



# TS<sup>®</sup> 120

## Test Telephone

### Users Guide

PN 2448072

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# TS<sup>®</sup>120 Test Telephone

## Overview of Features

The TS120 Test Telephone is a portable handset used by installers, repair technicians and other authorized personnel for testing of telephone lines and for temporary communications. The TS120 is powered by the telephone line. It does not require any batteries.

The following is a list of the TS120 features:

- Talk and Monitor modes
- Tone and Pulse dial signaling
- Transmitter mute
- Last Number Redial in Tone and Pulse Modes
- Automatic regulation of transmit and receive levels
- Hearing aid compatible receiver
- Calibrated Interruption of Line Current (Flash)
- Line polarity indicators
- Fully functional with either line polarity
- High impedance Monitor mode
- Electronic ringer
- Overvoltage protection
- Impact resistant and rain resistant
- Field replaceable line cord
- Field replaceable belt clip
- Ergonomic design

## 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](http://www.flukenetworks.com/registration).

## Contacting Fluke Networks



[www.flukenetworks.com](http://www.flukenetworks.com)



[support@flukenetworks.com](mailto:support@flukenetworks.com)









+1-425-446-4519

- Australia: 61 (2) 8850-3333 or 61 3 9329 0244
- Beijing: 86 (10) 6512-3435
- Brazil: 11 3759 7600
- Canada: 1-800-363-5853
- Europe: +31-(0) 40 2675 600
- Hong Kong: 852 2721-3228
- Japan: 03-6714-3117
- Korea: 82 2 539-6311
- Singapore: 65-6799-5566
- Taiwan: (886) 2-227-83199
- USA: 1-800-283-5853
- Anywhere in the world: +1-425-446-4519

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
	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
	Conformité Européenne. Conforms to relevant European Union directives.
	Do not put products containing circuit boards into the garbage. Dispose of circuits boards in accordance with local regulations.

### **Warning**

**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.

The TS120 housing is made of high-impact plastic. The unit is designed to provide rugged service and withstand the rough handling and shocks normally associated with field use. The TS120 housing is designed to permit operation of the Test Telephone in bad weather, such as in rain and dust storms.

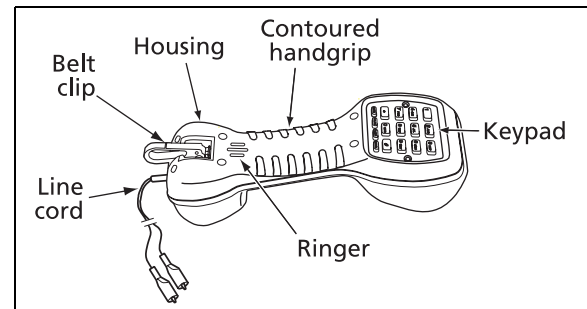
The back of the handgrip has a contoured surface. The contoured surface makes it easy for the user to grip the test telephone between jaw and shoulder, leaving both hands free to perform other tasks.

The keypad has 16 keys that are recessed into the receiver end of the housing. The recessed area provides physical protection to the keypad and reduces accidental pressing of the keys.

The belt clip is located on the transmitter end of the housing and is equipped with a spring-loaded clip that ensures a secure connection to belt loops and D-rings.

The line cord is attached through a rubber strain relief at the transmitter end of the unit. See "Line Cord".

The electronic ringer is located near the belt clip on the contoured hand grip.



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Figure 1. Physical Characteristics

## Mode Controls

See Figure 2.

The **TALK/MONITOR** switch is on the inside of the hand grip near the transmitter. It puts the unit on-hook (Monitor mode) or off-hook (Talk mode).

The **TONE/PULSE** switch is on the inside of the hand grip near the receiver. This switch selects the dialing mode.

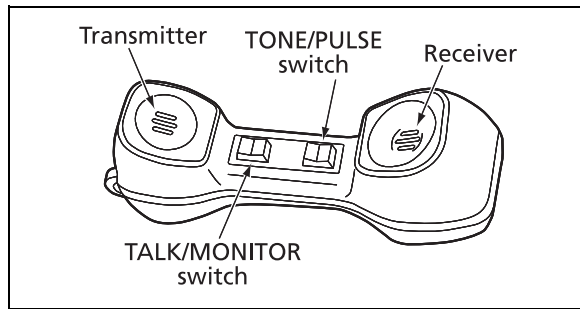


Figure 2. Controls and Indicators

## Keypad

See Figure 3.

The TS120 Test Telephone keypad includes 12 standard dialing keys and 4 special purpose keys. All keys on the keypad are functional when the unit is in the Talk mode. They are not functional when the unit is in the Monitor mode.

