FLUKE networks

IT200

IntelliTone™ Toner and Probe

Users Manual

October 2003

LIMITED WARRANTY AND LIMITATION OF LIABILITY

Each Fluke Networks product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is one year and begins on the date of purchase. Parts, accessories, product repairs and services are warranted for 90 days. This warranty extends only to the original buyer or end-user customer of a Fluke Networks authorized reseller, and does not apply to disposable batteries, cable connector tabs, cable insulation-displacement connectors, or to any product which, in Fluke Networks' opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation or handling. Fluke Networks warrants that software will operate substantially in accordance with its functional specifications for 90 days and that it has been properly recorded on non-defective media. Fluke Networks does not warrant that software will be error free or operate without interruption.

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Fluke Networks' warranty obligation is limited, at Fluke Networks' option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to a Fluke Networks authorized service center within the warranty period.

To obtain warranty service, contact your nearest Fluke Networks authorized service center to obtain return authorization information, then send the product to that service center, with a description of the difficulty, postage and insurance prepaid (FOB Destination). Fluke Networks assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation prepaid (FOB Destination). If Fluke Networks determines that failure was caused by neglect, misuse, contamination, alteration, accident or abnormal condition of operation or handling, or normal wear and tear of mechanical components, Fluke Networks will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer transportation prepaid and the Buyer will be billed for the repair and return transportation charges (FOB Shipping Point).

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IT200 IntelliTone™ Toner
IT200 IntelliTone™ Probe

Overview of Features

The IT200 IntelliTone™ toner and probe let you locate, isolate, and validate twisted pair (UTP/STP/SSTP, Cat 5e, Cat 6), coax cables (RG6, RG59, and others for CATV/CCTV), bare wire (such as speaker wire and security network wire), and Cat 3 telephone cabling. The toner also lets you validate voice and data services.

The toner and probe feature IntelliTone toning and detection. 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 IntelliTone feature also lets you use the IT200 toner and probe to validate and troubleshoot wiring on RJ11 and RJ45 cables.

The IT200 toner detects telephone and Ethernet service, indicates polarity and active line numbers on voice circuits, and indicates active pair number on Ethernet circuits.

The IT200 toner and probe also provide standard functions such as visual and audible signal strength indication, legacy 1 kHz toning and detection, continuity testing, and talk battery power for telephone line testing.

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**. If you do not have Internet access, print the registration form from the CD included with the product. Fill out the form, then mail or fax it to the appropriate address for your country.

Contacting Fluke Networks


www.flukenetworks.com


support@flukenetworks.com


+1-425-446-4519

- Australia: 61 (2) 8850-3333 or 61 (3) 9329-0244
- Beijing: 86 (10) 6512-3435
- Brazil: 11 3044 1277
- Canada: 1-800-363-5853
- 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: 1-800-283-5853

Visit our website for a complete list of phone numbers.

Unpacking

The IT200 products come with the accessories listed below. If something is damaged or missing, contact the place of purchase immediately.

ITK200 IntelliTone Kit

- IT200 Toner with 9 V battery
- IT200 Probe with 9 V battery
- 2 RJ11 to RJ11 patch cords
- 2 RJ45 to RJ45 patch cords
- Test lead set, banana jacks to alligator clips
- F connector adapter, female to female
- Quick Reference Guide
- Product Manuals CD

IT200 IntelliTone Toner

- IT200 Toner with 9 V battery
- 1 RJ11 to RJ11 patch cord
- 1 RJ45 to RJ45 patch cord
- Test lead set, banana jacks to alligator clips
- F connector adapter, female to female
- Quick Reference Guide
- Product Manuals CD

IT200 IntelliTone Probe

- IT200 Probe with 9 V battery
- Quick Reference Guide
- Product Manuals CD

Safety Information

⚠Warning

To avoid possible electric shock or personal injury:

