# Paragon

Boundless reverb

# Contents

# Introduction

Paragon is a true convolution reverb with the flexibility and control of a classic algorithmic reverb, giving you the sound of real spaces, now with unprecedented tweakability. Via re-synthesis, Paragon offers full control of the decay, room size and brightness of reverbs modelled on 3D recordings of real spaces - with no time-stretching, which means no artefacts - not to mention spectral analysis and precise EQ of the Impulse Responses themselves.

The IR library isn't too big, and it isn't too small, it's just right. Gone are the days of keeping an Impulse Response saved for every possible configuration of every possible space - with Paragon, all you need is a select few, which can be tweaked to create almost limitless combinations of spaces.

Perfect for surround applications including Dolby Atmos bed tracks, the reverb operates in up to 7.1.2 channels of audio.

# Interface

## General layout



1    **Bypass.** Bypasses the effect in-place. Allows for direct A/B comparisons with and without the effect, without altering other processing in the chain.

2    **Undo / redo.** Unlimited session undo and redo commands, to step back and forward through processing modifications.

3    **Preset browser.** Use the arrow buttons to step sequentially through presets, or click the end control to open the preset menu and select from a list. Double click the name to rename session presets.

   **Preset management.** The 'Installed' folder contains factory presets. These cannot be overwritten.

   User presets can be saved in 'User folder'. An asterisk ('*') will be shown against the preset name if settings have been changed from the saved version.
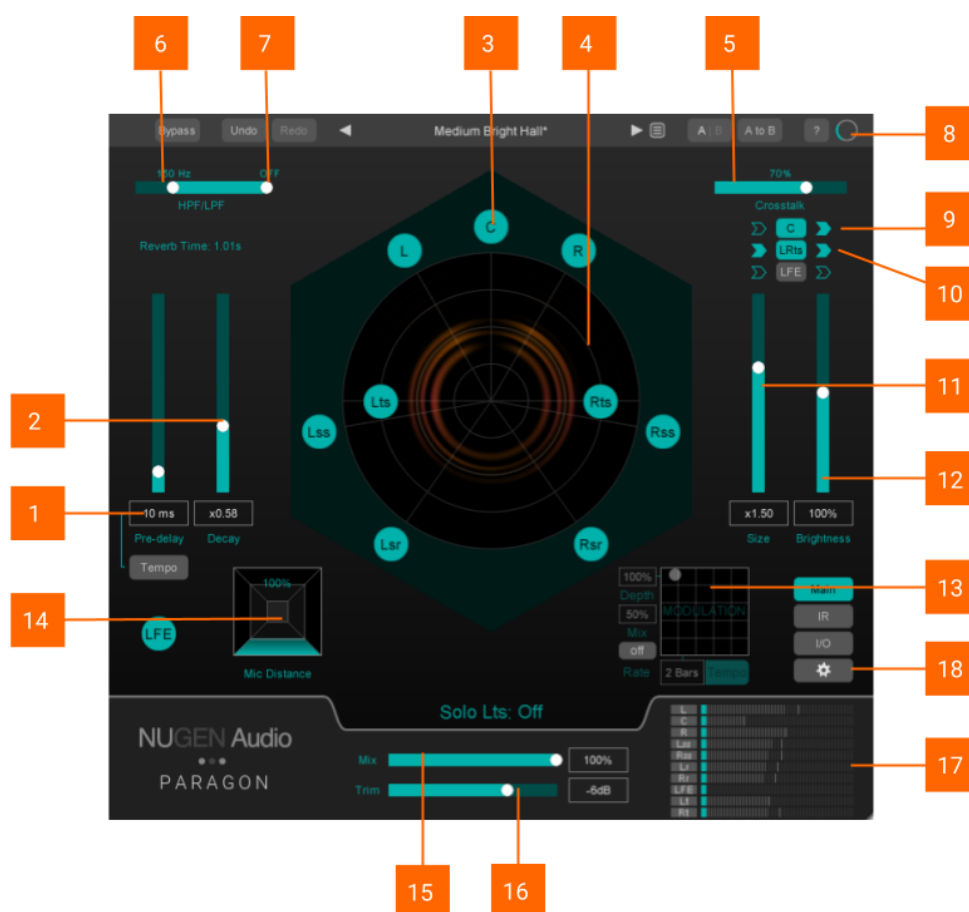
   Additional folders can be created using 'Add folder'.

