

24/48 Channel T-1 / PRI Logger



Installation Guide

Features

- Provides 48 channels of digital T-1 or ISDN PRI recording in “loop” mode when connected to a PBX.
- Digitally combines East and West audio for 24 channel recording of both sides of a T-1 or PRI line.
- Easily adjustable line format. Support for AMI, B8ZS, and most common T-1 formats.
- Support for fractional T-1 (FT-1) with individual channel disabling.
- Hi-Z tap module with adjustable attenuation quickly bridges trunk lines using RJ-48 connectors.
- Digital signatures with the time, date, and recording details are included in audio files.
- Easy Plug and Play USB configuration under Windows 2000, 2003, and XP .
- 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 D-Channel, 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 2-GHz or faster processor with 1GB or more of RAM.
- Windows 2003, Windows XP, Windows Vista or Windows Server 2008.
- Windows 2000 is not recommended.
- A free USB 480Mbps 2.0 port. *Slower USB 1.1 ports are not supported*
- You’ll need to know the line code and format of the attached T-1 or PRI lines.

Quick Installation

1. Run windows update from windowsupdate.microsoft.com to ensure you have the latest USB drivers available from Microsoft. This is particularly important under Windows 2000.
2. When bridging a 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.

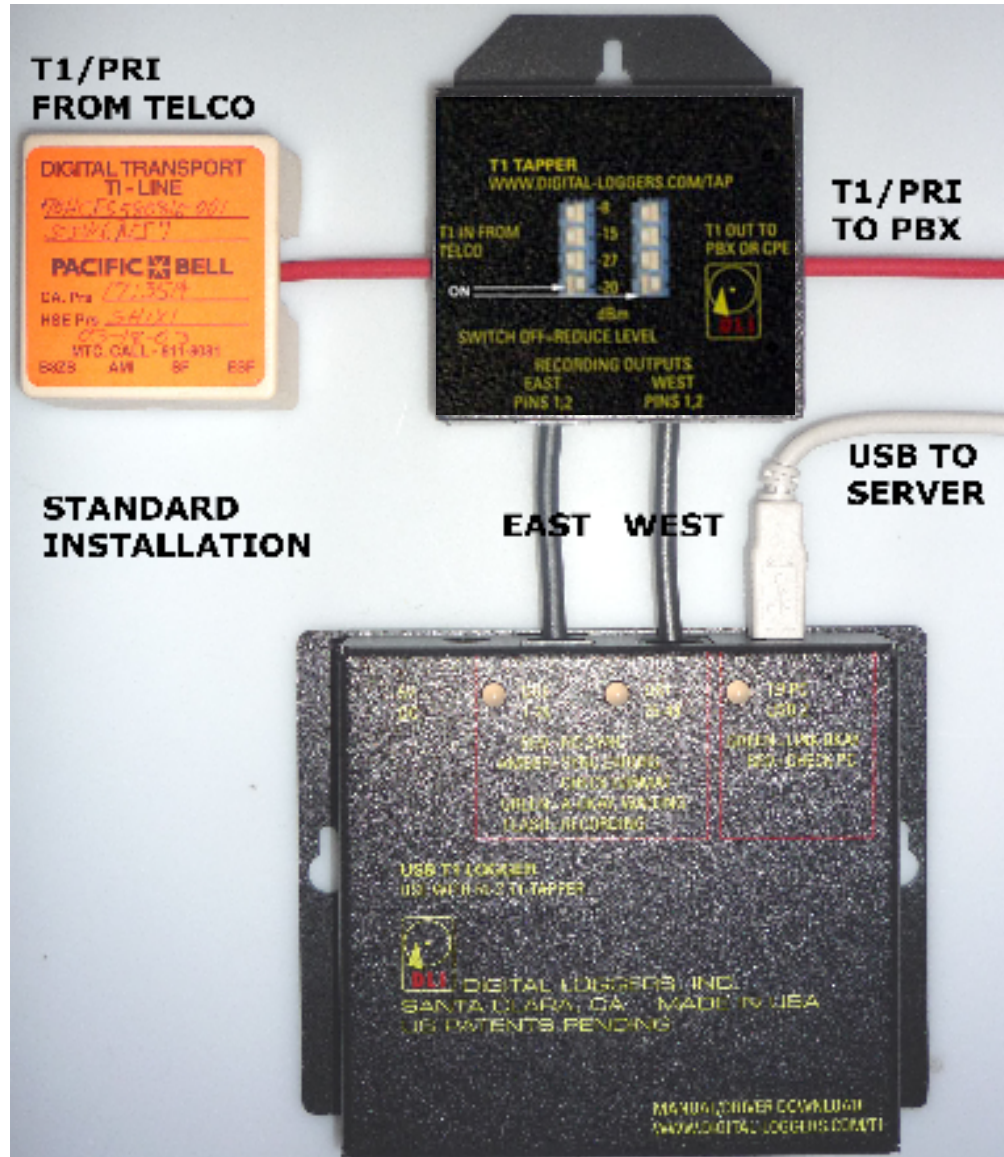
USB 2.0 to PC connection

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.

