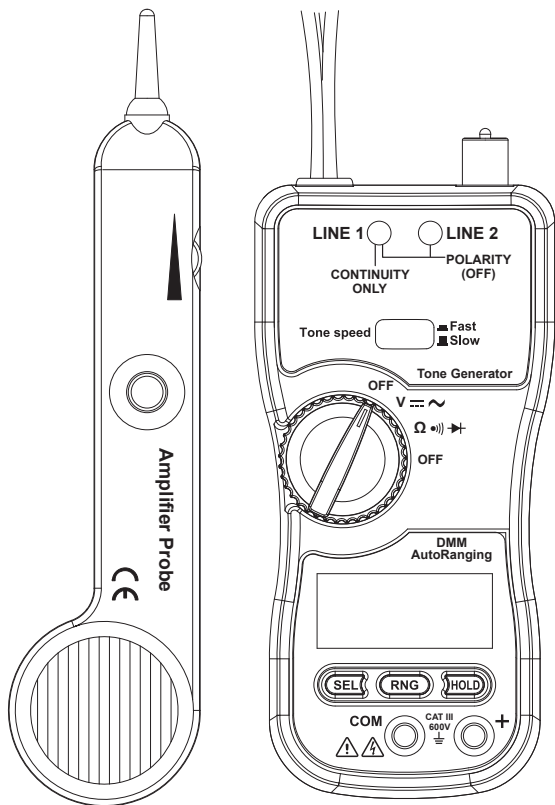


CABLE TRACER & DMM



INSTRUCTION MANUAL

Amplifier Probe

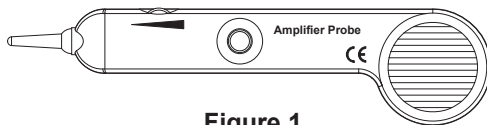


Figure 1

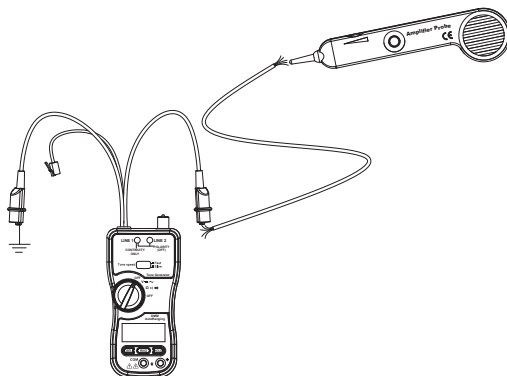


Figure 2

Features

- The Amplifier Probe is designed to identify and trace wires or cables within a group without damaging the insulation.
- Works with any Tone Generator to identify wires.
- Volume control for increased sensitivity and adjustable to suit work environment.
- Recessed ON/OFF button prevents battery drain.
- Power supply is from any 9V battery with a life of approximately 100 hours.
- An audio jack is provided for headset.

Instructions

- Connecting the tone generator.

In terminated working cables:

Connect one test lead to a terminated wire and the other test lead to earth or equipment ground.(See figure 2)

In unterminated or non-working cables:

Connect one test lead to an unterminated wire and the other test lead to another unterminated wire.

- Depress the round on/off spring-loaded button on the amplifier probe. The volume control switch can be adjusted to suit the environment. Volume can be increased to overcome noise, or decreased to reduce interference.
- Touch the tip of the amplifier probe to the insulation of each suspect conductor.
- Reception of tone will be loudest on the subject wire.
- An audio jack is provided for headset.

Maintenance

The amplifier probe is maintenance free except for battery replacement. Remove the screw from the battery compartment, replace the 9V battery and reassemble.

Warranty limited solely to repair or replacement; no warranty of merchantability, fitness for a particular purpose or consequential damages.

