BLACK BOX
NETWORK SERVICES

TLA1000

Telephone Line Analyzer

A rugged field tester with innovative feature sets.

Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500) • FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746 • Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018 • Web site: www.blackbox.com • E-mail: info@blackbox.com

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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this 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 necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

Normas Oficiales Mexicanas (NOM)
Electrical Safety Statement
INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.

2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.

3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.

4. Todas las instrucciones de operación y uso deben ser seguidas.

5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.

6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.

7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.

8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.

9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.

10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.

11. El aparato eléctrico deberá ser connectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra fisica y la polarización del equipo no sea eliminada.

13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.

14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.

15. En caso de existir, una antena externa deberá ser localizada lejos de las lineas de energia.

16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.

17. Cuidado debe ser tomado de tal manera que objectos liquidos no sean derramados sobre la cubierta u orificios de ventilación.

18. Servicio por personal calificado deberá ser provisto cuando:

    A: El cable de poder o el contacto ha sido dañado; u

    B: Objectos han caído o líquido ha sido derramado dentro del aparato; o

    C: El aparato ha sido expuesto a la lluvia; o

    D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o

    E: El aparato ha sido tirado o su cubierta ha sido dañada.

Safety Information

To ensure safe operation of the Telephone Line Analyzer, follow the instructions carefully and observe the warning messages listed below. Failure to observe warnings can result in severe injury or death and can cause damage to the tester.

NOTIFICATION

WARNING: xxV TOO HIGH, DISCONNECT NOW!

DEFINITION

High-voltage detection appears when the voltage on the cable is unsafe and exceeds 65 volts peak AC or DC.

Table of Contents

1. Specifications

Apparent Line Resistance — 275 Ohms at 20 mA

Battery Low Level — Approximately 4 volts

Compliance — CE

Environment— IP54 dust and water resistant;
Passed drop test at 20 ft.

Flash Duration — 600 ± 50 ms

Interface — Attached cord set

Input Protection — Up to 270 volts peak AC or DC

Languages — English, Spanish, and French

Line Current Range — 10 to 110 mA

Memory — (8) programmable locations: 32 digits with 16 character tag, stored in non-volatile memory; last number redial plus list of last 10 numbers dialed or received

Pause Duration — Tone: 3 seconds;
Pulse: 3.4 seconds

Pulse Dialing — Pulse rate: 10 pps ±10%;
Make/break ratio: 60% to 40% ±2% USA;
Interdigit interval: 820 ms;
Resistance during break: 120 Kohms minimum

Return Loss — Minimum 14 dB at 600 Ohms

Ringer Equivalence— In BELL mode: 0.0 (no ringer load)

Tone Dialing — DTMF output (into 600 Ohms);
Tone frequency error: ±1.5%;
Tone Level: High group: -6 ± 2 dBm;
Low group: -8 ± 2 dBm;
High group vs. low group difference (twist): 2 ± 1 dBm

Temperature Tolerance — Operating: 32 to 122° F (0 to 50° C);
Storage: -4 to +140° F (-20 to +60° C)

Humidity Tolerance — 10 to 90%, noncondensing

Altitude — 10,000 ft. (3050 m) maximum

Power— (4) AAA alkaline batteries,
Operation: 7 hours minimum, 150 hours maximum;
Standby: 2 years

NOTE: The loudspeaker and backlight draw a large amount of power and can discharge the battery quickly if used at high volume with the backlight at 100% on a line with high audio.

Size — 8.25"H x 2.5"W x 2"D (2.1 x 6.4 x 5.1 cm)

Weight — 19.74 oz. (559.7 g)

2. Overview

2.1 Introduction

The Telephone Line Analyzer is a self-contained, battery-powered, telephone test set for use by installers and repair technicians. Its state of the art design makes it rugged and water resistant. The Telephone Line Analyzer is ideal for temporary communication, and servicing and installing telephone and data lines.

2.1.1 Features

- Large backlit LCD display.
- Ergonomically designed body for comfortable use.
- Rainproof and highly water/dust resistant case to IP64 standard.
- Drop tested up to 20 ft.
- 60-inch angled bed of nails with piercing pin cord set.
- Glow-in-the-dark keypad.
- Metal spring loaded belt clip.
- Loudspeaker with fine volume adjustment.
- Adjustable earpiece volume, hearing aid compatible.
- Microphone mute with toggle on/off locking feature.
- Soft key menu system simplifies user interface and customizing.
- Contact list of up to 8 names and phone numbers.
- Supports three languages: English, Spanish, and French.
- Measures and displays ring frequency and voltage.
- Supports both CID and CWCID.
- Cushion boot for extra protection in ultra-harsh environments.
- Data Defender™ detects lines with data – DSL, T1, etc.
- High line voltage protection with override options.

- Active monitor circuitry minimizes load on subscriber line.
- DigitView™, DTMF digit detection and display in Monitor mode, diagnose premise equipment
- PwrSave™ circuitry for extra long battery life

2.1.2 Terms and Descriptions

Table 2-1 defines the terms used throughout this document and provides information to assist you with proper operation and understanding of the test unit.

Table 2-1. Terms and descriptions.