   Folder and user presets can be organised by clicking '…' (highlighted when the mouse pointer is placed over the folder/preset name). Folders can be deleted, renamed and browsed. User presets can also be moved and copied, set as a 'Favourite' or manually tagged. The search bar uses tags as well as preset names.

4    **A|B and A to B (B to A).** These controls switch data between the 'A' and 'B' memories for direct comparison between two sets of parameters. The A|B control toggles between 'A' and 'B' (current active memory is highlighted). The A to B (B to A) button transfers current settings to the memory indicated, i.e. from A to B or vice versa.

5    **?** Opens the 'About' page, with access to credits and the product manual (if installed).

# Main panel

Paragon's reverb decay and room size can be set significantly longer, larger, shorter and smaller than that of the original IR space, without introducing ugly artefacts as a result of stretching or removing samples.. The main panel controls all basic functionality.



1    **Pre-delay.** Alters the length of time between the original dry signal and the audible onset of early reflections and reverb tail, measured in milliseconds or samples. This can be locked to the project tempo, in which case it is measured in note subdivisions. Additional per-channel tweaks can be found in the I/O panel.

2    **Decay.** Controls the time taken for reverb reflections to fade away.

3    **Channel node.** Indicates an audio channel (L, C, R etc). Click to solo the channel output. Can be switched globally from 'solo' to 'mute' in the 'Settings' panel. Channels are paired left and right (where appropriate) by default. This pairing can be adjusted in the I/O panel.

4        **Reverb scope.** Provides a visual representation of the reverb itself. Brighter sections indicate increased reverb effect at that position in the surround or stereo panorama. Colour can be used to differentiate between wet and dry signal - useful for balancing and examining where the reverb is most audible.

5        **Crosstalk.** Affects the overall amount of crosstalk between each channel. Increases the influence each individual channel has on the reverb effect across the other channels. The higher the crosstalk, the more dry signal from one channel is sent to the reverb for other channels. Additional per-channel controls can be found in the I/O panel.

6        **High-pass filter.** Controls the low frequency cut-off point and attenuates frequencies below this point. Additional per-channel controls can be found in the I/O panel.

7        **Low-pass filter.** Controls the high frequency cut-off point and attenuates frequencies above this point. Additional per-channel controls can be found in the I/O panel.

8        **Updating icon.** Indicates that the most recent change you made requires an update to the model. This can take some time. The image will return to the NUGEN logo when all updates are complete.  Note that if you resize the interface to something bigger than your screen, or re-open a session on a machine with a smaller screen, you can hold down the control/command key and click this icon to return the interface to its default size.

9        **Center in/out.** Controls reverb on the center channel. The middle button toggles center reverb on/off. The left chevron dictates whether the center channel accepts any crosstalk. The right chevron dictates whether the center channel generates any crosstalk.

10       **LtRt in/out.** Controls reverb on the LtRt channels. The middle button toggles LtRt reverb on/off. The left chevron dictates whether the LtRt channels accept any crosstalk. The right chevron dictates whether the LtRt channels generate any crosstalk.

11       **Size.** Adjusts the modelled impulse response to simulate the space getting larger or smaller.

12       **Brightness.** Adjusts the modelled impulse response to give more or less prominence to the higher frequencies.

13       **Modulation.** Adds a modulation effect to the reverb signal, with individual controls for 'Rate', 'Depth' and 'Mix'. This effect can be locked to the project tempo.

