IMMERSIVE MUSIC
3D SOUND JUST GOT REAL
Please read this manual carefully before using the software.

Using headphones requires responsible listening!
Quick Start

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

System Requirements and supported Platforms

Supported sample rates:
44.1, 48, 88.2, 96, 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.
Table of Contents

1. Introduction .................................................................................................................. 2
   1.1 About 3D Audio ........................................................................................................ 2
   1.2 dearVR Audio Reality Engine .................................................................................. 3
   1.3 Version ....................................................................................................................... 3

2. Overview dearVR Engine ............................................................................................... 4
   2.1 Reflections ................................................................................................................ 4
   2.2 Reverb ......................................................................................................................... 4

3. dearVR Control Panel ................................................................................................... 5
   3.1 Position ...................................................................................................................... 6
   3.2 Virtual Acoustics ....................................................................................................... 9
   3.3 Master ......................................................................................................................... 10

4. Preset List ...................................................................................................................... 12

5. Troubleshooting / Known Issues .................................................................................. 13

6. Changelog .................................................................................................................... 14

7. Contact ......................................................................................................................... 15
1. Introduction

Thank you for purchasing our dearVR MUSIC 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 MUSIC 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.

1.1 - Full 360 degree 3D audio 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.

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!

1.3 Version

This manual is for dearVR MUSIC Version 1.2.2
2. Overview dearVR Engine

The dearVR MUSIC 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 distance to the boundaries, the time a reflection takes to arrive at his 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 MUSIC plugin contains a selection of 18 virtual acoustic presets for music production. You can easily adapt these reverb characteristics for your mix by changing the reverb size or applying a reverb filter.
3. Control Panel

3.0 – Overview processing units

The dearVR MUSIC plugin is made up of three processing units:

1. Position
2. Virtual Acoustics
3. Master

The signal flow starts in the Position Module, goes to the Virtual Acoustic Section 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 4 – Input Mode)

*Illustration 3.1 – 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 3.2 – 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 3.3 – Polar Coordinates](image)

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 3.4 – XYZ-Pad input disabled](image)
2 - Azimuth
Set Input Mode to Polar and use the Azimuth Slider to enter the left/right position in degrees (+/- 180°).
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 (+/- 90°).
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. (-96dB ⇒ +24dB)

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

6 - Zoom +/-
Use plus / minus buttons to zoom In or Out.
There are six different zoom stages:
3m / 6m / 12m / 18m / 24m / 30m

7 - 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 Virtual Acoustics

The Virtual Acoustic module adds reflections and reverb to the signal.

3.5 – Virtual Acoustics Module

1. **Preset**
   Menu to select different 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 room preset. Values (50% ⇒ 100%)

3. **Reflections On/Off**
   Switch to turn ON/OFF the Reflections rendering.

4. **Reflections Gain**
   Adjusts the overall gain of the Reflections section. Values (-96dB ⇒ +24dB)

5. **Reflections Damping**
   Applies a low-pass filter to the Reflections signal. Set frequency values between 500 Hz to 19999 Hz.

6. **Reverb On/Off**
   Switch to turn ON/OFF the Reverb rendering.

7. **Reverb Gain**
   Adjusts the overall gain of the Reverb section. Values (-96dB ⇒ +24dB)

8. **Reverb Damping**
   Applies a low-pass filter to the Reverb signal. Set frequency values between 500 Hz to 19999 Hz.

3.3 Master
### 3.6 – Master Module

1 - Input Channel
Sets dearVR input signal from a stereo audio clip. Left channel, Right channel or a mix.

**Note:** The green LED is illuminated if an input signal is detected.

2 - Output Format
Choose the Output Format:

- **Binaural**
  2 channel binaural output for playback via headphones.

- **FOA Youtube**
  4 channel first order Ambisonic output in AmbiX format. Format used by Youtube.

- **2.0 Stereo**
  2 channel stereo output for playback via stereo speaker setups. 3D positioning rendering is disabled.

**Note:** Higher Order Ambisonic output is only available in the dearVR pro version.

3 - Master Gain
Sets the overall output gain.
Values (-96dB ⇔ +24dB)

4 - Bypass
Bypass all dearVR processing.

5 - Bass Boost
Enable bass enhancement on the input signal.

6 - Performance
Use Performance Mode for static audio sources to reduce
**Mode**  
processing load.

**Note:** Only enable for static objects.

**7 – Input Signal**  
The green LED is illuminated if an input signal is detected.

<table>
<thead>
<tr>
<th><strong>Tip – Stereo Sources</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Using dearVR MUSIC 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 dearVR MUSIC 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.</td>
</tr>
</tbody>
</table>
4. 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.

<table>
<thead>
<tr>
<th>A. Rooms &amp; Halls</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concert Hall</td>
<td>5</td>
</tr>
<tr>
<td>Recording Hall</td>
<td>7</td>
</tr>
<tr>
<td>Church</td>
<td>5</td>
</tr>
<tr>
<td>Large Room</td>
<td>5</td>
</tr>
<tr>
<td>Small Room</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. MUSIC Production</th>
<th>PL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studio Room</td>
<td>5</td>
</tr>
<tr>
<td>Live Stage</td>
<td>7</td>
</tr>
<tr>
<td>Heavy Ambience</td>
<td>4</td>
</tr>
<tr>
<td>Plate Ambience</td>
<td>3</td>
</tr>
<tr>
<td>Small Ambience</td>
<td>2</td>
</tr>
<tr>
<td>Vocal Hall 1</td>
<td>7</td>
</tr>
<tr>
<td>Vocal Hall 2</td>
<td>7</td>
</tr>
<tr>
<td>Vocal Plate</td>
<td>8</td>
</tr>
<tr>
<td>Drum Room 1</td>
<td>6</td>
</tr>
<tr>
<td>Drum Room 2</td>
<td>6</td>
</tr>
<tr>
<td>Percussion Plate</td>
<td>5</td>
</tr>
<tr>
<td>String Hall</td>
<td>8</td>
</tr>
<tr>
<td>String Plate</td>
<td>8</td>
</tr>
</tbody>
</table>
5. Troubleshooting / Known Issues

1. Minimum Buffer Size.
   A minimum buffer size of 1024 is recommended.

   Due to restrictions within these hosts, no multichannel ambisonic outputs are available.
6. Changelog

v.1.1

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

v.1.2

- 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 ambisonic output was selected (Mac/Win, AAX, VST3, VST, AU)
- VST3 category was changed to enable dearVR MUSIC as a panner for ambisonic tracks in Nuendo (Mac/Win, VST3)
- Minor Bugfixes
7. Contact

Support

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

support@dear-reality.com

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

www.dearVR.com

Dear Reality GmbH
Binterimstrasse 8
40223 Düsseldorf
Germany

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.

dearVR Copyright © by Dear Reality GmbH. All rights reserved.

All trademarks or registered trademarks are the property of their respective owners.
No part of this documentation may be reproduced or transmitted in any form by any means, electronic or mechanical, without permission in writing from Dear Reality GmbH.