Term	Description and Uses
Talk Mode	In this mode, the Telephone Line Analyzer goes "off hook" and produces a dial tone when connected to a POTS line. While off-hook, the analyzer can dial phone numbers from its keypad or via internal memory slots.
Bell Mode	This is the "on-hook" or "off" mode. In this mode, caller ID and the ringer are activated when a call is being received.
Monitor Mode	Monitor mode allows listening to a line without loading it. It displays line voltage, on-hook Caller ID and any detected DTMF digits on the lines.
POTS line	"Plain Old Telephone Service" is the basic form of wired residential and small business service connection.

Table 2-1 (Continued). Terms and descriptions.

Term	Description and Uses
Hook Flash	Rapid depression and release of the switch hook, which is used for placing a call on hold, notifying an operator of a completed call, or signaling a PBX.
DTMF	Dual Tone Multi-Frequency is the signaling between the subscriber and switching equipment from push button telephones.
Tone	Tone dialing mode uses the DTMF method to signal the switching equipment for each numbered button press.
Pulse	Pulse dialing mode signals the central office or switch by opening and closing the telephone loop a specific amount of times, depending on the number dialed.
CID and CWCID	Caller ID is 1200 baud modem data sent between the first and second ring with information about the incoming call for display on a phone that recognizes CID. Call Waiting Caller ID is the same information sent to the phone while a call is in progress preceded by a call waiting tone.
Tip and Ring	Tip and Ring are the historical names for the two leads of a POTS line. Tip is the black lead and Ring is the red lead of the cord set. Contrary to modem standards, the black lead is a positive voltage with respect to the red lead.

2.2 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

- Telephone Line Analyzer
- Protective silicon boot
- A deluxe cord set made from nylon cloth covered test lead wire.
- This user's manual

2.3 Hardware Description

Telephone Line Analyzer

The Telephone Line Analyzer, illustrated in Figures 2-1 and 2-2, has four main parts: the connectors, the LCD display screen, the keypad, and the remote tester.

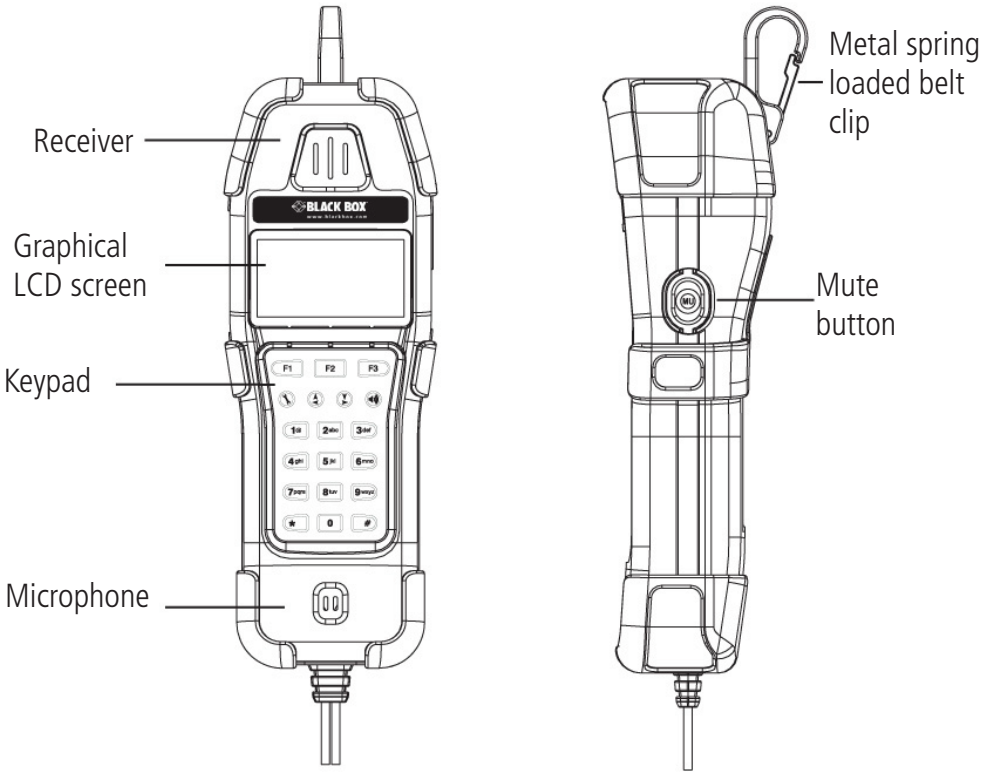


Figure 2-1. Telephone Line Analyzer components diagram #1.