14       **Mic distance.** Adjusts the balance of early reverb reflections to late reflections, in order to give an impression that the sound source is either closer to or further away from the listener.

**15**   **Mix.** A slide parameter, directly linked to both the dry and wet signals. Controls the percentage of the signal output that is either wet or dry.

**16**   **Trim.** Adjusts the wet gain, across all channels of audio, measured in 'dB'.

**17**   **Output metering.** Shows individual channel output levels. Clicking the channel label allows individual channel mute and solo controls, depending on the configuration determined in the 'Settings' panel. Muted channels will show a greyed-out meter, and that channel will no longer contribute to the audio output.

Channel colours can be modified via the settings panel, in order to assist with channel identification.

When the I/O panel is active, these meters are replaced with a smaller surround scope (see number 4).

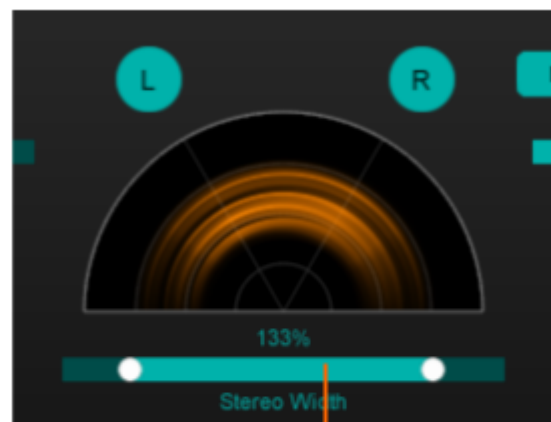**18**   **Panel Controls.** Used to switch between panels.

