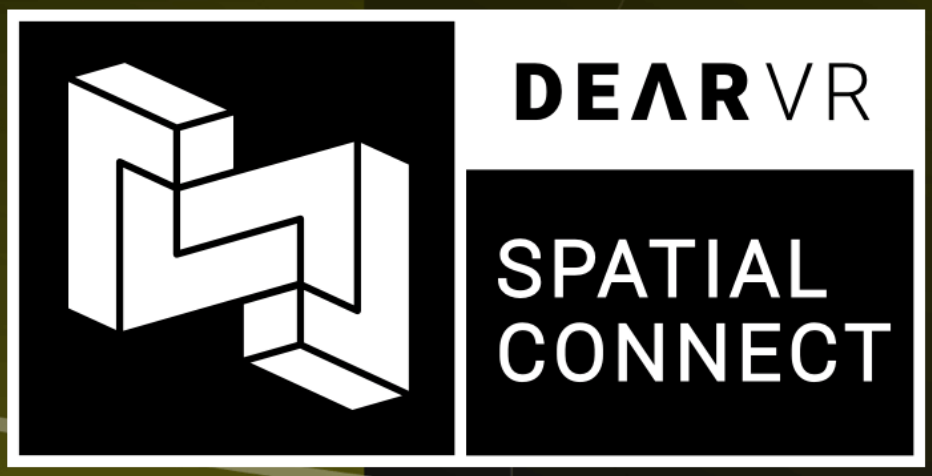

THE MIXING CONSOLE
OF THE FUTURE

DEARREALITY

USER MANUAL

v1.8.0

Please read this manual carefully before using the software.

Using headphones requires responsible listening!

Last updated: Oct 2023

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Table of contents

1 Introduction

Thank you for placing your trust in Dear Reality and welcome to the mixing console of the future!

With Spatial Connect, you will finally close the gap between creator and recipient to build truly immersive 3D Audio experiences.

This manual will help you understand the revolutionary workflow that is Spatial Connect and enable you to transfer your very own audio projects to the VR World.

Workflows for different DAWs:

You will encounter several alternative workflows which depend on the DAW-Flavour of choice.

These differentiations are marked by the respective icon of the DAW in question.

Currently, Spatial Connect supports the following DAWs:

 Cockos Reaper 5 / 6

 Steinberg Nuendo 12

 Steinberg Cubase 12

Important Note:

The content of this manual is partly represented in video format to help you understand the VR interactions and workflow of Spatial Connect in a rapid and fun way!

The tutorial videos can be viewed here.

If Nuendo or Cubase is adressed, we mainly use the name Nuendo, for a better overview.

Have fun!


DEARVR
SPATIAL
CONNECT

2 The Spatial Connect System

In its essence, Spatial Connect is a VR controller for your DAW[1] session and the dearVR PRO VST/VST3 Plugin.

It consists of two separate applications:

- Spatial Connect
- Spatial Connect Adapter

Spatial Connect, which is the main standalone application, houses the VR control interfaces and also hosts your 360° video if you require it to do so.

It is designed to run alongside your DAW session and communicate with your DAW using the OSC-Protocol.[2]

The Spatial Connect Adapter poses as the interface between Spatial Connect and your DAW and supplies your session with the head-tracking data derived from the VR-Headset.

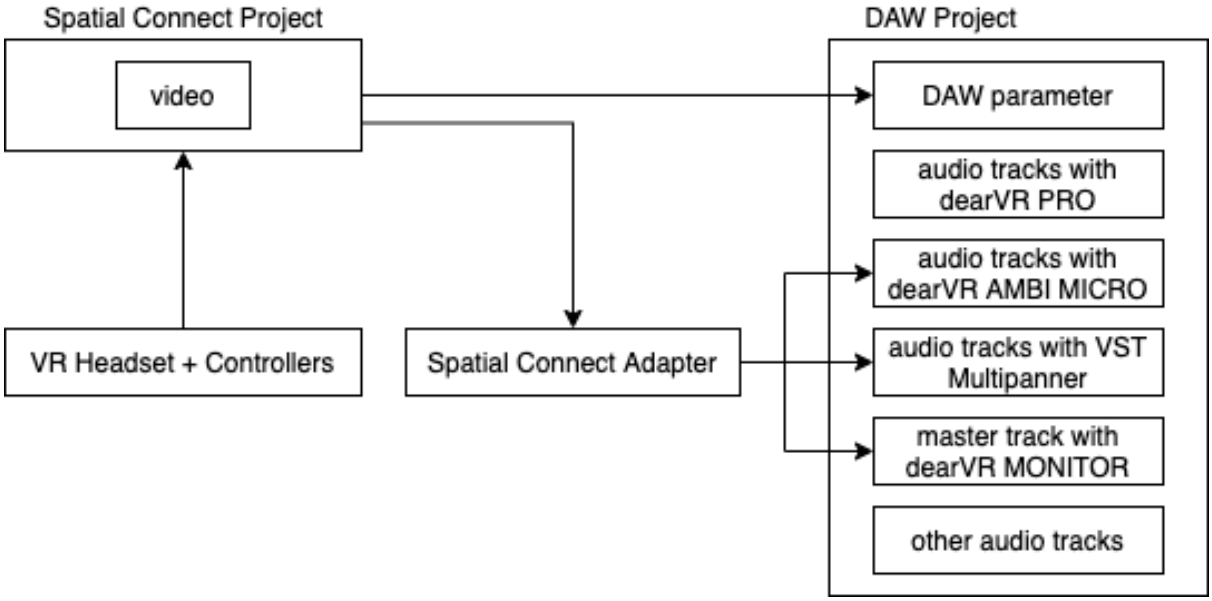
This data is used to create a stable binaural sound field.

In a concrete example, this means that when you turn your head 180°, sound sources which were previously located in front of you will now be perceived from behind.

Head-tracking is available for DAW tracks which hold either a dearVR PRO, a dearVR AMBI MICRO instance (see section 3.4) or a VST Multipanner.

[1] DAW = Digital Audio Workstation

[2] OSC = Open Sound Control: http://opensoundcontrol.org/introduction-osc



During your mixing session, the following applications have to run simultaneously:

- Spatial Connect
- Spatial Connect Adapter
- DAW

You can use two different setup modes for Spatial Connect:

- one-machine setup
  - a single machine running both Spatial Connect, the Spatial Connect Adapter, and the DAW
- two-machine setup:
  - a VR-ready machine running Spatial Connect
  - a machine running the DAW and the Spatial Connect Adapter
  - a common network used by both machines (for example your home WLAN network)

3 Installation

Please note that dearVR SPATIAL CONNECT requires an installation/license of the most recent version of dearVR PRO. If you do not already own a licensed installation of dearVR PRO, please refer to the dearVR PRO manual.

3.1 Meeting the requirements:

- VR-ready machine with Windows OS
- Steam and SteamVR Software:

  https://store.steampowered.com/about/
- HTC VIVE, HTC PRO or Oculus Rift Hardware
- if you use the Oculus Rift:

  Oculus Rift Software

  https://www.oculus.com/rift/setup/

- one of the following DAW-Installations:
  - Cockos Reaper >= 5.965/64bit
  - Steinberg Nuendo >= 12/64bit
  - Steinberg Cubase >= 12.0.7/64bit
- a valid license:

  You will be prompted for your dearVR account credentials when you first start Spatial Connect.

  By signing in, you will activate your license for the machine in use.

  https://www.dear-reality.com/account/register/

3.2 Configuration and Setup

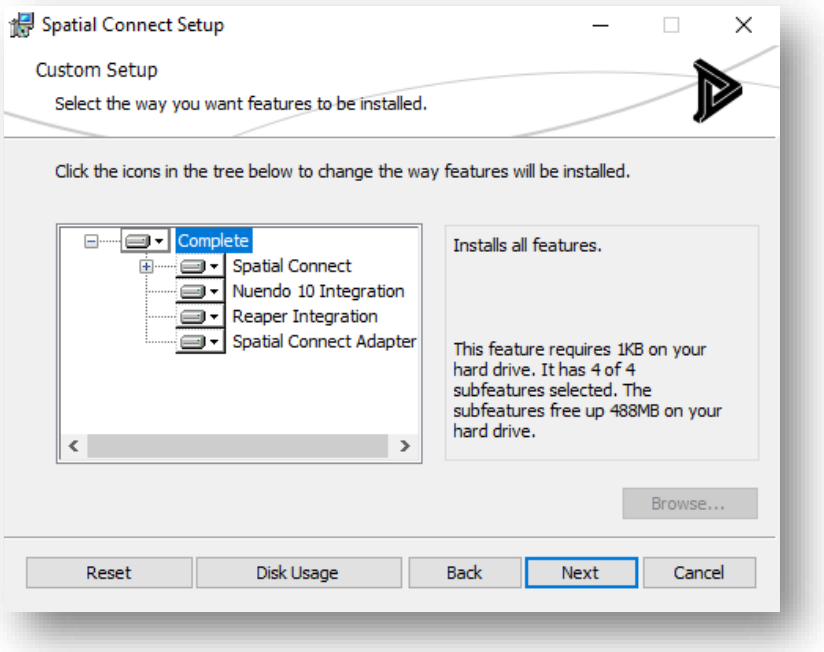
Spatial Connect can be set up in two ways:

- On one machine with Windows OS running both the DAW and Spatial Connect.
- On two machines, one with Windows OS running Spatial Connect and the other with either Windows or MAC OS, running the DAW.

This guide will provide variations for the two setup-possibilities when necessary.

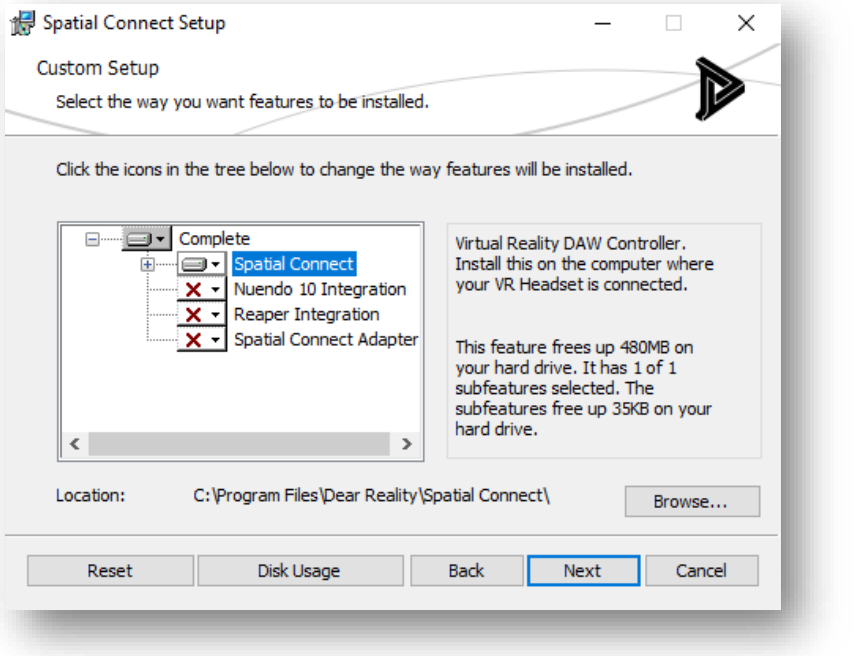
If your DAW and Spatial Connect run on the same machine, here is what you should do:

- Open the Spatial Connect.msi Setup file. Install the Spatial Connect Application, the Spatial Connect Adapter, and the DAW Integration (depends on which DAW you plan to use with Spatial Connect) in your Program Files directory:

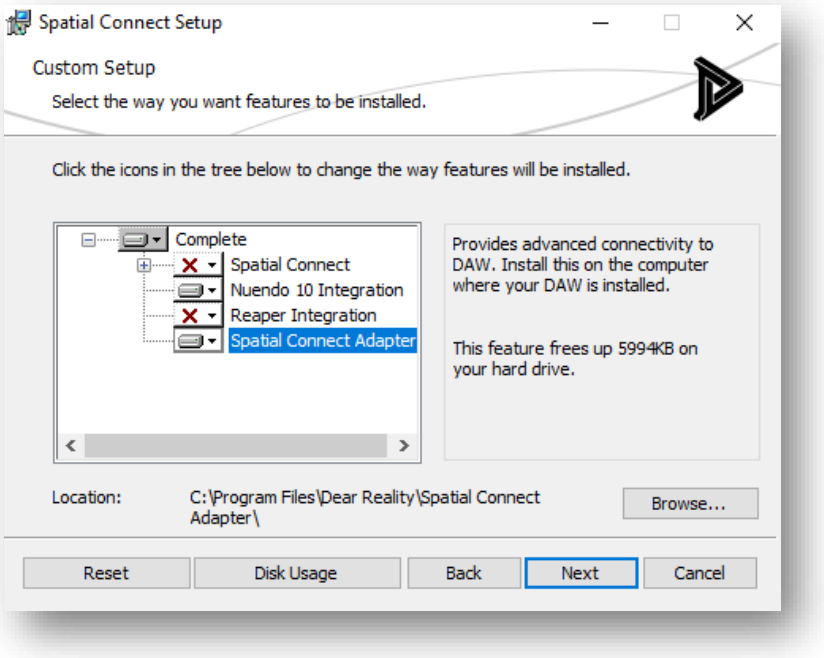


If your DAW and Spatial Connect run on two different machines, here is what you should do:

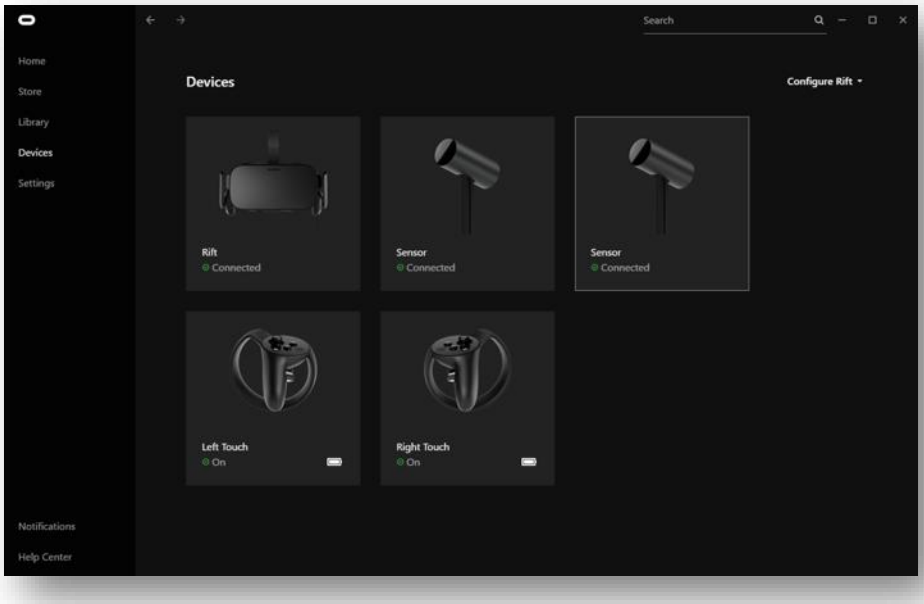
- On your VR-PC: Open the Spatial Connect.msi Setup file. Install the Spatial Connect Application in your Program Files directory:



- On your DAW machine: Open the Spatial Connect Setup file. Install the Spatial Connect Adapter and the DAW Integration (depends on which DAW you plan to use with Spatial Connect) into your Program Files directory:

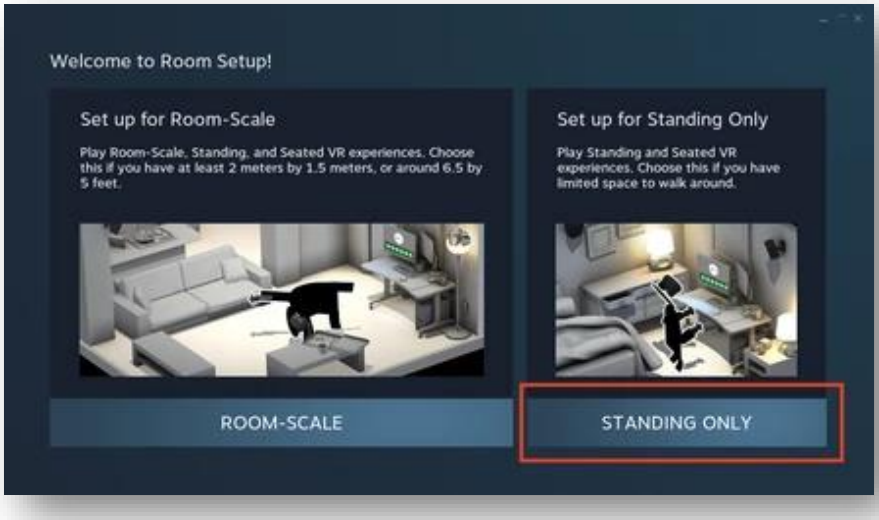


- Connect your HTC VIVE or Oculus Rift to your PC
- If you're using the **Oculus Rift**:
  - Make sure the Oculus software is installed and the configuration process is completed in your room.
  - Verify that everything is connected by navigating to ‘Devices’ in the Oculus Software. It should look like this:

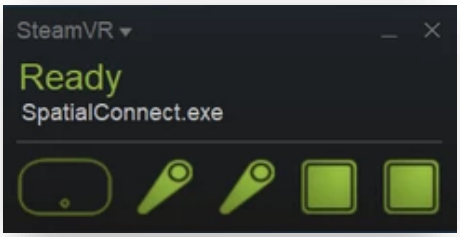


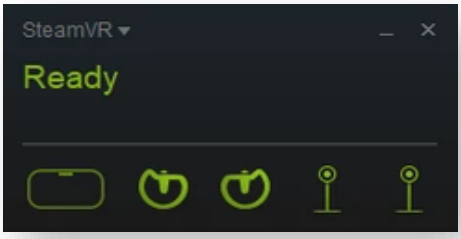
- Go to the Settings tab and check the box “allow unknown sources”.

- Open SteamVR and complete the room set up in “standing only” mode:



- Verify that SteamVR is configured correctly (all icons should be solid green, like in the picture below: left picture: HTC VIVE, right picture: Oculus Rift):



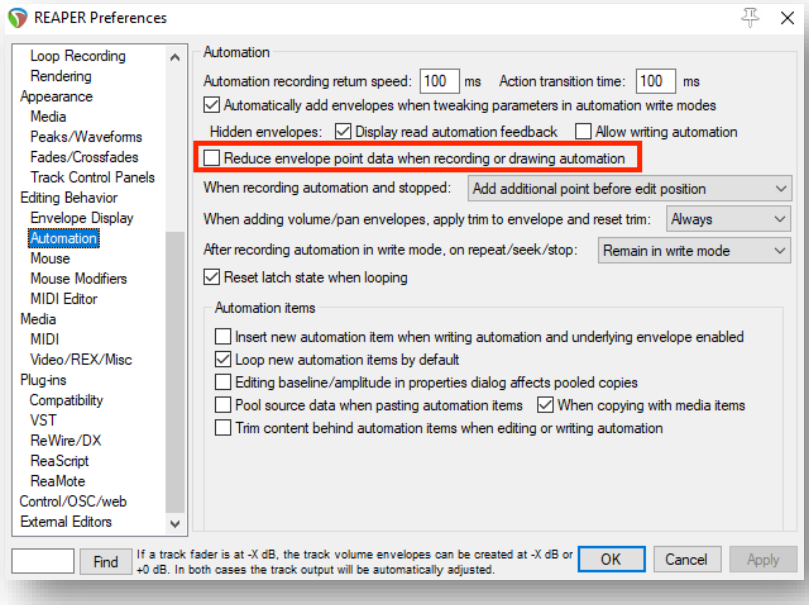


– On your DAW machine, make sure that the Spatial Connect Adapter is running (appears in your System Tray):

– Create a new session in your DAW

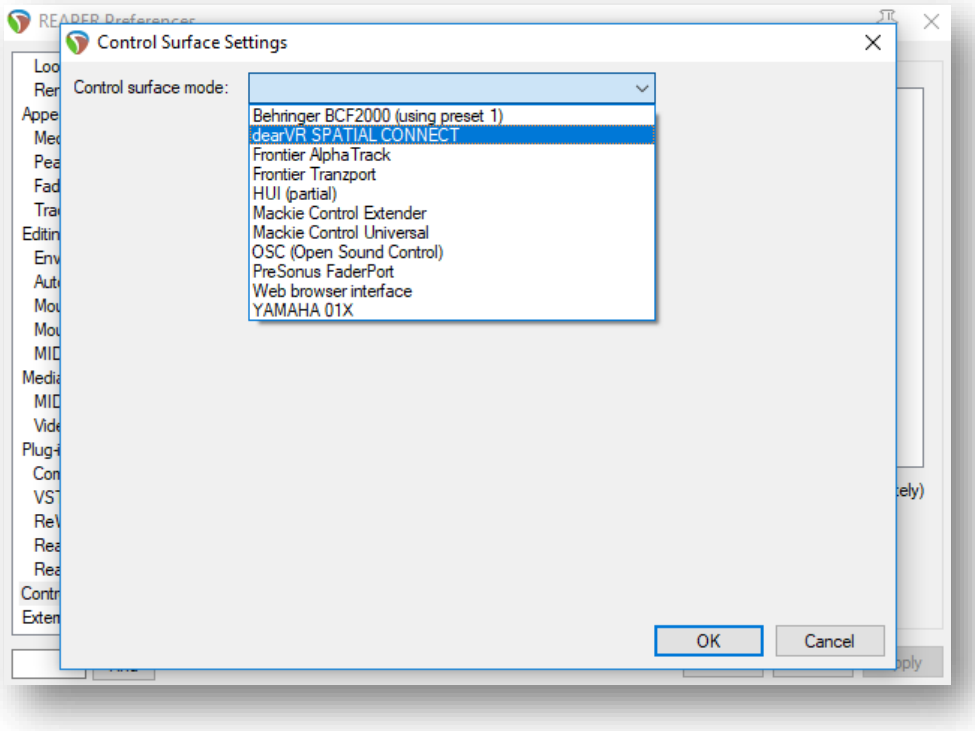
Reaper:

head to Preferences → Automation, and make sure that the checkbox “Reduce envelope point data when recording or drawing automation” is **deactivated:**



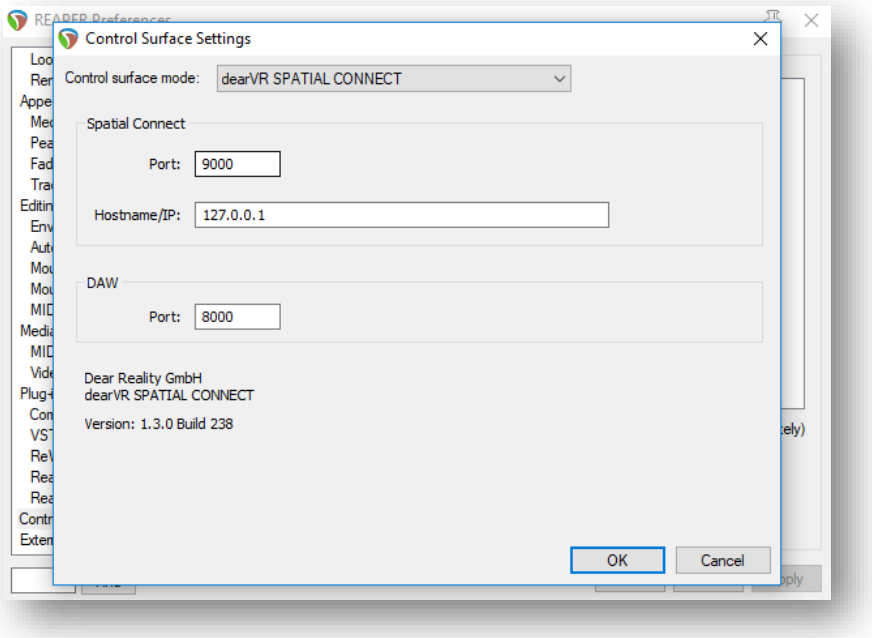
- Important Note: If you already installed and used an older version of Spatial Connect (< 1.2), please remove the old OSC device under Preferences → Control/OSC/web now before continuing!

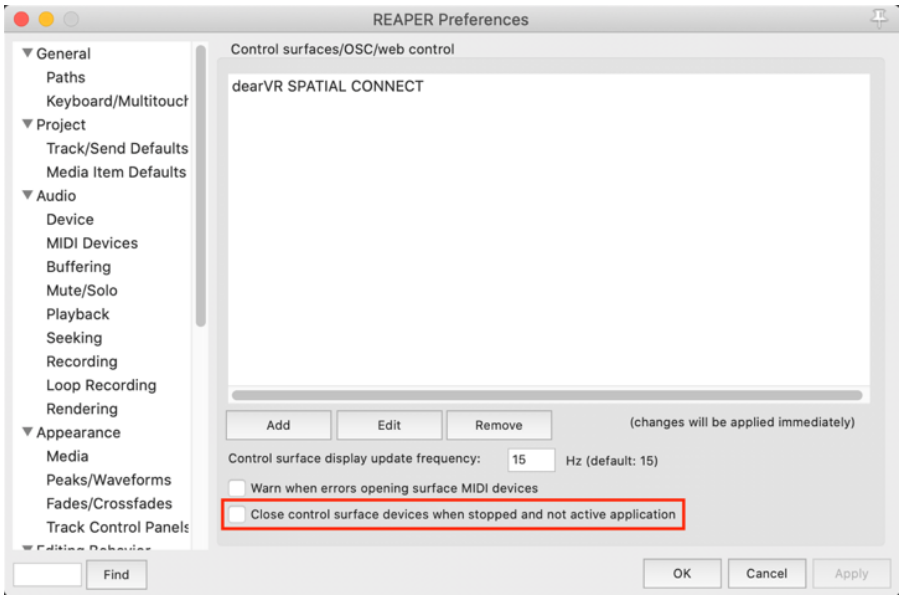
- In Preferences → Control/OSC/web, click Add and choose dearVR SPATIAL CONNECT in the Control surface mode dialog



– Spatial Connect is now registered as a control surface.

  By default, the following parameters are specified in the Control Surface Settings:



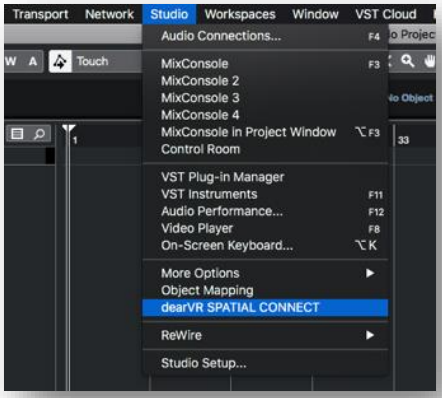


IMPORTANT:

In order for Spatial Connect to run correctly the option “Close control surface devices when stopped and not active application must be disabled! Otherwise, Spatial Connect cannot control Reaper when Reaper is not the active window.

Nuendo/Cubase:

- From the Menu, select Studio -> dearVR SPATIAL CONNECT



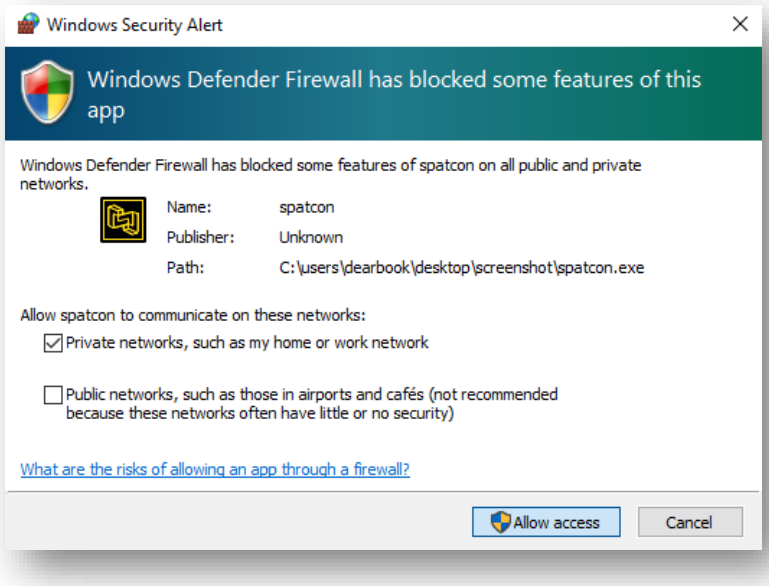
- By default, the following parameters are specified in the Control Surface Settings:

- You can leave the default settings as they are if you want to use the one-machine setup.