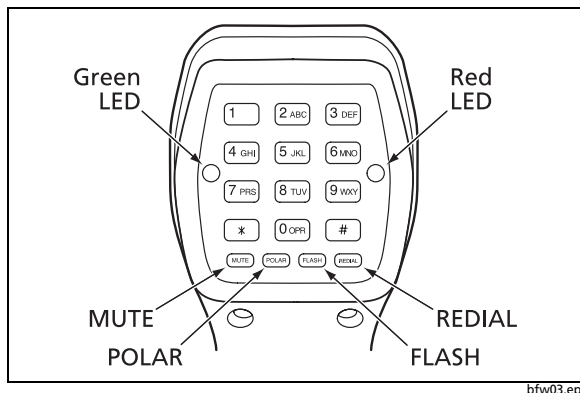


Figure 3. Keypad

**MUTE:** Pressing the **MUTE** key shuts off the TS120 transmitter for as long as the key remains depressed.

**POLAR:** When an off-hook unit is connected to a powered telephone line, pressing the **POLAR** key causes one of the LEDs to turn on. The LEDs indicate the polarity of direct current on the telephone line.

**FLASH:** Pressing this key will cause a timed interruption of the loop current. Some PBX setups or telephone office switches may use this signal to put a call on hold or to activate some special function.

**REDIAL:** This key allows the user to redial the last number dialed.

## Dialing Keys

See Figure 3.

When the **TONE/PULSE** switch is in the **TONE** position, each of the 12 dialing keys, when pressed, generate

dialing tones. This includes the asterisk (\*), and the pound (#) keys. When the **TONE/PULSE** switch is in the **PULSE** position, only the numeric keys (1, 2, 3, 4, 5, 6, 7, 8, 9, 0) will cause pulses to be generated when pressed. In Pulse mode, the asterisk and pound keys are not functional. In Pulse mode the asterisk and pound keys will not be stored in the redial memory.

The special purpose keys are labeled **MUTE**, **POLAR**, **FLASH**, and **REDIAL**.

## Light Emitting Diodes (LEDs)

See Figure 3.

The LEDs are on each side of the keypad. One or the other of the LEDs will light only when the test set is in the Talk mode, connected to a powered telephone line, and the **POLAR** key is pressed. The LEDs indicate the polarity of current on the transmission line. See "Polarity Check".

## Line Cord

See Figure 4.

The TS120 comes with a line cord for connecting the test telephone to telephone lines. This line cord consists of one red and one black insulated conductor, each approximately 1.5 meters long. Each conductor is fitted with an alligator clip. Each clip is covered with a neoprene boot to prevent the clips from causing electrical shorts.

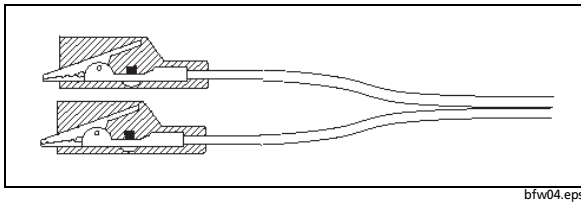


Figure 4. Line Cord

## Operation

### Warning

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

## Line Monitoring

Move the **TALK/MONITOR** switch to **MONITOR** and connect the red and black test leads to the telephone line wire pair under test. If there is any audio on the line under test, it can now be heard in the unit's receiver. Because the TS120 presents a high impedance to the line when in Monitor mode, it will not disturb existing signals on the line under test. Monitor mode is typically used by service personnel to verify that there is no call in progress on the wire pair before going off-hook.

## Dialing

### Note

*If tone dialing is selected, the tones associated with each digit will be generated as its respective key is pressed. If pulse signaling has been selected, the desired number may be entered at any rate on the keypad. The digits will automatically be pulsed out at the correct rate.*

Move the **TALK/MONITOR** switch to the **MONITOR** position and connect the red and black test leads to the wire pair under test. Move the **TONE/PULSE** switch to select the desired dialing mode. Move the **TALK/MONITOR** switch to **TALK**, and verify that dial tone is received. Enter the number to be called on the keypad. To end the call, either during or after dialing, move the **TALK/MONITOR** switch to the **MONITOR** position.

## Mixed Mode Dialing

On some telephone lines, calls can only be set up by pulse dialing. Once the call is established in Pulse mode, then the **TONE/PULSE** switch can be moved to the

**TONE** position. Tones can now be sent over the telephone lines by pressing dialing keys. This is useful when there is a need to send dialing tones as data to activate some function in a device connected to the other end of the telephone line. For example, dialing tones can be used to command an answering machine to play back recorded messages.

## Last Number Redial

If a call is not successful and you wish to redial that number, do the following: Put the TS120 Test Telephone into Monitor mode, then put the unit back into Talk mode, and press the **REDIAL** key. The last number dialed will be automatically redialed. The number in the redial memory is saved for about 8 minutes when the unit is in Monitor mode. The last number redial function is available in either the Pulse or Tone mode. The redial memory has a 23-digit capacity.



