TAC phone numbers and e-mail addresses, go to: www.jdsu.com/test_and_measurement/us_customer_support/index.html.

Conventions

Guide conventions This guide uses conventions as described in the following tables.

Table 1 Typographical conventions

Description	Example(s)
Keys that you press on the unit appear in this typeface .	Press the SEL key.
Output messages that appear in the LCD appear in <i>this typeface</i> .	Tone is active

Table 2 Notes, cautions, warnings conventions

NOTE

Notes include important supplemental information or tips related to the main text.



CAUTION

Indicates a potentially hazardous situation that could result in damage to the unit and/or minor or moderate bodily injury if indicated precautions are not taken.



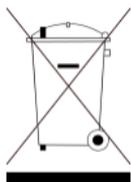
WARNING

Indicates a potentially hazardous situation that could result in damage to the unit, serious bodily injury, and/or death, as from electrocution, if indicated precautions are not taken.

Hardware packaging and labeling conventions

The following table provides definitions for symbols used on JDSU hardware.

Table 3 Symbol conventions on hardware packaging and labeling



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

Product Overview

1

This chapter provides a general description of the LanScaperPRO Network Tester. Topics discussed in this chapter include:

- “About the LanScaperPRO Network Tester” on page 2
- “Features and Capabilities” on page 3
- “Applications” on page 4
- “Product Parts and Ordering Information” on page 5
- “Specifications” on page 7

About the LanScaperPRO Network Tester

The LanScaperPRO Network Tester is a jack identifier, cable tester, Power over Ethernet (PoE) tester, and pinger in one tester. Easy to use, it combines the functions of a high-end cable tester and length measurement device with the capability to identify, monitor, and correct LAN issues associated with physical layer and link conditions in the network.



Figure 1 The LanScaperPRO Network Tester
In network mode testing, the LanScaperPRO enables quick identification at unknown RJ45 jacks of active Ethernet devices, POTS, Token Ring, or other devices. It can also detect the presence of devices using PoE at the other end of the jack or cable being tested. In addition, it

can be used to ping network devices to verify connections and IP addresses, automatically accessing DHCP hosts to obtain network information.

For cable testing, the LanScaperPRO provides full cabling testing, displaying a wiremap, ID, and any faults, including shorts, opens, miswires, split pairs, and reverses. It also measures cable length and generates tone levels for signal tracing and cable identification on all pairs, a selected pair, or a selected pin.

Features and Capabilities

- Detects and reports active Ethernet devices as well as POTS, ISDN, Token Ring, and other devices at the other end of a link for 10BASE-T or 100BASE-Tx.
- Identifies IEEE 802.3af PoE and legacy Cisco In-Line Power (ILP) at the other end of the jack or cable being tested, including the presence of raw DC power. Verifies wiring installation capability to provide PoE to end device.
- Simultaneously pings three addresses at once: target, router, and DNS server. DHCP support allows for pinging of router and DNS server with no setup.
- Blinks a link indicator to identify hub or switch port and links to Cisco bridge or router ports using Cisco Discovery Protocol (CDP).
- Tests cabling configuration and verifies connectivity while conducting tests for opens, shorts, miswires, split pairs, reverses, and high-resistance faults.

- Displays length measurement for each pair in feet or meters. Displays wiremaps and remote identifiers.
- Generates selectable tones on selected pins for use with tone tracers.
- Provides support for six languages, selectable from the setup options.
- Includes large backlit LCD that allows for clear display of setup information and test results.
- Preserves battery life through low power consumption and automatic turn off in any mode.

Applications

- Full cable testing with display of wiremap, ID, and any faults detected with pair-by-pair status message on shielded or unshielded network or coax cable.
- Remote mapping for up to 20 optional remote identifiers (see [“Accessories” on page 6](#)) for room identification.
- Cable length measuring for each pair using patented cable capacitance method.
- Link testing to identify PoE voltage, advertised speed, duplex mode, wiring mode, and polarity of transmit pair on active Ethernet and other devices connected to unknown jacks.
- Use of auto MDI/MDI-X protocol to instantly identify hub, switch, or NIC ports with straight through or crossover cable.
- Testing of PoE to ensure adequate power is present for powered devices such as VoIP phones.

Product Parts and Ordering Information

Table 4 describes orderable LanScaperPRO packages.

Table 4 LanScaperPRO Product Parts

Description	Part Number
LanScaperPRO Network Tester: <ul style="list-style-type: none">– Includes one LanScaperPRO main unit, one cable test remote, two 1 ft. patch cables, one RJ45 to alligator clip cable, two “no fault” RJ12 cables, and one nylon carrying case.	NT800
LanScaperPRO Network Tester Kit: <ul style="list-style-type: none">– Includes one LansScaperPRO main unit, eight cable test remotes, two 1 ft. patch cables, one RJ45 to alligator clip cable, two “no fault” RJ12 cables, one TT100 tone tracer, and one nylon carrying case.	NT850

For assistance with product ordering, go to www.jdsu.com/know/ and look for the ‘Contact NET Customer Assistance’ link. For information on optional, orderable accessories, see “Accesories” on page 6.

Accessories Table 5 describes optional orderable accessories for the LanScaperPRO.

Table 5 LanScaperPRO Optional Accessories

Description	Part Number
Master Wiremapping Kit: <ul style="list-style-type: none">– Includes 20-piece coax wiremapper set, 20-piece RJ45 wiremapper set, 20-piece RJ11 wiremapper set, 20 individually numbered unterminated remote identifiers, and a zippered pouch.	KP420
1-10 Coax Remote Identifiers <ul style="list-style-type: none">– (10-piece set)	TP310
11-20 Coax Remote Identifiers <ul style="list-style-type: none">– (10-piece set)	TP311
1-20 RJ45 Remote Identifiers <ul style="list-style-type: none">– (20-piece set)	TP312
1-20 RJ11 Remote Identifiers <ul style="list-style-type: none">– (20-piece set)	TP314
1-20 Unterminated Remote Identifiers <ul style="list-style-type: none">– (20-piece set, individually numbered)	TP315

For assistance with product ordering, go to www.jdsu.com/know/ and look for the 'Contact NET Customer Assistance' link.

Specifications

The following tables describe the specifications for the LanScaperPRO Network Tester.

Table 6 Physical specifications

Parameter	Specification
Size	4.50 cm x 8.87 cm x 18.56 cm (1.77 in. x 3.49 in. x 7.31 in.)
Weight	397 grams (14 oz.) with batteries

Table 7 Operating and storage environment

Parameter	Specification
Operating Temperature	0° to 50° C (32° to 122° F)
Storage Temperature	-30° to 80° C (-20° to 176° F)
Humidity	10% to 90%, non-condensing

Table 8 Battery life (4 AA Alkaline batteries, typical)^a

Usage Mode	Specification
Standby	2 years
Cable Testing	– 70 hours (no backlight) – 50 hours (50% backlight)
Network Testing	– 7 hours (no backlight) – 6.5 hours (50% backlight)

a. Times are for the full capacity of the battery used continuously.

Table 9 Cable specifications

Parameter	Specification
Cable Types	Shielded or unshielded, CAT6, CAT5E, CAT5, CAT4, CAT3, Coax
Minimum Cable Length for Testing of Split Pairs	1 meter (3 ft.)
Minimum Cable Length for Single-Ended Cable Test	1.25 meters (4 ft.)
Length Measurement Range (CAT5/6)	0 to 457 meters (0 to 1500 ft.)

Operation

2

This chapter describes the physical features, functionality, and basic operation of the LanScaperPro Network Tester. Topics discussed in this chapter include:

- “Physical Features of the Test Device” on page 10
- “Installing or Replacing the Batteries” on page 13
- “Safety Warnings and Cautions” on page 14
- “Powering the Unit On and Off” on page 15
- “Turning the Backlight On and Off” on page 15
- “Overview of Modes and Functions” on page 16
- “Navigating in the User Interface” on page 18
- “Network Connectivity” on page 20
- “Notes About Voltage Checking” on page 20

Physical Features of the Test Device

Front panel The LanScaperPRO includes the following features on the front panel. (See [“Feature descriptions”](#) on page 11.)



Figure 2 LanScaperPRO front panel

- Feature descriptions**
- **LINK indicator:** LED turns green when a network link is established.
 - **100 MB indicator:** LED turns green when the unit is connected or trying to connect at 100 MB speed.
 - **LOW BATT indicator:** LED turns red when the battery charge is getting low.
 - **Backlit LCD:** Graphical display, 128 x 64 pixels. Backlight can be toggled on and off. (**Note:** The unit ships with a clear, protective coating covering the LCD. Remove it for clearest view of the display.)
 - **Navigation arrow keys:** Used to scroll through options, set addresses, and adjust values for changeable options.
 - **SEL key:** Used to select menu and submenu options and to activate changeable options for value adjustment via the arrow keys and ACCPT key.
 - **ACCPT key:** Used to accept displayed values for changeable options selected with the arrow keys.
 - **QUIT key:** Used to back out from submenus and return to the previous (higher) menu level or to exit tests in progress.
 - **TEST key:** Used to initiate tests.
 - **Power key:** Used to power the unit on and off. Must be held down for one second to turn the unit off. (Before turning the unit on, read the section on [“Safety Warnings and Cautions” on page 14.](#))
 - **Backlight key:** Used to toggle between the LCD backlight being on or off.

Chapter 2 Operation

Physical Features of the Test Device

Connector (top) panel The top panel of the LanScaperPRO includes one RJ45 jack/test port that is used to connect to the cable or jack to be tested, as shown in [Figure 3](#).



Figure 3 LanScaperPRO connector panel

Back panel The back panel of the LanScaperPRO includes a battery compartment with a cover secured by two screws, as shown in [Figure 4](#). (See “[Installing or Replacing the Batteries](#)” on [page 13](#) for more information.)



