FLUKE networks

MicroScanner²™
Cable Verifier

Users Manual

January 2007

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4/04

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MicroScanner^2 Cable Verifier

Introduction

The MicroScanner^2 Cable Verifier is a hand-held test instrument that lets you verify and troubleshoot the wiring of twisted pair and coaxial cables and detect network services.

The tester does the following:

- Measures length up to 1500 ft (457 m) and detects opens and shorts on twisted pair and coaxial cabling.
- Detects split pairs on twisted pair cabling.
- Displays wiremap, cable length, proportional distance to opens, and the remote ID number all on one screen.
- Detects Ethernet ports on twisted pair cabling and reports the port speed.
- Detects PoE (Power over Ethernet) and telephone voltages on twisted pair cabling.
- IntelliTone™ function works with an optional Fluke Networks IntelliTone probe to help you locate and isolate cables behind walls, at patch panels, or in bundles. The analog toner works with standard analog probes and includes the SmartTone™ function for positive identification of cables in bundles.

Registration

Registering your product with Fluke Networks gives you access to valuable information on product updates, troubleshooting tips, and other support services. To register, fill out the online registration form on the Fluke Networks website at **www.flukenetworks.com/registration**.

Contacting Fluke Networks

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- Europe: +44-(0)1923 281 300
- Hong Kong: 852 2721-3228
- Japan: 03-3434-0510
- Korea: 82 2 539-6311
- Singapore: +65-6799-5566
- Taiwan: (886) 2-227-83199
- USA: 1-800-283-5853

Visit our website for a complete list of phone numbers.

Unpacking

The tester comes with the accessories listed below. If something is damaged or missing, contact the place of purchase immediately.

MicroScanner^2 Professional Kit (MS2-KIT)

- MicroScanner^2 tester with detachable wiremap adapter
- 2 AA alkaline batteries
- ITK200 IntelliTone probe
- 9 V alkaline battery
- Six remote ID adapters (numbers 2 through 7)
- Two shielded patch cords, 8-pin modular plug to 8-pin modular plug (RJ45 to RJ45), 0.3 m
- Two patch cords, 4-pin modular plug to 4-pin modular plug (RJ11 to RJ11), 15 cm
- Coaxial patch cord, F-connector to F-connector, 75 Ω, with push-on adapters, 1.8 m
- Test lead, 8-pin modular plug (RJ45) to 8 alligator clips
- Wrist strap
- Carrying case
- Folding pouch for accessories
- MicroScanner^2 Getting Started Guide
- IntelliTone Quick Reference Guide
- CD-ROM with MicroScanner^2 manuals
- CD-ROM with IntelliTone manuals

MicroScanner^2 Cable Verifier (MS2-100)

- MicroScanner^2 tester with detachable wiremap adapter
- 2 AA alkaline batteries
- Carrying pouch
- MicroScanner^2 Getting Started Guide
- CD-ROM with MicroScanner^2 manuals

Safety Information

Table 1 describes the international electrical symbols used on the tester and in this manual.

Table 1. International Electrical Symbols

	Warning or Caution: risk of damage or destruction to equipment or software. See explanations in the manual. On the tester's display this symbol indicates a cable fault or voltage on the cable.
	Warning: Risk of electric shock.
	This equipment not for connection to public communications networks, such as active telephone systems.
	Do not put products containing circuit boards into the garbage. Dispose of circuits boards in accordance with local regulations.

⚠Warning⚠

To avoid possible fire, electric shock, or personal injury:

- **Do not open the case; no user-serviceable parts are inside.**
- **Do not modify the tester.**
- **Do not use the tester if it is damaged. Inspect the tester before use.**
- **If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**
- **The tester is not intended to be connected to active telephone inputs, systems, or equipment, including ISDN devices. Prolonged exposure to the voltages applied by these interfaces may damage the tester. The tester shows a warning symbol (⚠) and the voltage polarities when it detects high voltage. Figures 1 and 11 show examples of this display.**

- **Before using the optional IntelliTone probe, read the safety information in the probe's documentation provided on the IntelliTone manuals CD.**
- **Do not use the tester if it operates abnormally. Protection may be impaired.**

⚠Caution

To ensure maximum accuracy of test results replace the batteries as soon as the low battery indicator appears (see "Battery Life, Status, and Replacement" on page 40).

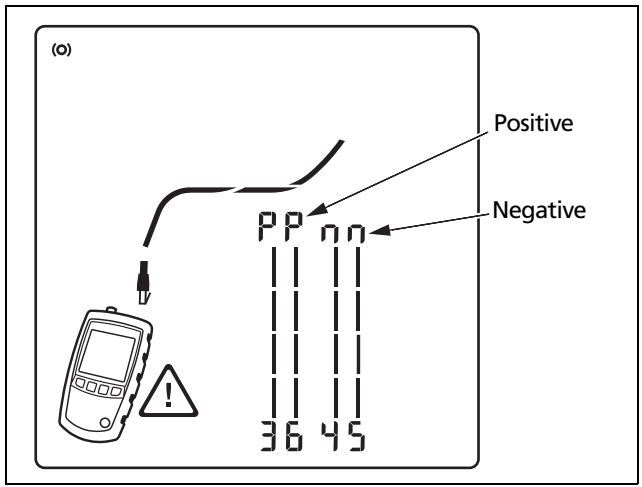

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Figure 1. High Voltage Display Example

MicroScanner^2 Features

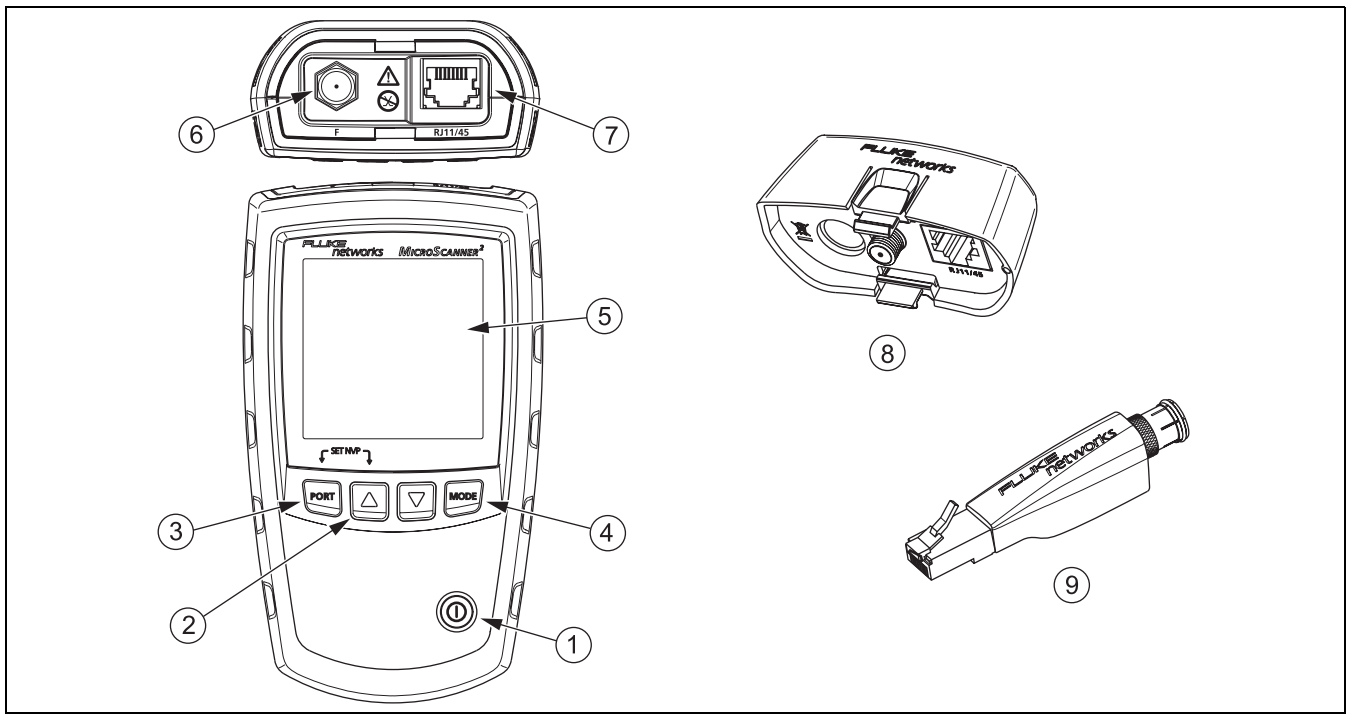

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Figure 2. MicroScanner^2 Features

① On/off key.

② △, ▽: Navigates through screens and changes settings. In toner mode, these keys cycle through the IntelliTone and analog toner songs.