## Polarity Check

Connect the TS120 Test Telephone to a powered wire pair. Move the **TALK/MONITOR** switch to **TALK** and press the **POLAR** key. The green LED will light if the red

test lead is connected to a more negative voltage than the black test lead. The red LED will light if the red test lead is connected to a more positive voltage than the black lead.

## Transmitter Mute

When using the TS120 Test Telephone in a noisy environment, such as near a street with a lot of automobile traffic, the ambient noise will enter the TS120 Test Telephone's transmitter and a portion of the noise will be sent to the receiver (side tone effect). This noise may be loud enough in the receiver to make it difficult to hear the person on the other end of the telephone line. Press and hold the **MUTE** key to shut off the transmitter, thus eliminating the ambient noise and making it easier to hear the person at the other end of the telephone line.

## Receiving Calls

To receive an incoming call, put the **TALK/MONITOR** switch in the **MONITOR** position. Incoming call signals on the telephone line will cause the TS120 Test Telephone to produce a ringing sound. To answer the incoming call, move the **TALK/MONITOR** switch to the **TALK** position.

## Maintenance

### Warning

To avoid electric shock, disconnect the alligator clips from any circuit before performing maintenance. Read all instructions carefully. Be aware of the dangers that exist when maintenance is not performed by an authorized service technician.

### Caution

Do not use CRC Cable Clean® or any similar chlorinated solvent on the TS120 Test Telephone. Doing so will damage the test telephone.

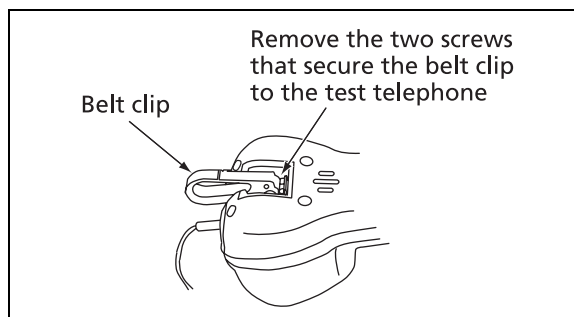
## Belt Clip Replacement

See Figure 5.

The TS120's belt clip can be replaced by the user if it becomes damaged or wears out. To obtain a replacement belt clip, contact your local Fluke Networks distributor and order part number P3218249.

To replace the belt clip assembly:

- 1 Using a Phillips screwdriver, remove the two screws that secure the belt clip to the test telephone housing.
- 2 Remove the old belt clip and replace with a new one.
- 3 Secure the belt clip assembly to the test telephone housing with the original screws. Be careful not to over tighten the screws.



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Figure 5. Replacing the Belt Clip

## Line Cord Replacement

The line cord can be replaced by the user. To replace the line cord refer to the instructions that come with the replacement line cord. To obtain a replacement line cord contact your local distributor or Fluke Networks and order part number P3218636.

## Specifications

Electrical	
Return Loss	>14 dB (ref 600 Ω)
Line Current Range	15 mA to 120 mA
Resistance to Continuous Current (Talk Mode)	275 Ω typical at 20 mA
Monitor Mode Impedance	>120,000 kΩ 300 Hz to 3400 Hz
Pulse Dial Output	
Pulsing Rate	10 pps ±1 pps
Open/Close Ratio	67/33
Inter-digit Interval	800 ms +20 %, -10 %
Resistance During Pulse Open	> 200,000 Ω
Protection Against Alternating Current Overvoltage	The TS120 survives up to 250 Vrms across its test leads.
Peak Acoustic Output of the Receiver	<110 dBspl in Talk mode
DTMF Output	
Tone Frequencies	
Tone Frequency Error	per ITU-T Q.23 ±1.5 % Maximum
Tone Level	
High Group	-6 dBm ±2 dB (into 600 Ω)
Low Group	-8 dBm ±2 dB (into 600 Ω)
High vs Low Tone Difference	2 dB ±1 dB
Last Number Redial (Tone/Pulse)	
Memory Capacity	23 digits
Memory Retention	8-minutes nominal
Ringer Loudness	> 70 dBA at a distance of 1 meter

Ringer Equivalent (REN)	0.14
Flash Duration	300 ms ±30 ms
Physical	
Measurements	10.25 in x 2.88 in x 3.38 in (26.0 cm x 7.3 cm x 8.6 cm)
Weight	0.5 kg (17.6 ounces) typical
Temperature	
Operating	-4 °F to +140 °F (-20 °C to +60 °C)
Storage	-4 °F to +151 °F (-40 °C to +66 °C)
Altitude	To 3,000 m (10,000 ft) maximum
Relative Humidity	5 % to 95 % (non-condensing)
Safety	
Telecom Electrical Safety Classification	TNV-3
IP54	
Certifications and Compliance	
	Conformité Européenne. Conforms to relevant European Union directives.
	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
<i>Notes</i>	
<i>Specifications subject to change without notice.</i>	
<i>Legal requirements may exist regarding permission to connect equipment to a Telecom network operated by a public network operator.</i>	