Cabling the Logger

T-1/PRI (Standard Installation, “Combine Mode”)

Standard installation provides 24 channels of recording and combination of digital “East” and “West” audio. Mount the T-1 Tapper near the Telco RJ demark jack. Warn users before disconnecting the T-1/PRI. Connect the red cable between the Telco RJ demark jack and the left side of the T-1 Tapper. Connect the existing cable to the PBX on the right side of the T-1 Tapper. Allow time for the T-1 line to resync, then check the PBX for normal operation before continuing.



Connect the black East and West cables between the T-1 Tapper and the T-1 Logger. Allow time for the T-1 line to resync, then re-check the PBX for normal operation. If a service interruption occurs after the logger is attached, decrease the level by switching to a lower level setting on the T-1 Tapper. The default setting of -20dBm works well in most applications. Be sure to select “combine mode” during installation for this cabling configuration.

T-1/PRI (Advanced Installation, “Separate Mode”)

Advanced installation in separate mode provides 48 channels of recording when connected to two dedicated T-1 ports on a PBX. This mode cannot be used to record calls between the PBX and the Telco. In this mode, the PBX line 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 software gain boost option should be set to 0dBm in separate mode.

“Separate mode” installation is only possible when a T-1 can be looped. Generating the audio stream generally requires PBX reprogramming. Audio paths must be created within the PBX from the recording sources to timeslots on the looped lines. Programming is required to direct each speech path to one of the 48 available timeslots.

After bridging looped lines, Recheck the PBX and proceed with driver installation selecting “separate mode” on the T-1 configuration page.

Power and USB Cabling

Power

The adapter is autosensing 100-240VAC, 50/60Hz. 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. Do not power up the logger until after driver installation has completed.

USB 2.0 to PC connection

Connect the USB cable between the PC and the logger only after completing software installation described below. 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.

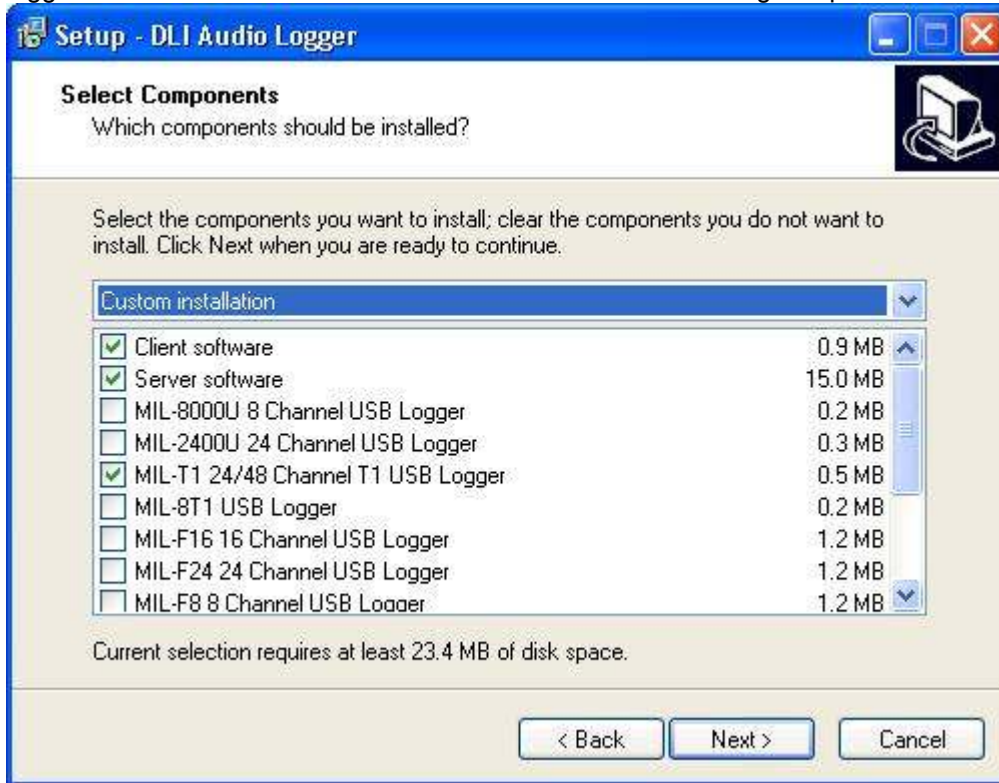
INSTALLING THE DLI LOGGER SERVICE VER. 3.0.x

Before installing, please note that Microsoft DOT Net Framework 2.0 is required.

