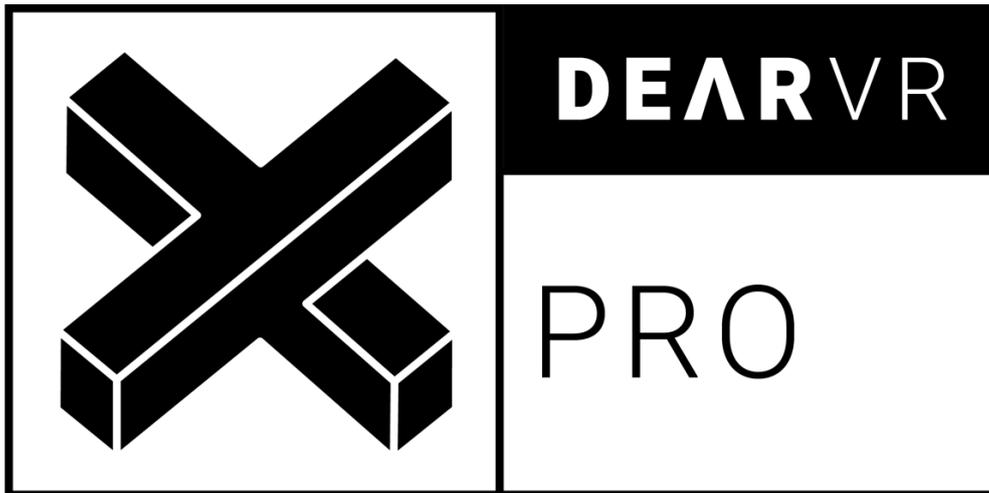




**IMMERSIVE 3D AUDIO**  
TOTAL CONTROL



# **USER MANUAL**

## **v1.4.1**

**Please read this manual carefully before using the software.**  
**Using headphones requires responsible listening!**

Last updated: March 2020  
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## Quick Start Guide

### Install and Authorize your new Plugin:

If you do not have an account, register for free on the [Plugin Alliance website](#).

Double-click the .mpkg (Mac) or .exe (Win) file

Follow the installation instructions.

Open the plugin in your DAW of choice and click on the interface to activate

If your computer is connected to the Internet, click the "I'm Online" button and enter your Plugin Alliance credentials on the following page.

#### Alternatively:

For offline activation instructions and additional information, please refer to the Activation Manual included in the installation folder of this plugin.

You may also follow this link to the online version of the manual.

**For more information, please visit: [www.plugin-alliance.com](http://www.plugin-alliance.com)**

## System Requirements and supported Platforms

Supported sample rates:

44.1, 48, 88.2, 98, 176.4 and 192 kHz, in both mono and stereo.

For latest System requirements & Supported Platforms, please check the product list page on the Plugin Alliance website to see particular details for your product.



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# 1 Introduction

Thank you for purchasing our dearVR PRO Plugin and welcome to the next step of immersive audio production. With the dearVR 3D audio technology you are able to design fantastic new music mixes for headphones or create deep auditory worlds and sound design within your DAW.

This manual will help you understand the dearVR PRO Plugin and how to use it in your projects.

## **Important Note:**

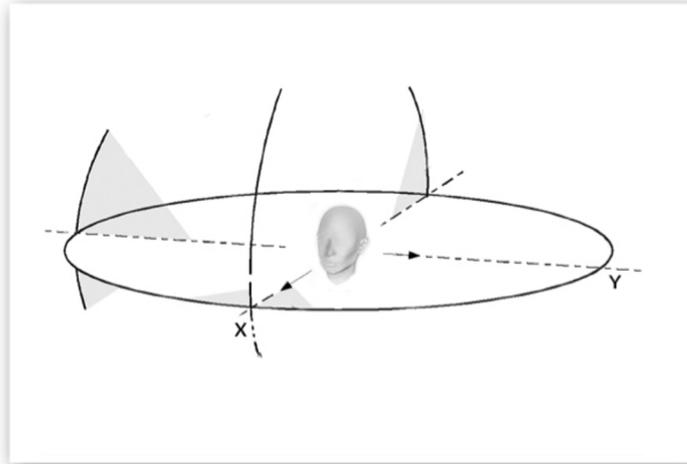
dearVR is a 3D audio technology for headphones. Any kind or brand will do, but if the output format is set to “Binaural”, you have to use a headphone for the plugin to work properly. Please check that your left and right earpieces are properly placed and let’s get started...

**Have fun!**

## 1.1 About binaural 3D Audio

Binaural 3D Audio is a technology that simulates the human spatial hearing via headphones. If you listen to common stereo audio with headphones, the perception of all sound sources is located inside your head - between your left and your right ear. With 3D Audio you get the sound outside of your head where it belongs. A sound appears to emanate from a specific point - anywhere within a full 360° three-dimensional sphere.

This gives you the ability to position a sound object all around the listener - behind, in front of, to the right or to the left of and even below or above.



*Illustration 1.1 - Full 360-degree 3D audio sphere*

The quality of a 3D Audio rendering process depends on many factors - primarily the shape of our body, our head and our ears. That's why a mix with 3D Audio can sound different to different people. Our uniqueness as human beings is actually a limitation for practical 3D Audio technology.

Another typical problem that occurs with binaural 3D Audio is the front-back confusion. Our natural hearing uses small micro-movements of our head to optimize the localisation of a sound source. The head tracking technology, which is part of virtual reality devices, offers a solution to this problem.

Binaural 3D Audio is not made for listening via stereo speakers. Although in general the playback is possible, you will have to face strong colorations of the sound depending on your playback system. The reason for this is crosstalk, meaning a large portion of the left speaker signal will also go to the right ear of the listener. Similarly, a large portion of the right speaker signal will go to the left ear of the listener. With headphones this is different: both the left and the right channel signal reaches its respective ear.

## **1.2 dearVR audio reality engine**

We call our dearVR technology an audio reality engine because it can produce stunningly realistic auditory worlds, comparable to our natural listening. For this, we listened back to our modelling technology over and over again and tweaked every parameter with our own ears.



The acoustic modelling of an environment needs more than just 3D spatial location. It combines distance, motion, reflections and reverb to complete a simulation of an acoustic scene.

All these phenomena can now be utilized for your sound design with just one plugin:  
The dearVR audio reality engine!

## 2 Overview dearVR Engine

The dearVR PRO Plugin is a 3D audio processor, enabling you to virtualize many different kinds of three-dimensional acoustic settings within your mix with a great amount of realism.

The virtualisation of an acoustic environment with object-based sound sources refers to combining 3D spatial location cues with distance, motion, and ambience. All these parts are needed to achieve a realistic simulation of an acoustic scene - far beyond simple 3D positioning.

For this reason, the dearVR Engine combines object-based 3D positioning with real time generated reflections depending on the room positioning and late diffuse reverberation.

### 2.1 Reflections

A signal being reflected once or twice from parts of a listening space - walls, ceilings and floor - arrives shortly after the direct signal at the listener's position. Such early reflections can be seen as a transition period before the reverberant field has built up.

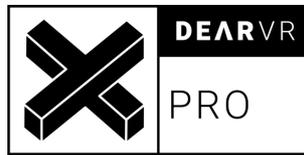
First reflections are responsible for our impression of the general character and the size of a room. These reflections are of great importance in binaural rendering in order to create a realistic localisation and the impression of sounds coming from outside of your head.

Early reflections can be modelled by considering acoustic boundaries as acoustic mirrors. Depending on the listener's position in a room and his/her distance to the boundaries, the time a reflection takes to arrive at his/her ears varies. Reflections also vary depending on the position of the sound source in the room.



## 2.2 Reverb

Reverb itself is an extremely complex reflection and diffusion pattern that builds up to a dense thickness from the moment you hear the original dry sound. For the dearVR Engine we captured the acoustic characteristics of different rooms or locations. The dearVR PRO plugin contains a selection of 46 room presets for spatial audio production. You can easily adapt these reverb characteristics for your mix by changing the reverb size or applying a reverb filter.



### 3 Control Panel



Illustration 3.1 - Overview processing units

The dearVR PRO plugin is made up of four processing units:

1. Position
2. Reverb
3. Reflections
4. Master

The signal flow starts in the Position Module, passes through the Reflections and Reverb sections and ends with the Output Format in the Master Module. Each module has a Gain controller before the signal enters the following section.

### 3.1 Position

The Position module renders distance, listening angle and elevation relative to the listener. It is possible to enter values as Polar or Cartesian coordinates.

**Important:** Azimuth, Distance and Elevation sliders (Polar Coordinates) are only active in Polar Mode (see 1 – Input Mode)

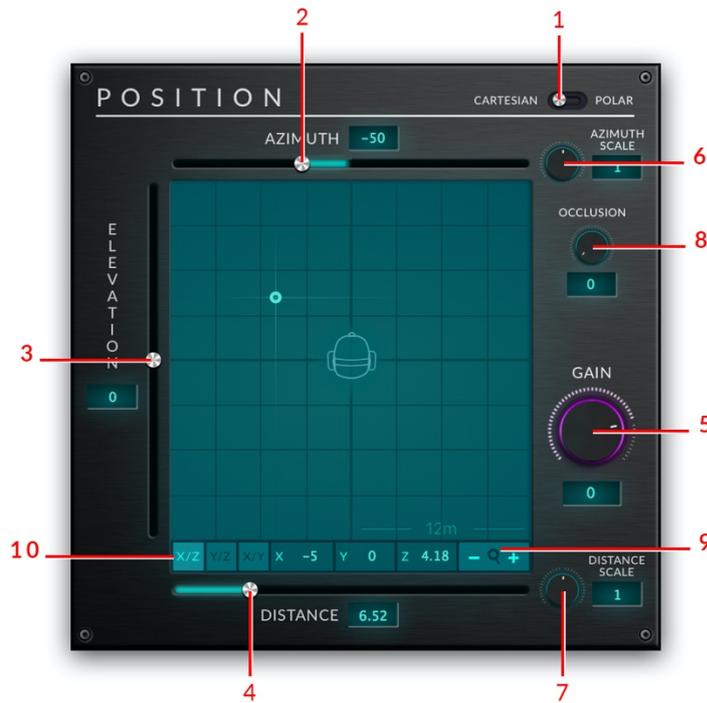


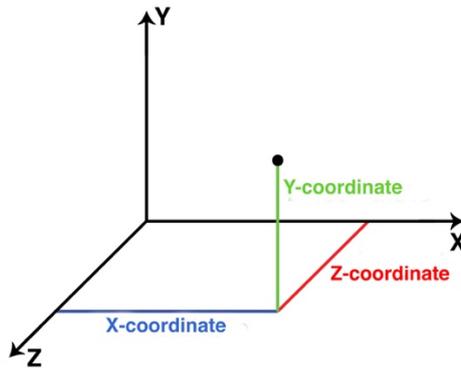
Illustration 3.2 - Position module

#### 1 - Input Mode

Use toggle to switch between **Cartesian** or **Polar Mode**.