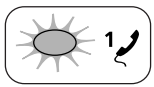
- **Never use the toner or probe on circuits of more than 100 V.**
- **Never use the toner, probe, or test leads if they are damaged. Inspect the cases and test leads for damage before use.**
- **Disconnect unused test leads and connectors from the toner when testing telephone circuits.**
- **Never open the case except to change the battery; no user-serviceable parts are inside.**
- **Turn off the toner or probe and disconnect all test leads before replacing the battery.**
- **Use only a 9 V battery, properly installed in the case, to power the toner and probe.**
- **If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**

Caution

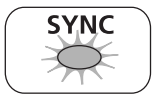
- **Avoid touching the probe tip to patch panel connections and using the tip to dig into cable bundles. Doing so regularly may damage the probe tip over time.**
- **To avoid unreliable test results, replace the battery as soon as the low battery indication appears.**

Battery Status

LEDs on the toner and probe light for 1 second at power on to indicate the battery status:



Toner battery status LED



Probe battery status LED

Green: Battery is good.

Yellow: Battery is marginal.

Red: Battery is low.

See “Battery Life and Replacement” on page 15 for more information on the battery.

Auto Power Down

The toner turns off automatically after 4 hours of inactivity. The probe turns off automatically after 1 hour of inactivity.

To reactivate the toner or probe, turn the rotary switch to any position except **OFF**.

Locating and Isolating Cables with the IntelliTone Function

The IntelliTone function provides two digital toning signals for locating and isolating cables: one signal lets you locate cables at a distance, and the other lets you isolate cables in bundles or at patch panels.

The toning signals are available at all connectors on the toner.

To locate and isolate cables, do the following:

1. Connect the IT200 toner to a jack or punch-down block as shown in Figure 1.
2. Turn the toner's rotary switch to ♩ for a one-note tone or ♫ for a two-note tone.
3. Turn the IT200 probe's rotary switch to (locate).
4. Use the probe to find the general location of the tone at a cable rack, patch panel, or behind a wall. The **SYNC** LED flickers when the probe is receiving the IntelliTone signal.

   In locating mode, the probe's LEDs light up from 1 to 8, then wrap back and light up from 1 to 8 again as the signal strength increases.

Note

If you cannot locate the IntelliTone signal on 2-conductor cables, the cable may be shorted. Use the cable map test (page 8) to test for shorts on cables with RJ11 and RJ45 connectors. Use the continuity test (page 13) to check for shorts on coax and non-terminated cables.

5. Turn the probe's rotary switch to (isolate).
6. Use the probe to isolate the tone source in the cable bundle or at the patch panel. The **SYNC** LED flickers when the probe is receiving the IntelliTone signal.

   In isolating mode, the probes LEDs light up from 1 to 8 as the signal strength increases.

Note

It is not necessary to touch the IT200 probe tip to the cabling or patch panel when searching for the IntelliTone signal.

