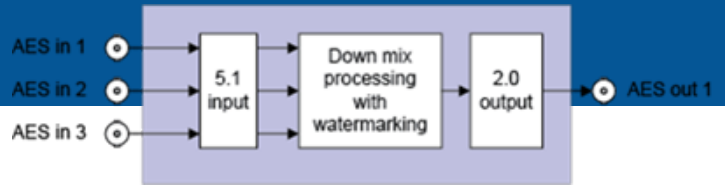# DTS Neural Surround™ DownMix

5.1 to Stereo

The DTS Neural Surround™ DownMix provides a process for taking a 5.1 mix and creating a stereo mix. This is called a LtRt watermarked signal and is backwards-compatible with Dolby® ProLogic® II. The stereo mix can be monitored, mixed, stored, edited and played back using a stereo audio infrastructure.

Features

DTS Neural Surround™ DownMix enables the transport of 5.1 surround sound through any stereo infrastructure. The process is based on the principle that both natural stereo and 5.1 content are two-dimensional; both contain width and depth spatial attributes. The DownMix can represent six channels of discrete audio sources in a stereo downmix by transforming the source positions into pure intensity and coherence.

Available for the Selenio™ MCP, Selenio 6800+™, X100™ and X50™ processing platforms.

Details

By transforming signal sources, intensity, time, coherence, polarity and phase into pure intensity and coherence before the six channels are combined, the DownMix amelio-rates problems suffered in traditional matrix encode systems (comb filtering, spatial distortion, etc). This proprietary DTS Neural Surround™ process, or watermark, guarantees that surround information is faithfully reproduced when later rendered by the UpMix and is backwards-compatible with Dolby® ProLogic II®. The stereo mix can be monitored, mixed, stored, edited and played back using a stereo audio infrastructure. In brief, the DownMix produces a stereo DownMix that accurately represents the original content, whether monitored in mono, stereo, matrix or Neural 5.1 Surround Sound.

The Selenio 6800+ platform includes the all-in-one APM6803+ and DAPM6802+ Advanced Audio Processing modules.

There is a plug-in option available for adding the DownMix to the Selenio X50™ and Selenio X100™ video and audio processors.

The Selenio™ Media Convergence Platform supports DTS Neural Surround™ DownMix as well.

Versions are available (see ordering information) for applications where DownMix and Loudness Control are required.

- When a 5.1 mix requires loudness control with a 2.0 downmix for simultaneous 5.1 and 2.0 output.
- When a downmix is required with loudness control – 5.1 mixes have a very wide dynamic range that requires loudness control for the stereo 2.0 downmix.

Commonly used in: production studios, audio monitoring, DTV facilities.

For more information, see the DTS Neural Audio Website.
(http://www.dts.com/)

Specifications

Specifications and designs are subject to change without notice

Sample Rate	32 to 48 kHz (AES/EBU, wordclock-slave)
Number of Available Channels	Depending on configuration, up to 4 AES3 input (stereo) and 4 AES3 output (stereo)

Ordering Information

DTS NEURAL SURROUND DOWNMIX FOR SELENIO MEDIA CONVERGENCE PLATFORM	
SELOPT-ADVAUD	APM (Audio Processing Module) plug-in advanced audio processing for FS, XD (requires software key license option(s))
SELOPT-SK-DTS	1 software key license for DTS Neural technologies option (3 software key licenses required for DTS Neural Surround(tm) UpMix or DownMix or 5.1 DTS Neural Loudness Control, 4 software key licenses required for DTS Neural Surround MultiMerge, 1 software key license required for 2.0 DTS Neural Loudness Control)

DTS NEURAL SURROUND DOWNMIX IN SELENIO 6800+	
APM6803+RLYT	HD/SD with relay bypass multichannel audio processing station with 8 discrete AES. Supports all DTS Neural Surround Sound and Loudness Control functions. Supports up to 2 Dolby decoders and encoders. Licenses are required for all DTS and Dolby functions
APM6803+T	SD/HD/3G multichannel audio processing station with 8 discrete AES. Implements all DTS Neural Surround Sound and Loudness Control functions. Supports up to 2 Dolby decoders and encoders. Licenses are required for all DTS and Dolby functions
DAPM6802+D	HD/SD-SDI dual channel advanced embedded audio Loudness Control processing module, supports all DTS Neural Surround Sound and Loudness Control functions. Licenses are required for all DTS functions. Takes 2 slots in 6800+ frame
DAPM6802+RLYD	HD/SD-SDI with relay bypass dual channel advanced embedded audio Loudness Control processing module, supports all DTS Neural Surround Sound and Loudness Control functions. Licenses are required for all DTS functions. Takes 2 slots in 6800+ frame
68OPT-DTS	1 software key license for DTS Neural technologies option (3 software key licenses required for DTS Neural Surround UpMix or DownMix or 5.1 DTS Neural Loudness Control, 4 software key licenses required for DTS Neural Surround MultiMerge, 1 software key license required for 2.0 DTS Neural Loudness Control)

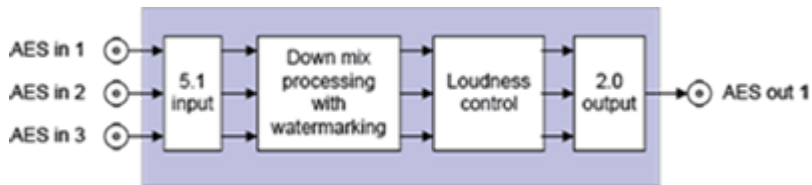| DTS NEURAL SURROUND DOWNMIX FOR SELENIO X50	
X50OPT-ADVAUD	APM (Audio Processing Module) plug-in advanced audio processing for X50-AV-2PS (requires software key license option(s))
X50OPT-SK-DTS	1 software key license for DTS Neural technologies option (3 software key licenses required for DTS Neural Surround UpMix or DownMix or 5.1 DTS Neural Loudness Control, 4 software key licenses required for DTS Neural Surround MultiMerge, 1 software key license required for 2.0 DTS Neural Loudness Control)

DTS NEURAL SURROUND DOWNMIX FOR SELENIO X100	
X100OPT-ADVAUD	Plug-in advanced audio submodule option (required for Dolby and DTS options)
X100OPT-SK-DTS	1 DTS Neural Surround and Loudness Control software key license option (1 for 2.0 Loudness Control or 2 x 1.0 Loudness Control, 3 for Upmix, Downmix, 5.1 Loudness Control, 4 for Multimerge, 4 x 2.0 Loudness Control, 1 x 5.1 + 2 Loudness Control), requires X100OPT-ADVAUD

Images/Diagrams

DownMix with Loudness Control

AES in 1 — 5.1 input → Down mix processing with watermarking → Loudness control → 2.0 output → AES out 1
AES in 2 —
AES in 3 —

5.1 Loudness Control with DownMix

AES in 1 — 5.1 input → Loudness control → 5.1 output → AES out 1, AES out 2, AES out 3
AES in 2 —
AES in 3 —

Down mix processing with watermarking → 2.0 output → AES out 4