SoundCode LtRt Tools™

LtRt Encoding and Pro Logic IIx Decoding Plug-In for Pro Tools™

Version 2.0 for Pro Tools AAX Systems on Macintosh OS X And Windows

PRELIMINARY USERS GUIDE

Created By Neyrinck
San Francisco, CA USA
www.neyrinck.com
info@neyrinck.com

Technical Support (USA)
www.neyrinck.com
support@neyrinck.com

Product Information (USA)
www.neyrinck.com
info@neyrinck.com

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Chapter 1
Introduction

Welcome To SoundCode LtRt Tools

SoundCode LtRt Tools is a set of AAX Native, DSP, and Audiosuite plug-ins for Pro Tools surround enabled systems. It features matrix encoding for compatibility with Pro Logic and Pro Logic II decoders. And it features Pro Logic IIx decoder with decoding options.

SoundCode LtRt Tools Features:

- Support for all Pro Tools surround formats: LCR, LCRS, Quad, 5.0, 5.1, 6.0, 6.1, 7.0, and 7.1.
- Volume, mute, and phase invert controls for logical channel groups: L-R, C, Ls-Rs, Cs/S, Lc-Rc.
- Support for Pro Tools automation to implement dynamic down mixing.
- Down mix volume control.
- Metering with adjustable peak hold, reference level, and response controls.
- Mute and phase invert controls available to diagnose phase issues.
- Pro Logic IIx decoding.
- A combine LtRt encoding and Pro Logic IIx decoding plug-in for simple LtRt monitoring.
- AAX DSP, Native, and Audiosuite operation.

System Requirements

To use SoundCode LtRt Tools, you need one of the following Digidesign-qualified Pro Tools systems that supports AAX plug-ins:

- Pro Tools HD 10.0 or later.
- Pro Tools 10.0 or later with the Complete Production Toolkit.

Important Sample Rate Information

SoundCode LtRt Tools will only operate at 44.1, 48 kHz sample rates.

Chapter 2
Installation

Installing SoundCode LtRt Tools

Installers can be downloaded from the Neyrinck website (www.neyrinck.com)

Installation steps are essentially the same, regardless of the bundle, package, or system you purchase.

Installation
To install SoundCode LtRt Tools:

1. If Pro Tools is running, Quit Pro Tools.
2. Locate and open (double-click) the plug-in installer.
3. Follow the instructions presented by the installation software.
4. When installation is complete, click Quit.

When you open Pro Tools, you will be prompted to authorize your new plug-in.

Authorizing SoundCode LtRt Tools

SoundCode LtRt Tools requires an authorized iLok USB Key to be connected to your computer when using Pro Tools. The iLok authorization needs to be obtained online and downloaded onto your iLok USB Key. You will need an iLok.com account to complete the process. If you do not yet have an ilok.com account, visit www.ilok.com to set up an account for free.

The iLok USB Smart Key is not supplied with your plug-in or software option. You can use the one included with certain Pro Tools systems or purchase one separately.

Removing Expired Plug-Ins

If you let a demo version of a plug-in expire, you should remove it from your system. Otherwise, each time you open Pro Tools you will be prompted with a message that the plug-in has expired.
To remove an expired plug-in:
Open the Plug-Ins folder on your Startup drive (Library/Application Support/Digidesign on OS X or c:\ProgramFiles\Common\Digidesign \DAE\PlugIns on Windows).
Drag the expired plug-in to a different location.

Chapter 3
Stereo Down Mixing Equations And Matrix Encoding

Down Mix Equations

Stereo down mixing can be expressed as two mathematical equations, one for the left channel and one for the right channel. The equation is a scaled sum of the surround channel inputs being mixed together. For example:

Lo = L + .707*Ls + .707*C
Ro = R + .707*Rs + .707*C

SoundCode LtRt Tools implements these down mix equations:

Lo(Lt) = (LR Level)*L + (C Level)*C + (LsRs Level)*Ls + (LcRc/S Level)*Lc/Cs + (LFE Level)*LFE

Ro(Rt) = (LR Level)*R + (C Level)*C + (LsRs Level)*Rs + (LcRc/S Level)*Rc/Cs+ (LFE Level)*LFE

What Sounds Best Is Best

There is not a standard stereo down mix equation that is correct for all applications. The best equation is the one that sounds the best. However, there might be an appropriate down mix equation for your application that depends on many factors. Be sure to understand your delivery requirements so that the down mix equations are set appropriately.