  If you want to use the two-machine setup, please change Hostname/IP to the IP address of your PC running Spatial Connect.

  If you know of any third party OSC devices already using the Ports 9000 or 8000, please change the Ports under Spatial Connect and DAW to another port value.

- Load your audio files and drop an instance of the dearVR PRO Plugin in the panner slot or the insert effects chain of your audio tracks (for further information on dearVR PRO please refer to the dearVR PRO manual)
- Launch the Spatial Connect application
- If prompted by the Windows firewall, allow Spatial Connect to communicate on your private network (this is needed for the connection to your DAW):

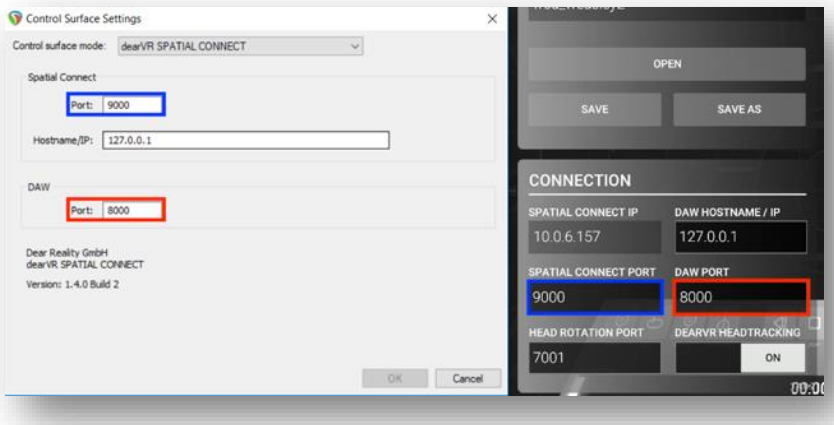


- When prompted for your license, please specify the email address and password you used for the registration at www.dear-reality.com.
- Your Spatial Connect session should now look similar like this one:

– Head to ‘settings’ in the spatial connect menu bar

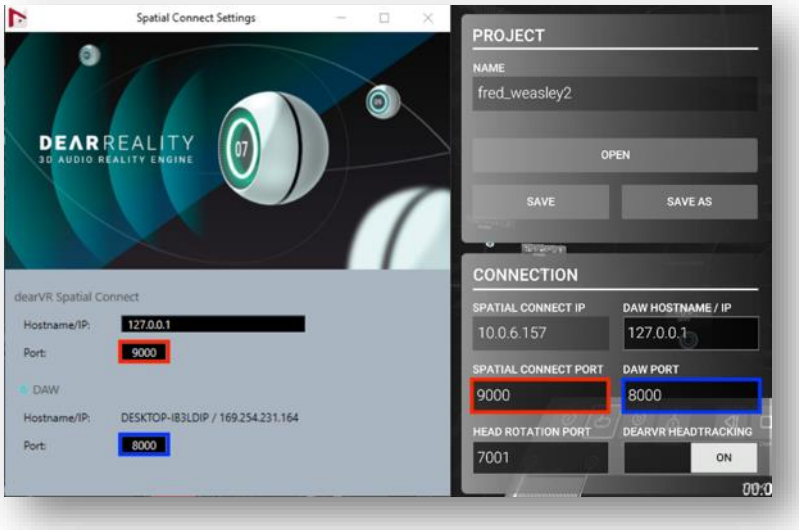
Reaper:

– Open your dearVR SPATIAL CONNECT Control surface settings again (by going to Control/OSC/web and double clicking on dearVR SPATIAL CONNECT)
– Make sure that the following ports and OSC settings match:



Nuendo/Cubase:

- Open your dearVR SPATIAL CONNECT Component settings again (by going to Studio -> dearVR SPATIAL CONNECT)
- Make sure that the following ports and OSC settings match:



If you're using a two-machine setup, make sure to specify

- the local IP address of your VR-PC under Hostname/IP in Reaper
- the local IP address of your DAW-PC or Mac under DAW IP in Spatial Connect

Note: The VST OSC port out address in Spatial Connect refers to the port specified in the Spatial Connect Adapter Settings. By default, this port is set to 7001.

You did it. Spatial Connect is now fully operational!

Read about all of the functionality in the chapters ahead, to get a detailed look into the system or head to our tutorial page and check out our quick video guides.

3.3 Best use

- Try to prepare your project with markers to see important cues in the Spatial Connect timeline, since you can't see the waveform in Spatial Connect.
- Specify your timeline-measurement steps in Reaper to minutes/seconds to match spatial connect (right click in the Reaper timeline → 'Minutes:Seconds').
- Move the VR interfaces like mini-map, meter bridge, and timeline by touching it, holding the grip button on the side of the controller, moving the interface to the desired position, and releasing the grip button.
- Temporarily solo a source by holding the trigger button while pointing at a source.
- For big-scale, performance-intensive productions, please use the video encoding guide. To optimize your video, increase your buffer size in the DAW and consider using smaller room presets.

Tip: high-resolution mode
Spatial Connect offers a high-resolution mode which really lets the application shine on the 2D Monitor. This is useful if you want to make some sleek-looking screenshots! The high-resolution mode for the 3D view can be activated/deactivated with the F11-key. For the VR mode, you can toggle its state with the F12-key. Please note that the activated high-resolution state will have an effect on the overall performance, so remember to deactivate it after taking your screenshots. The high-resolution mode has no effect whatsoever on the audio processing.

3.4 Ambisonic Workflow

If you want to apply head tracking of your VR headset to your Ambisonics stream/bus, you can use our free dearVR AMBI MICRO plugin which offers flexible and precise usage of Ambisonics files in your DAW (available on the dearVR website).
AMBI MICRO will automatically adapt the orientation of the Ambisonics file to your head-movement as long as dearVR Headtracking is activated in dearVR SPATIAL CONNECT.
An Ambisonics track with a dearVR AMBI MICRO plugin is treated as a non-dearVR source (see non-dearVR sources in section 5.3).
For more information on the plugin usage, please refer to the dearVR AMBI MICRO manual.

3.5 dearVR MONITOR workflow

You can also use Spatial Connect's headtracking to use it for dearVR MONITOR. As with dearVR MICRO, dearVR MONITOR will automatically connect to SPATIAL CONNECT to use the headtracking information provided by the VR headset (given that dearVR Headtracking is activated). You can display the speaker setup you are monitoring inside SPATIAL CONNECT.

3.6 Video Encode Guide

For the flawless synchronisation of a 360° video to your audio session, we need a fast and responsive video format.

We advise you to convert the videos that you plan to use with Spatial Connect to the best possible format. This guide shows you how to do this using the free encoder 'FFMPEG' on your Windows computer. The desired format should be x264, 3840*2160, 30 fps, and with a small GOP length (< fps).

- Download FFMPEG here.
- Unzip the file.
- Copy ffmpeg.exe from 'bin' to the location of your video.
- Rename your video to input.mp4.
- Open the command prompt (click 'start' and type **cmd** and enter).
- Navigate to your video using **cd**:
  - Specify the name of the folder you want to open from your current location with '**cd <folder>**' (replace <folder> with a folder name)
  - Repeat until you reach your destination
- Copy and paste the following command into the command prompt and hit enter:

  ffmpeg -i input.mp4 -c:v libx264 -g 15 -x264opts keyint=15 -preset medium -tune zerolatency -level 4.2 -b:v 100M -f mp4 output.mp4

Your video should now get encoded to a suitable format.
Rename your converted video (output.mp4) and open it up in Spatial Connect.

If you are still experiencing a stuttering video (e.g., due to using a low-end computer), try to lower the GOP size even further.

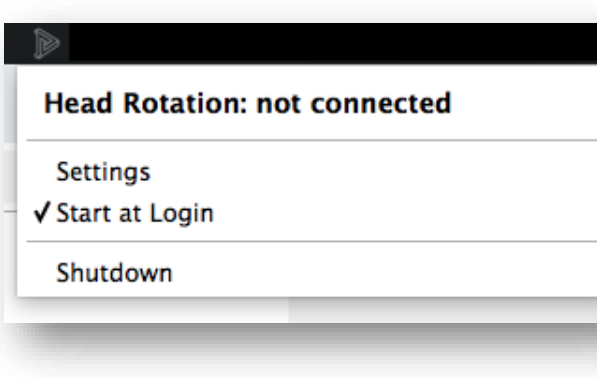
In extreme cases, you can even set it down to 1 (-g 1 -x264opts keyint=1), forcing ffmpeg to use only keyframes, but the quality will suffer while the file size will get bigger.

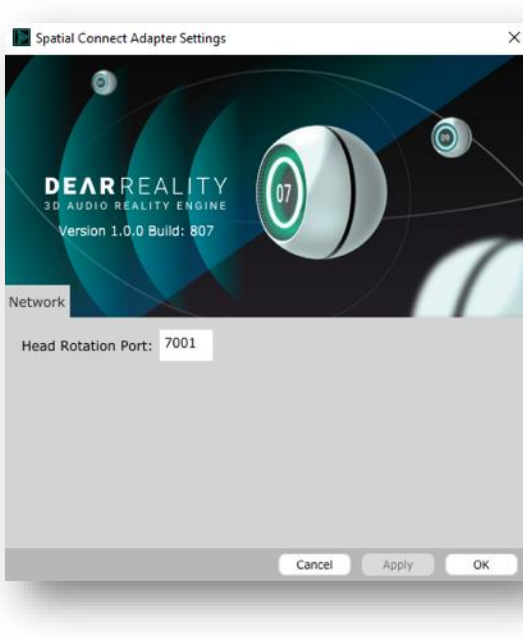
3.7 System requirements and supported platforms

For the latest system requirements and supported platforms, please refer to the product page on our website www.dear-reality.com.

4 Spatial Connect Adapter

The Spatial Connect Adapter acts as the interface between Spatial Connect and the DAW Session. If you're using a two-machine setup, it has to be installed on the DAW-machine.





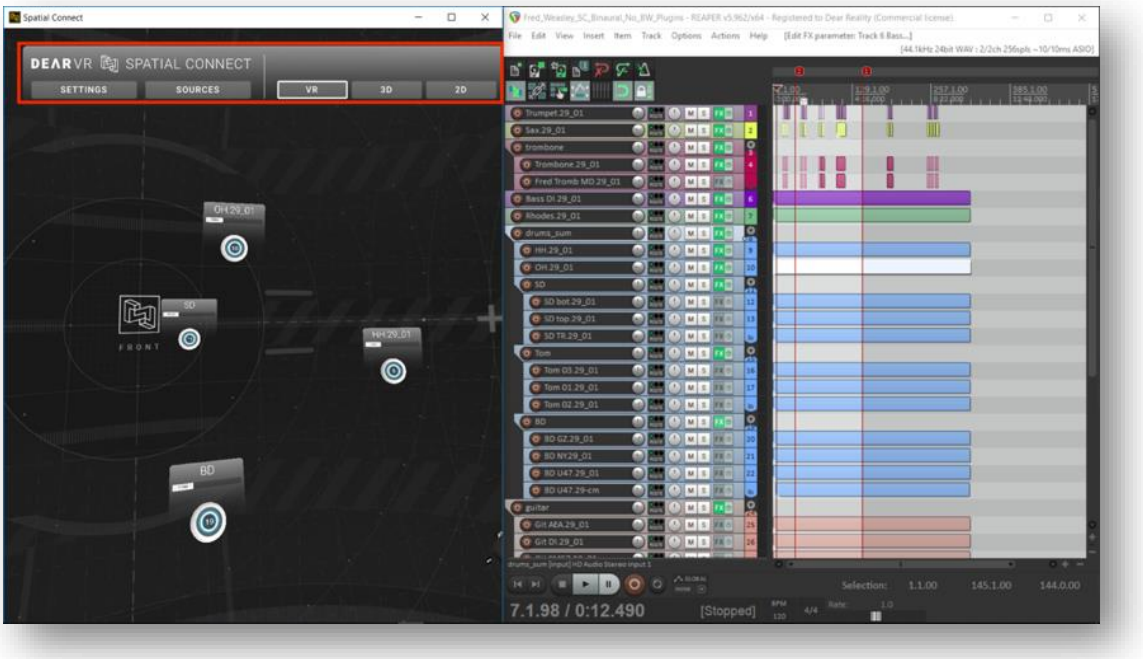
You can enter the Spatial Connect Adapter Menu (left picture) by right clicking the tray icon.

- **Head Rotation** indicates whether a connection to the Spatial Connect Application is established.
- **Settings** will open the Spatial Connect Adapter Settings. Here, you can specify the Head Rotation Port that is used by the Adapter.
    - Click Apply to make your changes and OK to exit the settings.

  Please make sure that this port is equal to the VST OSC port out in the Spatial Connect Settings.
- **Start at Login** is enabled by default, launching the Spatial Connect Adapter at the start-up routine of your machine. You can deactivate it with a left click if you prefer to open the Adapter manually before you start a Spatial Connect session.
- **Shutdown** will close the Spatial Connect Adapter menu.

5 2D User interfaces

The 2D user interfaces contain global parameter controls and configuration for your mixing session, which can be tweaked outside of the VR-space. They are accessible from the Spatial Connect Application.



