



# EtherScope<sup>TM</sup>

Network Assistant

## Getting Started Guide

PN 2103831

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# EtherScope™ Network Assistant










## Before You Start

### Safety Information

The EtherScope™ Network Assistant, hereafter referred to as the instrument. The product is designed for

troubleshooting and maintaining Local Area Networks (LANs).

The following symbols are used in this document and on the instrument:

	Not for connection to public telephone systems		Complies to CSA C22.2 No. 950 Canadian standards, and UL 1950 (US standards)
	Please read manual for safety		Underwriters Labatory certification
	Complies with European Union Directive		Do not dispose of Lithium Ion batteries in garage, recycle
	Shock hazard		Meets Australia EMC requirements
	Recycle Lithium Ion batteries		

### **⚠⚠ Warning**

To avoid possible electric shock or personal injury, follow these guidelines:

- Do not use this product if it is damaged. Before using the product, inspect the case. Look for cracked or missing plastic.
- Do not operate the product around explosive gas, vapor or dust.
- No serviceable parts.
- Do not connect a telephone line to this product.
- If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

### **⚠ Caution**

To avoid possible damage to the analyzer and to the equipment under test, follow these guidelines.

- Use the proper terminals and cable for all connections.

### ***Cleaning the Instrument***

To prevent moisture from entering the instrument, clean the front panel touch display with a moist cloth only. Do not spray water directly on the front panel touch display. Wipe the case with a damp cloth. Do not use organic solvents, acid, or alkali solutions.

***Has This Instrument Been Damaged in Shipping?*****ATTENTION!**

In case of damage, call the carrier at once for inspection, and request an inspection report. ALWAYS NOTIFY THE CARRIER FIRST! Please do not write the factory until you have notified the carrier, since this will delay the claim.

If this precaution is not taken, we cannot assist you in recovering the amount of claim against the carrier.

When the carrier's inspection report is obtained, you may return the instrument and copy of the inspection report to the factory immediately. See *Contacting Fluke Sales, Service and Support Centers*.

Thank you for purchasing EtherScope™ Network Assistant, hereafter referred to as the instrument. The product is designed for troubleshooting and maintaining Local Area Networks (LANs).

**EtherScope™** supports 10/100/1000 IEEE 802.3 (10BASE-T, 100BASE-TX, 1000BASE-T) through a RJ-45 interface.

**Note**

*Please read the safety information, check package contents, register the product, and check for software updates before you begin.*

***Package Content: EtherScope Network Assistant and Accessories***

The following equipment is supplied with the EtherScope Network Assistant.

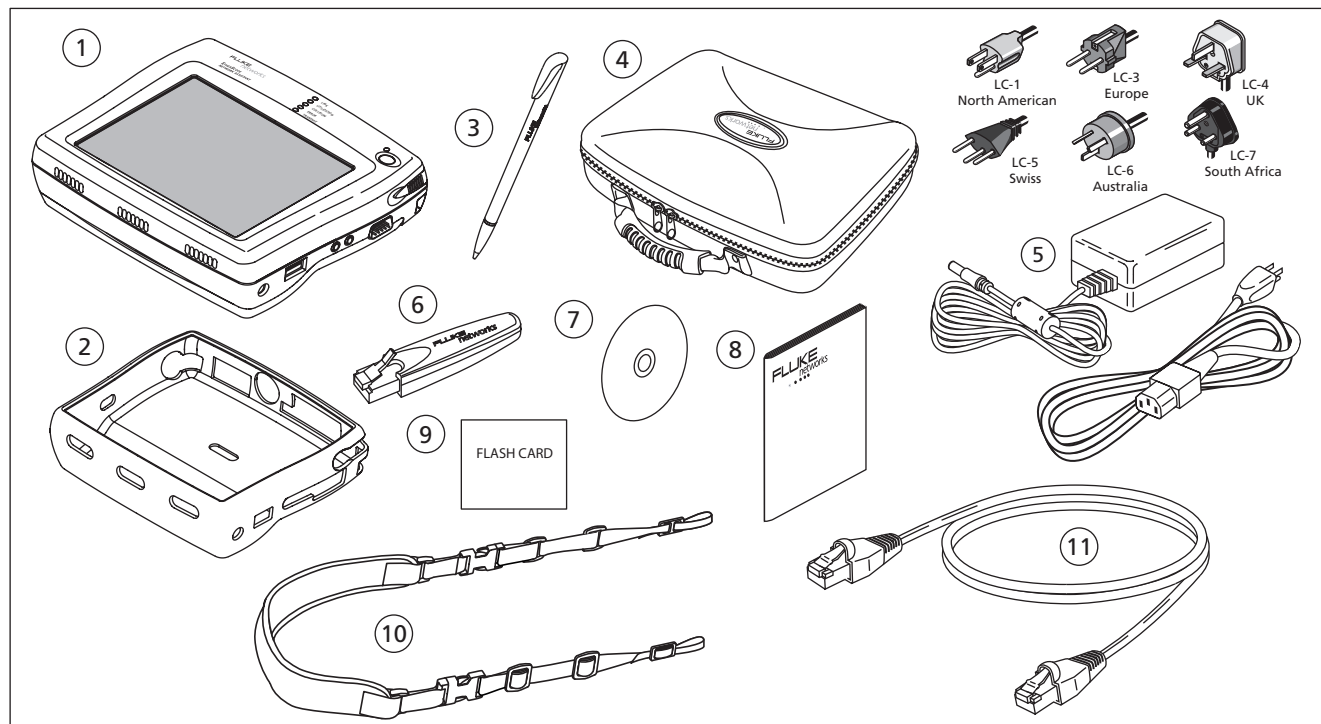


Figure 1. The EtherScope Network Assistant and Supplied Accessories

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**Supplied Items****Table 1: Supplied EtherScope Items**

No	Item	Description	Model/Part Number
1	EtherScope™	EtherScope mainframe	2063291
2	Holster	Removable form-fitting yellow holster	2128355
3	Stylus	Stylus for use with the instrument's touch panel display	1989325
4	Storage Case	Instrument fits in the storage case	2114180
5	External AC adapter, charger, power cord	Input: 90V -264V AC, 50/60Hz; Output: 15V DC, 1.3A (20W) , Power Cord varies per country	2118212
6	WireView™ wire map adapter (office locator)	Cable termination device with office locator ID #1. Used to perform the Cable Test Wire Map operation, and used as an office locator	2128396
7	CD-ROM	EtherScope™ Resource CD. Includes On-line Help and Getting Started Guide	2103846
8	Getting Started Guide	Provides basic operating information, accessory part numbers, specifications and introductory troubleshooting information	2103831
9	Compact Flash®	64MB Compact Flash® memory card used for storage expansion	2127262
10	Carrying Strap	Strap clips to the instrument for easy carrying	1541888
11	Network Patch Cord	1 meter Patch Cord	927868
N/A	Battery Pack	Rechargeable Lithium Ion battery pack installed in EtherScope	2044832

**Table 2. Other Available Accessories**

Item	Description	Model/Part Number
EtherScope™ Extended Kit	The EtherScope Extended Kit include additional accessories: spare rechargeable battery, external battery charger, external mini keyboard, wire map adapters (#2-6)	ES-EXT-KIT/2138808
WireView™ wire map adapters	Set of five wire map adapters with office locator IDs #2 through #6	WIREVIEW 2-6/2128409
External Keyboard	USB mini keyboard	OPVS2-KB/2134829
Battery Pack	Rechargeable Lithium Ion battery pack	ES-BATTERY/2044832
External Battery Charger	External battery charging station	ES-BATT-CHG/2114989

### **Registering your EtherScope Network Assistant**

Please take the time to register your product. The EtherScope Resource CD contains registration information and instructions. You can also register by going to [www.flukenetworks.com](http://www.flukenetworks.com), clicking on **Support**, then clicking on **Registration**. A *Log in* screen is displayed. Click on **Create** to setup an account password if you have not done so before. You will then

be able to log in using your email address and password. Once logged in, you can fill out the online registration form by clicking on **Register a product**.

As a registered user, you are entitled to entry level product support. This includes basic access to the online Knowledge Base library of product operation and application information, and web-based trouble ticketing. In addition, you will also receive Fluke Networks company and product information updates.

