

24/48 Channel T-1 Logger



Installation Guide

Features

- Provides 48 channels of digital T-1 recording in “loop” mode when connected to a PBX.
- Digitally combines East and West audio for 24 channel recording.
- Easily adjustable line format. Support for AMI, B8ZS, and most common T-1 formats.
- Support for fractional T-1 (F-T-1) with individual channel disabling.
- Hi-Z tap module for quick RJ-48 bridging of outside trunk lines.
- Digital signatures with the time, date, and recording details are included in audio files.
- Easy Plug and Play USB configuration.
- Maximum recording length can be set to split large files into easily manipulated sections.
- Maximum disk usage can be limited on a per-line basis to conserve disk space.
- Evidence Builder software analyzes Touch-Tones (DTMF), DID signaling, and Caller-ID information.

Requirements

- A **dedicated** PC is recommended, due to the high CPU usage required for real-time audio.
- A 2GHz or faster processor with 4GB or more of RAM.
- Windows XP or newer. Windows Server 2003 or newer.
- A USB 2.0 or 3.0 port. A dedicated USB controller is recommended.
- You’ll need to know the line code and format of the attached T-1 lines.

Quick Installation

1. Run windows update from to ensure you have the latest USB drivers
2. When bridging an outside T-1 span, use the T-1 Tapper to combine East and West sides of the line.
3. When looping T-1 spans on a PBX, run two separate cables directly to the logger and loop them back to the PBX. The T-1 Tapper isn’t used in this configuration.
4. Insert the CD and install the logging application.
5. Select the T-1 line type and code.
6. Run the “Logger Config” to allocate hard disk space to each line.
7. Attach the USB cable to a dedicated PC. Connect directly to a primary USB 2.0 port, not to a hub. We recommend that the logger is the only external USB device attached to your PC. Once attached, the USB configuration on this PC should not be changed. *The logger is a high-speed USB 2.0 device, running at 480Mbps. USB 1.1 ports will not work with this device. Beware of USB 1.1 cables which may cause errors. Use both a USB 2.0 High Speed cable and port. USB extenders and cables longer than the 3 meter USB specification are not recommended.*
8. Shut down the PC. Connect the power adapter to the 5V jack on the logger. Switch the PC power on *after* powering the logger.
9. Restart the PC. Install the drivers as prompted. Start the logging application.

10. Click on each line name to listen to recordings and verify audio quality using Windows Media Player.
11. Map a network drive to the workstations used for playback. Use Windows file system security to limit access to authorized individuals.
12. Install “Evidence Builder” software on playback workstations. This program allows you to scan recordings and catalog calls by DTMF and Caller-ID.
13. Install “Real Time Player” as needed for remote monitoring.
14. Install “Call Detail Recorder” if desired for SMDR, ANI, or ALI recording from RS-232 sources.

Included Hardware

The hardware installation kit includes:

- Qty 1 – T-1 Tapper – Provides a Hi-Z East and West tap in 24 channel mode.
- Qty 1 – T-1 USB 2.0 Audio Logger
- Qty 1 – USB 2.0 “A” to USB “B” high-speed cable – Connects host PC to Logger.
- Qty 1 – Short RJ-45 Cable – Connects CPE to Tapper in 24 channel mode.
- Qty 2 – Long RJ-45 Cables – Connect between to Tapper or PBX.
- Qty 1 – 5 volt regulated power supply.

Optional Installation Accessories

Call (408) 330-5599 for a full line of installation accessories, including:

- Channel Banks, FXO and FXS, from \$295.
- Punchdown blocks, adapters, and T1 cabling.
- T1 Test Sets, both new and refurbished.