Tone Generator / DMM

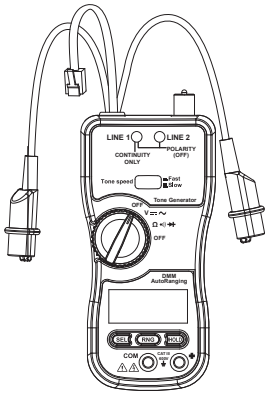


Figure 3

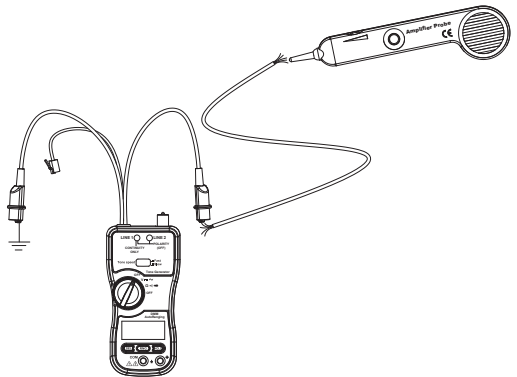


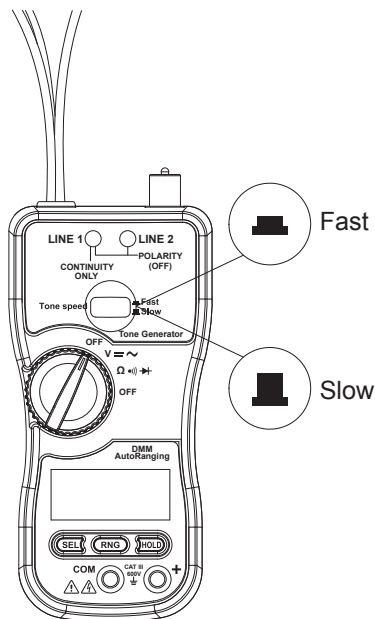
Figure 4

Functions of Tone Generator:

Features

- Red and black test leads with a standard 4 conductor modular cord and plug.
- A 3-position toggle switch controls the modes of operation and two bi-colored LEDs display line polarity for Lines 1 and 2.
- The tone and continuity (cont.) test functions only apply to Line 1.
- A tone selection push button is located on the front panel for choosing either a fast dual alternating tone or a slow dual alternating tone directly.

CAUTION:DO NOT CONNECT TO AN ACTIVE AC CIRCUIT EXCEEDING 24V IN THIS MODE.



Instructions

All of the following tests can be performed by using the red and black test leads or the modular plug.

NOTE:When using the modular test plug, the polarity test function applies to Lines 1 and 2. The continuity and tone functions ONLY apply to Line 1.

- **POLARITY TEST: IDENTIFYING TIP & RING (SWITCH TO "OFF")**
 1. Connect the RED test lead to the side of one line and the BLACK lead to the side of another line.
 2. The LED will glow "GREEN" when you connect the RED test lead to the RING SIDE of the line.
 3. The LED will glow "RED" when you connect the RED test lead to the TIP SIDE of the line.

- **IDENTIFYING LINE CONDITION (SWITCH TO "OFF")**
 1. Connect the RED test lead to the RING SIDE of the line and the BLACK to the TIP.
 2. Watch the LED:
 - 1.1 A BRIGHT "GREEN" LED indicates a CLEAR line.
 - 1.2 A DIM "GREEN" LED indicates a BUSY line.
 - 1.3 A BRIGHTLY FLICKERING "GREEN and RED" LED indicates a RINGING line.

- **VERIFYING LINES (SWITCH TO "OFF" THEN "CONT")**
 1. Dial the line to be verified.
 2. While the line is ringing, connect the RED lead to the RING SIDE of the line and the BLACK to the TIP.
 3. In the "OFF" position, the indicator lamp will flicker "RED and GREEN" when the test leads are connected to the subject pair.
 4. If you switch the test set to "CONT", it will terminate the call on the subject line.

- **SENDING TONE (SWITCH TO "TONE")**

CAUTION: DO NOT CONNECT TO ANY ACTIVE AC CIRCUIT EXCEEDING 24V IN THIS MODE.

1. Connect the test leads to the pair, or attach one lead to ground and one lead to either side of the line. (See figure 4)
2. A fast dual alternating tone, or a slow dual alternating tone can be selected from the tone selection push button.
3. Probe the suspected wires with the amplifier probe. Reception of tone will be strongest on the subject wire. In case of ready access to bare conductors, a handset or headphone may be used to receive the tone.

- **TESTING CONTINUITY (SWITCH TO "CONT")**

CAUTION:DO NOT CONNECT TO ANY ACTIVE AC OR DC CIRCUIT IN THIS MODE.

1. Connect the test leads to the subject pair.
2. Use "cont" position.
3. A bright "GREEN" light indicates continuity. The LED will not glow if the line resistance exceeds 12k Ω

- **TESTING CONTINUITY USING TONE (SWITCH TO "TONE")**

CAUTION:DO NOT CONNECT TO ANY ACTIVE AC OR DC CIRCUIT IN THIS MODE.

1. Connect the test leads to the subject pair.
2. Use a handset or headset at the remote end and touch the wire end(s) with the clip lead(s).
3. Reception of tone is an indication of continuity.

- **MODULAR TESTING**

1. All above tests are available through the modular plug for line 1 only - red and green wires.

- **COAX TESTING**

1. To test unterminated coax, connect red to outer shield and black to center conductor or red to outer shield and black to ground.
2. To test terminated coax, connect red to connector housing and black to center pin or red to connector housing and black to ground.

FUNCTIONS OF DMM:

Features

- 4000 counts LCD.
- Full automatic measurement.
Voltage measurement.
Resistor measurement.
- Range change function.
- Select function.
- Data Hold function.
- Continuity check.
- Diode measurement.
- Low battery indication.
- Input impedance: 10MΩ.

