



**SOUND  
PARTICLES**

# **Sound Particles**

## Reference Manual

January 2020  
v 2.1



## Welcome Note

Welcome to the world of Sound Particles!

Around 2004, I realized that the most interesting visual effects I was seeing on movies used “particle systems”, a computer graphics technique that generates thousands or millions of small points to simulate fire, rain, dust, smoke, fairy dust, explosions. And I thought “Wouldn’t be nice if we could use the same technology but for sound, using thousands of small sounds around you to generate a much more interesting soundscape?”. But that was only an idea, and time went on...

In 2012, I had finished my PhD and since no-one was using particle systems in sound, as a computer nerd that I am (this face doesn’t fool anyone), I decided to start creating my own particle system simulator for sound – and that was the beginning of Sound Particles.

I really hope you enjoy using Sound Particles. And if you have any question or suggestion, don’t hesitate to contact us. We REALLY love to receive feedback from our users.

**Nuno Fonseca, PhD**

CEO

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# Contents

<b>Welcome Note</b>	<b>1</b>
<b>Contents</b>	<b>2</b>
<b>Welcome Screen</b>	<b>5</b>
1.1 First Encounter	5
1.2 Authentication Methods	8
1.3 Buy Screen	12
1.4 “I have a voucher”	13
1.5 Offline Activation	14
1.6 Academic License	15
1.7 Account Management	17
1.8 Trial Mode	20
<b>New Project</b>	<b>21</b>
<b>Project Window</b>	<b>23</b>
3.1 General Notions	23
3.2 Views	24
3.3 Transport	29
3.4 Time Editor	31
3.5 Inspector	35
<b>Particle &amp; Audio Tracks</b>	<b>36</b>
4.1 General Notions	36
4.2 Particle Group	36
4.3 Particle Emitter	37
4.4 Recreating new particles	38

4.5 Audio Tracks	38
4.6 Audio Files	40
4.7 Particle's Starting Points	44
4.8 Modifiers	46
<b>Random Distribution</b>	<b>64</b>
5.1 Distribution Settings	64
5.2 Probability Distribution	67
5.3 Histogram	68
<b>Microphones</b>	<b>69</b>
6.1 Overview	69
6.2 Microphone Options	70
6.3 Speaker Setup	73
6.4 Microphone Position	74
6.5 Stems	75
6.6 Audio Hardware	76
<b>Render</b>	<b>77</b>
7.1 Overview	77
7.2 Auto-Render	77
7.3 Render (Manual)	78
<b>Export</b>	<b>80</b>
8.1 Export Audio	80
<b>Video</b>	<b>85</b>
9.1 Importing a video	85
9.2 Inspector - General	87
9.3 Inspector – Video Info	88
9.4 Inspector – Video Audio Hardware	89
<b>VR</b>	<b>90</b>
10.1 VR View	90
10.2 VR Client - Connection	91
10.3 VR Client – Headset	93



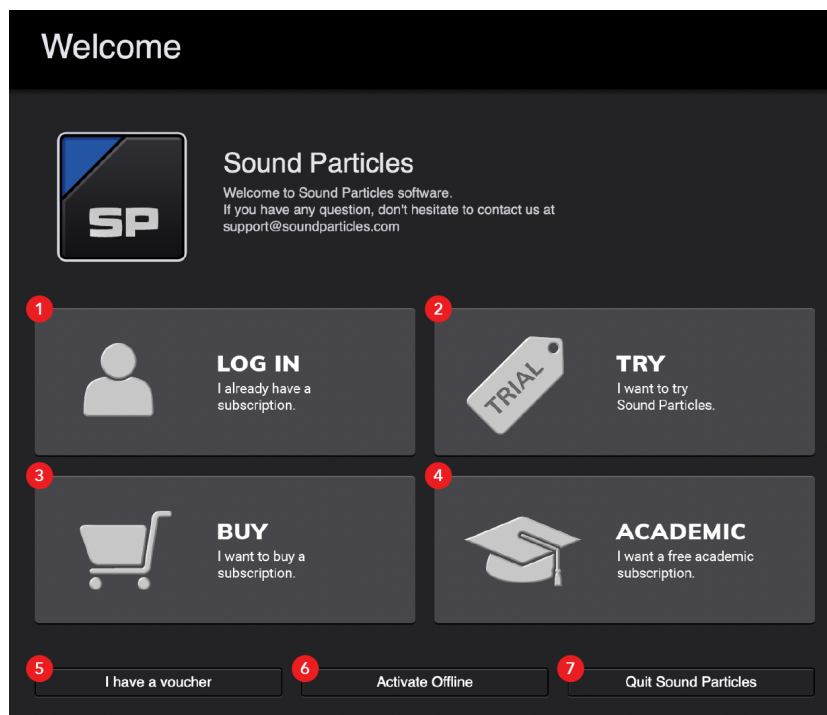
<b>CGI Import</b>	<b>97</b>
11.1. Import CGI Window	98
<b>I/O</b>	<b>102</b>
12.1 Hardware	102
12.2 Preview Audio	104
12.3 Binaural	105
<b>Project Settings</b>	<b>106</b>
13.1 Project Settings - Project File	106
13.2 Sample Rate	107
13.3 Sound Propagation	108
13.4 Reset	111
<b>Preferences</b>	<b>112</b>
14.1 Render	112
14.2 Units	113
14.3 GUI	116
14.4 VR	118
<b>Other Features</b>	<b>119</b>
15.1 Track Presets	119
15.2 Batch Processing	121
15.3 User Project Templates	125
15.4 Slider Controls	127
<b>Shortcuts</b>	<b>128</b>
16.1 Views Navigation	128
16.2 Time Editor	128
16.3 Menu Bar & Shortcuts	129
<b>EULA</b>	<b>133</b>
<b>ASIO SDK</b>	<b>137</b>

## Chapter 1

# Welcome Screen

### 1.1 First Encounter

The first time you run Sound Particles 2.0 on your computer, you will be presented with a **Welcome Screen**. This screen will give you access to many options regarding you Sound Particles experience, from:



Initial Welcome Screen

1. **Log In** - log into your existent account and have access to all of your license.

**Note:** If you already own one or more Sound Particles 2 licenses, Sound Particles will automatically create a new project with your highest tiered subscription.

2. **Try Sound Particles** - initiate the Trial version of Sound Particles.

**TIP:** The Trial version has **all the features** of the Commercial license, but...

**Note 1:** ... You are required to log-in or to register with an account.

**Note 2:** ... You cannot use it for **Commercial** or **Public** projects.

**Note 3:** ... Audio quality is limited to **15 bits**.

**Note 4:** ... Any exported audio will have an inaudible **watermark**.

3. **Buy Sound Particles** - buy a license of Sound Particles 2. You will then be required either to log-in or to register, where afterwards you will be redirected to our webstore (<https://my.soundparticles.com>) to complete the purchase process.

**Note:** By logging-in/registering on the app, you will be redirected to your browser automatically logged-in.

4. **Academic License** - this will take you to the Academic registration screen, allowing you to register yourself with your academic information to be granted a full Academic license to Sound Particles 2 for 1 year.

**Note 1:** If you are a student, tutor or staff member of any educational institution (even not or without classes related to audio), you can request a free Academic license that will grant you free access to the full software for 1 year.

**Note 2:** The Academic version has all the features of the Sound Particles 2 Indie license.

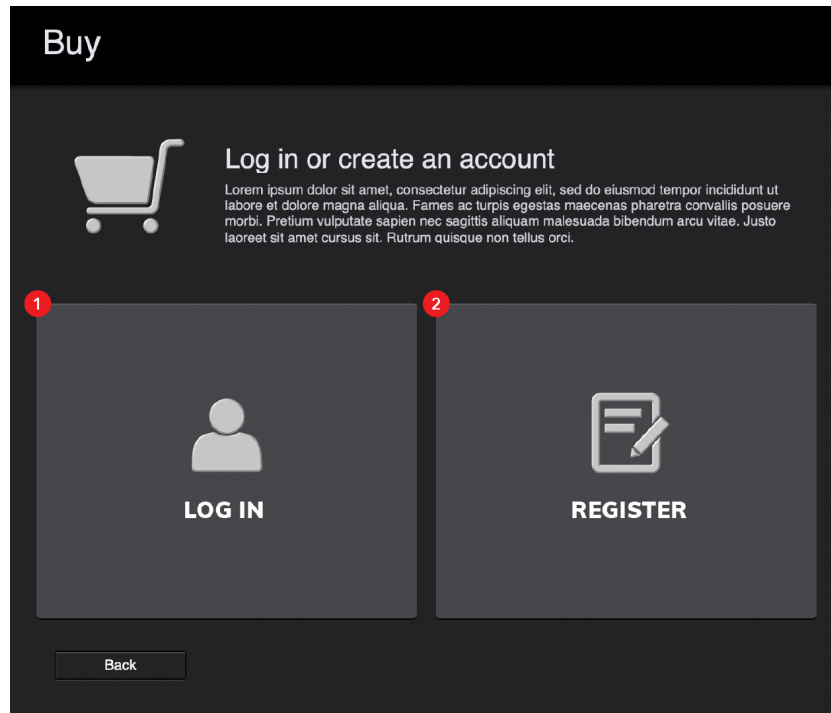
**Note 3:** The only limitation to this Academic version is that you cannot use it for **Commercial** projects.

5. **“I have a voucher”** - if you received a Sound Particles 2 voucher code, either from a friend, co-worker, a reseller, this option will allow you to claim any voucher you might have to your account (log-in or register required).
6. **Activate Offline** - if you wish to activate a Sound Particles 2 license without logging-in into your account on the app, you can do that through this screen.
7. **Quit Sound Particles** - close the application.

## 1.2 Authentication Methods

There are two possible authentication methods, 1. Logging-In or 2. Registering. You will be required to register or login to access the “Buy” and “I have a voucher” screens.

Additionally, the logging in page also lets you reset your password in case you have forgot it.