Cabling the Logger

Power

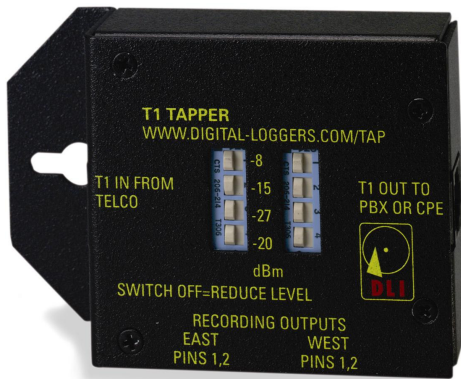
Confirm that the input voltage matches your power line. Plug the adapter into an outlet and attach the cable end into the jack marked ‘Power’ on the logger. The LEDs may not illuminate until the logger is activated and a USB connection is established.

USB 2.0 to PC connection

Connect the USB cable between the PC and the logger –***after software installation***-. The USB cable provided has a rectangular “Type A” plug on one end and a square “Type B” connector on the other. The square connector is the only connector that can be plugged into the logger. You must connect this cable to a high-speed USB 2.0 480Mbps port. The logger will not function with slower 11Mbps USB 1.1 ports.

Connection in 24-Channel “Combine” Mode

The T-1 logger supports two configurations, “Combine” and “Separate”. Use the “Combine” mode with the T-1 Tapper to bridge an outside T-1 span. This mode monitors all traffic on a T-1 line without terminating it. The Tapper provides a “high-Z” connection, which will not load the line.



To set up combine mode, first select an input level. The default level of -20dBm will work fine in most installations. For -20, set switches 1,2, and 3 Off, and switch 4 On. On is to the right, Off is to the left when looking at the front of the T-1 Tapper.

Next, attach the outside T-1 line (from the demark) to the left side of the tapper. The short red RJ-45 is ideal for between the Demark and the Tapper.

Attach the existing PBX cable to the right side of the tapper.

Allow time for the T-1 line to resync, then check the PBX for normal operation before continuing.

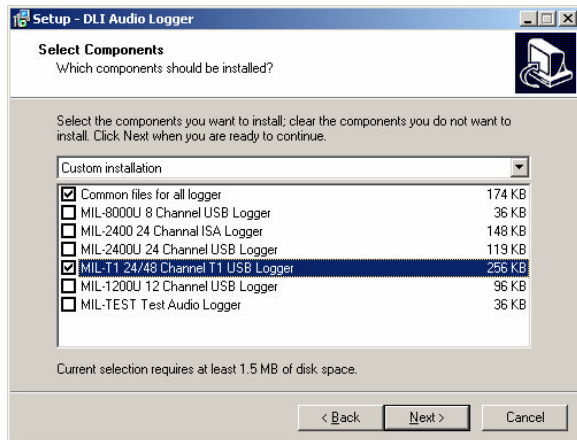
Next, connect the East and West outputs of the T-1 Tapper to the DS1 inputs on the logger. Two longer RJ-45 cables, such as the yellow cables provided can be used. Recheck the PBX, then proceed with software installation.

Connection in 48-Channel “Separate Recording” Mode

In 48 Channel mode, the PBX must first be “looped”. To do this, connect the East and West sides of the PBX T-1 line together. Then, bridge the loop to the logger with a short cable. The input to the logger is pins 1 and 2 of the RJ-48. The T-1 Tapper is not used in 48-channel mode. In this mode, the PBX must be programmed to cross connect a specified speech path (ie. Bob’s Extension) to a corresponding timeslot on the T-1. PBX programming is required to direct each speech path to one of the 48 available channels.

Software Installation

We highly recommend running a Microsoft Windows update before software.



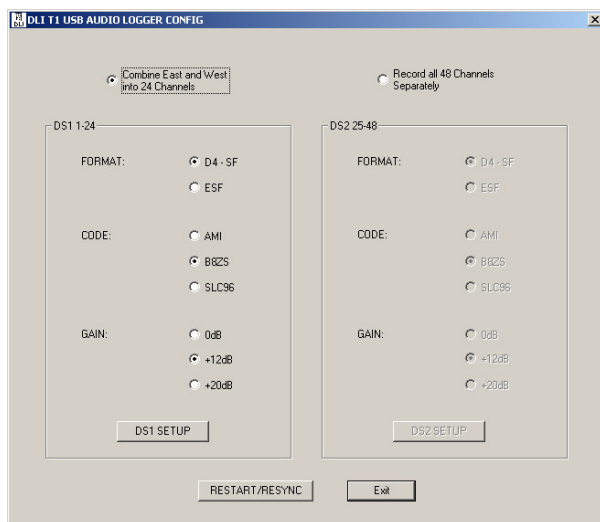
After updating, insert the logger installation CD into your CD-ROM drive. Installation starts automatically. Select the installation directory and shortcut name.

