



Telephone Line Simulator TLS-3B User's Manual



40-400-00032, Rev. B

TCI Library: www.telephonecollectors.info

Note

This manual covers Model TLS-3B-01.

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IMPORTANT SAFETY INSTRUCTIONS

When using this product, basic safety precautions, including the following, should always be followed to reduce the risk of fire, electric shock, and injury to persons.

1. Read and understand all instructions.
2. Follow all warnings and instructions marked on the product.
3. The product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply, consult your dealer or local power company. The product is designed for indoor use only.
4. To reduce the risk of electric shock, do not disassemble the product, but take it to qualified service personnel when service or repair work is required. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the appliance is subsequently used.
5. If the product does not operate normally by following the operating instructions, or if the product has been dropped or the cabinet has been damaged, or if the product exhibits a distinct change in performance, refer servicing to qualified service personnel.
6. If the product is used in a manner other than specified in this manual, the protection provided by the product may be impaired.
7. For the purpose of removing power from the product, the power input connector is the main power disconnect point. Pull the power cord away from the connector to ensure power disconnect.
8. Adequate air flow must be maintained in order for the product to operate correctly. Do not wrap the product in blankets, paper, or other material that may impede ventilation.



CAUTION: THIS PRODUCT
CONTAINS ELECTROSTATIC
SENSITIVE DEVICES. USE
APPROPRIATE HANDLING
PROCEDURES.

REGULATORY COMPLIANCE

FCC Part 15 Class A Notice: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Telephone Line Simulator TLS-3B

INTRODUCTION

The Teltone TLS-3B is a portable, two-line device that emulates the public telephone network. The TLS-3B is a tool for demonstrating telephone instruments and other telecommunications equipment, such as fax machines and modems. The TLS-3B's small size and light weight make it ideal for trade shows and other sales presentations. It can also be used for testing telephone sets, key systems, and PBX installations.

Like the public telephone network, but on a smaller scale, the TLS-3B can provide dial tone, audible ring and busy signals to two telephones or other devices connected to it. When a user picks up one phone (or other device) to dial up the second phone, the TLS-3B sends ringing current to the second phone until it goes off-hook. The TLS-3B then establishes a connection between the two phones. Either telephone can then initiate a disconnect sequence by going on-hook.

Many of the TLS-3B's features are programmable, including telephone numbers, off-hook modes, signal delays, test tone frequencies, and line attenuation. The TLS-3B also provides Caller Identification information to both lines, and lights a Visual Message Waiting indicator.

In other words, the TLS-3B is a simple telephone network in a box. When a telephone connection is not available, or when installing a temporary telephone line would be costly, the TLS-3B provides all the signals and functions you will need to demonstrate or test your telephones, modems, and other telecommunications equipment.

TLS-3B CONNECTORS AND LIGHTS

The front panel of the TLS-3B has two telephone line jacks, with a green status indicator light for each line, and a green Power indicator light. The power input connector is on the rear panel. See Figure 1.