ITU-R BS.775

The ITU has published a document that recommends certain down mix equations. The document is identified as ITU-R BS.775. SoundCode LtRt Tools comes with Pro Tools presets that allow you to set the down mix according to the IT recommendations.

Dolby Digital Metadata

Dolby Digital is a technology that discretely encodes surround audio as a digital bit stream. It is used by DVD and Digital Video Broadcast (DVB) systems. The bit stream also carries information about the audio and that information is called metadata. The metadata can include down mix equation information. The equation information can be used by a DVD player or a DVB set-top box to provide a stereo down mix if the system is not connected to a surround speaker system. Dolby Digital does not provide for complete equation flexibility, though. The center channel can be mixed at these levels: -INF, -6.0 dB, -4.5 dB, -3.0 dB, -1.5 dB, 0.0 dB, 1.5 dB, and 3.0 dB. The rear surround channels can be mixed at these levels: -6.0 dB, -4.5 dB, -3.0 dB, -1.5 dB. The front left and right channels are always mixed at a level of 0.0 dB.

Matrix Encoding

Matrix encoding is a technology where multiple channels of audio are summed together in a way that a decoder can extract information and separate them again. The decoded surround signals will not be the exact signals that were summed together when encoded, but decoding technologies such as Dolby Pro Logic II can provide very effective decoding that provides a good listening experience for home theater systems. Dolby Pro Logic I is capable of decoding a LCRS format. Dolby Pro Logic II is capable of decoding a 5.1 fomat.

Chapter 4
SoundCode LtRt Tools Overview

Integrated Stereo Down Mixing
SoundCode LtRt Tools makes it simple to add down mix processing to a Pro Tools session for many types of applications. SoundCode LtRt Tools is aa AAX DSP and Native plug-in that can simply be inserted on a Pro Tools track. Because it is a plug-in, it is compatible with powerful Pro Tools features such as control surface operation, automation, and preset management.

Down Mix Compatibility Checking
SoundCode LtRt Tools can be used to check how a surround mix will down mix to stereo. SoundCode LtRt Tools features a “Bypass” control that can be used to enable/disable down mixing while mixing with a surround speaker system. When enabled, the surround mix is down mixed to stereo and output on the left and right channels of the surround speaker system. Also, SoundCode LtRt Tools can be used to feed a dedicated, alternate stereo speaker system.

Stereo LtRt Program Delivery
SoundCode LtRt Tools can be used to matrix encode and down mix a surround mix to stereo LtRt for stereo LtRt mix delivery. Many broadcaster’s require both surround mixes and stereo LtRt mixes. SoundCode LtRt Tools makes it simple to do so. The matrix encoding can be set for PL2 or PL1 mode which are compatible with Dolby Pro Logic I and Dolby Pro Logic II decoders.

Edit On Any Pro Tools System
SoundCode LtRt Tools makes it easy to edit surround audio projects using a Pro Tools system connected to a stereo speaker system. Just insert SoundCode LtRt Tools on the surround mix bus and all audio channels will be mixed to stereo so an editor hears everything with just two speakers or headphones.

Pro Tools Monitoring
The Pro Tools Complete Production Toolkit allows Pro Tools to open Pro Tools HD surround projects. But Pro Tools hardware such as M-Box Micro can only output two audio channels. SoundCode LtRt Tools can be used by Pro Tools systems to make a stereo monitor mix when working with surround projects. For more information, read chapter 6, Monitoring Surround Projects With A Stereo Interface.