Figure 4 LanScaperPRO back panel

Installing or Replacing the Batteries

To run the LanScaperPRO Network Tester, four new Alkaline or charged NiMH AA batteries must be installed in the battery compartment. (Note that batteries are not included with the unit; you must supply your own.) Use the procedure below to install or replace the batteries.

NOTE

After batteries are installed in the unit, if the LOW BATT indicator light comes on, the batteries should be replaced as soon as is practical. If the LOW BATT indicator is on and the unit is not, the batteries must be replaced to continue using the unit.

To install or replace the batteries

- 1** Disconnect the tester from any external connection before opening it to install or replace the batteries.
- 2** Using a screwdriver, remove the two screws holding the battery compartment cover. Remove the cover.
- 3** If replacing old batteries, pull them out of the battery compartment and dispose of them according to local regulations.
- 4** Insert four new Alkaline or charged NiMH AA batteries.
- 5** Replace the cover and screws.

Safety Warnings and Cautions

Read the following warnings and cautions carefully before attempting to use the LanScaperPRO Network Tester.



WARNING

Do not attach the LanScaperPRO to primary power lines, as it may be damaged and cause a safety hazard. When connecting to an unknown jack or plug, the LanScaperPRO should be off. Once connected, press the power key to turn the unit on and then run the Port Discovery test to ID the connection.



WARNING

The LanScaperPRO is not intended to connect to “Hazardously Live” circuits (more than 42.4 Vac or 60 Vdc). There is a danger of electrical shock or fire if connected to a hazardously live circuit.



CAUTION

Improperly crimped, damaged, or un-crimped plugs can damage the jack on the LanScaperPRO. Inspect plugs for proper termination and crimping before inserting into the tester. Contacts on a plug should always be recessed into the plastic grooves. Do not use with standard 6 position plugs (RJ11/RJ12), or the LanScaperPRO jack may be damaged. Use the provided “no fault” (green transparent plugs) 6 position RJ cable, which can be connected to 6 or 8 position jacks without causing any damage.

Powering the Unit On and Off

Read the section on [“Safety Warnings and Cautions” on page 14](#) before turning the unit on the first time.

Turning the unit on To turn the unit on, press the power key. (See [“Physical Features of the Test Device” on page 10](#).) When the unit powers up, text appears in the LCD and the LCD backlight lights up. The first time you power the unit on, it will default to the main menu. On subsequent power ups, the unit will turn on in the last mode used before turn off.

If the LOW BATT indicator light comes on when you power up, the batteries should be replaced as soon as is practical. (See [“Installing or Replacing the Batteries” on page 13](#).) If the light turns on but the unit does not, the batteries must be replaced before the unit can be used.

Turning the unit off To turn the unit off, press the power key and hold it down until the LCD goes blank. The unit will turn off automatically after about 15 minutes in all modes except Tone Generator (60 minutes) and Hub Flash (30 minutes).

Turning the Backlight On and Off

The backlight comes on when the unit is started and turns off automatically about five minutes after the last press of any key. You can turn the backlight on or off at any time while the unit is on by pressing the backlight key. Using the backlight increases power consumption by 20-50%, depending on the operation mode of the tester.

Overview of Modes and Functions

The LanScaperPRO features nine test modes, four properties functions, and three setup modes, as described in the following sections. See [“Navigating in the User Interface” on page 18](#) to learn how to access these features.

Network Test modes

- **Port Discovery:** Detects and reports active Ethernet devices, as well as identifying many of the possible connections using an RJ45 jack.
- **Ping Test:** Simultaneously pings three addresses at once: a target, a router and a DNS server. DHCP protocol support allows for pinging of a router and DNS server with no setup.
- **Hub Flash:** Blinks a link indicator to help identify a hub or switch port.
- **Cisco Discovery:** Links to a Cisco bridge or router port, detects and displays the Cisco Discovery Protocol (CDP) messages broadcast over the network to inform each other of their existence.
- **PoE Test:** Power over Ethernet (PoE) detection identifies IEEE 802.3af and legacy Cisco In Line Power (ILP) modes and displays pins used to carry the power as well as verifying the wiring installation capability to provide power to the end device without excessive loss.

See [Chapter 3](#) for more information on network testing modes.

- Cable Test modes**
- **Cable Test:** Single-ended (no remote) testing of cables for shorts, opens, and split pairs. Full cable test finds all wiring faults including split pairs with a remote connected. Results displayed in wiremap format with a pair by pair status message. Displays PASS for T568A/B passing cables.
 - **Remote Mapping:** Displays the number of the Remote Identifier (Wiremapper) attached to the end of the cable under test. There are sets of 20 Remote Identifiers (Wiremappers) available.
 - **Cable Length:** Displays measurements for each pair in feet or meters using cable capacitance method.
 - **Tone Generator:** Generates selectable tones on selected pins for use with tone tracers.

See [Chapter 4](#) for more information on cable test modes.

- Properties functions**
- **Last DHCP Values:** Displays the results of the most recent DHCP negotiation between the unit and a DHCP server.
 - **MAC Address:** Displays the factory-set Media Access Control (MAC) number for the unit.
 - **Product Version:** Displays the firmware version of the two microcomputers in the unit.
 - **Charge Remaining:** Displays the approximate charge remaining in the batteries of the unit.

See “[Viewing Unit Properties](#)” on [page 54](#) in [Chapter 5](#) for more information on properties functions.

- Setup modes**
- **Change Language:** Allows users to select a different LCD display language.
 - **Calibrate Length:** Calibrates the unit to compensate for variations in the measurement of cable length.
 - **Find Length Constant:** Enables measurement of the length constant of an attached known length of cable.

See “[Modifying Unit Settings](#)” on page 59 in [Chapter 5](#) for more information on setup modes.

Navigating in the User Interface

When you first power up the LanScaperPRO, the Main Menu appears on the LCD:



Figure 5 The LanScaperPRO Main Menu

To navigate through menus and submenus in the LCD, select changeable options, and set values for changeable options, use the keys on the keypad as described below:

- Use the up and down arrow keys to move the highlight to the desired selection on the screen.

- Use the **SEL** key to select the highlighted option on the screen. When moving down through the menu matrix, the next submenu level will be displayed.
- Use the **QUIT** key to move back to a previous menu or to exit test setup or result screens.

NOTE

Pressing the **QUIT** key a sufficient number of times will always eventually return you to the Main Menu.

- When a changeable option is selected (via the **SEL** key), the highlight will flash. To adjust the value for the selected option:
 - Use the up and down arrow keys to scroll through the possible values for the option.
 - Use the **ACCPT** key to accept the currently displayed value for the option.
 - Use the **QUIT** key (instead of the **ACCPT** key) to exit change mode for the option and revert to the previously selected value for the option.

Setting options for some tests and unit settings requires a somewhat more complex value selection method. Full details are provided in the relevant sections in later chapters of this guide.

Network Connectivity

The LanScaperPRO recognizes Auto-Negotiation using Fast Link Pulses to report advertised Ethernet capability. The LanScaperPRO also supports auto MDI/MDI-X protocol to allow for connection to a hub, switch, or NIC with a straight through or crossover cable. The LanScaperPRO operates using 10 base-T or 100 base-Tx for all network transmissions.

Notes About Voltage Checking

All tests start with a check for voltages on the pins on the tester's jack. If found, the message `-Voltage Found- Press Test to run PoE Test` appears, and the only option for the user is to press the **TEST** key to start the PoE test to determine what type of interface or what voltages are present on the jack. The exception to this behavior is in the Port Discovery mode, in that some voltages on specific pins will be identified as potential non-Ethernet devices. See [“Performing Port Discovery Tests” on page 23](#) for more information.

NOTE

If a Cable Test is started while connected to a PoE source device, the discovery voltage put on the cable may not be detected by the LanScaperPRO and can cause erroneous test results.

Performing Network Tests

3

This chapter describes how to perform network tests using the LanScaperPRO Network Tester. Topics discussed in this chapter include:

- [“Network Testing Overview” on page 22](#)
- [“Performing Port Discovery Tests” on page 23](#)
- [“Performing Ping Tests” on page 25](#)
- [“Performing Hub Flash Tests” on page 33](#)
- [“Performing Cisco Discovery Protocol Tests” on page 35](#)
- [“Performing PoE Tests” on page 36](#)

Network Testing Overview

The LanScaperPRO features five network test modes, as described in the following sections:

- “Performing Port Discovery Tests” on page 23
- “Performing Ping Tests” on page 25
- “Performing Hub Flash Tests” on page 33
- “Performing Cisco Discovery Protocol Tests” on page 35
- “Performing PoE Tests” on page 36

Accessing the Network Test Menu Network tests are performed via the Network Test Menu.
Menu To access the Network Test Menu

- 1 Scroll through the LanScaperPRO Main Menu (see [Figure 5 on page 18](#)) using the arrow keys until **Network Test Menu** is highlighted.
- 2 Press the **SEL** key.
The Network Test Menu appears.



Figure 6 The Network Test Menu

Performing Port Discovery Tests

The Port Discovery test identifies what type of Ethernet equipment, if any, is connected to the other end of the jack or cable being tested.

To perform a Port Discovery test

- 1 Connect the LanScaperPRO to the unknown jack or cable to be tested. Connect to jacks via a patch cord; for cables, plug the cable directly into the tester.
- 2 Access the Network Test Menu. (See [“Accessing the Network Test Menu”](#) on page 22.)
- 3 Scroll through the menu options using the arrow keys until **Port Discovery** is highlighted.
- 4 Press the **SEL** key.

The Port Discovery screen appears.

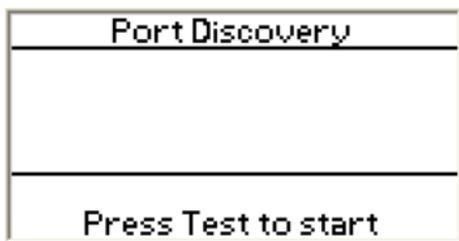


Figure 7 The Port Discovery screen

- 5 Press the **TEST** key to begin the test.