### **Charging the Instrument's Battery**

Although the instrument's battery is pre-charged in the factory, please fully charge the battery before you begin using the product. See *"Getting Started - Charging the Battery"* for charging instructions.

### **Updating your EtherScope Network Assistant Software**

After registering the product, please take the time to check for new EtherScope software. For software update instructions, see "Configuring EtherScope for Your Network" located in the "Getting Started" section of this document.

### **Contacting Fluke Networks Sales, Service and Support Centers**

Visit the Fluke Networks contact website at [www.flukenetworks.com/contact](http://www.flukenetworks.com/contact). Send email to [support@flukenetworks.com](mailto:support@flukenetworks.com). For operator assistance in the USA, call 1-800-28-FLUKE (1-800-283-5853).

To order accessories or get the location of the nearest Fluke Networks distributor or service center, call:

Anywhere in the world: +1-425-446-4519

Australia: 61 (2) 8850-3333 or 61 (3) 9329-0244

Beijing: 86 (10) 6512-3435

Brazil: 11 3044 1277

Canada: 1-800-36-FLUKE (1-800-363-5853)

Europe: +44 1923 281 300

Hong Kong: 852 2721-3228

Japan: +81-3-3434-0181

Korea: 82 2 539-6311

Singapore: +65-6738-5655

Taiwan: (886) 2-227-83199

USA: 1-800-28-FLUKE (1-800-283-5853)

## Getting Started

### *EtherScope Network Assistant Physical Features*

The EtherScope instrument is designed to be used as a dispatched or desktop network test device. The product is shipped with a removable, protective, form-fitting, yellow holster that provides more ruggedness for dispatched tasks. The instrument also ships with a stand for use on a desktop. Remove the holster to access the stand and the removable battery pack. A stylus for navigating the user interface is stored in the upper-right corner of the product. Figure 2 illustrates the physical features of the product.

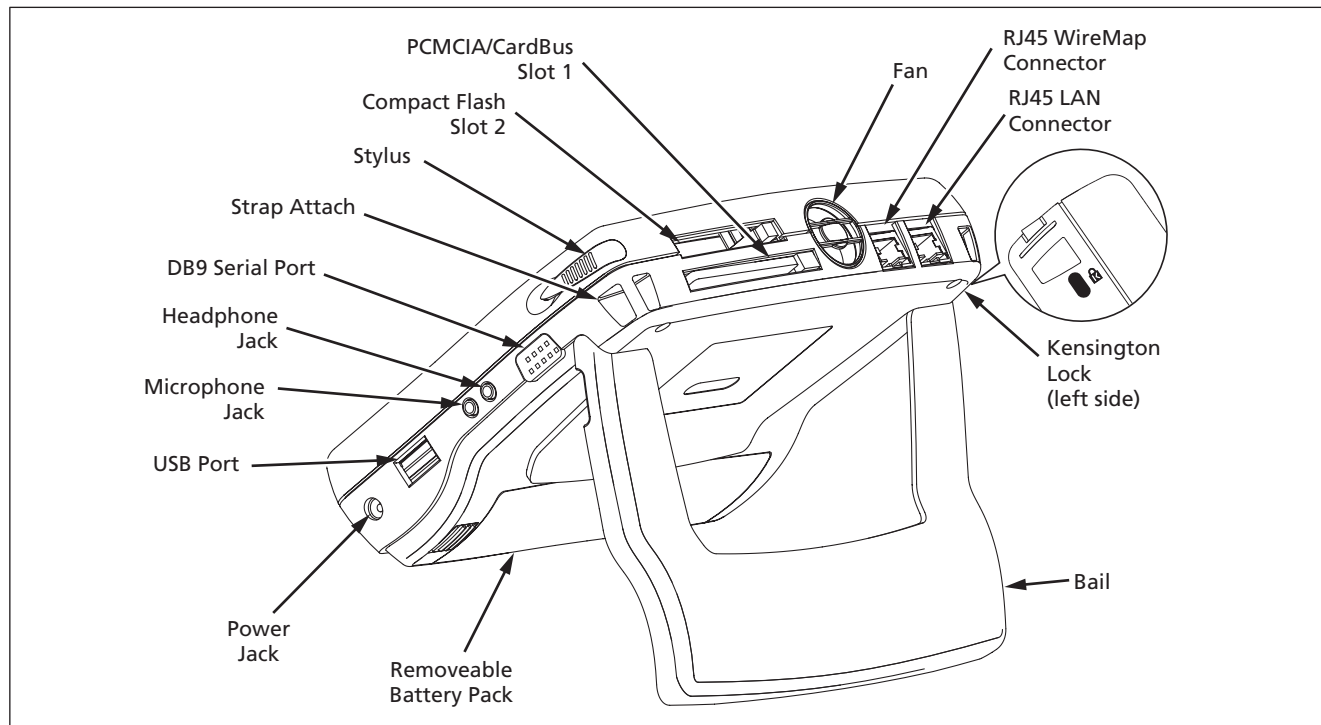
### Network Connections

EtherScope Network Assistant provides IEEE 802.3 10/100/1000 BASE-TX analysis through the **LAN** RJ-45 connector. The **WireMap** RJ-45 connector is used to test patch cables. **PCMCIA/CardBus®** interface (slot 1) will be used to support future EtherScope network analysis.

### Peripheral Support

The instrument provides the following external interfaces:

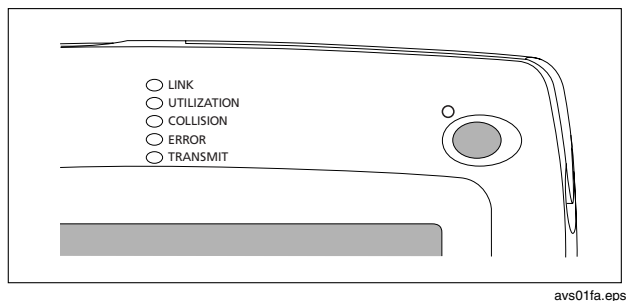
- Serial DB-9 – network device connection via serial cable
- USB port - keyboard, mouse
- CompactFlash® (type 1 and 2) – software updates, memory expansion, Report storage
- Headphone – quiet operation of the instrument, future application(s)
- Microphone – future application(s)



**Figure 2. EtherScope™ Network Assistant Physical Features**

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## Status LEDs



**Figure 3. EtherScope Status LEDs**

The LEDs on the front of the instrument represent the following conditions:

### Link

- Green Solid - link present for all speeds
- Off - no cable or no link present

## Utilization

Represents traffic relative to where the instrument is connected (local traffic).

- Green Blinking = 0% to 50%
- Yellow Blinking = 51% to 89%
- Red Blinking = 90% to 100%

## Collision

- Yellow Blinking – indicates that collisions have been detected by the instrument on the local network. The more collisions that occur, the faster the light blinks.

## Errors

- Red Blinking - indicates that errors have been detected on the local network segment. Errors include bad FCS, undersized or oversized packets, jabbers, and ghosts.

### Note

*Ghosts are energy on a cable that appears to be a frame but does not have a valid beginning of a frame pattern.*

## Transmit

- Green Blinking – Indicates the instrument is transmitting packets. The more transmit activity, the faster the light blinks.

## Running the Instrument on the Battery

The product comes with a removeable, rechargeable Lithium-Ion battery which is capable of powering the instrument for approximately 4 hours of full operation. The instrument is able to operate using the AC adapter with or without the presence of the battery. Interrupting the power source will cause loss of data.


### Note

*Although the instrument will run on the AC adapter without the presence of the battery pack, it is not the recommended mode of operation. The battery pack also provides stability for the instrument when using the stand.*

## Charging the Battery

The battery can be charged while installed in the instrument or removed for charging in an external battery charger (purchased separately). An extra battery and/or charger can be purchased individually or as part of the EtherScope™ Network Assistant Extended Kit. See Figure 3, *Battery Installation and Charging* for instructions.

When fully discharged, the battery takes approximately 4 1/2 hours to reach full charge when the instrument is powered off. When the product is powered on, it will take approximately 7 hours.

Tap the **Battery**  icon, located on the right side of the status bar, to obtain the status of the battery charge remaining and the power source being used.

## Removing the Battery

The battery is located behind the product stand. To remove the battery, remove the protective holster (if installed), push the release tab toward the battery, pull up on left side to dis-engage the connections and lift out of the mainframe.