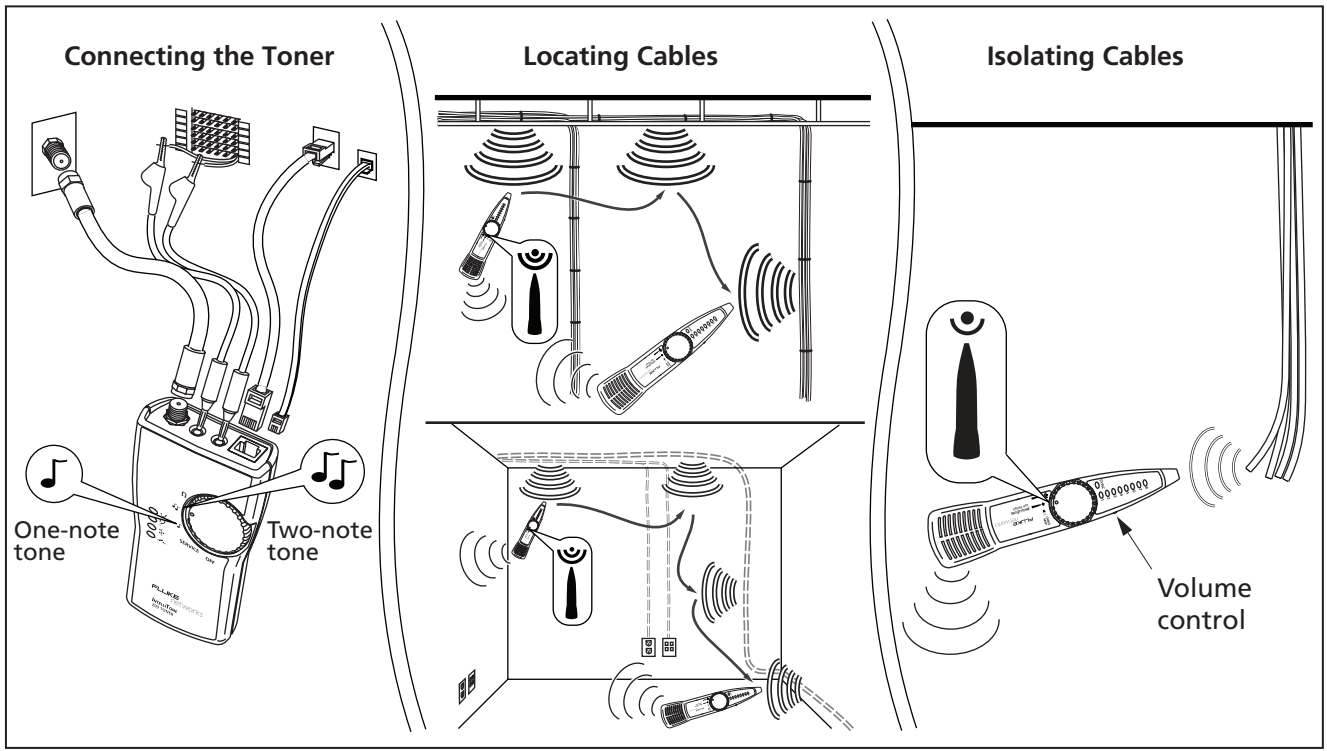


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Figure 1. Locating and Isolating Cables

Validating RJ11 and RJ45 Cable Maps

You can use the IT200 or IT100 toner and IT200 probe to validate the cable map on RJ11 and RJ45 connectors. The cable map function finds the most common wiring faults on twisted pair cabling: shorts, opens, and crossed pairs.

1. Connect an IT200 or IT100 toner to a RJ11 or RJ45 jack, as shown in Figure 1.
2. Turn the toner's rotary switch to ♩ or ♫.
3. If necessary, use the IP200 probe to locate the correct connector at the other end of the cabling, as described in the previous section.
4. Connect the IP200 probe to the RJ11 or RJ45 jack; then turn the probe's rotary switch to **CABLE MAP**.
5. The probe's LEDs and beeper indicate the cable map, as follows:
    - The number of each LED corresponds to a pin on the connector. You can enable the **SYNC** LED to validate the shield. See "Validating the Cable's Shield" on page 10.
    - Each LED that corresponding to an active pin flashes briefly, then should light for about 1 second. The brief flash shows which LED is next in the sequence.
    - The probe also beeps in different tones to indicate good wiring, miswires, shorts, and opens.
    - Miswire: If one LED flashes briefly, then another LED lights for one second, the wire for the first LED is miswired to the pin for the second LED.
    - Short: If two LEDs turn on for 1 second at the same time, those two pins are shorted together. If more than 2 wires are shorted together, the LEDs for the shorted pins indicate opens.
    - Open: If an LED flashes briefly, then no LEDs turn on, that pin is open.