③ PORT: Selects the RJ45 or coaxial connector as the active port.

④ MODE: Cycles through the cable test, toner, and PoE detect modes.

For additional modes, hold down keys while turning the tester on:

- PORT + △: Lets you calibrate length measurements and select meters or feet as the length unit.
- MODE + ▽: Activates a demonstration mode where the tester shows examples of test result screens.

Note

Auto shutoff is disabled in demonstration mode.

- △ + ▽: Displays the version and serial number screens.

⑤ LCD display with backlight.

⑥ F-connector for connecting to 75 Ω coaxial cable.

⑦ Modular jack for connecting to telephone and twisted pair network cable. The jack accepts 8-pin modular (RJ45) and 6-pin modular (RJ11) connectors.

⑧ Wiremap adapter with F-connector and 8-pin modular jack. See page 10.

⑨ Optional remote ID locator with F-connector and 8-pin modular jack. See page 10.

Display Features

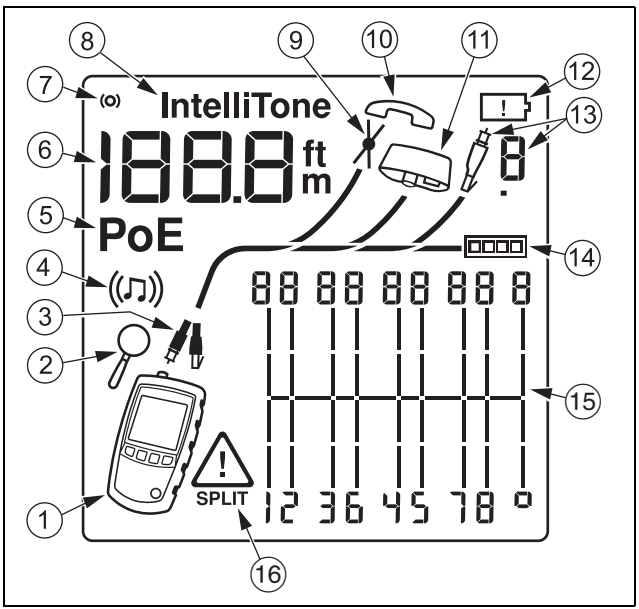

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Figure 3. Display Features

1. Tester icon
2. Detail screen indicator. See page 20.
3. Indicates which port is active, the RJ45 port ( ) or the coaxial port ( ).
4. Tone mode indicator. See page 32.
5. Power over Ethernet mode indicator. See page 31.
6. Numeric display with feet/meters indicator.
7. Test activity indicator, which is animated when a test is running.
8. IntelliTone appears when the toner is in IntelliTone mode. See pages 32 and 36.
9. Indicates a short on the cable. See pages 13 and 30.
10. Telephone voltage indicator. See page 16.
11. Indicates a wiremap adapter is connected to the far end of the cable.
12. Low battery indicator. See page 40.
13. Indicates an ID locator is connected to the far end of the cable and shows the locator's number.
14. Ethernet port indicator. See page 18.

⑮ Wiremap diagram. For opens, the number of segments lit for the wire pair indicates the approximate distance to the fault. The rightmost segments indicate the shield. See pages 12 through 15.

⑯ The ⚠ Indicates a fault or high voltage on the cable. **SPLIT** appears when the fault is a split pair. See page 15.

Auto Shutoff

The tester turns off after 10 minutes if no keys are pressed and nothing changes at the tester's connectors.

Note

Auto shutoff is disabled in toner and demonstration modes.

Changing the Length Units

1 Hold down PORT and △ while turning on the tester.

2 Press MODE to switch between meters and feet.

3 Turn the tester off then on to return to testing mode.

Using the Wiremap Adapter and Remote ID Locators

Terminating twisted pair cabling with the standard wiremap adapter or optional remote ID locators lets the tester detect all types of wiremap faults. Without this termination, the tester cannot detect crossed wires or crossed pairs. For a wire pair with one wire open, termination is required to detect which wire is open. Without termination, the tester shows both wires as open.

Using multiple remote ID locators helps you identify connections at patch panels. The tester shows the number of the locator connected to the far end of the cabling, as shown on page 23.

To connect a remote ID locator to a modular (RJ) jack in a confined area or to a 4-pin modular jack (RJ11), use the optional universal adapter and a patch cord, as shown in Figure 4.

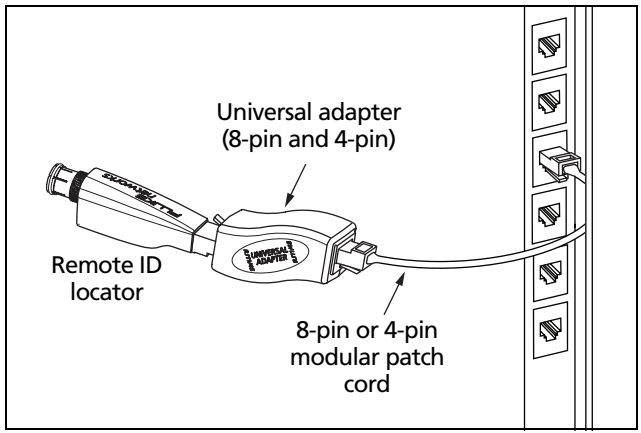

Figure 4. Connecting a Remote ID Locator in a Confined Area or to an RJ11 Jack

Testing Twisted Pair Cabling

1 Turn on the tester.

If the tester is already on and in coaxial test mode (), press PORT to switch to twisted pair test mode ().

2 Connect the tester and wiremap adapter or ID locator to the cabling as shown in Figures 5 through 17.

The test runs continuously until you change modes or turn the tester off.

Notes

You can measure length without connecting a far end adapter; however, an adapter is required for a complete wiremap test.

If the **PoE** *indicator appears, see page 31.*

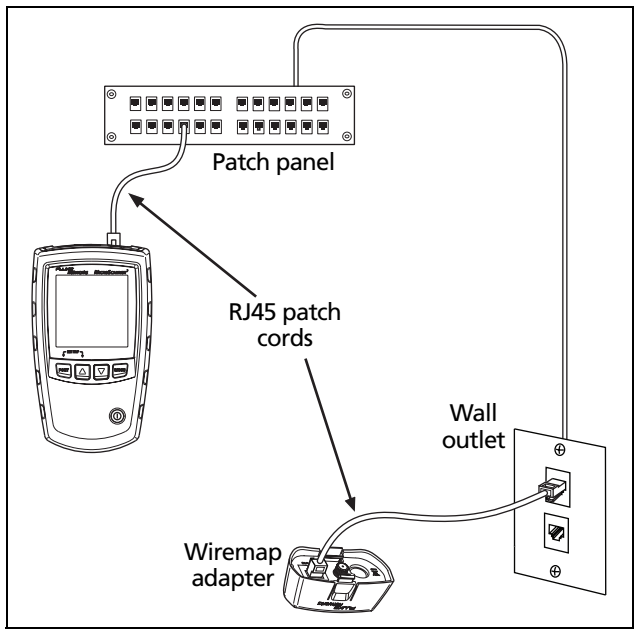

Figure 5. Connecting to Twisted Pair Network Cabling

Twisted Pair Test Results

The following figures show typical test results for twisted pair cabling.

Open on Twisted Pair Cabling

Figure 6 shows an open on wire 4.

Notes

If only one wire in a pair is open and a wiremap adapter or remote ID locator is not connected, both wires are shown as open.

The warning icon (⚠) does not appear if both wires in a pair are open because open pairs are normal for some cabling applications.

The three segments shown for the wire pair length indicate the open is approximately 3/4 the distance to the end of the cabling. The cable length is 75.4 m.

To see the distance to the open, use △ or ▽ to view the individual result for the wire pair. See page 20.

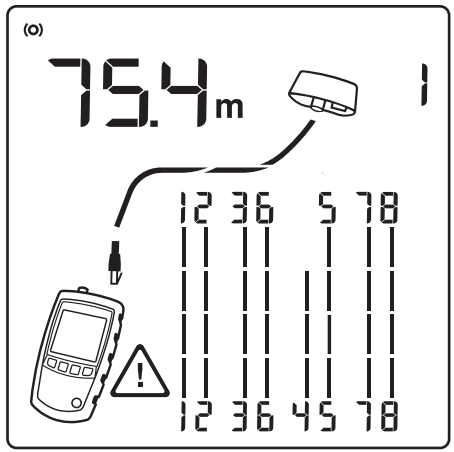

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Figure 6. Open on Twisted Pair Cabling

Short on Twisted Pair Cabling

Figure 7 shows a short between wires 5 and 6. The shorted wires flash to indicate the fault. The cable length is 75.4 m.