<http://www.microsoft.com/downloads/details.aspx?FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5&displaylang=en>

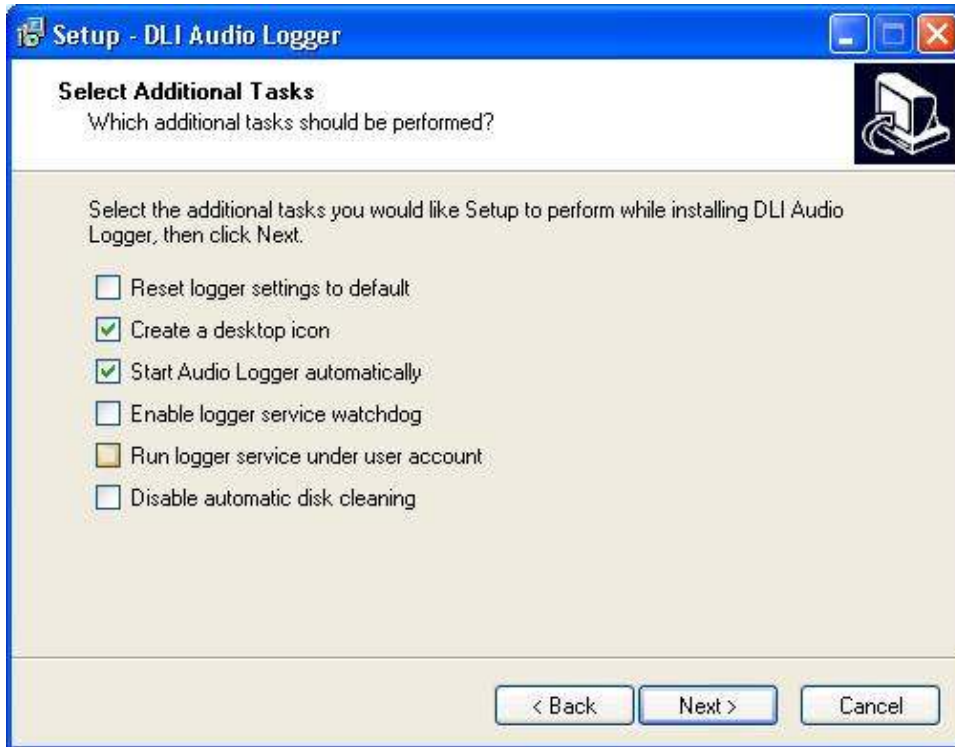
Install the Service software:

Select Server Software, Client Software and MIL-xxxx Logger software, where the -xxx is the model of your logger. Both Client and Server must be installed on the recording computer.



At least **three** items must be checked on a recording system.

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Reset logger settings to default: Any settings previously set will be overwritten with default settings.

Create a desktop icon: This will create icons on the desktop for your convenience.

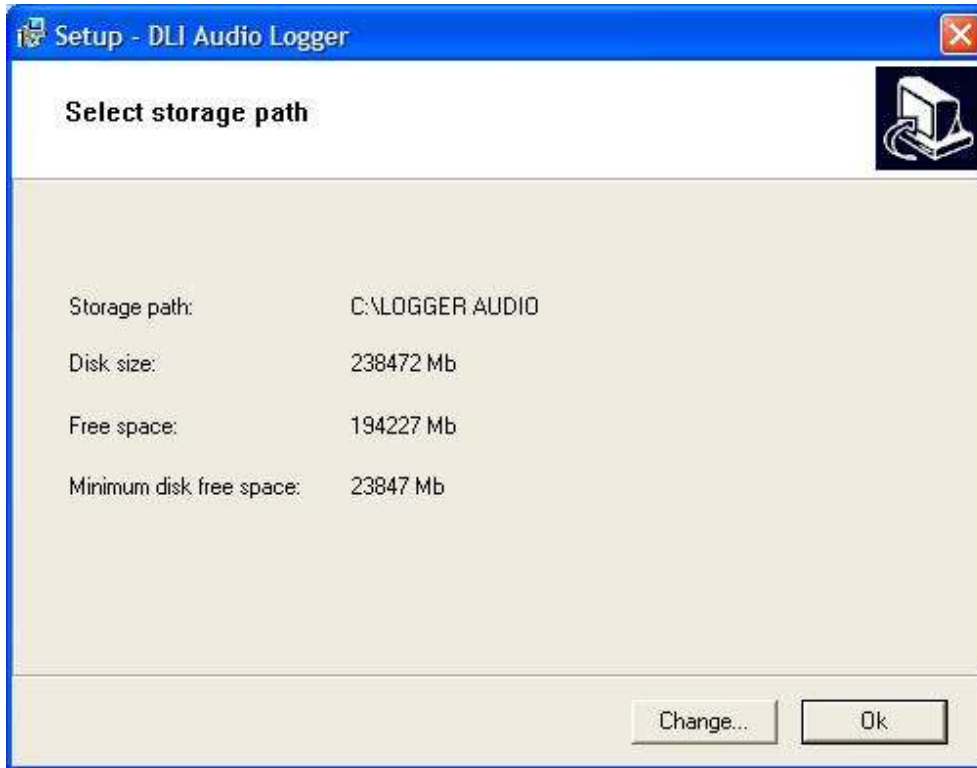
Start Audio Logger automatically: The logger will run immediately after installing and automatically when the computer starts.

Enable logger service watchdog: A service that ensures that the services start and keep running. **Required if recording to a network drive.**

Run logger service under user account: **Required if recording to a network drive.** While this is not recommended, it is possible on a good performing network. Note: Username must be entered as **Domain\Username**. The user name must have local administrator rights to the local computer and full network permissions* to the shared directory on the server.