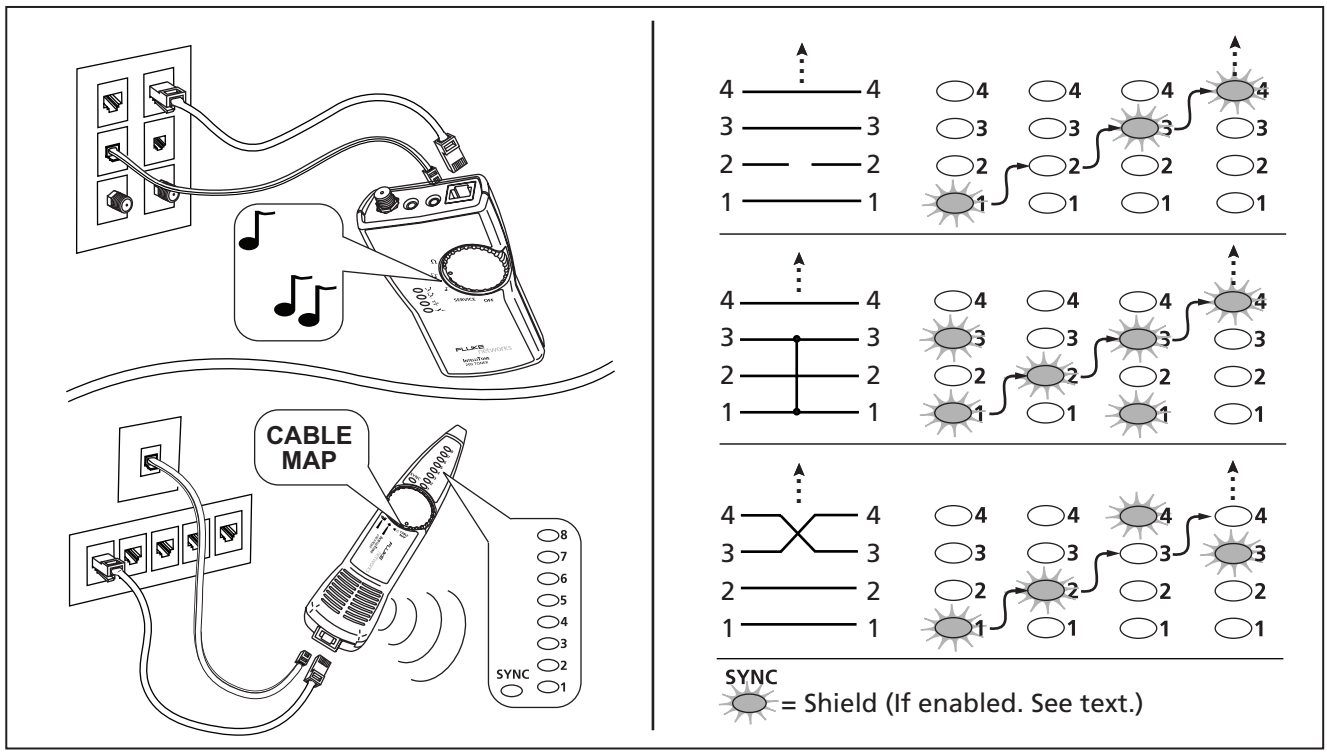

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Figure 2. Validating Cable Maps

Validating the Cable's Shield

To use the probe's **SYNC** LED for shield validation during cable map tests, do the following:

1. Remove the battery door and battery from the probe, as described under "Battery Life and Replacement" on page 15.
2. Turn the probe's rotary switch to **CABLE MAP**.
3. Replace the battery and battery door.

The **SYNC** LED will now indicate a good, open, or shorted shield as described in the previous section.

To disable shield validation via the probe's **SYNC** LED, do the following:

1. Remove the battery door and battery from the probe, as described under "Battery Life and Replacement" on page 15.
2. Turn the probe's rotary switch any position except **CABLE MAP**.
3. Replace the battery and battery door.

Validating Telephone Service and Polarity

The toner detects telephone service and circuit polarity on its banana, RJ11, and RJ45 jacks.

Note

This test requires power from the Central Office battery.

1. Turn off the toner.
2. Connect the toner to the circuit as shown in Figure 3. Disconnect unused test leads and connectors from the toner.
3. Turn the toner's rotary switch to **SERVICE**.
4. The LEDs indicate telephone service and polarity as shown in Figure 3.

