



Logic Pro 8 TDM Guide

In general, DAWs take one of two approaches to audio signal processing: the use of dedicated hardware DSPs (TDM systems), or the native processing capabilities of the computer CPU.

Logic Pro allows you to make use of both your TDM system DSPs and the computer's native CPU processing resources. The link between the DSP world of your TDM system, and your computer's native CPU processing resources is the ESB TDM.

The ESB TDM allows your computer's CPU to process one audio engine (Direct TDM), and the DSP of the TDM hardware to process another (DAE). This is done by using two different mixers in Logic Pro: A TDM Mixer (using the DAE) and a native mixer (called the DTDM Mixer). The first one handles TDM plug-ins, while the other works with native plug-ins—in both Audio Unit and Logic formats.

Up to eight of the DTDM Mixer outputs can be routed in to the TDM Mixer. The output signals are received by the ESB TDM inputs—using TDM aux channel Input slots. This enables all Logic tracks, native and Audio Unit plug-ins—including software instruments—to be used in conjunction with your TDM system DSPs.

This guide will introduce you to all that you “need to know” to get your TDM hardware up and running with Logic Pro 8. It will also introduce you to the ESB TDM and EXS24 TDM.

The use of Logic Pro 8 functions is discussed in the *Logic Pro 8 User Manual*.

Audio Hardware and Drivers

To use Logic Pro 8 with your TDM System, you will need at least Pro Tools HD 7.4 (on both Intel and PPC computers).

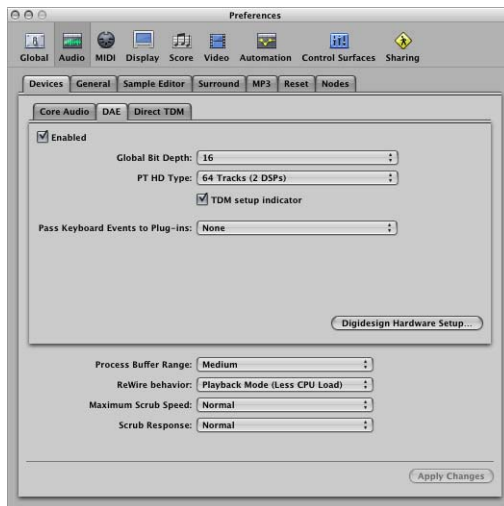
Selecting and Configuring a Device

Selecting, and activating, a particular audio hardware device is achieved directly in Logic Pro, via the Logic Pro > Preferences > Audio > Devices dialog. You can choose between the Core Audio, DAE, and Direct TDM tabs in the Devices pane.

- *Core Audio*: The Core Audio tab activates and adjusts audio hardware devices that use Core Audio drivers. For full details on the Core Audio device settings, see the *Logic Pro 8 User Manual*.
- *DAE*: DAE is the abbreviated form of Digidesign Audio Engine. This is the driver software used to access TDM hardware (including use of on-board DSP chips) in Logic Pro 8.
- *Direct TDM*: The native Direct TDM (DTDM) audio engine of Logic Pro is used to process the DTDM Mixer—which you can route into the (aux channel) inputs of the TDM Mixer, using the ESB TDM. This allows your computer's CPU to perform native (instrument and effect) processing in Logic Pro, while using the DAE.

DAE Settings

The DAE parameters can only be set after activating the DAE. To do so, check the Enabled box in the upper left corner of the DAE tab. You will then have access to the following parameters:

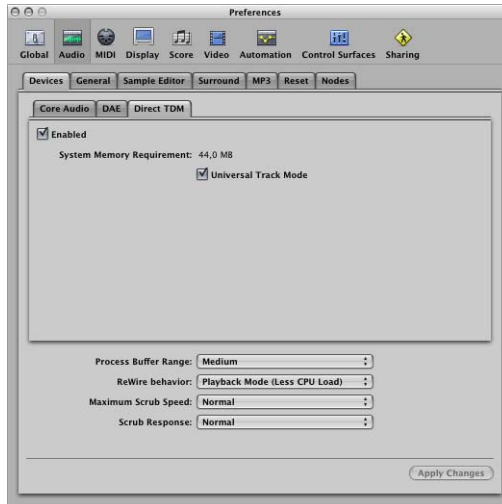


- *Global Bit Depth*: This parameter allows you to choose between 16 bit or 24 bit playback and recording.
Note: The DAE does not allow the use of 16 and 24 bit files simultaneously.
- *PT HD Type*: This parameter allows you to define the number of tracks for your Pro Tools HD system. Each entry in the pop-up menu allows you to define the required number of tracks, based on the number of Pro Tools HD DSPs that you want to use (and actually have) in your system.
- *TDM Setup Indicator*: The TDM Setup Indicator is a small status window that shows the current TDM process (inserting a TDM plug-in, for example). This parameter switches the display of this window on or off.
- *Pass Keyboard Events to Plug-ins*: Any key commands that are not used by a plug-in are passed on to Logic Pro. Under normal conditions, this ensures that functions like Start and Stop will continue to work. If this isn't the case, use the options in this menu to specify that only certain key combinations will be passed to the plug-in. All other key presses will be received by Logic Pro.
- *Digidesign Hardware Setup Button*: Opens the Digidesign Hardware Setup window that contains all important system settings for your hardware.

Note: The Process Buffer Range and ReWire Behavior parameters at the bottom of the Devices tab have no effect on the DAE!

Direct TDM Settings

To activate Direct TDM, check the Enabled box in the upper left corner of the Direct TDM tab.



Universal Track Mode

Universal Track Mode, when engaged, allows the playback of stereo and mono regions on a single track. Even-numbered audio channels are *not* regarded as the right channels of the odd-numbered stereo audio channel to their left. Every audio channel has its own Format button. Dependent on whether a mono or stereo region is played back, the Pan knob will behave as either a Balance or Pan control. If you play back a mono region, and the Pan knob is set to the center position, both channels of the audio channel strip will output the same signal level.

Note: Universal Track Mode has limited routing capabilities, as it doesn't allow separate handling of the left and right audio channels.

The Non-Universal Track Mode is useful if you want (or need) to play different mono files for the left and right mono channels of a single audio channel strip, even when it is assigned as a stereo channel. A stereo/stereo plug-in inserted into this stereo channel receives different signals for the left and right channels.

About TDM

Logic Pro allows you to make use of the TDM functions supported by Pro Tools HD systems. TDM stands for Time Division Multiplexing—the time-interlaced transmission of multiple digital audio signals (or streams) through a single data bus. This bus system is physically isolated from the computer system bus, and runs between the individual TDM-capable PCI boards. Up to 512 digital audio channels, each with 24 bit resolution, can be transmitted on the TDM bus. These streams form the signal paths within a virtual mixer. These signal paths are necessary for the insertion of plug-ins, which are calculated on the DSP hardware, and routed into the individual channels, or are selected through auxiliary busses.

Note: It should be noted that the TDM channel count is sample rate dependent, so if a rate of 88.2 or 96 kHz is used, the 512 channels available to a PT HD system will be halved to 256. At a sample rate of 192 kHz, this will again be halved to 128.

Differences to Native Processing

Basically, the use of Logic Pro with a TDM system is very similar to the use of Logic Pro with the native processing capabilities of your computer. Here is an overview of the main differences between the two systems:

- In a TDM system, all audio processing is done by the DSP chips of the TDM hardware. This means that native Logic plug-ins can not be run on the TDM DSPs. TDM plug-ins, however, can be fully used and automated.
- The TDM hardware determines the overall features of the system: number of tracks, number of TDM plug-ins that can be used simultaneously, number of in/outputs, and so on. Please refer to your ProTools system manuals for further information.
- Stereo recordings require two tracks, and are recorded as two separate files. In the Arrange window, a stereo recording is handled as two linked regions, which use two tracks. In the Sample Editor, stereo recordings are displayed as a stereo file. All odd-numbered audio channels can be switched to stereo. Doing so will cause the following even-numbered audio channels to be “locked” to the preceding odd-numbered channels. The odd numbered channel controls both sides of the stereo recording.
- The DAE does not support the QuickTime engine, so the Logic Pro movie facilities will not be available if you work exclusively with the DAE. Simply activate Core Audio or DTDM to use the movie facilities when working with the DAE.