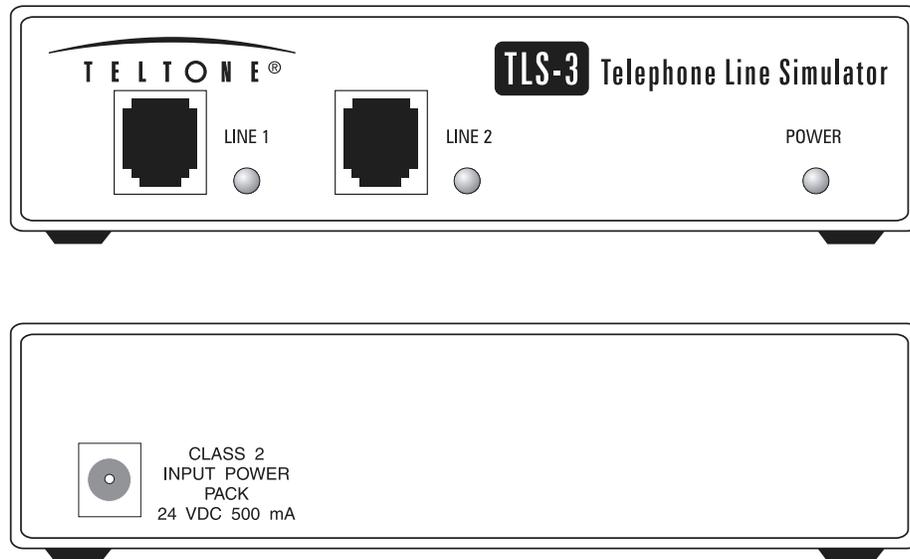


Figure 1. TLS Front and Rear Panels

Status Lights

When a telephone (or other device) connected to one of the Line connectors is off hook, the corresponding Line indicator lights (see Table 1). The Line light dims (not totally dark) when the TLS-3B decodes valid DTMF from the off-hook device. If the off-hook device sends rotary dialing signals, the line indicator will flicker on and off during dialing.

Table 1. LED Indicators

| Indicator | State | Description |
|---------------|----------------------------|---|
| Line 1/Line 2 | On | Line is off-hook. |
| | Flashing (fast on/off) | Line is ringing. |
| | Blinking (slow on/off) | Programming mode: Line is selected for programming. |
| | Half brightness | During dialing, indicates that a valid DTMF digit is present. |
| | Dim blinking between rings | Caller ID is being sent to the called phone number. |
| Power | Single blink | Setup 1 |
| | Double blink | Setup 2 |

When the TLS-3B sends a ringing signal to a telephone attached to one of the Line connectors, the corresponding Line indicator flickers on and off rapidly.

The green Power indicator alternates between full and half brightness (blink) when the TLS-3B is operating. A single blink indicates Setup 1. A double blink indicates Setup 2. For information about programming different setups, see “Programming the TLS-3B” on page 8.

If the Power indicator is dark, no power is connected to the TLS-3B. If it lights, but does not flicker, the TLS-3B's internal processor is not working properly.

Line Jacks

Two Line connectors (RJ11 modular telephone jacks) are located on the front panel. These connectors mate with the plugs on standard modular telephone cords.

Power Connector

The power connector requires a 24-volt DC power source. A 120-VAC 24-volt DC power pack is supplied with the TLS-3B. Do not use the TLS-3B with a power pack that supplies a different voltage. Use only with a Class 2 power supply!

HOW TO INSTALL THE TLS-3B

The TLS-3B works with analog loop start telephone sets only. It will not work with ground start, proprietary, or digital phone sets.

Follow these steps to install the TLS-3B:

1. Plug the connector at the end of the power pack cable into the connector on the rear panel of the TLS-3B.
2. Plug the power pack into a 120-volt AC wall outlet. The POWER indicator will light.
3. Use a modular telephone cable to connect the telephones (or other devices such as modems or fax machines) to the Line 1 and Line 2 connectors of the TLS-3B.
4. Lift the handset of the telephone connected to Line 1. The Line 1 indicator should light. Hang up and do the same thing for Line 2.



Warning: The TLS-3B generates a 100-volt ringing signal. Keep your hands away from the plugs at the end of modular cables plugged into the TLS-3B when the other line is off hook.



Caution: Do not try to connect the TLS-3B to the public telephone network. Incoming ringing signals use voltages that can damage internal components in the TLS-3B.

Installing a Call Identifier

To use the TLS-3B's Caller ID feature, you must use an external call identifier or a telephone set with built-in Caller ID. In most cases, the call identifier goes between the TLS-3B and the telephone set. You should follow the instructions supplied with the call identifier. If the call identifier instructions tell you to plug a cable into a wall outlet, connect it to the TLS-3B.

HOW TO OPERATE THE TLS-3B

The TLS-3B has one talk path between the two lines. When a telephone connected to either line goes off-hook while the other is still on-hook, the off-hook telephone receives dial tone. If a telephone is already off-hook, the second telephone will not receive dial tone (silence).