### Figure 4. Battery Removal and Charging



## Powering the Instrument On and Off




### Powering the Instrument On

Press the green **On/Off** button on the front of the instrument. When the instrument is first powered on, it goes through a complete power-up sequence which initializes the processor and memory, performs a self-test, loads the operating system, loads the EtherScope application software, and displays the instrument **Test Results** (auto test) screen as shown in Figure 5.

### Powering the Instrument Off



**Suspend** - With the instrument powered *on*, press and hold the green **On/Off** button on the front of the instrument until the green LED turns amber (approximately one second). This places the instrument in a power saving state used to prolong battery life. While in this state, the instrument will no longer be collecting data. Touching the button again will instantly take the instrument out of the *standby* state to the *on* state.













**Power down** – To completely power down the instrument, press and hold the **On/Off** button until the green LED turns off (approximately two seconds). This procedure will perform a complete power down of the instrument.

For more control of power setting, access the instrument's power management utility by tapping the *Desktop* icon  found on the Status bar at the bottom of the screen, select *Settings* and tap the *Light & Power*  icon. This utility can be used to set power saving modes as well as screen brightness. Screen brightness can also be modified by tapping the *Light & Power*  icon located on the Taskbar (lower-right corner of the screen).

### Navigating the User Interface

The EtherScope Network Assistant user interface is designed to provide as much relevant information as possible on each screen. On most screens, a list of information is provided on the screen's right-side pane, and a focused view of a selected item is shown on the left-side preview pane. Here are some tips for navigating the user interface.

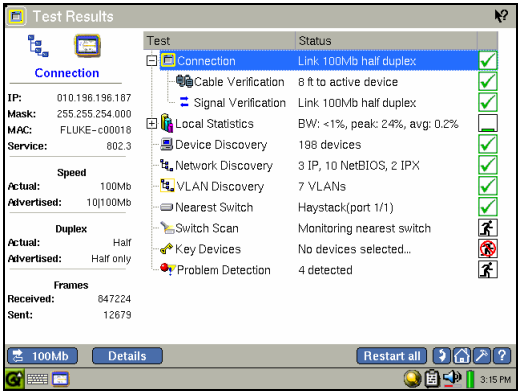
- All **blue text** represents a **hyperlink** to a separate, related screen within the user interface.
- Select the operations buttons (e.g., , ) located on the Taskbar at the bottom of the screen to perform tasks specific to a test or function in a test.
- Operations buttons are disabled when they are not applicable to a test.

- Highlight **Connection** on the **Test Results** screen and select the  button to navigate to the **LAN Instrument Settings** screen or tap the *EtherScope*  icon and select LAN Instrument Settings from the drop-down list.
- To directly navigate to a specific test screen within the user interface, tap the *EtherScope*  icon found in the upper-left corner of each screen and select the test screen from the drop-down list.
- Tap the  icon next to list items to expand and view more tests or details.
- Tap the *Keyboard*  icon located on the Status bar to bring up the keyboard and tap it again to put it away. The keyboard allows both text and numeric entry.
- Tap the *Close*  icon to return to the previous view on the same screen. The  icon is found in the upper-left of the preview pane on relevant screens.
- Tap the column headings in lists to sort data.
- To assist in finding a specific device in a list, use the button located at the top right of the screen. Enter a partial or full name or address in the entry box and select **Find** to initiate the search.
- Tap the *Back*  icon to return to the previous screen.
- Tap the *Home*  icon to return to the **Test Results** auto test screen.
- Tap the  icon for screen level help.
- Tap the *Tools*  icon for a drop-down list of troubleshooting tools.
- Tap the  icon (upper-right) for help about an item on a screen.

### Using the Instrument for the First Time

The EtherScope instrument is designed to automatically provide quick visibility into the state of your local area network. The instrument will begin a series of automated tests simply by plugging it into a network.

As the automated tests are running, the product provides information about the status of each test and indicates the success or failure of a particular test. Using the stylus, tap any test to display a preview of the details available for that test. The preview pane appears on the left side of the screen.




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Figure 5. EtherScope Test Results Screen

### Starting the EtherScope Network Assistant Application

Plug one end of an Ethernet cable into the instrument's RJ-45 LAN connector and the other end into the network. After power on, the EtherScope application will automatically start and display the **Test Results** (auto test) screen.

The instrument will automatically verify cable characteristics including length, test the signal quality and establish connectivity at the physical layer. By default, the instrument will auto-negotiate to the highest speed and duplex allowed by the link partner. See "[Configuring EtherScope for Your Network](#)" for information on how to set the instrument to link at a specific speed and duplex. The *link*  icon on the left side of Taskbar indicates the link speed and duplex mode. Two solid arrows indicate a full duplex connection. One solid and one outlined arrow represent a half duplex connection.

## Getting Automated Test Results

Once link is established, the product will begin monitoring the network for **Utilization, Errors, Protocols, Top Talkers** and common **Problems**. By default, the instrument monitors utilization and error statistics on the local network segment. It also provides the ability to monitor remote device interfaces. See "[Troubleshooting in a Switched Environment](#)" for information on how to configure the instrument to monitor and explore other network devices and segments. Tap the  next to the **Local Statistics** test to view **Protocol Statistics** and **Top Talker** tests. These tests provide information about the top protocols discovered on the local network segment and the top consumers of the local network bandwidth.

The instrument attempts to become an active device on the network by obtaining an IP address and beginning a sequence of tests that will discover IP, NetBIOS and IPX networks and the devices, services, and VLANs found in the broadcast domain. By default, the instrument will attempt to use DHCP to obtain an IP address and other network information. See "[Configuring EtherScope for Your Network](#)" if your network policy requires the use of fixed IP addresses or to change other network configuration data such as the default router.


### Note

*If a valid IP address was not found, the product will still be able to analyze traffic for statistics and passively discover devices. However, without a valid IP address, the instrument will not be able to run its active discovery tests.*

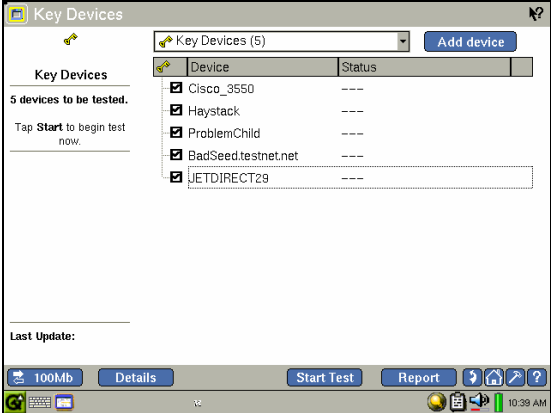
The EtherScope instrument examines each device it discovers to learn more about the device's capabilities and possible problems. To obtain the best results, the instrument needs to be configured with the SNMP community strings being used on your network. The product uses the default community strings *public*, *private* and *security*. See "[Configuring EtherScope for Your Network](#)" for instructions for entering additional community strings. In the event that the instrument does not automatically discover a device, it may be manually added to the discovery database using the **Add Device** button located on the **Device Discovery** and **Key Devices** screens.

Once configured, the **Key Devices** test is run as part of the initial auto test designed to provide the overall state of your network. **Key Devices** tests for availability of critical devices on your network. The **Key Devices** test is also designed to be used for specific maintenance and troubleshooting tasks such as verification of connectivity of a PC to critical network services (e.g., print, DHCP,

default router, email). The **Key Devices** test is automatically run once when the EtherScope is turned on. The auto test, including **Key Devices**, can be rerun by pressing the **Restart** button.

To configure the product to test specific device(s) on your network, highlight the **Key Devices** test from the **Test Results** screen and select the **Details** button. The drop-down list at the top of the screen provides categories of discovered devices. Highlight a category to get a list of devices, tap the check box next to the device to mark it as a *key device*  icon, and tap the **Save** button. You can add a device not automatically discovered using the **Add device** button. Configured **Key Devices** will persist between troubleshooting sessions.




Use the **Restart** button to initiate a ping test on the selected devices. Tap the **Report** button to save the test results. Highlight a device and press **Details** to view network configuration parameters about the device.