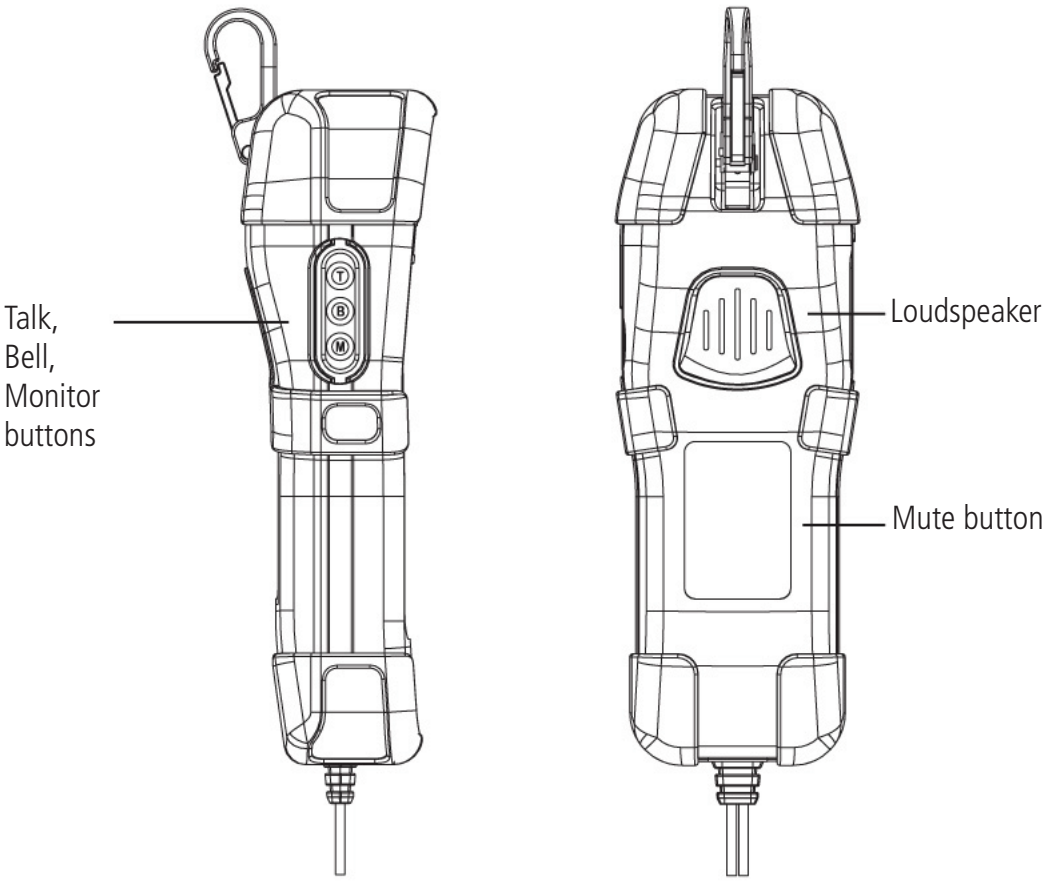


Figure 2-2. Telephone Line Analyzer components diagram #2.

Angled Bed of Nails with Piercing Clip Cord Set

One angled bed of nails with piercing pin cord set is located at the bottom of the Telephone Line Analyzer. The connectors enable you to securely connect with individual telephone cable connectors.

Figure 2-3. Angled bed of nails with piercing clip cord set.

3. LCD Display Screen and Keypad Functions

3.1 LCD Display Screen

The Telephone Line Analyzer has a transreflective graphical LCD display screen, shown in Figure 3-1. The LCD display screen shows the following: modes and related icons, memory, and battery life indicator.

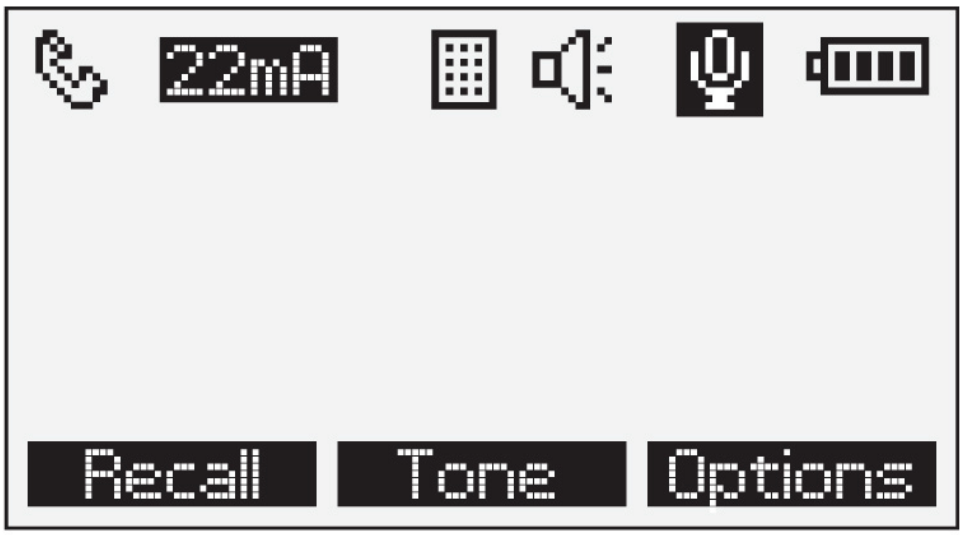


Figure 3-1. LCD display screen.

3.1.1 Talk Mode

When the Talk button is pressed, the Telephone Line Analyzer goes off hook and displays the line condition on the LCD display screen. Table 3-1 shows the information displayed on the screen when the analyzer goes off hook.

Table 3-1. Talk Mode display.

Icon	Icon and Description
mA	mA is the loop current measured on the line, normal polarity  reverse polarity. 
Telephone Icon	 Indicates that the Telephone Line Analyzer is operating in Talk Mode.
Tone/Pulse Icon	Displays whether the Telephone Line Analyzer is in DTMF tone mode  or pulse dial mode. 
Speaker Icon	 Appears when the loudspeaker is active.