The TLS-3B stores two separate configurations, called Setup 1 and Setup 2. This enables two different users to store settings they use often (for example, the sales staff might use the TLS-3B in one setup, and engineering the other). When the unit is in Setup 1, the Power LED blinks once; when it is in Setup 2, it blinks twice. For information about programming different setups, see "Programming the TLS-3B" on page 8.

Each line has two programmable telephone numbers. For programming information, see "Programming the TLS-3B" on page 8. To call the other telephone, lift the handset and dial one of the numbers assigned to the telephone you want to call. The TLS-3B recognizes both rotary (pulse) and tone dialing.

The default telephone numbers for the two lines are:

Line 1 = 101 and 201

Line 2 = 102 and 202

Calling Line 2

To call Line 2 (Primary):

- Dial 102.

One long ring (2 seconds on, 4 seconds off), repeated until answer.

To call Line 2 (Secondary):

- Dial 202.

Two short rings (programmable): 800 mS on, 400 mS off, 800 mS on, 4 seconds off

Calling Line 1

To call Line 1 (Primary):

- Dial 101.

One long ring (2 seconds on, 4 seconds off), repeated until answer.

To call Line 1 (Secondary):

- Dial 201.

Two short rings (programmable): 800 mS on, 400 mS off, 800 mS on, 4 seconds off

When the other telephone rings, lift the handset to answer. The two telephones are now connected. To break the connection, hang up either telephone.

The Caller ID transmission sends the primary telephone number of the caller's line.

Calling Party Supervision

The U.S. telephone network typically uses Calling Party Supervision, meaning that even though the called party hangs up, he may be reconnected to the calling party when the phone is taken off-hook again. The calling party must hang up for the called party to be fully disconnected before initiating a new call. The telephone network will timeout and disconnect the call within 5-20 seconds, giving the called party dial tone when he goes off-hook again.

The TLS-3B also provides Calling Party Answer Supervision. If the called party goes on-hook and comes off-hook again before the forced disconnect or disconnect tone is sent, the call will be reestablished. However, if the calling party goes on-hook and then goes back off-hook again after the forced disconnect is sent, the call will not be reestablished.

Forced Disconnect

Cutoff On Disconnect (COD) or Forced Disconnect, as it is also called, is a feature provided by the TLS-3B. COD is a break in loop current that is sent to the off-hook telephone when the other party goes on-hook (hangs up). The COD pulse duration is programmable (default is 850 ms).

The COD delay (the time from on-hook until the COD pulse is sent) is also programmable, but only for the calling party when the called party goes on-hook. When the calling party goes on-hook, the COD delay is always 2 seconds before the COD is issued to the called party.

For programming information, see "System Commands" on page 9.

Off-Hook Modes

The off-hook mode specifies what you hear when you lift the receiver on one of the telephones connected to the TLS-3B. The three off-hook modes are Normal, which provides dial tone; Ringdown, which causes the other telephone to ring; and Silence, which connects the telephone to silence. The Normal mode is the default. For programming information, see "Individual Line Commands" on page 11.

CALLER ID

The TLS-3B provides optional Caller ID (FSK) signaling on both lines. It supports both Single Message Format (Date/Time/Number) and Multiple Message Format (Date/Time/Number/Name). The Caller ID transmission is sent during the first long silent interval after the first ringing cycle. A typical standard ringing period is composed of a 2-second ringing cycle and a 4-second silent interval. Distinctive ringing periods may be several short ringing cycles followed by at least a 3-second silent interval. The TLS-3B is capable of many different types of ringing cycles and silent periods (see "Programming the TLS-3B" on page 8), but a silence period of at least 3 seconds is required in order to send a Caller ID message.

The display of the Caller ID information depends upon the type of equipment connected to the TLS-3B, it may appear on the telephone itself, in the display of a separate device, or on the video display of a personal computer.

Caller ID Date/Time

The TLS-3B issues a Date/Time value of 01/01 1:05 for the initial call after power is applied. Subsequent calls will increment the time by 5 minutes. The Date/Time will be reset back to the initial value of 01/01 1:05 if power is cycled on the TLS-3B.