TDM Plug-ins

TDM plug-ins and settings can be used in Logic Pro. Please make sure that the plug-ins are installed correctly. The use of TDM plug-ins is very similar to the use of native plug-ins. TDM plug-ins can be fully automated.

Note: Logic Pro does not support TDM Surround and multi mono plug-ins with two or more channels.

All TDM plug-in settings are saved with the project, and are automatically restored the next time the project is loaded.

Logic Pro can read the Digidesign format for plug-in settings (the supplied settings of most plug-ins are saved in this format). Logic Pro automatically displays the corresponding files in the file selector box when loading settings via the Settings menu of plug-in windows. Settings files are usually located in a Settings folder, within the Mac OS X Library/Application Support/Digidesign folder. The name of the most recently chosen setting is indicated by a dot in the menu listing.

Support of TDM Plug-in Side Chains

You can select a different source for the side chain input (or key input) in some TDM plug-ins—Compressors, Noise Gates, Vocoder, and so on. All tracks, busses, or inputs can be used as a side chain input source.

RTAS Plug-ins

Please note that RTAS plug-ins can not be used in Logic Pro 8—only Audio Unit, TDM, and native Logic Pro plug-ins are supported.

If you currently own any RTAS plug-ins, you should install the Audio Unit equivalents for use in Logic Pro. Most plug-ins are available in several formats.

If no Audio Unit version is available on your RTAS plug-in installation CDs, please visit the websites of the plug-in manufacturers.

Specific TDM Functions

Please note the following if you want to make use of your hardware's TDM functions with Logic Pro 8.

TDM Mixer Plug-in

Please ensure that the Plug-ins folder (found inside the DAE folder) only contains one Mixer plug-in; either the Stereo Mixer or Stereo Dithered Mixer.

You may also have one of the Surround Mixer plug-ins residing here, but these Mixer plug-ins have no function within Logic Pro.

Changing Global Bit Depth

If TDM hardware is being used, Logic Pro will ask whether you want to use 16 bit or 24 bit depth, when first opened. You can change the Global Bit Depth in the Logic Pro > Preferences > Audio > Devices > DAE tab at any time.

Sample Editor

All functions of the Sample Editor can be used on 16 bit and 24 bit audio files. You can even exchange sound material in either direction (between 16 and 24 bit files) when using DTDM, via the Copy and Paste commands.

Note: AudioSuite plug-ins are supported at 16 and 24 Bit depth, if using DAE.

Simultaneous Operation of TDM and Other Hardware

Please note the following if you wish to use a TDM system and other audio hardware simultaneously.

Control Playback

The Audio Bin, Browser, and Sample Editor allow you to choose the desired playback hardware unit: Simply Control-click the Prelisten button, and choose the desired hardware from the shortcut menu:

- If you choose Core Audio, an additional audio channel strip (named “Prelisten”) is created automatically in the Environment, and used for playback.
- If you choose the DAE, the highest numbered audio channel strip (possible with your configuration) is used for playback. Note that this channel may be assigned to an arrange track when you use the Create Track functions.

Total Number of Audio Tracks

When operating different audio hardware devices simultaneously, the number of possible playback tracks cannot be determined by merely adding them up. This is especially true if the connected systems place a strain on the CPU.

The number of tracks may also be reduced if the connected systems access the same hard disk bus. The impact of this can be reduced (resulting in an increase in the total track number) by using different hard drives for the various systems. As an example; DTDM or Core Audio and/or a QuickTime movie reads from an internal drive, and DAE from an external FireWire drive.

ESB TDM and EXS24 TDM

The ESB TDM and EXS24 TDM plug-ins enhance TDM system functionality by expanding the TDM Mixer capabilities. If working at 44.1/48 kHz, up to 32 additional channels are available. These extra channels can be used for multiple EXS24 TDM sampler instances, and up to eight inputs routed from DTDM—the native audio engine which runs parallel to the DAE.

About the ESB TDM and EXS24 TDM

The ESB TDM plug-in allows you to route up to eight audio channels of the native (computer CPU processing) DTDM Mixer into the DSP-based TDM Mixer.

This is similar to having a card equipped with a multi channel digital output installed in the computer, and physically connected to a second multi channel input module for your TDM system. The ESB TDM effectively replaces the audio card's digital outputs and driver, the TDM audio interface and the cables between them.

