FLUKE
networks®

TS®19
Portable Test Telephone

Users Guide

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 for the mainframe is 18 months and begins on the date of purchase. Parts, accessories, product repairs and services are warranted for 90 days, unless otherwise stated. Ni-Cad, Ni-MH and Li-Ion batteries, cables or other peripherals are all considered parts or accessories. The warranty extends only to the original buyer or end user customer of a Fluke Networks authorized reseller, and does not apply to any product which, in Fluke Networks' opinion, has been misused, abused, 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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4/04-18

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TS®19 Portable Test Telephone

Contents

Introduction

The TS19 Portable Test Telephone, often called a "butt-in," is a self-contained, line-powered, portable handset used by installers, repair technicians, and other authorized personnel for line testing and temporary communications.

The TS19 Portable Test Telephone provides both DTMF (Touch Tone) and dial pulse output. The TS19 also provides last number redial, dual monitor impedance, an electronic ringer (on/off), and field replaceable line cords and belt clips.

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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- Brazil: 11 3759 7600
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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

Visit our website for a complete list of phone numbers.

Safety Information

The following IEC symbols are used either on the test set or in the manual:

⚠	Warning: Risk of personal injury. See the manual for details. Caution: Risk of damage or destruction to equipment or software. See the manual for details.
⚡	Warning: Risk of electric shock.
⏚	Earth ground
CE	Conformité Européenne. onforms to relevant European Union directives.
CSA	CAN/CSA-C22.2 No. 60950-1-03 CAN/CSA-C22.2 No. 1010.1-92 + CSA-C22.2 No. 1010.1B-97, UL/ANSI 3111-1
⌧	Do not put products containing circuit boards into the garbage. Dispose of circuits boards in accordance with local regulations.

⚠ ⚠ Warning

Good safety practices prohibit the connection of the TS19 and similar test sets to 117 volts AC commercial electrical power; should the TS19 be connected to commercial power, all warranties are voided.

The TS19 Portable Test Telephone is not designed to meet the outside plant requirements of Bellcore Publication TR-TSY-000344. It is recommended that this product not be used outside during adverse and/or wet weather conditions.

Do not use the test set if it is damaged. Before you use the test set, inspect the case. Look for cracks or missing plastic. Pay particular attention to the insulation surrounding the connectors.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired.

Physical Characteristics

See Figure 1.
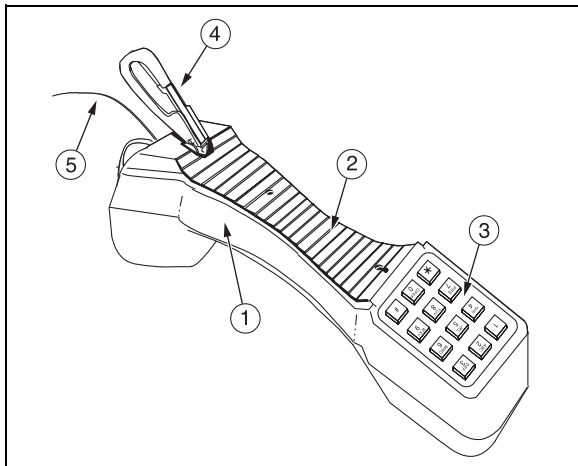
Figure 1. Physical Characteristics

① The case is designed to give rugged service and withstand the rough handling and shocks normally associated with craft tools.

② The back of the handgrip is contoured and has a non-slip surface, freeing both hands while the Portable Test Telephone rests on the shoulder.

③ The keypad has 12 keys on a black plastic bezel that is recessed into the receiver end of the housing. The recessed bezel protects the keypad and prevents accidental key presses.

④ The spring-loaded belt clip ensures a secure connection to a belt loop or D-ring. The belt clip may be replaced in the field (see Belt Clip Replacement).

⑤ The Portable Test Telephone is equipped with one of two cord configurations. The line cords may be replaced in the field.