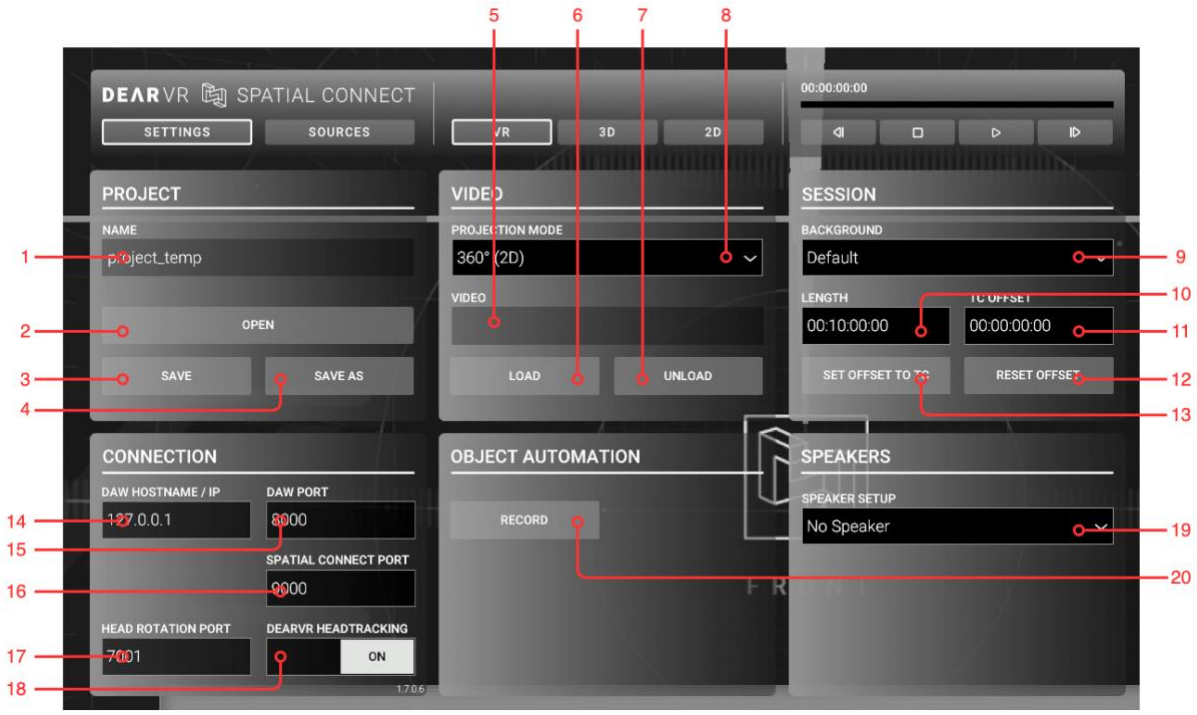
5.1 Settings

The Settings section provides you with configuration options for video, OSC, and head-tracking, as well as essential project management tools.

Your 3D mixing project consists of a DAW session and a separate Spatial Connect project, saved as a ".spatialconnect" file. This file will store the following settings:

- The path name to the loaded video file
- All parameters specified in the settings, except the OSC ports (DAW IP, DAW OSC port in, VST OSC port out, and DAW OSC port out)

The OSC ports are saved globally and remain the same for each spatial connect project. Spatial Connect will always load the last opened project file on start-up.



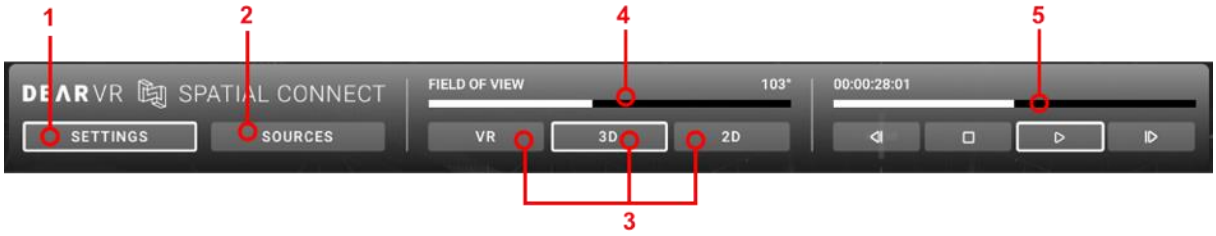
1 - Project name	Depicts the name of the currently loaded project
2 - OPEN	opens an existing SPATIAL CONNECT project file.
3 - SAVE AS	saves the current project settings to a new SPATIAL CONNECT project file.
4 - SAVE	updates the currently loaded Spatial Connect project file with the specified settings. If no project is currently loaded, the functionality is equal to 'save as'
5 - Video file	shows the filename of the currently loaded 360° video.
6 - LOAD	loads an existing 360° video.
7 - UNLOAD	unloads the currently loaded video and removes it from the SPATIAL CONNECT project file.
8 - PROJECTION MODE	specifies the projection mode of the 360°- or switches to the 2D-video format.
9 - BACKGROUND	Adjust your virtual mixing environment
10 - LENGTH	displays the length-timecode of the loaded video in the HH:MM:SS:FF format.[3]
11 - TC-OFFSET	displays the current Timecode-offset. The value can be changed directly in the input text field or set to the current position of the play-head by pressing the set offset current TC button The timecode offset describes the delay time after which the video playback begins. This is used to compensate silence at the beginning of the DAW session.

[3] hours:seconds:minutes:frames

12 - SET OFFSET TO	Set the TC-offset to the current timeframe
13 - RESET OFFSET	Set the TC-offset to 00:00:00:00
14 - DAW HOSTNAME IP	specifies the OSC port used by Spatial Connect to send data to the DAW
15 - SPATIAL CONNECT PORT	specifies the OSC port used by Spatial Connect to receive data from the DAW.
16 - DAW PORT	specifies the OSC port used by Spatial Connect to send data to the DAW
17 - HEAD ROTATION PORT	specifies the OSC port used by Spatial Connect to send the Head Rotation data to the dearVR PRO plugin.
18 - DEARVR HEADTRACKING	activates head-tracking for all dearVR PRO instances in the DAW session.
19 - SPEAKERS	If you are mixing for a multichannel format, you can let SPATIAL CONNECT display your speaker setup inside the application.
20 - OBJECT AUTOMATION RECORD	Starts an object automation recording

5.2 Toolbar

The Toolbar controls the global transport functions. It can be accessed with the 2D GUI of Spatial Connect.



1 - SETTINGS Open the settings menu

2 - SOURCES Open the sources menu

3 - VR/3D/2D Switch the view mode of the main space (see section 6)

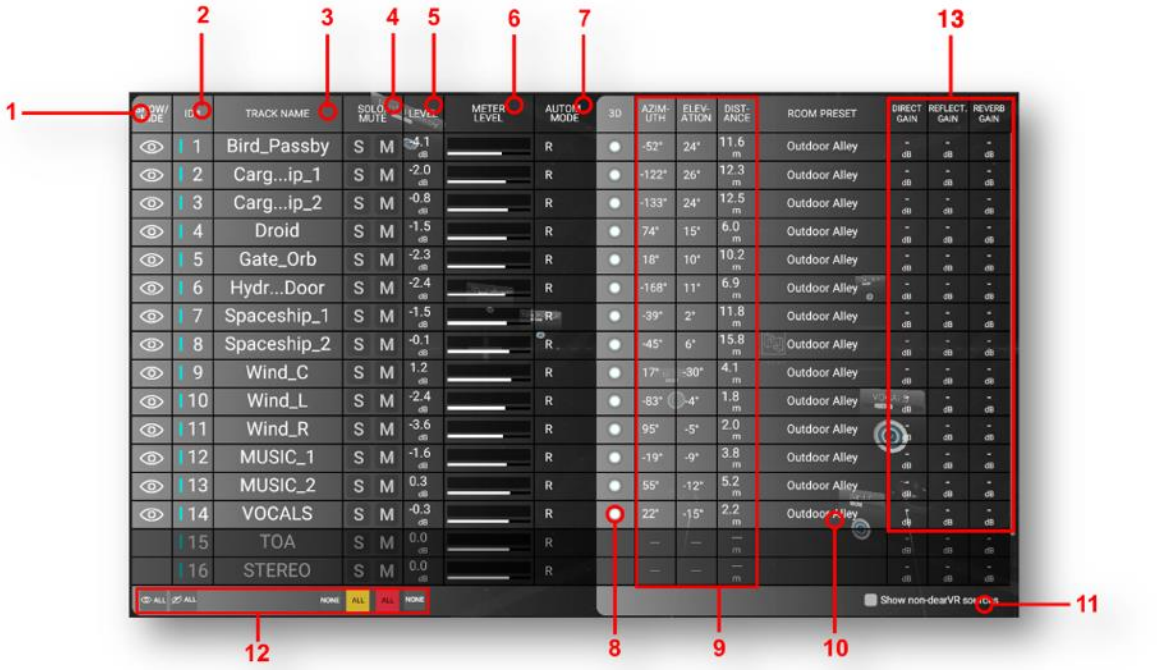
4 - FIELD OF VIEW The timeline represents the time axis and play head of the DAW session. You can navigate it by right-clicking on it and dragging the play head to a different position. It will also show a timecode in the HH:MM:SS:FF format

5 - TIMELINE The timeline represents the time axis and play head of the DAW session. You can navigate it by right-clicking on it and dragging the play head to a different position. It will also show a timecode in the HH:MM:SS:FF format. You can also use the transport buttons below which mirror the VR transport buttons (see section 9.1)

5.3 Sources

The source list provides an overview of all the important data of your session within VR.

The source list is divided into the DAW-related parameters (left side) and the 3D/dearVR PRO plugin parameters (right side).



1- SHOW / HIDE

Visibility state of the audio source.

To change the visibility state:

- touch the visibility state icon with the selector sphere.
- press the trigger button.

An invisible audio source will disappear from the main space and the minimap.

The meter bridge will indicate an invisible audio source with a darker shading of the meter segment.

2-	**ID#**	The numeric ID of the audio source.
3-	**TRACK NAME**	The track name of the audio source.
4-	**SOLO/MUTE**	The solo and mute states of the audio sources. To activate/deactivate solo/mute: – touch the solo or mute button with the selector sphere. – press the trigger to activate/deactivate solo or mute.
5-	**LEVEL**	The current gain of the audio track in decibels
6-	**METER LEVEL**	Displays the level metering of the audio tracks. The white line beneath the metering segment indicates the gain of the audio tracks.
7-	**AUTOMATION MODE**	Shows the current automation mode of the audio tracks
8-	**3D**	This indicator lights up when an instance of dearVR PRO or the VST Multipanner is detected on the audio track
9-	**AZIMUTH/ ELEVATION/ DISTANCE**	Depicts the positional data of the audio source in the angular values of azimuth, elevation, and distance.
10-	**ROOM PRESET**	Shows the currently chosen Reverb Room Preset of the audio sources.
11-	**Show non-dearVR Sources**	Triggers whether non-dearVR sources should be shown as visible audio sources in the main space
12-	**ALL/NONE**	global switches which can be used to toggle solo/mute/visibility for all sources at once
13-	**DIRECT GAIN / REFLECTION GAIN / REVERB GAIN**	The current gain of the individual direct / reflection / reverb module. You can change the levels by grabbing and pulling them with your mouse

Tip: non-dearVR sources
Ambisonics source material in your mixing session are also treated as non-dearVR sources Use the dearVR AMBI MICRO plugin for head-tracking of your Ambisonics tracks in order to create immersive ambience (see section 3.4 or the dearVR AMBI MICRO manual) You can use the output setting of dearVR PRO to encode the remaining audio tracks into an Ambisonics format. (please refer to the dearVR PRO manual) In some cases, mono/stereo sources can also lead to quite effectual contrasts to the object-based 3D panning of the other tracks in your scene. Warning: Positioning a non-dearVR source will result in left-right panning. Do not change the position of your Ambisonics sound sources as its stereo panning will distort the spatial perception.

6 View modes

Spatial Connect can be operated using 3 different view modes which are designed to adapt to your current workflow-requirements.

You can choose your preferred view mode in the toolbar:

VR The view-mode which enables your VR Hardware and the dearVR Headtracking Connection.

Make sure it is enabled before you dive into your VR-Headset.

Note: In VR mode, the rotation is locked to the yaw axis and the rotation applied with your mouse will affect the VR-headset view.

3D The cropped field of view of the 360° video translated to a 2D screen.

You can use the mouse to rotate the view of the main space in non-VR mode by left clicking and dragging the mouse in different directions.

2D The 2D view displays your 360°-video in its equirectangular view, essentially squashing the whole 360° field of view in a 2D representation.

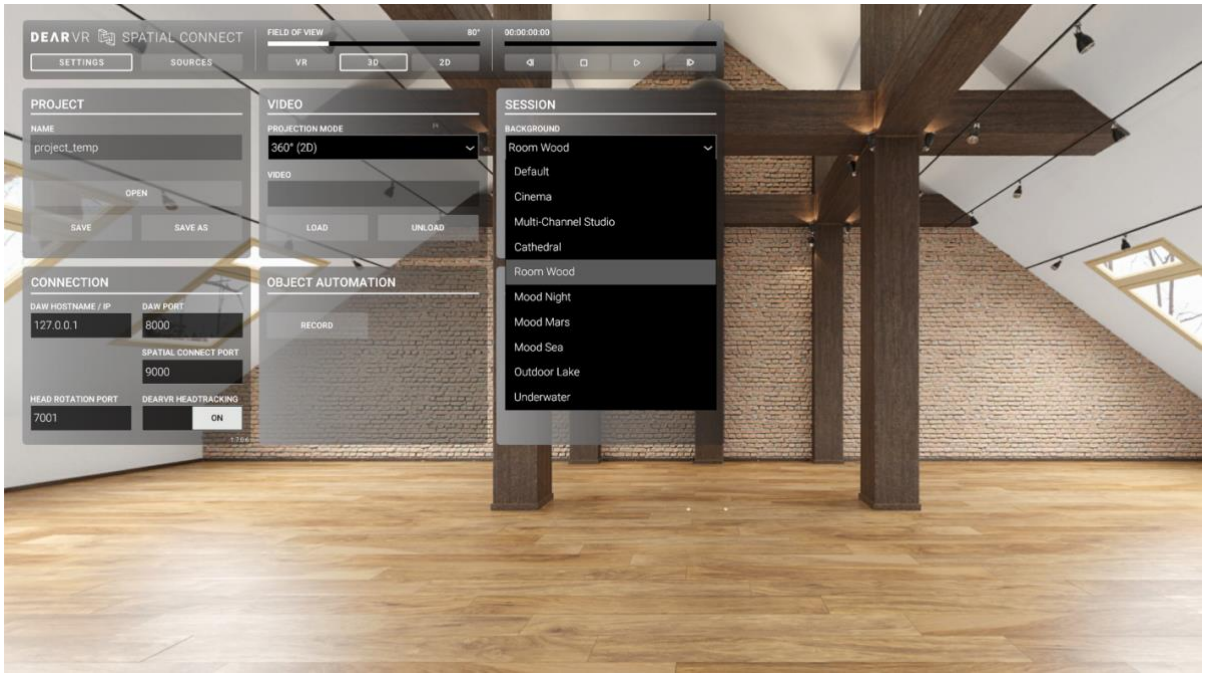
This enables you to use Spatial Connect without your VR-headset.

You can move a source by dragging it to a different position with a left click and adjust the distance of the source with your mouse-wheel.