ESB TDM routes digital signals via software within the computer, with no need for any additional hardware to be installed or connected.

The EXS24 TDM plug-in allows the insertion of up to 32 mono/16 stereo EXS24 mkII samplers in the top Insert slots of aux channel strips in the TDM Mixer. Ensuing Insert slots allow the sampler output signals to be processed with TDM effect plug-ins.

Note: The EXS24 TDM is available as a mono or stereo plug-in, but not as a multi output plug-in.

EXS24 TDM or ESB TDM?

If you want to process the output signals of (up to 32) EXS24 TDM samplers with TDM effect plug-ins exclusively, please read the EXS24 TDM section directly below. Bear in mind that if you want to use the EXS24 TDM exclusively, there is no need to activate DTDM in addition to the DAE (unless you need to use the movie facilities of Logic Pro).

In scenarios where you want to use both Logic Pro's native audio system (DTDM) and your TDM system, please refer to "ESB TDM" on page 11. The information found in this section also applies to the routing of natively processed signals (from other Logic Pro or Audio Unit instruments) into the TDM Mixer.

EXS24 TDM

If no aux channel strips exist in your TDM Mixer, please create them in your project.

To create TDM channel strips that are displayed in both the Mixer and the Arrange window:

- 1 Open the New Tracks dialog by doing one of the following.
 - Click the New Tracks button.
 - Choose Track > New in the Arrange window (or use the corresponding key command).
- 2 In the New Tracks dialog, make sure that the Auxiliary (for EXS24 TDM) button is active.
- 3 Choose other settings (number of tracks, and so on) as desired.
- 4 Click OK.

To insert the EXS24 TDM:

- Click-hold on the top Insert slot of a TDM aux channel strip. A pop-up menu appears, allowing you to choose the EXS24 TDM.



To play the EXS24 TDM sampler inserted in the aux 1/2 channel:

- Select the corresponding aux track in the Arrange window.

When the track is selected, you will be able to play and record the sampler instance.

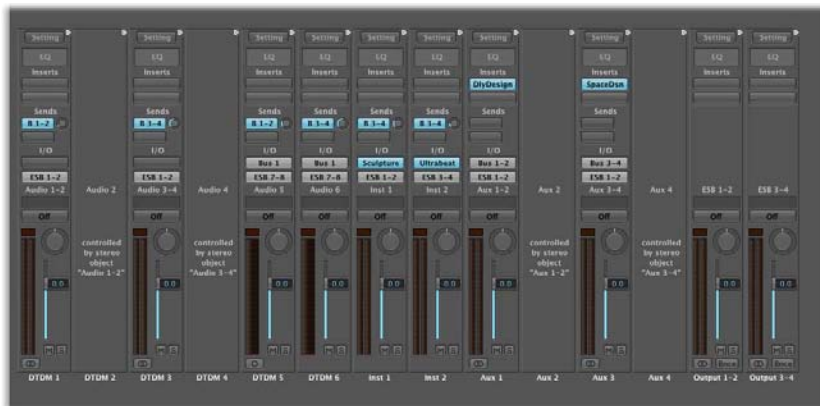
Subsequent Insert slots within the aux channel strip—beginning with the second—allow the insertion of TDM effect plug-ins, used to process the sampler's output signal. Further processing options via sends (leading to the effect busses) and output routings behave as per usual. The input routing parameter has no effect, this is as per using TDM instruments (such as Virus TDM).

ESB TDM

The ESB TDM allows the outputs of the DTDM Mixer—processed by the native DTDM audio engine—to be routed into the inputs of the TDM Mixer. You can activate the DTDM driver via the Logic Pro > Preferences > Audio > Devices tab.

Further information on the parameters of the DTDM driver can be found in “Direct TDM Settings” on page 4.

Dependent on the number of required channel strip types, your DTDM Mixer could look something like this:



This mixer example features six audio channel strips, two aux channel strips, two instrument channel strips, and two stereo sums. It's possible to use up to 255 audio channel strips and 64 aux channel strips.