Table 3-1 (Continued). Talk Mode display.

Microphone icon	Indicates if the microphone is muted  or unmuted. 
Battery icon	Displays the remaining battery life. A new set of batteries has four bars. 
Recall softkey	Press F1 to go to the Speed Dial screen.
Tone softkey	Press F2 to toggle between tone and pulse dialing.
Options softkey	Press F3 to activate a popup menu for dialing A–D and Pause.

3.1.2 Memory Storage

While in the Setup menu, numbers 1–8 will be displayed representing the 8 name and number locations. By selecting a memory location number, you will be able to edit or erase an entry. See Table 3-2 for a description of the display screen updates when Memory Storage is in use.

Table 3-2. Memory storage.

Values	Description
1 2 3 4 5 6 7 8	The unit has eight memory storage locations.
Memory Dial	Each memory slot has the option to view or enter a name and number.
Memory Name	A name up to 16 characters long can be stored to identify the number stored in that location.
Memory Number	Up to 32 digits can be saved in each of the eight memory locations.

3.1.3 Battery Life Indicator ( )

The battery life icon appears in the upper right corner of the LCD display screen to demonstrate the approximate remaining battery life. A new set of batteries shows four bars. The number of bars decreases as the battery is nearing depletion. At about 4.2 volts, the battery icon has no bars. At about 3.5 volts, the screen starts to fade. Results may be unreliable at this point.

NOTE: The Telephone Line Analyzer will turn off if the power supply goes out of regulation from a low battery condition.

3.1.4 Detection Warnings

When entering Talk mode the Telephone Line Analyzer performs several tests before going off-hook. These tests include high and low voltage checks and data detection. The following describes the types of warning screens that might be encountered.

The voltage warning display screen is presented if the voltage detected on a cable exceeds 65 volts peak AC or DC. If this screen appears, the Telephone Line Analyzer disconnects from the line and retries every few seconds. The Telephone Line Analyzer should be disconnected immediately from the source of voltage to prevent damage. See Figure 3-2.

Figure 3-2. Over voltage warning.

The high current warning is displayed if the current on the line exceeds 125mA. If this screen appears, the Telephone Line Analyzer should be disconnected immediately from the source of the current. See Figure 3-3.

Figure 3-3. Over current detection warning.

If a line is in use, the Telephone Line Analyzer will display the line in use screen. To connect, press the F2 soft key. See Figure 3-4.

Figure 3-4. Line in use warning.

If data is found, the Data Present warning is displayed with the measured kHz. See Figure 3-5.

Figure 3-5. Data Present Warning.

NOTE: The Telephone Line Analyzer continually checks for the presence of voltage on a connected cable.

3.2 Keypad

The Telephone Line Analyzer is equipped with a glow-in-the-dark keypad. There are seven control buttons illustrated in Figure 3-6. Three buttons, appearing on the top row of the keypad, are used with the corresponding menu option displayed on the LCD screen. A Setup button will access the setup menu in Monitor or Talk modes. The Up/Left, Down/Right buttons are used to scroll through menu options or adjust the volume. The Speaker button activates the Telephone Line Analyzer's loudspeaker. The twelve digit telephone keypad is used to dial a number or send DTMF tones. The button functions are explained in Table 3-3.