Handgrip Controls

See Figure 2.
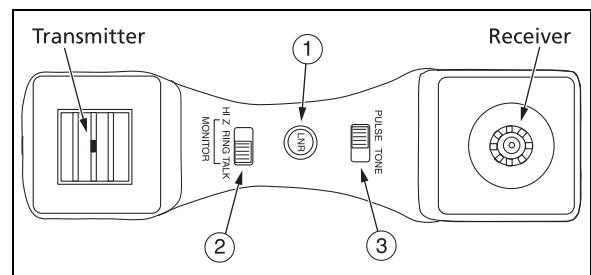
Figure 2. Handgrip Controls

① **Last Number Redial Button:** The **LNR** button serves as a last number dialed key. The number may be redialed in either pulse or tone mode as selected by the **PULSE/TONE** switch. The last number dialed may be up to 18 digits long.

Note

The redial memory has a 15-minute time limit after the TS19 has been disconnected from a working telephone line. After 15 minutes, the number will be lost from memory.

② **HI Z/RING/TALK Switch:** This three-position slide switch is labeled as **HI Z** for high impedance monitoring, **RING** for ringer and low impedance monitoring, and **TALK** for talk.

- In the **HI Z** position, the TS19 is on hook with a high impedance coupling to the telephone line. This allows for telephone line monitoring without disrupting conversations, data or signaling.

- In the **RING** position, the TS19 is on hook with an electronic ringer connected to the telephone line. The TS19 is low impedance coupled to the line for monitoring of optional line identification tones. Also, the TS19 provides enhanced receive levels.

- In the **TALK** position, the TS19 is off hook and may be used for dialing and talking. In this mode, the TS19 performs as an ordinary telephone.

③ **PULSE/TONE switch:** This two-position slide switch labeled **PULSE/TONE**, is located on the inside of the handgrip just below the receiver. The switch selects the signaling output. **TONE** for DTMF of **PULSE** for dial pulse.

Keypad Controls and Indicators

See Figure 3.

Keys: The 12 standard keys will send either DTMF tones or dial pulses, depending on the **PULSE/TONE** switch setting.

Polarity LED: This red LED is located just below the keypad. The LED indicates polarity (see "Polarity Check"). The red LED lights if the red test lead is connected to the Tip (positive) side and the black test lead is connected to the Ring (negative) side.
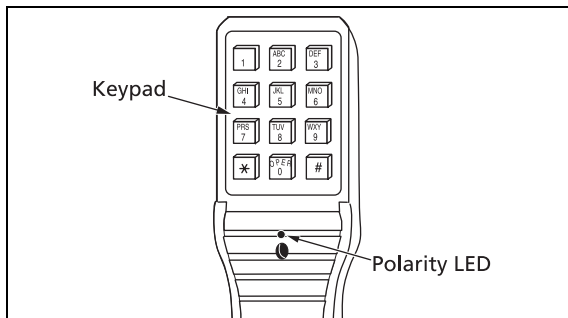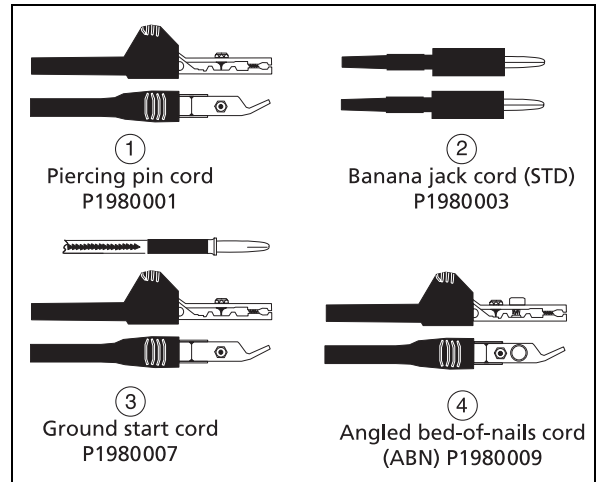

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Figure 3. Keypad

Cords

See Figure 4.