If a voltage is detected, the test terminates, and the user is offered the option to press the **TEST** key to run the PoE test to try to identify the voltage found. (See “[Performing PoE Tests](#)” on page 36.)

If no voltages are found, the test for active Ethernet devices commences. If the remote device is running in Auto-Negotiation mode, the LanScaperPRO detects and decodes the Fast Link Pulses (FLP). The advertised Ethernet speeds, duplex mode, wiring mode, and polarity of the transmit pair appears. The wiring mode is indicated by reference to the type of device that would normally transmit on that pair -- the hub/switch or NIC -- assuming straight through cabling. With a cross-over cable present, a NIC would be labeled as a hub, etc. The AUTO indication appears if the device connected is capable of auto-MDI / MDI-X transmit/receive pair swapping.

If no Auto-Negotiation pulses are detected, the LanScaperPRO attempts to wake a “sleeping” port by sending out FLP bursts for a short time. Some Ethernet ports are inactive while not connected in order to save power. These are known as “sleeping” ports and depend on the incoming FLP bursts to wake them into active mode. If the port responds, the advertised Ethernet speeds, duplex mode, wiring mode, and polarity of the transmit pair appears.

If no active Ethernet port has been detected, the LanScaperPRO attempts to connect in both 100 and 10 MB modes in non-Auto-Negotiation mode. If successful, the connection speed and wiring mode

are reported. (Note that the duplex mode of the remote device cannot be detected without Auto-Negotiation.)

If no active Ethernet devices are found, the LanScaperPRO checks the cable for the typical signatures of inactive Ethernet, Token ring, or ISDN devices. If found, the LanScaperPRO will report what it detects. If none of the above is found, the LanScaperPRO invokes a Cable Test and displays the results. (See [“Performing Cable Tests” on page 41.](#))

To exit Port Discovery mode, press the **QUIT** key.

Performing Ping Tests

The Ping test is used to request an echo back from an addressed device (target) and verify IP connectivity between the LanScaperPRO and another device.

To perform a Ping test

- 1 If the jack or plug is unknown, run a Port Discovery test to verify that an active Ethernet port is connected. (See [“Performing Port Discovery Tests” on page 23.](#))
- 2 Connect the LanScaperPRO to the network.
- 3 Access the Network Test Menu. (See [“Accessing the Network Test Menu” on page 22.](#))
- 4 Scroll through the menu options using the arrow keys until **Ping Test** is highlighted.
- 5 Press the **SEL** key.

The Ping Mode screen appears. (See [Figure 8](#) on page 26.)

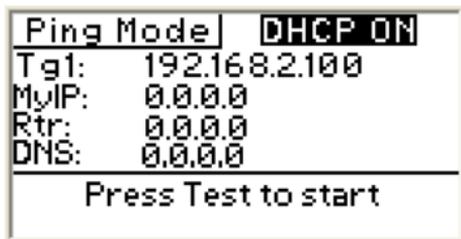


Figure 8 The Ping Mode screen

- 6 (Optional) Select the DHCP mode to be used (DHCP ON or DHCP OFF) by doing the following:
 - a Highlight the DHCP field using the arrow keys.
 - b Press the **SEL** key. The DHCP field starts flashing.
 - c Use the arrow keys to change the on/off setting.
 - d To accept the new value, press the **ACCPY** key.
For more information on the DHCP ON and DHCP OFF modes, see [“Understanding DHCP ON/DHCP OFF modes”](#) on page 32.
- 7 (Optional) Select a different IP target to be used by doing the following:
 - a Highlight the Tg (target number) selection field using the arrow keys.
 - b Press the **SEL** key. The Tg field starts flashing.

- c Scroll through the available targets using the arrow keys. Note that while you are scrolling, the IP address of the target currently visible in the T_g field appears in the target IP address field to the right of the T_g field.
 - d When the desired target is displayed in the T_g field, press **ACPT** to select it. There are four target numbers available (T_g1 - T_g4), plus a T_g- option that will leave the target disabled.
- 8 (Optional) Modify the IP address for the selected target by doing the following:
- a Highlight the IP address for the target selected (to the right of the T_g field) using the arrow keys.
 - b Press the **SEL** key.
The Edit Target IP screen appears.

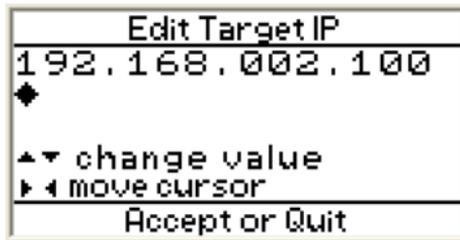


Figure 9 The Edit Target IP screen

- c Modify the IP address by using the left and right arrow keys to select the digit to be changed and the up and down arrow keys to change the value of the selected digit. Note that the IP address appears in typical decimal dot format. Each of

the four decimal numbers separated by periods represents one hexadecimal byte of the four byte IP address and can only have values from 0-255. In addition, each digit in the decimal number can only be set to a value valid for that position, as in, the high order digit in any of the decimal numbers can only be set to 0,1, or 2. Each digit can also only be set to a valid value in relation to the low-order digits in that number. For example, the high order digit can only be set to 2 if the low order digits are less than 55. The desired IP address may have to be entered from right to left to allow the low order digits to be set prior to the high order digit. Any IP address can be entered for a target, either on or off the LAN segment, even “reserved” IP addresses.

- d** When complete, press **ACCP**T to save the new target IP address value or press **QUIT** to revert to the to the previous target IP address.
- 9** If **DHCP OFF** mode was selected, an IP address must be manually entered for **MyIP** (the IP address for the LanScaperPRO). To enter or modify this address, complete the following steps:
- a** Highlight the IP address to the right of the **MyIP** field using the arrow keys.
 - b** Press the **SEL** key.
- The Edit My IP screen appears. (See [Figure 10 on page 29](#).)



Figure 10 The Edit My IP screen

- c** Modify the IP address by using the left and right arrow keys to select the digit to be changed and the up and down arrow keys to change the value of the selected digit. (For more information on modifying the IP address, refer to [step c on page 27](#), under [step 8](#).)
 - d** When complete, press **ACCPT** to save the new target IP address value or press **QUIT** to revert to the to the previous `MyIP` address.
- 10** If `DHCP OFF` mode was selected, an IP address must be manually entered for `Rtr` (the IP address of the router on the LAN). To enter or modify this address, complete the following steps:
- a** Highlight the IP address to the right of the `Rtr` field using the arrow keys.
 - b** Press the **SEL** key.

The Edit Router IP screen appears. (See [Figure 11 on page 30](#).)



Figure 11 The Edit Router IP screen

- c** Modify the IP address by using the left and right arrow keys to select the digit to be changed and the up and down arrow keys to change the value of the selected digit. (For more information on modifying the IP address, refer to [step c on page 27](#), under [step 8](#).)
 - d** When complete, press **ACCPT** to save the new target IP address value or press **QUIT** to revert to the to the previous `Rtr` IP address.
- 11** If `DHCP OFF` mode was selected, an IP address must be manually entered for `Mask` (the Netmask to be used). To modify this address, complete the following steps:
- a** Highlight the IP address to the right of the `Rtr` field using the arrow keys.
 - b** Press the **SEL** key.
The Edit Netmask screen appears. (See [Figure 12 on page 31](#).)



Figure 12 The Edit Netmask screen

- c Select the Netmask to be used by using the up and down arrow keys to scroll through the available values. Notice that a limited number of values are possible.
 - d When complete, press **ACCPT** to save the new target IP address value or press **QUIT** to revert to the to the previous `Rtr` IP address.
- 12** Press the **TEST** key to begin the test.

A series of status messages is displayed at the bottom of the screen while the LanScaperPRO is establishing a link and negotiating the DHCP configuration. Once pinging begins, ping status messages are displayed, showing acronyms for each active conversation. (See [“Status and Error Messages for Network Tests” on page 66](#) for more information.)

As part of the ping test, the LanScaperPRO checks for voltages and then searches for link pulses on its jack, automatically configuring the interface to connect to a hub, switch, or NIC in either 100 MB or 10 MB mode. Once an active link is found, the tester configures its IP address parameters as selected by the user. Once the parameters are set, the tester

Chapter 3 Performing Network Tests

Performing Ping Tests

starts sending out ping packets to the selected target, the router, and (in `DHCP ON` mode) the DNS server. The pings continue for 15 minutes after the last key press, after which the LanScaperPRO automatically turns off.

- 13** To view information about a specific device once the test is complete, do the following:
 - a** Highlight a device acronym using the left and right arrow keys.
 - b** Press the **SEL** key. One of two detailed status messages is displayed.
 - c** Press the **SEL** key again to advance to the next screen and view the second status message. (The screen will auto-advance in 10 seconds.)
- 14** Press the **QUIT** key once to exit the active Ping Test and again to move back to the Network Test Menu.

Understanding DHCP ON/ DHCP OFF modes

The LanScaperPRO ping function operates in two modes: `DHCP ON` and `DHCP OFF` (Manual Mode). DHCP is a protocol negotiation used to automatically configure the IP parameters of the LanScaperPRO on a specific LAN segment. (For more information, see the entry for DHCP under “[Internet Protocol Definitions](#)” on page 80.)

With DHCP on, the next time the ping test is started, the tester will request IP parameters it needs for LAN communication from a DHCP server on that LAN segment. If a response from a server is received, the tester will configure itself with the acquired parameters and start the ping. (Note that the only IP parameter not received from

the host is the Target IP address, which is always manually entered.) If no response is received, the tester cannot do any pinging on that LAN. In that case, the DHCP off state must be selected, and all of the ping setup parameters must be manually entered. The next ping test will then attempt to communicate with those parameters.

Performing Hub Flash Tests

The Hub Flash test is used to help identify a hub or switch port.