**Main.** Opens the main panel - visible by default when the plug-in opens.

**IR.** Opens the Impulse Response controls.
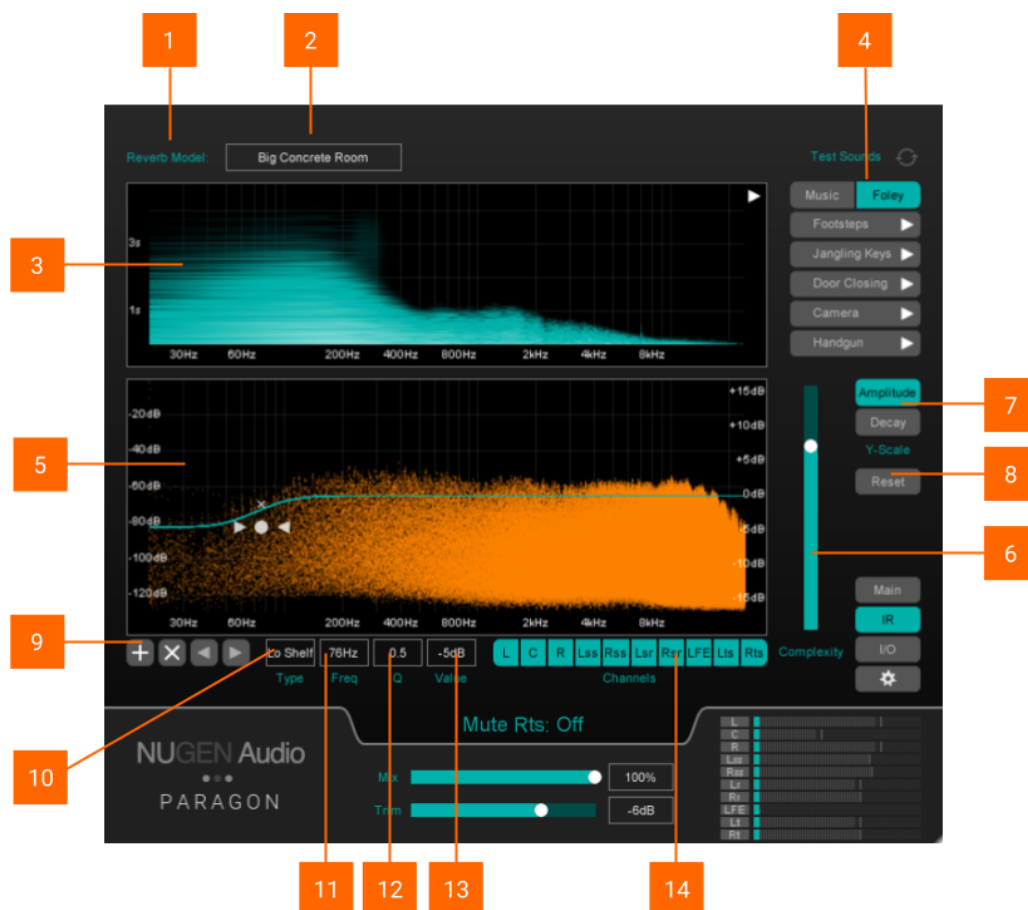
**I/O.** Opens the I/O controls.

**Gear icon.** Opens the 'Settings' panel.

**19**   **Stereo width.** A mid/side control which adds width to the signal. This control is only visible when using Paragon in stereo.

# IR panel

The IR panel allows you to select an Impulse Response recording of a real space. From there, you can seamlessly tweak the frequency response, by EQing the reverb model itself and altering the frequency-dependent decay rate.
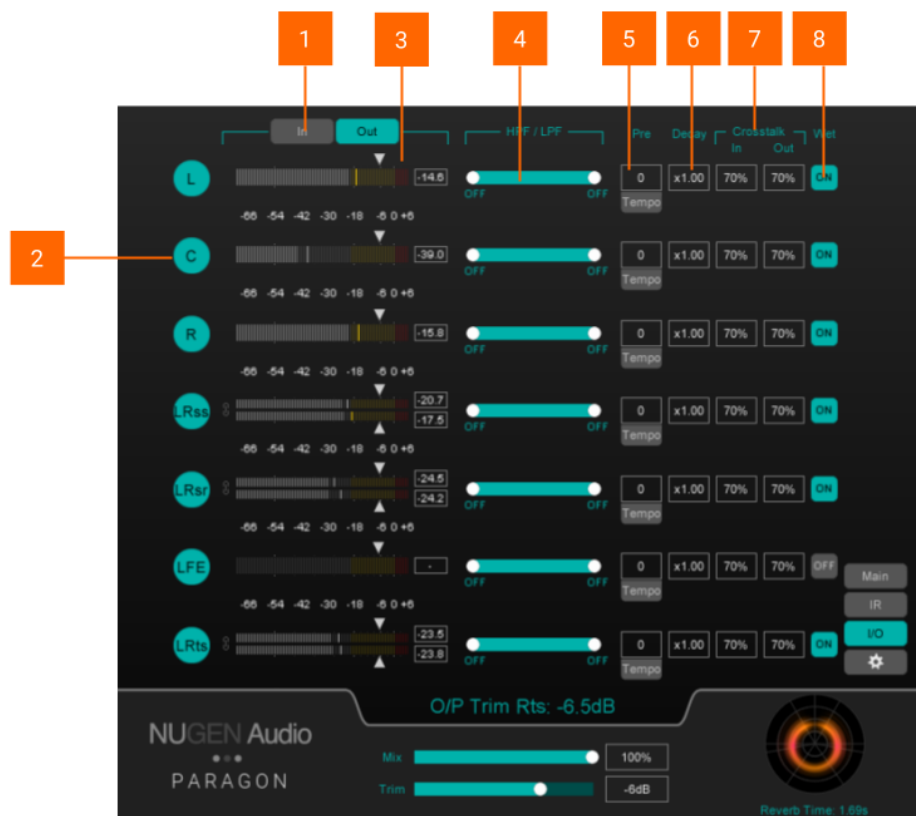


1       **Reverb Model.** Loads individual Impulse Response models.