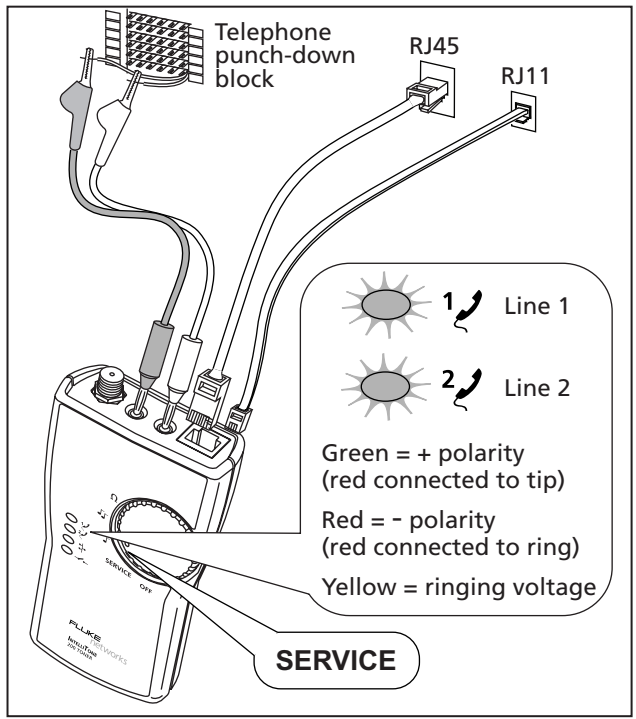

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Figure 3. Validating Telephone Service and Polarity

Validating Ethernet Service

The toner detects link pulses for 10BASE-T, 100BASE-TX, and 1000BASE-T Ethernet service on pins 1, 2 and 3, 6 of its RJ45 jack.

1. Turn off the toner.
2. Connect the toner to the circuit as shown in Figure 4.
3. Turn the toner's rotary switch to **SERVICE**.
4. The Ethernet LED indicates service on pins 1, 2 or 3, 6 as shown in Figure 4.

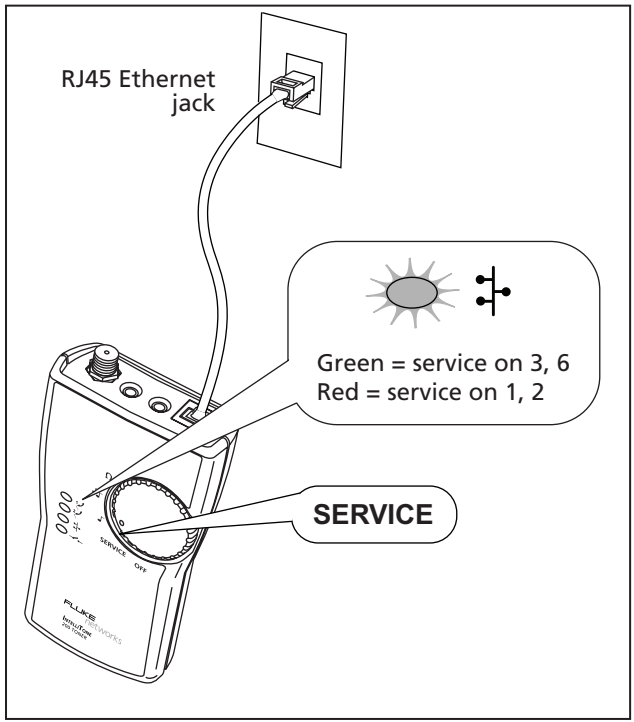

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Figure 4. Validating Ethernet Service

Testing for Continuity

You can use the toner to test circuits and components for continuity.

1. If you are testing a circuit, verify that it is not powered. Use the toner's **SERVICE** function to check voice and Ethernet circuits for power. Use a voltage meter to check other types of circuits for power.
2. Turn off the toner.
3. Connect the toner to the circuit or component as shown in Figure 5.
4. Turn the toner's rotary switch to Ω.
5. The continuity LED indicates an open or closed circuit as shown in Figure 5.