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**Figure 6. Key Devices Screen**

The initial auto test is designed to provide quick problem visibility. As a part of the test, the instrument will detect and display discovered devices and the problems they may be experiencing (e.g., default router not responding, duplicate IP, only device in a domain). The problems are categorized by severity

-  Errors
-  Warnings
-  Information

Highlight the Problem Detection test for a summary of problems detected by category. Tap **Details** for list of devices and associated problems. As problems are resolved, they will be re-categorized as **Resolved**. The instrument also allows you to delete problems that may not be of concern for you. Highlight the device and tap the **Delete** button. These items will be moved to **Deleted Problems** found at the end of the problem list in the right pane of the screen. The problems may also be deleted for a particular troubleshooting session by highlighting a device found in the **Deleted Problems** list and selecting the **Delete** button again. Deleted problems do not persist between troubleshooting sessions.

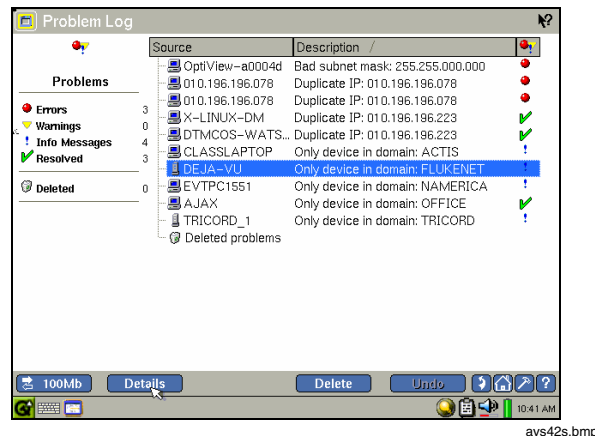


Figure 7. Problem Log Screen

### Getting More Details about Test Results

Once you have reviewed the state of your network reported on the **Test Results** screen, you can get more visibility into specific areas by highlighting a test and tapping the **Details** button or the test [hyperlink](#) in the preview pane. You will be presented with the complete details for a selected test or more information about a selected device.

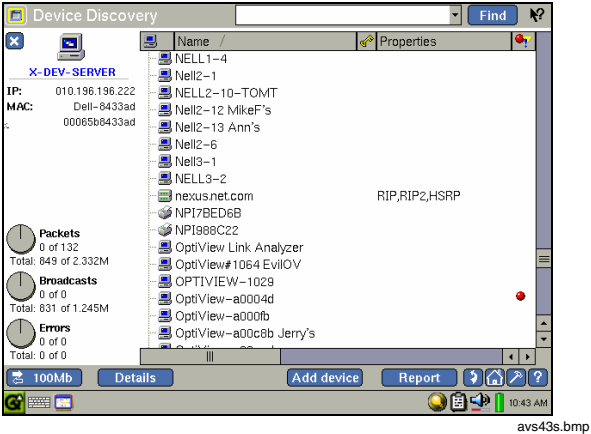


Figure 8. Device Discovery Screen

The EtherScope instrument provides a set of tools commonly used in the maintenance and troubleshooting process. When troubleshooting a specific device, a relevant set of these tools is available via [hyperlinks](#) on the **Device Details** screen. Tap the specific hyperlink to initiate the test or operation for the selected device.

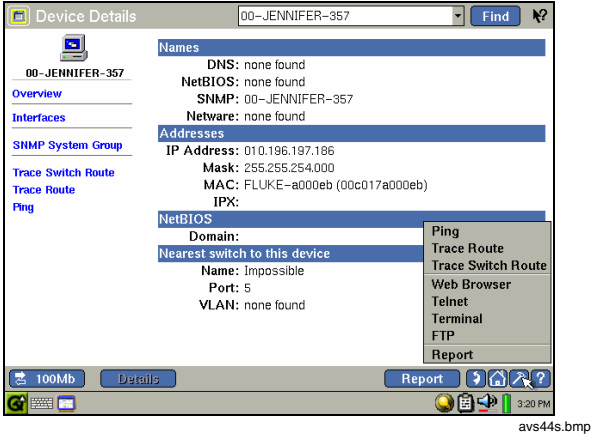




Figure 9. Device Details - Overview Screen

To directly access the available troubleshooting tools, tap the *Tools*  icon located on the Taskbar and select a tool from the drop-down list.


### Troubleshooting Tools

- Ping
- Trace Route
- Trace Switch Route
- Web Browser
- Telnet
- Terminal
- FTP
- Report

### Documenting (or Saving) Tests Results

The EtherScope Network Assistant supports your need to document the state of your network. On most screens and for most tests a  button is available that will save the test results in an XML-formatted file. The **Report** capability is also available from the *Tools* Taskbar. The **Report** selection is disabled when it is not applicable.

EtherScope reports are stored to a compact flash card. The card must be installed in Slot 2 prior to saving a report. If a compact flash card is not detected, you will be reminded to insert the compact flash card. When the **Report** button is selected, you will be asked to name the report. A default name is provided. A directory of saved reports can


be viewed from the *Desktop/Reports* tab. Tap the *Desktop*  icon in the lower left of the screen status bar and select **Reports** from the drop-down to view the list of saved reports. The reports are not viewable on the EtherScope. The saved reports can be viewed with a web browser from your PC.



See the [“Remote Access to Your Instrument”](#) section for more information on this topic.

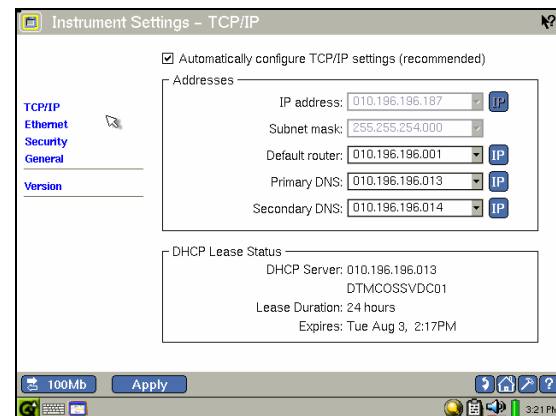


## Configuring EtherScope for Your Network

Although the EtherScope instrument is designed to provide as much automated configuration as possible, every network is different. For the product to provide you with the best network analysis possible, some default settings may need to be changed.

The **Connection** test result reports the configuration and link status of the instrument. When the **Connection** test is highlighted, tap the **Details** button to display the **LAN Instrument Settings** screen to view or modify the current instrument TCP settings. The **Instrument Settings** screen is directly accessible from the *EtherScope application*  icon Status bar.


Tap one of the hyperlinks found on the left pane of this screen to view additional instrument settings. When finished with the configuration task, tap the **Apply** button. Tap the Home  icon to return to the Test Results screen or tap the EtherScope  icon found in the upper-left corner of the screen to go to other specific tests within the user interface.

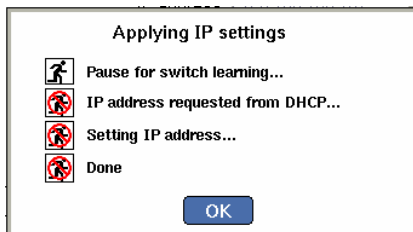


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**Figure 10. LAN Instruments Settings Screen**

## TCP/IP Settings

If DHCP is available, the **Instrument Settings - TCP/IP** screen will display the address that the instrument was able to obtain. To use a static IP address or to change the subnet mask, tap the checkbox **Obtain an IP address from DHCP** to disable (uncheck) auto-configuration via DHCP. Highlight the **IP address** or other field that you wish to change, tap the **Keyboard**  icon and enter an IP address. Once data has been entered, tap the **Apply** button to save the changes. EtherScope provides a progress dialog as shown below.



progresslog.bmp


Figure 11. TCP/IP Progress Dialog

### Note

*When assigning a manual IP address, the address can be for an alternate network but must be in the same broadcast domain.*

When changing from the use of a static IP address to DHCP, tap the **Obtain an IP address from DHCP** checkbox and select the **Run auto configuration** button. The instrument will automatically obtain a new IP address from a DHCP server.

## Ethernet Settings

In the event that you need to override the instrument's link auto-negotiation process, tap the **Ethernet** hyperlink or link speed/duplex button  to open the **Instrument Settings - Ethernet** screen. To force the instrument to link at a specific speed and duplex, select **Use Forced Setting**, then select one of the **Forced Setting** choices, and then tap the **Apply** button.