Note

When there is a short, the far-end adapter and the mapping of the unshorted wires are not shown.

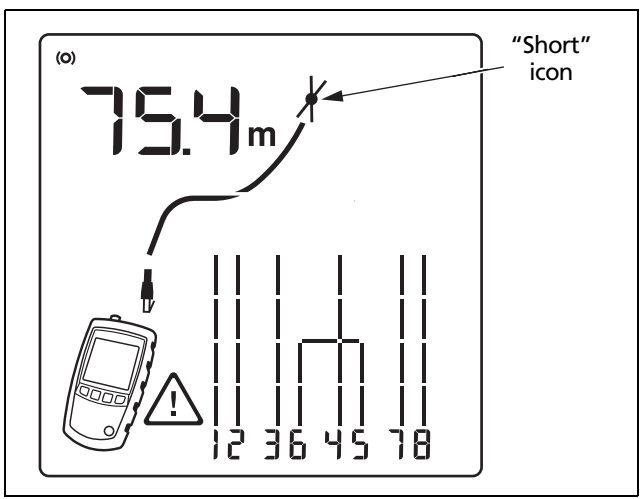

Figure 7. Short on Twisted Pair Cabling

Crossed Wires

Figure 8 shows that wires 3 and 4 are crossed. The the pin numbers flash to indicate the fault. Cable length is 53.9 m. The cable is shielded.

Detection of crossed wires requires a far-end adapter.

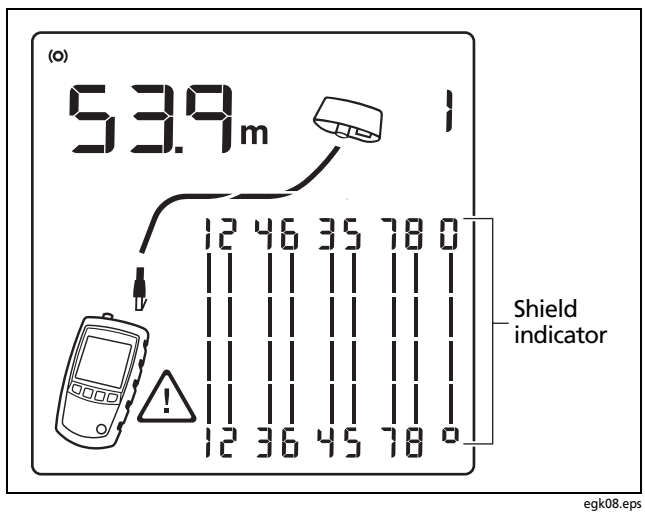

Figure 8. Crossed Wires

Crossed Pairs

Figure 9 shows that pairs 1,2 and 3,6 are crossed. The pin numbers flash to indicate the fault. This crossed pair is likely caused by mixing 568A and 568B cabling.

Detection of crossed pairs requires a far-end adapter.

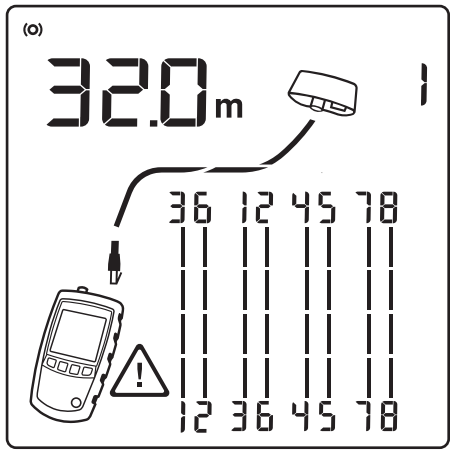

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Figure 9. Crossed Pairs

Split Pair

Figure 10 shows a split pair on 3,6 and 4,5. The split pair flashes to indicate the fault. The cable length is 75.4 m.

In a split pair, continuity from end to end is correct, but is made with wires from different pairs. Split pairs cause excessive crosstalk that interferes with network operation.

Note

Cables with untwisted pairs, such as telephone cords, typically show split pairs due to excessive crosstalk.

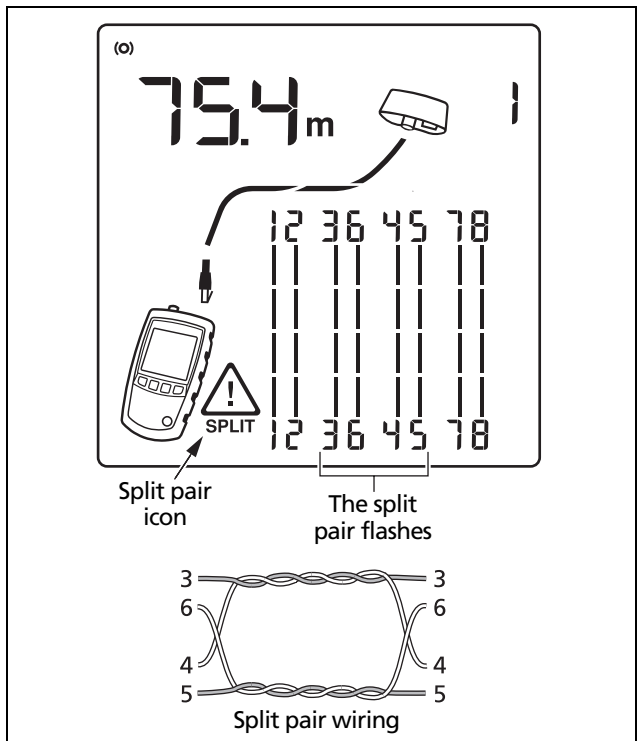

Figure 10. Split Pair

Telephone Voltages Detected

Figure 11 shows that telephone voltage is detected on pair 4,5.

Length is not shown because the voltage interferes with length measurements.

⚠Warning⚠

The tester is not intended to be connected to active telephone inputs, systems, or equipment, including ISDN devices. Prolonged exposure to the voltages applied by these interfaces may damage the tester.

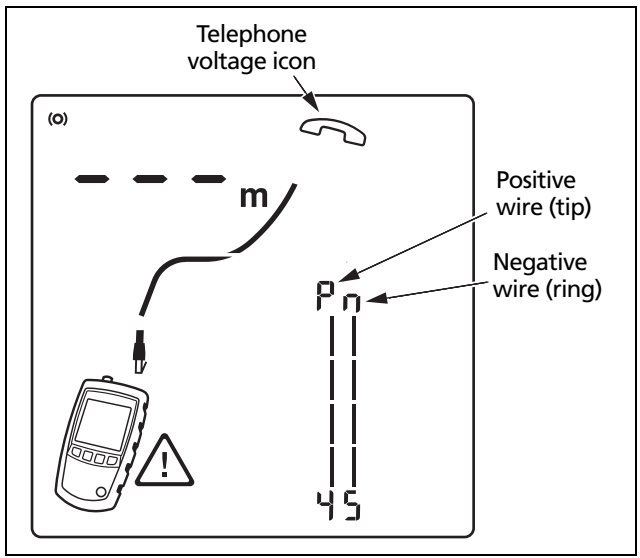

Figure 11. Telephone Voltages Detected

Bridge Tap Detected

Figure 12 shows a bridge tap detected at about 53.2 m. Only the first bridge tap detected is reported. The distance to a bridge tap is approximate because multiple reflections from the bridge tap interfere with length measurements.

Note

Bridge taps more than 328 ft (100 m) from the tester or taps less than 16 ft (5 m) long may not be detected.

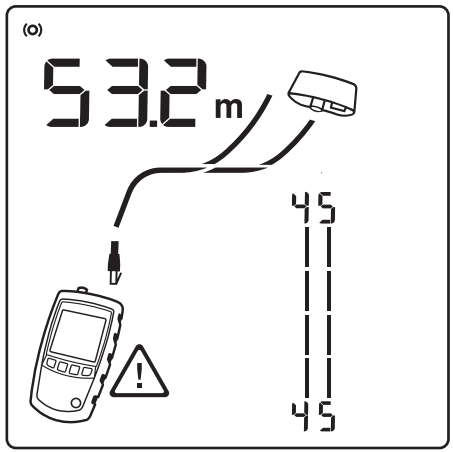

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Figure 12. Bridge Tap Detected

Ethernet Port Detected

The tester can detect active and inactive Ethernet ports, as shown in Figure 13.

① Ethernet port icon.

② Port speed for an active 1000 megabit port. The speeds are 10, 100, or 1000 megabits per second. The example shows 1000 megabits per second. If the port supports multiple speeds the number cycles through the speeds.

③ Cable length. Dashes are shown if the tester cannot measure the length. This can occur if the port does not produce reflections.

