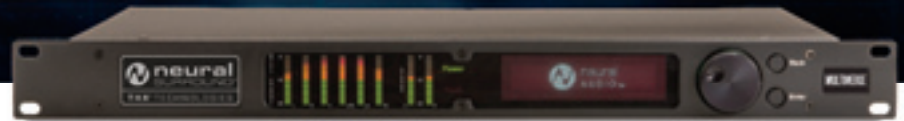


# Neural-THX<sup>®</sup> Surround Audio Processing UpMix, DownMix, MultiMerge Neural Loudness Control<sup>™</sup> (NLC)



# Neural-THX® Surround

## Ease the Transition to 5.1 Audio in Today's Television Systems

Harris Corporation is the exclusive broadcast partner of Neural Audio Corporation and offers a range of next-generation audio infrastructure products that enable surround sound transport over stereo audio paths; seamless audio transitions between mono, stereo and surround sound before Dolby® Digital (AC-3) compression; and loudness control for those annoying level changes between differing programs and commercials. Neural-THX® Surround DownMix, UpMix, MultiMerge and Neural Loudness Control™ (NLC) integrate easily with Harris signal processing products — including the X75™ and X85™ all-in-one processors and the 6800+™ and NEO® modular processors — to maintain proper video-to-audio timing for lip sync purposes.

### Upmixing and Downmixing Audio

The video upconversion process has improved in quality and price to the point that SD signals are typically converted for HDTV systems and then downconverted when necessary. All editing/recording/playback can be done in the HD domain — eliminating the need for a completely separate SD editing/recording/playback system. Audio can be treated in a similar fashion as video when it comes to upconversion. Today, it is possible to derive a natural-sounding surround sound signal from a stereo mix. The downmix process allows the carriage of a surround sound signal over a stereo path with inaudible surround sound information — a definite advantage for adding a surround sound mix into an existing stereo audio infrastructure. This stereo signal can be mixed, edited and monitored as a stereo signal. The upmix process recognizes the matrixed or “watermarked” surround sound information and uses it to reproduce the original signal.

### Upmixing Stereo to 5.1

Using Neural Audio's patented technology, Neural-THX® Surround UpMix positions individual elements within the surround field, creating unparalleled image stability and granularity. This patented approach avoids taking “artistic license” with content by placing audio exactly where it would be heard in a professional Live End Dead End (LEDE) listening environment. Mono or panpot stereo will image in front of the listener, whereas stereo containing depth information will surround the listener. By offering surround sound rear-speaker audio consistency with a natural sound and removing dialogue leakage, the upmix process allows for better performance and an overall more consistent and stable audio experience.

### Key Benefits of Using Harris and Neural Audio Infrastructure Solutions

#### Economy

Enables you to move to 5.1 surround sound using your existing stereo audio infrastructure

#### Audio Upconversion

Add an “upconvert” to your audio signal while upconverting your video signal to maintain proper video-to-audio timing

#### Improved “Audio Experience”

Any audio signal can be processed to a pleasing 5.1 before compressing, and loudness control may be added for those annoying level changes that occur between differing programs and commercials

#### Integration of Neural-THX® Surround with Harris Signal Processing Solutions

Neural-THX® Surround products have a fixed user-settable propagation delay. Using Harris 6800+™, NEO® or X75/X85™ products, a corresponding video delay can be easily added to maintain proper video-to-audio timing for correct lip sync.



Neural-THX® Surround UpMix is commonly used for audio monitoring, and in production studios and DTV facilities.

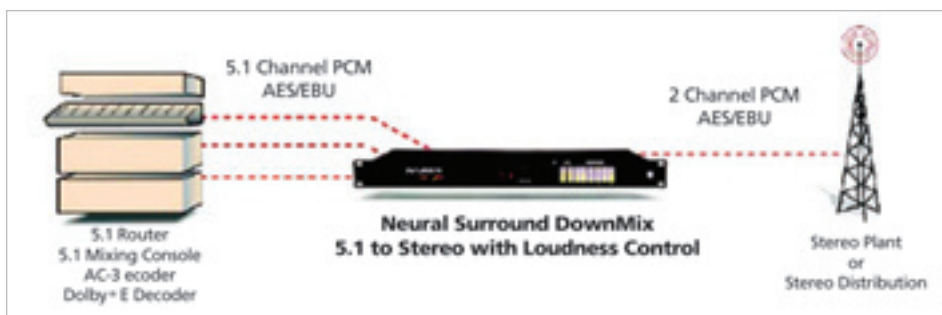
# Neural Loudness Control™ (NLC)