Authentication Choice after clicking Buy

**Note:** You need an Internet connection to be able to do any of these actions.

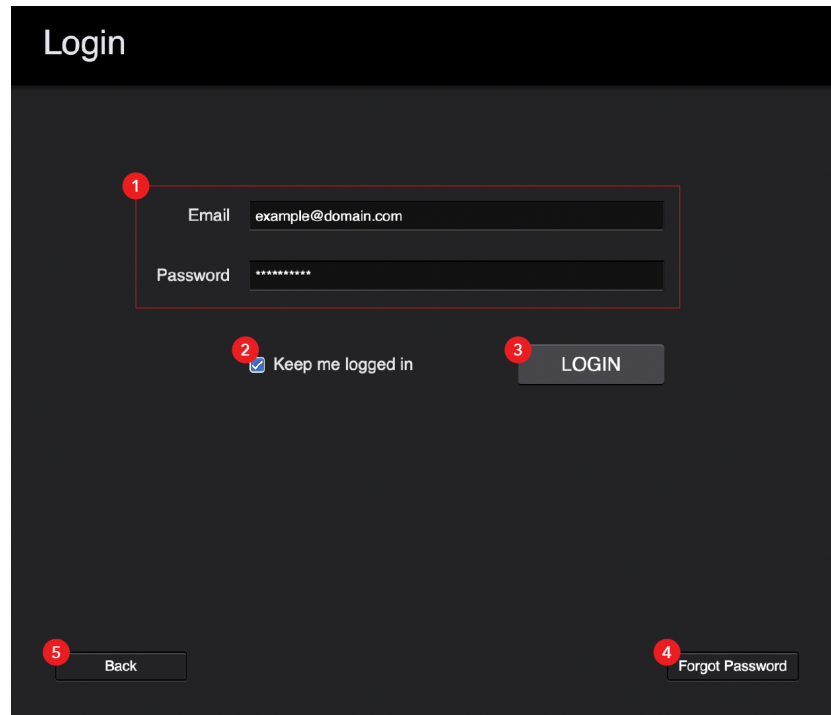
### 1.2.1 Log In

There are three possible moments that you are required to log-in into your account:

First Page

Buy

I have a voucher

A screenshot of a dark-themed login interface. At the top, the word "Login" is displayed in white. Below it, there are two input fields: "Email" with the placeholder text "example@domain.com" and "Password" with masked characters "\*\*\*\*\*". A red box with a "1" in a red circle highlights these two fields. Below the password field, there is a checkbox labeled "Keep me logged in" with a "2" in a red circle next to it. To the right of the checkbox is a "LOGIN" button with a "3" in a red circle. At the bottom left, there is a "Back" button with a "5" in a red circle. At the bottom right, there is a "Forgot Password" button with a "4" in a red circle.

Log-In Screen

1. **Authentication Details** - the e-mail and password of your account needed for authentication.
2. **Keep me logged in** - keeps you logged in to your account when you close the software.
3. **Login (button)** - authenticates the inserted information above.

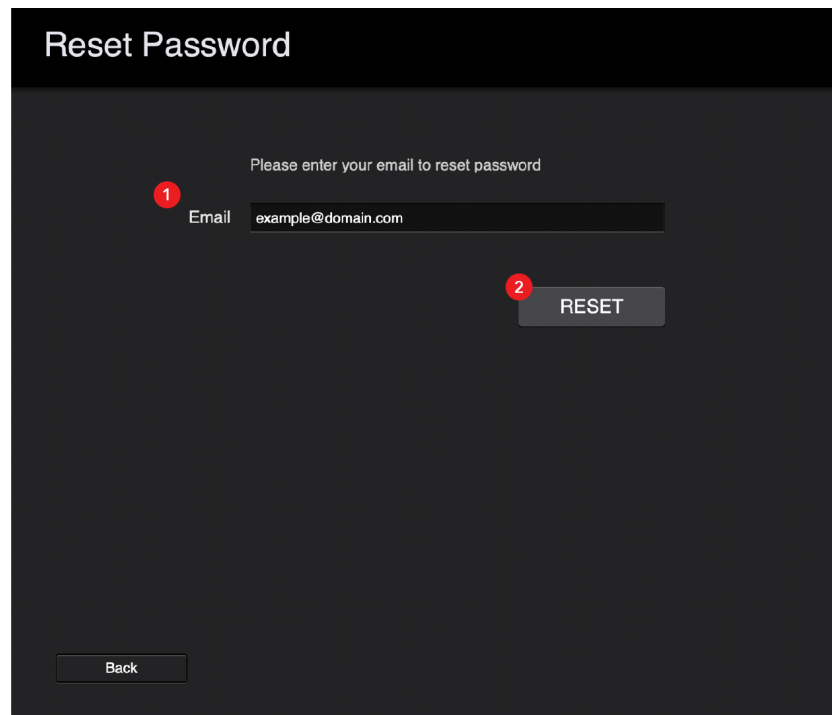
**Note 1:** If the authentication fails, error messages, in red, will appear, and also contact link to our support team.

**Note 2:** After logging in, Sound Particles will open a new project with your highest tiered valid license.

4. **Forgot Password** - takes you to the screen to for your account's password recovery.
5. **Back** - returns you to the previous screen.

### 1.2.2 Forgot Password

In the case you have forgotten your account's password, you will be redirected to a screen where you can start the process of resetting the password.



Reset Password

Please enter your email to reset password

1 Email

2 RESET

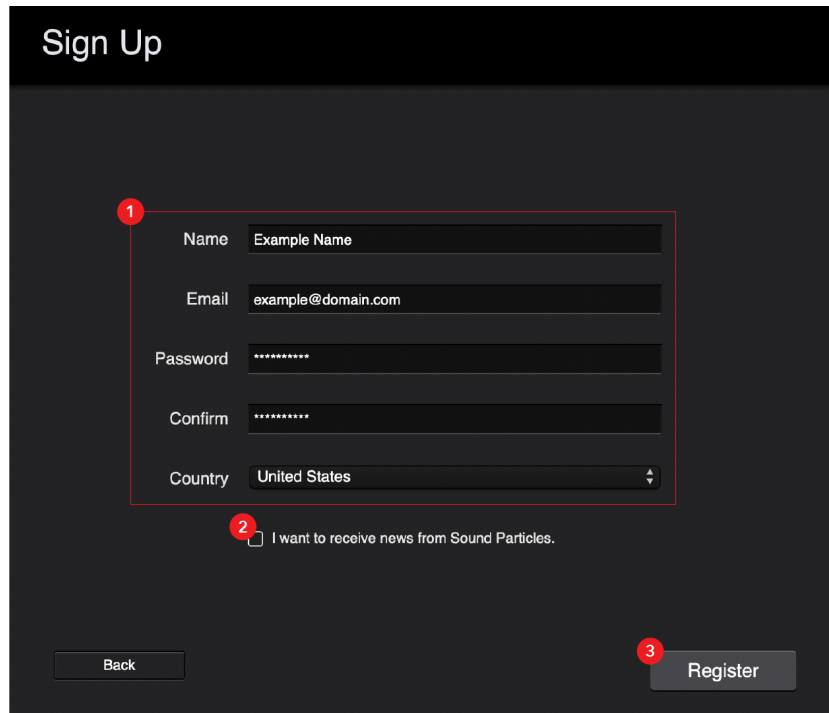
Back

Reset Password Screen

1. **E-mail** - the e-mail of your account. You will then receive a mail with instructions to reset the password.
2. **Reset** - sends the request after the e-mail was written.

### 1.2.3 Register

If you don't have an account back at our webstore, registering on the application will automatically create you a new account there and you will be automatically logged-in.

The image shows a 'Sign Up' form on a dark background. The form is titled 'Sign Up' in white text at the top left. It contains several input fields: 'Name' with the placeholder 'Example Name', 'Email' with the placeholder 'example@domain.com', 'Password' with a masked input (seven asterisks), 'Confirm' with a masked input (seven asterisks), and 'Country' with a dropdown menu showing 'United States'. A red box with a red circle containing the number '1' highlights the first four fields. Below these fields is a checkbox with a red circle containing the number '2' next to it, followed by the text 'I want to receive news from Sound Particles.' At the bottom left is a 'Back' button, and at the bottom right is a 'Register' button, which has a red circle containing the number '3' next to it.

Sign Up Screen

1. **Account Information** - here you can write down your Name, e-mail, password (and its confirmation) and country.

**Note:** You cannot change your e-mail after registering your account.

2. **Newsletter Subscription** - if you want, you can opt-in to receive newsletters from us by checking the box.

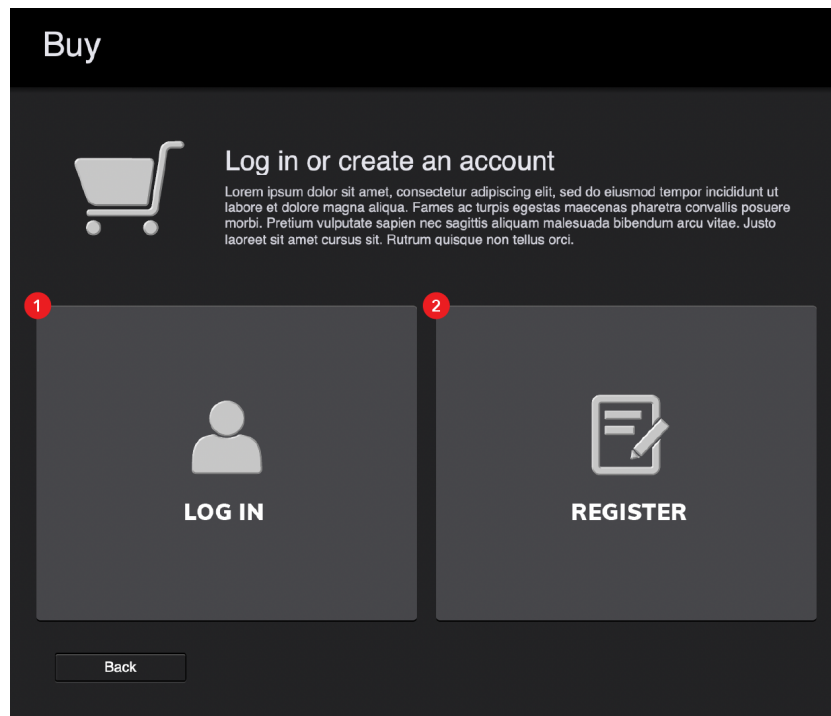
**Note:** You can opt-out at any time.

3. **Register** - after filling out everything, this button finishes up the registration.



## 1.3 Buy Screen

On the home screen, after you press “Buy” and completing one of the Authentication Methods, you will see a “Buy” button (1). By clicking that button, you will be redirected already authenticated to your client panel, on our webstore, through your default browser, for you to complete the purchase of the license you require.