Chapter 5
The SoundCode LtRt Encoder Plug-In

Overview
The SoundCode LtRt Encoder Plug-In is a AAX DSP or Native plug-in that can be inserted on any surround audio or auxiliary track that has three or more audio channels. There are two plug-in types to choose from when inserting SoundCode LtRt Encoder on a surround track. The first type has an output stem format

that matches the input stem format. The second type has a stereo output stem format and thus will “convert” a surround track to have a stereo output. The type you will choose depends upon your application.

Matched Input And Output Stem Formats

SoundCode LtRt Tools features two plug-in types, Stereo and LtRt Encoder, that can be inserted on a track so that the number of input channels and output channels is the same. These plug-ins are listed in the Pro Tools plug-in insert popup list. They are named:

SoundCode LtRt Encoder (LCR-to-LCR)
SoundCode LtRt Encoder (LCRS-to-LCRS)
SoundCode LtRt Encoder (Quad-to-Quad)
SoundCode LtRt Encoder (5.0-to-5.0)
SoundCode LtRt Encoder (5.1-to-5.1)
SoundCode LtRt Encoder (6.0-to-6.0)
SoundCode LtRt Encoder (6.1-to-6.1)
SoundCode LtRt Encoder (7.0-to-7.0)
SoundCode LtRt Encoder (7.1-to-7.1)

Stereo Output Stem Format

SoundCode LtRt Encoder features two plug-in types, Stereo and Stereo LtRt, that can be inserted on a track and will convert the track to stereo output. These plug-ins are listed in the Pro Tools plug-in insert popup list. They are named:

SoundCode LtRt Encoder (LCR-to-Stereo)
SoundCode LtRt Encoder (LCRS-to-Stereo)
SoundCode LtRt Encoder (Quad-to-Stereo)
SoundCode LtRt Encoder (5.0-to-Stereo)
SoundCode LtRt Encoder (5.1-to-Stereo)
SoundCode LtRt Encoder (6.0-to-Stereo)
SoundCode LtRt Encoder (6.1-to-Stereo)
SoundCode LtRt Encoder (7.0-to-Stereo)
SoundCode LtRt Encoder (7.1-to-Stereo)

SoundCode LtRt Encoder User Interface

The SoundCode LtRt Encoder user interface is shown here:

Logically Grouped Channels

The SoundCode LtRt Encoder user interface simplifies the down mixing interface by logically grouping left and right-paired channels and providing a single level, mute, and phase-invert control for the pair.

Description and Use Of Controls

L R Level
C Level
Ls Rs Level
Cs Level
Lc Rc Level
LFE Level
Each logical down mix input can be

adjusted to mix a variable amount of the input to the down mix. The range is –INF to + 3 dB. Some of these input controls may not be visible if the input is not applicable to the surround format being down mixed.

L R Mute
C Mute
Ls Rs Mute
Cs Mute
Lc Rc Mute
LFE Mute
Each logical input can be muted to remove it from the down mix.

L R Phase-Invert
C Phase-Invert
Ls Rs Phase-Invert
Cs Phase-Invert
Lc Rc Phase-Invert
LFE Phase-Invert
Each logical input can be phase-inverted in the down mix.

Level
This control adjusts the overall down mix level.

Down Mix
This control is only available with plug-ins that have an output stem format the same as the input stem format. When enabled, the stereo down mix is applied to the left and right output channels. When disabled, the inputs are passed through, but the mute and phase-invert controls are still active.

Limiting
This control provides a brick wall limiting function that allows you to control the peak level of the down mix. It can be set from 0 dBFS to -10 dBFS.

Type
This control is only available in the LtRt Encoder plug-in type and lets you select the type of matrix encoding for the down mix. The choices are PL2, PL1, and LoRo. PL2 is compatible with Dolby Pro Logic 2 decoders. PL1 is compatible with Dolby Pro Logic 1 decoders. LoRo provides no matrix encoding.