Length may fluctuate or be obviously too high if the port's impedance fluctuates or varies from the cable's impedance. When in doubt, disconnect the cable from the port to get an accurate length measurement.

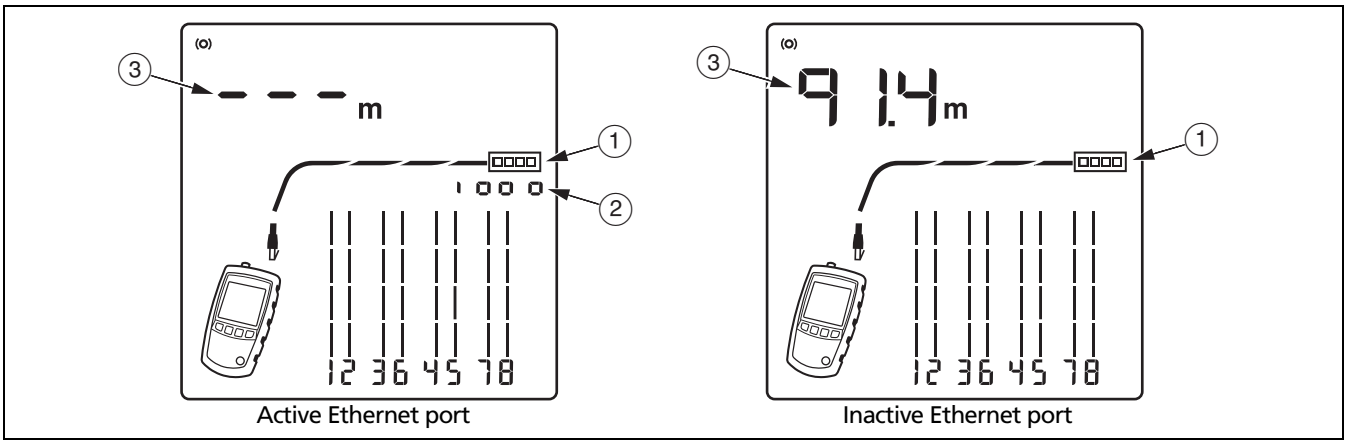

Figure 13. Ethernet Port Detected

Viewing Individual Results

To see individual results for each wire pair, use △ or ▽; to move among the screens.

In this mode, the tester continuously tests only the wire pair you are viewing.

Figure 14 shows examples of these screens.

① Short on pair 1,2 at 29.8 m.

Notes

On the individual results screens, shorts are shown only when they are between wires in a pair.

When there is a short, the far-end adapter and the mapping of the unshorted wires are not shown.

② Pair 3,6 is 67.7 m long and is terminated with the wiremap adapter.

③ Open on pair 4,5 at 48.1 m. The open could be on one or both wires.

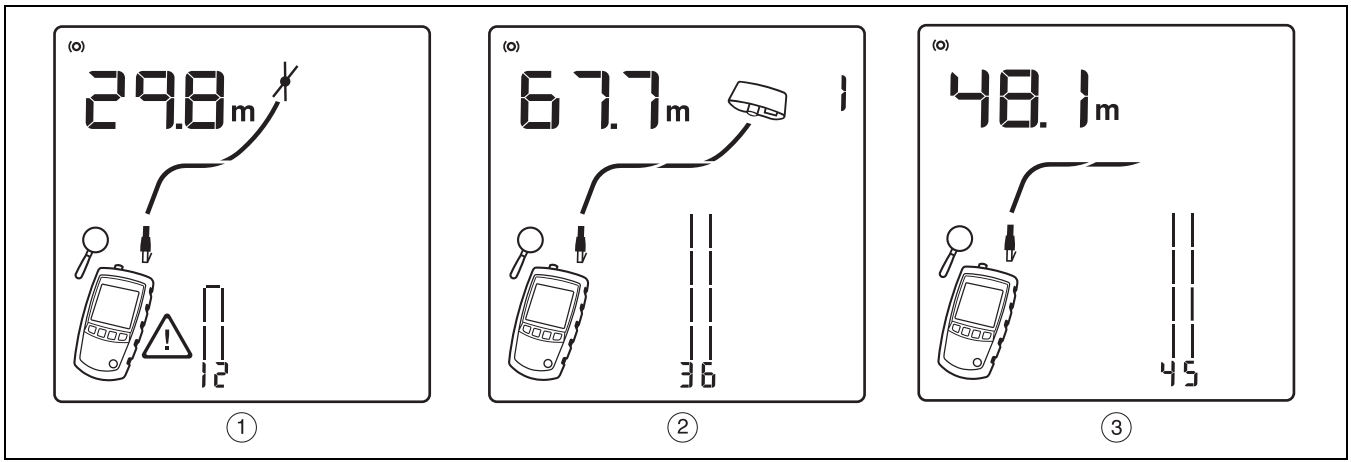

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Figure 14. Results Screens for Individual Wire Pairs

Using Multiple Remote ID Locators

Using multiple remote ID locators helps you identify multiple network connections at a patch panel, as shown in Figure 15.

The display in Figure 15 shows that the tester is connected to the cable terminated with remote ID locator number 3.

⚠Caution

Do not use multiple far end adapters in star or bus topologies. Doing so causes incorrect wiremap results.

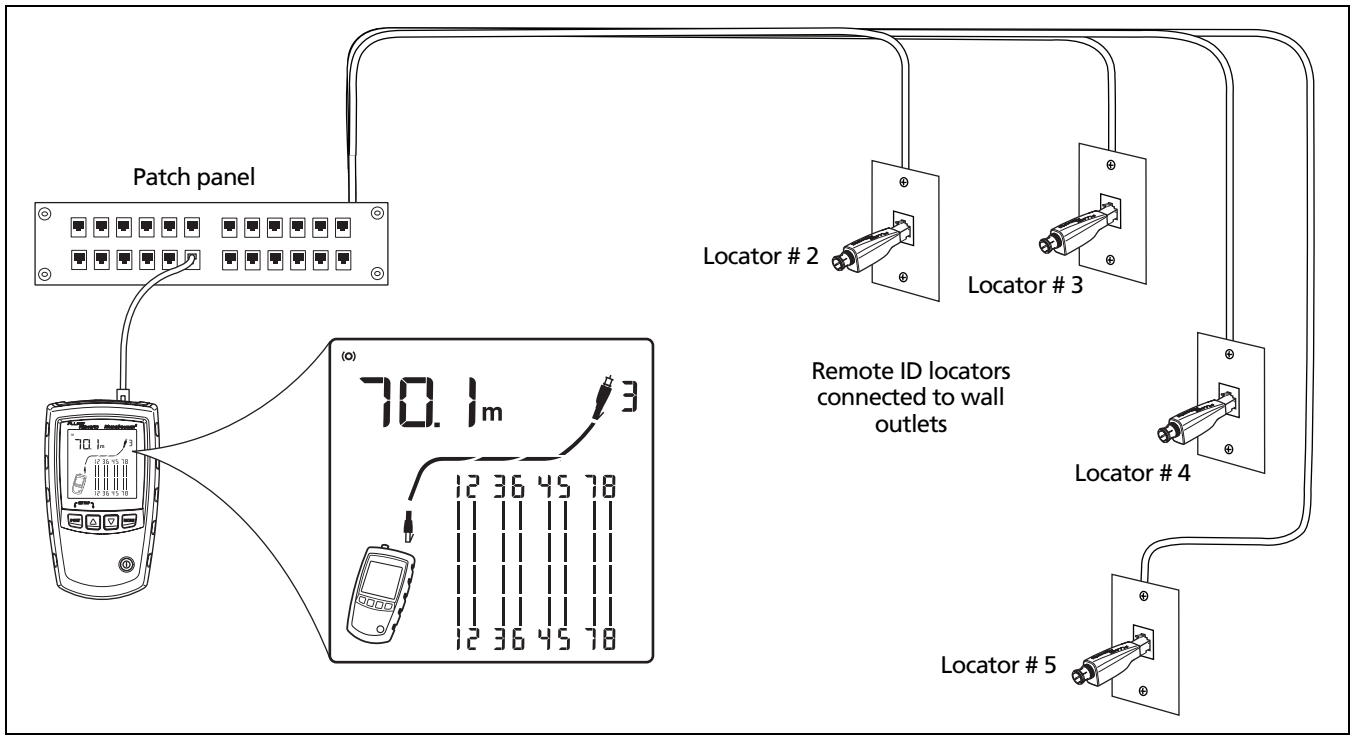

Figure 15. Using Multiple Remote ID Locators

Connecting to Telephone Networks Wired in Star Topologies

Telephone cables wired in a star topology (Figure 16) are connected together at a bridge tap at the distribution center. The bridge tap connects each wire to all other wires of the same number.