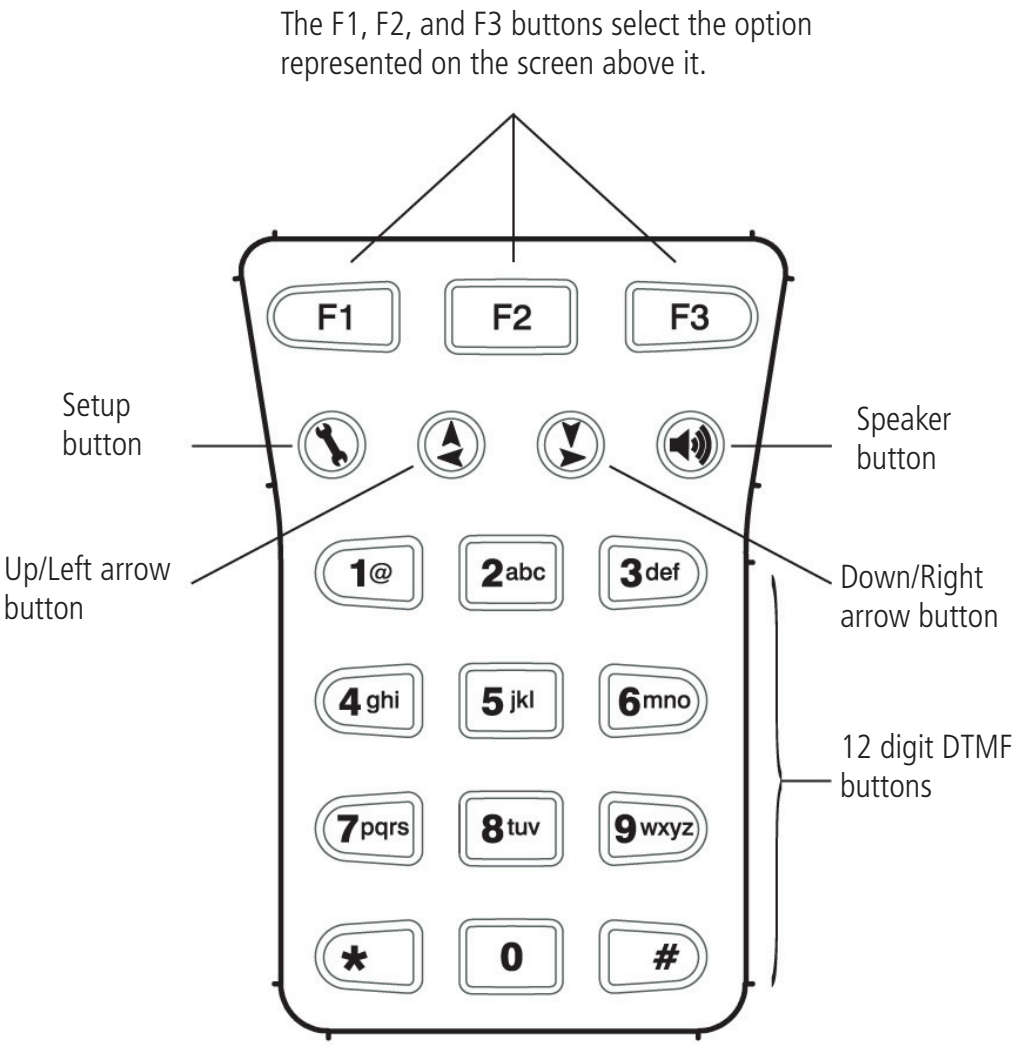


Figure 3-6. Keypad.

Table 3-3. Keypad.

Button Name and Icon	Description
Talk 	The Talk button is used to power on the Telephone Line Analyzer and goes "off-hook" if appropriate line voltage is detected. • While in Talk mode, the Talk button can be pressed to "Flash" the line. • The Setup menu is accessible in Talk mode.
Bell 	• Pressing the Bell mode button will power off the Telephone Line Analyzer. • Goes "on-hook" if the Telephone Line Analyzer was in Talk mode. • Bell mode is used for Caller ID and the incoming call ringer.
Monitor 	• Monitor mode is used to listen for line condition and measure line voltages. • DTMF digits are captured and displayed. • The setup menu is accessible in Monitor mode.
F1/F2/F3 	F1, F2, and F3 correspond to the options displayed on the LCD screen directly above them.

Table 3-3 (Continued). Keypad.

Button Name and Icon	Description
Up/Left Down/Right arrow buttons 	• In Talk and Monitor mode, these buttons are used to adjust the volume. • In the Setup mode, these buttons are used to scroll through options, delete an entry, or add a space.
Speaker 	• The Speaker button activates the loudspeaker on the back of the Telephone Line Analyzer. • Hold the Speaker button down for 2 seconds to toggle the backlight on/off.
Mute 	• The Mute button silences the microphone while in Talk mode. • When the loudspeaker is on, the mute button will mute the loudspeaker and activate the microphone, a push to talk function. • In Monitor mode, hold the Mute button down to mute the loudspeaker.
Setup 	The Setup button wil display the Setup menu in Monitor or Talk mode.

4. Operation

To ensure safe operation of the Telephone Line Analyzer, follow the instructions carefully and pay attention to the warning and caution symbols. Failure to observe warnings can result in severe injury or death and can damage the unit.

4.1 Turning the Unit On/Off

4.1.1 Turn Unit On

Press the Talk or Monitor mode button on the side of the Telephone Line Analyzer. It immediately measures voltage (monitor mode) or current (talk mode) when powered ON.

4.1.2 Turn Unit Off

Press the Bell mode button to power off the Telephone Line Analyzer. The startup screen will be displayed for 10 seconds before unit is fully powered off.

4.2 Automatic Power Down

The Telephone Line Analyzer has automatic power-off for all modes to conserve the battery. The default power-off time is set for 20 minutes of no activity. To change the automatic power-off, refer to the Setup Mode portion of the instruction manual. To "wake up" the test set when the Telephone Line Analyzer has timed out and powered OFF, press the TALK or MON button.

4.3 POTS Testing General Guidelines

The Telephone Line Analyzer is intended for temporary connection for servicing phone lines.

4.4 Connecting to a POTS Line

The angled bed of nails with piercing pin cord set attached to the Telephone Line Analyzer must be used to properly connect to telephone lines. Connect to Tip and Ring on a 66 block, 110 block, or modular adapter (banjo). Because typical phone line voltage is negative, the red lead is connected to Ring (negative), and the black lead is connected to positive ground (Tip).

NOTES:

The angled bed of nails with piercing clip cord set attached to the Telephone Line Analyzer must be used to properly connect to telephone lines.

For 66/110 blocks, affix the angled bed of nails with piercing pin cord set to tip and ring. When testing from an RJ11, use an appropriate modular adapter (banjo).

CAUTION:

xx Volts, DISCONNECT NOW! message appears when the voltage surpasses 65 volts peak AC or DC. Do not operate the Telephone Line Analyzer on cable systems exceeding a voltage value of 65 volts or current in excess of 125 mA.