The TS19 comes with either a standard cord or an angled bed-of nails cord (see ② and ④ below). The line cord can be replaced in the field (see "Line Cord Replacement").

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Figure 4. Line Cords

Various cord types may be ordered for field replacement:

① **Piercing Pin Cord:** This cord is equipped with a modular plug on one end, and has two five and one half foot long fabric covered leads, one red and one black. Each conductor is fitted with an alligator clip offset 20 degrees to minimize clip shorting. The clips have insulation piercing spikes and a neoprene boot. Cord Number: P1980001.

② **Banana Jack Cord (STD):** This is the standard cord. This cord is equipped with a modular plug at one end and two banana jacks at the other with alligator clip adapters. Cord Number: P1980003.

③ **Ground Start Cord:** This cord consists of two conductors with alligator clips. In addition, the red (ring) conductor has a banana jack attached. This jack is located six inches below the Portable Test Telephone and is partially covered by the outer fabric of the cord. A separate cord is also included. This cord is 36 inches long with a banana plug on one end and an alligator clip on the other. Cord Number: P1980007.

④ **Angled Bed-of-Nails Cord (ABN):** This cord is similar to the standard cord (STD), except that each alligator clip is equipped with a "bed-of-nails" and an insulation piercing spike. Cord Number: P1980009.

Operation

⚠ ⚠ Warning

When connecting to metallic network wires, always handle alligator clips by the insulated boots.

Monitoring: Move the **HI Z/RING/TALK** switch to **HI Z** and connect the line leads to the telephone line under test. Monitoring may now be done without disrupting traffic.

Polarity Check: Move the **HI Z/RING/TALK** switch to **TALK**. Connect the line leads to the telephone line under test. The red LED lights if the red test lead is connected to the Tip (positive) side and the black test lead is connected to the Ring (negative) side.

Dialing:

1   Move the **PULSE/TONE** Switch to **PULSE** or **TONE**, depending on the type of dial signaling required. Move the **HI Z/RING/TALK** switch to **HI Z**. Connect the line cord clips to the telephone line. Listen to verify that the telephone line is idle.

2   Move the **HI Z/RING/TALK** switch to **TALK** and verify that dial tone is received (when finished). Enter the desired number to be called on the keypad. If tone signaling is selected, the tones for each digit are generated as each key is pressed. If rotary dial pulse signaling is selected, the desired number may be entered at any rate on the keypad; digits will automatically be pulsed out at the correct rate. To end the call, move the **HI Z/RING/TALK** switch to the **HI Z** position.

Last Number Redial: The last number dialed can be automatically redialed with the **PULSE/TONE** switch set to **PULSE** or **TONE**. Use the following procedure for a number up to 18 digits long:

1   Go on hook (move the **HI Z/RING/TALK** switch to the **HI Z** position) for at least ½ second.

2   Move the **HI Z/RING/TALK** switch back to the **TALK** position.

3   Press the **LNR** button and the number will be automatically redialed.

Note

The redial memory has a 15 minute time limit after the Portable Test Telephone has been disconnected from a working telephone line. After 15 minutes, the number will be lost from memory.

Electronic Ringer (On/OFF): Move the **HI Z/RING/TALK** switch to **RING** and connect line leads to the telephone line. The piezo-electric transducer electronic ringer will "ring" whenever it detects ringing voltage on the line. Answer the call by moving the **HI Z/RING/TALK** switch to **TALK**. To disable the ringer, move the **HI Z/RING/TALK** switch to **HI Z**.

Troubleshooting

The following troubleshooting procedures are based largely on the audible *click* heard in the receiver of the TS19 when the two Portable Test Telephone leads are placed on battery potential and ground respectively, or across the terminal of an electrically charged capacitor. These *clicks* and other sounds can help you locate open circuits, shorts, crosses, and grounds.

To locate a short circuit: Open one side of the telephone line and place the test set in the loop — one lead to each side of the opened line. On the CO side of the fault, a loud *click* will be heard. On the field side of the fault, **no** *click* will be heard.