The eight output signals of this mixer are routed into the TDM Mixer. The output signals are received by the ESB TDM inputs—chosen as input sources on the TDM aux channel strips. In the following example, aux channels 1–8 have been set up in this fashion:



Within mono aux channel strips, you can select the desired output channel of the DTDM Mixer (ESB 1–8). Stereo aux channels can be set to input channel pairs ESB1–2, 3–4, 5–6, and 7–8. Please take a closer look at the available inputs:



Logic Pro 8 handles mono and stereo channel settings separately. This means that you can set up the ESB inputs for eight mono channels, and then switch the audio channels to stereo operation. Once the desired DTDM output channels are set appropriately for each aux input, save your project as a template. This will allow you to switch quickly between mono and stereo setups, without needing to manually change settings each time.

Tips and Tricks

This section provides tips and tricks that may be handy when using Logic Pro with TDM hardware.

Importing Projects Produced With Other Hardware

If you simply want to use the native processing capabilities of Logic Pro, start Logic Pro using Core Audio—with the Digidesign Core Audio driver activated.

You will be asked if you'd like an automatic conversion if the project was created on a non Core Audio system, provided that the Universal Track Mode setting is the same on both systems.

Be aware of problems with incompatible plug-ins and/or settings, as mentioned above.

If you want to do more advanced work on this project, with the addition of TDM plug-ins and instruments, you need to load the project into a DAE/DTDM system.

To load a project that originated on a Core Audio system into a DAE/DTDM system:

- 1 Deactivate DAE and ensure that DTDM is active.
- 2 Ensure that the Universal Track Mode setting is the same for both Core Audio (on the project's origin system) and DTDM on your system.
- 3 Open the project. You will be asked if you'd like it automatically converted to DTDM.

Logic Pro 8 loads the project into a DTDM environment, and checks if there is a channel strip available for every channel of your hardware. If not, a suitable number of channel strips are automatically created. This facility means that whenever you change the hardware in a given computer, or move project data to another computer (with different hardware), the channel strips will change as well—while maintaining their EQ, effect, and send settings.

Should the plug-ins used by the project be different on the two computers, unavailable plug-ins are grayed out in the Insert slots of the appropriate channels. You will need to manually insert/replace these plug-ins with plug-ins that are available for use on the target computer.

- 4 When the converted project has loaded, reactivate DAE.

Note: You need to reopen Logic Pro after activating the DAE.

- 5 Relaunch Logic Pro and open the converted project.

All DTDM track outputs are routed to one of the ESB outputs.

- 6 Create the required DAE aux channel strips.
- 7 Choose the desired ESB outputs in the Input slot(s) of the aux channel strip(s).

Using DAE, DTDM, and Core Audio Simultaneously?

You should avoid the use of more than two audio engines simultaneously within Logic Pro 8. The strain on the PCI bus can be problematic, resulting in a number of DAE error messages.

Your first choice should be DAE—in conjunction with DTDM. If necessary, choose DAE and Core Audio.

System Performance and TDM DSP Usage

The Logic Pro System Performance window doesn't reflect any native processing via the DAE—which may be caused by the insertion of numerous EXS24 TDM instruments. You can check the DSP load in the TDM DSP Usage window (Options > Audio > Open TDM DSP Usage).

Card	DSP #	Name	Usage
1	1	HD Engine	100%
1	2	StreamManager	25%
1	3	HRStereoMixer	25%
1	4		0%
1	5		0%
1	6		0%
1	7		0%
1	8		0%
1	9		0%
2	1		0%
2	2		0%
2	3		0%
2	4		0%
2	5		0%
2	6		0%
2	7		0%
2	8		0%
2	9		0%

Bounce Strategies

The easiest way to perform a stereo bounce is to choose File > Bounce. This will open the Bounce dialog for outputs 1/2 of your primary audio hardware. It is highly recommended that you use the first output pair of your audio device for main playback duties.

Note: If you are using other output channel strips for primary playback duties, please use the Bounce button on these channels.

You can set the file format, bit depth, and sample rate of the bounce file in the Bounce dialog. More information about other bouncing parameters can be found in the *Logic Pro 8 User Manual*.

DAE

You can perform real time bounces in mono, stereo, and all surround formats supported by Logic Pro 8. Offline bounces are not possible when you use the DAE.

Please bear in mind that none of the TDM surround features are available in Logic Pro.

DTDM

If using the DTDM output channels, all offline and online bouncing features afforded by Core Audio are available to you.