The default components “T-1 USB Logger” and “Common Files” should be checked. Click “Next”.

To starting recording automatically after login, check ‘Start Logging Automatically’. If a machine is left unattended, this ensures uninterrupted operation in the event of a power failure and subsequent reboot.

Setup will complete automatically. Click “Finish”.

T-1 Format and Line Code Configuration



After installing the drivers, this window appears. First, select the operating mode for the logger, either “Combine East and West” or “Record all 48 Channels Separately”.

If you are combining channels, the format of each channel is the same, so the options on the right are grayed out.

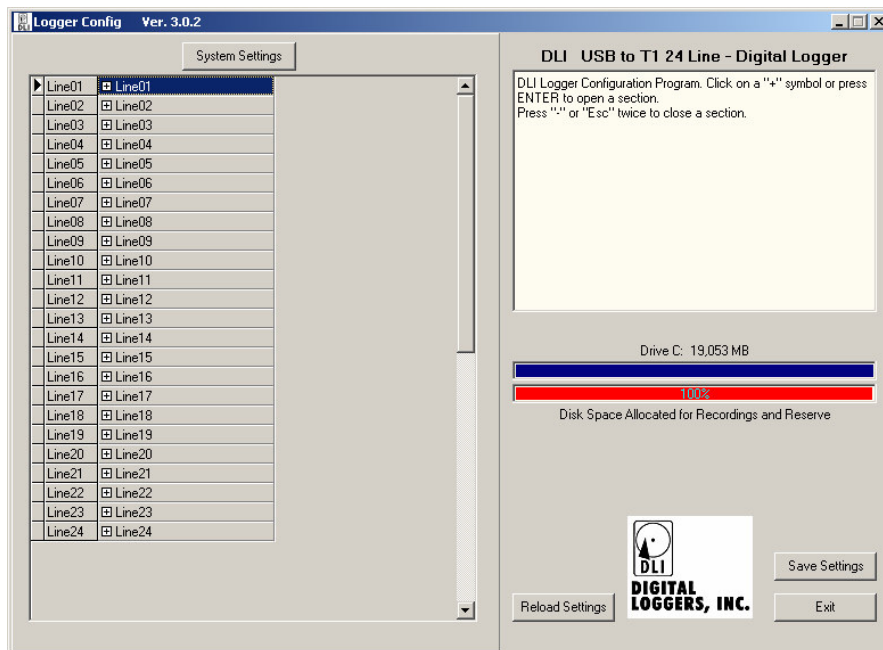
When recording in “Separate” mode, each T-1 may be set to a different mode, line code, and input gain level.

Set FORMAT to D4 or ESF to match the T-1. Set CODE to match the T-1 line code.

A default gain of +12dBx is fine if you are using the T-1 Tapper. Set the gain to 0dBx if you are looping from a PBX. Additional gain may be added for longer cable runs.

After the line types are set correctly, press “DS1 Setup” to configure the recording directories for each of the 24 timeslots as shown below. In 48 channel mode, a DS2 button appears for channels 25-48, which correspond to channels 1-24 on the second T-1. When you are finished configuring, press “Exit”.

Channel Configuration



Each timeslot corresponds to one recording channel. By default, the first T-1 has timeslots named “Line01” to “Line24”.

When recording separately, the second T-1 has timeslots named “Line25” to “Line48”.

In “combine” mode, audio from both East and West sides is digitally combined into timeslots named “Line01” to “Line24”.

To change the recording

properties for a particular timeslot, click a the small + symbol to the left of the line name. The settings for that channel are displayed.