The tester detects bridge taps and measures the distance to the bridge tap. To measure the length of each cable connected to the bridge tap, connect the wiremap adapter or remote ID locator to the bridge tap and the tester to the wall outlet.

The tester cannot measure length past the bridge tap because reflections from the bridge tap connections interfere with measurements.

If you connect the tester to the bridge tap, the tester measures the length only to the bridge tap, which is only the patch cord length.

⚠Caution

Do not use multiple far end adapters in star or bus topologies. Doing so causes incorrect wiremap results.

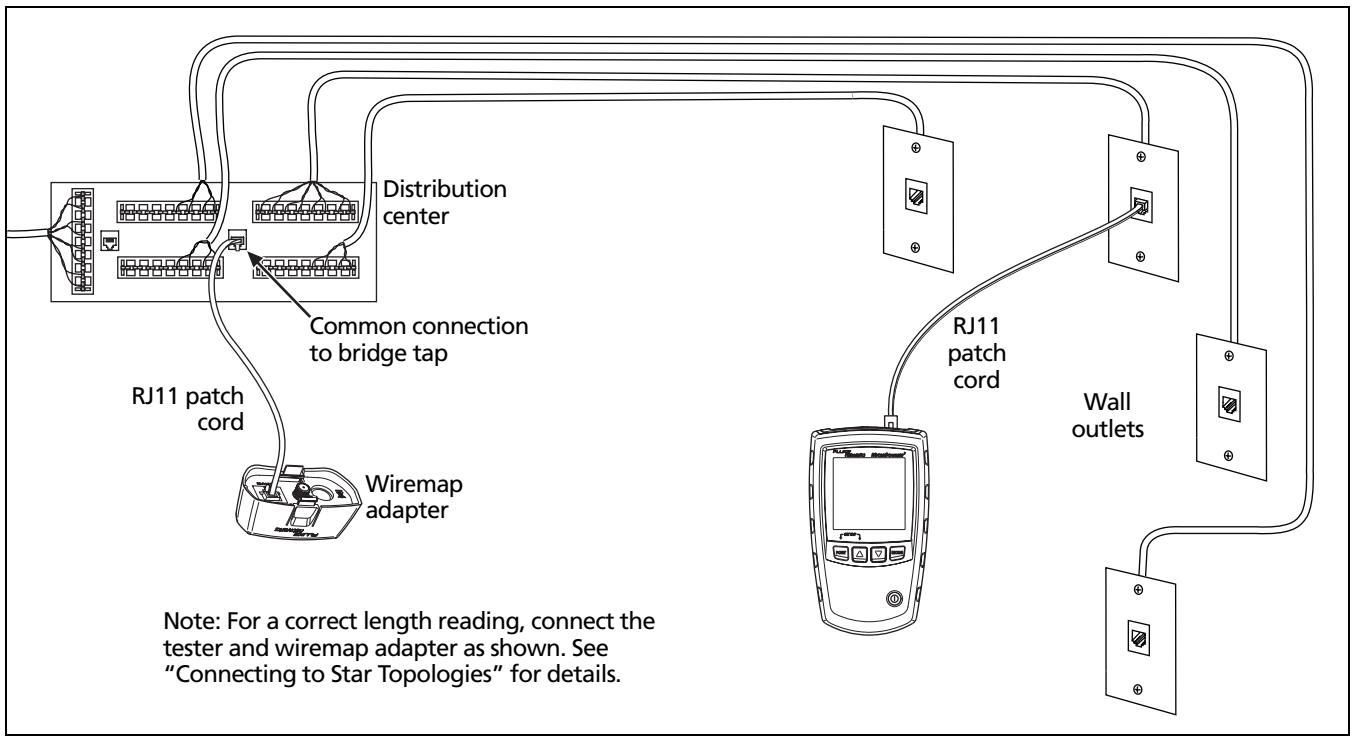

Figure 16. Connecting to a Telephone Network Wired in a Star Topology

Connecting to Telephone Networks Wired in Bus Topologies

Telephone cables wired in a bus topology (Figure 17) connect the wall outlets in series. In this topology, you measure the length from the last outlet to the wiremap adapter.

If you connect to an outlet in the middle of the series, the tester reports a bridge tap. The length reported is the length to the outlet, which is the patch cord length. The tester cannot measure length past the outlet because reflections from the cables on either side interfere with measurements.

If you are unsure which outlet is the last in the bus, do the following:

1. Connect the wiremap adapter or ID locator to the beginning of the bus at the distribution center.

2. Connect the tester to an outlet and run the twisted pair cable test.

   If the tester reports a bridge tap, move to another outlet. The last outlet will not show a bridge tap, and will show the length to the distribution center.

⚠Caution

Do not use multiple far end adapters in star or bus topologies. Doing so causes incorrect wiremap results.

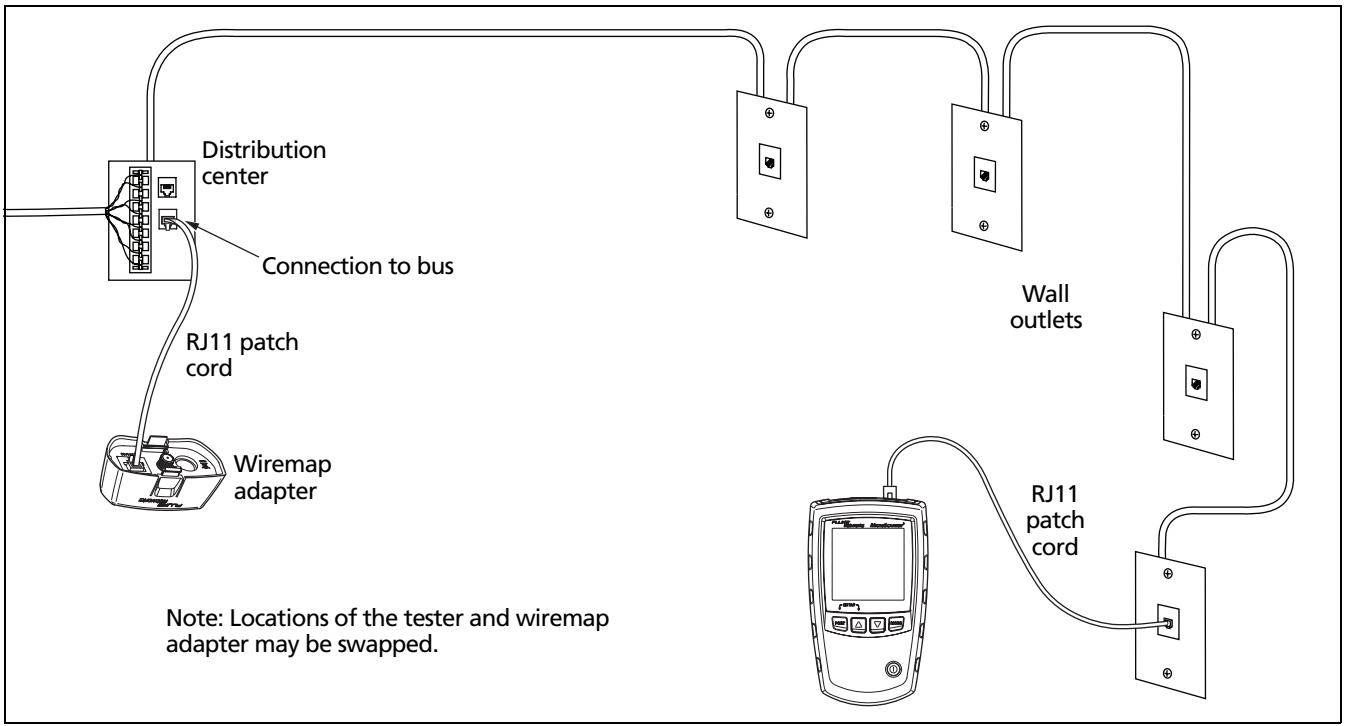

Figure 17. Connecting to a Telephone Network Wired in a Bus Topology

Testing Coaxial Cabling

1 Turn on the tester; then press PORT to switch to coaxial test mode ( ).

2 Connect the tester and wiremap adapter or ID locator to the cabling as shown in Figure 18.

   For cabling not terminated with an F-connector, use an adapter or hybrid patch cord to connect to the cabling.

The test runs continuously until you change modes or turn the tester off.