Disable automatic disk cleaning: This disables the automatic purging of old recordings. You must ensure that the disk does not run out of space if this option is selected.

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Select the drive to where you would like the recordings stored.

*If recording to a network drive, the path must be in a UNC format: [\\Server\SharedDirectory](#). Be sure that the user account has full permissions to the shared directory.

During installation, windows will open and close, this is normal.

A screenshot of a Windows command prompt window. The title bar shows the file path: "file:///C:/WINDOWS/Microsoft.NET/Framework/v2.0.50727/InstallUtil.exe". The window contains the following text:

```
Microsoft (R) .NET Framework Installation utility Version 2.0.50727.832
Copyright (c) Microsoft Corporation. All rights reserved.

Running a transacted installation.

Beginning the Install phase of the installation.
See the contents of the log file for the C:\Program Files\Digital Loggers Inc\DL
I Audio Logger\Integration Utility\EventService\DliEvent.exe assembly's progress
.
The file is located at C:\Program Files\Digital Loggers Inc\DLI Audio Logger\Int
egration Utility\EventService\DliEvent.InstallLog.
Installing assembly 'C:\Program Files\Digital Loggers Inc\DLI Audio Logger\Integ
ration Utility\EventService\DliEvent.exe'.
Affected parameters are:
  logtoconsole =
  assemblypath = C:\Program Files\Digital Loggers Inc\DLI Audio Logger\Integrat
ion Utility\EventService\DliEvent.exe
  logfile = C:\Program Files\Digital Loggers Inc\DLI Audio Logger\Integration U
tility\EventService\DliEvent.InstallLog
Installing service DliEventWinService...
Service DliEventWinService has been successfully installed.
Creating EventLog source DliEventWinService in log Application...
```

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Plug your logger in and power on your device. Some devices will cause the Windows hardware wizard to run. (This may be automatically handled on Windows Vista or Windows Server 2008)

Select No if the wizard offers to connect to Windows Update to search for software.



Let Windows install the drivers automatically.



Note: The hardware wizard may appear multiple times, depending on your logger model. Let each installation complete completely.

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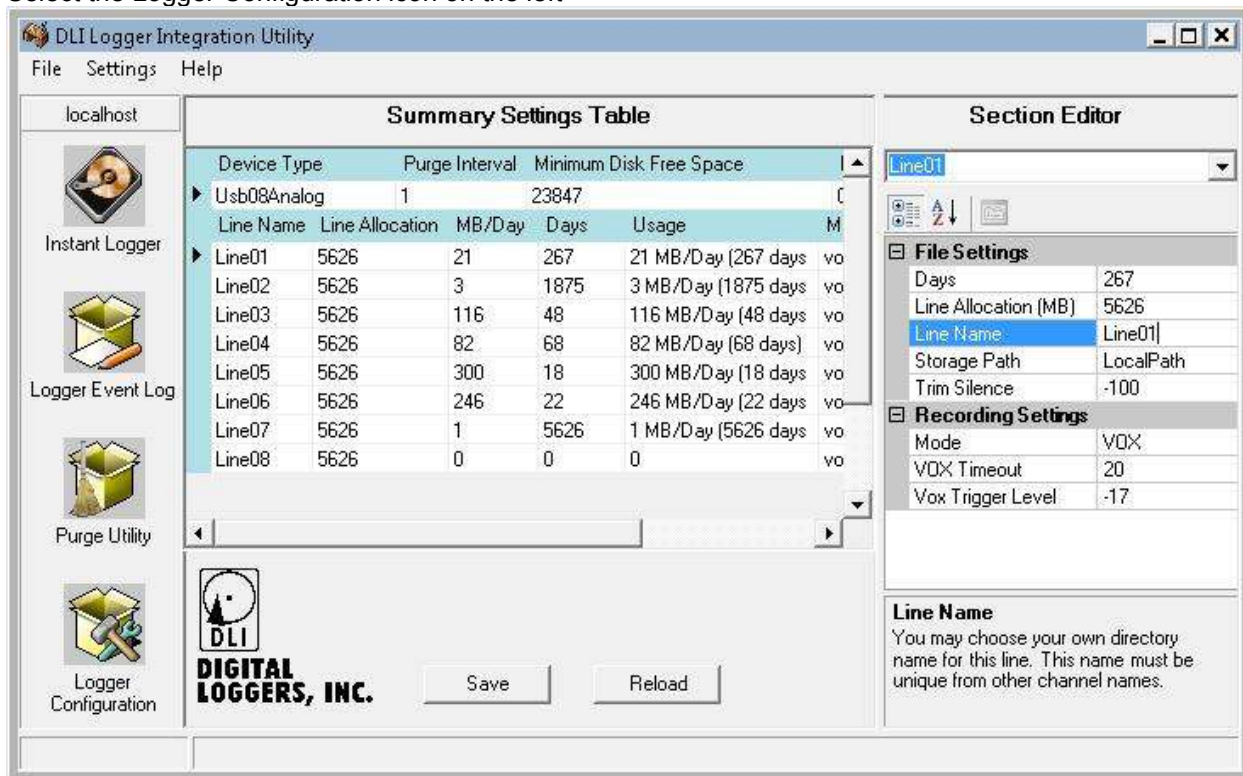
Start the DLI Service Manager and verify that the services are running. If not, start them by clicking the *Start All* button.