- 1 Connect the LanScaperPRO to a jack or plug at the workstation location for which the Ethernet port is to be located.
- 2 Access the Network Test Menu. (See [“Accessing the Network Test Menu”](#) on page 22.)
- 3 Scroll through the menu options using the arrow keys until **Hub Flash** is highlighted.
- 4 Press the **SEL** key.

The Hub Flash screen appears.



Figure 13 The Hub Flash screen

- 5 Press the **TEST** key to begin the test.

The test starts with a voltage check test (see [“Notes About Voltage Checking” on page 20](#)), then attempts to link at 100 and 10 MB speeds in the hub wiring mode. If the hub wiring mode fails, the LanScaperPRO switches the wiring mode to NIC, and tries the two speeds again. Each attempt to link at speed and wiring mode takes 3 seconds, so it takes 12 seconds to test all modes.

If no link is found, an audio tone signal is sent down the cable so the cable can be located at the other end with a tone tracer. The audio tone alternates with the 12 second link test until a link is found, or the test is stopped by timeout or the user.

Once a link is established, the LINK LED on the LanScaperPRO will illuminate, and the link will be held up for 3 seconds, then dropped for 3 seconds to blink the link indicator on the device at the other end. The LanScaperPRO will automatically turn off in 30 minutes.

While the tester is searching for an active link partner, it displays the message `Find Active Link`. Once a link is made, the tester displays `Link Active` and the LINK LED flashes. The speed of the link can be determined by checking if the 100 MB LED is lit. If the tester loses the link, it reports `Lost Link` for several seconds, then returns to the search for a link partner.

NOTE

Some modes of Full Duplex non-auto negotiation Ethernet connection will not link properly with the LanScaperPRO, and the Hub Flash function will not work.

- 6 Press the **QUIT** key to stop the test.

Performing Cisco Discovery Protocol Tests

This test detects Cisco Delivery Protocol (CDP) messages broadcast by Cisco bridges and routers over the network to inform each other of their existence. Using CDP, network devices periodically advertise their own information to a multicast address on the network, making it available to any device or application that wishes to listen and collect it. A direct connection to the port of interest is required, because the CDP packets are not IP addressed and are not forwarded through other switches. They are intended to identify the specific port which they are transmitted from and are not designed to be propagated through a network.

To perform a Cisco Discovery Protocol test

- 1 Connect the LanScaperPRO to a jack or plug at the workstation location for which the Cisco Discovery Protocol (CDP) is to be displayed.
- 2 Access the Network Test Menu. (See [“Accessing the Network Test Menu” on page 22.](#))
- 3 Scroll through the menu options using the arrow keys until **Cisco Discovery** is highlighted.

- 4 Press the **SEL** key.
- 5 Press the **TEST** key to connect to the Ethernet port and capture the CDP information.

Once a CDP packet is collected, the messages are displayed, along with headings for each of the fields in the message, as in [Figure 14](#).



```
CDP Display Screen
Device ID:
cisco_3524
Device address:
IP Address
192.168.1.252
Port ID:
```

Figure 14 The CDP Display Screen, post-test

- 6 Use the up and down arrow keys to scroll through the information.
- 7 Repeat steps 5 and 6 as needed.
- 8 Press the **QUIT** key to exit Cisco Discovery mode.

Performing PoE Tests

The Power over Ethernet (PoE) test identifies what power-providing equipment, if any, is connected to the other end of the jack or cable being tested.

To perform a PoE test

- 1 Connect a patch cable to the unknown jack or connect the cable plug directly to the tester.

- 2 Access the Network Test Menu. (See [“Accessing the Network Test Menu”](#) on page 22.)
- 3 Scroll through the menu options using the arrow keys until **PoE Test** is highlighted.
- 4 Press the **SEL** key.

The PoE Test screen appears.

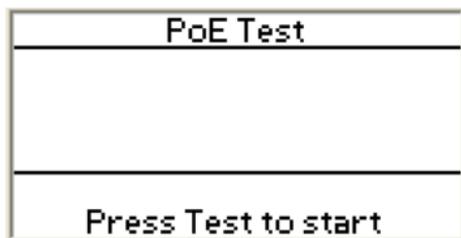


Figure 15 The PoE Test screen

- 5 Press the **TEST** key to begin the test.

The test first looks for the presence of voltages on the connector pins. (See [“Notes About Voltage Checking”](#) on page 20.) If voltages are found in typical telephone or ISDN locations, the LanScaperPRO reports that it may be connected to a phone or ISDN line. In this mode, the unit also tests for a legacy PoE mode known as "PoE Homebrew" power. This is raw DC power that may be connected to the center taps of the Ethernet transformers and thus appear on the 1-2, 3-6 pairs, or the 4-5, 7-8 pairs. This type of power was designed into systems prior to the introduction of the IEEE 802.3af specification. The LanScaperPRO detects and reports this voltage and then can continue to test for active Ethernet.

If no other voltages are present, the LanScaperPRO tests for PoE. Four different PoE modes/connections are tested for:

- Cisco legacy In Line Power (ILP), connected in the End Span (1-2, 3-6 pairs) configuration
- Cisco legacy In Line Power (ILP), connected in the Mid Span (4-5, 7-8 pairs) configuration
- IEEE 802.3af (IEEE) modes, connected in the End Span (1-2, 3-6 pairs) configuration
- IEEE 802.3af (IEEE) modes, connected in the Mid Span (4-5, 7-8 pairs) configuration

If one of these PoE sources is detected, the PoE mode, the pairs carrying the power, and the polarity of the voltage are determined and displayed. As part of the process, the voltage and current are verified to meet the IEEE specifications.

Once the test is complete and the results displayed, the user is offered the option to press the **SEL** key to display the Network Test Menu and run any network tests without retesting for voltages. (Once valid PoE is determined, it is safe to run the LanScaperPRO network tests on the system.)

If you do not wish to run a network test at this point, you can change the jack connection and press the **TEST** key to run another PoE test or press the **QUIT** key to exit the PoE test mode.

Note that some other non-standard legacy PoE protocols may not be detected by the LanScaperPRO, and can cause erroneous test results.

Performing Cabling Tests

4

This chapter describes how to perform different types of cabling tests using the LanScaperPRO Network Tester. Topics discussed in this chapter include:

- “Cable Testing Overview” on page 40
- “Performing Cable Tests” on page 41
- “Performing Remote Mapping Tests” on page 45
- “Performing Cable Length Tests” on page 47
- “Performing Tone Generator Tests” on page 49

Cable Testing Overview

The LanScaperPRO features four cable test modes, as described in the following sections:

- [“Performing Cable Tests” on page 41](#)
- [“Performing Remote Mapping Tests” on page 45](#)
- [“Performing Cable Length Tests” on page 47](#)
- [“Performing Tone Generator Tests” on page 49](#)

Special notes and cautions Read the following notes and cautions before proceeding with cabling testing.



NOTE

If the connection to the unit is changed while a test is in progress, the results are unreliable.



CAUTION

The LanScaperPRO attempts to protect its more sensitive circuitry by testing for dangerous voltages on the pins prior to running a test. (Note that some non-standard legacy PoE protocols may not be detected by the LanScaperPRO and can cause erroneous test results.) Changing the connections while a test is in process bypasses this automatic protection and may result in damage to the tester.

Accessing the Cable Test Menu Cable tests are performed via the Cable Test Menu.

To access the Cable Test Menu

- 1 Scroll through the Main Menu using the arrow keys and highlight **Cable Test Menu** in the LCD.
- 2 Press the **SEL** key.
The Cable Test Menu appears.

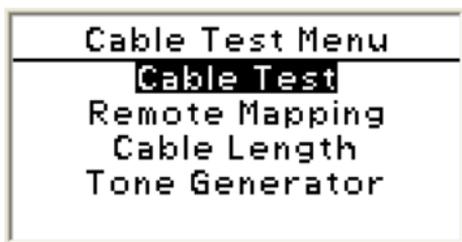


Figure 16 The Cable Test Menu

Performing Cable Tests

The Cable test provides support for both single-ended (no remote) testing of cables for shorts, opens, and split pairs and full cable (with a remote connected) testing that finds all wiring faults, including split pairs. Results are displayed in wiremap format with a pair by pair status message, and PASS is displayed for T568A/B passing cables.

To perform a cable test

- 1 Connect the LanScaperPRO to the unknown jack or cable to be tested. Connect to jacks via a patch cord; for cables, plug the cable directly into the tester.

Chapter 4 Performing Cabling Tests

Performing Cable Tests

- 2 Access the Cable Test Menu. (See “[Accessing the Cable Test Menu](#)” on page 41.)
- 3 Scroll through the menu options using the arrow keys until **Cable Test** is highlighted.
- 4 Press the **SEL** key.

The pre-test Cable Test Results screen appears with two areas showing at the top: the cable pairs status area on the left and the wiremap area on the right.

Cable Test Results	
1-2:	12 36 45 78 S
3-6:	
4-5:	
7-8:	
Press Test to start	

Figure 17 The Cable Test Results screen, pre-test

- 5 Press the **TEST** key to begin the test.

Two new areas appear at the bottom of the screen: the test status area on the left and the Remote ID area on the right. A bar moving across the Remote ID area indicates the test is in progress.

If no remote is attached to the far end of the cable, a single-ended test for shorts, opens, and split pairs is run.

If a remote is connected to the other end of the cable prior to starting the test, a complete cable test is run.

Upon completion of the test, the cable pairs status, wiremap, test result, and Remote ID is displayed on the Cable Test Results screen, as [Figure 18](#).