The most important settings are:

Record Trigger Mode

Set this to **VOX** for normal operation. Choose **Disable** if this timeslot is not occupied (on a fractional T-1, for example).

Line Name

Choose “Bob’s Desk” or a similar name if you have a time slot assigned to a single speech path in your PBX. If you have a particular phone number assigned to that timeslot, it may be useful to include the number in the line name, such as “DLI Main Hunt Group (408) 330-5599”. If you are recording from an outside trunk, a separate program will allow you to search by Caller-ID or DTMF signaling after recording. *Since this Line Name will be used as a recording directory, be careful not to include characters disallowed in file names, such as “/” “,” or “\”.*

Maximum Megabytes

The logger can automatically delete old calls to conserve the disk space used by each channel. This setting controls the maximum amount of disk space used by each channel. Oldest calls are automatically deleted to free disk space. To turn this feature off (not recommended), set this field to “0”. If you specify a maximum, the logger will check disk space periodically. If recording size exceeds your setting, the logger will automatically delete files starting with the oldest day. The logger will continue deleting calls until disk usage reaches the setting. It’s important to set this so that the total space used does not exceed the available disk space.

Host PC USB Connection



After installing the software and setting the line configuration, connect the USB cable between the PC and the logger.

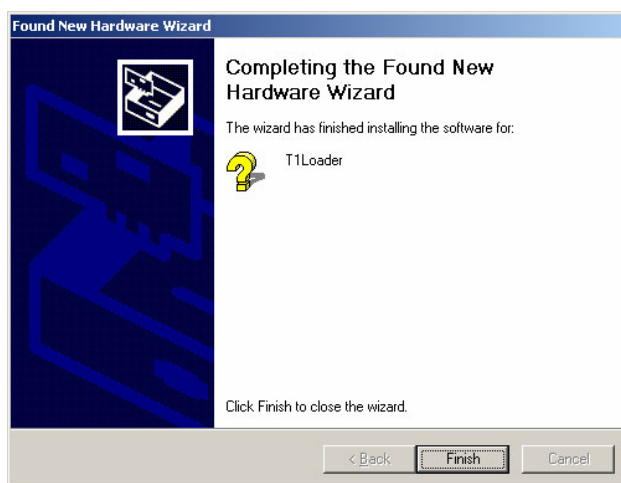
Important note: *Not all USB cables are created equally. Make sure you’re using a USB 2.0 High-Speed cable rated for 480Mbps to ensure reliable operation.*

On most systems, this message window will appear.

Click “No, not this time”, and press “Next” to continue.

Windows will locate the driver installed from CD.

On the next screen, select “Install the software automatically”, and press “Next”.

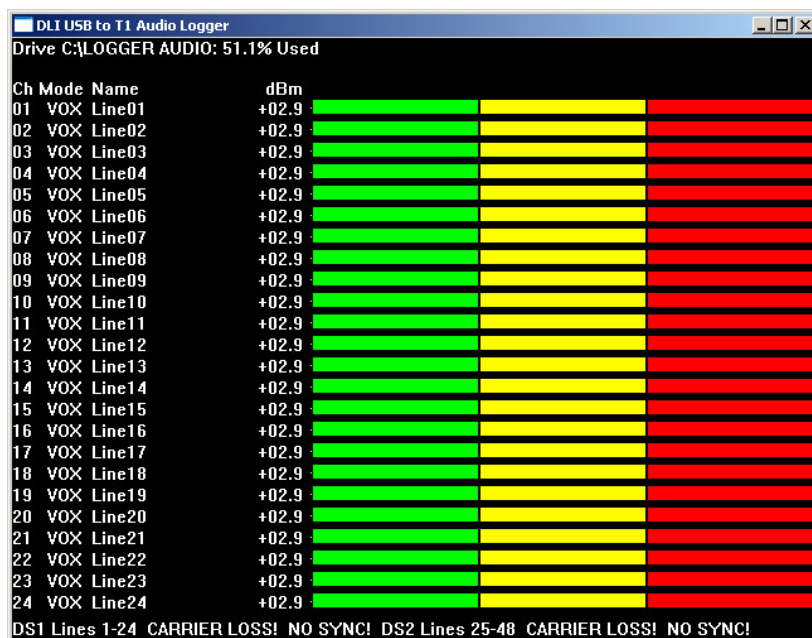


After drivers are installed, this message appears. Click “Finish”, and click on the icon to start the logger.