Verify that the Integration Utility shows that everything is ok.



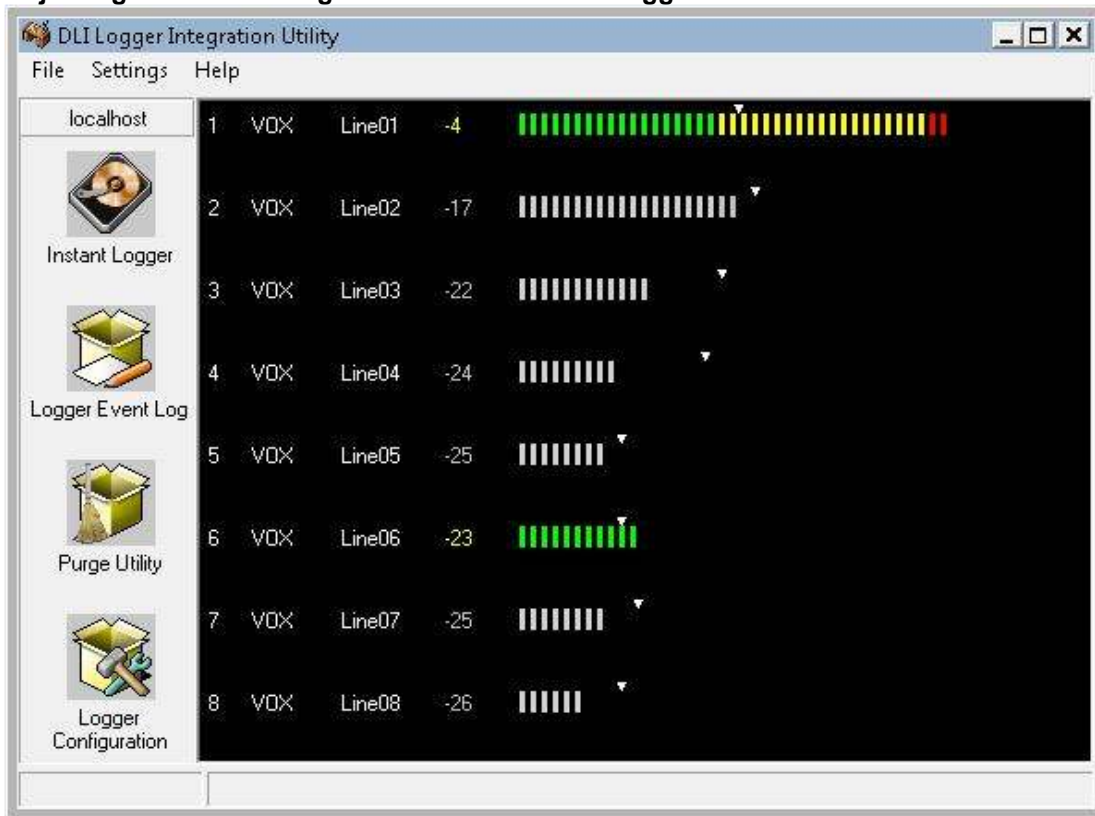
Double-click on the icon to display the utility on the screen.
Select the Logger Configuration icon on the left



You can set the line names, etc, here.

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Adjusting when recording occurs - Manual VOX trigger level



Note the state of the channels. When the audio level bars are non-existent or not colored, no recording is occurring. If the bars are green, yellow or red, recording to a file is occurring. Be sure that the bars are not colored when no audio is present.

On DLI Audio Loggers without automatic gain control such as the MIL-8000U and the MIL-F16, the volumes knobs on the unit (gain controls) and VOX trigger level in LoggerConfig will need to be adjusted. Adjust the audio level so that touch tones cause the recorder bars to go well into the red. Recording will continue and the bars will be colored after the last audio signal until the timeout has expired. When the lines are quiet, set the VOX Trigger Level so that the recording is not triggered but audio causes the recording to start. You may need to adjust the VOX Trigger Level again. Adjusting these levels correctly is required for proper Caller-ID and DTMF decoding.

With version 3.0.242.65 and higher:

Click on the line number will open Windows explorer to the recording directory.

Right-Click on the mode to change the recording mode.