To locate an open circuit: Bridge the test set across the circuit line — one test lead on tip, the other on ring. Moving away from the CO, the fault is at the point where the loud *click* disappears.

To verify continuity: Place one of the line leads on a local ground and the other on the conductor in question. On a good Ring conductor, a *click* will be heard. On a good Tip conductor, an inductive *hum* will be heard (due to the difference in ground potential between the CO ground and the local ground).

⚠ Warning

When testing circuits close to the battery source, the clicks may be loud enough to hurt your ear if the receiver is held too tightly against the ear. The TS19 is designed to rest comfortably on the shoulder with the receiver away from the ear. It should be used in this position when listening for clicks.

Maintenance

⚠ ⚠ Warning

Disconnect clips from any metallic connections before performing any maintenance. Read all instructions completely and understand possible hazards to end user if not performed by authorized service personnel.

⚠ Caution

Do not use CRC Cable Clean® or any similar chlorinated solvent on the TS19. Doing so will damage the TS19 Test Telephone.

Belt Clip Replacement

The ordering number for the replacement belt clip is P3218249. To replace the belt clip assembly:

1 Place the TS19 on a firm and level working surface with the keypad up.
2 Remove the two screws which secure the belt clip to the TS19's plastic grip (one screw also secures the strain relief cord). Remove and discard the old belt clip.
3 Position the new belt clip so that its screw mounting holes line up with the mounting holes in the TS19. Insert the screws and tighten. Make sure the strain relief for the cord is properly reinstalled.

Line Cord Replacement

To replace the line cord:

⚠ ⚠ Warning

Disconnect from telephone network when replacing line cord.

1 Place the TS19 on a firm and level working surface with the keypad up.
2 Remove the screw and the strain relief cord.
3 Depress the plastic tang on the modular plug of the line cord where it enters the TS19's modular jack and gently pull the plug and cord free from the jack. Discard the cord.
4 Insert the modular plug of the replacement cord into the TS19's modular jack and listen for a click. The click indicates that the plug has "locked" into position with its tang properly engaged to prevent accidental removal.
5 Reinstall the screw for the strain relief cord.

Specifications

Electrical	
Loop Limit	2.4 kΩ maximum at 48 VDC (nominal 15 mA minimum loop current)
DC Resistance (Talk Mode)	150 Ω typical at 80 mA current
AC Impedance (Monitor Mode)	Low impedance (Ring position) 600 Ω at 1 KHz typical High impedance (HI Z position) 100 kΩ minimum at 1 KHz
Rotary Dial Output	
Pulsing Rate	10 pps +0.5 pps
Percent Break	60 % ± 2 %
Interdigit Interval	800 ms typical
Leakage During Break	> 50 kΩ
DTMF Output	
Tone Frequency Error	±1 % maximum
Level per Tone Pair	+2 dBm maximum, -8 dBm minimum
High versus Low Tone Difference	4 dB maximum
Physical	
Length	8.75 in (22.2 cm)
Width	2.375 in (6.03 cm)
Height	3.375 in (8.57 cm)
Weight	10.8 oz (.307 kg) maximum
Environmental	
Temperature	Operating: -5 °C to +40 °C Storage: -40 °C to +66 °C
Drop	1 m, 4 times
Altitude	To 3,000 m (10,000 ft) maximum
Relative Humidity	10 % to 80 % (non-condensing)
Regulatory Standards Used	
47 CFR Part 15, Subpart B	
ICES-003 Issue 3	
AS/NZS 3548	
EMC Directive 89/336/EEC, EN 55022:98, EN 61326:97, A1:98 Annex C, EN 61000-4-2, EN 61000-4-3	
LV Directive 73/23/EEC, EN 610010.1 (1993)	
Certifications and Compliance	
CE Conformité Européenne. Conforms to relevant European Union directives.	
CSA ® CAN/CSA-C22.2 No. 60950-1-03 C US CAN/CSA-C22.2 No. 1010.1-92 + CSA-C22.2 No. 1010.1B-97, UL/ANSI 3111-1	
Specifications subject to change without notice.	