6.1 Virtual mixing environments

If you don’t require a 360° video for your production process but still want to adjust your visual surroundings, you can utilise the 360° Background option to place yourself in an array of different virtual environments.

In order to choose one of the 10 available presets, use the Background dropdown-menu.



6.2 2D Video

Besides 360°-videos, you can also use dearVR SPATIAL CONNECT alongside 2D video content.

This view-mode comes in handy if want to judge your 3D-Audio Mix for a 2D movie while still taking advantage of the whole 360° sphere to do your audio mixing.

In order to view the loaded video in 2D, select the video screen (2D) in the view mode dropdown.

Tip: virtual cinema / multichannel studio
If you choose both 2D video projection and the cinema background, the 2D video is automatically scaled to the Cinema screen. This enables you to simulate a cinema viewing experience while monitoring your 3D audio mix. This also applies to the TV-screen in the Multichannel Studio background.

7 Main Space

The main space describes the main window below the toolbar of the Spatial Connect application when you're looking at your computer screen (3D mode) and the 3D space all around you when you enter VR (VR mode).

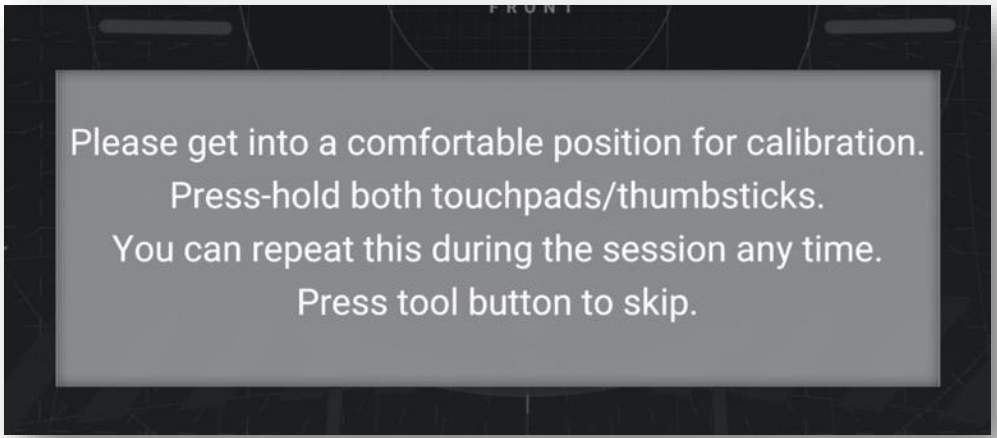
The main space also acts as the spherical canvas for a loaded 360° video.

Two kinds of objects live in the main space:

- the audio sources (see section 7.2)
- the VR modules (see section 9)

7.1 Calibration

At the beginning of your session, you will be asked to calibrate your position with the following message:



These calibration steps are necessary to ensure the correct placement of audio sources and control panels in Spatial Connect.

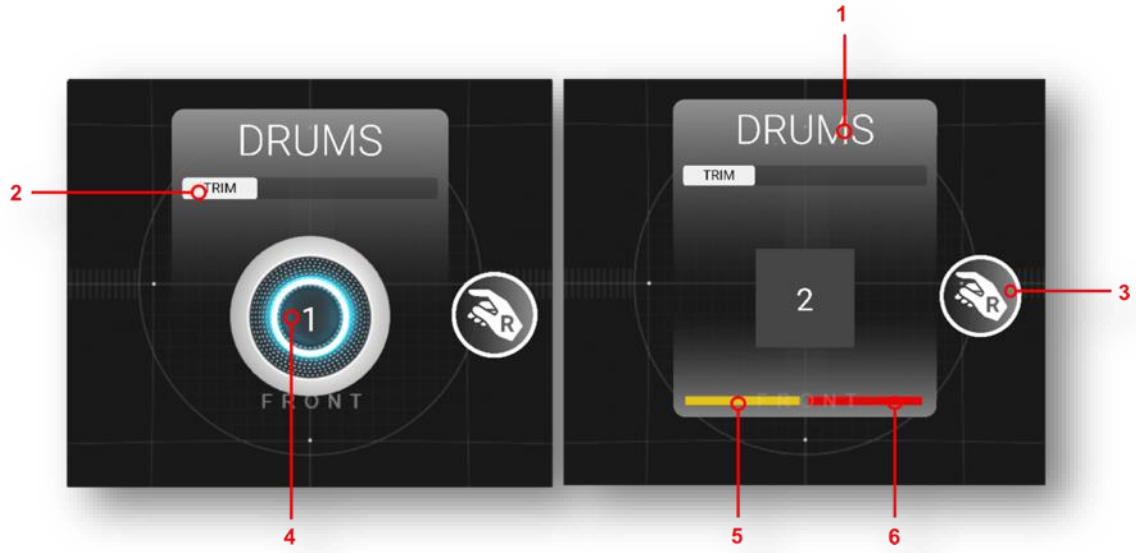
It is also very useful to adapt Spatial Connect to your individual needs when changing your position and thus the focal point of the VR experience.

7.2 Audio sources

The audio source represents an audio track of your DAW session.

There are two types of audio sources:

- the dearVR source (left)
  - contains an instance of dearVR PRO in its insert effects channel.
  - it's position in 3D space will automatically be translated to the dearVR PRO 3D-Audio rendering engine.
- the non-dearVR source (right)
  - contains no instance of dearVR PRO in its insert effects channel.
  - it's position in 3D space will automatically be translated to the stereo panning of the audio track.



1- Track name Derived from the DAW audio track name.

2- Automation mode Current automation mode of the audio source. The automation mode can be changed with the controller (see section 8.5)

3- Selection indicator Indicates that the audio source is currently selected.

- R = with the right controller
- L = with the left controller

4- Track number Track number derived from the DAW track order.

5- Solo Indicates an activated solo state of the source.

6- Mute Indicates an activated mute state of the source.

Nuendo/Cubase:

Steinberg offers their own built-in 3D panner, the VST Multipanner.

This panner is integrated with Spatial Connect and can be controlled just as easily as an audio track containing a dearVR PRO instance.

Every audio track using the VST Multipanner is recognized as a 3D audio source in the source list and main space.

PLEASE NOTE:

dearVR PRO and the native Steinberg panners operate differently on their source material which requires special attention:

- Audio tracks with a stereo configuration in Nuendo/Cubase cannot be controlled by Spatial Connect. This applies both to the VST Multipanner with a Multichannel configuration and a common stereo-configured track. However, dearVR PRO with its integrated stereo down-mixer requires a stereo input and will not work properly with a mono configuration.

  To avoid unintended behavior, please follow this guideline while operating Nuendo and Spatial Connect:

  - If using the native **VST Multipanner**, make sure that you specified a **mono configuration** for your track (this track can still output to any multichannel track)
  - If using **dearVR PRO with binaural** output, please make sure that you specified a **stereo configuration** for your track
  - If using **dearVR PRO in the 3D panner slot** (for Ambisonics/ Multichannel output), you can use **either mono or stereo configuration** for your track (routed to an Ambisonics bus)

- For more information on Ambisonics routing, please refer to the dearVR PRO manual
- Due to compatibility assurance, the maximum distance controlled by the VR-Controllers is capped to 30m. Any VST Multipanner which was set to >30m by mouse will be reset to 30m once modified by a VR-controller

8 Controller

The HTC VIVE and Oculus Controllers are your hands-on tools to interact with the VR world. With Spatial Connect, they can be used to great effect when interacting with your 3D Audio mix.

Spatial Connect can be controlled by both the Oculus Rift and HTC VIVE controllers.

The controllers use two distinct modes for VR-interaction:

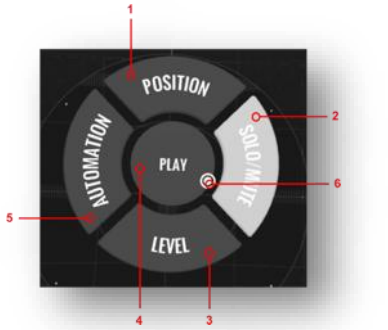
- Ray mode:
  - This control mode is used to interact with the audio sources.
  - A white ray is cast from the controller into the main space. At the end of the ray, a circle represents the pointer, which indicates the current target of your controller. Pressing the trigger button will activate the interaction on the target.
- Touch mode:
  - This control mode is used to interact with the VR modules (see section 9).
  - It is automatically activated as soon as a controller moves in direct proximity of any module.

    When activated, the controller model is hidden, and the blue selector sphere is shown instead.
  - You can interact with the modules in VR space by touching an element with the selector sphere and pressing the trigger button.

8.1 Ring Menu

To provide you with full control over a broad range of tools, the controllers can switch into different modes, changing the functionality of the controller.

The ring menu enables you to switch between those modes. To activate the ring menu, press and hold the TOOLS button and move your controller in the direction of the desired mode. The position of your controller is reflected by the selection indicator. Release the TOOLS button to confirm our choice.



1- POSITION	Activate position mode.
2- SOLO/MUTE	Activate solo/mute mode.
3- LEVEL	Activate level mode.
4- PLAY/PAUSE	When the session is currently paused or stopped: Plays the session. When the session is currently playing: Pause the session.
5- AUTOMATION	Activate automation mode.
6- Selection indicator	Indicates the position of your controller within the ring menu. A panel will light up when the selector hovers in its direction. Release the TOOLS Button to confirm your choice.

8.2 Position mode

Directly move your sound sources to any position in 3D-space. Push your sound sources away or pull them right in front of you.

The processing of dearVR PRO will ensure high-fidelity localisation in real time.

To change the relative position of the audio source:

- aim at an audio source
- press and hold the trigger button
- tilt the controller in different directions

To adjust the distance of the audio source:

- trigger and hold the source
- scrub towards/away from source on the touchpad
- click and hold the touchpad in the top- or bottom-half and adjust the speed of the distance modification with the position of your finger on the touchpad

8.3 Solo/Mute mode

Single out or mute your audio sources to keep track of the most important material for each moment.

The changes will be directly reflected in the solo/mute states of your DAW.

The current solo/mute state will be depicted at the audio source.

To change the solo/mute:

- click the left or right half of the touchpad to activate solo or mute respectively.
- aim at the audio source.
- press the trigger button.

You can also activate solo/mute from the source list and solo with the solo grip.

8.4 Level mode

Bump up the volume or quiet things down using the level tool.

Move your whole arm up and down while selecting the source so you can enjoy adjustments with high resolution.

The level changes will be reflected in the volume fader of your DAW session.

To change the volume of an audio track:

- trigger + hold.
- aim at the source you want to level.
- move the whole controller up and down.

You can also adjust the level using the metering-bridge.

8.5 Automation mode

The automation mode enables you to record changes over time.

Your automation will be written to your DAW in real time for every source with an activated automation mode other than ‘trim/read’.

Supported parameters for automation:

- position
- level
- virtual acoustic presets

To activate an automation mode on a source:

- click one of the selection-fields of the touch pad to activate trim, latch, touch, or write
- aim at an audio source
- trigger

The activated automation mode is displayed above the audio source.

Tip – automation modes
Please refer to the DAW reference for a detailed description of the different automation modes (trim/read = read, latch preview is not implemented).

Reaper:

The supported Automation Modes in Reaper include:

- Trim
- Touch
- Latch
- Write

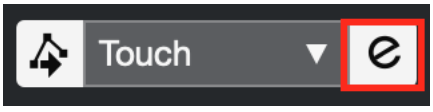
Automation Modes are set locally for each audio source

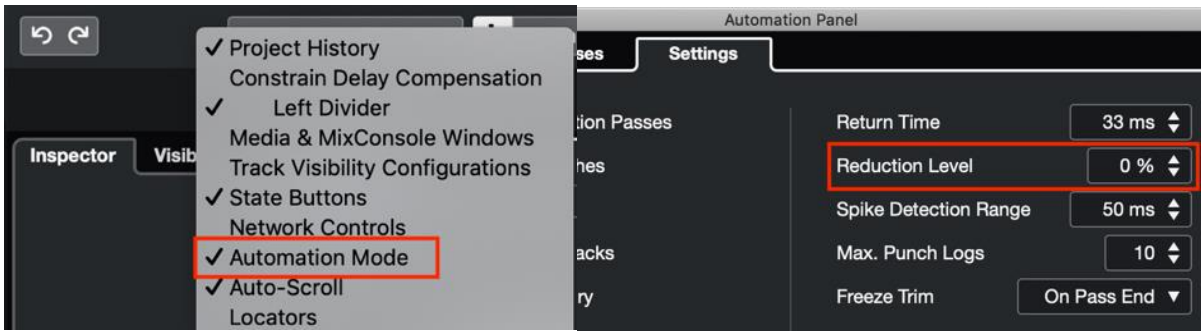
Nuendo/Cubase:

The supported Automation Modes in Nuendo include:

- Read (R)
- Read/Write (R/W)
- Off

Make sure to set Nuendo's/Cubase's reduction rate for Automations to 0%. Otherwise Nuendo will smooth your automations which will change them and has a totally different outcome in the worst case. You can find the option in the top toolbar. Right-click in an empty space there and make sure the panel "Automation mode" is visible. Then click on the "e" in the automation panel and go to settings. There you can find the reduction rate.





Automation Modes are set locally for each audio source.

The type of Automation is dictated by the global automation mode specified in the Automation Panel. Currently, the global automation is to be switched traditionally by mouse.

8.6 Temp-Solo

You can temporarily activate the solo state of an audio source using the temp-solo function. This is very useful for the quick isolation of a source and can be activated while positioning or levelling simultaneously.