##### 1. Cartesian Mode

Cartesian Coordinates X, Y, Z represent distances from the listener.

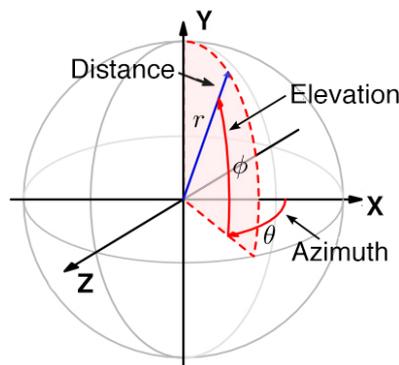


*Illustration 3.3 - Cartesian Coordinates*

In Cartesian Mode, change position by dragging the audio source icon with the mouse in the XYZ-Pad. You can also enter numeric value into the XYZ display field.

## **2. Polar Mode**

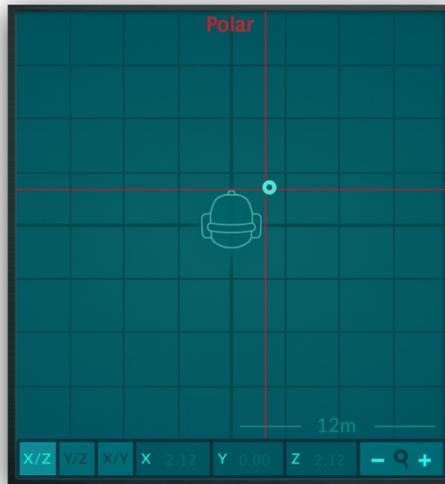
Azimuth and Elevation parameter describe an angle in degree, whereas Distance is set in meter (length of vector  $r$ )



*Illustration 3.4 - Polar Coordinates*

In Polar Mode, change position with the Azimuth, Elevation and Distance sliders. You can also enter numeric value into the display fields next to the sliders.

**Note:** It is not possible to drag the audio source icon with the mouse while being in Polar Mode. A red position marker together with the note “POLAR” will appear.



*Illustration 3.5 - XYZ-Pad input disabled*

## 2 - Azimuth

Set Input Mode to Polar and use the Azimuth Slider to enter the left/right position in degrees ( $\pm 180^\circ$ ).

Use display next to the Azimuth slider to enter numeric values.

**Note:** Slider is disabled if Input Mode is set to Cartesian!

## 3 - Elevation

Set Input Mode to Polar and use the Elevation Slider to enter the object height in degrees ( $\pm 90^\circ$ ).

Use display next to the Elevation slider to enter numeric values.

**Note:** Slider is disabled if Input Mode is set to Cartesian!

## 4 - Distance

Set Input Mode to Polar and use the Distance Slider to enter the object distance (max. 30 meter).

Use display next to the Distance slider to enter numeric values.

**Note:** Slider is disabled if Input Mode is set to Cartesian!

## 5 - Gain

Sets the level of the audio source direct signal - independent of reflections and reverb gain. ( $-96\text{dB} \Leftrightarrow +24\text{dB}$ )

**Note:** Values for direct, reflection and reverb levels influence the distance perception.

## 6 - Azimuth Scale

Scale the internal dearVR horizontal-angle processing.

Values: ( $0.2 \Leftrightarrow 4.0$ )



**Note:**

Value < 1.0 results in more sideways position perception.  
Value > 1.0 results in more centred position perception.

**7 - Distance Scale**

Multiplier for the internal dearVR distance processing. The processed distance is calculated by distance \* distance scale.

Values: (0.01 ↔ 10.0)

**Note:**

Value > 1.0 lead to an increased distance perception.  
Value < 1.0 lead to a decreased distance perception.

**8 - Occlusion**

Acoustic occlusion describes the alteration within a sound field if the sonic wave is blocked by an object or wall. Occlusion Knob sets the level of occlusion if a sound source is occluded by an object.

Values: (0.0 ↔ 1.0)

**9 - Zoom +/-**

Use plus / minus buttons to zoom In or Out.

There are six different zoom stages:

**3m / 6m / 12m / 18m / 24m / 30m**

**10 - Display Mode  
(X/Z Y/Z X/Y)**

Switch between three different Display Modes:

**X/Z** is a top view.

**Y/Z** is a side view.

**X/Y** is a rear view.

**Note:** The Icon in the middle of the Display gives a quick overview of the chosen mode.

***Tip – Shortcut Reset Position***

Press ALT and double-click into the XYZ display to reset the source position to default values.

### 3.2 Reflections

The reflections module generates reflection patterns depending on the sound source position. If the sound object moves, the reflection pattern adapts to the direction of the signal. With Realtime Auralization, it is possible to create real-time reflections depending on the sound source position and distance relative to six walls: Left, Front, Right, Top, Back, Bottom. Walls are indicated within the XYZ-Pad using narrow lines.



Illustration 3.6 - Reflections Module

- 1 – Wall Distance**
  - Listener’s distance to the ceiling / ground in meter
  - Listener’s distance to the front / rear wall in meter. Value modifies delay and level of reflexion from front / rear direction.
  - Listener’s distance to the left or right wall in meter. Value modifies delay and level of reflexion from left / right direction.
- 2 - Reflections Gain**
  - Adjusts the overall gain of the reflections section.
  - Values (-96dB ⇔ +24dB)
- 3 - Reflections Damping**
  - Applies a low-pass filter to the reflections signal.
  - Set frequency values between 500 Hz to 19999 Hz.
- 4 - Reflections On/Off**
  - Switch to turn ON/OFF the reflections rendering.
- 5 – Realtime Auralization**
  - Activates real-time processing to generate first reflections corresponding to the listener and sound object position relative to the chosen wall distances.



Value 0 means no boundary.

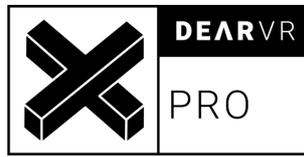
### 3.3 Reverb

For the reverb module we created 46 Virtual Acoustic presets, capturing the characteristics of different rooms and locations. You can easily adapt these acoustics to a specific scene or room by changing the size or applying the damping filter.



*Illustration 3.7 - Reverb Module*

- 1 - Preset**                      Menu to select different Virtual Acoustic room presets.  
For an overview and detailed description of all presets see chapter 4. Preset List.
  
- 2 - Size**                        Slider to decrease the reverb time of the selected preset.  
Values (50% ⇔ 100%)
  
- 3 - Reverb Gain**               Adjusts the overall gain of the reverb section.  
Values (-96dB ⇔ +24dB)
  
- 4 - Reverb Damping**        Applies a low-pass filter to the reverb signal.  
Set frequency values between 500 Hz to 19999 Hz.
  
- 5 - Reverb On/Off**            Switch to turn ON/OFF the Reverb rendering.



## 4 Master

The Master module is responsible for defining input, output and general options like bypass and performance mode.

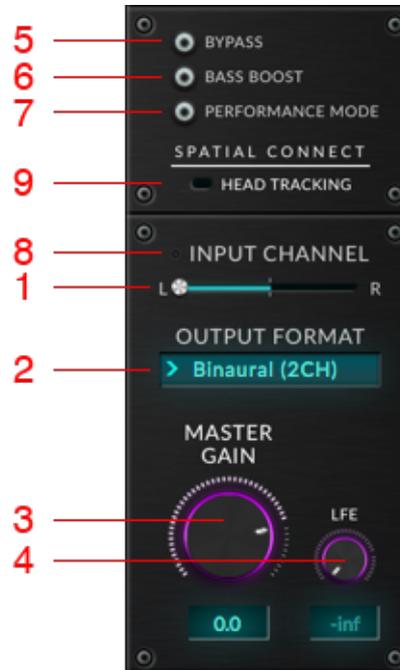


Illustration 3.8 - Master Module

### 1 - Input Channel

Sets dearVR input signal from a stereo audio clip.

Left channel, Right channel or a mix.

### 2 - Output Format

Select Output Format:

We provide 34 different output formats for you so you can select the perfect one for you. There is the binaural option, 6 Ambisonics formats and 27 multichannel formats for you to choose from. You can find the different channel layouts for each format in the appendix.

### 3 - Master Gain

Sets the overall output gain.

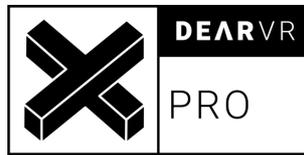
Values (-96dB ⇔ +24dB)

### 4 - LFE

Sets the LFE output level when using a multichannel configuration with an LFE.

### 5 - Bypass

Bypass all dearVR processing.



#### 6 - Bass Boost

Enable bass enhancement on the input signal.

#### 7 - Performance Mode

Use Performance Mode for static, non-moving audio sources, to reduce processing load.

**Note:** Only enable for non-moving objects. Moving the audio source while Performance Mode is active might cause glitches.