2       **Modelled IR name display.** Shows the name of the current Impulse Response.

3       **Spectrogram.** Displays the Impulse Response using a spectrogram view.

4       **Test sounds.** Plays pre-loaded sound files and tests these sounds against the Impulse Response. Test sounds are split into Music and Foley sounds, and you can toggle whether the sounds loop using the loop button.

5       **Frequency graph display.** Main EQ display for the Impulse Response. The graph shows frequency on the X axis and either initial dBFS or decay-dB-per-second on the Y axis. EQ nodes can be added in order to equalise the Impulse Response.

**6**      **Complexity.** Affects the complexity of the resynthesized Impulse Response. A higher value gives a higher number of components, creating a more complex reverb. A lower value gives a lower number of components, this speeds up re-calculation, but creates a less rich reverb.

**7**      **Amplitude / Decay.** Dictates which parameter is measured on the Y axis of the frequency graph. Amplitude is measured in initial dBFS and decay is measured in dB-per-second

**8**      **Reset function.** Resets all user-created settings and restores the default settings of the Impulse Response model.

**9**      **Add/subtract EQ node.** Adds or removes EQ pin points on the frequency graph. Can be used either to dampen unwanted frequencies in the Impulse Response, or to accentuate certain frequencies.

**10**      **Type (node).** Changes the shape of the EQ node - bell curve, high shelf or low shelf.

**11**      **Frequency read out.** Gives the frequency readout in 'Hz' for the most recently active node. Click and drag to adjust the value, or double-click to enter a specific value manually.

**12**      **Q.** Edits the Q-curve of the chosen node. The higher the value, the wider and more gradual the curve. The lower the value, the steeper the curve. Q-curve can also be adjusted by dragging the arrows on either side of each node.

**13**      **Value.** The amplitude or decay value of the currently selected node (depending on the Y-axis setting). Altering this value affects the amplitude/decay of the reverb components where the EQ node has been placed.

**14**      **Channel on/off.** Dictates which channels of audio should be affected by the EQ.

# I/O panel

The I/O (input/output) panel provides trim and monitoring controls for all channels. Each set of channels also has controls for pre-delay, decay, cross-talk, and high/low pass filters.



1    **In / Out.** Switches between trim controls for the input and output.  The corresponding meters also change accordingly.

2    **Channel node.** Click to solo the channel(s). For some higher channel configurations, channels will be grouped into left and right pairs.

3    **Trim control arrows.** Can be dragged horizontally to apply a dB offset (increase or decrease). For grouped pairs, the upper arrow controls the left channel and the lower arrow controls the right channel. The box on the right shows the peak reading for each channel (click to reset).

4    **High-pass and low-pass filters.** Controls the high-pass and low-pass filters for each channel or pair of channels. Attenuates frequencies outside the indicated range.

5    **Pre-delay.** Controls the pre-delay time (in milliseconds) for each channel or pair of channels. This is in addition to the global pre-delay time on the main panel. Click and drag up and down to increase or decrease the pre-delay. This can also be edited by double clicking the box and manually typing a value.

6        **Decay.** Controls the reverb decay time for each channel or pair of channels. Click and drag up and down to increase or decrease the decay time. This value is multiplied by the global decay time before being applied to each individual channel.

7        **Crosstalk.** Controls the amount of crosstalk, or 'bleed', between channels. Without cross-talk, the reverb is effectively multi-mono. For example, if the dry signal is coming through the left channel only, and crosstalk is disabled, the reverb effect will only be applied to the left channel, and all other channels will remain silent. With crosstalk enabled, reverb will be generated in other channels, even if the dry signal is silent in all other channels. This creates a much more realistic effect. The percentage value controls and displays how much crosstalk is entering or leaving each channel.

8        **Wet.** Toggle the wet signal on/off for each channel.

# Settings panel



### Input Routing

Selects and changes the input routing for surround audio coming into the plug-in. This should usually match the routing for your DAW/NLE.