Specification

AC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	$\pm(1\%rdg+5dgt)$
4V	1mV	$\pm(1\%rdg+5dgt)$
40V	10mV	$\pm(1\%rdg+5dgt)$
400V	100mV	$\pm(1\%rdg+5dgt)$
750V	1V	$\pm(1\%rdg+5dgt)$

Input impedance: 10MΩ

DC Voltage

Range	Resolution	Accuracy
400mV	0.1mV	$\pm(0.5\%rdg+3dgt)$
4V	1mV	$\pm(0.5\%rdg+3dgt)$
40V	10mV	$\pm(0.5\%rdg+3dgt)$
400V	100mV	$\pm(0.5\%rdg+3dgt)$
1000V	1V	$\pm(0.5\%rdg+3dgt)$

Input impedance: 10MΩ

Resistance

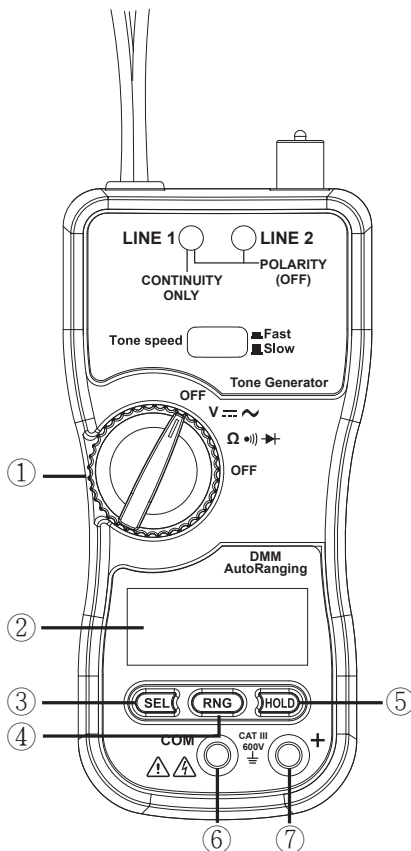
Range	Resolution	Accuracy
400 Ω	0.1 Ω	$\pm(1.2\%rdg+3dgt)$
4k Ω	1 Ω	$\pm(1.2\%rdg+3dgt)$
40k Ω	10 Ω	$\pm(1.2\%rdg+3dgt)$
400k Ω	100 Ω	$\pm(1.2\%rdg+3dgt)$
4M Ω	1k Ω	$\pm(1.2\%rdg+3dgt)$
40M Ω	10k Ω	$\pm(2.0\%rdg+4dgt)$

Overload Protection 500V DC

Continuity Test:

Range	Audible threshold
400 Ω	Less than 25 Ω

Instrument Layout



① Function rotary switch

② LCD

③ Select Button

④ Range Button

⑤ Hold Button

⑥ COM Terminal

⑦ "+" Terminal

Button functions

(1) Function rotary switch

The rotary switch selects the function.

(2) LCD

3999-count LCD with LOW BATTERY indication.

(3) Select Button

For AC/DC function selection.

In the resistance + continuity + diode function, press the Select button to select resistance, continuity or diode function.

(4) Range Button

Press the Range button to select the manual range mode. In manual range mode, each time press Range button (less than one second), the range increments and new value is displayed. To exit the manual range mode and return to auto mode, press the RANGE button (More than one second).

(5) HOLD Button

Press the HOLD button (HOLD annunciator turns on) makes the meter stop updating the LCD display. This mode can be nested in most of the special modes. Enabling HOLD function in automatic mode makes the meter switch to manual mode, but the full scale range remains the same. Hold function can be cancelled by changing the measurement mode, pressing range, or push HOLD again.

(6) COM Terminal

This is the ground input terminal. Use the BLACK test lead to connect.

(7) "+" Terminal

This is positive input terminal for voltage / ohm measurement. Use the RED test lead to connect.

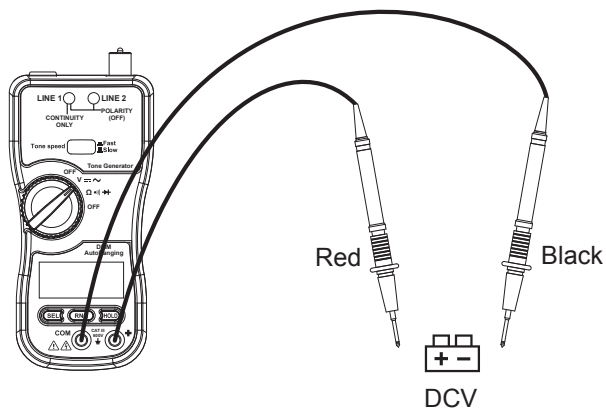
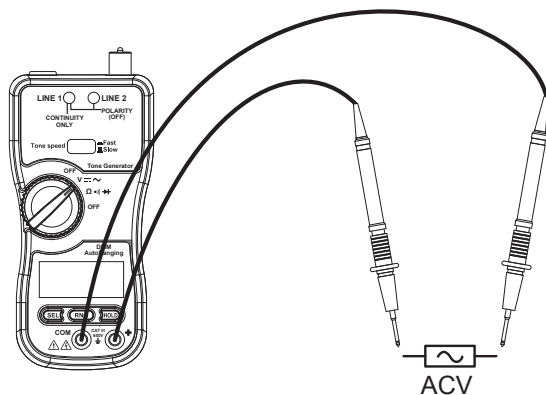
Measurement