#### 8 - Input Signal

The green LED is illuminated if an input signal is detected.

#### 9 - Head Tracking

Signal LED is illuminated if Head Tracking is controlled by dearVR SPATIAL CONNECT software.

#### *Tip – Stereo Sources*

Using the dearVR plugin creates a 3D audio object as a point source. In case you want a stereo audio signal to spread within the 3D space, you have to create two separate tracks for the stereo file - each with an instance of the dearVR plugin. Set one input slider to Left and the other to Right. Position both audio objects together and adjust their distance between each other by ear.

## 5 Ambisonic Workflows

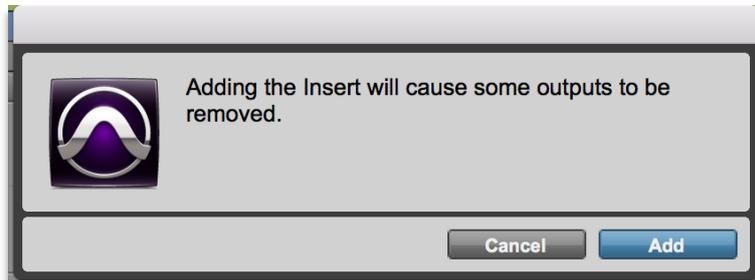
### 5.1 Pro Tools



1. Create a mono/stereo track. Add dearVR PRO plugin (FX category “Reverb”) with (Mono/stereo to Ambisonics 1<sup>st</sup>/2<sup>nd</sup>/3<sup>rd</sup> order) to the track.

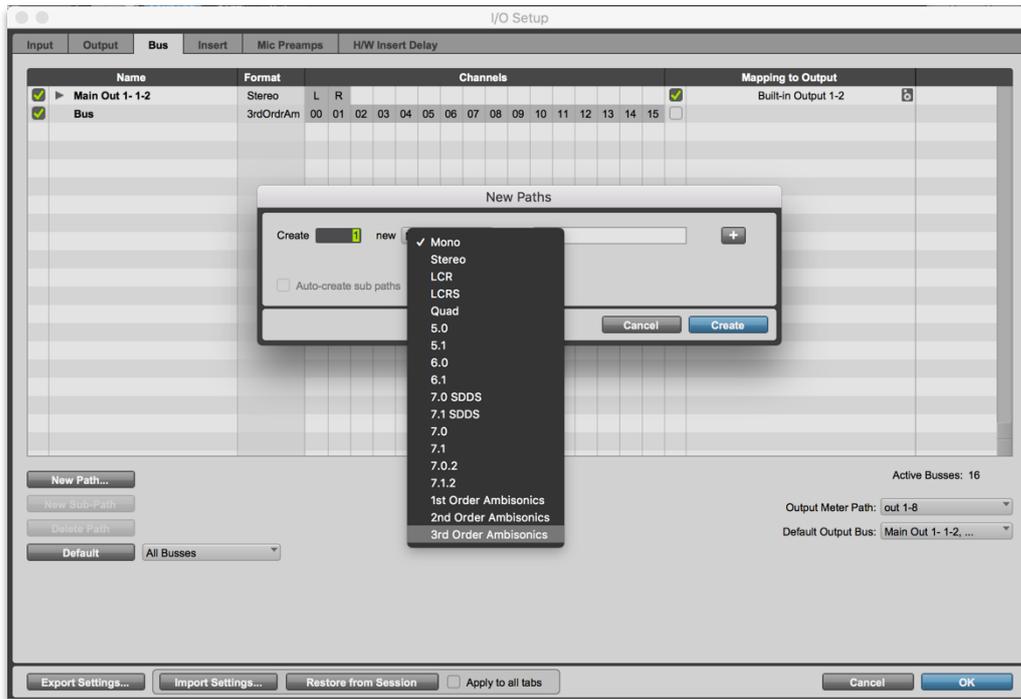


Accept the following warning:



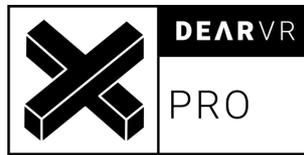


2. Create a new bus (1<sup>st</sup> / 2<sup>nd</sup> / 3<sup>rd</sup> Order Ambisonics).



3. Route dearVR tracks output to the Ambisonics bus.





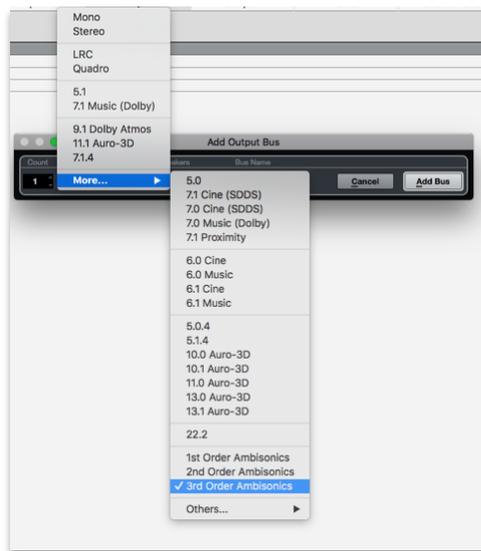
### Notice

To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at [www.dearvr.com](http://www.dearvr.com)

## 5.2 Cubase 10 / Nuendo 10



1. Head to Studio -> Audio Connections and create an Ambisonics-Bus by clicking Add Bus and choosing e.g. 3rd Order Ambisonics under Configuration.

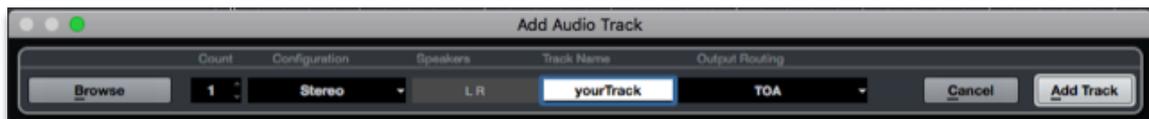


2. Right-click your new Ambisonics Bus and click specify it as the Main Mix. The Ambisonics Bus should now appear in a red color in your Audio Connections.



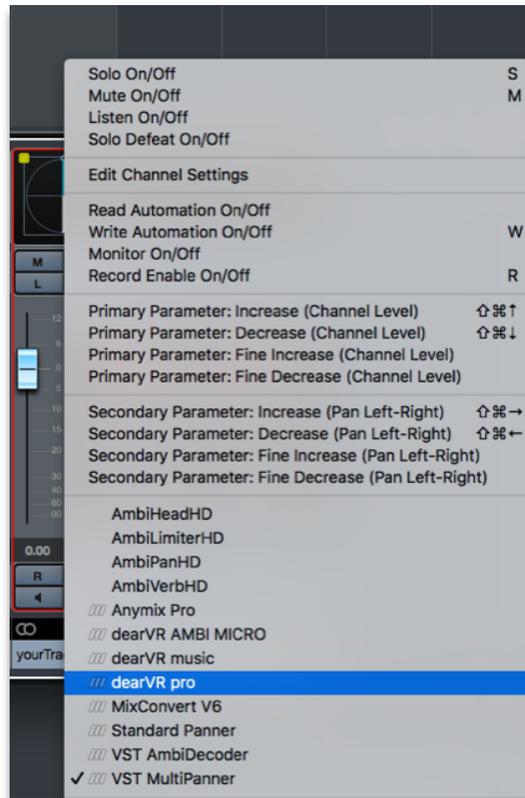
| Bus Name     | Speakers       | Audio Device  | Device Port   | Click |
|--------------|----------------|---------------|---------------|-------|
| ▽ Stereo Out | Stereo         | Groove        |               | Click |
| → Left       |                |               | Left          |       |
| → Right      |                |               | Right         |       |
| ▽ TOA        | 3rd Order Ambi | Not Connected |               |       |
| → 0          |                |               | Not Connected |       |
| → 1          |                |               | Not Connected |       |
| → 2          |                |               | Not Connected |       |
| → 3          |                |               | Not Connected |       |
| → 4          |                |               | Not Connected |       |
| → 5          |                |               | Not Connected |       |
| → 6          |                |               | Not Connected |       |
| → 7          |                |               | Not Connected |       |
| → 8          |                |               | Not Connected |       |
| → 9          |                |               | Not Connected |       |
| → 10         |                |               | Not Connected |       |
| → 11         |                |               | Not Connected |       |
| → 12         |                |               | Not Connected |       |
| → 13         |                |               | Not Connected |       |
| → 14         |                |               | Not Connected |       |
| → 15         |                |               | Not Connected |       |

- Close the Audio Connections Window and create a new track with **mono or stereo** configuration. Select your Ambisonics Bus under Output Routing.





4. Right click on the Panner field of Nuendo and select **dearVR pro** from the dropdown menu:



For every new track, just repeat steps 3 and 4 or duplicate your audio track.

### **Notice**

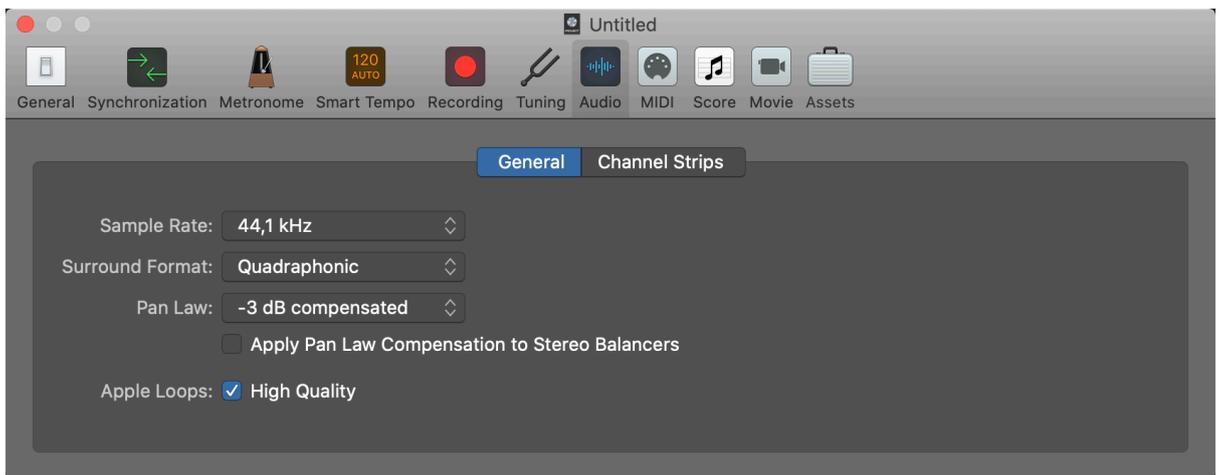
In order to monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at [www.dearvr.com](http://www.dearvr.com)

If using dearVR PRO with binaural output, please use the **insert effects slot** on a **stereo** track!