Cable Test Results					
1-2: Open	12	36	45	78	S
3-6: Split				U	
4-5: Short				X	
7-8: Revrs	12	36	45	78	S
FAIL	Rem ID: 3				

Figure 18 The Cable Test Results screen after a complete cable test

A guide to interpreting the test results by area, left to right and top to bottom:

- **Cable Pairs Status Area:** Displays the status for each pair in the cable. Possible values include: Split, Short, Open, Revrs (Reverse), and High R (High Resistance).
- **Wiremap Area:** The top row of numbers in the wiremap area represents the connector pins on the main unit, while the second row represents those on the remote. Lines that connect the top row to the second row show the connections detected. If there is a miswire, the lines cross, indicating the connections are not straight through. If no connection is detected for some of the pins, there are no lines between the rows. If a short is detected, the lines connect between the shorted pin numbers on the top row. If multiple

Chapter 4 Performing Cabling Tests

Performing Cable Tests

pins shorted together, lines connect all the shorted pins. If there are multiple shorts, the horizontal lines connecting the pins are separate.

- **Test Result Area:** Displays the results of the test. Possible values are `PASS` and `FAIL`.
- **Remote ID Area:** Displays the ID found for the remote. If no remote is found, `No Remote` is displayed.

For more information, see [“Interpreting Cable Test Results” on page 70 in Chapter 6.](#)

NOTE

Partial and erroneous results will be displayed if a cable is removed or connected while the test is in process.

Once the test is complete, you can run another test or use the **QUIT** key to exit Cable Test mode and return to the previous menu.

NOTE

Any patch cables used to connect the tester and remote to a cable run must be short compared to the cable run for accurate open and split pair indication (no more than 10% of the total run length or 3 feet, whichever is less). A cable must be at least 4 feet long for a single-ended test to work properly.

Performing Remote Mapping Tests

The Remote Mapping test finds and displays the number of the remote identifier (wiremapper) attached to the end of the cable under test. This test assumes that a one-of-twenty remote identifier is connected at the terminal end of each cable to be mapped. Twenty piece sets of remote identifiers are available from JDSU as separately orderable accessories. (See [“Accessories” on page 6.](#))

To perform remote mapping tests

- 1 Place a remote identifier at the terminal end of each cable to be mapped. (Multiple cables can be mapped in one operation by first attaching one remote identifier to the terminal end of each cable and then testing each cable one-at-a-time at the central location to identify the unique ID of each attached identifier.)
- 2 At the central location (equipment closet) where the cables to be mapped come together, connect the cable to be mapped to the connector on the LanScaperPRO.
- 3 Access the Cable Test Menu. (See [“Accessing the Cable Test Menu” on page 41.](#))
- 4 Scroll through the menu options using the arrow keys until **Remote Mapping** is highlighted.
- 5 Press the **SEL** key.

The pre-test Mapping Test Results screen appears with two areas showing at the top: the cable pairs status area on the left and the wiremap area on the right. (See [Figure 19 on page 46.](#))

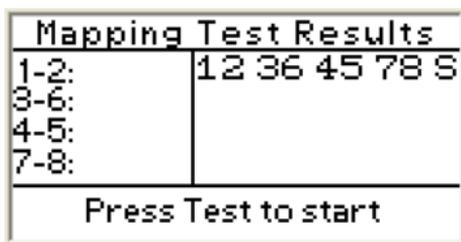


Figure 19 The Mapping Test Results screen, pre-test

- 6 Press the **TEST** key to begin the test.

A new area appears at the bottom of the screen: the Remote ID area on the right. A bar moving across the Remote ID area indicates the test is in progress.

Upon completion of the test, the number of the attached remote identifier is displayed on the Mapping Test Results screen. In addition, the results of the open-ended cable test are displayed to provide status on all pairs found in the cable. (For more information on cable test results, look under [step 5](#) under “Performing Cable Tests” on page 41.) The pins that were found to be connected to the remote identifier are shown as connected to M. Any cable faults found that prevented detection of the identifier are displayed rather than the number.

- 7 Disconnect the cable just tested from the tester.
- 8 Repeat steps 2-7 until mapping of all cables to be mapped is complete.

Performing Cable Length Tests

The Cable Length test finds and displays measurements for each pair in feet or meters using the cable capacitance method. The test measures the length of a cable by measuring its capacitance and using the capacitance per unit length (length constant) to calculate the length.

To perform a cable length test

- 1 Connect the cable to the LanScaperPRO. (The other end may be connected to a remote.)
- 2 Access the Cable Test Menu. (See [“Accessing the Cable Test Menu”](#) on page 41.)
- 3 Scroll through the menu options using the arrow keys until **Cable Length** is highlighted.
- 4 Press the **SEL** key.

The pre-test Cable Length screen appears.

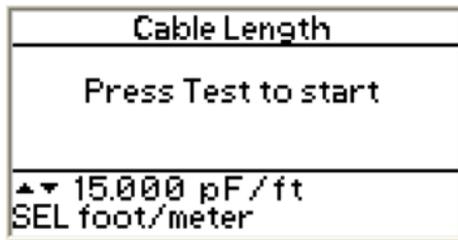


Figure 20 The Cable Length screen, pre-test

- 5 (Optional) Use the **SEL** key to change the length display between feet and meters.

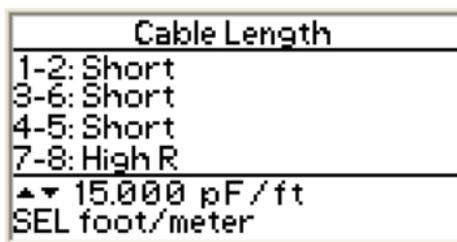
- (Optional) Adjust the length constant by using the up and down arrow keys, if necessary.

NOTE

The length constant can also be adjusted in the Setup menu prior to starting a Cable Length test. See “[Finding a length constant](#)” on page 62 in [Chapter 5](#).

- Press the **TEST** key to begin the test.

A bar moving across the bottom of the screen indicates the test is in progress. Upon completion of the test, the length of each pair that has no faults appears on the Cable Length screen, along with the current value of the length constant. If a pair has a fault, a fault message appears for that pair instead of a length measurement, as in [Figure 21](#).



Cable Length	
1-2:	Short
3-6:	Short
4-5:	Short
7-8:	High R
▲▼ 15.000 pF/ft	
SEL foot/meter	

Figure 21 Cable Length test results

Performing Tone Generator Tests

The Tone Generator test generates selectable tones for use with tone tracers on either all pairs, a selected pair, or a selected pin, depending on user selection. The signal generated on a pair has the signal on one pin and the complement of the signal on the other pin of the pair, yielding a nominal 10 volts peak to peak across the pair.

To perform a tone generator test

- 1 Connect the cable to be traced to the tester.
- 2 Access the Cable Test Menu. (See “[Accessing the Cable Test Menu](#)” on page 41.)
- 3 Scroll through the menu options using the arrow keys until **Tone Generator** is highlighted.
- 4 Press the **SEL** key.

The pre-test Tone Generator screen appears. (See [Figure 22](#).)

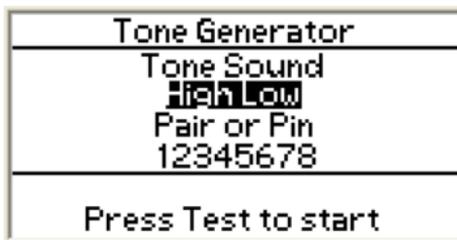


Figure 22 The Tone Generator screen, pre-test

Chapter 4 Performing Cabling Tests

Performing Tone Generator Tests

One of four tone sounds and one of fourteen pair or pin options can be selected. All pins not being driven are held at tester ground.

- 5 (Optional) Change the tone sound to be used by doing the following:
 - a Using the arrow keys, highlight the value under `Tone Sound`.
 - b Press **SEL**. The value starts flashing.
 - c Scroll through the available tone values using the arrow keys.
 - d Press **ACCPT** when the desired tone value is displayed to select it.

NOTE

To exit `Tone Sound` change mode without changing the setting, press the **QUIT** key.

- 6 (Optional) Change the cable pair or pin to be used by doing the following:
 - a Using the arrow keys, highlight the value under `Pair or Pin`.
 - b Press **SEL**. The value starts flashing.
 - c Scroll through the available tone values using the arrow keys.
 - d Press **ACCPT** when the desired tone value is displayed to select it.

NOTE

To exit `Pair` or `Pin` change mode without changing the setting, press the **QUIT** key.

- 7 Press the **TEST** key to begin generating the tone.
If the tone is generated successfully, `Tone is active` is displayed at the bottom of the screen.
- 8 To change tone options, press the **QUIT** key to stop the tone. Press **QUIT** again to exit this mode.

NOTE

For strongest signal, do not connect to a remote. Due to the shielding effect of twisted pairs, the strongest signal is obtained by having one wire of a pair carry tone. Selecting a single pin instead of a pair will do this.

Chapter 4 Performing Cabling Tests

Performing Tone Generator Tests

Viewing Properties and Modifying Settings

5

This chapter describes how to view properties and modify settings in the LanScaperPRO Network Tester. Topics discussed in this chapter include:

- [“Viewing Unit Properties” on page 54](#)
- [“Modifying Unit Settings” on page 59](#)

Viewing Unit Properties

The LanScaperPRO features four viewable unit properties, as described in the following sections:

- “[Viewing last DHCP values](#)” on page 55
- “[Viewing the unit MAC address](#)” on page 56
- “[Viewing the product version](#)” on page 57
- “[Viewing the battery charge remaining](#)” on page 58

Accessing the Properties menu

Unit properties are viewed via the Properties Menu.

To access the Properties Menu

- 1 Scroll through the LanScaperPRO Main Menu (see [Figure 5 on page 18](#)) using the arrow keys until **Properties** is highlighted.

- 2 Press the **SEL** key.

The Properties menu appears.



Figure 23 The Properties menu

Viewing last DHCP values The Last DHCP Values screen displays the results of the most recent DHCP negotiation between the LanScaperPRO and a DHCP server. The values displayed cannot be modified, only viewed to determine the configuration of the LAN segment under test.

To view last DHCP values

- 1 Access the Properties menu. (See [“Accessing the Properties menu”](#) on page 54.)
- 2 Scroll through the menu options using the arrow keys until **Last DHCP Values** is highlighted.
- 3 Press the **SEL** key.

The Last DHCP Values screen appears.