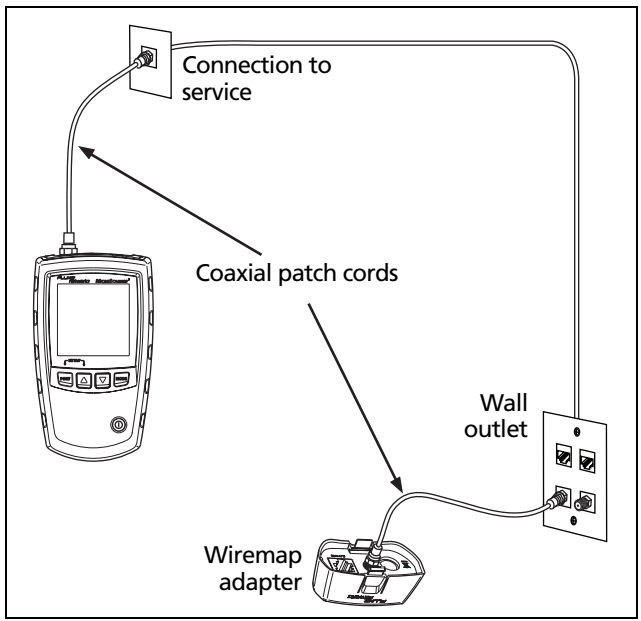

Figure 18. Connecting to Coaxial Cabling

Coaxial Results

Figure 19 shows a good coaxial cable 38.4 m long and terminated with remote ID number 3.

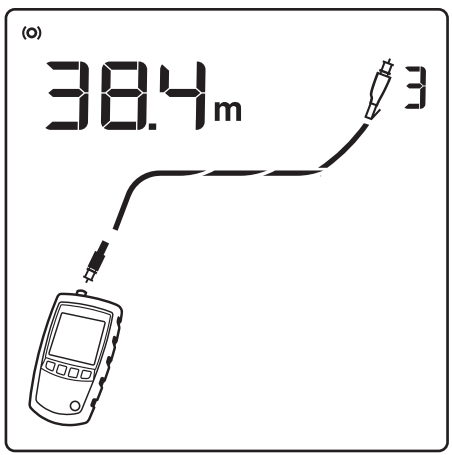

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Figure 19. Coaxial Results

Open on Coaxial Cabling

Figure 20 shows an open 12.1 m from the tester.

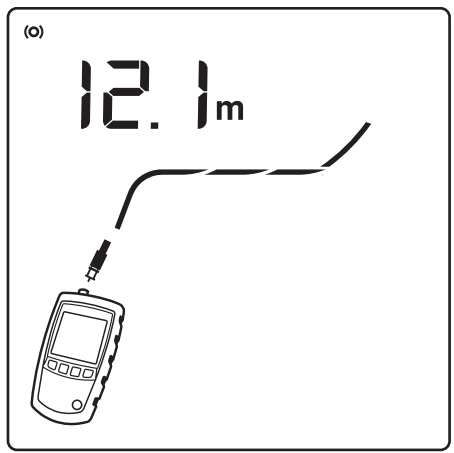

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Figure 20. Open on Coaxial Cabling

Short on Coaxial Cabling

Figure 21 shows a short 12.1 m from the tester.

egk22.eps

Figure 21. Short on Coaxial Cabling

Unknown Termination on Coaxial Cabling

Figure 22 shows a cable connected to a device at the far end, such as a television, CATV service, VCR, DVD player, satellite dish, splitter, or antenna. Dashes shown for length mean the tester cannot measure length because the device does not produce reflections.

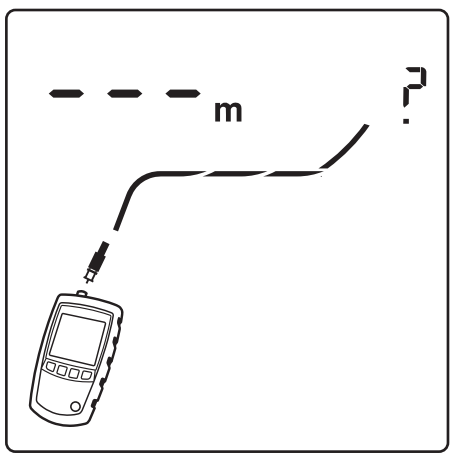

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Figure 22. Unknown Termination on Coaxial Cabling

Detecting Power Over Ethernet

The tester can detect PoE voltage from 802.3af sources.

To select PoE mode, press MODE until **PoE** appears on the display, as shown in Figure 23 (1).

In PoE mode, the tester solicits PoE power on pairs 1,2-3,6 and 4,5-7,8. The tester may activate a PoE source and will not be damaged by PoE power.

If PoE power is detected, PoE appears above the powered pairs (2). The PoE may blink as the PoE source turns the power on and off.

In twisted pair test mode, a flashing **PoE** mode indicator means that PoE power may be available. To verify the presence of a PoE source, switch the tester to PoE mode.

Note

The tester will not detect PoE schemes that are not compliant with the IEEE 802.3af standard, such as Cisco® Inline Power.

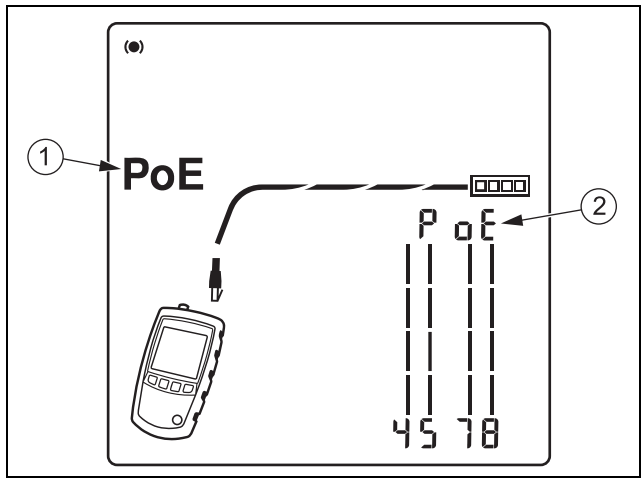

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Figure 23. PoE Display

Using the Toner

You can use the tester with an optional tone probe to locate cables in bundles, at patch panels, or behind walls.

Use the tester's IntelliTone™ mode with an optional Fluke Networks IP100 or IP200 tone probe. The digital IntelliTone signal is easier to detect at a distance than analog tones, and its frequency and encoding eliminate cable misidentification due to signal bleed and radiated or ambient noise.

The tester's analog tone mode is compatible with most tone probes.

The analog tone mode features the SmartTone™ function for positive identification of cables in bundles.

Toning in IntelliTone Mode (optional IntelliTone probe required)

Refer to Figures 24 and 25.

1 Connect the tester to the cable.

2 Press PORT to select twisted pair ( ) or coaxial ( ) cable.

3 Press MODE until ( ), **IntelliTone**, and and a scrolling pattern of 1s and 0s appear on the display (1, 2, and 3 in Figure 24).

4 To toggle between the two IntelliTone songs press △ then ▽. The display shows the song number (4).

If you press ▽ or △ repeatedly, the tester cycles through the IntelliTone and analog songs.

5 Turn the probe's rotary switch to (locate).

6 Use the probe to find the general location of the tone at a cable rack, patch panel, or behind a wall, as shown in Figure 25. The **SYNC** LED lights up green when the probe is receiving the IntelliTone signal.

The probe's LEDs light up from 1 to 8 as the signal strength increases. The higher the number, the stronger the signal.

Notes

If you cannot locate the IntelliTone signal on 2-conductor cables, the cable may be shorted. Use the tester to check for shorts. See pages 11 and 13.

7 Turn the probe's rotary switch to (isolate).

8 Use the probe to isolate the tone source in the cable bundle or at the patch panel. The **SYNC** LED lights up green when the probe is receiving the IntelliTone signal.

The probe's LEDs light up from 1 to 8 as the signal strength increases. The higher the number, the stronger the signal.