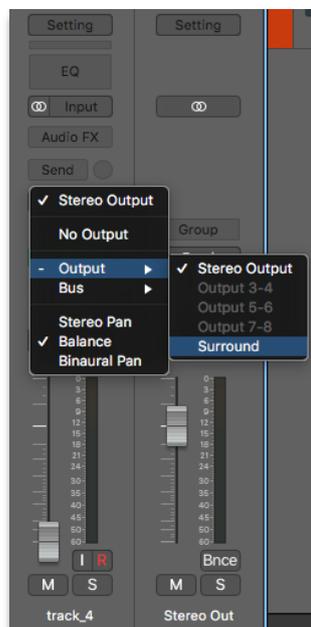
## **5.3 Logic Pro X**



1. Head to File -> Project Settings -> Audio and choose Quadraphonic as your Surround Format



2. Create a new audio track and set the Output to Surround





3. Add the dearVR PRO Audio Unit as an insert effect and choose FOA YouTube or FOA FuMa in the Output section.
4. For every new track, just repeat steps 2 – 3 or duplicate your audio track

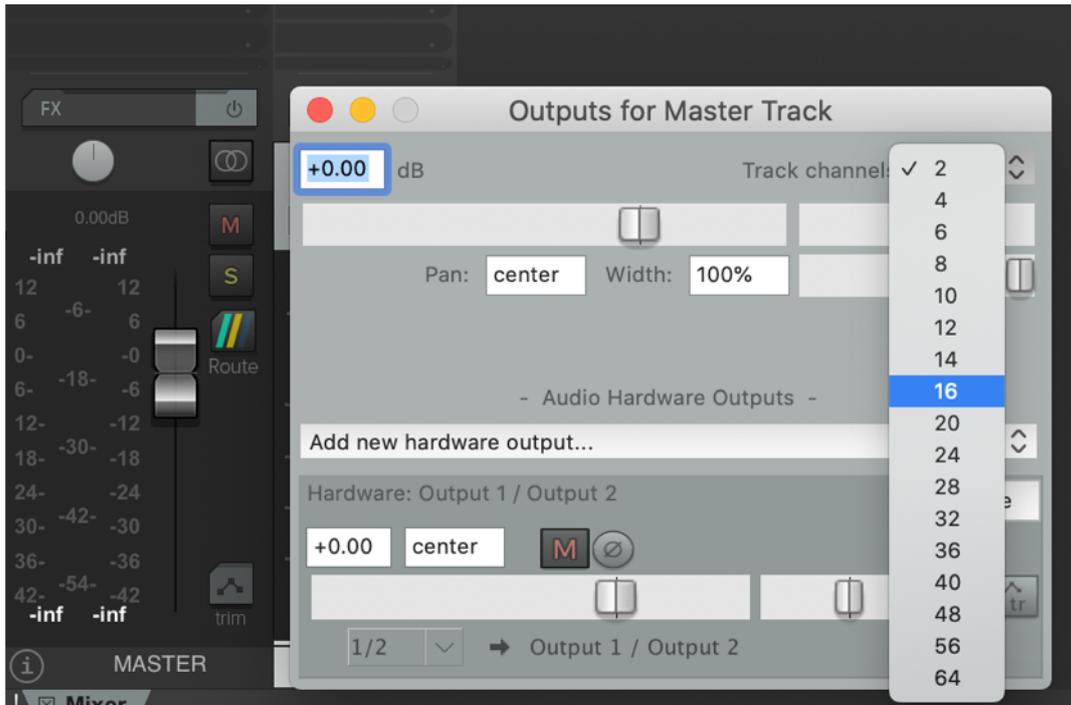
#### **Notice**

To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at [www.dearvr.com](http://www.dearvr.com)

## 5.4 Reaper

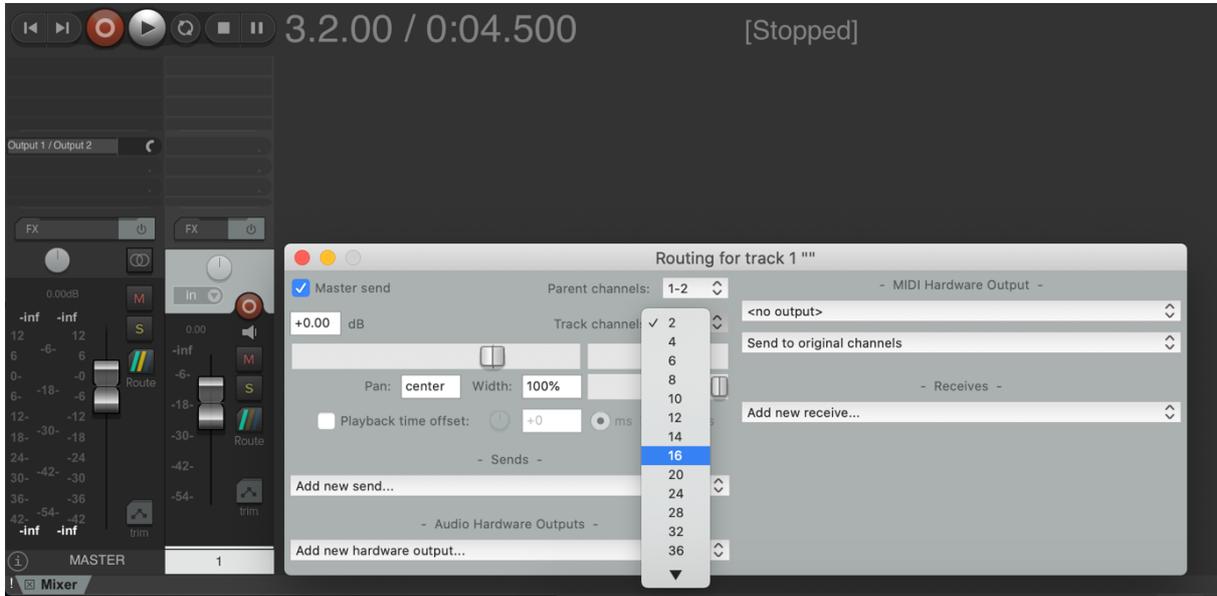


1. Configure your master to have as many channels as you need for your Ambisonics format by clicking on Route on the master channel.





2. Create a new track and also here change the number of track channels to the number of the channels your Ambisonics format uses.



3. Put dearVR PRO on the track and select your Ambisonics format in the plugin as output.
4. For every new track with an Ambisonics output repeat steps 2 and 3.

### Notice

To monitor the Ambisonics bus with headphones please check out the **dearVR AMBI MICRO** plugin at [www.dearvr.com](http://www.dearvr.com)