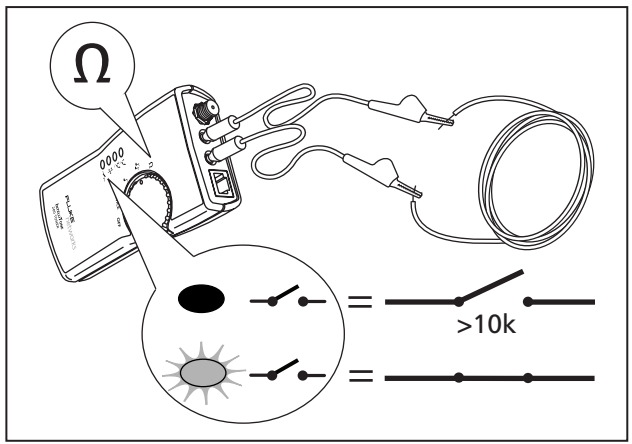

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Figure 5. Continuity Test

Powering a Telephone Test Set

The toner can supply 6 V into a 600 Ω circuit to power a telephone test set when Central Office battery power is not present.

1. Turn off the toner.
2. Connect the toner to the voice circuit as shown in Figure 6.
3. Turn the toner's rotary switch to Ω.
4. Use the telephone test set for talking or other functions.

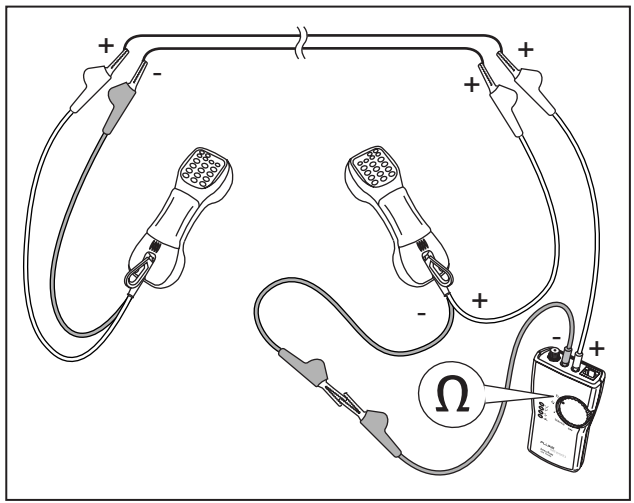

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Figure 6. Powering a Telephone Test Set

Toning/Probing with the 1 kHz Tone Function

The IntelliTone signal from the IT200 toner includes a 1 kHz tone you can trace with a non-IT200 probe.

The position on the IT200 probe lets you use the probe to trace a 1 kHz tone from a non-IT200 toner.

Maintenance

Clean the case with a soft cloth dampened with water or water and a mild soap.

Caution

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

Battery Life and Replacement

The toner and probe batteries last for about 20 hours of typical use.

Figure 7 shows how to replace the battery in the toner and probe.

Note

The position of the probe's rotary switch when the battery is replaced enables or disables shield validation for cable map tests. See "Validating the Cable's Shield" on page 10.

⚠Warning

To avoid possible electric shock or personal injury:

- **Turn off the toner or probe and disconnect all test leads before replacing the battery.**
- **Use only a 9 V battery, properly installed in the case, to power the toner and probe.**

Caution

To avoid unreliable test results, replace the battery as soon as the low battery indication appears. See "Battery Status" on page 5.