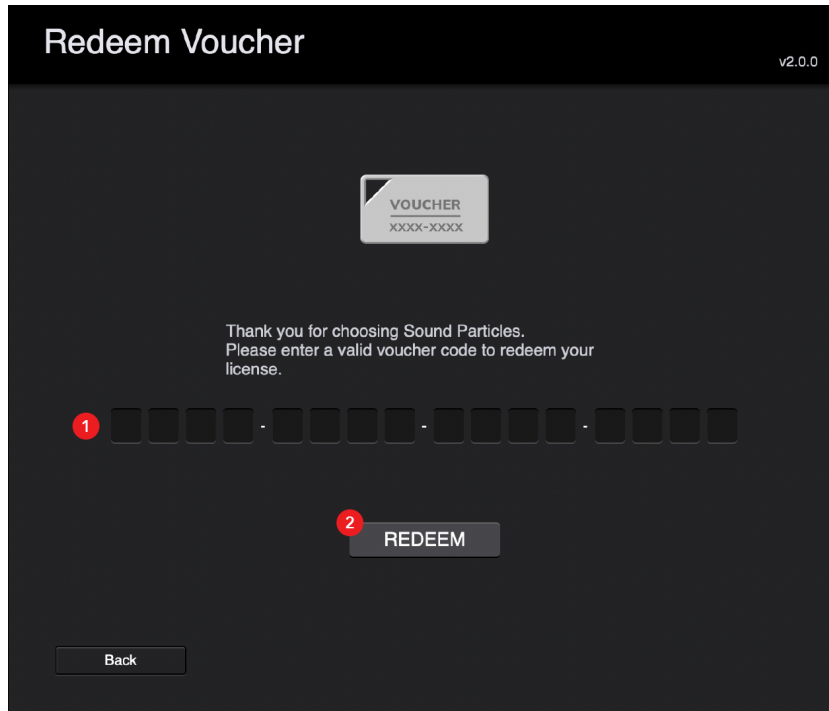


Buy Screen

When you return to Sound Particles after acquiring a license, you will be presented with your My Account Panel already opened (see Section 1.7), where then, by refreshing it, the newly purchase license should appear.

## 1.4 “I have a voucher”

The initial process, after activating this option on the home screen, is the same as the Buy one: you have first log-in or register. Afterwards, you will then be presented with a Voucher Claim screen, that will allow you to write down your voucher code and claim it to your logged account.

The image shows a mobile application screen titled "Redeem Voucher" in the top left corner, with a version number "v2.0.0" in the top right. The background is dark gray. In the center, there is a light gray rectangular box representing a voucher, with the word "VOUCHER" and a code "XXXX-XXXX". Below this, a message reads: "Thank you for choosing Sound Particles. Please enter a valid voucher code to redeem your license." Underneath the message is a form for entering a 12-digit code, divided into three groups of four digits by hyphens. A red circle with the number "1" points to the first digit input field. Below the input fields is a button labeled "REDEEM" with a red circle and the number "2" next to it. At the bottom left, there is a "Back" button.

Redeem Voucher Screen

1. **Voucher Code Form** - in here, you will insert the 12-digit voucher code you have received.
2. **Redeem** - this will start the process of verifying the voucher code written down.

**Note:** If the voucher code is wrong or there's another a problem, a red error message will appear and also a quick link for our support e-mail.

## 1.5 Offline Activation

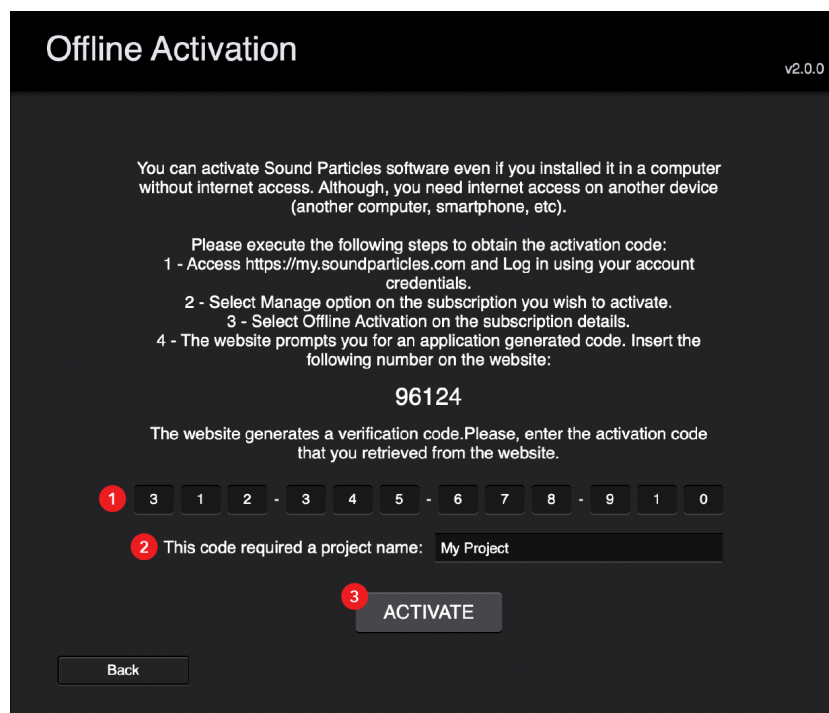
With the Offline Activation, you can activate a local license without the need to authenticate yourself on the application.

**Note:** You still need to have a valid account with at least 1 license bought/assigned.

This works by going to the respective screen, and then taking the 5-digit number that it displays onto the “Offline Activation” screen on your “Manage License” screen of your account on our webstore. Then, in return, it will give you the 12-digit number needed for that activation.

**Note 1:** Each of both 5-digit and 12-digit numbers are never the same, meaning that if you enter the Offline Activation screen again, it will display a new 5-digit number, and that will also change how the 12-digit is composed of.

**Note 2:** If you're activating a Team license, you will also need the correct Project Name. Make sure it is the correct one, as even if you have the correct Offline code, inserting the wrong Project name will not allow you to activate the license.



**Offline Activation** v2.0.0

You can activate Sound Particles software even if you installed it in a computer without internet access. Although, you need internet access on another device (another computer, smartphone, etc).

Please execute the following steps to obtain the activation code:

- 1 - Access <https://my.soundparticles.com> and Log in using your account credentials.
- 2 - Select Manage option on the subscription you wish to activate.
- 3 - Select Offline Activation on the subscription details.
- 4 - The website prompts you for an application generated code. Insert the following number on the website:

**96124**

The website generates a verification code. Please, enter the activation code that you retrieved from the website.

1 3 1 2 - 3 4 5 - 6 7 8 - 9 1 0

2 This code required a project name:

3 **ACTIVATE**

**Back**

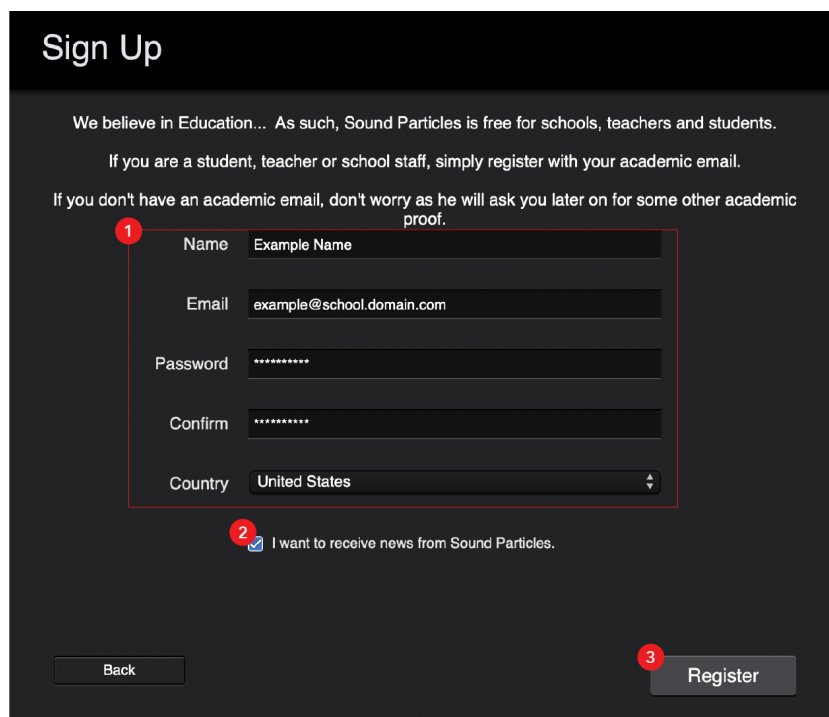
Offline Activation Screen

1. **Activation Code** - insert the 12-digit number obtained from your client panel.
2. **Project Name (Team)** - if your license is a Team license, you will have to write down the correct Project name.
3. **Activate** - validate the place information to proceed to the activation.

## 1.6 Academic License

If you're an academic student, tutor or staff member, you are entitled to a 1-year free license of the Indie license of Sound Particles.

To have that license, you will have to enter the “Academic” screen through the home page, where you will be redirected to a page for you to register an account with your academic information.



The image shows a 'Sign Up' form for academic users. The form is titled 'Sign Up' and includes a message: 'We believe in Education... As such, Sound Particles is free for schools, teachers and students. If you are a student, teacher or school staff, simply register with your academic email. If you don't have an academic email, don't worry as he will ask you later on for some other academic proof.' The form fields are: Name (Example Name), Email (example@school.domain.com), Password (masked with asterisks), Confirm (masked with asterisks), and Country (United States). A red box labeled '1' highlights the form fields. A checkbox labeled '2' is checked and labeled 'I want to receive news from Sound Particles.' A 'Back' button is on the left and a 'Register' button is on the right, with a red box labeled '3' highlighting the 'Register' button.

Academic Registration Screen

1. **Academic Account Information** - a form for you to fill with your academic information.

**Note:** It's highly recommended that you register with an academic domain. Otherwise, you will require that you show us some kind of proof of your academic status.