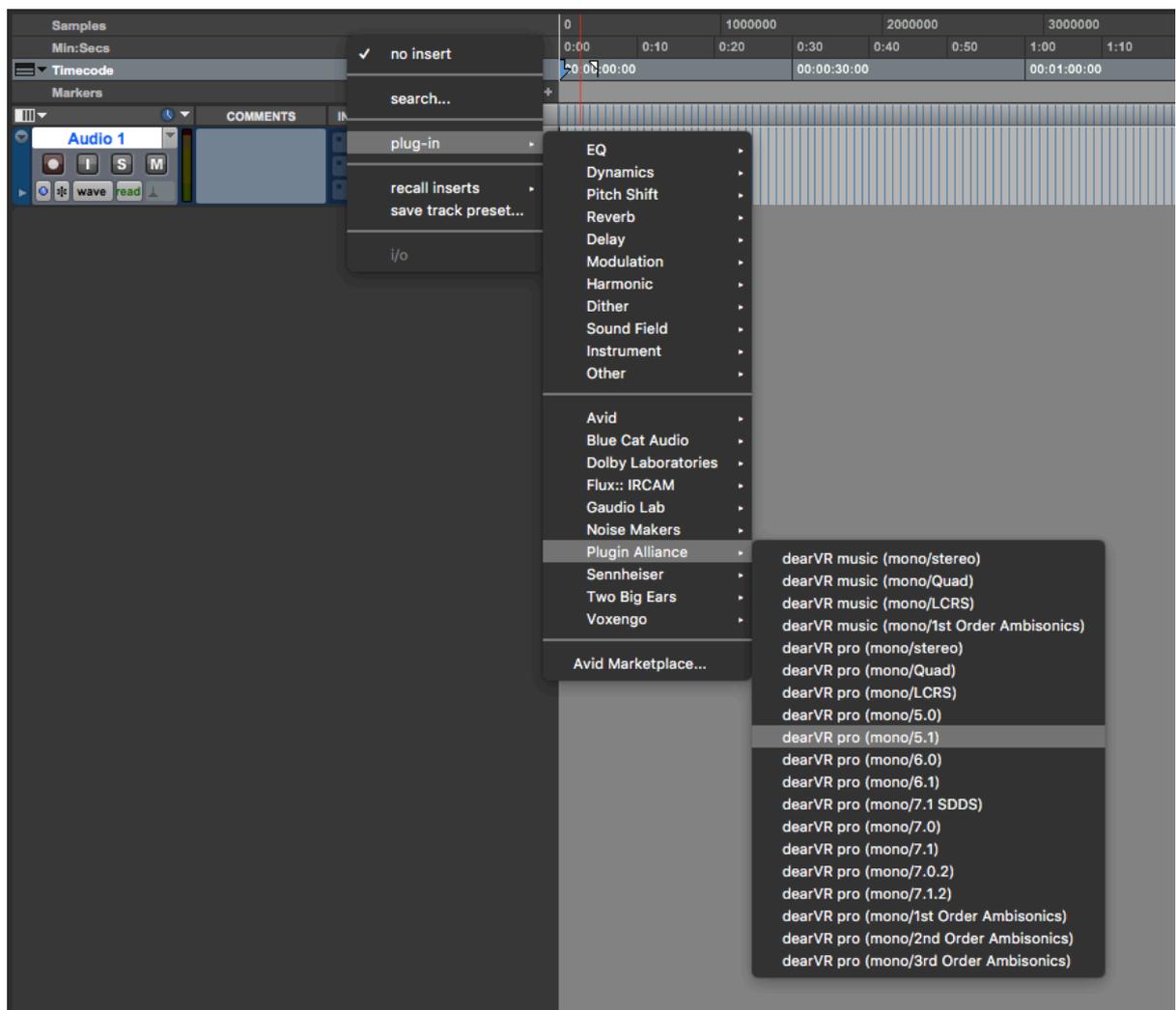


## 6 Multichannel Workflow

### 6.1 Pro Tools

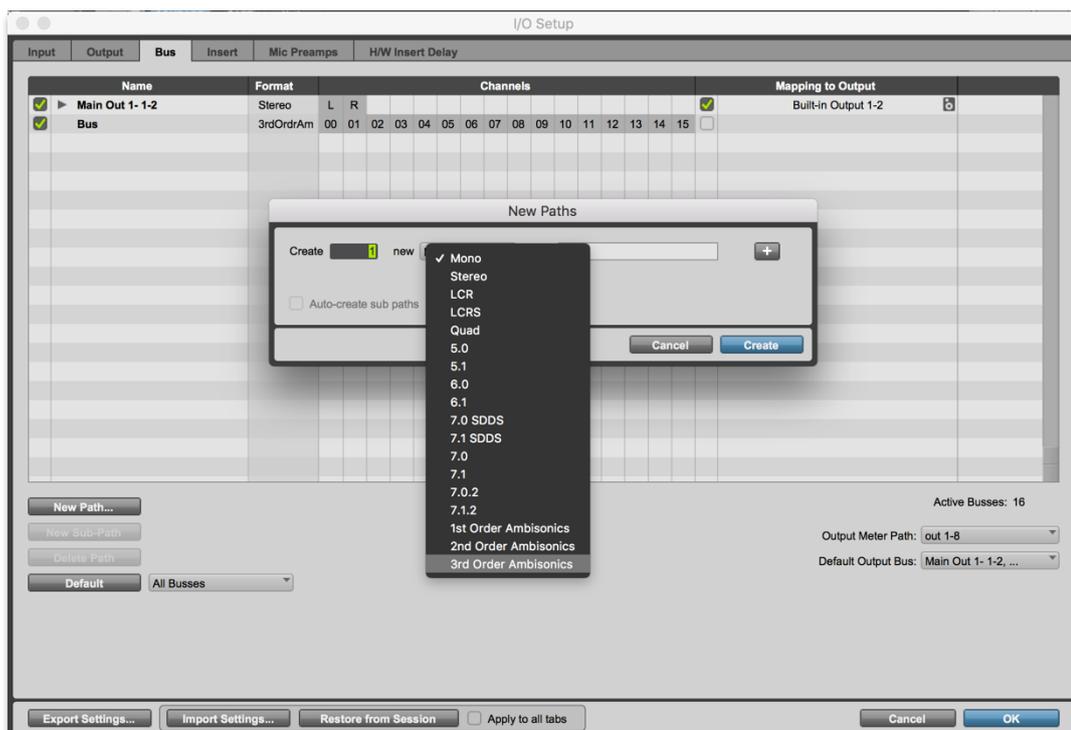
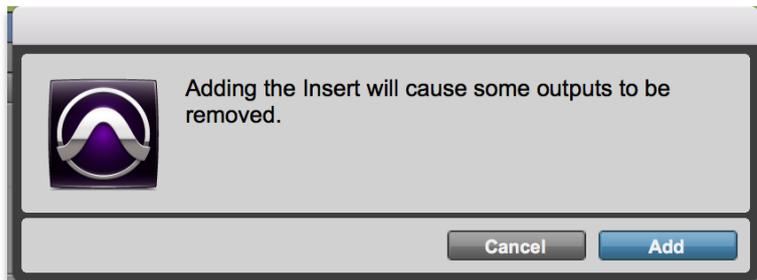


1. Create a mono/stereo track. Add dearVR PRO plugin (FX category "Reverb") with mono / stereo as input format to your preferred multichannel output format to the track.





Accept the following warning:



2. Create a new bus or output with your preferred multichannel format.
3. Select the configured multichannel format as output format in DearVR PRO. Route dearVR tracks output to the multichannel bus.

**Attention: Pro Tools uses the Cine formats for 5.0 and 5.1.**

4. For every new track, just repeat steps 2 – 3 or duplicate your audio track.

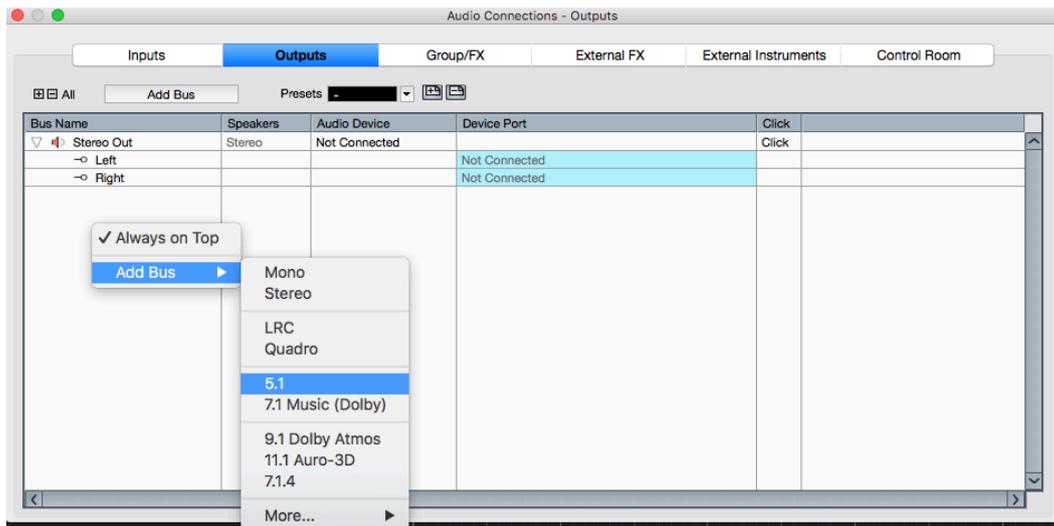


A screenshot of the DEARVR PRO software interface. The top section shows a timeline with a timecode of 00:01:00:00. Below the timeline is a track control area for 'Audio 1' with a 'dearVR pro' plugin. The main interface is divided into several sections: 'POSITION' with a 3D grid and controls for Azimuth, Elevation, and Distance; 'REVERB' with 'VIRTUAL ACOUSTICS' set to 'Medium Recording Hall' and 'REFLECTIONS' with 'REALTIME AURALISATION' selected; and various gain and damping controls. The bottom of the interface shows the 'Plugin Alliance' logo and 'NFR' branding. On the right side, there is a vertical sidebar with 'I/O' and 'S A-E' controls.

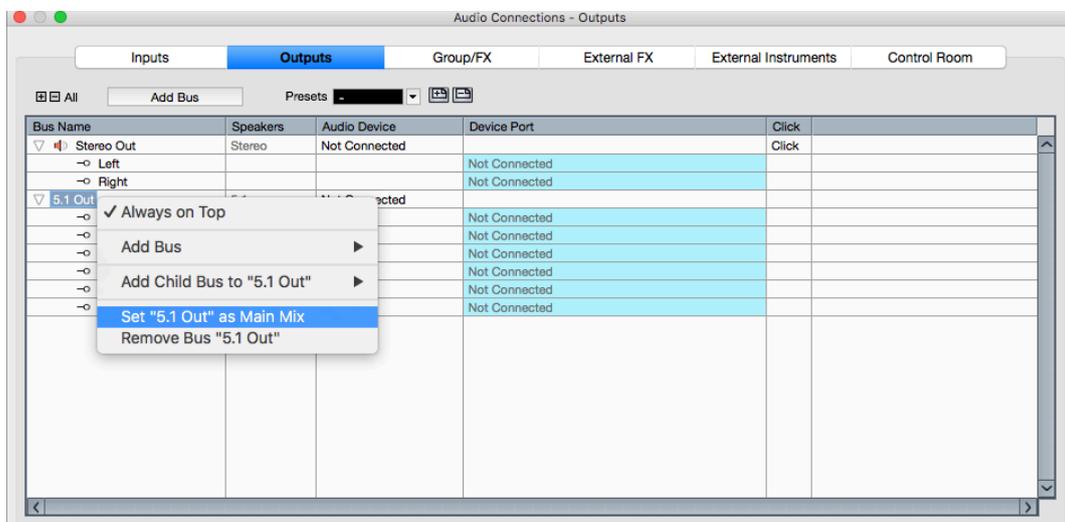
## 6.2 Cubase 10 / Nuendo 10



1. Head to Studio -> Audio Connections and create a bus with your preferred multichannel output configuration by clicking Add Bus and choosing e.g. 5.1.



2. Right-click your new multichannel bus and specify it as the Main Mix. The multichannel bus should now appear in a red color in your Audio Connections.