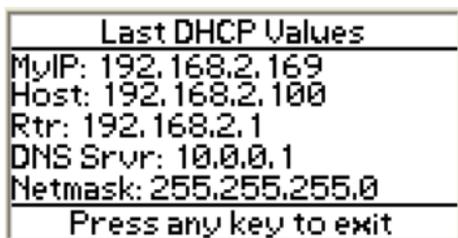


Figure 24 The Last DHCP Values screen

Chapter 5 Viewing Properties and Modifying Settings

Viewing Unit Properties

The following last DHCP values are shown:

- **MyIP:** The IP address for the LanScaperPRO.
- **Host:** The IP address of the DHCP server on the LAN.
- **Rtr:** The IP address of the router on the LAN.
- **DNS Srvr:** The IP address of the DNS server accessible from the LAN
- **Netmask:** The Netmask in use.

Any 0.0.0.0 entries mean that the last DHCP server did not provide the requested information. If all entries are 0.0.0.0, the most likely cause is that DHCP ON mode was selected, but the LAN did not provide a DHCP server.

Viewing the unit MAC address

The MAC address screen displays the factory-set Media Access Control (MAC) number for the specific LanScaperPRO unit. Every Ethernet-interfaced device must have a universally unique identifier to be used as its address. This information is provided as a convenience to the user.

To view the unit MAC address

- 1 Access the Properties menu. (See [“Accessing the Properties menu”](#) on page 54.)
- 2 Scroll through the menu options using the arrow keys until **MAC address** is highlighted.
- 3 Press the **SEL** key.

The MAC address screen appears and displays the MAC address for the unit, as shown in [Figure 25](#) on page 57.

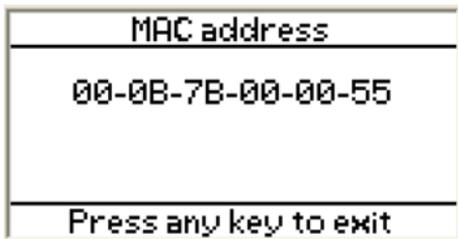


Figure 25 The MAC address screen

Viewing the product version

The Product Version screen displays the version of the firmware in the two microcomputers in the LanScaperPRO unit. This firmware cannot be changed in the field. This information is provided to allow the user to report it to the product support representative if a problem arises.

For product support, go to www.jdsu.com/know/ or send an e-mail to nettechsupport@jdsu.com.

To view the product version

- 1 Access the Properties menu. (See "[Accessing the Properties menu](#)" on page 54.)
- 2 Scroll through the menu options using the arrow keys until **Product Version** is highlighted.
- 3 Press the **SEL** key.

The Product Version screen appears and displays the firmware version installed in the unit, as shown in [Figure 26 on page 58](#).

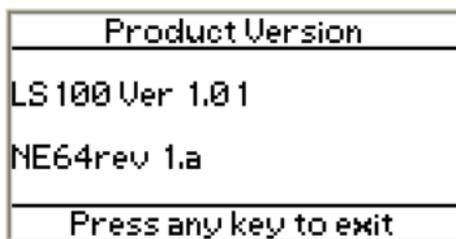


Figure 26 Product Version screen

Viewing the battery charge remaining

The Charge Remaining screen displays the approximate charge remaining in the batteries in the unit. Note that the percentages of charge remaining are calculated for alkaline cells at typical 70° room temperature. Due to the temperature rise in the cells during active Ethernet activity, the charge remaining may read low (or the red LED may go on) and then recover after the unit is off and the batteries cool. If rechargeable batteries are used, the charge remaining levels will not be accurately represented. The red LED will warn when the batteries are in need of recharge. Once the batteries have reached a discharge level too low to guarantee proper operation of the unit, the unit will shut itself off and not turn on until new batteries are installed.

To view the battery charge remaining

- 1 Access the Properties menu. (See [“Accessing the Properties menu”](#) on page 54.)
- 2 Scroll through the menu options using the arrow keys until **Charge Remaining** is highlighted.
- 3 Press the **SEL** key.

The Charge Remaining screen appears and displays the percentage of battery charge remaining, as shown in [Figure 27](#).

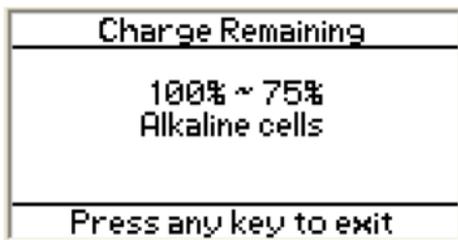


Figure 27 Charge Remaining screen

Modifying Unit Settings

The LanScaperPRO features three adjustable unit properties, as described in the following sections:

- “[Changing the display language](#)” on page 60
- “[Calibrating cable length](#)” on page 61
- “[Finding a length constant](#)” on page 62

Accessing the Setup menu

Unit properties are modified via the Setup Menu.

To access the Setup menu

- 1 Scroll through the LanScaperPRO Main Menu (see [Figure 5 on page 18](#)) using the arrow keys until **Properties** is highlighted.
- 2 Press the **SEL** key.
The Setup menu appears.

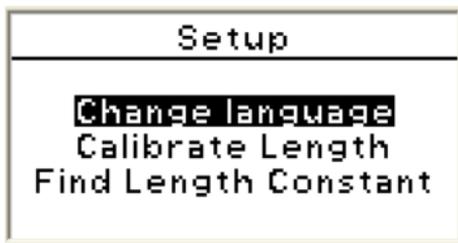


Figure 28 The Setup menu

Changing the display language The Change language screen allows users to select the language to be used for the display of messages on the LCD. Six display languages (English, Spanish, Portuguese, Italian, German, and French) are available.

To change the display language

- 1 Access the Setup menu. (See [“Accessing the Setup menu” on page 59.](#))
- 2 Scroll through the menu options using the arrow keys until **Change language** is highlighted.
- 3 Press the **SEL** key.

The Current Language screen appears and displays the current language selected, highlighted and flashing, as shown in [Figure 29 on page 61.](#)



Figure 29 Current Language screen

- 4 Scroll through the language choices using the arrow keys until the desired language is displayed.
- 5 Press the **ACCPT** key to accept the currently displayed language option.
The display language is changed, and the user is returned to the Setup menu.

NOTE

To exit the Change language screen without changing the display language, press the **QUIT** key.

Calibrating cable length

The Calibrate Length screen allows the LanScaperPRO to be calibrated to compensate for variations in the measurement of cable length.

To calibrate cable length

- 1 Access the Setup menu. (See [“Accessing the Setup menu” on page 59.](#))
- 2 Scroll through the menu options using the arrow keys until **Calibrate Length** is highlighted.

- 3 Press the **SEL** key.

The Calibrate Length screen appears.

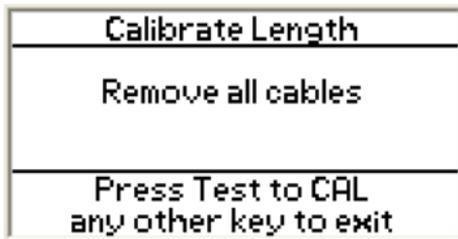


Figure 30 Calibrate Length screen

- 4 Remove all cables from the tester, as directed by the screen.
- 5 Press the **TEST** key or press any other key to exit.
If the **TEST** key is pressed, the tester runs the calibration routine, stores the value, and returns the user to the Setup menu.

NOTE

The effect of a patch cable on the measured length of a cable run can be eliminated by leaving the patch cable attached to the tester while calibrating cable length.

Finding a length constant

The Find Length Constant screen allows for the measurement of the length constant of an attached known length of cable. It is recommended that at least 50 feet of cable be used to minimize the resolution error. (1 foot in 50 = 2% uncertainty).

To find a length constant

- 1 Access the Setup menu. (See “[Accessing the Setup menu](#)” on page 59.)
- 2 Scroll through the menu options using the arrow keys until **Find Length Constant** is highlighted.
- 3 Press the **SEL** key.

The Find Length Constant screen appears, with the message `Attach Measured Cable` showing.

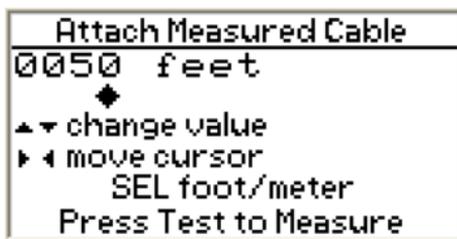


Figure 31 Find Length Constant screen

- 4 Connect a known length of cable to the tester.
- 5 (Optional) Change the unit of measure to feet or meters by pressing the **SEL** key.
- 6 Set the length of cable on the display by using the left and right arrow keys to select the digit to be changed and the up and down arrow keys to change the value of the selected digit. The maximum valid values are 1500 feet or 460 meters, and the user is not allowed to enter an invalid length.
- 7 Press the **TEST** key to measure the capacitance and calculate the length constant.

Chapter 5 Viewing Properties and Modifying Settings

Modifying Unit Settings

The tester runs the cable test and selects a pair which has no faults for the measurement. The tester has a limited range of valid length constants and will not allow an invalid setting to be saved.

After the length constant is calculated, the value appears and the user is given the option to save the length constant.

- 8 Press **ACCPT** key to save the length constant or press the **QUIT** key to revert to the previously set length constant.

Interpreting Test Results

6

This chapter describes the possible test results for LanScaperPRO network tests and cable tests. Topics discussed in this chapter include:

- [“Status and Error Messages for Network Tests” on page 66](#)
- [“Interpreting Cable Test Results” on page 70](#)

Status and Error Messages for Network Tests

DHCP Request

In the ping test with DHCP on, the LanScaperPRO displays this message on the first status line while it is trying to get the required information from a DHCP server. The DHCP request is repeated every 10 seconds when a response is not received, and the count is shown on the same line as the status.