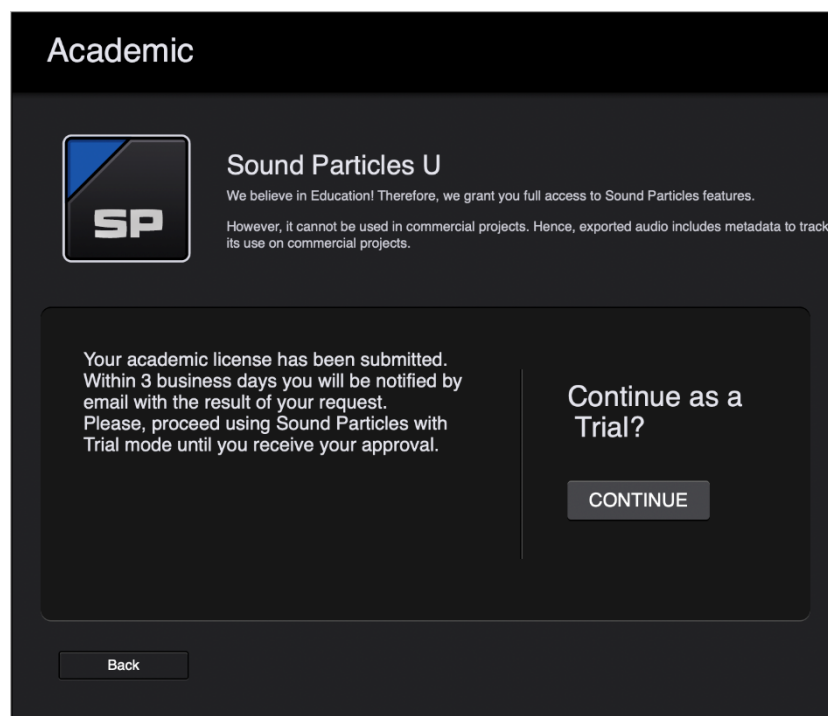
2. **Newsletter Subscription** - if you want, you can opt-in to receive newsletters from us by checking the box.

**Note:** You can opt-out at any time.

3. **Register** - submit your academic registration.

### 1.6.1 Academic Request Result

After filling out everything, your request will be analyzed for acceptance within no more than 3 working days. Until then, you may use the Trial version of the software, as shown on the screens after your registration.



*Post Academic Registration Trial Notification*

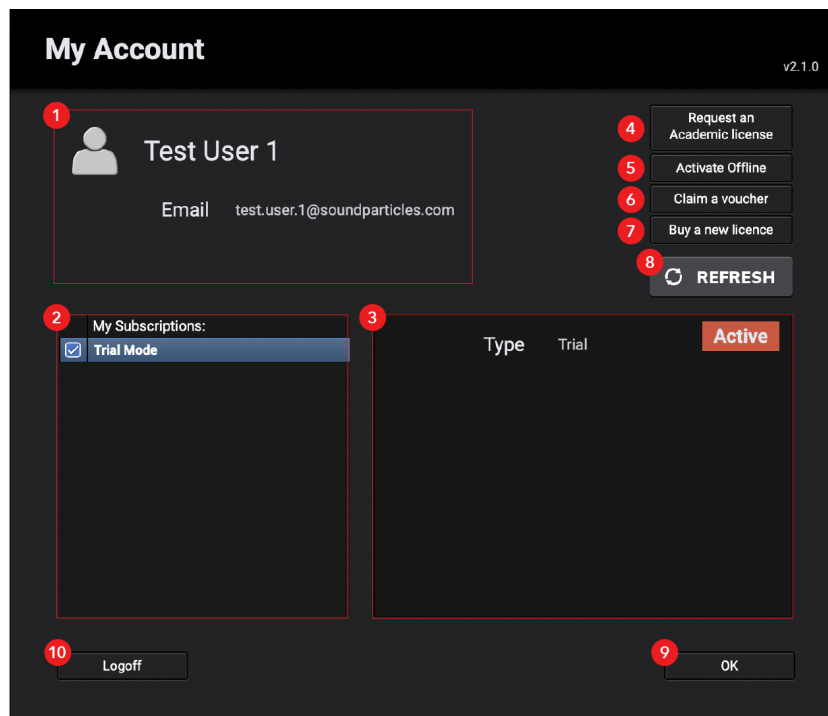
If your request is accepted, the next time you enter Sound Particles, a new project will be started with "Academic: [version]" below the "SP" logo, on the New Project window (see Chapter 2).

## 1.7 Account Management

After logging-in/registering on the application, you will then be able to access your Account panel that provides your subscriptions details, such as subscription type, project (if applied) and expiration date.

When logging-in through, “Buy” from the home page, your account panel will open even if the then browser window blocks the view.

To access your Account Management screen, you need to go to “Sound Particles -> Manage Account”, on the Menu Bar, when on a project window.



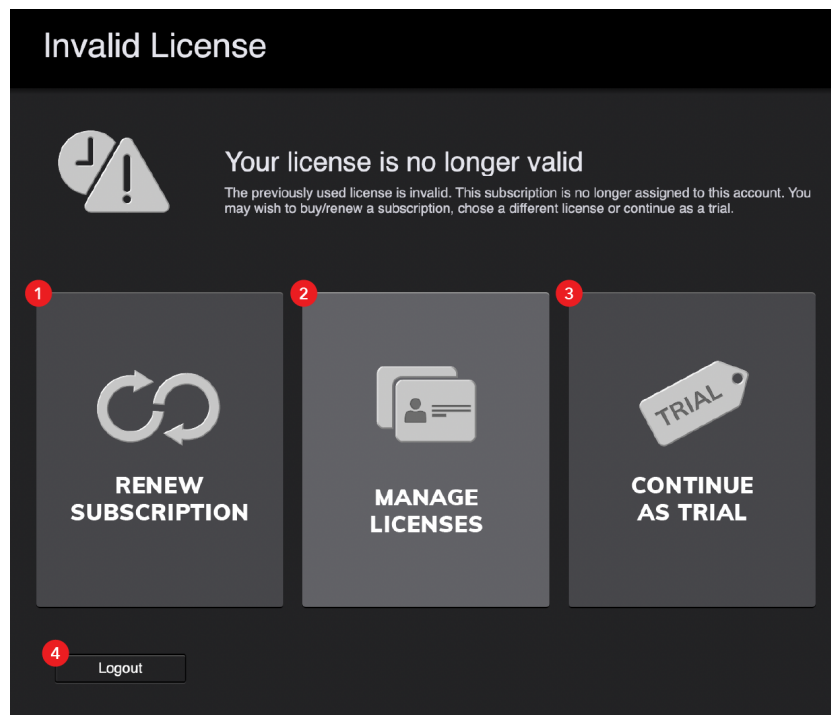
User Account Panel

1. **Account Information** - your account information, such as Name and E-mail.
2. **Subscriptions** - your acquired subscriptions. Here, you can also select which subscription you want activated and to use.
3. **Subscription Information** - information regarding the selected subscription, such as its Expiration Date, its Plan and Type, and if it's Active or Expired/Invalid.
4. **Request an Academic license** – activating this option automatically signs your account for an Academic license on our database. (Only visible if your account does not have an Academic license).

5. **Activate Offline** – opens the Offline activation screen, allowing you to activate one of your licenses without being connected to the Internet (you will need to have Internet access on another device).
6. **Claim Voucher**– opens the Claim Voucher screen, allowing you to redeem a voucher of a product not yet activated on your account (if valid).
7. **Buy a new license** – opens my.soundparticles.com on your account homepage on your Internet browser.
8. **Refresh (button)** - a refresh button to allow any new/updated licenses to appear after refreshing the list.
9. **OK** - opens a new project with Sound Particles running the active license.
10. **Logoff** - logs off of the account and returns you to the home page of the Welcome Screen.

### 1.7.1 Invalid License

If you have kept your account logged-in or log-in into an account where its last active license became expired or invalid, a warning screen will appear warning you about it, also giving you 3 options to resolve the situation.



Invalid License Screen

1. **Renew Subscription** - this will open your default browser and will take to your “Manage Licenses” screen.
2. **Manage Licenses** - open the “My Account” screen on the app.

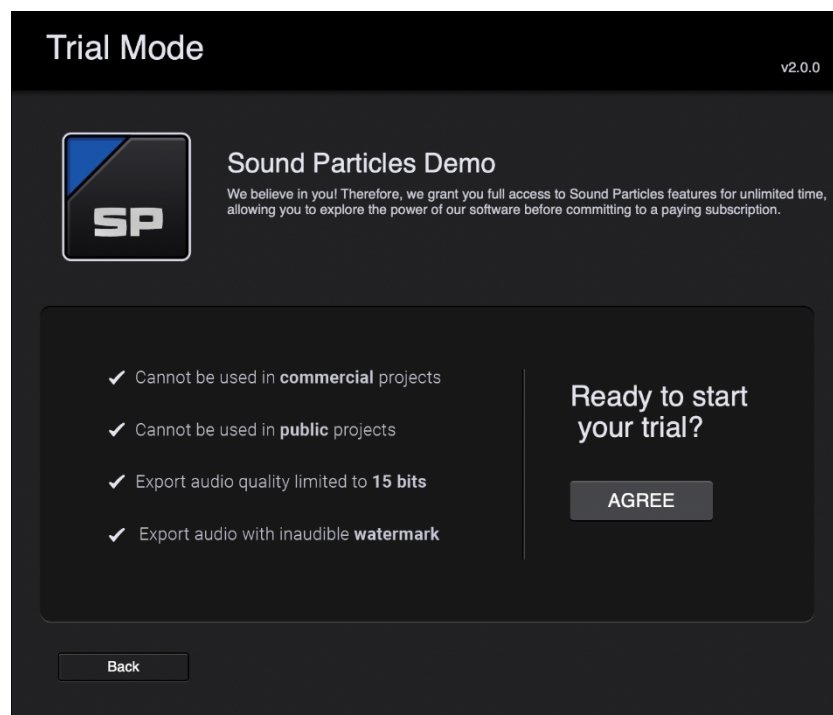
3. **Continue as Trial** - continue using Sound Particles as a Trial (rules of usage on Commercial and Public projects will apply; see Section 1.1).
4. **Logout** - log off of the account and return to the Welcome Page.