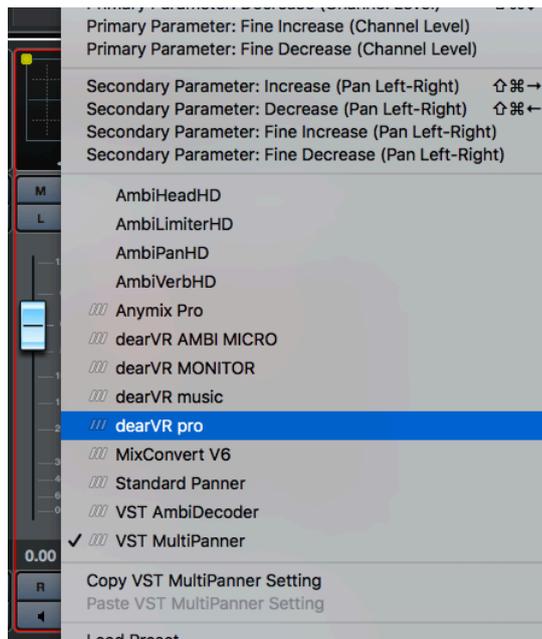


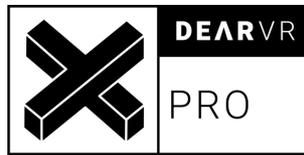


3. Close the *Audio Connections* Window and create a new track with **mono** or **stereo** configuration. Select your multichannel bus under *Output Routing*



4. Right click on the Panner field of Nuendo and select dearVR pro from the dropdown menu. Inside the plugin choose the output format you configured in Nuendo.





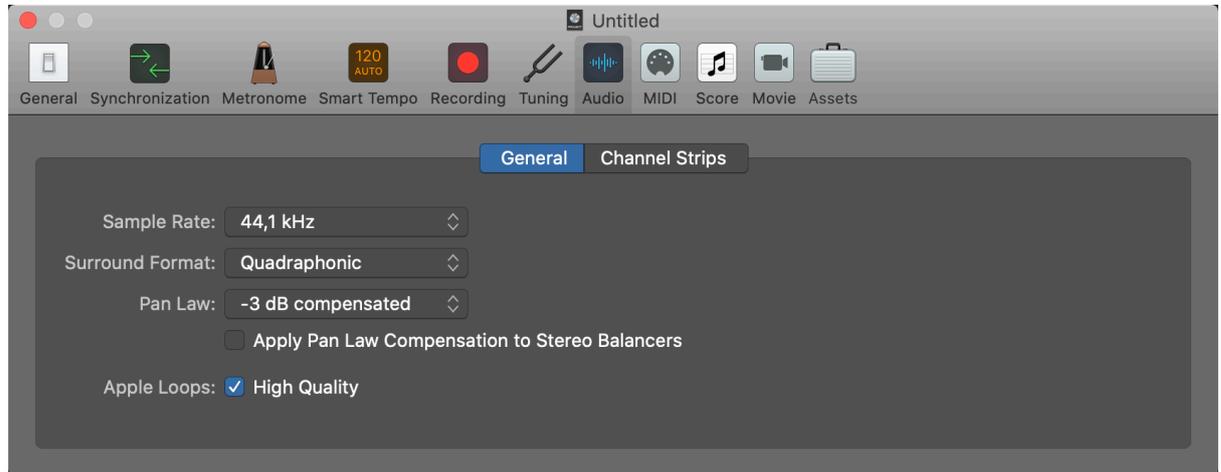
5. For every new track, just repeat steps 3 and 4 or duplicate your audio track.



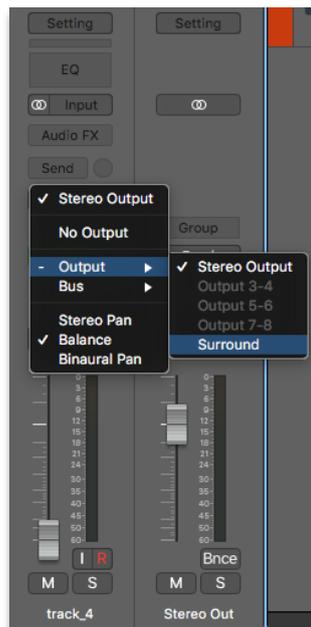
## 6.3 Logic Pro X



1. Head to File -> Project Settings -> Audio and choose your preferred Surround format



2. Create a new audio track and set the Output to Surround.



3. Add the dearVR PRO Audio Unit as an insert effect and choose the Surround format in the Output section.



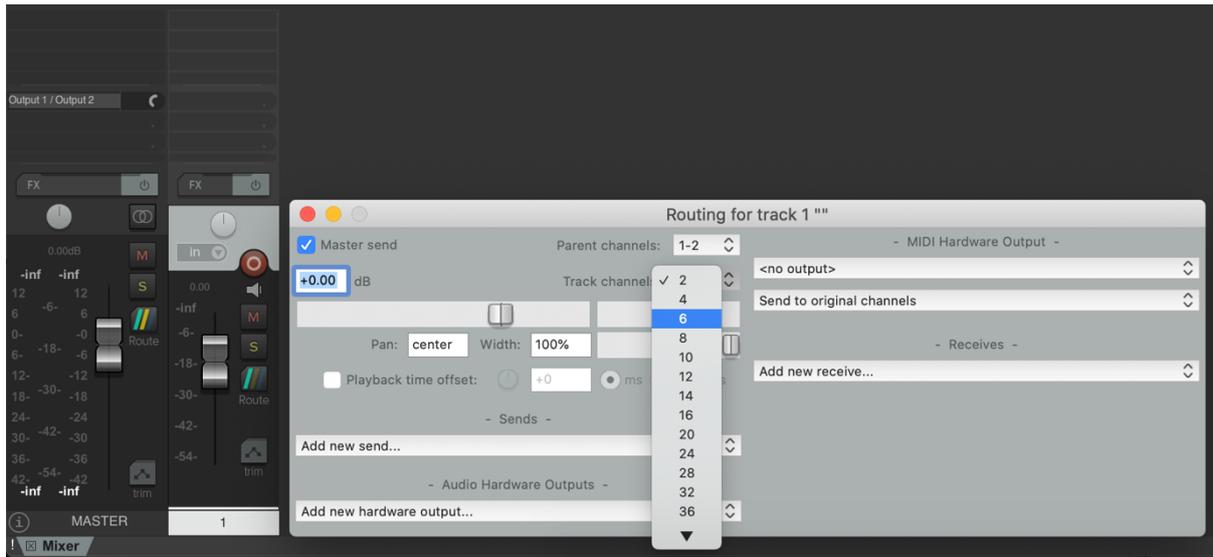
## 6.4 Reaper



1. Configure your master to have as many channels as you need for your multichannel format by clicking on Route on the master channel.



2. Create a new track and also here change the number of track channels to the number of the channels your multichannel format uses.



3. Put a dearVR PRO instance on the track and select your multichannel format in the plugin as output.
4. For every new track with a multichannel output repeat step 2 and 3.



## 7 Preset List

**Note:** The larger a room the longer the reverb – and the more performance is needed!

Performance Level (**PL**) illustrates the performance load within a range from 1-10.

Level 10 needs the most performance.

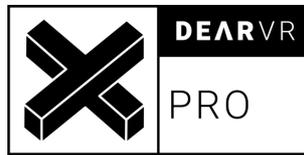
| A. Rooms & Halls     | Room Size                                    | PL |
|----------------------|--|----|
|                      | Auralization - Wall Distance (meter)         |    |
|                      | LEFT   FRONT   RIGHT   TOP   BACK   BOTTOM   |    |
| Concert Hall 1       | 12,9m   14,0m   10,5m   20,8m   25,1m   1,8m | 5  |
| Concert Hall 2       | 14,1m   16,6m   13,3m   21,5m   28,3m   1,8m | 5  |
| Large Recording Hall | 15,7m   12,1m   15,9m   22,2m   19,3m   1,8m | 7  |
| Small Recording Hall | 7,7m   5,4m   7,9m   12,0m   9,3m   1,8m     | 4  |
| Kings Hall           | 13,7m   10,4m   13,9m   20,3m   7,3m   1,8m  | 5  |
| Cathedral            | 27,5m   24,2m   29,0m   30,0m   30,0m   1,8m | 10 |
| Church               | 13,9m   17,9m   11,5m   25,5m   22,1m   1,8m | 5  |
| Chapel               | 14,7m   12,4m   14,1m   23,0m   16,3m   1,8m | 8  |
| Large Room           | 7,9m   4,4m   6,9m   10,0m   5,5m   1,8m     | 5  |
| Medium Room          | 3,8m   2,1m   4,1m   4,0m   2,8m   1,8m      | 4  |
| Small Room           | 2,7m   1,5m   2,6m   3,6m   2,2m   1,8m      | 3  |