### Note

*The \* next to the value in the link button (bottom left on the task bar) indicates the speed/duplex is a forced setting.*

To allow EtherScope to auto-negotiate the link speed, select **Use Auto-Negotiation**, and select all the speed/duplex settings you want EtherScope to auto-negotiate to.

A factory assigned MAC address is provided. The instrument's MAC address can be changed on this screen to enable testing of switch forwarding tables, ARP caches, etc., as part of the troubleshooting process. To change the instrument Mac address, enter the new MAC address in the **MAC Address** field and select **Save MAC address**. To return to the instrument's default MAC address, select **Restore factory MAC**.

## Security Settings

From the **Instrument Settings – Security** screen, you may also establish a password for controlled access to the remote user interface and for the management of SNMP community strings.



**Figure 12. LAN Instrument Security Settings**

### Setting and Changing a Password

To establish a password, tap the **Enter password** entry box located under *Password Control*, enter a password and tap **Create Password**. A password can be a maximum of 40 characters in length with no minimum. You will be prompted to re-enter your chosen password to confirm it. Fields that are secure are displayed with "\*". The fields and controls on the **Security Settings** screen are disabled until you successfully log on by entering the password and selecting the **Login** button.

To change a password, enter the existing password and tap the **Change password** button. In the fields provided, enter a new password and re-enter to confirm it.

### Clearing a Password

To clear a password, you must enter the existing password. Press the **Change Password** button. In the new password entry field, enter nothing.

### Note

*If you forget the password, you will need to contact your authorized service center or Fluke Networks product support for assistance. See page 7 for contact phone numbers.*

### Configuring SNMP Community Strings

The EtherScope instrument provides more detailed network information through the interrogation of discovered SNMP agents on your network. To configure the product for SNMP community strings being used on your network, tap the **Security** hyperlink. The default community strings are *public*, *private* and *security*. You can change or add SNMP community strings on the **Security Settings** screen. Tap the **Edit** button next to the entry box and enter the community string(s), leaving a space between strings.

### Note

*The discovery process successively tries the community strings in the order in which they are listed. List the strings in order of frequency of use for a quicker discovery.*

## General Settings

Tap the **General** hyperlink on the **Instrument Settings** screen to view the general product settings.

### Edit user-defined devices...

The **Edit user-defined devices...** button allows you to edit or delete existing user-defined devices, or add a new device that is either outside of the local broadcast domain, or not being discovered.

### Show vendor prefix with MAC address

You can control how a device's MAC address is shown. By default, it will be shown with a vendor prefix. When unchecked, the MAC address will be shown in raw hexadecimal format.

### Enable fast connect mode

EtherScope offers a fast connect mode which allows you to quickly get a network link and DHCP address. By default, when the instrument is first plugged into a network, it tries to determine whether it is connected to the same broadcast domain as it was previously connected. If it is, it saves the data it had previously collected.

**Enable fast connect mode** allows for a faster response time when you are repeatedly connecting the instrument

to different networks. For example, select this mode when you are verifying the connectivity of multiple office cubicles in a new installation. In fast connect mode, the instrument automatically resets its discovery database when changing the network connection or when returning to the **Test Results** screen from the **Cable** or **Signal Verification** screens.

## ***Updating EtherScope Software***

You may check for available software downloads on the Fluke Networks website. At your request, the software will be downloaded to your PC. You can then copy the file to a CompactFlash®. Power off the instrument, install the CompactFlash® containing the update file in slot 2 and then power on again. The update will take approximately five minutes. Once the process has completed, the EtherScope application will automatically restart. You may also request a compact flash card that includes the EtherScope software from Fluke Networks. See *Contacting Fluke Networks Sales, Service and Support Centers* section near the front of this document.

## ***Touch Screen Recalibration***

The product uses a touch screen that has been calibrated at the factory. In the unlikely event that the touches on the screen are off target, use the *Recalibrate* utility found on the instrument's *Desktop/Settings*. Tap the *Recalibrate* icon. You will be prompted to touch the display at certain points to perform the calibration.

## **Troubleshooting in a Switched Environment**

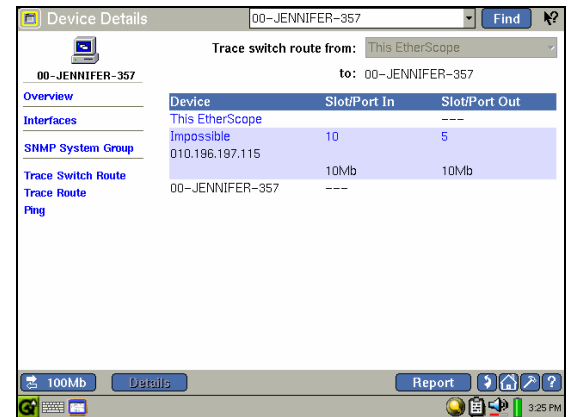
Getting the right visibility into switched VLAN environments can ease or speed the process of network troubleshooting. You can use the EtherScope Network Assistant features to get that needed visibility.

### **Device Discovery**

**Device Discovery** is one of the product's automated tests. This test provides the foundation for troubleshooting connectivity and performance problems on your network. The instrument automatically detects the switch slot/port/VLAN information on the network the instrument is connected to. Highlight **Device Discovery** to see the type and number of devices found. Tap **Details** or one of the categories to obtain a list of the devices, their network configuration and capabilities. Highlighting a specific device in the list provides a preview of traffic to and from that device. Tap **Details** to obtain more device specific information and directly access tools typically used to further troubleshoot connectivity or performance problems in the context of the device.

### **Trace Switch Route**

In addition to automatically reporting where a particular device is connected in switched environment, you can determine the physical path between two devices on a network by using **Trace Switch Route** test. From a **Device Details** screen, tap the **Trace Switch Route** hyperlink. The test will automatically discover the switch path between the instrument and the selected device. The results can be used to further understand the potential source of a problem.




avs47s.bmp

**Figure 13. Trace Switch Route**

## Nearest Switch

An integral part of discovery is finding and reporting the switches on the network. The EtherScope instrument uses SNMP to search for the nearest switch. The **Nearest Switch** is discovered by examining the bridge forwarding tables of all the local switches. Once discovered, the nearest switch's active ports will be monitored for utilization and errors.

## VLAN Discovery

As part of the automated network discovery process, the instrument will discover VLANs configured within a broadcast domain. Tap the *Home*  icon and highlight **VLAN Discovery** for a preview of the VLAN inventory. Select **Details** to see a listing of VLANs. When expanded, the member switch interfaces are provided. Highlight an interface and select **Details** button to get a preview of status, port traffic, and devices configured for that interface.

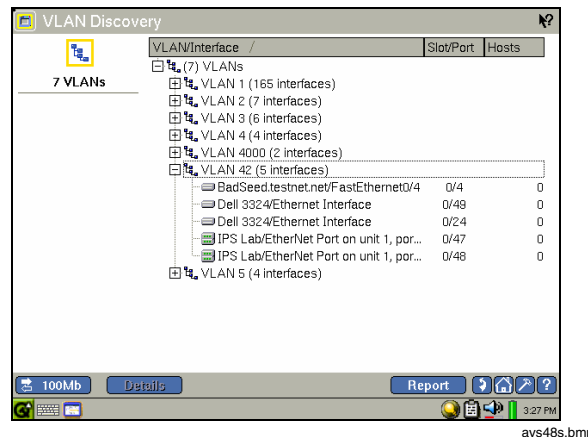


Figure 14. VLAN Discovery Screen



The EtherScope Network Assistant is primarily a broadcast domain product. The product makes its best effort to automatically discover all devices in the broadcast domain under test, including all switches. To assist the automated discovery process, you can explicitly add a local or off-net device(s) to the discovery database through the **Add Device** button. The **Add Device** button is located on the **Device Discovery** and **Key Devices** screens in the user interface. User-added devices are saved in the instrument and will persist between troubleshooting sessions.

### Switch Scan

The **Switch Scan** test provides the capability to continuously monitor the discovered Nearest Switch and one additional switch (user-selected) on your network. A preview of the results is reported when **Switch Scan** is highlighted on the **Test Results** screen. Tap **Details** for a detailed graphical view and to configure this test for additional devices. Select the drop-down box for a list of discovered switches and highlight the desired device. By default, the Nearest Switch will be monitored. To disable the **Switch Scan** test for the Nearest Switch, uncheck the box provided.