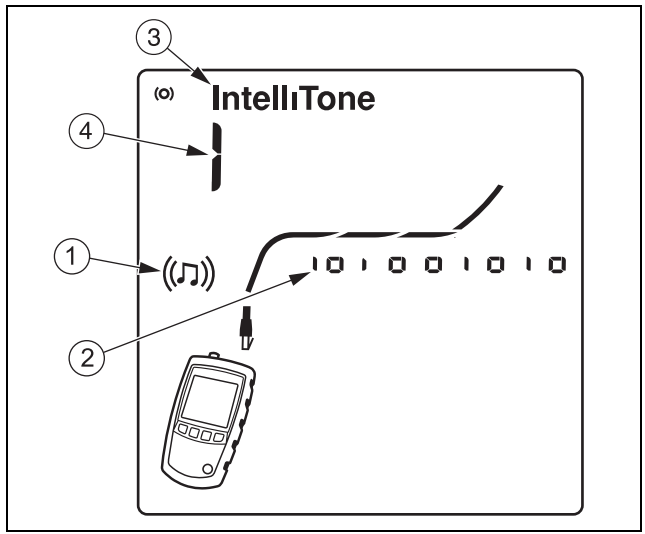

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Figure 24. IntelliTone Toner Mode Display

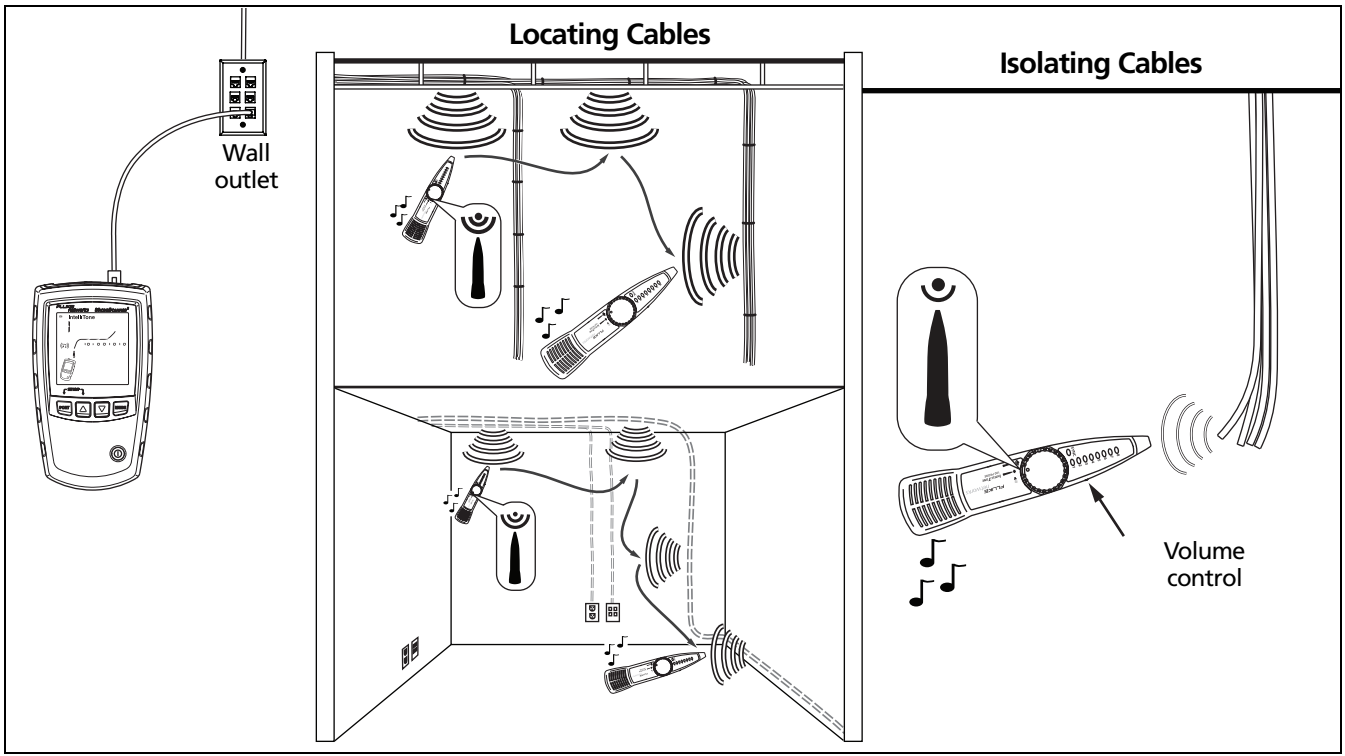

Figure 25. Using the Toner in IntelliTone Mode

Analog Toner Mode (optional tone probe required)

Refer to Figure 26.

1 Connect the tester to the cable.

2 Press PORT to select twisted pair or coaxial cable.

3 Press MODE until (♫) appears on the display (1); then press ▽ to enter analog toner mode. The display shows a scrolling sinewave in analog toner mode (2).

4 To change songs, press ▽. The display shows the song number (3). The analog toner has four songs.

If you press ▽ or △ repeatedly, the tester cycles through the analog and IntelliTone songs.

5 Use the probe to search for the cable.

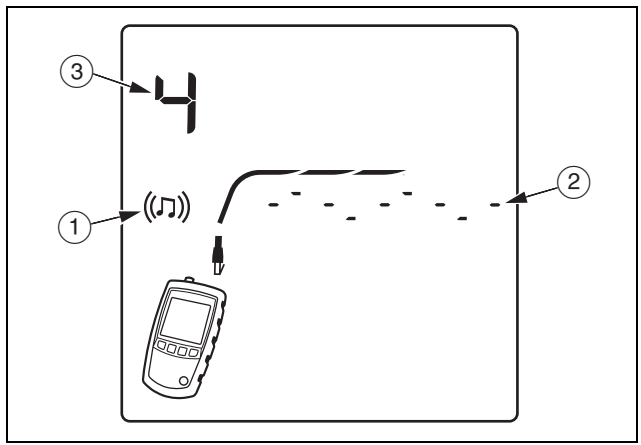

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Figure 26. Analog Toner Mode Display

Using the SmartTone Function

Use the SmartTone™ function when you have trouble locating a cable. This function changes the toner's song when you short a wire pair in the cable connected to the tester. SmartTone works with the IntelliTone probe and with analog probes.

Note

Use the SmartTone function only on dry pairs of wires that are unterminated at both ends. Do not use this function on powered wires.

1 Press PORT to select twisted pair or coaxial cabling.

2 Press MODE until (♫) appears on the display.

3 Press ▽ to select the analog toner mode (**IntelliTone** disappears from the display).

4 At the far end of the cabling, place the probe near the ends of the cables.

5 Momentarily short a wire pair in a cable (twisted pair) or short the conductor and shield in a cable (coaxial). If the song changes when you release the short, you have found the cable connected to the tester.

Using the IntelliTone Cable Map Function (optional IP200 probe required)

The tester's IntelliTone function works with an optional IP200 probe's cable map function to verify wiring at the far end of the cabling. The probe's cable map function identifies the most common wiring faults on twisted pair cabling: shorts, opens, and crossed pairs.

1 Press PORT to select twisted pair cabling (▮).

2 Turn the probe's rotary switch to **CABLE MAP**.

3 Connect the tester and probe to the cabling as shown in Figure 27.

4 Press MODE until (♫) appears on the display. IntelliTone mode is indicated by **IntelliTone** and a scrolling pattern of 1s and 0s on the display. See Figure 27.

5 The probe's LEDs light in sequence to indicate the cable's wiring. See the probe's documentation for details.

Note

Normally, the probe's **SYNC** *LED lights to indicate reception of the IntelliTone signal. You may change the LED's function to indicate shield continuity. See the probe's documentation for details.*

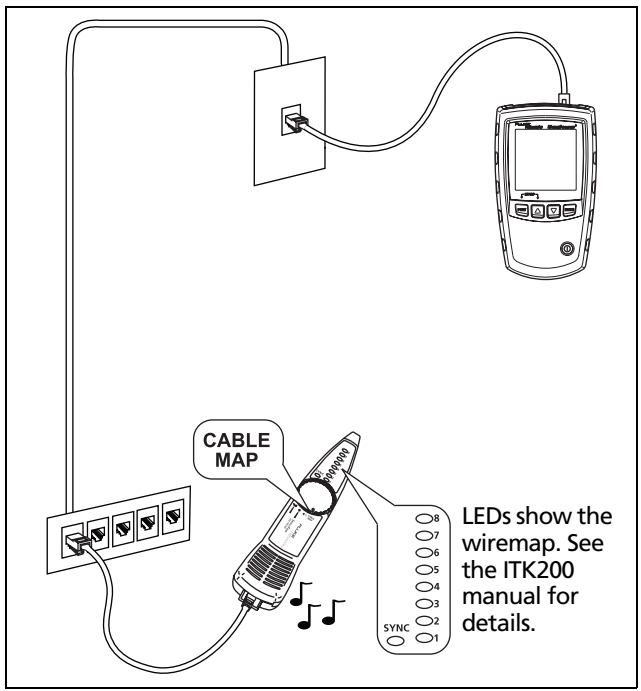

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Figure 27. Using the Toner with the IP200 IntelliTone Cable Map Function

Calibrating Length Measurements

The tester uses an NVP value (nominal velocity of propagation) and the signal delay through the cable to calculate length. The tester's default NVP values are usually accurate enough to verify length; however, you can increase the accuracy of length measurements by adjusting the NVP to a specified or actual value.