Caller ID and Distinctive Ringing

Since there are circumstances such as privacy blockage, an out of area call, or a transmission error, in which Caller ID is blocked, the TLS-3B can simulate these events.

If you change the distinctive ringing cycles, remember that a 3-second silence is required for the Caller ID information to be sent.

Compatibility with Caller ID Devices

Since there are a variety of Caller ID devices, the appearance of the information and the amount displayed may differ slightly. For example, the format of the date and time may be displayed differently.

Please note the following items when using Caller ID equipment:

- Some Caller ID devices cannot display the calling name and, therefore, do not accept the Multiple Message Format (default). If this is the case with your device, use the Single Message Format instead.
- Caller ID will be sent during the first 3-second silence in the ring cycle. If you change the distinctive ringing cycles, remember that a 3-second silence is required for the Caller ID information to be sent. (If there is not at least a 3-second silence, Caller ID will not be sent).
- Some Caller ID Devices require a 7-digit telephone number. If this is the case with the device you are using, program the TLS-3B with 7-digit numbers.

Using Caller ID Prefixes

Caller ID messages can be changed with one of three prefixes, entered before the number you are dialing:

- *67 = Private
- *87 = Out of area call
- *88 = Check sum error

For example, dialing *67 102 will ring Line 2 (assuming the default phone numbers are used) and change the Caller ID message to a private message.

Dialing *87 102 will change the Caller ID message to an “out of area” call. The Caller ID display will indicate that the call originated from an area in which Caller ID is unavailable.



Note: Depending on the type of Caller ID display you are using, if private or out-of-area feature is invoked, the date and time will be shown, but not the number or name.

Dialing *88 102 will simulate a Caller ID checksum error. The Caller ID display will indicate that an error occurred in Caller ID transmission.



Note: Caller ID displays react differently to a checksum error. Some attempt to display the data, others display “line error”, and others ignore the data. Also, some Caller ID displays require a 7- or 10-digit number. If this is the case with the device you are using, program the TLS-3B with 7- or 10-digit numbers as required.

Visual Message Waiting Indication

VMWI (Visual Message Waiting Indication) is a FSK signal issued by the Central Office when a customer has a recorded voice message waiting to be retrieved. This FSK burst is an on-hook signal that is sent after an OSI (Open Switching Interval), which is a period of silence after some action. The TLS-3B can be used to simulate the VMWI signal by going off-hook on one of the lines and entering *50 to activate VMWI or *51 to de-activate VMWI for the other line.



Note: Different manufacturers Caller ID equipment react differently to this signal. See your equipment manual for details.

*50 = Activates VMWI

*51 = De-activates VMWI

PROGRAMMING THE TLS-3B

The TLS-3B has a long list of features and functions, which a user can configure from a touchtone telephone connected to either line. The TLS-3B stores two separate configurations in memory. This enables, for example, two separate groups (such as Engineering and Sales) to set up and use the TLS-3B for their applications. When programming and using Setup 1, the Power LED blinks once. When programming and using Setup 2, the Power LED blinks twice.

All programming commands begin with an asterisk (*) and end with a pound sign (#). You can cancel a command before it is complete, by entering an asterisk before the final pound sign. In some cases, a second asterisk may be necessary to cancel the command. The response from the TLS-3B is three short tones.

Many commands either enable or disable specific functions in the TLS-3B. In all of these commands, 0 disables the function, and 1 enables it. For example, the command *10#0# disables the hook-flash detect function. *10#1# enables the hook-flash detect function.

Commands are broken into two types:

- System Commands affect both lines.
- Individual Line Commands affect only the line being programmed.

While programming a line, its LED blinks on and off at a slow rate indicating programming mode.