In addition to the instantaneous results, a longer-term view of an interface can be obtained. Highlight an interface and tap the **Trend** button. The switch interface becomes the source for short term trending of a selected port.

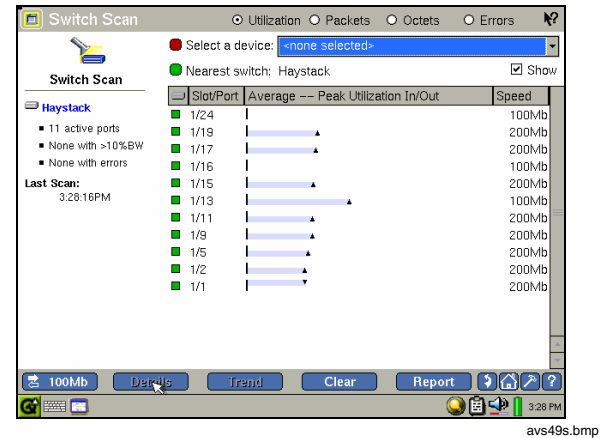


Figure 15. Switch Scan Screen

By default, the instrument will monitor the local network segment. However, it can provide visibility into remote devices and segments without direct connection to the specific remote network segment. To reconfigure the source for network statistics, highlight **Local Statistics** on the **Test Results** screen and select **Details**.

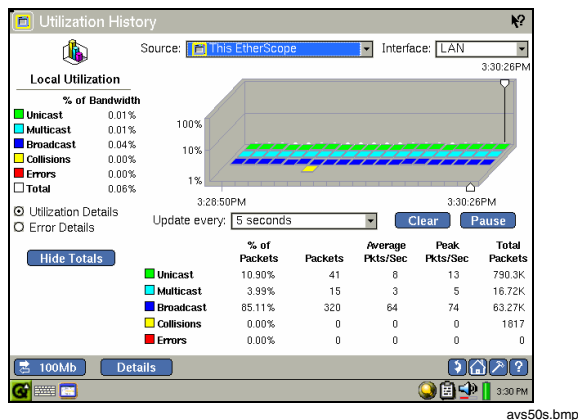


Figure 16. Local Statistics History Screen

Select an alternative discovered switch and interface source from the drop-down source and interface boxes at the top of the **Utilization History** screen. The instrument will continue to monitor and trend the source throughout the session or until the source is changed. It also continues to monitor local utilization and errors in the background.

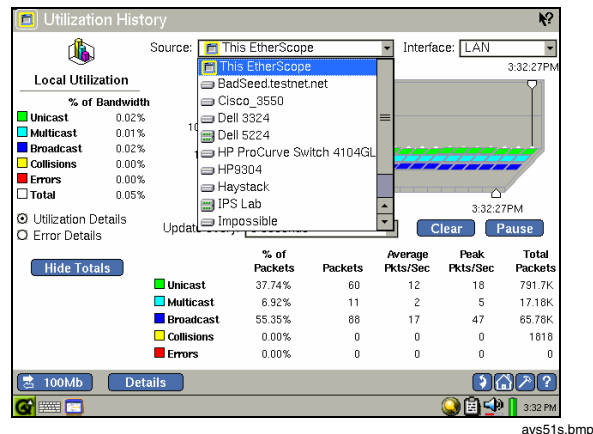




Figure 17. Remote Utilization Screen

*Note*

*Changing the Remote Statistics Source Device will automatically change the device that was previously selected in the SwitchScan test.*

The EtherScope product provides the means to view and change the configuration of switches and other network infrastructure devices through a web browser interface or telnet session. The web browser and telnet applications are accessible from the instrument Taskbar Tools  or Desktop .

## **Troubleshooting Cable and Link Problems**


One of the fundamental process steps of network troubleshooting is to identify and eliminate physical and link problems before investigating higher layers of the network for the source of problems. The product examines the network connection process through its **Cable Verification** and **Signal Verification** tests. These tests are run as part of the instrument's autotest, the results of which are reported on the initial **Test Results** screen of the user interface.

### **Testing Network Cables**

Figure 18 illustrates the different cable test capabilities. All cable test detail results are reported in the **Cable Verification** screen.

### **Testing the Network Connection**

Plug one end of an Ethernet cable into the instrument's LAN connector and the other end into the network. After power on, the EtherScope application will automatically start and display the **Test Results** (auto test) screen. A cable is automatically tested when it is connected to the instrument and during the power-up sequence. The **Cable Verification** test is rerun when a cable change is detected or when **Restart All** is selected.

Expand the **Connection** test to view the **Cable and Signal Verification** results by tapping the  icon. The instrument will automatically verify cable characteristics. The length for twisted-pair copper wires on the 10/100/1000 BASE-TX interface is reported under **Status**.

*Note*

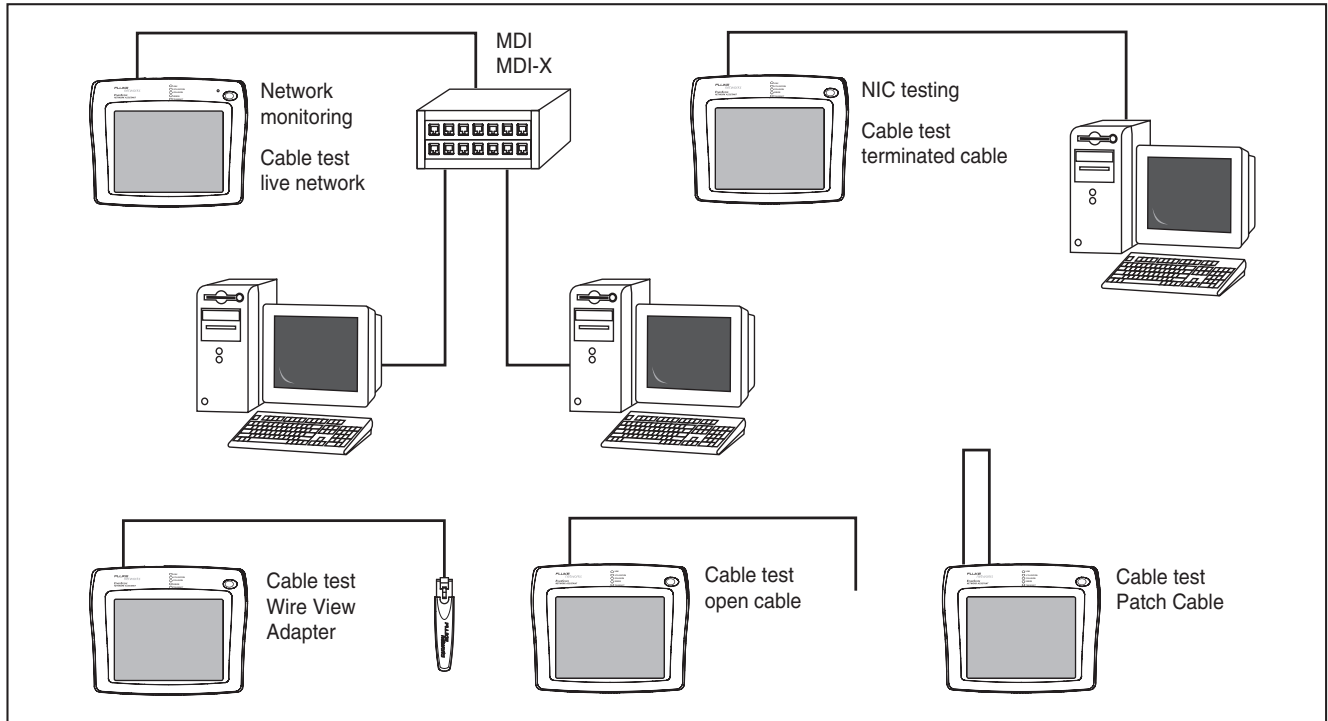
*It is not necessary to disconnect the far end of the cable for the length to be measured. Cable length can be measured while the cable is connected to a wire map adapter, connected to nothing (un-terminated), or connected to an active hub, switch, or NIC. See "Figure 18 Cable Test Capabilities".*

A **green** check mark indicates a valid cable is detected. Highlight the **Cable Verification** test to preview the cable connection partner, the length and pair summary of the cable. A **red** X indicates that there is a problem with the cable. Other tests depend upon a functional cable with a successful link. Select **Details** and run a comprehensive cable verification test, including length, cable impedance and termination impedance on all pairs. If needed, the cable may be re-tested by selecting the **Rerun Test** button on the **Cable Verification** screen, or by simply disconnecting and reconnecting the cable to the instrument.