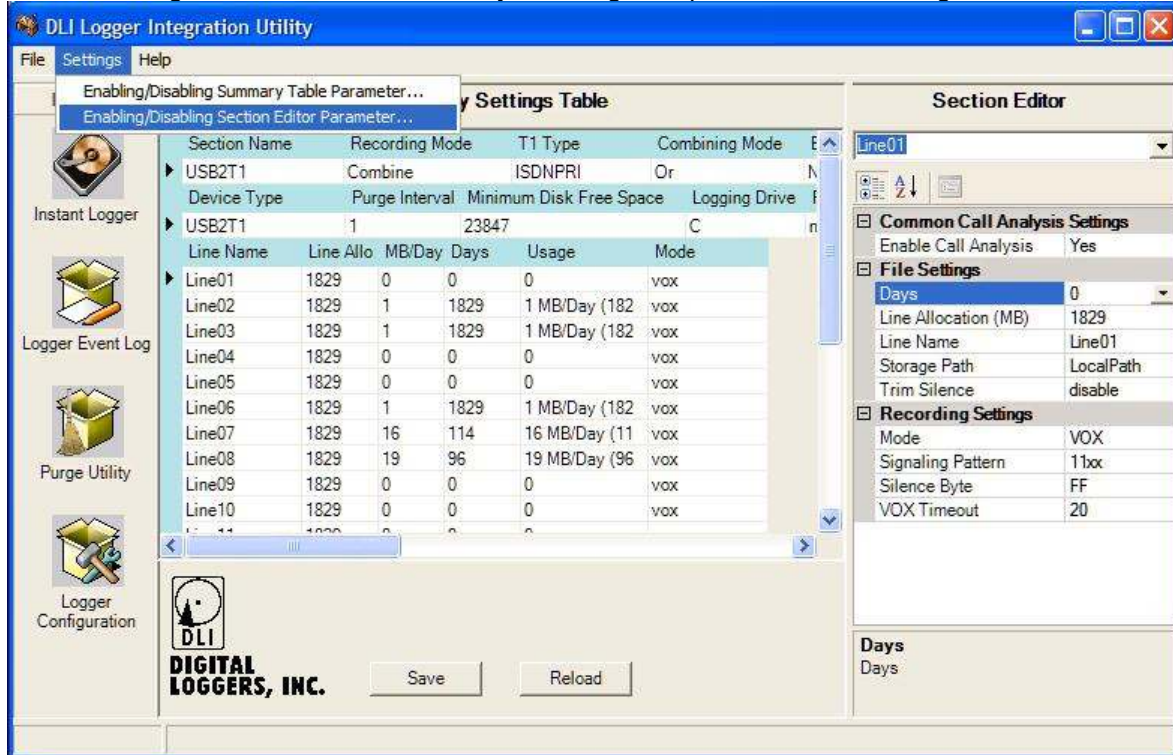
Click on the Line Name to change the name of the recording folder.

Using the mouse you can drag the VOX trigger level to the appropriate location.

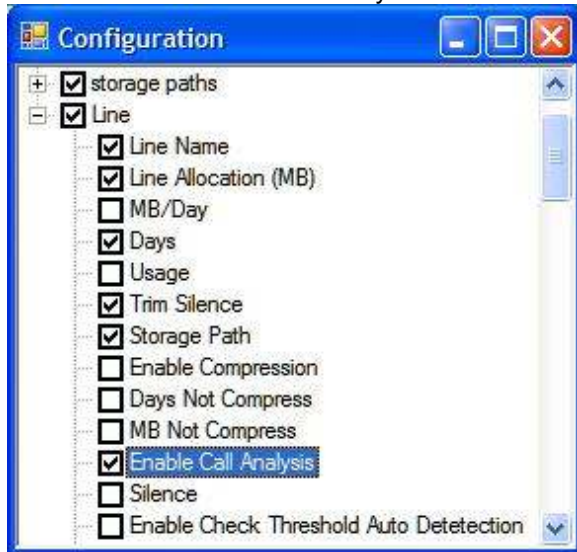
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CUSTOMIZING THE CONFIGURATION SCREEN

Several setting can be shown or hidden by selecting the options from the settings screen.



Here I added "Enable Call Analysis" to the line settings screen.



Enabling Call Analysis - decoding incoming and outgoing phone numbers:

Section Editor - Line Settings:

Set **Enable Call Analysis** to **Yes** for each line. (Right-click and copy the settings to other lines)

*** Do not enable Call Analysis on a T1-PRI or it will overwrite the D_Channel decoding.**

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Logger Wizard

The Logger Wizard that can help in the initial configuration and is available here:

<http://www.digital-loggers.com/downloads/>

LOGGER SPECIFIC SETTINGS AND INFORMATION

MIL-2400U: This logger can use hardware VOX or software VOX. If "Use Hardware VOX" is set to no, the VOX trigger level settings will be used.

MIL-T1: The lights on the logger will not flash green until the application is running and in synch.