| B. Postproduction      | Room Size                            |       |       |       |       |        | PL |
|------------------------|--------------------------------------|-------|-------|-------|-------|--------|----|
|                        | Auralization - Wall Distance (meter) |       |       |       |       |        |    |
|                        | LEFT                                 | FRONT | RIGHT | TOP   | BACK  | BOTTOM |    |
| Office 1               | 3,2m                                 | 1,9m  | 3,9m  | 4,5m  | 2,8m  | 1,8m   | 2  |
| Office 2               | 6,7m                                 | 2,4m  | 6,9m  | 5,3m  | 3,3m  | 1,8m   | 2  |
| Small Studio           | 2,7m                                 | 2,0m  | 3,4m  | 4,7m  | 2,1m  | 1,8m   | 2  |
| Medium Conference Hall | 6,7m                                 | 3,4m  | 6,9m  | 7,0m  | 3,3m  | 1,8m   | 3  |
| Cellar                 | 2,5m                                 | 2,8m  | 3,0m  | 3,2m  | 2,1m  | 1,8m   | 4  |
| Empty Room             | 5,0m                                 | 3,2m  | 3,7m  | 5,8m  | 4,3m  | 1,8m   | 3  |
| Small Livingroom       | 2,3m                                 | 3,1m  | 2,7m  | 2,9m  | 2,6m  | 1,8m   | 2  |
| Staircase              | 4,7m                                 | 3,5m  | 4,9m  | 8,0m  | 3,3m  | 1,8m   | 4  |
| Corridor               | 2,7m                                 | 2,0m  | 2,6m  | 8,8m  | 4,5m  | 1,8m   | 5  |
| Bathroom               | 2,1m                                 | 2,0m  | 2,3m  | 2,8m  | 1,6m  | 1,8m   | 3  |
| Restroom               | 2,7m                                 | 1,5m  | 3,2m  | 4,2m  | 2,3m  | 1,8m   | 4  |
| Car 1                  | 0,6m                                 | 0,7m  | 1,7m  | 1,6m  | 1,9m  | 1,3m   | 1  |
| Car 2                  | 0,5m                                 | 0,7m  | 1,0m  | 1,3m  | 1,6m  | 1,2m   | 1  |
| Booth                  | 3,7m                                 | 2,1m  | 3,3m  | 2,5m  | 1,3m  | 1,8m   | 2  |
| Cinema                 | 8,0m                                 | 7,0m  | 9,0m  | 14,0m | 9,0m  | 1,3m   | 2  |
| Warehouse              | 12,0m                                | 10,0m | 8,0m  | 20,0m | 15,0m | 1,8m   | 10 |
| Outdoor Street         | 24,9m                                | 0,0m  | 22,5m | 0,0m  | 0,0m  | 1,8m   | 5  |
| Outdoor Alley          | 14,2m                                | 0,0m  | 16,5m | 0,0m  | 3,1m  | 1,8m   | 5  |



| C. Music production | Room Size                                    | PL |
|---------------------|--|----|
|                     | Auralization - Wall Distance (meter)         |    |
|                     | LEFT   FRONT   RIGHT   TOP   BACK   BOTTOM   |    |
| Studio Room         | 6,7m   3,4m   6,9m   8,0m   3,3m   1,8m      | 5  |
| Live Stage          | 11,7m   5,4m   11,9m   16,5m   14,3m   1,8m  | 7  |
| Live Arena          | 20,2m   17,0m   21,5m   25,0m   15,7m   1,8m | 7  |
| Heavy Ambience      | 6,7m   3,1m   6,9m   8,0m   3,3m   1,8m      | 4  |
| Plate Ambience      | 6,7m   3,1m   6,9m   8,0m   3,3m   1,8m      | 3  |
| Medium Ambience     | 6,7m   3,1m   6,9m   8,0m   3,3m   1,8m      | 3  |
| Small Ambience      | 6,7m   3,1m   6,9m   8,0m   3,3m   1,8m      | 2  |
| Vocal Hall 1        | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 7  |
| Vocal Hall 2        | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 7  |
| Vocal Plate         | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 8  |
| Drum Room 1         | 6,7m   3,1m   6,9m   8,0m   3,3m   1,8m      | 6  |
| Drum Room 2         | 2,7m   3,1m   2,9m   6,0m   4,3m   1,8m      | 6  |
| Percussion Plate    | 6,7m   3,4m   6,9m   8,0m   4,3m   1,8m      | 5  |
| Percussion Ambience | 6,7m   3,4m   6,9m   8,0m   4,3m   1,8m      | 2  |
| Acoustic Hall       | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 6  |
| String Hall         | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 8  |
| String Plate        | 20,2m   15,0m   21,5m   25,0m   12,7m   1,8m | 8  |



## 8 Multichannel configurations

| Channel | Channel description   |
|---------|-----------------------|
| L       | Left                  |
| R       | Right                 |
| C       | Center                |
| BC      | Back center           |
| LC      | Left center           |
| RC      | Right center          |
| LFE     | Low frequency effects |
| SL      | Surround left         |
| SR      | Surround right        |
| SB      | Surround back         |
| SSL     | Side surround left    |
| SSR     | Side surround right   |
| SBL     | Surround back left    |
| SBR     | Surround back right   |
| HFL     | High front left       |
| HFR     | High front right      |
| HFC     | High front center     |
| HBL     | High back left        |
| HBR     | High back right       |
| T       | Top                   |
| TL      | Top left              |
| TR      | Top right             |

| 2.0 Stereo                              |            |           |
|---|------------|-----------|
| Channel number                          | 1          | 2         |
| Channel description                     | L          | R         |
| Azimuth (as in dearVR PRO)<br>Elevation | -30°<br>0° | 30°<br>0° |

| LCRS |            |          |           |            |
|------|------------|----------|-----------|------------|
|      | 1          | 2        | 3         | 4          |
|      | L          | C        | R         | SB         |
|      | -30°<br>0° | 0°<br>0° | 30°<br>0° | 180°<br>0° |



| Quad |            |           |             |            |
|------|------------|-----------|-------------|------------|
|      | 1          | 2         | 3           | 4          |
|      | L          | R         | SBL         | SBR        |
|      | -30°<br>0° | 30°<br>0° | -135°<br>0° | 135°<br>0° |

| 4.0 |            |           |             |            |
|-----|------------|-----------|-------------|------------|
|     | 1          | 2         | 3           | 4          |
|     | L          | R         | SL          | SR         |
|     | -30°<br>0° | 30°<br>0° | -110°<br>0° | 110°<br>0° |

| 5.0 Film |            |          |           |             |            |
|----------|------------|----------|-----------|-------------|------------|
|          | 1          | 2        | 3         | 4           | 5          |
|          | L          | C        | R         | SL          | SR         |
|          | -30°<br>0° | 0°<br>0° | 30°<br>0° | -110°<br>0° | 110°<br>0° |

| 5.0 ITU |            |           |          |             |            |
|---------|------------|-----------|----------|-------------|------------|
|         | 1          | 2         | 3        | 4           | 5          |
|         | L          | R         | C        | SL          | SR         |
|         | -30°<br>0° | 30°<br>0° | 0°<br>0° | -110°<br>0° | 110°<br>0° |

| 5.1 Film |   |   |   |    |    |     |
|----------|---|---|---|----|----|-----|
|          | 1 | 2 | 3 | 4  | 5  | 6   |
|          | L | C | R | SL | SR | LFE |



|  |            |          |           |             |            |   |
|--|------------|----------|-----------|-------------|------------|---|
|  | -30°<br>0° | 0°<br>0° | 30°<br>0° | -110°<br>0° | 110°<br>0° | - |
|--|------------|----------|-----------|-------------|------------|---|

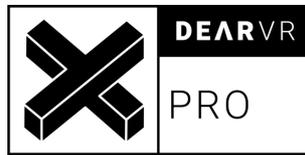
| 5.1 ITU |            |           |          |     |             |            |
|---------|------------|-----------|----------|-----|-------------|------------|
|         | 1          | 2         | 3        | 4   | 5           | 6          |
|         | L          | R         | C        | LFE | SL          | SR         |
|         | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° |

| 6.0 |            |           |          |             |            |            |
|-----|------------|-----------|----------|-------------|------------|------------|
|     | 1          | 2         | 3        | 4           | 5          | 6          |
|     | L          | R         | C        | SL          | SR         | BC         |
|     | -30°<br>0° | 30°<br>0° | 0°<br>0° | -110°<br>0° | 110°<br>0° | 180°<br>0° |

| 6.1 |            |           |          |     |             |            |            |
|-----|------------|-----------|----------|-----|-------------|------------|------------|
|     | 1          | 2         | 3        | 4   | 5           | 6          | 7          |
|     | L          | R         | C        | LFE | SL          | SR         | BC         |
|     | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | 180°<br>0° |

| 7.0 |            |           |          |            |           |             |            |
|-----|------------|-----------|----------|------------|-----------|-------------|------------|
|     | 1          | 2         | 3        | 4          | 5         | 6           | 7          |
|     | L          | R         | C        | SSL        | SSR       | SBL         | SBR        |
|     | -30°<br>0° | 30°<br>0° | 0°<br>0° | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° |

**7.1**



|  |            |           |          |     |            |           |             |            |
|--|------------|-----------|----------|-----|------------|-----------|-------------|------------|
|  | 1          | 2         | 3        | 4   | 5          | 6         | 7           | 8          |
|  | L          | R         | C        | LFE | SSL        | SSR       | SBL         | SBR        |
|  | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° |

| 7.1 SDDS |            |           |          |     |             |            |            |           |
|----------|------------|-----------|----------|-----|-------------|------------|------------|-----------|
|          | 1          | 2         | 3        | 4   | 5           | 6          | 7          | 8         |
|          | L          | R         | C        | LFE | SL          | SR         | LC         | RC        |
|          | -40°<br>0° | 40°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | -20°<br>0° | 20°<br>0° |

| 5.0.2 |            |           |          |             |            |             |            |
|-------|------------|-----------|----------|-------------|------------|-------------|------------|
|       | 1          | 2         | 3        | 4           | 5          | 6           | 7          |
|       | L          | R         | C        | SL          | SR         | HFL         | HFR        |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° |

| 5.0.4 |            |           |          |             |            |             |            |              |             |
|-------|------------|-----------|----------|-------------|------------|-------------|------------|--------------|-------------|
|       | 1          | 2         | 3        | 4           | 5          | 6           | 7          | 8            | 9           |
|       | L          | R         | C        | SL          | SR         | HFL         | HFR        | HBL          | HBR         |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |

| 5.1.2 |            |           |          |     |             |            |             |            |
|-------|------------|-----------|----------|-----|-------------|------------|-------------|------------|
|       | 1          | 2         | 3        | 4   | 5           | 6          | 7           | 8          |
|       | L          | R         | C        | LFE | SL          | SR         | HFL         | HFR        |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° |



