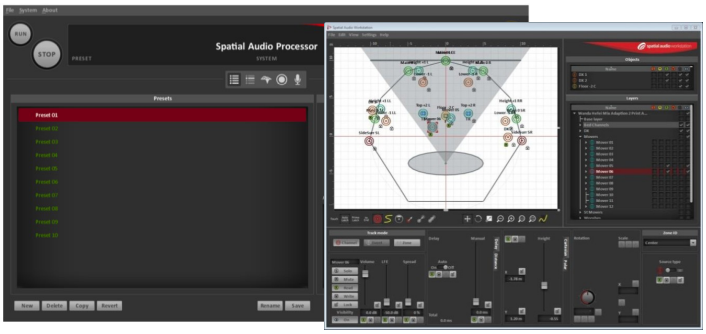
ENCIRCLED Spatial Audio Production

for immersive sound experiences



This document provides general information on the content creation workflow for IOSONO immersive audio systems. Find out how to create and render object-based mixes using the Spatial Audio Workstation plugin and ENCIRCLED's IOSONO spatial audio processors.

IOSONO audio systems rely on an object-based audio model to describe spatial audio scenes. This enables the mixing and reproduction of complex sound scenes independent from the loudspeaker layout available and introduces intuitive and flexible workflows to content creation.

Following the object-based data model, sounds are described as audio objects - consisting of audio data and metadata – these being 3-dimensional with a variety of other object properties like level, spread, etc. During mixing and distribution, the audio objects are kept individual, along with the descriptive metadata, without defining any feeds or balance into specific speakers.

The Spatial Audio Workstation is the preferred mixing tool for creating that descriptive metadata for linear production employing object-based concepts. For monitoring and reproducing an object-based sound scene, an IOSONO spatial audio processor renders the objects (audio plus metadata) onto the given loudspeakers system in real time for optimized spatial presentation using the advanced IOSONO algorithm.

Technical environment

The Spatial Audio Workstation (SAW) is a core plugin for Steinberg's Nuendo digital audio workstation (DAW) running on a Windows PC. Users who are familiar with Nuendo can run the complete IOSONO audio production inside Nuendo. If users prefer to work with another DAW for editing and mixing, like ProTools, Digital Performer or others, the DAW of choice can be linked to Nuendo using up to 64 audio busses and sync connection. In this case, Nuendo and the SAW will be used for spatial authoring, final recording of the audio data and export of the IOSONO master file exclusively.

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Technical specifications are subject to change without prior notice.
Please check www.encircled-audio.com for latest information.

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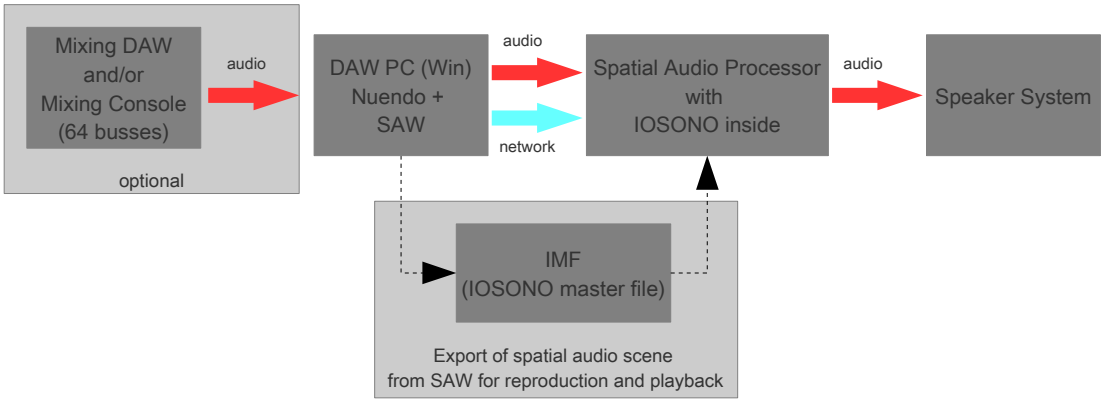


General mixing workflow in content production

Mixing Workflow

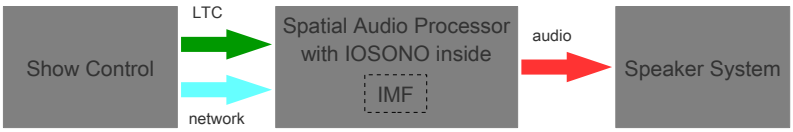
In your Nuendo session, one monophonic audio track (or bus) will be routed to a dedicated SAW mixing bus and linked to the SAW panner, creating an object. Up to 64 of these individual objects can be used in parallel. If you want to use multitrack audio (stereo, 5.1, etc.), these tracks can be split upon import and positioned in 3D space using individual objects per channel to recreate the intended signal arrangement. Stereo source material can be exploited by an integrated upmix algorithm. This feature, combined with an easy-to-use parameter set, controls the spreading of the stereo track audio to a 360° surround field. All object parameters including motion can be automated and edited on the SAW plug-in and in Nuendo's automation lanes.

Object types

Three types of sound sources can be reproduced in an IOSONO system:
• **Point Source** – An object having a constant position, usually associated with a sound coming from the screen or a point near the wall.
• **Plane Wave** – An object at an infinite distance away. The sound has a constant angular position no matter where a listener is in the room. This is especially useful for ambiances and reverb returns.
• **Focus Source** – An object within the room. Especially useful for sound effects to complement 3D images in systems with sufficient speaker count.

Session export and reproduction

After an audio scene is completed in the SAW, the entire session, comprising audio and metadata, is exported as an IMF (IOSONO Master File) container, which can be read and reproduced using IOSONO spatial audio processors. For reproduction, IMF files will most likely be stored on the internal storage of an IOSONO spatial audio processor and be read from there. Content playback can be controlled by a graphical user interface, via show control commands or time code reference.



Reproduction (render) scenario for object-based IMF controlled by a Show Control.

Source materials

Source audio can come from standard and advanced recording techniques (close/distant miking, multichannel and immersive formats) as well as from multichannel stems. The more discrete and isolated sound events there are in an audio track of the source material, the more freely they can be controlled in space independent of other sound events in the mix. Sound events that are combined in a track can only be authored as that combination but not separately from then on.