### Output Routing

Selects and changes the output routing for surround audio coming out of the plug-in. This should usually  match the routing for your DAW/NLE.

### Main Node / Secondary

This option dictates whether selecting a channel node either solos or mutes the relevant channel(s).

### Pre-delay

This option chooses whether to display the pre-delay in milliseconds or samples.

### Test Level

This option dictates what loudness the test audio should be played at.

## Colours

Colours are automatically saved with the preset. Meter splits only affect the meters on the I/O panel.

## Additional Options

Additional "expert" options can be accessed under 'Credits and Options' by clicking the NUGEN logo in the bottom left of the UI. This includes:

### Early Reflection balancing

Automatically balances Early Reflections (which might not have been "symmetrical" in the original IR recording) for a more symmetrical sounding reverb.

### Smooth parameter updates

Switching off this function will improve processing speeds, but may result in unwanted artefacts.

### Automate all parameters

Allows automation of all parameters. Requires reloading of the plug-in host.

# Practical Application

### Dolby Atmos

Paragon is the first 3D-compatible convolution reverb. The plug-in supports up to 7.1.2 channels of audio, making it suitable for creating Dolby Atmos bed tracks, or for other immersive audio applications.

### Streamlined IR library

Paragon's increased tweakability compared with other convolution reverbs means no more need for a huge library of Impulse Responses taking up space. With careful manipulation of Paragon's controls, the user can create practically any combination of spatial characteristics.

### Adjustable crosstalk

Paragon's adjustable crosstalk creates a sense of liveliness, and offers the control to determine how reverb from each channel interacts with the other channels. So for example, the user could improve dialog intelligibility by removing reverb from the centre channel, but still maintain a sense of space and location by sending the dry centre channel audio to other reverb channels, via the crosstalk.

# Reporting a Problem

If you encounter a problem with any of NUGEN Audio's products, please let us know, to help us improve them.

You can email the NUGEN Audio support team at support@nugenaudio.com.

To make it easier for use to resolve the issue you are seeing:

- Please give a clear explanation of  the problem, including any steps required to reproduce it if appropriate.
- Please state how frequently you've experienced the problem.
- Please supply details of the system you are using, in particular:
    - The operating system (Windows/Mac OS) and version.
    - Host application and version.
    - CPU speed and RAM available.

Please be patient with any problems you may experience, particularly with products at a beta stage of release. At NUGEN Audio we take problems with our software seriously,  and will endeavour to correct them as quickly as possible.

# Credits

- IR modelling technology originated by Dr. Jez Wells, University of York
- Location recordings by Rinse Veltman, Tonework
- Anechoic Recordings from Cologne University of Applied Sciences
- Additional recordings from [www.openairlib.net](www.openairlib.net)
- "Canon EOS Rebel T5i Photo Single Shoot.wav" created by ChazzRavenelle of freesound.org
- "keys ringing.wav" created by Anton of freesound.org
- "Door, Front, Closing, A.wav" created by InspectorJ of freesound.org

# Version History

| | |
|---|---|
| 1.0.1 | Initial release |
| 1.1.0 | Improved preset browser |
| | Improved EQ node interactor (Q-curve control) |
| | Added outdoor IR models and foley test sounds |
| | Added early reflection balancing |
| | Added option to disable smooth parameter updates |
| 1.1.1 | Fixed model automation |
| | Fixed 7.0.2 crash |
| 1.2.0 | Added ST license |
| | Added stereo compact layout |
| | Added new stereo visualisation |
| | Added Stereo Width |
| | Added Mic Distance |
| | Added Modulation |
| | Added Tempo Lock to Pre-Delay |
| | Fixed parameters missing from Pro Tools automation |
| | Fixed size and model automation in Nuendo |
| 1.3.0 | Added compact view |
| 1.4.0 | Apple Silicon native support |
| | Link to feedback form in menu |

Notes:

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