| 5.1.4 |            |           |          |     |             |            |             |            |              |             |
|-------|------------|-----------|----------|-----|-------------|------------|-------------|------------|--------------|-------------|
|       | 1          | 2         | 3        | 4   | 5           | 6          | 7           | 8          | 9            | 10          |
|       | L          | R         | C        | LFE | SL          | SR         | HFL         | HFR        | HBL          | HBR         |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |

| 7.0.2 |            |           |          |            |           |             |            |             |            |
|-------|------------|-----------|----------|------------|-----------|-------------|------------|-------------|------------|
|       | 1          | 2         | 3        | 4          | 5         | 6           | 7          | 8           | 9          |
|       | L          | R         | C        | SL         | SR        | SBL         | SBR        | TL          | TR         |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° | -80°<br>75° | 80°<br>75° |

| 7.0.4 |            |           |          |            |           |             |            |             |            |              |             |
|-------|------------|-----------|----------|------------|-----------|-------------|------------|-------------|------------|--------------|-------------|
|       | 1          | 2         | 3        | 4          | 5         | 6           | 7          | 8           | 9          | 10           | 11          |
|       | L          | R         | C        | SL         | SR        | SBL         | SBR        | HFL         | HFR        | HBL          | HBR         |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |

| 7.1.2 |            |           |          |     |            |           |             |            |             |            |
|-------|------------|-----------|----------|-----|------------|-----------|-------------|------------|-------------|------------|
|       | 1          | 2         | 3        | 4   | 5          | 6         | 7           | 8          | 9           | 10         |
|       | L          | R         | C        | LFE | SL         | SR        | SL          | SR         | TL          | TR         |
|       | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -90°<br>0° | 90°<br>0° | -110°<br>0° | 110°<br>0° | -80°<br>75° | 80°<br>75° |

| 7.1.4 |   |   |   |     |    |    |     |     |     |     |     |     |
|-------|---|---|---|-----|----|----|-----|-----|-----|-----|-----|-----|
|       | 1 | 2 | 3 | 4   | 5  | 6  | 7   | 8   | 9   | 10  | 11  | 12  |
|       | L | R | C | LFE | SL | SR | SBL | SBR | HFL | HFR | HBL | HBR |



|            |           |          |   |            |           |             |            |             |            |              |             |
|------------|-----------|----------|---|------------|-----------|-------------|------------|-------------|------------|--------------|-------------|
| -30°<br>0° | 30°<br>0° | 0°<br>0° | - | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |
|------------|-----------|----------|---|------------|-----------|-------------|------------|-------------|------------|--------------|-------------|

| 9.1.2      |           |          |     |            |           |            |           |             |            |             |            |  |
|------------|-----------|----------|-----|------------|-----------|------------|-----------|-------------|------------|-------------|------------|--|
| 1          | 2         | 3        | 4   | 5          | 6         | 7          | 8         | 9           | 10         | 11          | 12         |  |
| L          | R         | C        | LFE | SSL        | SSR       | SL         | SR        | SBL         | SBR        | TL          | TR         |  |
| -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -60°<br>0° | 60°<br>0° | -90°<br>0° | 90°<br>0° | -135°<br>0° | 135°<br>0° | -80°<br>75° | 80°<br>75° |  |

| 8.0        |           |             |            |             |            |              |             |  |
|------------|-----------|-------------|------------|-------------|------------|--------------|-------------|--|
| 1          | 2         | 3           | 4          | 5           | 6          | 7            | 8           |  |
| L          | R         | SL          | SR         | HFL         | HFR        | HBL          | HBR         |  |
| -30°<br>0° | 30°<br>0° | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |  |

| 9.1        |           |          |     |             |            |             |            |              |             |  |
|------------|-----------|----------|-----|-------------|------------|-------------|------------|--------------|-------------|--|
| 1          | 2         | 3        | 4   | 5           | 6          | 7           | 8          | 9            | 10          |  |
| L          | R         | C        | LFE | SL          | SR         | HFL         | HFR        | HBL          | HBR         |  |
| -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |  |

| 10.0       |           |          |             |            |           |             |            |              |             |  |
|------------|-----------|----------|-------------|------------|-----------|-------------|------------|--------------|-------------|--|
| 1          | 2         | 3        | 4           | 5          | 6         | 7           | 8          | 9            | 10          |  |
| L          | R         | C        | SL          | SR         | T         | HFL         | HFR        | HBL          | HBR         |  |
| -30°<br>0° | 30°<br>0° | 0°<br>0° | -110°<br>0° | 110°<br>0° | 0°<br>90° | -30°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |  |

11.1



|  |            |           |          |     |             |            |           |             |           |            |              |             |
|--|------------|-----------|----------|-----|-------------|------------|-----------|-------------|-----------|------------|--------------|-------------|
|  | 1          | 2         | 3        | 4   | 5           | 6          | 7         | 8           | 9         | 10         | 11           | 12          |
|  | L          | R         | C        | LFE | SL          | SR         | T         | HFL         | HFC       | HFR        | HBL          | HBR         |
|  | -30°<br>0° | 30°<br>0° | 0°<br>0° | -   | -110°<br>0° | 110°<br>0° | 0°<br>90° | -30°<br>30° | 0°<br>30° | 30°<br>30° | -135°<br>30° | 135°<br>30° |

| 13.1 |            |           |             |           |             |              |             |
|------|------------|-----------|-------------|-----------|-------------|--------------|-------------|
|      | 1          | 2         | 3           | 4         | 5           | 6            | 7           |
|      | L          | R         | C           | LFE       | SBL         | SBR          | SL          |
|      | -30°<br>0° | 30°<br>0° | 0°<br>0°    | -         | -135°<br>0° | 135°<br>0°   | -110°<br>0° |
|      |            |           |             |           |             |              |             |
|      | 8          | 9         | 10          | 11        | 12          | 13           | 14          |
|      | SR         | T         | HFL         | HFC       | HFR         | HBL          | HBR         |
|      | 110°<br>0° | 0°<br>90° | -30°<br>30° | 0°<br>30° | 30°<br>30°  | -135°<br>30° | 135°<br>30° |



## 9 Troubleshooting / Known issues

### 1. Minimum Buffer Size.

A minimum buffer size of 1024 is recommended.

### 2. Multichannel output for Ableton Live, Samplitude, cakewalk, Cubase Elements, Cubase Artist

Due to restrictions within these hosts, no multichannel or Ambisonics outputs are available.

### 3. Cubase/Nuendo behaviour for mono audio tracks

Due to the internal routing of the Cubase/Nuendo mono track, the spatialization processing of dearVR PRO is restricted.

This issue arises when a mono -> stereo track is setup in Cubase/Nuendo and dearVR PRO is placed on an insert effects slot. In order to avoid this issue please always use dearVR PRO with a stereo track in Nuendo/Cubase, even if you're working with mono material.

### 4. Legacy Incompatibility with Cubase/Nuendo panner slots

Since the introduction of the Nuendo and Cubase Pro panner slots, dearVR PRO no longer operates in the insert effects chain, when it's being used to output Ambisonics.

A Nuendo/Cubase session with dearVR PRO placed in the insert effects slot is therefore not compatible with the new panner slot setup.

Please note that this doesn't apply to a binaural only session (2CH as this setup doesn't require the panner slot)

### 5. Do not open a session created with a version of dearVR PRO > 1.2.2, after upgrading to version 1.2.2, as it will reset your dearVR PRO settings (plugin parameters, automation).

This issue only persists in the VST3 version of the plugin and you can work around it by de-installing the VST3 version, and thus forcing Nuendo/Cubase to use the VST2 version of dearVR PRO.



## 10 Changelog

### v.1.1

- Support of higher sample rates  
88.2 kHz, 96 kHz, 176.4 kHz and 192 kHz, in both mono and stereo
- Minor Bugfixes

### v.1.2

- Headtracking Control by dearVR SPATIAL CONNECT
- Improved performance
- Smoother transitions when changing virtual acoustics presets
- UI Update
- Minor Bugfixes

### v.1.2.2

- FIX - only low-resolution automation for Logic Pro
- FIX - wrong latency was reported if Ambisonics output was selected (Mac/Win, AAX, VST3, VST, AU)
- Allowing 16x16 I/O to enable TOA in Nuendo (Mac/Win, VST3)
- VST3 category was changed to enable dearVR PRO as a panner for Ambisonics tracks in Nuendo (Mac/Win, VST3)
- Minor Bugfixes

### v.1.4.0

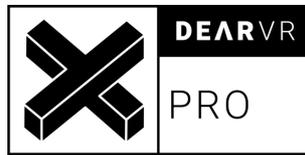
- Multichannel feature
  - 26 new output formats for multichannel setups
  - LFE control knob
  - Multichannel Reflection and Reverb
  - Height and bottom perception even without top or bottom speakers
- Up to 60% performance boost in binaural mode
- FIX Reflection delay was dependent on block size in Ambisonics



- FIX Issues when placing dearVR PRO in the panner slot in Nuendo 8.3
- FIX where reflections did not work with performance mode and Ambisonics output
- Minor Bugfixes

#### **v.1.4.1**

- Added support for ASIO guard in Nuendo
- Minor bugfixes



## 11 Contact

### Support

Please let us know if there are any questions concerning the dearVR Plugin.

If you need further assistance, please send an email to:

[support@dear-reality.com](mailto:support@dear-reality.com)

For the latest news concerning dearVR please visit our website at:

[www.dearVR.com](http://www.dearVR.com)



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### Caution

Using headphones requires responsible listening. Damage to hearing occurs when listen to loud sounds with headphones over time.

- Set the volume control of your computer to a minimum when connecting your headphones.
- Set the volume in a quiet environment and select the lowest volume at which you can hear adequately.
- Do not turn the volume control to high, as this can cause permanent hearing damage.
- Be aware that you can adapt to higher volume settings over time, not realizing that the higher volume may be harmful to your hearing.

Dear Reality GmbH will in any event not be liable for any damage to hearing caused by loud sounds.

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