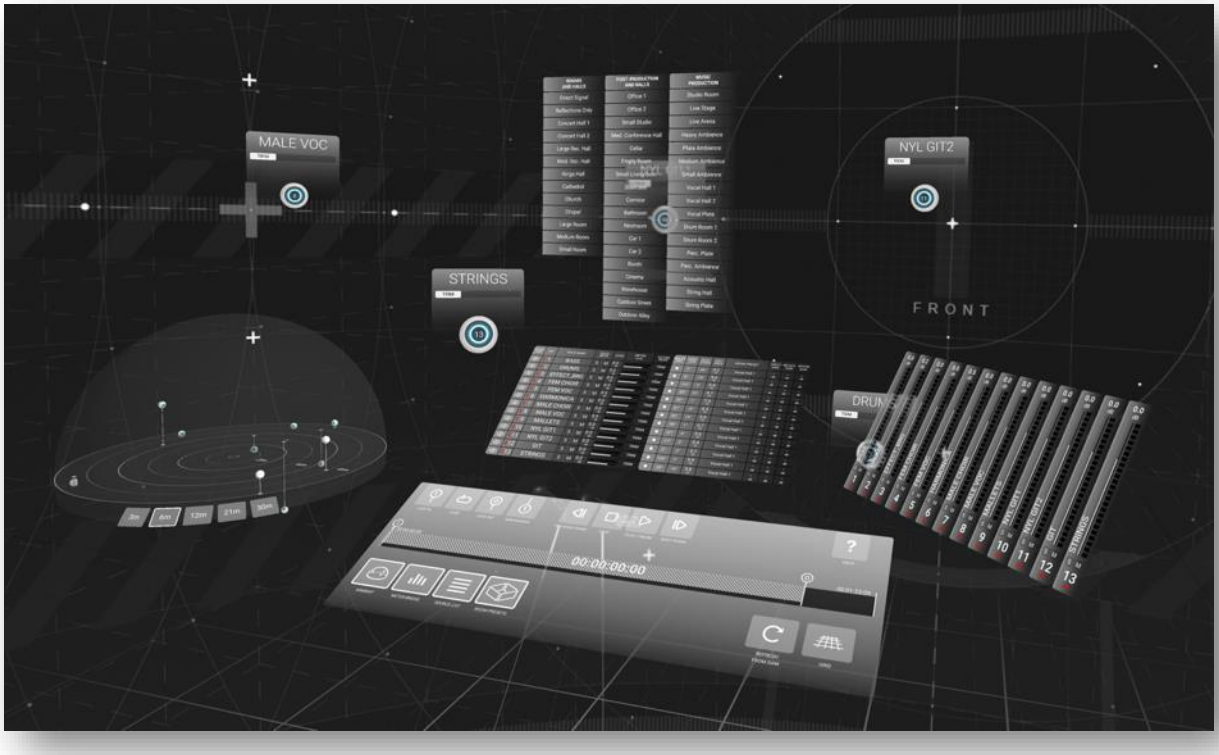
To activate Temp-Solo:

- aim at an audio source in the main space.
- press and hold the grip button.

  the solo state of the audio source is activated.
- release the grip button.

  the solo state of the audio source is deactivated.

9 VR Modules



The VR modules are virtual interactive panels that add functionality to your VR-mixing workflow.

To interact with the VR modules:

- Move your controller towards a module until you're in direct contact with it (just like reaching for an object on your desk). The virtual representation of your controller will be replaced by the selector-sphere.
- Touch an element of the module with the selector-sphere.
- Depending on the application, press or hold the trigger button.

You can reposition each module in 3D space by:

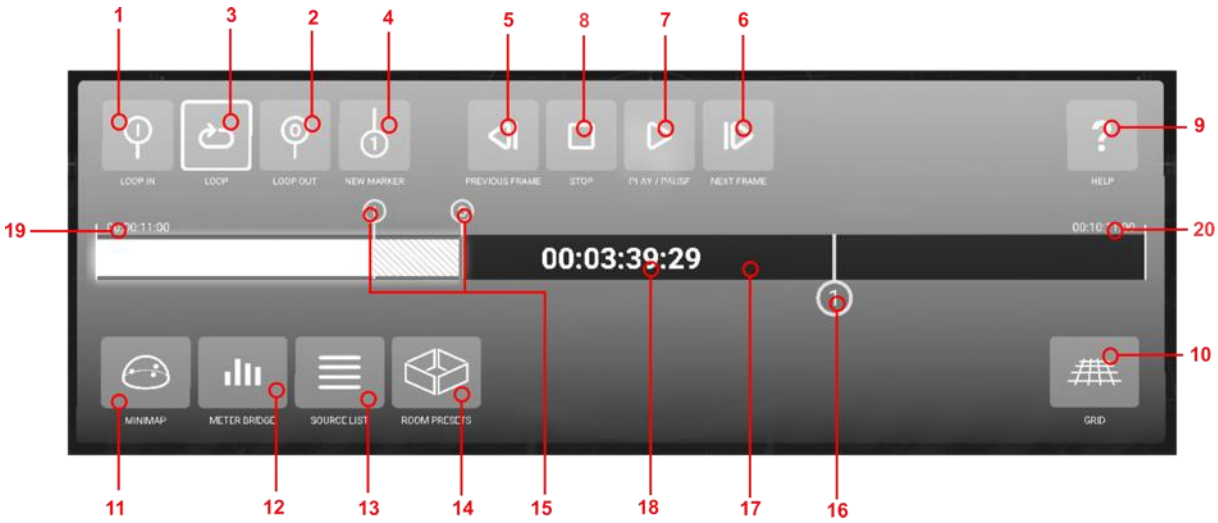
- Moving your controller into the desired module.

- Pressing and holding the grip button. The module will be attached to the controller.
- Moving the controller to the desired position.
- Releasing the grip-button.

Tip – Module shortcuts
The four modules can not only be activated in VR but also can be triggered with the buttons F1-F4!

9.1 Transport module

The transport module is the main module of Spatial Connect and is always visible in the VR space. From here, you can also activate all the other VR modules.



1 - LOOP IN Insert a loop marker at the current position of the play head.

2 - LOOP OUT Insert a loop-out marker at the current position of the play head.

3 - LOOP Activate the loop specified by the loop markers.

4 - NEW MARKER Insert a new marker at the current position of the play head.

5 - PREVIOUS FRAME Navigate a single frame back in the timeline.

6 - NEXT FRAME Navigate a single frame forward in the timeline.

7 - PLAY/PAUSE If the session is currently stopped/paused:

- start the playback of the session

If the playback of the session is currently active:

- pause the session (this moves the play head to the current position)

8 - STOP Stop the playback of the session. (this moves the play head to its last stationary position)

9 - HELP Activate/deactivate the tooltips. The tooltips will provide useful information about your controller tools and transport module within VR.

10 - GRID Activate/deactivate the grid. The grid provides you with distance reference points in the VR space.

11 - MINIMAP Activate/deactivate the minimap module.

12 - METER BRIDGE Activate/deactivate the meter bridge module.

13 - SOURCE LIST Activate/deactivate the source list module.

14 - ROOM PRESETS Activate/deactivate the room presets module.

15 - LOOP MARKERS The loop markers specify the timeframe that will be repeated if loop is activated.

The loop area is indicated by the grey hatching.

To relocate a marker:

- touch the desired loop marker with the selector sphere.
- press and hold the trigger button (the loop marker will be attached to the controller).
- move the controller along the timeline to a new position.
- release the trigger button.

16 - MARKER

You can use the markers to highlight important points in your session.

To jump to a marker:

- touch the desired marker with the selector sphere.
- press the trigger button.

To reposition a marker:

- touch the desired marker with the selector sphere.
- press and hold the trigger button (the marker will be attached to the controller).
- move the marker along the timeline to a new position.
- release the trigger button.

  Important note: Currently, repositioning a marker is possible only when the session is stopped or paused.

To delete a marker:

- touch the desired marker with the selector sphere.
- press the trigger two times in a row.

17 - PLAY HEAD

The play head indicates the current position of the session within the timeline.

To reposition the play head:

- touch the play head with the selector sphere.

- press and hold the trigger (the play head will be attached to your controller).
- move the play head to a new position.
- release the trigger button.

18 -	**TIMECODE**	The timecode indicates the current position of the play head in the HH:MM:SS:FF format
19 -	**TC OFFSET**	This shows the TC offset of the current session (see Section 0).
20 -	**END OF THE SESSION**	This exhibits the timecode at the end of the session.

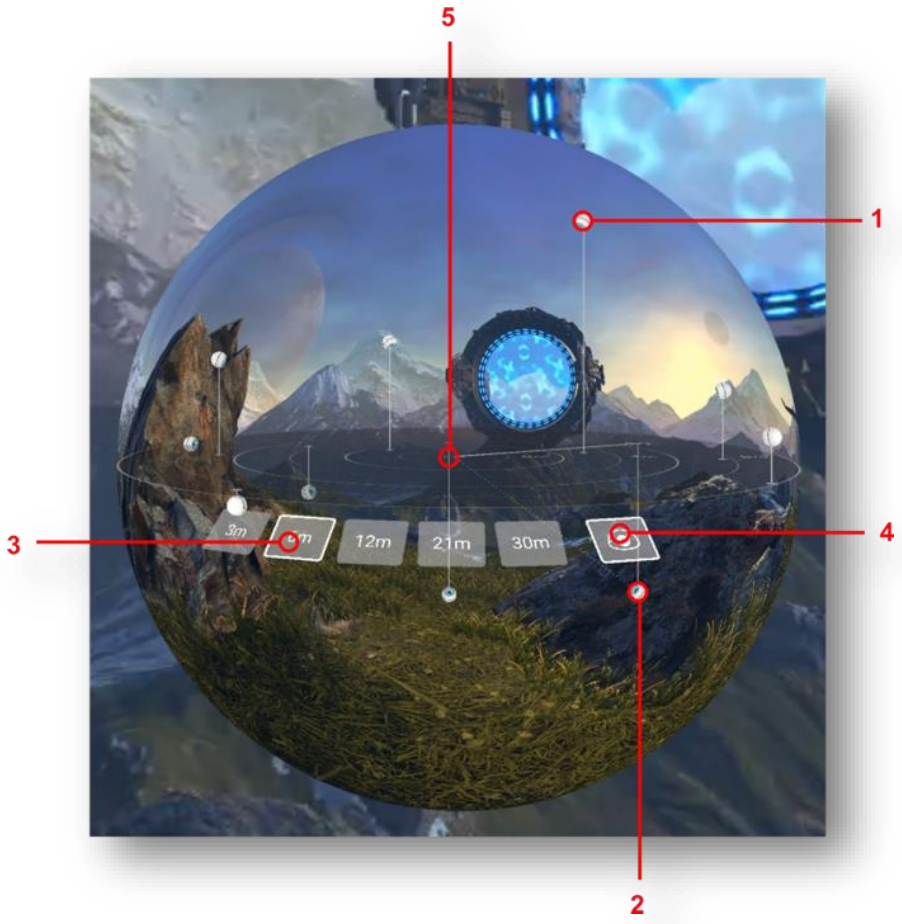
The currently activated buttons are indicated by a white framing of the corresponding panel.

9.2 Minimap

As your mixing session grows in complexity, you might want to get yourself an overview of all your audio sources present in the scene from time to time.

This is where the minimap comes into play.

The minimap is an interactive miniature view of your whole mixing session and reflects the surrounding VR space, the audio sources, and their automation in real time.



1 - Mini audio source The mini audio source reflects an audio source in the main space.

To reposition a mini audio source:

- touch the mini audio source with the selector sphere.
- press and hold the trigger (the mini audio source will be attached to your controller).
- move the mini audio source to a new position within the minimap.

2 - Selected audio source A selected mini audio source is indicated by a white triangle, tracing the distance measurements of the mini audio source.

3 - Zoom stage The zoom stage specifies the radius of the minimap. You can use to scale the miniature view to fit your current editing requirements.

To change the zoom stage:

- touch a zoom stage panel with the selector sphere.
- press the trigger button.

The currently activated zoom stage is indicated by the white framing of the panel.

4 - Minimap video The video can also be played back within the minimap.

To activate/deactivate the minimap video:

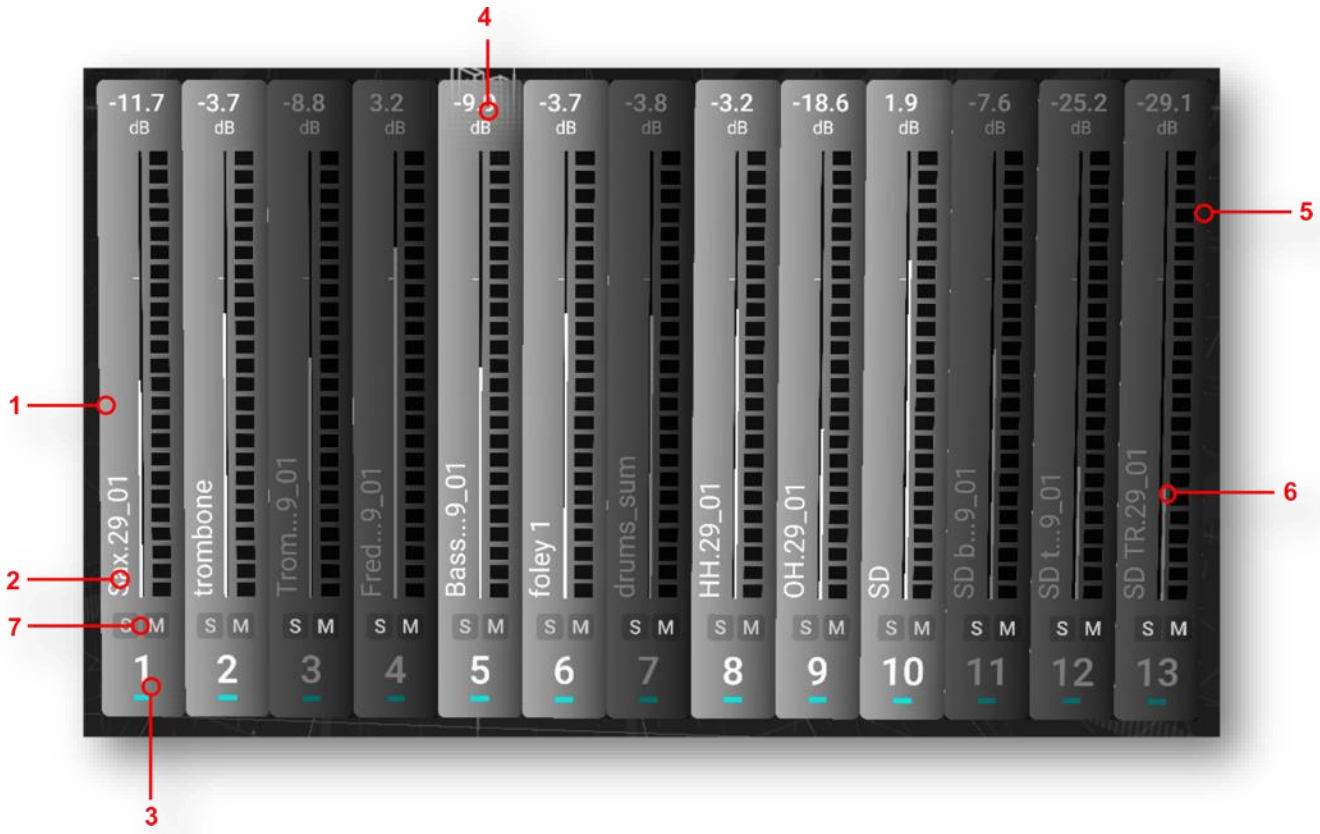
- touch the minimap video panel with the selector sphere.
- press the trigger button.