On some systems, this Windows process of loading drivers may repeat twice. Also, a system reboot may be necessary at this point.

Using the Logger

Click on the DLI Audio Logger icon to start the application. The main screen appears:



In “combine” mode, each line has a separate VU meter, which shows the recording level on that line.

In “separate” mode, 48 VU levels are displayed, but VU bars are not present.

The recording mode for each line (for example VOX or OFF) is displayed to the left of the line name.

Click on the line name to explore the recordings for that line.

The bottom of the screen shows Carrier Loss and Sync Loss warnings if the T-1 connection is interrupted or received levels are too low.

The ‘Explore Calls’ Function

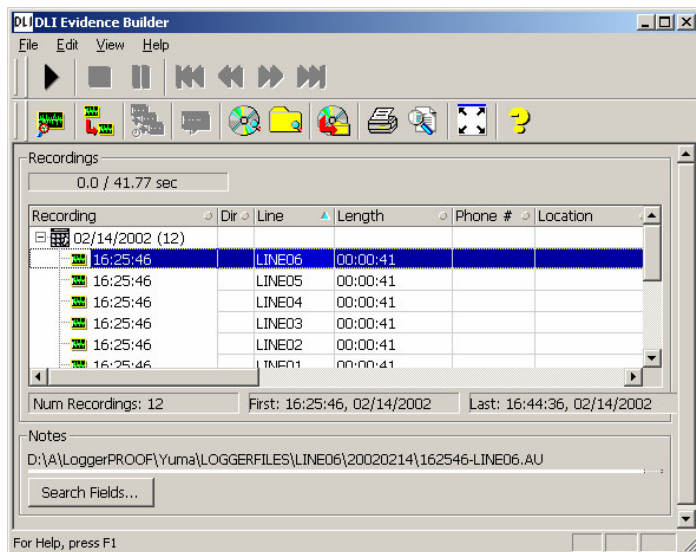
Click on the line name to explore the recording directory for that line. Each line is stored in a separate folder, and each day is stored in a subfolder. The file names correspond to the recording start time. From here, you can edit, copy, or transfer files using Windows Explorer by clicking the right mouse button.

Status LEDs

When both inputs to the logger are properly configured, two green LEDs illuminate near the input jacks. When the logger is ready to record, the two green LEDs near the T-1 lines flash. If a sync error is detected by the internal framer, the corresponding LED turns yellow.

When the USB connection is properly established and the driver is running, a third green LED illuminates near the USB jack.

Evidence Builder Software

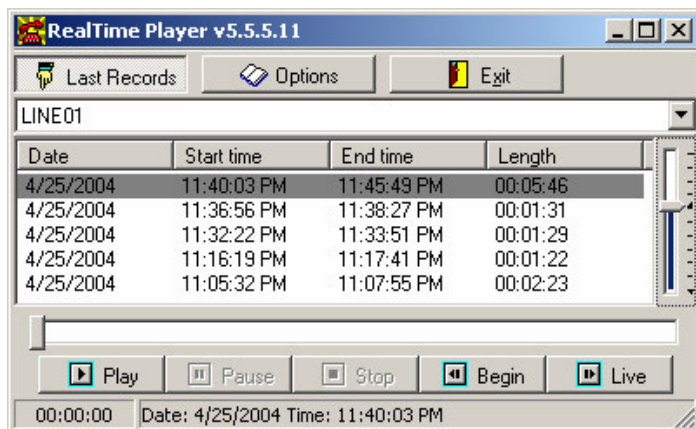


Evidence Builder Software (or the commercial version, known as Call Analysis Software) is provided free on a separate CD. Load this on a workstation and point it at the recording directories to analyze incoming calls, create call lists, sort calls, and search by DID.