CAUTION:

Internal components of the Telephone Line Analyzer are protected to 270 volts peak AC or DC and a voltage clamp will activate. Connecting the unit to cabling systems with voltage above 270 volts peak AC or DC may damage the test unit and pose a safety hazard for the user.

4.5 The Talk/Bell/Mon (T/B/M)

T/B/M buttons are on the left side of the Telephone Line Analyzer. The following subsections describe how the Telephone Line Analyzer works in each of the three settings.

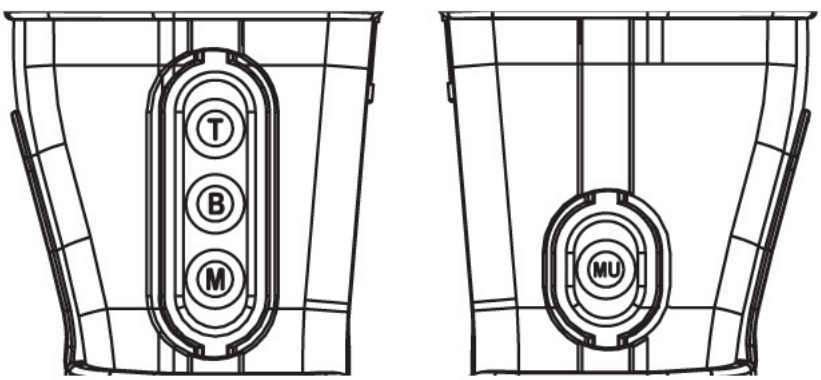


Figure 4-1. Using the TALK/BELL/MON and Mute buttons.

4.5.1 The TALK Setting (TALK Mode)

The "TALK" or off-hook position takes the Telephone Line Analyzer "off hook" on a standard "POTS" (plain old telephone service) voice phone line. While the Telephone Line Analyzer is off-hook, it can dial numbers either directly from the keypad or from its memory dial slots.

Off-Hook Protection

The Telephone Line Analyzer checks for low voltage, high voltage, and presence of data before going off-hook. Once off-hook, the Telephone Line Analyzer checks for excess loop current. The Telephone Line Analyzer must measure 18 volts or more on the line it is connected to (a voltage level indicating a live but not in use line) before it will go off hook. If the Telephone Line Analyzer doesn't go off hook, it displays "Off-Hook Protection", the voltage measured for the line, and an option to "Connect" on its LCD screen. To connect, press the F2 button under "Connect" to go off hook despite this voltage reading and attempt to operate normally. (Because the Telephone Line Analyzer's internal voice circuits are line powered, it won't work if there's insufficient power on the line).

The Telephone Line Analyzer also checks for line voltage exceeding 65 volts. If it finds the line voltage exceeds this level, it doesn't go off-hook but displays the messages: "xxV,TOO HIGH!" and "DISCONNECT NOW!!" It continues to monitor the line voltage for about five minutes, then powers down if the high voltage has not been removed. The Telephone Line Analyzer will automatically go off-hook if the voltage goes below the 65 volt threshold. The line current will be displayed on the top line of the LCD. The Telephone Line Analyzer detects the polarity of the connection and will reverse-video the line current to indicate a reverse connection.

In addition to the voltage checks when going off-hook, the Telephone Line Analyzer uses patented Data Defender™ technology to check for data being present on the line. If data is detected, "Off-Hook Protection," "Signal: xxx KHz," and "Active Data Found" are displayed. The average signal frequency of the largest amplitude data energy is displayed. An override soft key option, "Connect," is displayed and by pressing F2, the Telephone Line Analyzer will go off-hook. The override feature may be needed should high frequency energy be present on a circuit due to stray coupling. The Data Defender™ circuitry is active in monitor mode and will display signal frequency and "Active Data Found" if data is present. Data Defender™ is a trademark of Independent Technologies, Patent number 6,556,661.

DSL Detection

The Telephone Line Analyzer's average frequency reading will be either in the range of 70 to 90 KHz at the premise (upstream) end of an active DSL link or 260 to 280 KHz at the DSLAM (downstream) end due to the pilot tones.

T1 Detection

The Telephone Line Analyzer's average frequency reading will read the carrier frequency between 700 and 800 KHz on a T1 line.

CWCID

In Talk mode the Telephone Line Analyzer supports Call Waiting Caller ID (CWCID or Type 2 Caller ID). When a call is already in progress, an incoming call's ID is displayed on the screen. During this time, the label "CWCID" replaces the line current field. The user can switch to the incoming call by pressing the Talk button to "Flash" the line.

Speed Dial

In Talk mode, function key F1 ("Recall") accesses a screen for speed dialing. From the Speed Dial screen, press the zero (0) key to dial the last number dialed or a Memory Dial slot by pressing 1 through 8. The soft function keys provide further access to the Memory Dial slots or Recent Call List by pressing the soft key and scrolling through the slots using the arrow keys. Press the Dial soft key to dial the currently displayed number.

Flash

To flash the phone line, press the "T" (Talk) button while off hook. The Flash function breaks the phone line connection for 0.6 seconds, simulating a phone "hookflash" signal. Hookflashes are often used to transfer calls or to activate special PABX or central-office features.

Volume Control

Use the  keys to adjust receiver and loudspeaker volume. During adjustment, a bar graph is displayed to show the volume percentage. The receiver and loudspeaker have separate volume settings. Volume levels for Talk mode and Monitor mode are set and stored independently.