Off-Hook Mode

The off-hook mode specifies what you hear when you lift the receiver on one of the telephones connected to the TLS-3B. The three off-hook modes are Normal, which provides dial tone; Ringdown, which causes the other telephone to ring; and Silence, which connects the telephone to silence. The Normal mode is the default. Use one of these commands to set the Off-Hook Mode:

| | |
|-----------------------------|------------------|
| Normal (dial tone) | *32#0# (default) |
| Ringdown | |
| --Primary Ringing Cadence | *32#1# |
| --Secondary Ringing Cadence | *32#2# |
| Silence | *32#3# |

Caller ID Format

This command specifies the type of Caller ID/Visual Message Waiting Indicator (VMWI) message format the currently selected line will use. This option is controlled by the called line.

| | |
|-------------------------|------------------|
| No Caller ID/VMWI | *50#0# |
| Single Message Format | *50#1# |
| Multiple Message Format | *50#2# (default) |

Caller ID Names

This command selects the Caller ID name that the calling line will send. This option is controlled by the calling line.

| | |
|---|------------------|
| Line 1: Clinton Bob / Line 2: Reagan Rick | *51#0# |
| Line 1: Montana Jim / Line 2: Marino Jim | *51#1# |
| Line 1: Anderson Allen / Line 2: Jones Jennifer | *51#2# (default) |
| Sequence through all names and numbers | *51#3# |

WARRANTY AND SERVICE

Warranty Information

Teltone warrants this product to be free from defects in material and workmanship for a period of one year, given proper installation and usage. At its sole discretion, Teltone will repair or replace free of charge any unit found to be defective during the warranty period. Units found defective beyond the warranty period will be repaired or replaced at a flat rate.

Return Procedures

If a unit is found to be defective, contact Teltone customer service to obtain a RMA (Return Material Authorization) number and shipping instructions. When returning units, provide the following information:

- Unit model number, unit part number, and serial number (obtained from the Unit ID label on the bottom of the unit).
- Teltone RMA number
- All available fault information
- Complete shipping and billing address
- Repair purchase order

Technical Assistance

For technical assistance on this product, call Teltone technical support at 425-951-3390 or send an email to support@teltone.com.

SPECIFICATIONS

Signaling

| | |
|----------------------------|--|
| Ring Frequency | 20 or 25 Hz |
| Ring Wave Form | Rounded square wave |
| Dial Tone Delay | 0 - 511 mS in 100 mS increments. Default = 100 mS |
| Network Response Delay | 0 - 511 mS in 100 mS increments. Default = 200 mS |
| Line Attenuation | -6 or -16 dB |
| Call Progress Signals | |
| Dial Tone | 350 + 440 Hz continuous |
| Ringback | 440 + 480 Hz follows ringing cadence |
| Busy | 480 + 620 Hz 500 ms on/500 ms off |
| Reorder | 480 + 620 Hz 250 ms on/250 ms off |
| Tone Output Level | -19 dBm nominal w/low attenuation -24 dBm nominal w/high attenuation |
| Forced Disconnect Duration | 850 mS ±25 ms |
| Line Impedance | 900 Ω ±20% |
| Dialing Requirements | |
| Rotary | 8 - 12 pps |
| DTMF Tone On/Off | >40 ms |
| On/Off-Hook Detect | <6 mA = on-hook >18 mA = off-hook |
| Off-Hook Loop Current | >25 mA with 400 Ω total loop resistance |
| On-Hook Detect | >400 mS (switchhook flash disabled) >1100 mS (switchhook flash enabled) |

Caller ID/VMWI

Operation is per guidelines set in Bellcore Document TR-NWT-000030, Issue 2, Oct 92

| | |
|-------------------|------------------|
| Output Level | |
| Low Attenuation | -17 dBm +3/-4 dB |
| High Attenuation | -28 dBm +3/-4 dB |
| Transmission Rate | 1200 ±12 baud |
| Mark (Logic 1) | 1200 Hz ±12 Hz |
| Space (Logic 0) | 2200 Hz ±22 Hz |

Visual Message Waiting Indicator (VMWI) will operate as specified in Bellcore Document TR-NWT-001401, Issue 1, Sept 93 and FSD 01-02-2000.