The default NVP values are 70 % for twisted pair cable and 82 % for coaxial cable.

Note

NVP values can vary among cable types, lots, and manufacturers. In most cases, these differences are minor and may be disregarded.

Setting the NVP to a Specified Value

To enter the NVP value specified by the manufacturer:

1. Turn on the tester while holding down the PORT and △ keys.
2. To set the NVP for the coaxial port (), press PORT.
3. Use △ and ▽ to set the NVP value.
4. To save the setting and exit NVP mode, turn the tester off then on again.

Determining a Cable's Actual NVP

You can determine a cable's actual NVP by adjusting the measured length to match a known length of cable.

To determine a cable's NVP:

1. Turn on the tester while holding down the PORT and △ keys.
2. To set the NVP for the coaxial port (), press PORT.
3. Connect a known length of the cable to be tested to the tester's twisted pair or coaxial connector.

Notes

*The cable must be at least 49 ft (15 m) long. If the cable is too short, "**---**" appears for the length.*

For the best accuracy, use a cable between 49 ft (15 m) and 98 ft (30 m) long.

The cable must not be connected to anything.

4 To switch between meters and feet, press MODE.

5 Use △ and ▽ to change the NVP until the measured length matches the actual length of the cable.

6 To save the setting and exit NVP mode, turn the tester off then on again.

Maintenance

⚠Warning⚠

To avoid possible fire, electric shock, personal injury, or damage to the tester:

- **Do not open the case. No user-serviceable parts are inside.**
- **Replacing electrical parts yourself will void the tester's warranty and might compromise its safety features.**
- **Use only specified replacement parts for user-replaceable items.**
- **Use only Fluke Networks authorized service centers.**

Cleaning

Clean the display with glass cleaner and a soft, lint-free cloth. Clean the case with a soft cloth dampened with water or water and a mild soap.

⚠Caution

- **To avoid damaging the display or the case, do not use solvents or abrasive cleansers.**

Battery Life, Status, and Replacement

⚠Warning⚠

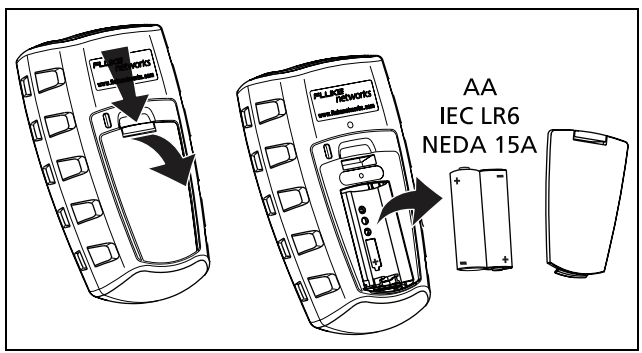
- **To avoid possible electric shock or personal injury:**
- **Turn off the tester and disconnect all test leads before replacing the battery.**
- **Use only the correct type of batteries, properly installed in the case, to power the tester.**

The batteries last for about 20 hours of typical use.

Replace the tester's batteries when the low battery indicator ( ) appears. See Figure 28.

You can use the following types of AA (IEC LR6) batteries in the tester:

- Alkaline
- Lithium
- Rechargeable nickel-metal hydride (NiMH)
- Rechargeable nickel-cadmium batteries (NiCD)



egk28.eps

Figure 28. Replacing the Tester's Batteries

Checking the Tester's Version and Serial Number

Turn the tester on while holding down the △ and ▽ keys.

Use △ and ▽ to scroll through the screens:

- SOF : Software version
- Sn : Serial number
- FAC : Factory test date

To exit this mode, turn the tester off.

If Something Seems Wrong

If something seems wrong with the tester, refer to Table 2.

If Table 2 does not help you solve a problem with the tester, contact Fluke Networks for additional help. If possible, have the tester's version and serial number.

For warranty information, refer to the warranty at the beginning of this manual. If the warranty has lapsed, contact Fluke Networks for repair prices.

Table 2. Troubleshooting the Tester

Symptom	Action
The keypad does not respond.	Press and hold ⏻ until the tester turns off; then turn the tester on again.
The tester will not turn on.	Replace the batteries, verifying that they are installed correctly. See Figure 28 on page 40.
Length measurements are incorrect.	Check the NVP value. See "Calibrating Length Measurements" on page 38.

Options and Accessories

To order options and accessories (Table 3), contact Fluke Networks.

For the latest list of options and accessories visit the Fluke Networks website at **www.flukenetworks.com**.

Table 3. Options and Accessories

Option or Accessory	Fluke Networks Model Number
Remote ID Locator Kit, numbers 2-7	MS2-IDK27
Wiremap adapter	MS2-WM
Test lead, 8-pin modular plug (RJ45) to 8 alligator clips	CLIP-SET
Coaxial Adapter Kit (F-connector barrel adapter, female-to-female BNC adapter, female-to-female RCA adapter)	CIQ-COAX
Universal adapter, 8-pin/4-pin modular jack to 8-pin/4-pin modular jack	CIQ-RJA
Carrying case for MicroScanner^2 Professional kit	MS2-CPK
Carrying pouch for MicroScanner^2 tester	MS2-POUCH

Specifications

Specifications apply at 23 °C (73 °F), unless otherwise noted.

Environmental Specifications

Operating temperature	32 °F to 113 °F (0 °C to 45 °C)
Storage temperature	-4 °F to +140 °F (-20 °C to +60 °C)
Operating relative humidity (% RH without condensation)	90 % (50 °F to 95 °F; 10 °C to 35 °C) 75 % (95 °F to 113 °F; 35 °C to 45 °C)
Shock and Vibration	Random, 2 g, 5 Hz-500 Hz (Class 2) 1 m drop test with and without wiremap adapter attached
Safety	EN 61010-1 2nd Edition
Altitude	4000 m; Storage: 12000 m
EMC	EN 61326-1
Certifications and compliance	CE Conforms to relevant European Union directives. Conforms to relevant Australian standards.

General Specifications

Test connectors	Shielded 8-pin modular jack accepts 8-pin modular (RJ45) and 4-pin modular (RJ11) plugs. F-connector for coaxial cable.
Power	Battery type: 2 AA (NEDA 15A, IEC LR6) alkaline batteries Battery life: 20 hours of typical use Other compatible battery types: 2 AA photo lithium, NIMH, NICAD
Dimensions and weight (with batteries installed and wiremap adapter attached	3 in x 6.4" x 1.4 in (7.6 cm x 16.3 cm x 3.6 cm) 0.8 lb (0.36 kg)
Display	Monochrome LCD with backlight

Test Modes

Cable test	Measures length, verifies wiremap, identifies remote ID locators, and detects Ethernet ports. Displays results on one screen.
Tone	Generates Intellitone™ and normal analog toning signals
PoE	Solicits and detects the presence of 802.3af compatible PoE (Power over Ethernet) devices

Performance Specifications

Cable types tested	**Twisted pair:** UTP, FTP, SSTP **Coaxial**: 75 Ω, 50 Ω, 93 Ω
Length test	**Range**: 460 m (1500 ft) **Resolution**: 0.3 m (1 ft) **Typical accuracy**: ± 4% or 0.6 m (2 ft) whichever is greater. NVP uncertainty is an additional error. **Calibration**: User-settable NVP for twisted pair and coax. Can determine actual NVP with known length of cable.
Wiremap test	Detects single-wire faults, shorts, miswires, split pairs, and up to seven far-end adapter IDs. The wiremap is drawn with proportional length to visually indicate the approximate location of faults.
Port detection	Detects the advertised speed of 802.3 Ethernet ports.
Tone generator	Supports toning and cable mapping with a Fluke Networks digital IntelliTone™ probe. Generates four tones compatible with typical analog probes. SmartTone™ feature gives positive identification of cables in bundles when using an IntelliTone or an analog probe.

Regulatory Information

This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15, Subpart J of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of the equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Appendix A: Diagnosing Wiremap Faults

Appendix A lists the typical causes of wiremap failures.

Open

- Wires connected to wrong pins at connector or punchdown blocks
- Faulty connections
- Damaged connector
- Damaged cable
- Wrong pairs selected in setup
- Wrong application for cable

Split Pair

Wires connected to wrong pins at connector or punchdown block.

Reversed Pairs

Wires connected to wrong pins at connector or punchdown block.

Crossed Pairs

- Wires connected to wrong pins at connector or punchdown block.
- Mix of 568A and 568B wiring standards (12 and 36 crossed).
- Crossover cables used where not needed (12 and 36 crossed).

Short

- Damaged connector
- Damaged cable
- Conductive material stuck between pins at connector.
- Improper connector termination
- Wrong application for cable

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–V–

–W–