## 1.8 Trial Mode

If you want to give Sound Particles 2.0 a try before being certain if you want to buy it, you can, just by clicking on “Trial”. You will be required to log-in or register yourself with an account (that will be further created on my.soundparticles.com). After logging-in/registering, you will be then required to agree with the conditions of usage of the Trial Version:

- Cannot be used on **Commercial** nor **Public** projects
- Exported audio with maximum quality of 15 bits
- Exported audio with inaudible watermark
- Cannot edit some of the Metadata fields



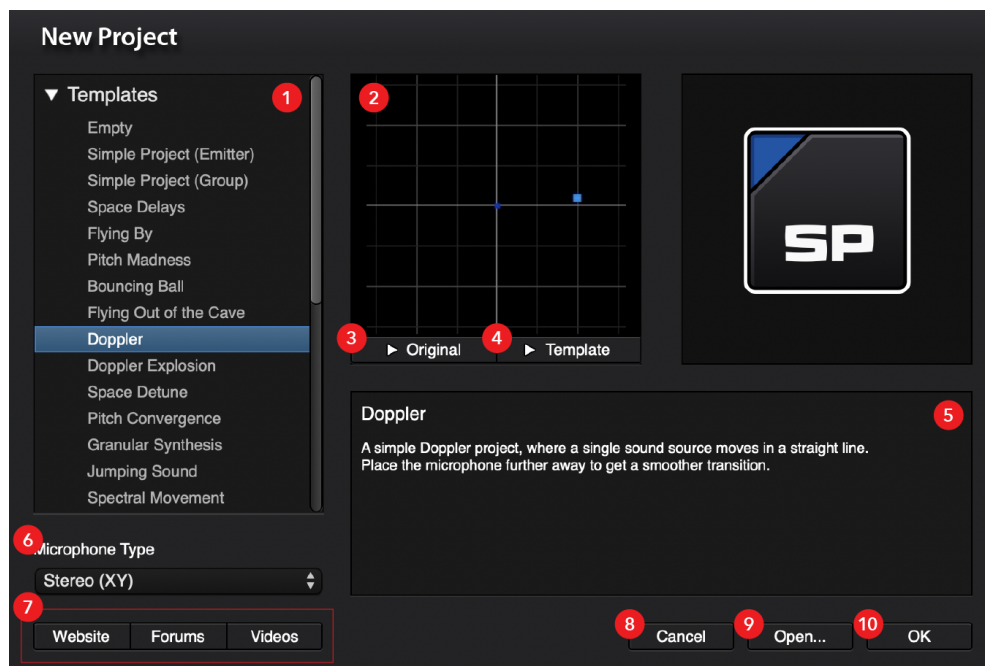
*Trial Mode Agreement Window*

**TIP:** The Trial version has ALL the features and you can try it for as long as you want.

## Chapter 2

# New Project

When you open a Sound Particles project after choosing your license, a project window will open presenting you the “New Project” panel that will help you in pre-selecting what kind of project you want based on numerous default Templates (with descriptions and audio comparisons between the original and templated samples) and also with which microphone you want to start your project with, alongside other utilities.



New Project Window

1. **Templates** - the list of available default Templates, which contain different project settings that you can both preview visually (2) and also compare between the original (3) and altered (4) audio samples of that selected Template.

**TIP:** If you want to start from scratch, select the “Empty” template.

2. **Template Viewfinder** - this viewfinder shows you a video preview of how the selected Template scene looks like.

**Note:** The video preview will synchronize when you playback the Template sample (4).

3. **Original Audio Sample** - the original, unaltered audio sample of the selected Template. Press the button to listen to it.
4. **Template Audio Sample** - the audio sample resulted from rendering the selected Template with the original audio sample (3).
5. **Template Description** - a small description of the Template.
6. **Microphone Type** - a pop-up button that allows you to select a microphone that you may want to start your project with:
  - 6.1. **None**
  - 6.2. **Mono (Omni)**
  - 6.3. **Stereo (XY) window**
  - 6.4. **5.1**
  - 6.5. **7.1**
  - 6.6. **Dolby Atmos (9.1)**
  - 6.7. **Auro-3D (11.1)**

**TIP:** For more insight about the Microphones, go to Chapter 6.

7. **Website/Forums/Videos** - buttons that allow you to access useful links about the software, such as our website, our forums and our video tutorials.
8. **Cancel** - cancel the creation of the project.
9. **Open...** - open a previously saved project file.
10. **OK** - open the selected Template.

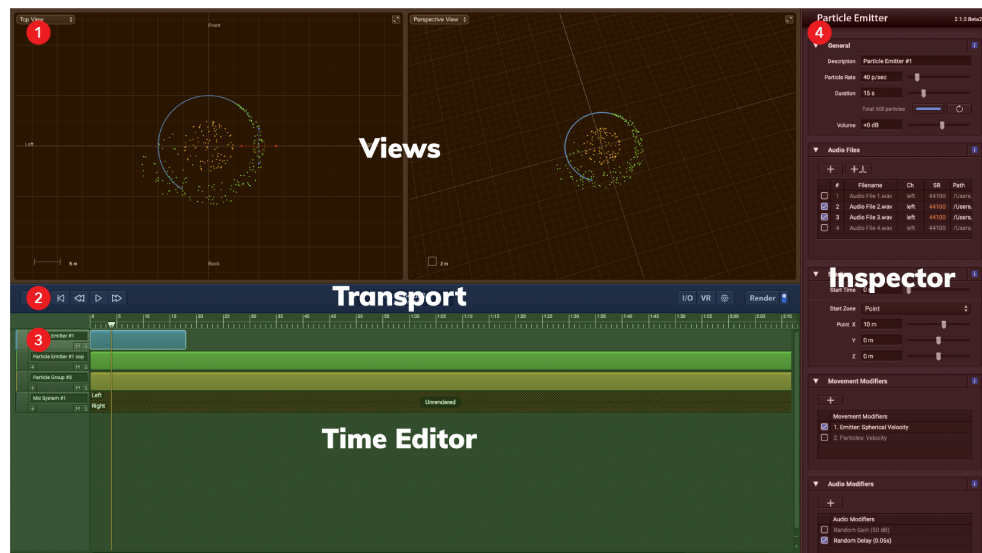
## Chapter 3

# Project Window

## 3.1 General Notions

The Project Window is the most important part of your workflow, as it is where you will find all the tools that will help you in creating your scene, shaping it to your needs and also allowing you to access other innovative tools to expand your workflow and project previewing, such as the VR (chapter 10) and Binaural (chapter 12) modes.

The Project Window is divided into 4 sections:



Project Window

1. **Views** - where you can observe and edit your scene and its objects through various perspectives. Can be used as a Dual or Single View.

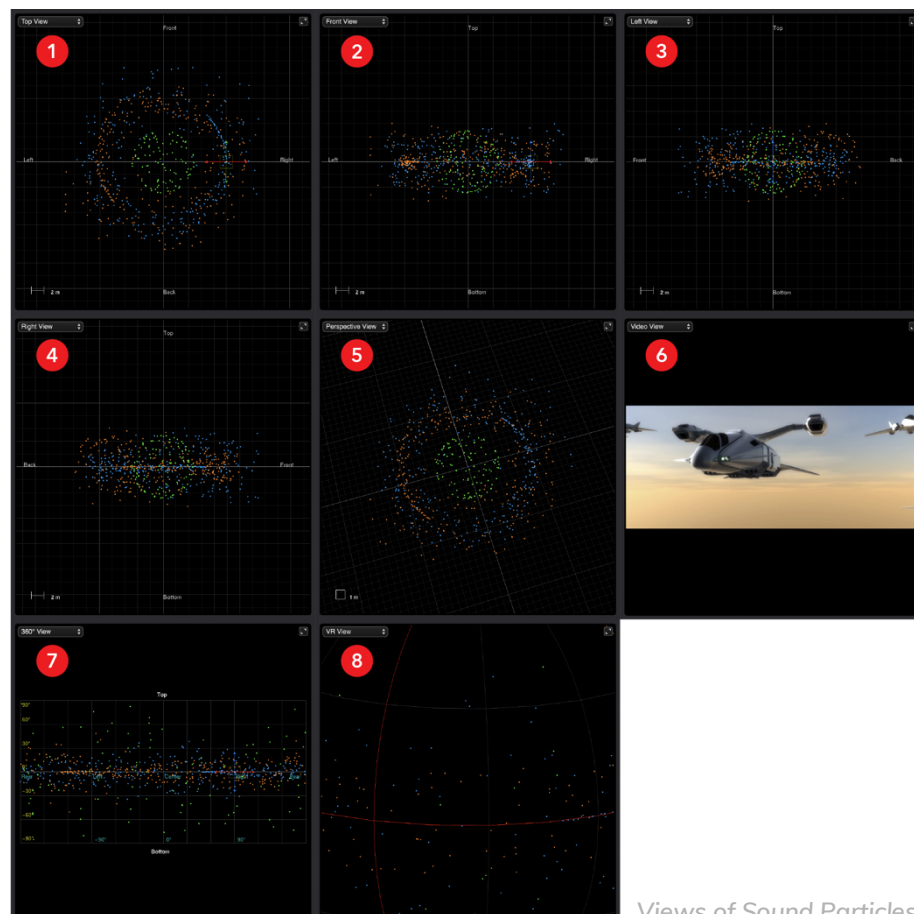
2. **Transport** - where you can add objects to the scene, control the Playback, watch the current time and special modes status (VR, Binaural), access utility menus and choose how to render the scene.
3. **Time Editor** - where you can sort, move and control your created tracks (particles/audio tracks, microphones and video tracks). You can also Mute/Solo each track, and also manually create automation tracks for compatible tracks.
4. **Inspector** - where you will edit/add parameters of selected objects or navigate through the utility menus (I/O, VR and Project Settings).

## 3.2 Views

### 3.2.1 Available Views

Sound Particles 2 has a set of 8 views in total. Within these, they can be divided into 4 categories/items:

- 3D Views
- Video View
- 360° View
- VR Views



Views of Sound Particles

1. **3D View - Top View** - placed above the scene.
2. **3D View - Front View** - parallel with the Left-Right directions, with Top-Bottom in front of it.
3. **3D View - Left View** - placed 90° to the left of the horizontal plane, having the Front at the left and the Back at the right.
4. **3D View - Right View** - placed 90° to the right of the horizontal plane, having the Back at the left and the Front at the right.
5. **3D View - Perspective View** - gives you a full 3D perspective of the scene, allowing you to move, rotate and zoom in and out on it.

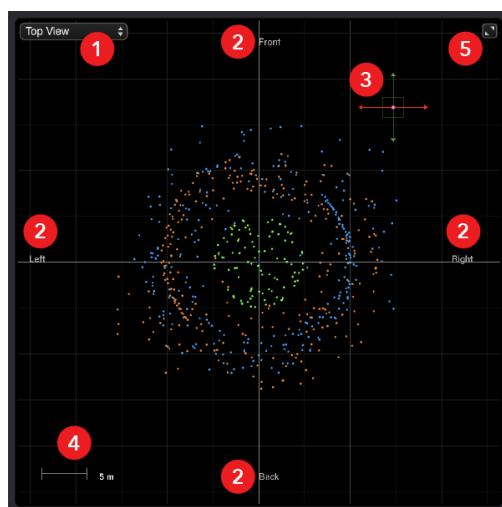
**TIP:** See Chapter 15, Section 15.1, on how to move and control the 3D Views.

6. **Video View** - if you import a Video Reference to Sound Particles, you can watch it by itself and as imported on this view.
7. **360° View** - with this view, you have a 360° horizontal and 180° vertical perspective of the scene. This view is useful if you want to work with particles on top of videos, both for standard or full 360° videos (see chapter 9).
8. **VR View** - this view allows you to see your scene from a 360° camera perspective, with the particles surrounding as constructed on the scene.