Using the Multi-function Mute Button

When the test set is off hook in the TALK mode and the loudspeaker is OFF, you can mute the Telephone Line Analyzer microphone by pressing down the mute button on the right-hand side of the Telephone Line Analyzer. If you tap the button for less than 2 seconds, the mute lock feature is enabled and the microphone icon is in reverse video. The test set will remain muted until you press the button again. If you hold this button down for more than 2 seconds, the mike will be muted only while the button is held down; as soon as you let go, it will resume operating normally.

When the test set is off hook in the TALK mode with the loudspeaker ON, the microphone is automatically muted to prevent feedback. The mute button is used to turn the loudspeaker OFF and the microphone ON so that you can talk to the remote party over the phone line. The microphone is only ON while the mute button is being held down. Under these conditions, when the mute button is pressed, the speaker icon is displayed in reverse video and the microphone icon is displayed normally.

When the test set is in the Monitor mode with the loudspeaker ON, the mute button is used to mute the loudspeaker. The loudspeaker is only OFF while the mute button is being held down in a push to talk like operation. While muted, the speaker icon on the screen is displayed in reverse video.

4.5.2 The BELL Setting (BELL Mode)

Figure 4-2. Caller ID Screen.

The BELL mode is the “off state” of the Telephone Line Analyzer. The keypad is disabled and the Telephone Line Analyzer is in its lowest power state. The test set monitors the phone line to which it is connected for ringing and Caller ID signals. If it detects an incoming ring, it sounds the electronic ringer. If the Telephone Line Analyzer detects incoming Caller ID information, it will test the signal for correct format, checksum, and display the frequency and RMS voltage of the ring signal at the top of

the screen. In Bell mode, if the Telephone Line Analyzer is not taken off hook while it is ringing, it will power OFF again about 10 seconds after the end of ringing.

4.5.3 The MON Setting (MONITOR Mode)

The MON position (MONITOR mode) causes the Telephone Line Analyzer to use its high impedance amplifier so that you can listen to a line without loading it. On-hook Caller ID is also received, checked and displayed in this mode. The line voltage is measured and displayed, with reverse polarity indicated by a reverse video icon. The Telephone Line Analyzer™ also monitors the line it is connected to for DTMF signals. If it detects any of the 16 valid DTMF signals it will display the characters on the LCD.

Figure 4-3. Monitor mode screen.


Headset Icon—Indicates that the Telephone Line Analyzer is in Monitor mode.

xxV—The voltage measured on the line, normal and reverse polarity.


Speaker Icon—Appears when the loudspeaker on the back is active.

 Battery Icon—Displays remaining battery life. A new set of batteries has four bars.

When the test set is in the Monitor mode with the loudspeaker ON, the mute button is used to mute the loudspeaker. The loudspeaker is only OFF while the mute button is being held down. While muted, the speaker icon on the screen is displayed in reverse video.

Volume Control

Use the  keys to adjust receiver and loudspeaker volume. During adjustment a bar graph is displayed to show the volume percentage. Volume levels for Talk mode and Monitor mode are set and stored independently.

Setup Menu

To enter the Setup Menu, the phone must be in talk or monitor mode (not Off Hook Protection mode). By pressing the Setup key, the Telephone Line Analyzer will present a list of options that can be modified. The Telephone Line Analyzer command keys now take on their setup-mode functions/identities.

You can use the  scroll keys to move to different items. Pressing the Setup key will exit the setup menu.

Setup mode automatically exits after 2 minutes without a key press.

Figure 4-4. Setup menu screen.

Memory Dial

The Memory Dial entry displays the eight memory dial records that are available (see Figure 4-4). The digits in reverse video identify slots that are not empty. Press a numeric key to jump immediately to that slot. Alternately, press function key F3 to access slot #1 of the Memory Dial list.

In the Memory Dial list, use the arrow keys to move up and down between entries. Function key F3 opens the entry for editing and function key F1 deletes (clears) an entry (see Figure 4-5).

Figure 4-5 Memory Dial Name and Number.

When in Talk mode, function key F2 (Call) dials the currently displayed number. When editing a Memory Dial slot, you enter the name first (see Figure 4-6).

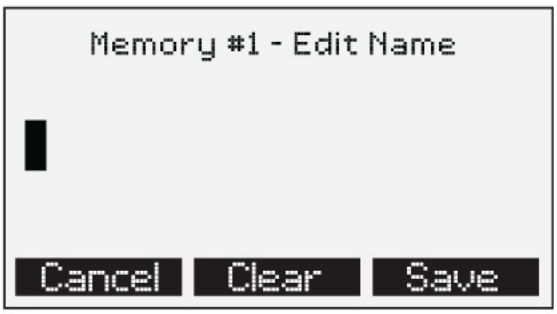


Figure 4-6. Memory Dial Edit.

Up to 16 characters can be used to identify a record. Enter characters by pressing a numeric key to cycle through its associated letters. Both uppercase and lowercase letters are available via the scrolling mechanism. Pressing the left arrow key deletes to the left, pressing the right arrow key moves to the right, adding a space. The Clear function key (F2) deletes the entire entry. Use the other function keys to cancel (F1) or save (F3) the edited results. If you do not want to change the existing name, just press F3 to proceed to number entry.