Chapter 6
The SoundCode LtRt Decoder Plug-In

Overview

The SoundCode LtRt Decoder Plug-In is a licensed Dolby Pro Logic IIx decoder. It will decode stereo LtRt encoded audio back to surround using Pro Logic IIx Movie Mode, Pro Logic II Movie Mode, and Pro Logic decode modes. Pro Logic decoders are used worldwide in cinema and television systems to expand stereo LtRt audio to surround LCRS, 5.1, and 7.1. Adjust the Dolby Mode control to select between LCRS, 5.1, and 7.1 decoding. Adjust the down mixing control to preview how a downmixing system after the decoder will sound. Adjust the channel mute and solo controls to monitor specific channels.

Pro Logic Iix/II Movie Mode

Dolby's Pro Logic IIx/II decoding technology can operate in one of two modes, Movie Mode and Music Mode. SoundCode LtRt Tools only operates in Movie Mode. Movie Mode is the mode used to decode stereo LtRt encoded material. Music Mode is the mode used to decode non-LtRt encoded material. The Movie Mode adds delay to the surround output channels. The Ls and Rs channels are delayed 10 ms relative to the front channels. The Lb and Rb channels, when decoding to 7.1, are delayed an additional 10 ms.

Decoding Modes

The LtRt Tools decoder lets you select different Dolby decoding modes that are used in consumer decoders. Pro Logic IIx mode decodes to a 7.1 output. Pro Logic II decodes to a 5.1 output. Pro Logic decodes to an LCRS output. Select between the modes in the user interface to listen to the different modes. Please note that the decoder does not decode any audio to an LFE channel.

Processing

The LtRt Tools decoder lets you down mix the decoder output to stereo or mono so you can audition the audio if down mixing happens after a Pro Logic decoder. Select between stereo, mono, and center mono.

Channel Mute/Solo

The LtRt Tools decoder provides channel mute and solo controls. This lets you isolate channels to better monitor the decoding results.

Chapter 7
The SoundCode LtRt Monitor Plug-In

Overview

The SoundCode LtRt Monitor Plug-In is a AAX DSP or Native plug-in that can be inserted on any surround audio or auxiliary track that has three or more audio channels. It provides an LtRt encoder and a Pro Logic IIx decoder that lets you easily monitor how a surround mix will be heard in consumer listening

environments. Adjust the Dolby Mode control to select between LCRS, 5.1, and 7.1 decoding. Adjust the downmixing control to preview how a downmixing system after the decoder will sound. Adjust the channel mute and solo controls to monitor specific channels.

Chapter 8

Monitoring Surround Projects With A Stereo Interface

Overview

The SoundCode LtRt Encoder Plug-In allows a Pro Tools LE user with a stereo I/O interface such as Mbox 2 Micro and the Complete Production Toolkit to open, edit, and save surround-based projects. This chapter suggests how to use SoundCode LtRt Tools with stereo I/O interfaces and optionally, a Dolby Pro Logic decoder to listen in surround.

Complete Production Toolkit For Pro Tools LE

The Complete Production Toolkit option for Pro Tools adds surround capability to Pro Tools . Any Pro Tools I/O interface can be used. If a stereo interface such as Mbox 2 Micro is used, you can use SoundCode LtRt Encoder to down mix the surround audio to stereo for monitoring.

Adapting A Surround Project

You can follow these steps to adapt a surround-based project that uses a surround output so that it can be monitored in stereo.

1. Go to File>Save As to save a copy of the session if desired.

2. In I/O Setup, create a new 5.1 bus
3. Create a 5.1 aux track

4. Insert the SoundCode LtRt Tools 5.1/Stereo plug-in on the aux track

5. Set the aux track's input to the new 5.1 bus, and its output to the Main Stereo outputs

6. Change the output of all tracks which are routed to a 5.1 output (which is disabled) to the 5.1 bus. (This will not remove any automation on the tracks).

7. Optionally, you can monitor the stereo output using a Dolby Pro Logic decoder to expand the audio to surround. The best way to do this is set Mode = PL2 in SoundCode LtRt Encoder and use a Dolby Pro Logic II decoder set to Movie Mode. Movie Mode provides 5.1 decoding.