Electrical

| | |
|-----------------|--------------------------------|
| Power Input | 24 VDC nominal, 500 mA minimum |
| On hook Voltage | -42 VDC nominal |
| Ringing Voltage | ≥ 50 VAC RMS @ 20 Hz, @ 3 REN |

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Physical Dimensions

| | |
|--------|--------------------|
| Size | 5.5 x 1.5 x 9.0 in |
| Weight | 1 lb 5 oz |

Environmental

| | |
|-----------------------|---|
| Operating Temperature | 0°C to +50°C @ 95% humidity, non-condensing |
| Storage Temperature | -20°C to +60°C long term |

Regulatory Compliance

| | |
|---------------|----------------------|
| EMC | |
| United States | FCC Part 15, Class A |

SUMMARY OF PROGRAMMING COMMANDS

System Commands

| Command Name | Command | Notes |
|--|---|---|
| Programming Mode Setup 1 Setup 2 | **99## **98## | |
| Reset to Factory Defaults | *00#0#*00#0# | |
| Tone Following Disconnect | *04#X# | Dial Tone (default) X=0 Busy Signal X=1 Reorder Signal X=2 Silence X=3 |
| Forced Disconnect Duration (COD) | *05#time# | Range = 0 to 100 in 50 mS steps (100 = 5 seconds). 850 mS (default), i.e. *05#17#. |
| Cutoff on Disconnect Delay | *06#time# | Range = 11 to 200 in 100 ms steps. Factory default is 2 seconds, i.e. *06#20#. |
| Ringing Frequency | *07#X# | 20 Hz X = 0 (default) 25 Hz X = 1 |
| Hook-flash Detect | *10#X# | Disable X = 0 (default) Enable X = 1 |
| Line Attenuation | *09#X# | X = 0 attenuation = -6 dB (default) X = 1 attenuation = -16 dB |
| Test Numbers Dial Tone Busy Signal Reorder Tone Ringback Tone Silence | *60#number# *61#number# *62#number# *63#number# *64#number# | Valid digits are 0-9. Default = 83781 (Test 1) Default = 83782 (Test 2) Default = 83783 (Test 3) Default = 83784 (Test 4) Default = 83785 (Test 5) |

Individual Line Commands

| Command Name | Command | Notes |
|---|--|---|
| Select Line 1 | *01# | |
| Select Line 2 | *02# | |
| Primary Telephone Number | *11#number# | Range = 0-16 digits. Factory default primary number for Line 1 is 101, and for Line 2 is 102. |
| Secondary Telephone Number | *12#number# | Range = 0-16 digits. Factory default secondary number for Line 1 is 201, and for Line 2 is 202. |
| Second Dial Tone Number | *13#number# | Range = 0-16 digits Valid numbers are 0-9. Factory default is 711. |
| Dial Tone Delay | *20#time# | Range = 0 to 511 in 100 mS increments. Factory default is 100 mS. |
| Network Response Delay | *21#time# | Range = 0-511 in 100 mS increments. Factory default is 200 mS. |
| Second Dial Tone Delay | *22#time# | Range = 0-255 in 100 mS increments. Factory default is 500 mS. |
| Secondary Number Ring Cadence | *23#x#y#x#y#x#y# | Default is 800 ms on, 400 ms off, 800 ms on, and 4000 ms off. Factory default is *23#8#4#8#40#0#0# . |
| Busy Signal | *30#X# | Busy Signal X = 0 (default) Reorder Tone X = 1 |
| Non-Valid Number Signal | *31#X# | Busy Signal X = 0 Reorder Tone (default) X = 1 |
| Off-Hook Mode | *32#X# | Normal (dial tone) X = 0 (default) Ringdown Primary # X = 1 Ringdown Secondary # X = 2 Silence X = 3 |
| Caller ID/VMWI Format | *50#X# | None X=0 Single Message Format X = 1 Multiple Message Format X=2 (default) |
| Caller ID Names Line 1:Clinton Bob/Line 2:Reagan Rick Line 1:Montana Jim/Line 2:Marino Don Line 1:Anderson Allen/Line 2:Jones Jennifer Sequence through all names and numbers | *51#0# *51#1# *52#2# (default) *51#3# | |