Figure 4-7. Number Dial Edit.

Once you save the slot's name, you then enter the associated phone number. On the Edit Number screen, use the function keys to cancel (F1), save (F2) or access other options (F3). The Options key activates a popup menu that contains additional operations. Press F3 again to view the second page of the popup menu. Each item on the popup menu is activated by pressing the key shown to its left. The popup menu allows you to enter additional DTMF numbers (A-D), add a pause to the dialing sequence, change to tone dialing, and clear (erase) the phone number.

Enter a phone number with the Telephone Line Analyzer's keypad. As the number is entered it is formatted according to the Number Format defined below (e.g. 123-4567). Use the left arrow key to delete to the left.

Recent Call List

The Telephone Line Analyzer automatically stores the last 10 numbers called or received. To view the list, press F3 (View) while Recent Call is displayed in Setup. Scroll through the list of recent calls with the and keys. Press the Setup key to exit. Use function key F1 (Del) to delete an entry from the list and function key F3 (Save) to save an entry in the Memory Dial list.

Language

Use function keys F1 and F3 to switch between English, French, and Spanish.

Number Format

This entry defines how telephone numbers are displayed. Use function key F3 to edit the numeric formatting. When editing, use the pound key (#) to enter a digit placeholder and the one key (1) to scroll through a short list of symbols (minus, plus, parenthesis, period, forward slash). The zero key (0) enters a space. The scroll keys delete left or move right during editing. Use the function keys to Cancel, Clear or Save the edited format.

Ring Volume

The Ring volume can be adjusted by pressing F1 (decrease) and F3 (increase). The Telephone Line Analyzer will sound an audible ring relative to the volume setting. To repeat the ring, you can press F2 (Ring).

Display Contrast

The display contrast can be adjusted from 40% to 70% using the F1 button (decrease) and F3 (increase). The contrast immediately adjusts to the specified level.

Backlight Level

The backlight can be adjusted from 0% to 100% using the F1 button (decrease) and F3 (increase). The backlight immediately adjusts to the specified level. Note that higher backlight levels drain the battery more quickly. The backlight is turned on and off at any time by pressing and holding the speaker key for two seconds.

Auto Power off

The auto power off can be adjusted from 10 minutes up to 60 minutes or off (Never) using the F1 button (decrease) and F3 (increase and off). This controls how long the phone remains in Talk or Monitor mode, with no activity, before returning to Bell mode.

5. Maintenance

5.1 Battery Replacement

ELECTRIC SHOCK WARNING: *Disconnect Telephone Line Analyzer leads before opening the battery door.*

1. Carefully remove the silicon boot from the Telephone Line Analyzer.
2. Using a #1 Philips head screwdriver, remove all four screws on the battery door, located in the back of the Telephone Line Analyzer towards the bottom of the unit.
3. Take off the battery door and remove the old batteries.
4. Replace with four AAA alkaline batteries. Slide the batteries into the battery cartridge according to the diagram printed on the bottom of the battery compartment.
5. Return the battery door to the unit and tighten the screw to secure the battery door. The door is keyed to fit in only one direction.
6. Carefully replace the silicon boot on the Telephone Line Analyzer.

CAUTION: *Do not over tighten the battery door. Doing so can damage the test unit.*

5.2 Cleaning

Use a damp, clean cloth to clean the tester.

NOTES:

1. *Disconnect the Telephone Line Analyzer test leads before cleaning. Failing to do so can damage the unit and result in personal injury.*
2. *Do not use abrasive, harsh cleaners or solvents to clean the Telephone Line Analyzer.*

5.3 Storage

When the Telephone Line Analyzer is not in use, store it in a dry, protective case. The battery should be removed if the tester is stored for a long period of time.

Do not expose the Telephone Line Analyzer to high temperatures or humidity. When stored in temperatures exceeding the limits listed in Chapter 1, Specifications, allow the Telephone Line Analyzer to return to the normal, recommended operating conditions before using it.

6. Troubleshooting

6.1 Contacting Black Box

If you determine that your Telephone Line Analyzer is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

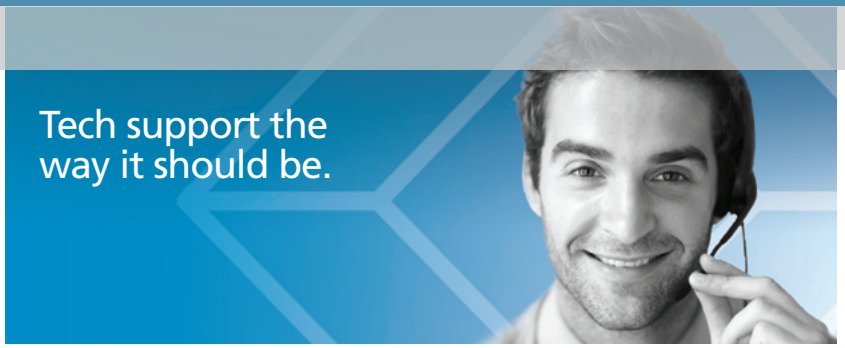
- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

6.2 Shipping and Packaging

If you need to transport or ship your Telephone Line Analyzer:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

Black Box Tech Support: FREE! Live. 24/7.



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