5 - Listener position The listener position is the centre of the 3D coordinate system and represents the centre of your head within the minimap.

9.3 Meter bridge

The meter bridge brings to the VR world the traditional mixing console we all know and love.

You can directly monitor and level your audio sources from here.



1 - Metering segment

Each metering-segment represents one audio track in your session.

Their number adapts dynamically as you delete or add new tracks in your DAW session.

A light segment indicates that the source holds a dearVR PRO plugin while a dark segment indicates that there is no dearVR PRO instance present on the insert effects channel of the audio track

2 - Track name The track name of the audio track derived from the DAW session.

3 - Track ID The numeric ID of the audio track derived from the DAW session.

4 - Gain The current gain of the audio track in decibels.

5 - Meter Displays the current level of the audio track.

6 - Gain Slider The current gain depicted as a fader position.

To adjust the gain of the audio track:

- touch the metering segment with the selector sphere.
- press and hold the trigger button.
- move the controller up and down along the metering segment.

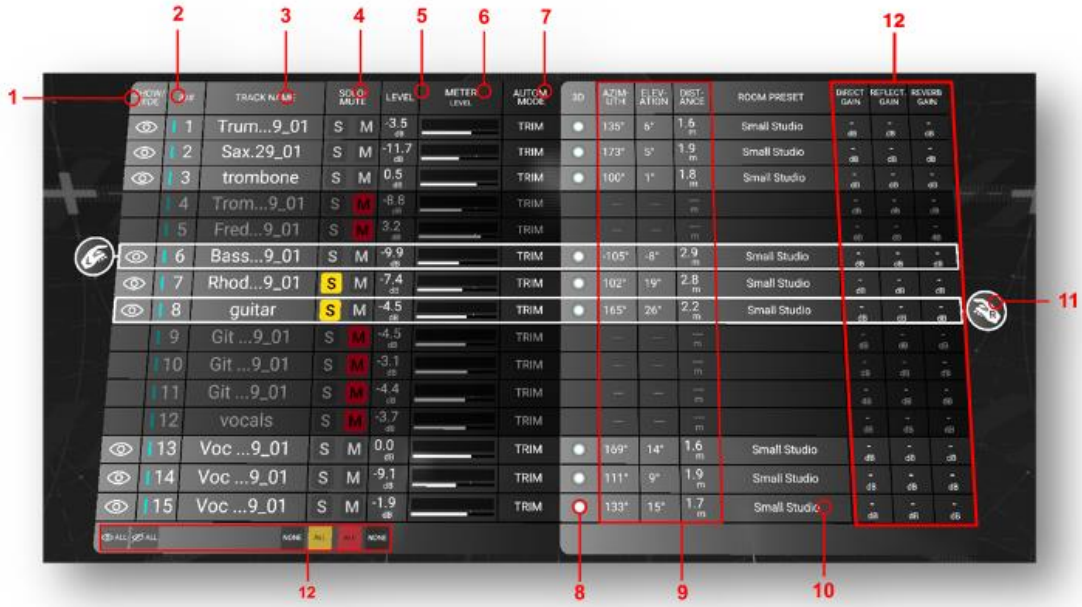
7 - Solo/mute Activate solo and mute for each track directly from the meter bridge

9.4 Source list

The source list provides an overview of all the important data of your session within VR.

It's the VR version of the 2D source list (see section 5.3)

The source list is divided into the DAW-related parameters (left side) and the *dearVR PRO* plugin parameters (right side).



1 - SHOW / HIDE

Visibility state of the audio source.

To change the visibility state:

- touch the visibility state icon with the selector sphere.
- press the trigger button.

An invisible audio source will disappear from the main space and the minimap.

	The meter bridge will indicate an invisible audio source with a darker shading of the meter segment.
2 - ID#	The numeric ID of the audio source.
3 - TRACK NAME	The track name of the audio source.
4 - SOLO/MUTE	The solo and mute states of the audio sources. To activate/deactivate solo/mute: – touch the solo or mute button with the selector sphere. – press the trigger to activate/deactivate solo or mute.
5 - LEVEL	The current gain of the audio track in decibels
6 - METER LEVEL	Displays the level metering of the audio tracks. The white line beneath the metering segment indicates the gain of the audio tracks.
7 - AUTOMATION MODE	Shows the current automation mode of the audio tracks
8 - 3D	This indicator lights up when an instance of dearVR PRO or the VST Multipanner is detected on the insert effects chain of the corresponding audio track.
9 - AZIMUTH/ ELEVATION/ DISTANCE	Depicts the positional data of the audio source in the angular values of azimuth, elevation, and distance.
10 - ROOM PRESET	Shows the currently chosen Reverb Room preset of the audio sources.
11 - Selector	Indicates a selected audio source. – L = selected with the left controller. – R = selected with the right controller

To select an audio source:

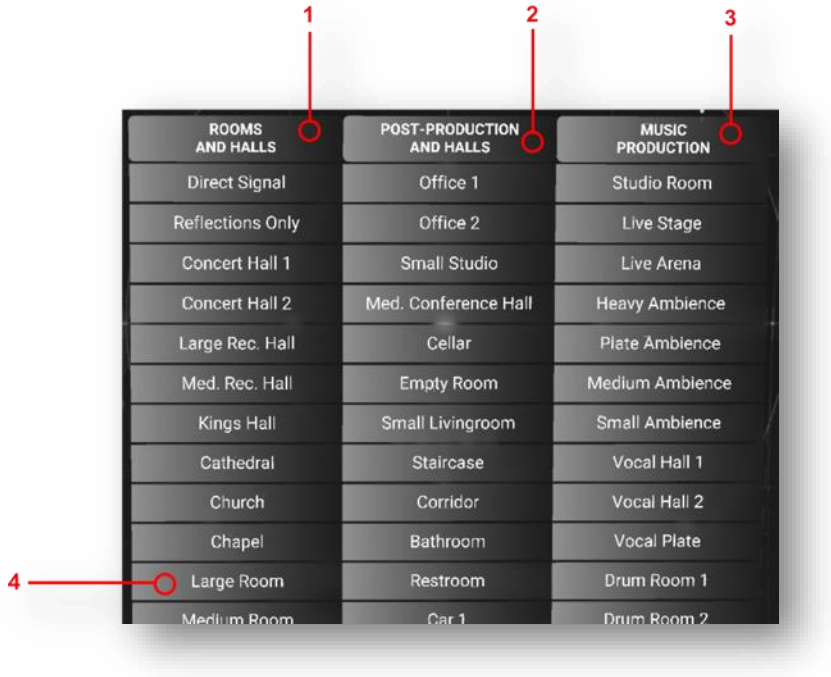
- touch an audio source segment with the selector sphere.

12 - ALL/NONE global switches which can be used to toggle solo/mute/visibility for all sources at once

13 - DIRECT GAIN / REFLECT GAIN / REVERB GAIN The current gain of the individual direct / reflection / reverb module. You can change the levels by grabbing them with the controller.

9.5 Room presets

The Room Presets module is the control centre for the virtual acoustics engine of dearVR PRO.



1 - Rooms and Halls A virtual acoustics category that models realistic rooms and halls.

2 - Post- Production and Halls A virtual acoustics category that models a selection of special environments.

3 - Music Production Virtual acoustic environments tailored to applications in spatial music production.

4 - Preset panel One distinct room preset.

To activate a room preset:

- touch the preset panel with a controller.
- press the trigger button.

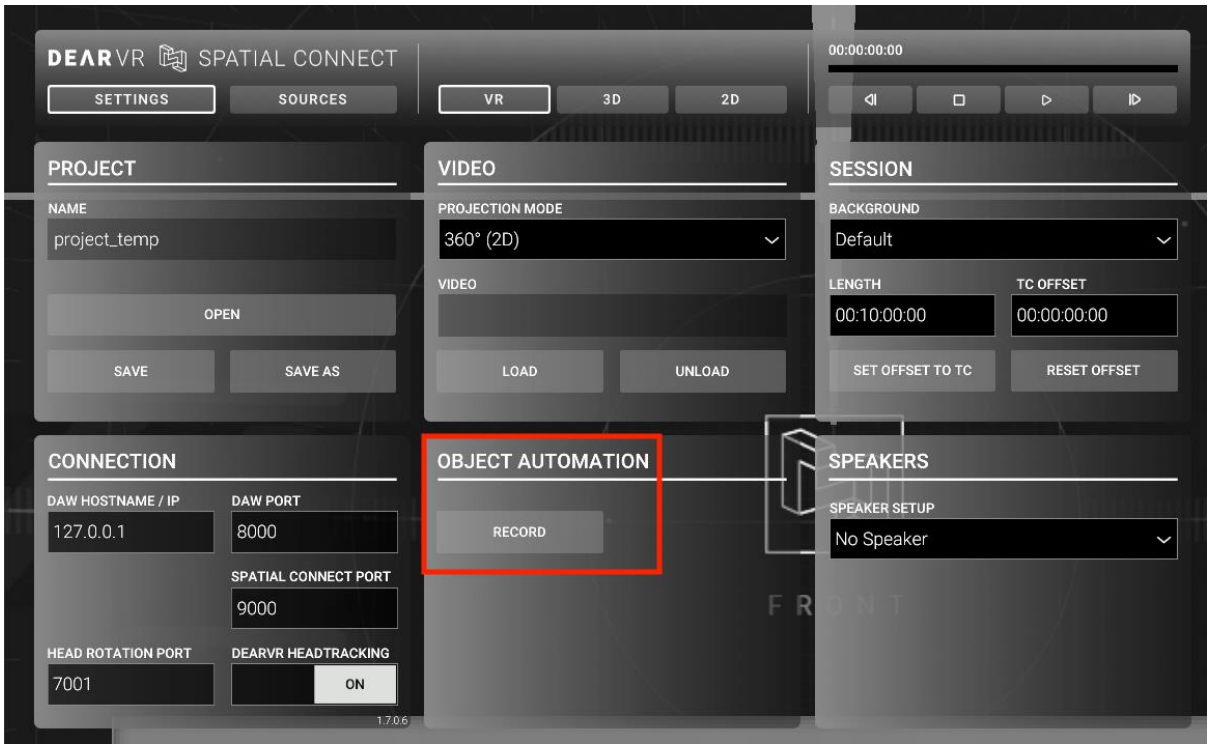
10 Transfering automations from dearVR SPATIAL CONNECT to Unity

Premixing a sound design in a DAW can be very essential for game development. But creating the same automations in Unity per hand again should not be necessary. Therefore, we created a workflow to export these automations from SPATIAL CONNECT to use them with dearVR UNITY to get the same spatialization.

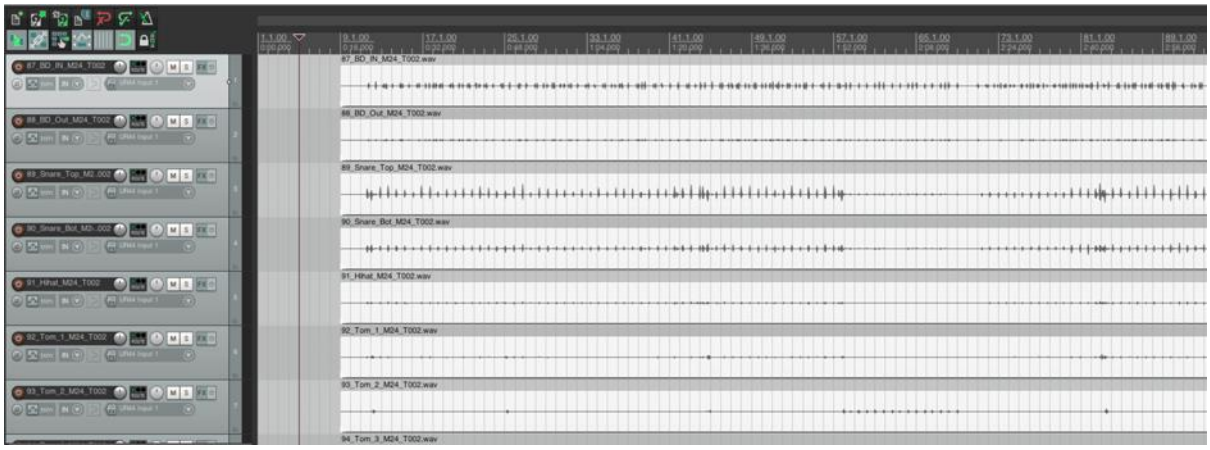
10.1 Export object automations using SPATIAL CONNECT

To export automations from SPATIAL CONNECT we added a record button to the GUI. Pressing the recording button starts the playback in the DAW and records the positions of all 3D audio sources over time. The object automations are stored in the same folder where the configuration is stored and have ".dear" as a suffix. Make sure, that you save your configuration in a place where you can find the object automations easily after recording and that you start the recording at the beginning of your audio regions to have them synchronized when importing to dearVR UNITY. The object automations naming is handled like this: spatialconnect-project-name_channel-number_channel-name.dear, where spatialconnect-project-name is the name of your spatial connect project, channel number is a counter for all channels (starting with 01) and channel-name is the name of the channel in your DAW.

SPATIAL CONNECT will record all object automations you did with dearVR PRO, also the ones that don't have any explicit automation curves. Then only the position will be saved in the automation. To get the automation curve aligned with your audio, all tracks need to start at the same time and your cursor needs to be at the beginning of all audio when starting the recording of the object automations.