To catalog files from a remote server, first map this drive to your workstation. Be sure to use proper security.

Next, choose the “Catalog Files From Hard Drive” button and select the recording directory.

Remote Monitoring of Live Audio

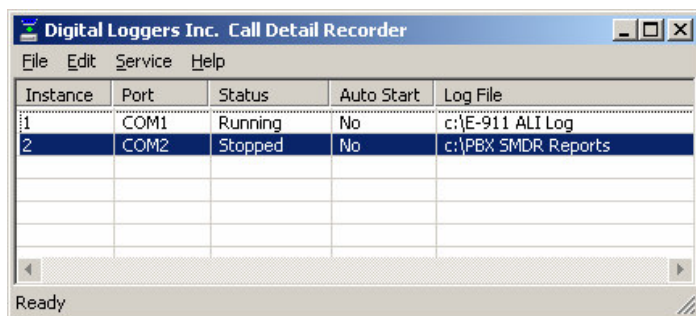


Anyone with remote access to the recording directory on the file server may monitor calls. An application called Real Time Player is provided on the workstation CD. Download this from www.digital-loggers.com/rtp.exe

To remotely monitor calls, load the Real Time Player application on a workstation. Click on “options”. Use the browse button to select a source directory with archived or incoming calls. Live calls will be highlighted. Select a call and press

“play”, or press “live” to continuously monitor calls. Windows security may be used to selectively control access to specific lines.

Recording SMDR, ANI, and ALI Streams



ANI, ALI, or SMDR data streams may be logged using our call detail recorder utility. This utility logs up to 8 RS-232 serial ports simultaneously. Download this utility from:
www.digital-loggers.com/cdr.exe

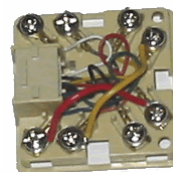
Frequently Asked Questions

Amber LEDs illuminate over the DS1 connections. Why?

First, check your T-1 line code and format settings. They must exactly match the line you're connected to. When running in 48-channel mode, make sure that a loopback has been properly installed.

How can I loop a T-1?

This can be done in software or hardware, either internally to the PBX or CSU/DSU. To do this in hardware just tie the transmit and receive pairs together. On an RJ-48, this means pins 1 and 2 connect to pins 4 and 5. In other words, the East output is sent from a PBX on pins 1 and 2. The West input is received on pins 4 and 5. Both DS1 ports on the logger receive on pins 1 and 2. The easiest way to do this is by placing two small jumpers within your RJ-48 jack. A CSU/DSU isn't necessary. You can also bridge across loopback plug.



What kind of T-1 lines are supported?

The logger supports all US standard T-1 lines as well as Japanese formats. AMI, B8ZS, SF, ESF line codes are supported. FT-1 lines will work fine. For FT-1, just disable logging on data channels and unused channels.

How many channels can I record?

Since the logger has two T-1 framers, you can record up to 48 channels. If you have a PBX programmed to output audio via a T-1 card, each of the 48 channels can be recorded individually. PBX programming is required to use this mode. If you are bridging an outside T-1 span in half-duplex "Combine" mode, you can combine the audio from the East and West sides of the line automatically. In this configuration, you'll record 24 channels. No PBX configuration is required in "Combine" mode.

How many T-1 loggers can I connect per PC?

One per server (a maximum of 48 lines) with the basic software package.

Is FT-1 supported? How can I select a particular DID channel from within a T-1 line?

When bridging an outside T-1 line, you can individually select the timeslots you'd like to record. Fractional T-1s are supported by disabling the unused timeslots. If you have DID speech paths to individual timeslots, these DIDs are recorded in separate directories by default. If you have a "supertrunk" T-1 with more DIDs than timeslots, you first record all pertinent time slots. After recording, you can select specific DIDs for review and replay by using our Evidence Builder software. This program is included free with T-1 loggers.

Support

Please visit www.digital-loggers.com for more frequently asked questions, free driver updates, manuals and accessories. If we haven't answered your questions here, please call (408) 330-5599 or send an email to support@digital-loggers.com. We'll be glad to help.