## 3.2.2 View's Anatomy

Each category of View mentioned on 3.2.1 has its own anatomy of unique elements to it, also sharing some common items with the sister Views.

### I. 3D Views



Top View

1. **View Mode** - a pop-up button that allows you to select if you want Single or Dual Views and/or which view you want to be active on the current panel.
2. **Directions** - these labels show what direction is represented on that axis.
3. **3D Manipulator** - this icon allows you to move the selected object around more easily just by pressing & dragging it on the View (except for 3D View – Perspective).
4. **Scale** - display a comparison figure to show how much the 3D View grid squares have in size.
5. **Maximize** - this button maximizes the View to full-screen, keeping only the Transport visible.

## II. Video Views

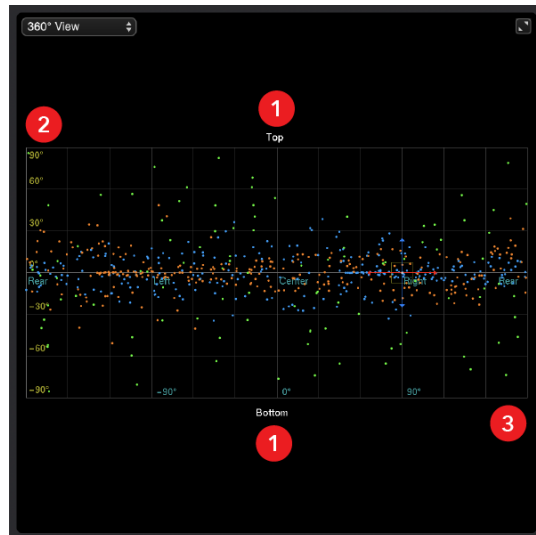
The Video View allows you to watch the imported Video Reference without any particles or other scene element on top of it, giving you a clear view of it.



Video View

### III. 360° Views

In this view, you have unique elements regarding the 360°h/180°v workflow, such as:

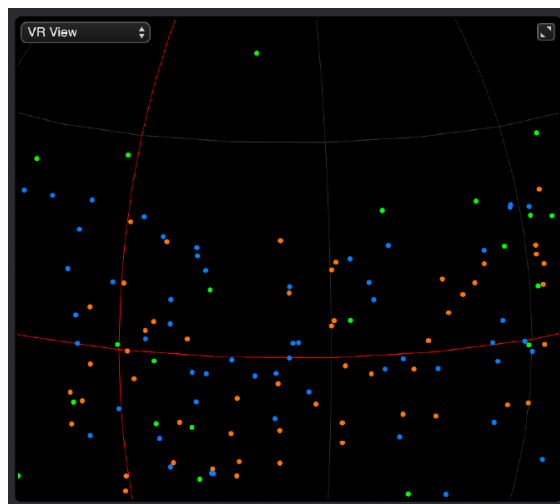


360° View

1. **Top/Bottom** - indication of where the top (+90°) and bottom (-90°) of the view are.
2. **Vertical angles** - angular sub-divisions of the vertical axis (-90° - 90°).
3. **Horizontal angles** - angular sub-divisions of the horizontal axis (-180° to 180°).

### IV. VR Views

On the VR view, you can playback and visualize your whole scene within a 360° camera, allowing you to move around and watch its playback in real-time.





### VR View

By then adding an Ambisonics microphone to the scene (see Chapter 6), and then activating the Binaural mode (see chapters 12), you can simulate a head tracking experience as the audio of the scene will adjust to your orientation and as you move around with the camera.

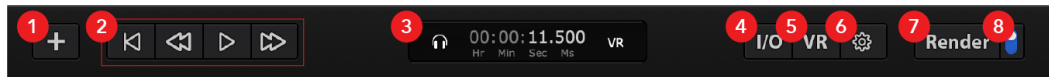
Also, if you import a 360° video reference, you can watch and look around that same video in full 360° (see chapter 10).

More information regarding the full use of the VR tools of Sound Particles found on chapter 10.

**TIP:** The red vertical curve, as shown on the image, represents the center of the View. You can also use the VR “Home” button to reset the View (see Chapter 10).

### 3.3 Transport

The Transport allows you to do various actions regarding your project, both from the Time Editor control; project configuration, saving and rendering; and hardware configuration. The available elements are:



#### Transport

**TIP:** You can disable this view by clicking Cmd / Ctrl + Shift + T or deactivating it through the Menu Bar's ("View -> Transport").

1. **Add** - this button allows you to add numerous objects to your scene, such as:
  - 1.1. **"Add Audio Track"** - add an Audio Track to the scene (see Chapter 4).

**Note:** The default Audio Track has a "Mono" source.

- 1.2. **"Add Particle Group"** - add a Particle Group to the scene (see Chapter 4).
- 1.3. **"Add Particle Emitter"** - add a Particle Emitter to the scene (see Chapter 4).
- 1.4. **"Add Microphone"** - add a Microphone to the scene (see Chapter 6).

**Note:** The default mic is "Stereo".

- 1.5. **"Add Video Reference"** - add a Video track to the scene (see Chapter 9).

2. **Playback Controller** - these buttons allow you to control the playback of your scene:
  - 2.1. **"From Start"** - places the playhead at the beginning (00:00:00:00) of the Time Editor.
  - 2.2. **"Rewind 10 seconds"** - places the playhead 10 seconds before its current position.
  - 2.3. **"Play/Pause"** - starts/pauses the scene's playback.

**TIP:** If you have "Unrendered" microphones, and have the Auto-Render "On", this will render and playback audio in real-time (see Topic 8).

- 2.4. **“Forward 10 seconds”** - places the playin-head 10 seconds ahead its current position.

**3. Mini-Display** - in here, you can find information regarding:

- 3.1. **“Forward 10 seconds”** - places the playhead 10 seconds ahead its current position.
- 3.2. **Binaural (headphones)** - if the headphone's icon is displayed, the Binaural mode is “On” (see Chapter 12).
- 3.3. **Current Time** - the current Time position of the Time Editor playhead.
- 3.4. **VR** - if the “VR” label is displayed, Sound Particles is connected to the Sound Particles VR app (see Chapter 10).

- 4. **I/O** - access the I/O inspector (see Chapter 12).
- 5. **VR** - access the VR inspector (see Chapter 10).
- 6. **Project Settings** - access the Project Settings menu (see Chapter 13)
- 7. **Render (Manual)** - manually render the scene (see Chapter 7).

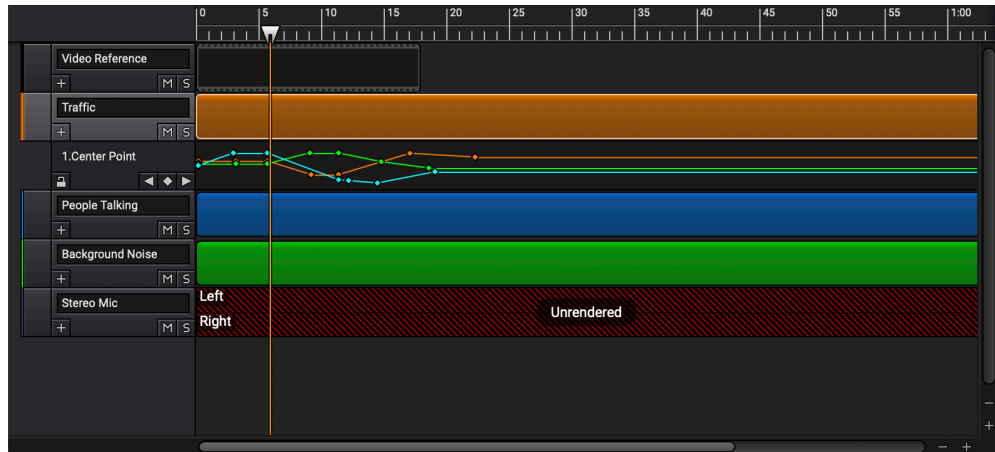
**Note:** Only has an effect if there are sections unrendered. If everything is rendered, this button will have no effect.

**TIP:** You can still use this button even with the Auto-Render “On”.

- 8. **Auto-Render** - activate/deactivate the Auto-Render mode.

**TIP:** If “On”, you can playback your unrendered scene/sections in real-time, allowing you to preview any part of your scene without fully and manually rendering it.

## 3.4 Time Editor



Time Editor

The Time Editor is where all the elements (tracks) within your scene are displayed.

To start placing items on the Time Editor, you can simply use the “Add” button on the Transport, or use “Project -> Add” on the Menu Bar (top of the project window).

With it, you can place, move and organize your items as you like, and it’s also your gateway to access the element Inspectors to edit their parameters and configurations, by just clicking over an existing track.

On the left end of the tracks, you are also able to SOLO or MUTE every kind of track through the “M” & “S” buttons, and also add Automation (for every available parameter of that track) by clicking on the “+” button.

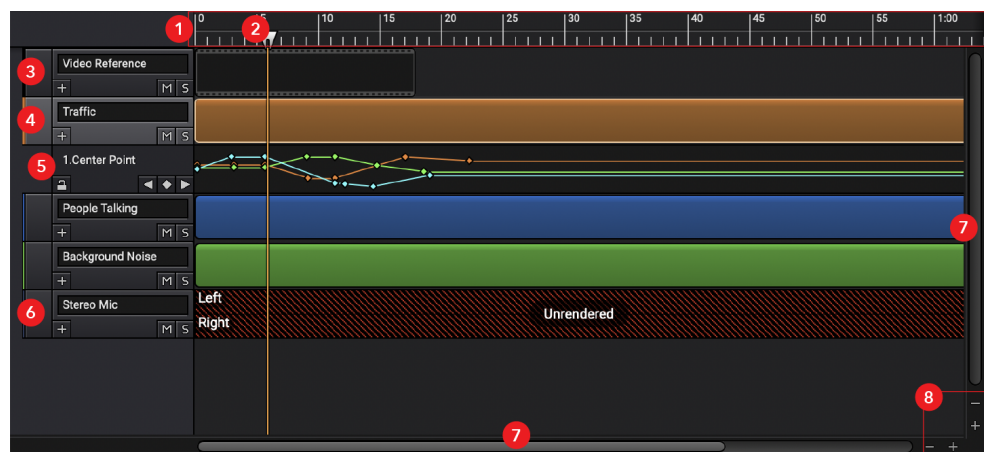
The Time Editor track order is done with the following tier:

1. **Video Track (if available)**
2. **Particle/Audio Tracks**
3. **Microphone Tracks**

**TIP 1:** You can drag your tracks around (excluding Microphones) by pressing and holding on top of them with your mouse. This will also change the “Start Time” of the track (see Chapter 4).