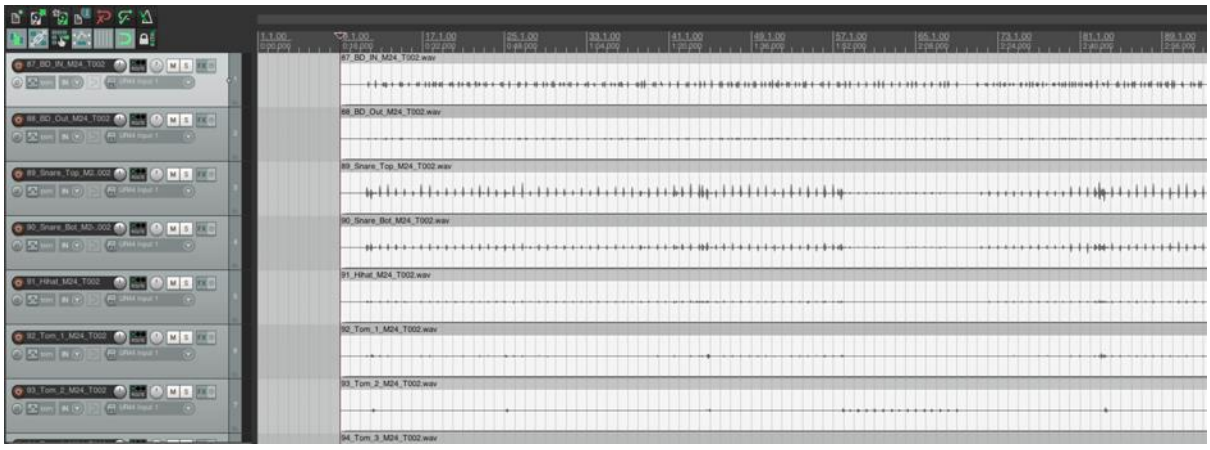


Example 1: Be careful! Marker not aligned with the regions!



Example 2: Be careful! Regions not aligned!

Example 3: This works correctly

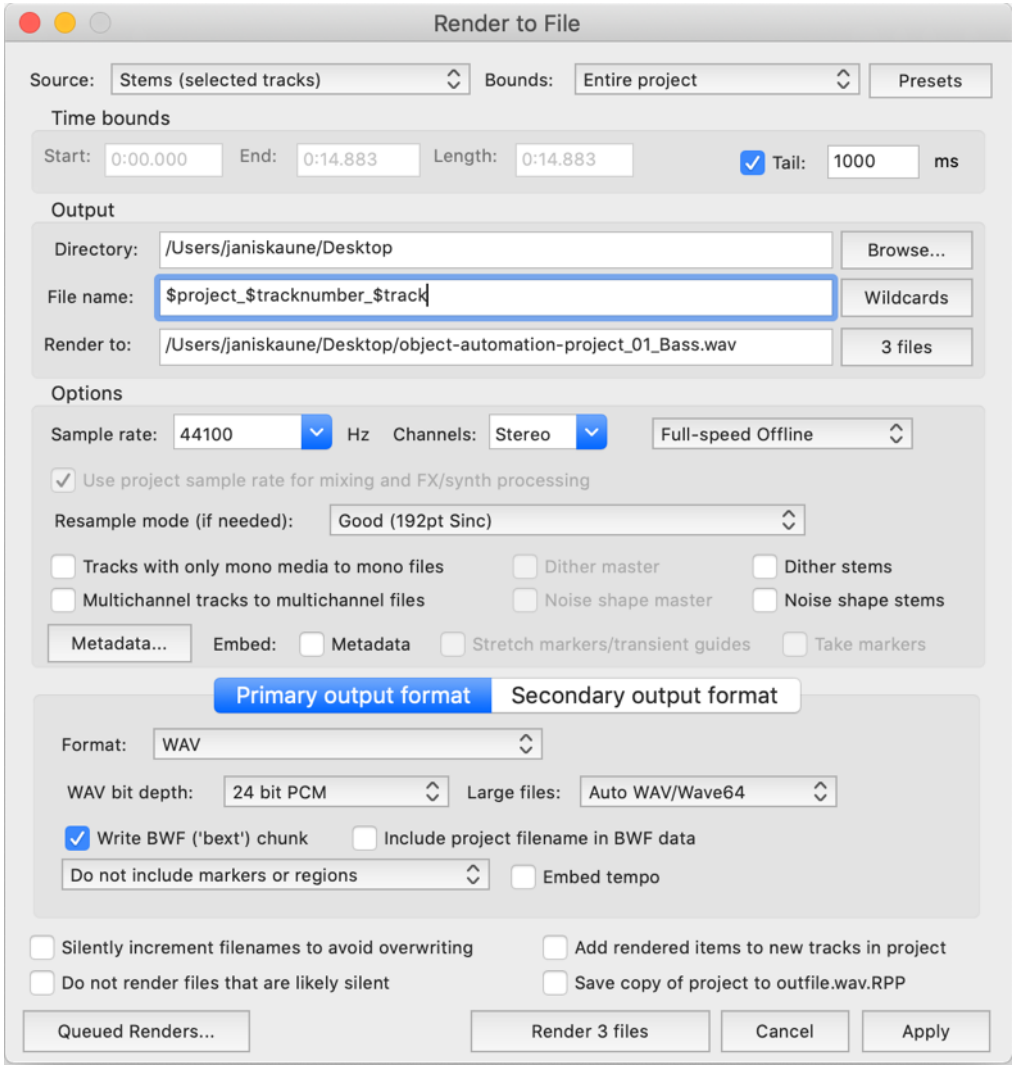


If your audio does not start all at the same time you can export the automations from a fixed point (e.g. 00:00:00:00) and then do a multichannel bounce also beginning at the same time. Many DAWs offer an option for multichannel export. Name the exported files like the created

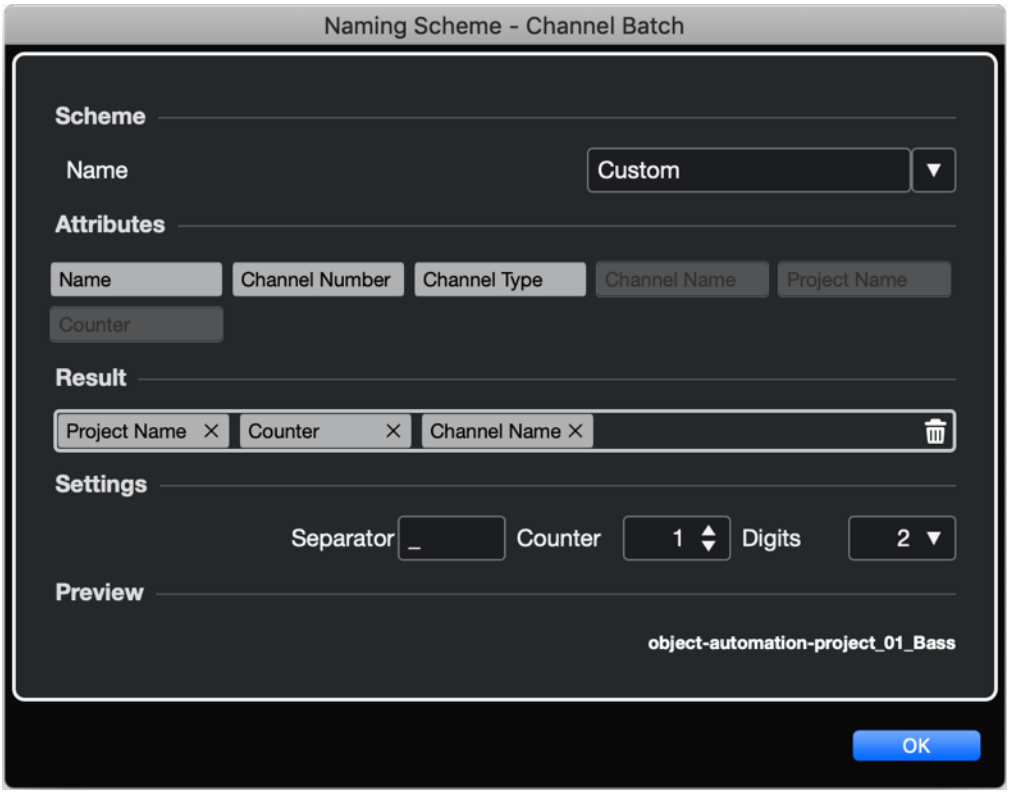
.dear files, which is “SPATIALCONNECT project name”_”channel number”_”channel name”. This helps the automations to link automatically to the audio during import.

You can export your stems afterwards in Nuendo or Reaper. To get the same names, you can configure this naming conventions in the export window:

Reaper:



Nuendo/Cubase:



With dearVR UNITY we deliver also an importer for the object automation files. When pulling .dear-files into the UNITY assets folder the importer automatically recognizes them as object automations and will create an automation clip and a prefab with a placeholder model for you to use in your scene. The importer also links a soundfile to the Unity audio source component if there is a clip present in the folder where you imported the object automation which has the same name as the object automation! So if you have a object automation with the name project_01_bass-drum.dear your sound file needs to have the name project_01_bass-drum.wav (or .mp3, .aac, etc.).

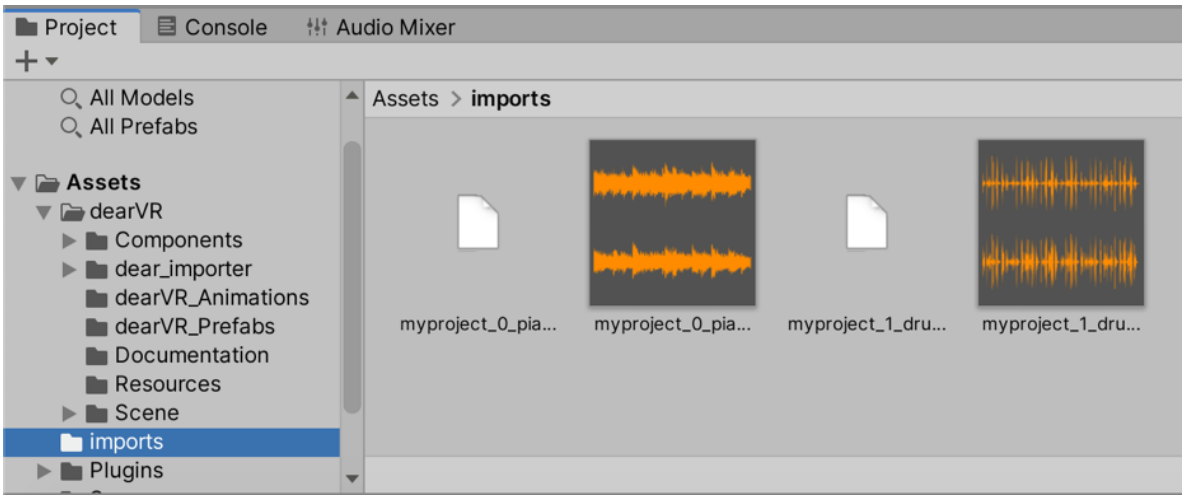
10.2 Importing object automations in Unity

It is crucial to import the files in the correct order or else some connections might be missing:

- First the .wav files
- Afterwards the .dear files into the SAME folder

The files created by the importer are in the following folders:

- Animation clips: `dearVR/dearVR_Animations`
- Prefabs: `dearVR/dearVR_prefabs`



The animation clips can be pulled onto game objects to link the object automation to the object. An automator component will be created automatically.

The prefabs are game objects that are already fully functional as spatialization objects. They consist of a game object that already has an animation component, a dearVR source component and an audio source component. If there was a sound file with the same name

as the object automation in the folder during import the sound file is already assigned to the audio source.

All in all, the fastest way to set up your Spatial Connect project inside Unity you need to follow these steps:

- Export the object automations using Spatial Connect.
- Import the sound files you used in your project into Unity (make sure they have the same name as the object automations
- Import your object automations into Unity
- Create a new scene (or open an existing one)
- Import the prefabs into your scene
- Press play!

11 Steinberg VST Multipanner Support / Dolby Atmos

With the Dolby-Atmos Integration of Nuendo and the VST Multipanner, you can now create complete Dolby Atmos Mixes from VR using dearVR SPATIAL CONNECT.
Just let go of the mouse and control the Steinberg VST Multipanner and therefore your Object based audio tracks or beds with your VR controllers.

The Steinberg multipanner works differently with the distance parameter as dearVR, therefore they have to be treated differently in Spatial Connect. The VST Multipanner has no audible distance parameter. Instead, the visual distance in SPATIAL CONNECT changes the number of speakers the sound comes from. The closer the source, the more speakers are used. So, to place a source in the center speaker only, you must place the source exactly in front of you with maximum distance.

Because the Multipanner works with a square instead of a sphere it is not possible to get into the corner of the Multipanner's panning area while placing sources with SPATIAL CONNECT. If you want to place sources there, you have to do it manually in the DAW. The sources still appear inside SPATIAL CONNECT.

For the Dolby Atmos-Steinberg Installation and Setup, please refer to Steinbergs Dolby documentation on the matter.

12 Troubleshooting / Known issues

- Head-tracking is only supported for the 64bit version of the DAW
- When your video is longer than the endpoint of your audio material in the reaper session, Reaper immediately stops playback when attempting to play the session at a point beyond your last placed audio track.

  As a workaround, place a short audio file at the end of your video in the reaper session and mute it so that it won't interfere with your mix.
- The Trim/Read mode of the Reaper DAW will not work with the dearVR PRO plugin parameters (automation will always overwrite manual changes).
- Nuendo/Cubase: the audio source representations will exhibit a stuttering motion when reading automation data. This is a visual flaw and will not affect the audio processing
- Due to a minor issue concerning the license manager, your license can’t be validated in the following situation:
  - Your internet connection is turned off
  - An ethernet cable is still plugged into your machine

  To remedy this issue, please disconnect your ethernet cable when operating Spatial Connect offline.
- When one controller is placed within one of the VR panels, the other controller can’t be used to deactivate this panel at the same time
- Spatial Connect is no longer compatible with Nuendo 10 and 11. Please use older implementation if you are still using these versions.

We’re excited to hear about the great content you’ll create with dearVR Spatial Connect.

Have fun conducting your 3D Audio Mix!

13 Changelog

dearVR SPATIAL CONNECT v1.8.0

- Support for Nuendo 12 / Cubase 12
- Apple Silicon support for 2 machine setups
- Minor bug fixes

dearVR SPATIAL CONNECT v1.7.0

- Added multichannel speaker setup visualization
- New licensing engine
- Minor bug fixes

dearVR SPATIAL CONNECT v1.6.0

- Added control for direct, reflections and reverb level
- Added new background “Multichannel studio”
- Added high-resolution VR mirror screen
- Added object automation export
- Minor bug fixes

14 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

For the latest news concerning dearVR please visit our website at:
www.dear-reality.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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