Find Active Link

The tester is searching for incoming link pulses while waiting to start an active test. Hub Flash, Cisco Discovery, and Ping test modes need to be connected to an active network in order to run. In those modes, this status appears while the tester is searching both the 1-2 and 3-6 pairs for incoming Ethernet Link pulses.

Link Found

Status displayed while searching for link pulses after an incoming signal has been detected.

Link Not Found

Status displayed while searching for link pulses and nothing has been detected.

Link word Err

The link word captured by the LanScaperPRO during Port Discovery test from an attached Ethernet device was decoded improperly by the tester. May indicate a cable problem, or a hardware problem with the connected device.

Lost Link

A test was active, after having found incoming link pulses, but they stopped being received, possibly due to the cable being disconnected or the connected device being shut off.

NE64 no response

The Ethernet interface chip used in the LanScaperPRO reported a problem to the CPU during internal communication. May be caused by a hardware problem inside the tester.

No IP address

The DHCP server responded to the tester DHCP request, but did not provide an IP address for MyIP.

Packet Rcv Err

An Ethernet packet was received by the LanScaperPRO with errors in the header or packet data. May be caused by excessive signal noise on the Ethernet cable or a hardware problem with the device transmitting to the tester.

Ping Test Detailed Status Messages

These messages may be displayed when the **SEL** key is used to access the status details during active Pinging.

IP add = DNS add

The active Target IP address is the same as the DNS Server IP address, so the Target Ping is automatically disabled.

IP add = Rtr add

The active Target IP address is the same as the Router IP address, so the Target Ping is automatically disabled.

No ARP Response

The IP address active for this conversation is being ARP'ed, but is not responding. The IP address may be unused, or the device may be powered off or not connected.

No Ping Response

The IP address active for this conversation is not responding to ping requests. If the addressed device is on the LAN segment, it may be powered off or not connected. If the addressed device is remote, it may be inaccessible due to WAN problems, it may be powered off, or the device at the Router IP address may not be forwarding the ping packets.

No Rtr Response

The IP address is off the LAN, requiring the ping go through the Router, but the Router IP address is not responding to ARP.

No Router IP

The DHCP server did not provide an IP address for the Router.

PoE Homebrew

Some devices designed prior to the advent of IEEE 802.3af Power over Ethernet provide raw power for IP phones or wireless transceivers on the same wires that carry the Ethernet data signals without using the detection algorithms defined by the IEEE. They do this by connecting a voltage to the center-taps of each transformer in their Ethernet interface. The LanScaperPRO reports this and allows the Network tests to continue.

Resistance Problem

The Power over Ethernet (PoE) load test determined that if the maximum 15 Watt load was in place in a remote Powered Device, the voltage drop in the wiring system would cause the voltage supplied to the device to be below the IEEE-specified 36 Volts.

Rtr must be on MyIP LAN segment

Displayed in Setup while setting the Manual Router IP address. The LanScaperPRO requires that the Router be at an IP address on the LAN segment as defined by the Netmask and MyIP addresses. Setup will not allow the Router IP address to be set to an off-LAN address.

Voltage Found, Press Test to Run PoE Test

The tester will not run tests when voltage and possibly destructive power is found. Voltages are checked for at the beginning of each test, and if found will terminate the test in progress. The only option is to run the PoE test (by pressing **TEST**.)

Interpreting Cable Test Results

The **PASS** message will be displayed if the cable has all pins properly connected per T568A/B. The **FAIL** message will be displayed if there is any fault. This requires that a remote be attached to the far end of the cable to allow the wiremap to be verified.

Definition of Errors

The classes of faults discussed on the following pages are listed in order of severity. Note that more severe errors can mask lower severity errors. For example, if there is a short in the cable, miswires and splits pairs may not be detected for the pairs involved in the short fault. So, if a higher severity error is displayed, there may be others of lower severity that are not displayed. Given this, it is a good idea to retest cables after repairing faults.

Short

The pair has a low resistance connection from one wire of the pair to the other wire of the pair, to any other wire in the cable or the shield.

Miswire

A wire or both wires of a pair are not connected to the correct pins at the other end of the cable. While testing with a remote, the wiremap shows the connections between the upper line of pin numbers on line 1 (main) to the lower row of pin numbers, line 2 (remote). In single-ended test mode, this type of error is not detectable.

Reverse Pair

A special case of a miswire in which the pair is wired to the correct pair of pins or to another designated pair of pins, but the two leads are reversed. In single-ended test mode, this type of error is not detectable.

Split Pair

A split pair is an error in the twisting of the wires together within the cable. The cables generally are made up of eight wires twisted together in 4 pairs. These 4 pairs are designated as pairs by the wiring standards and are intended to carry a signal and its return. 1&2, 3&6, 4&5 and 7&8 are the pairs designated by T568A/B for a RJ45 jack or plug. A cable can be wired with correct continuity but not with correct pairing. This most often happens when the cable is terminated consistently at both ends, but in the wrong order. A dynamic or AC test is required to detect this type of error. If the only error is a split pair error,

Chapter 6 Interpreting Test Results

Interpreting Cable Test Results

the cable has correct continuity. If cross talk is not a concern, as in flat satin cable, the cable is good if the only error is the split pair error.

High Resistance Fault

If the tester detects a resistance between pins while running the cable test, the number of the pin on the wiremap display will be replaced with the letter **R**. This type of fault is caused by some sort of connection between the pins which has some resistance and thus is not a **Short** but is still a problem in the wiring. In some specific cases of pin connections, a short or resistance may cause the test results for a pin to be ambiguous, and in that case a **?** character will be displayed on the wiremap for that pin.

Glossary of Network Terms and Internet Protocols

A

This appendix provides definitions of key network terms and relevant Internet protocols. Topics discussed in this appendix include:

- [“Network Terms and Definitions” on page 74](#)
- [“Internet Protocol Definitions” on page 80](#)

Network Terms and Definitions

10 Base-T

The earliest definition of Ethernet was for 10 Million Bits per second, 10 Mbps. The Ethernet specification defined several different cabling schemes, including CAT5 (4-pairs of wire) and Coax wiring. The 10 in 10 Base-T defines 10 Mbps and the Base-T defines CAT5 cabling. 10 Base-2 defines 10 Mbps over coax.

100 Base-Tx

A newer Ethernet specification that defines 100 Mbps data rate as an upgrade for higher network bandwidth. Several different cable schemes are defined for 100 Mbps. The 100 in 100 Base-Tx defines the data rate as 100 Million Bits per second. The Base-Tx defines the cable scheme as 2-pairs of wires in a CAT5 cable.

1000 Base-T

The newest common Ethernet communication protocol, 1000 Base-T employs full duplex baseband transmission over four pairs of Category 5 balanced cabling. The aggregate data rate of 1000 Mb/s is achieved by transmission at a data rate of 250 Mb/s over each wire pair. The use of hybrids and cancellers enables full duplex transmission by allowing symbols to be transmitted and received on the same wire pairs at the same time. Baseband signaling with a modulation rate of 125 MBd is used on each of the wire pairs. Note that the LanScaperPRO active network modes work in 10 Base-T or 100 Base-Tx

modes. It relies on the legacy compatibility built in to all 1000 Base-T equipment to communicate. The LanScaperPRO can detect 1000 Base-T advertised rate.

One other cable scheme defined as Base-T4 uses 4 pairs of wires in the CAT5 cable. Very few Ethernet devices use this scheme, as the 2-pair scheme dominates the market. The LanScaperPRO can recognize and report this capability in the Port Discovery mode, but it does not operate in that mode. The LanScaperPRO reports this in Port Discovery mode as 100 Base-T4.

Cross-Over Cable

An Ethernet (CAT5/6) cable which connects the 1-2 pair on one end to the 3-6 pair on the other. This allows a NIC device to connect directly to another NIC device, or hub to a hub. These are often used to connect one hub (or switch) to another hub (or switch) to enable LAN expansion. Note that if one of the hubs has an "UPLINK" connector, that connector can be used with a straight through cable to connect a normal hub port to the "UPLINK" port.

Hub

Ethernet physical wiring is done on a point-point mechanism, but an Ethernet network is a star network, where any device can communicate directly with any other device on that network. A hub is physical device that has multiple Ethernet connectors (ports) on it. Inside, the hub receives incoming data from any of its ports and then transmits what it receives back out on all its ports. Thus, all communications between all devices is visible to all

other devices on that LAN. The hub has no IP or MAC address of its own. It is thus, a "transparent" device that merely enables multiple Ethernet devices to communicate between themselves.

Hubs are typically older Ethernet devices that are 10BaseT. Most 10/100 hub like devices are now switches (see definition). LanScaperPRO uses a hub as a definition for a specific Ethernet connection pin assignment that allows it to connect directly to a NIC device using a straight through cable.

MAC (Media Access Control)

Protocol defined for addressing network-interfaces on a unique basis. Each manufacturer of electronic devices that interface to a MAC-controlled mechanism (like Ethernet) must register with the IEEE and get a set of unique addresses. Each device that manufacturer builds is assigned a single address from that manufacturer's set of addresses. Ethernet will not work properly if more than one device on the LAN has the same MAC address.

MDI/MDI-X (Medium Dependent Interface, X for Crossover)

The physical cable interface defined in IEEE 802.3 is called MDI on one end and MDI-X on the other end. The LanScaperPRO refers to these connectors as NIC and hub respectively. A recent development in Ethernet devices is the ability to determine what type of device is connected on the other end of the cable and adjust itself to communicate properly. The LanScaperPRO will recognize and report this type of device as an Auto Hub/NIC device during port discovery.

NIC (Network Interface Card)

Typically an option card plugged into a PC card slot that provides an Ethernet interface for that PC. LanScaperPRO uses the term NIC to define the connector pin out that allows for direct connection to a hub device using a straight-through cable.

Polarity

Ethernet transmit and receive driver chips use differential voltages to improve noise immunity. Thus each direction of transmission uses a pair of wires, one for the positive (+) side and the other for the negative (-) side. Early Ethernet interface chips were not designed to recognize and compensate for reversed cable pairs, so a crossed (+) and (-) pair could cause problems. Modern Ethernet chips can compensate, so the wiring is not critical, but the LanScaperPRO can determine the difference, and will report it.