**TIP 2:** You can disable this view by clicking Cmd / Ctrl + T or deactivating it through the Menu Bar’s (“View -> Time Editor”).

All the Time Editor elements are highlighted below:



Detailed Time Editor

1. **Time Sub-Divisions** – the Time sub-divisions and their respective value.

**TIP:** Depending if you zoom in or out, the sub-divisions could range more or less Time on the same space.

2. **Playhead** – the position where the playback will start.

**TIP:** By changing the position of the playhead, you can immediately see the current frame of the views according to its position.

3. **Video Track** – when you import a Video Reference, its respective track will appear always at the top of the Time Editor.

**TIP:** You can change where the video starts, either by dragging it with the mouse or changing its Time Offset on its Inspector (see Chapter 9).

4. **Particle/Audio Tracks** – by adding Particle Tracks (Groups/Emitters) or Audio Tracks, they will be placed below a Video Track, but above Microphone tracks.

**TIP:** By opening their context menu (clicking with your Secondary Mouse Button over them), it's possible to move each track up and down between them.

5. **Automation Tracks** – when you create any Automation for compatible parameters, the respective track will appear below the track that's being automated. On Automation tracks, you can create and manipulate keyframes over time and as you desire. **On it, you have 4 buttons available:**

- 5.1. **Lock/Unlock Automation** - locks/unlocks any further editing and manipulation on the Automation Track.
- 5.2. **Go to Previous Keyframe** - places the playhead over its previously available keyframe.
- 5.3. **Create Keyframe** - creates a keyframe if the playhead is on an empty space of the curve(s).
- 5.4. **Go to Next Keyframe** - places the playhead over its next available keyframe.

**Note:** This type of track does only appear if you create an Automation for a parameter.

**TIP 1:** Sound Particles will automatically create a keyframe on the Automation curve if you change the parameter on a time where none exist.

**TIP 2:** You can control the keyframes values by either edit the automated parameters on their fields (text fields, sliders, pop-up buttons, etc.) or by dragging their 3D Manipulator.

**TIP 3:** You can also create an Automation track for a certain parameter by opening its Context Menu over the parameter on the Inspector.

You can also do certain key combinations when working with keyframes, such as:

- **Select Single Keyframe:** Primary Mouse Button Click (on keyframe)
- **Select Multiple Keyframes:** Primary Mouse Button Click on empty area inside Automation track + Drag (to expand selection area)
- **Create Keyframe:** Double Click with Primary Mouse Button on an empty section.
- **Add Keyframe to Selection:** Cmd/Ctrl + Primary Mouse button click (on keyframe) or Cmd/Ctrl + Primary Mouse Button Click on empty section inside the Automation track + Drag (to expand selection area)
- **Remove Keyframe from Selection:** Cmd/Ctrl + Primary Mouse Button Click (on keyframe)
- **Single Drag:** Primary Mouse Button Click (on keyframe) + Drag
- **Multiple Drag:** Shift + Primary Mouse Button Click + Drag
- **Single/Multiple Keyframe Horizontal Drag:** Shift + Alt + Primary Mouse Button Click + Drag
- **Single/Multiple Vertical Drag:** Shift + Cmd/Ctrl + Primary Mouse Button Click + Drag

6. **Microphone Tracks** - when you create a Microphone, a respective track will be displayed on the Time Editor, which also allows you to access the Microphone's Inspector (see Chapter 6). It will also display the waveform of any render done to your scene.

**TIP 1:** If the scene is unrendered, the Microphone(s) track will be displayed reddish and with a "Unrendered Label".

**TIP 2:** if by changing the volumes of Tracks and/or the Microphone clips the render, there will be sections in red displaying the respective clipped sections.

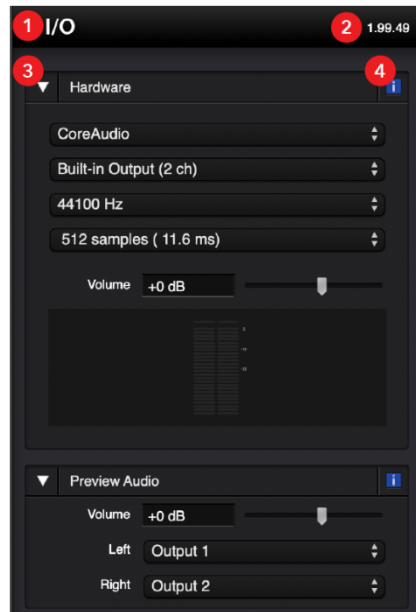
7. **Scroll bars** - allows you to navigate horizontally or vertically through the Time Editor.

**Note:** Depending on the levels of zoom or track length, the scroll bars may not be enabled.

8. **Zoom In/Out** - allows you zoom-in (+) or zoom-out (-) both horizontally or vertically.

## 3.5 Inspector

The Inspector is the panel on the right side of the screen that allows you to access all the options and parameters related to a certain track / utility.



*I/O Transport*

1. **Title** - the title of the track/utility that you've selected.
2. **Software version** - the software version will appear in all inspectors on the top-right corner.
3. **Close / Open Panel** - use this button to close or re-open one of the panels available.
4. **Quick Help** - use this button to access a Quick Help window displaying information regarding that same panel and all of its components.

**TIP:** You can disable this view by clicking Cmd / Ctrl + I or deactivating it through the Menu Bar's ("View -> Inspector").



## Chapter 4

# Particle & Audio Tracks

## 4.1 General Notions

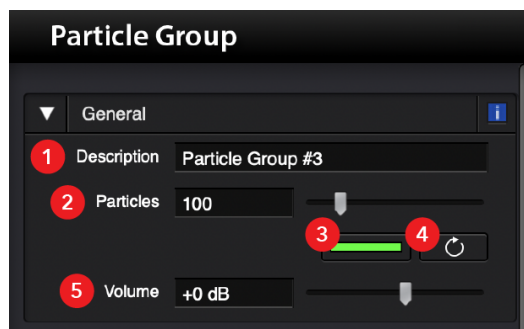
Particle Tracks are objects that create particles in your scene, and there are two different types:

- Particle group
- Particle emitter
- Single sound sources (e.g. a single particle emitting a mono sound)

Additionally, you can opt for an Audio Track, that allows you to only have a single audio source file that can then create a number of particles, according to the format of the audio file imported to it.

## 4.2 Particle Group

A Particle Group creates, by default, stationary particles in the scene, each individual group's particles are created at the same time.

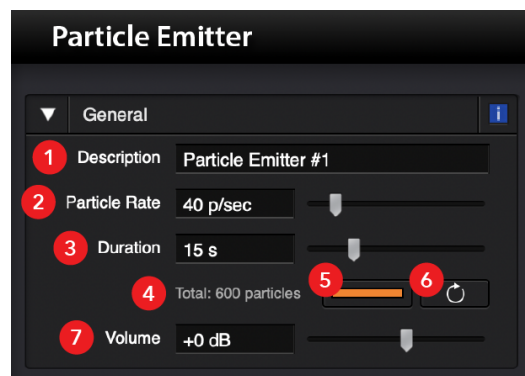


Particles Group Panel

1. **Description** - a brief description to identify this group.
2. **Particles** - the total number of particles of this group.
3. **Color (button)** - the color of the particles (used only for visualization - doesn't affect the sound).
4. **Recreate (button)** - creates a new set of particles.
5. **Volume** - the volume (audio gain) of the sound created by these particles (can be automated).

## 4.3 Particle Emitter

A Particle Emitter is a particle object that creates particles over a given period of time.



Particles Emitter Panel

1. **Description** - a brief description to identify this group.
2. **Particle rate** - how many particles, per second, do you want to create? (can be automated).
3. **Duration** - how long should the emitter continue to create new particles? This value does not affect the sound duration of each particle. The parameter is applied to the created particles.
4. **Total** - a label with the total number of particles (total = rate \* duration).
5. **Color (button)** - the color of the particles (used only for visualization - doesn't affect the sound).
6. **Recreate (button)** - creates a new alternate set of particles.
7. **Volume** - the volume (audio gain) of the sound created by these particles (can be automated).

## 4.4 Recreating new particles

Since particles are randomly created (within the user specified constraints), the same settings can be applied to a new set of particles to generate different output results. Each time the user presses the “Recreate” button, a different set of particles is created, which will generate a slightly different result. From a practical point-of-view, this acts as a new “recording take”, allowing you to generate a slightly different output result.

## 4.5 Audio Tracks

Audio Tracks can be used when you want to position sound from an audio file at a specific position, audio tracks support mono, stereo, 5.1, 7.1, or Ambisonics audio files, creating a single particle for each channel. In the case of Ambisonics files, an array of particles is created, capable of generating the exact same soundfield as the original audio file.



Audio Track Panel

1. **Description** - a brief description to identify this group.
2. **Source** - the type of sound source: mono (1 particle), stereo (2 particles), 5.1 (5 particles), 7.1 (7 particles), or Ambisonics (6, 18, 66, 162 or 642 particles).

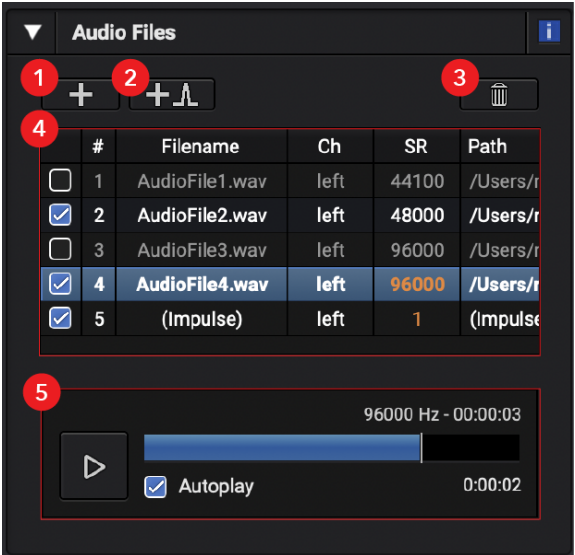
**Note:** With Ambisonics sound sources, if you use a microphone that is positioned outside the origin (0,0,0), you should disable propagation delay (project settings) to prevent comb filtering due to different delays coming from different sound sources.

3. **Decode To** - if an Ambisonics source is selected, this field will be presented, allowing you to choose how to decode the Ambisonics file to: 6; 18; 66; 162; or 642 virtual sound sources.