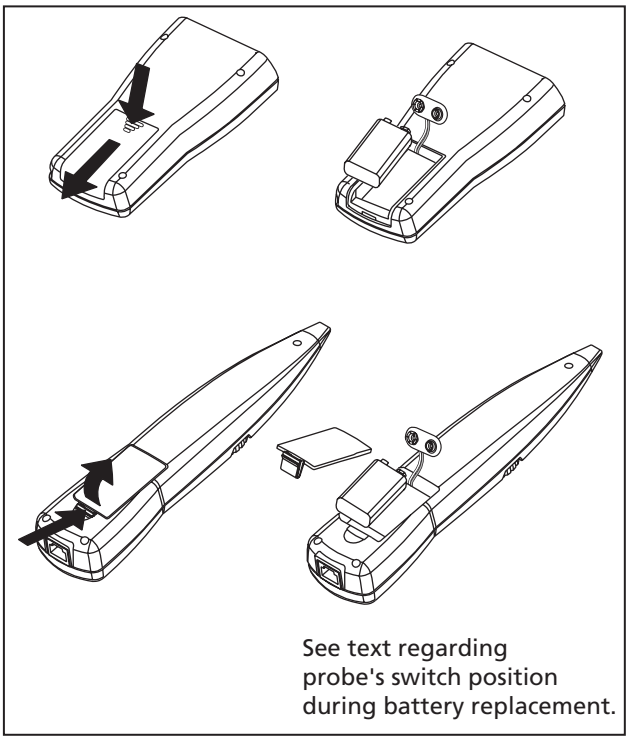

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Figure 7. Replacing the Battery

Accessories

To order accessories (Table 1), contact Fluke Networks.

For the latest list of IT200 accessories and other cable testers visit the Fluke Networks website at **www.flukenetworks.com**.

Table 1. Accessories

Accessory	Fluke Networks Model or Part Number
Test lead set, banana jacks to alligator clips	MT-8203-22
Test lead set, banana jacks to alligator clips with bed of nails	MT-8203-20
Soft carrying case	MT-8202-05

Specifications

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

Environmental and Regulatory Specifications

Operating temperature	32 °F to 104 °F (0 °C to 40 °C)
Storage temperature	-4 °F to +140 °F (-20 °C to +60 °C)
Operating relative humidity (% RH without condensation)	95 % (50 °F to 95 °F; 10 °C to 35 °C) 75 % (95 °F to 104 °F; 35 °C to 40 °C) uncontrolled < 50 °F (< 10 °C)
Vibration	Random, 2 g, 5 Hz-500 Hz
Shock	1 m drop test
Safety	EN 61010-1 1st Edition + Amendments 1, 2
Altitude	3000 m
EMC	EN 61326-1

IT200 Toner Electrical Specifications

Talk battery voltage	6 V into 600 Ω
Output power	5 V p-p
Voltage protection	100 V
Tone frequencies	IntelliTone™ signal: encoded digital signal Legacy tone: 1 kHz
Battery type and life	9 V alkaline (NEDA 1604A or IEC 6LR61); 20 hours typical
Auto power down	Turns off automatically after 4 hours of inactivity

IT200 Probe Electrical Specifications

Tone detection	Detects IntelliTone™ signal from IT100 or IT200 toner and 1 kHz signal from other toners.
Battery type and life	9 V alkaline (NEDA 1604A or IEC 6LR61); 20 hours typical
Auto power down	Turns off automatically after 1 hour of inactivity

Feature Compatibility

IntelliTone Toner/Probe Feature	Product Compatibility	
	IntelliTone Toner and Probe	Works with Legacy Toner or Probe
IntelliTone locate mode	◆	
IntelliTone isolate mode	◆	
Cable map validation	○	
Shield validation	○	
Legacy 1 kHz tone	◆	◆
Visual / audible proximity indicators	◆	◆
○ Requires IntelliTone IP200 probe.		

Certifications and Compliance

CE Conforms to relevant European Union directives.

Dimensions

Toner: 5.54 in x 2.94 in x 1.25 in
(14.1 cm x 7.5 cm x 3.2 cm)

Probe: 8.73 in x 1.88 in x 1.26 in
(22.2 cm x 4.8 cm x 3.2 cm)

Weight (with battery)

Toner: 6.0 oz (170 g)

Probe: 4.7 oz (133 g)