Power over Ethernet (PoE)

A method of providing power to remote devices such as IP telephones, WiFi access points, or IP cameras using the Ethernet cable. The IEEE has standardized a method for safely detecting compatible equipment and providing that power in their IEEE 802.3af specification. Cisco Systems developed a method of providing PoE prior to the IEEE specification and their method is called Cisco In Line (ILP) power. The devices that provide the power are termed Power Source Equipment (PSE) and the devices that use the power are called Powered Devices (PD). Both of these PoE methods can provide power using either the

1-2, 3-6 pairs or the 4-5, 7-8 pairs in an RJ45 cable depending on the location of the PSE. If the switch or router at the end of an Ethernet cable run is the PSE, it is termed an Endspan device, and it can safely use the 1-2, 3-6 pairs in the cable. Other PSE devices are designed to be added to an existing wiring installation, and are designed to be added Midspan and provide the power using the 4-5, 7-8 pairs. Since in 10/100 MB Ethernet installations, those pairs are not used by the Ethernet devices, they can safely be used for power distribution. The LanScaperPRO detects, tests, and reports any PSE devices on the cable being tested which support either IEEE or ILP protocols in both the Endspan and Midspan configurations.

Straight-Through Cable

An Ethernet (CAT5/6) cable which connects all 4 pairs in the cable straight through to the corresponding pairs in the far end connector. This allows a NIC device to connect directly to a hub device.

Switch

Similar to a hub, a switch is a multiple port Ethernet connection device that allows for multiple Ethernet devices to communicate between each other. Unlike a hub, a switch has internal logic that determines which port a specific MAC address is found on, and once it has determined that, it only forwards traffic destined for that address to that port. This allows for fewer collisions on the LAN by not re-transmitting every packet on every port.

Multiple simultaneous point-point communications can pass through a switch at the same time, as long as each end point is on a different port on the switch.

Like a hub, a switch (in its primary mode) has no IP or MAC address of its own. Also like a hub, a switch uses "hub" pin out on its connectors to allow direct connections to NIC interfaces.

T568A/B

The EIA/TIA structured wiring standards for telecommunications wiring. A and B versions are electrically identical and can not be distinguished with a wiring test. The color codes and pair numbering is different, however, and care must be taken to use one version within a network. A cable wired to A on one end and B on the other results in a cross-over cable.

UPLINK

A special connector or mechanical switch that changes the pin out of one connector on a hub or switch to NIC pin out. This allows a straight-through cable to be used to connect one hub (or switch) to another while building a LAN.

Internet Protocol Definitions

ARP (Address Resolution Protocol)

Used to determine Ethernet (MAC) address when a device starts to communicate with another. The IP address is known and a broadcast is used to request the specific IP addressed device to respond with its MAC address so further communication can be specifically addressed between the two.

DHCP (Dynamic Host Configuration Protocol)

Used when a new IP device is added to a LAN and it needs to get information about the IP addresses used on that LAN. One DHCP server must be present on the LAN to provide a response to a DHCP request transmitted to a broadcast address and inform the new device of several configuration details. A DHCP server is not required on a LAN, but if it does not exist, all the devices on the LAN must be manually configured. Much information can be provided by the DHCP server, the LanScaperPRO requests and uses:

- an IP address for itself (My IP)
- the IP address of the DHCP server on the LAN
- the Netmask in use
- the IP address of the Router on the LAN
- the IP address of the DNS server accessible from the LAN

DNS (Domain Name Server)

Provides translation of URL addresses (like www.yahoo.com) to IP addresses so that access to the internet devices can be requested using human-understandable identifiers. DNS servers are commonly found on the Internet and are of interest to the LanScaperPRO, because accessing (pinging) the DNS server proves that the LanScaperPRO can access a device on the WAN.

Gateway (Router)

See "[Router \(Gateway\)](#)" on page 82.

IP (Internet Protocol)

Short for TCP/IP (Transmission Control Protocol/Internet Protocol). Communications addressing scheme defined by DARPA (Defense Advanced Research Projects Agency) to control the publicly accessed internet network.

IP Address

Specific number assigned to a single device to allow it to be uniquely identified on the network to which it is connected. On a LAN, the IP address must be within the range of addresses defined for that LAN by the Network Mask in use. On the internet, all IP addresses must be universally unique to allow addressing that specific device. IP addresses consist of 4 hexadecimal digits that are commonly written in "dotted decimal" format. 192.168.254.4 is an example. Note that each set of decimal numbers divided by the periods must be in the range of 0-255 as they represent hexadecimal values of 00-FF.

ISP (Internet Service Provider)

Commercial supplier of access mechanisms for public access to the internet.

LAN (Local Area Network)

Connection mechanism for a business, home, school, or any group of devices to communicate with each other. In the LanScaperPRO case, it is a group of computers, printers, routers, and possibly other devices connected by Ethernet. Distinct from the WAN due to the IP addressing in a "Subnet".

Network Mask (Subnet Mask)

IP addressing scheme that divides the entire IP address network into smaller sections (Subnets.) In the LanScaperPRO use, the Network mask is used to identify an IP address as being located either on the LAN (local subnet) or on the Internet, and therefore accessed over the WAN.

PING (Packet Internet Groper)

A simple communication protocol (ICMP Echo) used to request an echo back from an addressed device (target). The LanScaperPRO uses this to verify IP connectivity between itself and another device.

Router (Gateway)

If a device is attempting to communicate with an IP address, and it finds that the target is not on its local network (by comparing the target address with its own address and the Netmask) the device must forward its request to a router. The router forwards the communica-

tion to the target device across the WAN. This typically puts the communications on the internet, but may also be another LAN subnet, or a private network of some other type. A router has an IP address and MAC address (on Ethernet) of its own for direct communications, which differentiates it from a hub or switch. A hardware box sold as a router will usually include a hub or switch chip inside, providing a convenient connection point for multiple Ethernet devices.

Target

In the Ping protocol, an IP address must be selected to receive an echo request. This address is the "target" address for that Ping. In the LanScaperPRO, a target must be selected manually on the Ping Mode screen. This target can be on the LAN, or anywhere else accessible through a router connected to the LAN. If the target is not on the LAN, the router IP address must be known so the Ping can be sent to the router which forwards it on toward the ultimate location.

TCP/IP (Transmission Control Protocol/Internet Protocol)

See "[IP \(Internet Protocol\)](#)" on page 81.

WAN (Wide Area Network)

The "remote" interface on a router. The WAN may be accessed via a DSL line, broadband cable connection, ISDN, T1 line, or even a dial-up modem line. This term used to loosely define the hardware path used to communicate with any IP-addressed device not on the local LAN.

Appendix A Glossary of Network Terms and Internet Protocols
Internet Protocol Definitions

Customer Services

B

This appendix provides a description of customer services available through JDSU (including returns policies and procedures) and warranty information. Topics discussed in this appendix include:

- [“Customer Service \(Standard Services\)” on page 86](#)
- [“Warranty Information” on page 88](#)

Customer Service (Standard Services)

Customer Service accompanies the sale of every JDSU product. Customer Service services include:

- Technical Assistance (Business Hour)
- Instrument Repair (Under Warranty Repair, Calibration Services, and Upgrade Services)
- Immediate Return Authorizations

Technical Assistance (Business Hour) Expert business hour technical support, including help with product configuration, circuit qualification, and complete network trouble sectionalization is provided with your product (see [“Technical Assistance” on page x](#)).

Instrument Repair Our service centers provide repair, calibration, and upgrade services for JDSU equipment. JDSU understands the impact of equipment down time on operations and is staffed to ensure a quick turnaround. Available services include the following:

Product Repair — All equipment returned for service is tested to the same rigorous standards as newly manufactured equipment. This ensures products meet all published specifications, including any applicable product updates.

Calibration — JDSU’s calibration methods are ISO approved and based on national standards.

Factory Upgrades — Any unit returned for a hardware feature enhancement will also receive applicable product updates and will be thoroughly tested, ensuring peak performance of the complete feature set.

Equipment Return Instructions Before returning any product to JDSU, you must first request a Return Merchandise Authorization Number by contacting Customer Service at (805) 383-1500. No shipments will be accepted without this number, which must be clearly marked on the shipping label. When shipping the product, follow these additional guidelines:

- Ship the equipment with a copy of the sales receipt, if available.
- Attach a description of the operational problem.
- Include a contact name, phone number, and E-mail address.
- Pack securely to prevent damage during shipping.

When the product is ready for shipping, ship prepaid to:

JDSU
808 Calle Plano
Camarillo, CA 93012 USA

For each piece of equipment returned for repair, attach a tag that includes the following information:

- Owner's name, address, and telephone number.
- The product type and model.
- Warranty status.

Appendix B Customer Services *Warranty Information*

- A detailed description of the problem or service requested.
- The name and telephone number of the person to contact regarding questions about the repair.
- The return authorization (RA) number (US customers), or reference number (European Customers).

If possible, return the equipment using the original shipping container and material. If the original container is not available, the unit should be carefully packed so that it will not be damaged in transit; when needed, appropriate packing materials can be obtained by contacting JDSU Technical Assistance. JDSU is not liable for any damage that may occur during shipping. The customer should clearly mark the JDSU-issued RA or reference number on the outside of the package and ship it prepaid and insured to JDSU.

Warranty Information

JDSU guarantees that its products will be free of all defects in material and workmanship. This warranty extends for the period of 12 months for test instruments and 3 months for cables from date of manufacture or purchase (proof of purchase required).

All product deemed defective under this warranty will be repaired or replaced at JDSU's discretion. No further warranties either implied or expressed will apply, nor will responsibility for operation of this device be assumed by JDSU.

www.jdsu.com/know

Document Information

Doc. # 21119252

Revision 000, 02-08

English