## Downmixing 5.1 to Stereo

The downmix process is based upon the principle that both natural stereo and 5.1 content are two-dimensional — both contain width and depth spatial attributes. Neural-THX® Surround DownMix can represent six channels of discrete audio sources in a stereo downmix by transforming the source positions into pure intensity and coherence. By transforming signal sources, intensity, time, coherence,

polarity and phase into pure intensity and coherence before the six channels are combined, the Neural-THX® Surround DownMix ameliorates problems suffered in traditional matrix encode systems (comb filtering, spatial distortion, etc.). This proprietary Neural-THX® Surround process, or “watermark,” guarantees that surround information is faithfully reproduced when later rendered by the Neural-THX® Surround

UpMix. The stereo mix can be monitored, mixed, stored, edited and played back using a stereo audio infrastructure. In brief, the Neural-THX® Surround DownMix produces a stereo downmix that accurately represents the original content — whether monitored in mono, stereo, matrix or Neural 5.1 Surround Sound.



Neural-THX® Surround DownMix is commonly used for audio monitoring, and in production studios and DTV facilities.

## MultiMerge 5.1 DTV Production Solution

Neural-THX® Surround MultiMerge provides a 5.1 mix no matter what audio signal is provided at the input. The output provides seamless transitions between mono, stereo (LR), stereo matrix (LtRt), watermarked (LwRw) and true 5.1 mixes. This process provides viewers with a 24/7 surround broadcast. With

Neural-THX® Surround MultiMerge inline, 5.1 original content is passed unaffected within the broadcast plant, while original stereo content is rendered using an upmix process to a 5.1 surround sound image. The result is a consistent surround experience for the viewer.



Neural-THX® Surround MultiMerge is commonly used in front of STL paths, Dolby® E or AC-3 encoders.

## Neural Loudness Control™ (NLC)

Neural Loudness Control™ (NLC) provides a solution to TV broadcasters and network operators needing to manage perceived loudness levels within a specific desired volume range. Unlike traditional volume management solutions, this innovative solution uses Neural Audio’s perceptual loudness measurement tool to model how the human ear will perceive the loudness of the audio content. This process accounts for many variables that can affect how audio is perceived, including spectral and density differences and temporal overlaps. By accounting for the human experience of listening, Neural Audio’s loudness measurement accommodates both stereo and multichannel audio equally well. NLC may be provided as an audio processing device in 1RU or may be integrated into the UpMix, DownMix and MultiMerge products so that the user can solve audio problems using less equipment and rack space.

**For more information, please visit:**

[www.neuralaudio.com](http://www.neuralaudio.com)  
[www.neuralsurround.com](http://www.neuralsurround.com)

## **ONE Company for Workflow Solutions Throughout the Broadcast Chain**

Harris is the ONE company delivering interoperable workflow solutions across the entire broadcast delivery chain — providing today's broadcaster with a single, integrated approach to capitalize on the benefits of IT and mobile applications. By providing unparalleled interoperability across our product portfolio, Harris is able to offer customers integrated solutions that improve workflows, save money, enable new revenue streams and provide a migration path to emerging media business models. To meet the evolving needs of broadcast, distribution, government agencies and entertainment businesses, Harris is the ONE answer for change.

## **Service And Support**

At Harris, we are committed to customer service excellence. It is our goal to provide the highest level of support by applying a simple rule: We take ownership of helping our customers succeed. Our support teams consist of innovative technical experts who support all situations regarding product performance, integration and operational processing. We are adept at providing proven solutions, making workflows better and ensuring reliability of the product and system. At Harris, our experienced and dedicated teams stand ready to help you meet your goals for premium product performance, 100% up-time and reduced maintenance investment.

## **Warranty**

Because we want to assure you that Harris stands beside its products and system solutions, our products carry a standard set of warranty services, which are competitive with — and in some cases outperform — others in the industry.

## **Service Packages**

We offer value-add services that allow you to customize the level of services you need in meeting mission-critical performance levels. Our service package options offer many ways to upgrade your standard warranty by choosing the All-Inclusive OnePak, or by selecting individual services from our extensive portfolio. Our service and support advisors can assist in the selection of the individual services that best suit your requirements.

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**For more information please visit [www.broadcast.harris.com](http://www.broadcast.harris.com).**

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