Decoding incoming Caller ID

Enable call analysis as indicated above

Section Editor - System Settings:

File Settings:

Set **Number Field Content on Incoming Call** to **DTMF**

Set **Number Field Content on Outgoing Call** to **Disable**

MIL-T1 (PRI-ISDN) NI-2:

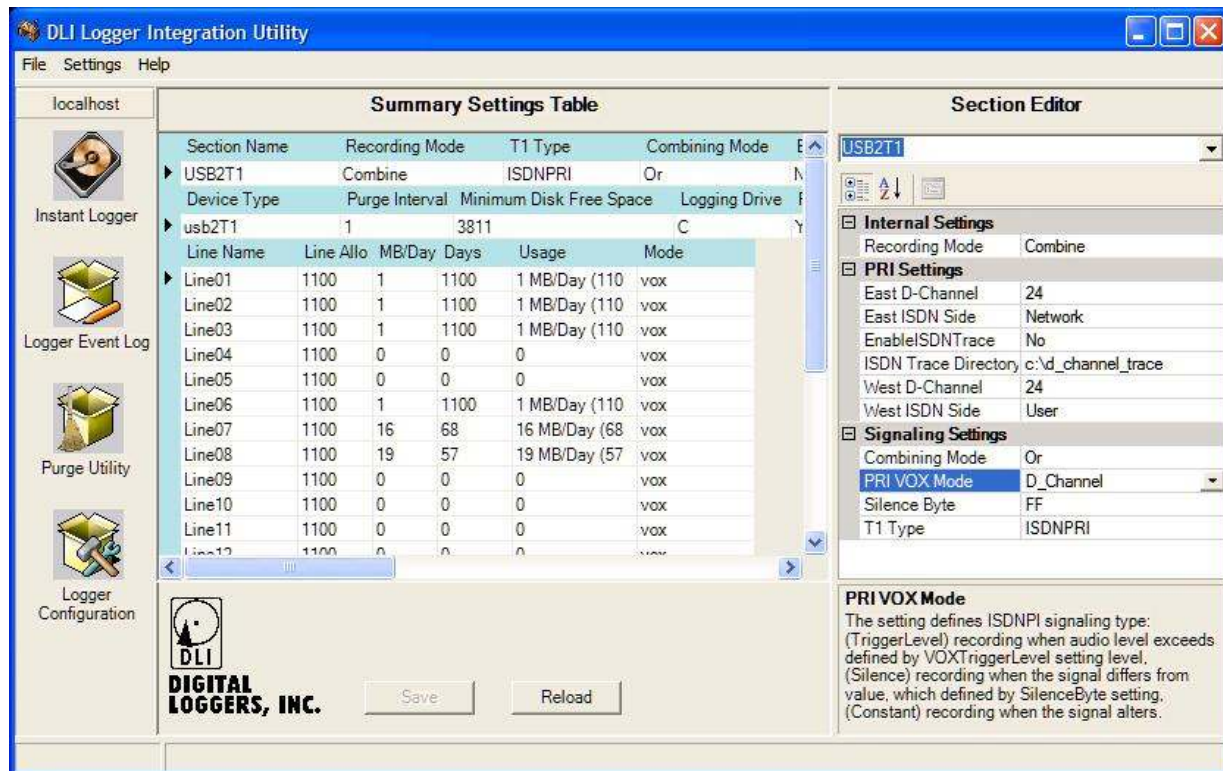
Decoding incoming DID (possible if the PRI signaling contains DID numbers)

Section Editor - System Settings:

File Settings:

Set **Number Field Content on Incoming Call** to **Called**

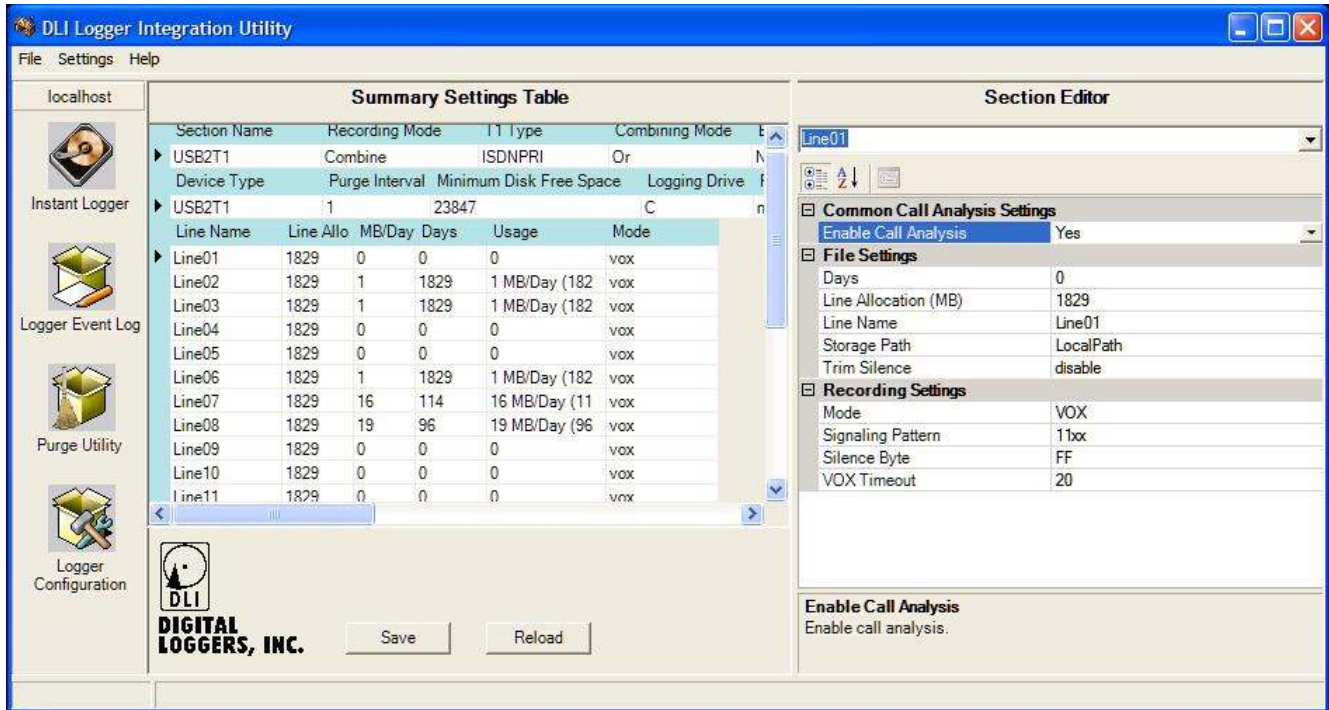
Set **Number Field Content on Outgoing Call** to **Calling**