(1) Voltage measurement

Insert the BLACK test lead to COM and the RED test lead to the "+" terminal.

Switch to V \square \sim function for ACV or DCV selection.

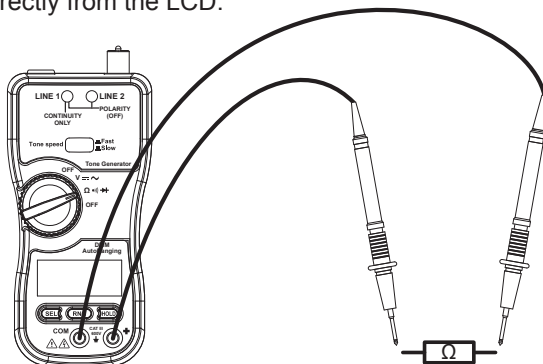
Get the reading directly from the LCD.



(2) Resistance Measurement

Switch to OHM range and make sure there is no power in the circuit being measured. Insert the BLACK test lead to the COM and the RED test lead to the "+" terminal.

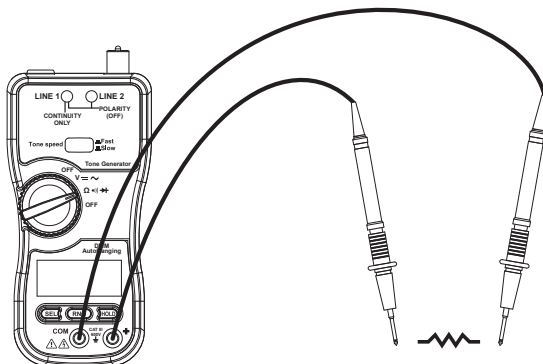
Connect the test leads to the circuit or device under test and get the reading directly from the LCD.



(3) Continuity Check

Continuity check shares the same configuration with 400.0Ω manual resistance measurement mode, but with buzzer output to indicate continuity. The buzzer generates a 2kHz sound whenever the digit number less than 25Ω.

Because the cycle time of measurement is only 50ms, the least significant digit will not display.

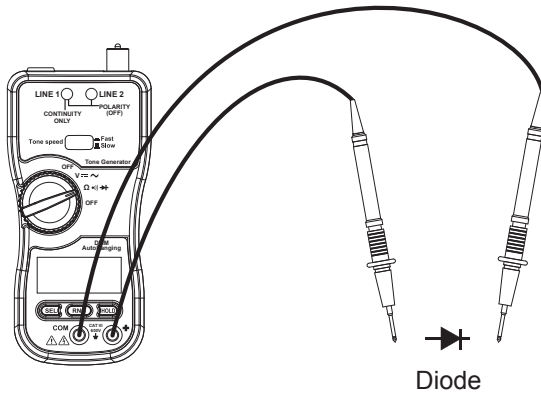


(4) Diode Measurement

Diode measurement mode shares the same configuration with 4000V manual voltage measurement mode.

If the test circuit is open or the voltage drop between the two ports of the device (diode) under test are larger than 2V, the LCD will show "OL".

The buzzer generates a 2kHz sound whenever the digit number is less than 0.25V. Because the cycle time of measurement is only 50ms, the least significant digit will not display.



Maintenance

(1) Battery replacement

Amplifier Probe : Adjust the volume control to at least 4 or 5 on the Amplifier Probe, hold down the push button, and place the tip of the probe near a live conductor (i.e., a 110V power cord). If no sound is generated, replace a 9V battery inside the Amplifier Probe.

Tone Generator : Select the "Tone" switch on the Tone Generator. Adjust the volume control to at least 4 or 5, hold down the push button, and place the tip of the probe to the cables attached to the Tone Generator. If no tone is generated, replace a 9V battery for the Tone Generator.

Multimeter : Replace two AAA batteries with the "B" symbol appears at the upper left hand corner of the LCD.

(2) Cleaning and Storage:

WARNING

To avoid electrical shock or damage to the meter, do not get water inside the case.

Periodically wipe the case with a damp cloth and detergent.

Do not use abrasives or solvents.

If the meter is not used for over 60 days, remove the battery for storage.