When troubleshooting connectivity problems in a network, it is critical to know not only that the cable is good, but also if the connection into the network through a hub or switch is the source of a problem.

The EtherScope Network Assistant provides a cable locating feature used for tracing the connectivity of a cable into a switch or hub port. Select the **Locate Cable** button (found in the **Cable Verification** screen) to use this feature. Once the tone configuration is selected, a continuous tone is generated. This feature is used in conjunction with an analog tone probe.

The EtherScope instrument also supports wire map adaptors with cable identifiers (office locator) used to map cables from the wiring closet to offices. WireView™ wire map adapter #1 is supplied standard with the product. Additional WireView™ identifiers are available for separate purchase. See Table 2, *Other Available Accessories*.



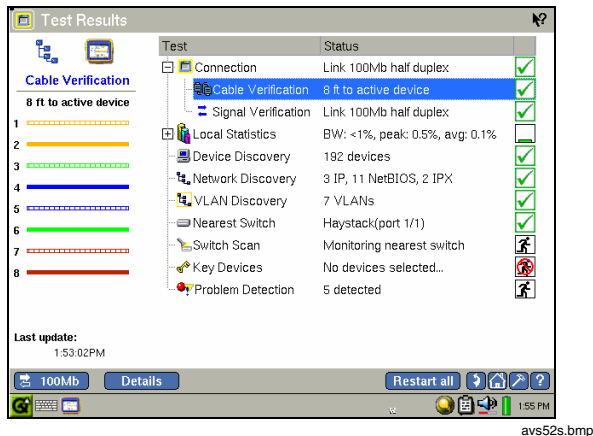
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**Figure 18. Cable Test Capabilities**

## Troubleshooting the cable

The EtherScope product provides a number of tools used to further troubleshoot cable problems.

The supplied wire map adapter is used to confirm end-to-end copper wire connections. Using the wire map adapter, you can see cabling shorts, opens, and mis-wired connections on the **Cable Verification** screen. There is a built-in wire map adapter RJ-45 port on the top of the instrument for convenient patch cable testing.



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Figure 19. Cable Verification Screen

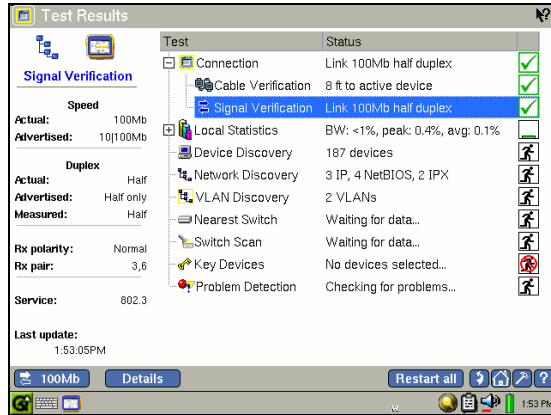
## Verifying the Connection Process

The instrument automatically tests the signal quality and establishes connectivity at the physical layer. You can observe the Ethernet cable signal levels and the IEEE 10/100/1000BASE-T/TX connection process. Running this test will initially monitor the cable status, determine the device connection status, and initiate Ethernet auto negotiation if appropriate.

### Note

*When the instrument is configured for fast connect mode (under **General Settings**), the discovery database will be reset upon returning to the **Test Results** (Front Page) screen from the **Cable Verification** or **Signal Verification** screens.*

To view test results, expand the **Connection** test and highlight **Signal Verification**. A summary of the auto-negotiation process is displayed in the preview pane. Select the **Details** button to view the initial auto test detailed results.



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**Figure 20. Signal Verification Screen**

From the **Signal Verification** screen, tap the **Start Test** button to initiate the full **Signal Verification** suite of tests. The instrument scans the cable line voltages for DC level and over voltage conditions, checks for presence and amplitude of link pulse and data signals, reports the partner device supported signaling as well as the advertised auto negotiation speed and duplex from the link partner and the EtherScope instrument. The tests are designed to provide visibility into possible link quality and configuration issues that could be contributing to connectivity or performance problems.


In order to provide comprehensive link signal information, the Signal Verification test does a complete auto-negotiation regardless of the current link configuration. For example, if the instrument is configured to link only at 100Mbit half-duplex, the Signal Verification test will temporarily override that configuration to measure the complete auto-negotiation process. When the test is exited, the previous link configuration settings will be restored.

## Accessing Help and Other Capabilities

### Accessing and Navigating the Help System

The help system is an integral part of the product. The instrument provides two levels of help within the user interface.

#### What's This Help

The instrument's **What's This Help** describes the function (or outcome) of an individual control. Tap the  button on the Titlebar and then tap an area of the screen, a button or items on a screen. The text box contains information about the item selected.

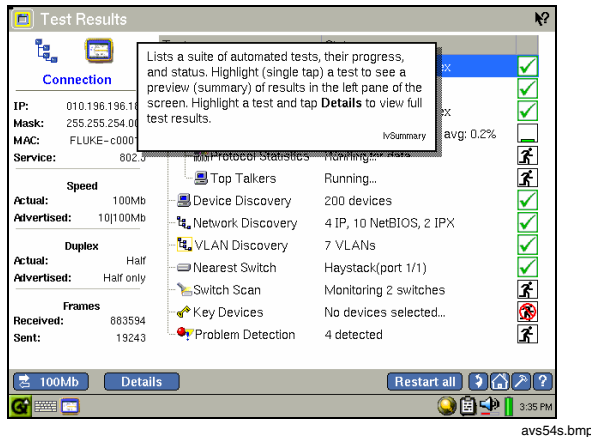



Figure 21. What's This? Help

### Screen Level Help

The Screen Level Help provides “how to” information to allow you to complete the task(s) that are possible within each view. This help is available from the  icon in the Taskbar. Screen level help is displayed in the instrument's on-board browser. This area is scrollable to allow for more detailed text. The browser is resizable so test information is still viewable alongside help text to help maintain context.

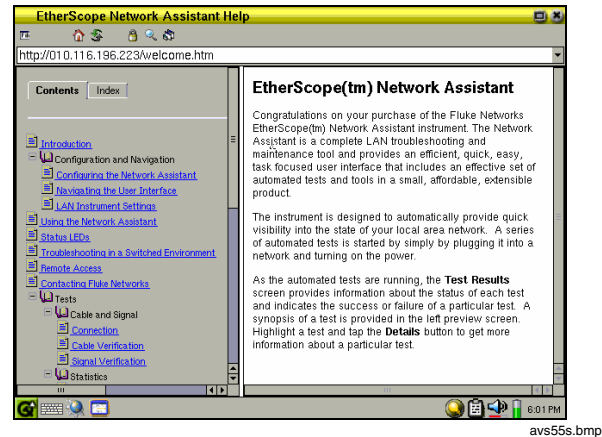


Figure 22. Screen level Help

When the screen level help is launched, the current screen topic is displayed. You can also select a topic from the Table of Contents (left pane). The help file is also available on the EtherScope™ Resource CD.

### Accessing the Online Documentation

This “Getting Started Guide” (PDF format) is provided on the EtherScope™ Resource CD in English, German, French, Spanish, Japanese, and Chinese.



## **Remote Access to Your EtherScope Network Assistant**

### **User Interface**

EtherScope Network Assistant can be viewed and controlled remotely. The instrument contains a Virtual Network Connection (VNC) server used for remote access. To access the remote user interface, launch a web browser installed on your PC, and enter the instrument IP address. The instrument's IP address is located on the preview pane of the **Test Results** screen when the **Connection** test is highlighted. This will display the **EtherScope™ Web Server** home page. You may bypass the web server and directly access the remote user interface as described in the [User Interface](#) section above. From the **VNC Authentication** screen, click **OK**. A password is not required, but a password can be set on **LAN Instrument Settings – Security** screen. See *Configuring EtherScope for Your Network* for more information.

The user interface will be displayed. Use a mouse to navigate the product. The instrument can be accessed by multiple users, but is controlled by one user at a time.

### **Web Server Home Page**

The instrument's web server provides a means to remotely access the EtherScope Network Assistant. From the web server, you can access reports saved on compact flash

installed on the product, view real time reports of current data, and launch the remote user interface application.