Go to the Section Editor select USB2T1 from the drop-down list

In the Signaling Section, set **PRI VOX Mode** to **D_Channel**

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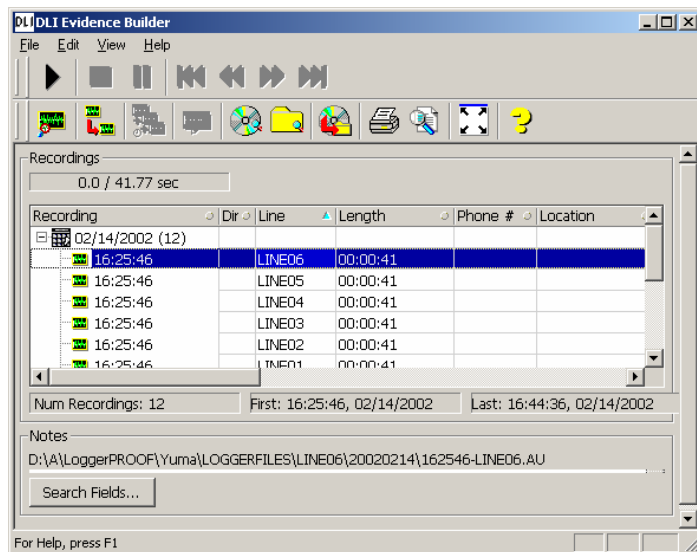
Next, in the Section Editor, select Line01.

Be sure that Enable Call Analysis is set to No on each channel or it will overwrite the D_Channel decoding.

Next, in the Section Editor, select Line24.

Set **Mode** to **Disable** to prevent full time recording of the signaling channel.

Evidence Builder Software

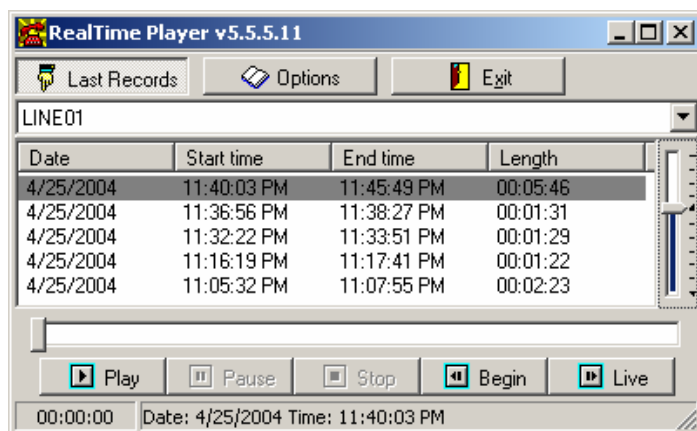


Evidence Builder Software (or the commercial version, known as Call Analysis Software) is provided free on a separate CD. Load this on a workstation and point it at the recording directories to analyze incoming calls, create call lists, sort calls, and search by DID.

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

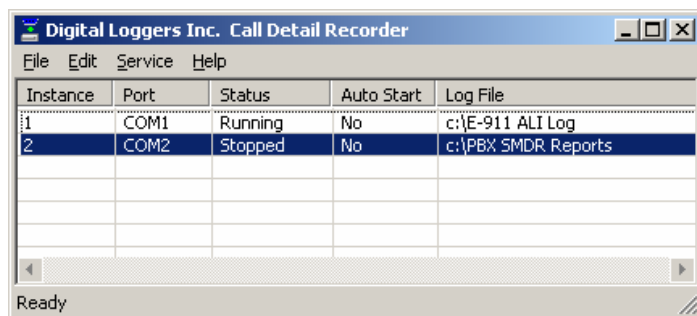


Anyone with remote access to the recording directory on the file server may monitor calls. An application called Real Time Player is provided on the workstation CD. Download this from www.digital-loggers.com/rtp.exe

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

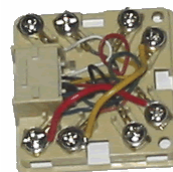
Frequently Asked Questions

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.