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**Figure 23. Web Server Home Page**

### **User Interface Events that will Terminate a Remote Session**

The active TCP/IP session between the remote user interface software and the instrument can be severed under the following conditions:

- If IP parameters are manually changed on the instrument and **Apply** is selected in the **Instrument Settings - TCP/IP** screen
- If you go to the Cable Verification Details screen
- If you go to the Signal Verification Details screen
- If the instrument's MAC address is changed in the **Instrument Settings - Ethernet** screen
- If the Ethernet link goes down on either interface due to temporary network outage
- System Info – resource usage (memory, storage), version information
- Terminal – command line, telnet
- Web Browser – internet access

### ***Other Utilities Provided Through the EtherScope Desktop Environment***

The EtherScope product's desktop environment is available from all user interface screens through the *Desktop*  icon found in the lower-left corner.

#### **Applications**

- Calculator – simple
- Calendar
- Clock – time, stop watch, alarms
- Fluke Networks EtherScope™ – launch the instrument's application

## Settings

- Appearance – modify user interface background color
- Date/Time – settings
- Light & Power – power management and screen contrast
- Recalibrate – touch screen calibration
- Sound - keyboard and screen auto settings

## Reports

- List of saved report files

## **Troubleshooting Your Instrument**

### **Powering the Instrument Completely Off**

*If you suspect the application environment or the instrument (hardware) has locked-up, you may have to completely power-down the instrument by pressing and holding the On/Off button for approximately five seconds.*

### **Before Calling Technical Support**

Before calling technical support, you can perform these basic instrument troubleshooting steps to pinpoint many problems:

#### **Does the instrument power-up?**

Connect the AC adapter/charger to determine if the battery has a charge. The instrument will not power up if the batteries are completely discharged.

If the instrument only powers up with the AC adapter connected, the internal battery may be completely discharged.

#### **Does the instrument user interface appear?**

The **Test Results** screen should be displayed after power-up.

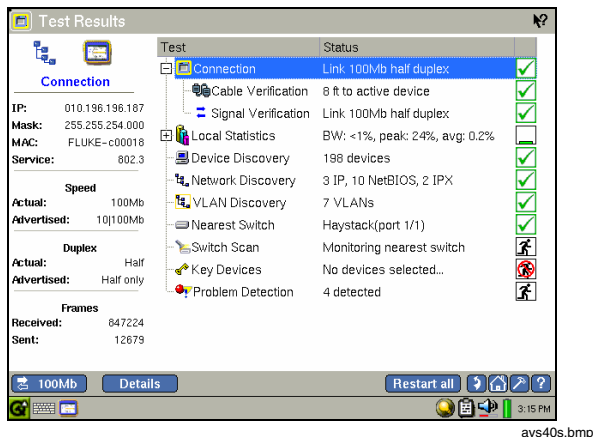


Figure 24. Test Results Screen

### Unexpected IP Discovery or Tools results?

Does the instrument have a valid IP address? Highlight **Connection** on the **Test Results** screen to see if a valid IP has been configured. Also, verify that the DHCP capability in the **LAN Instrument Settings - TCP/IP** screen has not been disabled. If an IP address has been manually entered, it may not be within the local subnet.

### Do the touch targets seem to be off?

Try navigating around the display to verify if the touch target calibration is off (this is rare). If you suspect the calibration is off, select the **Desktop** icon, select **Settings** from the drop-down list, and then tap **Recalibrate** utility icon. You will be prompted to tap the display at certain points to perform the calibration.

### Are you connected to the network?

- Link light should be solid green if a link exists.
  - Some activity on **Transmit** and/or **Utilization** LEDs should be seen.
  - Check the **Test Results** screen, **Connection** test results. Highlight the **Connection** test to check the connection information for a IP address in the left pane of the screen.
  - Confirm that **Cable Verification** passed. Try a different cable if necessary. From the **Test Results** screen, expand the **Connection** test and highlight **Cable Verification**. Check the status and the test results preview information found on the left pane of the screen.

### Does Cable Test pass?

A network connection can not be made if cable test does not pass. Check the connection status on the **Test Results** screen. Status will indicate whether or not a cable was detected. Expand the **Connection** test and highlight **Cable Verification** to check the results of the test. A red X will indicate that the test did not pass. Select the **Details** button for details results. To retest the cable, tap the **Rerun Test** button.

### Does the battery charge state appear erratic or inconsistent, or is the battery not consistently holding a normal charge?

Charge the battery pack for at least 7 hours.

### Does the touch panel display not respond to input?

Press the **On/Off** button to place the instrument in standby mode. Press the **On/Off** button again to resume from standby.

If the problem still persists, press and hold the **On/Off** button for six seconds to shut down. Press the **On/Off** button again to power up the instrument.

### Restoring the EtherScope Network Assistant Default Configuration and Software

In the event your instrument becomes unstable, you may restore the factory default configuration. From the **Test Results** screen, highlight the **Connection** test and select **Details**. Tap **General** to display the **General Settings** screen and select the **Restore defaults** button.



### Caution

If you restore the default configuration, all locally stored data will be lost.

## Specifications

**Table 3. General Specifications**

Weight	.82 kilograms (2 lbs)
Dimensions	19.1 x 15.2 x 4.4 centimeters, (7.5 x 6 x 1.75 inches)
LCD touch screen display	640 x 480 pixels, TFT (active) color panel, active area 129.6 (H) mm x 97.4 (V) mm
LED indicators (mainframe)	6
Battery	Lithium Ion 7.2V DC (nominal), 4.2Ah
External AC adapter/battery charger	AC input: 120V - 240V, 50/60Hz, 1.5A; DC output: 15V, 3.3A
Communication and accessory ports	1 USB, 1 PCMCIA /Cardbus (PC Card type II), 1 Compact Flash (Card Type I/II), 1 DB-9 serial, headphone jack
Network analysis ports	RJ-45 10/100/1000 BASE-T Ethernet ( <b>EtherScope™</b> Standard/Pro), PCMCIA/Cardbus 802.11a/b/g Wireless ( <b>EtherScope™</b> Wi-Fi/Pro)
Vibration	Meets requirements of MIL-PRF-28800F for Class 2 random vibration
Environmental	Operating temperature: 0°C –40 °C w/95% relative humidity Non-Operating (storage) temperature: -20°C to +60°C

	<p> Electromagnetic Interference complies to EN61326, Class A. Criteria C</p> <p> The product network interfaces are NOT FOR CONNECTION TO PUBLIC TELEPHONE SYSTEMS and should only be connected to the public phone network through regulatory agency compliant modem devices</p>
Certifications and Approvals	CSA Canada & United States, CE, FCC Part 15 Class A, C-TICK N10140; UL and CSA approvals for universal AC adapter

### **Cable Types**

Unshielded Twisted Pair LAN cables (100 UTP category 3, 4, 5, 5E, and 6 ISO/IEC Class C and D)

Foil-screened Twisted Pair cables (100 and 120 Ohm ScTP category 3, 4, 5, and 6 ISO/IEC Class C and D)

### **Cable Length**

**Table 4. Cable Length, Resolution 1m (3 ft.)**

<b>Open, shorted or with wire map adapter</b>	1 to 305m (3 ft. to 1000 ft.)	+/- [5% of reading + 1m (3 ft.)]
<b>Terminated with greater than or equal to 20% reflection</b>	1 to 305m (3 ft. to 1000 ft.)	+/- [5% of reading + 1m (3 ft.)]

*Note*

*Length accuracy is dependent upon the cable type selected in the **Cable Verification** screen.*

**Receive Level**

100 to 5000mVp-p

**Datalink Signal**

500mVp-p to 4000mVp-p

**Measuring Terminated Cables**

Cable Verification tests individual twisted-pairs of a cable that are terminated into most equipment vendors' Ethernet ports such as on a hub, switch or NIC.

All cable tests other than WireView™ wire map and office locator ID are operational in the presence of datalink signal.

**Fault Tolerance**

The RJ-45 10/100/1000 BASE-T Ethernet connection on the analyzer is designed to withstand a maximum of 100 volts.

**WireView™ Wire Map Adapter/Office Locator Compatibility**

Detects combinations of shorts, opens, and connector miswires. Compatible with Fluke Networks WireView™ wire map adapter/office locator.