4. **Volume** - the volume (audio gain) of the sound created by these particles (can be automated).
5. **Color (button)** - the color of the particles (used only for visualization - doesn't affect the sound).

## 4.6 Audio Files

You can add one or more audio files to your particle Group/Emitter. Each particle will randomly select one of the available files. For Audio Tracks, only one audio file can be added.



Audio Files Panel

1. **+** - add a new audio file.
2. **+ Impulse** - add a simple impulse. This easy-to-render signal can be used for tests or when you want to capture an impulse response.
3. **Trash** - remove the audio file from the available audio files. Don't worry, this will NOT remove the audio file from your computer.
4. **Table** - table displaying the available audio files (streams) that will be played by the particles, presenting their enabled/disabled state, filename, the used channel, original sample rate and full path.

**TIP:** You can **enable** or **disable** your imported audio files to allow to try different results using different combinations between the imported files.

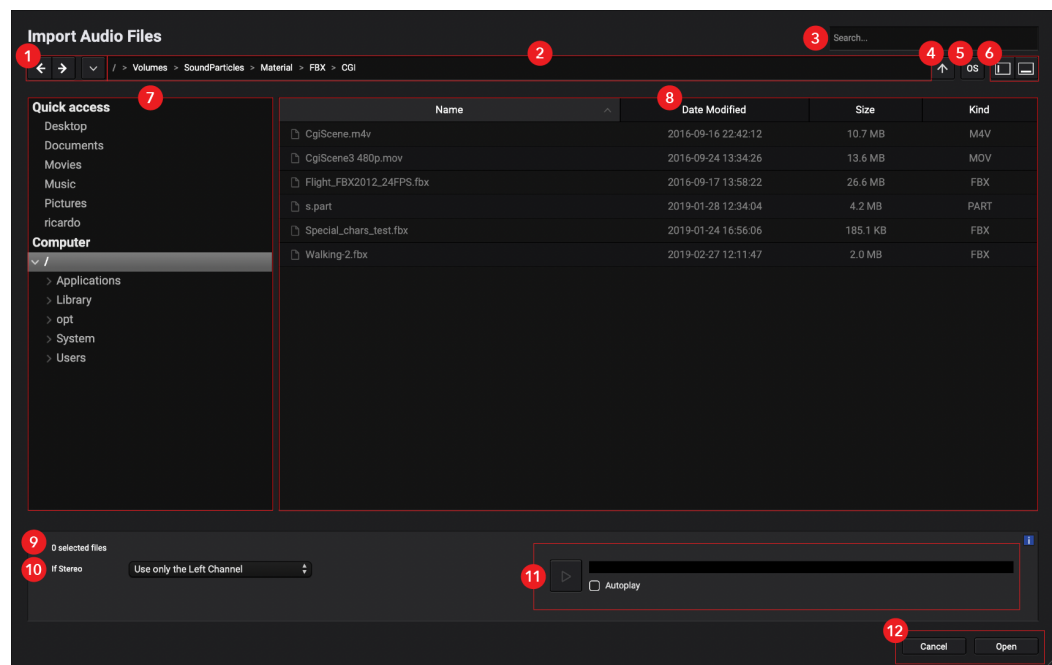
**Note:** When you enable/disable an audio file, you will have to **re-render** the scene's microphone(s).

5. **Audio Player** - as you select a file within the table, an audio player control will appear, allowing you to listen its audio content.

**Note:** This control uses the audio output defined in the settings of the I/O.

### 4.6.1 Importing Audio Files

When clicking “Add Audio File(s)”, a proprietary file explorer window will appear, allowing you to navigate through your computer and also getting access to a file import configuration and an audio preview for selected files.



Import Audio Files Window

1. **Back/Forward/History** – use these buttons to navigate through the directories history or to access its full list.
2. **Address Bar** - type or paste an address within your computers file system to access a file, you can use this bar to be redirected directly to the directory.
3. **Search Bar** – type or paste text here to search for a specific file/folder on the currently opened directory.
4. **Go up** - this button allows you to move to the previous hierarchical address in the directory.
5. **OS button** - if you prefer to navigate and import through the native OS file explorer, this button opens the respective OS explorer window.

6. **Hide/Show Quick Access & Preview** – use these buttons to either hide or show the Quick Access (left) or the Preview (right).
7. **Quick Access & Computer Global View** - a list with the most usual Quick Access links to preferred directories and also the access to a tree-view that shows you all directories starting at the root of your computer.
8. **Directory View** - a “detailed list” view of the current selected directory, showing all its files (Name, Date Modified, Size and Kind).

**TIP:** You can reorder (in ascending or descending orders) each available column.

9. **Number of Selected Files** - how many files are currently selected.
10. **Import Options** - the following conversion options are available when importing multichannel audio files.
  - 10.1. **“If Stereo”** - for Groups/Emitters and Mono/Stereo Audio Tracks, you have the following options:
    - 10.1.1. **Use only the Left Channel** - your particles will play only the left channel.
    - 10.1.2. **Use only the Right Channel** - your particles will play only the right channel.
    - 10.1.3. **Convert to Mono** - a mono version of the file will be created and used by the particles.
    - 10.1.4. **[Non-Mono objects] Use Both Channels** - some particles will reproduce the left channel and other particles reproduce the right channel.
  - 10.2. **Format (Audio Tracks - 5.1 / 7.1)** - when importing files for 5.1 or 7.1 Audio Tracks, you can select a specific format:
    - 10.2.1. **5.1**
      - SMPTE - L R C LFE Ls Rs
      - Film - L C R Ls Rs LFE
    - 10.2.2. **7.1**
      - SMPTE - L R C LFE Lss Rss Lsr Rsr
      - Film - L C R Lss Rss Lsr Rsr LFE
  - 10.3. **LFE (Audio Tracks - 5.1 / 7.1)** - when importing files for 5.1 or 7.1 Audio Tracks, you can select what to do with the LFE channel:
    - 10.3.1. **Use** - mix the file's LFE channel within all the other channels.
    - 10.3.2. **Ignore** - don't use the LFE channel for the audio track.

- 10.4. **Ch. Order (Audio Tracks - Ambisonics)** - when importing Ambisonics files for Ambisonics Audio Tracks, you can select which channel order to use for your Ambisonics file:

10.4.1. **ACN** - 0(W) 1(Y) 2(Z) 3(X)

10.4.2. **FuMa** - W(0) X(3) Y(1) Z(2)

- 10.5. **Norm (Audio Tracks - Ambisonics)** - when importing Ambisonics files for Ambisonics Audio Tracks, you can select which normalization method to use for your Ambisonics file:

10.5.1. **SN3D**

10.5.2. **N3D**

10.5.3. **maxN**

10.5.4. **FuMa**

11. **Preview** - if you select one audio file, an audio preview control will appear, allowing you to listen to the file. This control uses the audio output defined on the I/O "Hardware" settings.

12. **Cancel/OK** - cancel the import / import the selected audio files with the defined Import Options.

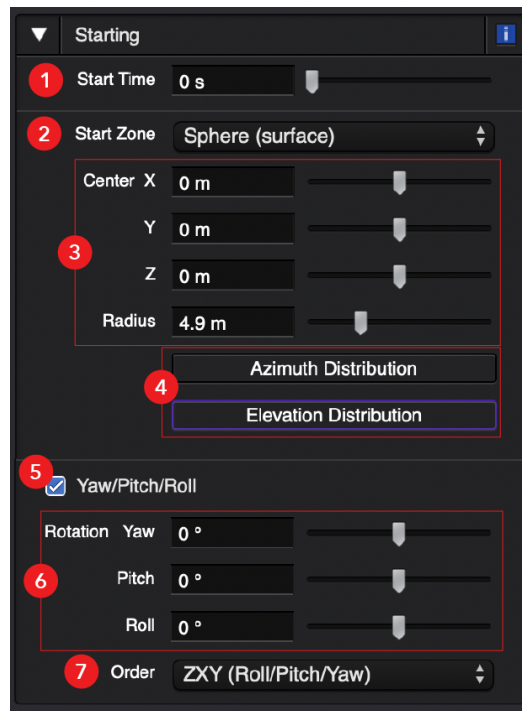
**Note 1:** If the audio file has a different sample rate from the sample rate of your project, a warning dialog will appear, only to inform you that the audio file is automatically resampled to the new sample rate.

**Note 2:** If you change the sample rate of your project, all audio files are resampled for the new sample rate (if required) based on the original audio stream (not from the already resampled version).



## 4.7 Particle's Starting Points

Information about when and where the particles start.



Particles Starting Panel

1. **Starting Time** - particles are created after this initial time value. If you don't want all particles to start at the same time, you can add a Delay audio modifier (available at the Audio Modifiers section) or use a particle Emitter.
2. **Start Zone** - area where particles are initially created.

**Possible values:**

- 2.1. **Point** - all particles are created at the same point.
- 2.2. **Line** - all particles are creating within a line segment.
- 2.3. **Circle (line)** - all particles are created within a circle line.
- 2.4. **Circle (inside)** - all particles are created inside a circle.
- 2.5. **Rectangle** - all particles are created inside a rectangle.
- 2.6. **Triangle** - all particles are created inside a triangle.
- 2.7. **Sphere (surface)** - all particles are created within the surface of a sphere.
- 2.8. **Sphere (inside)** - all particles are created inside a sphere.
- 2.9. **Cylinder (inside)** - all particles are created inside a cylinder.
- 2.10. **Cylinder (surface)** - all particles are created within the round surface of a cylinder.

- 2.11. **Box** - all particles are created inside a box.
- 2.12. **Torus** - all particles are created inside a torus.

**3. Starting zone settings** - depending on the starting zone, several parameters are available:

- 3.1. **Point** - point.
- 3.2. **Line** - endpoint A, endpoint B.
- 3.3. **Circle (line)** - center point, radius.
- 3.4. **Circle (inside)** - center point, radius.
- 3.5. **Rectangle** - center point, width/depth (rectangle sides).
- 3.6. **Triangle** - endpoint A, endpoint B, endpoint C.
- 3.7. **Sphere (surface)** - center point, radius.
- 3.8. **Sphere (inside)** - center point, radius.
- 3.9. **Cylinder (inside)** - center point, radius, height.
- 3.10. **Cylinder (surface)** - center point, radius, height.
- 3.11. **Box** - center point, width/depth/height (box sides).
- 3.12. **Torus** - center point, main radius, section radius.

**4. Random Settings Button(s)** - some parameters may have a random settings button, which allows you to define special random distributions.

**TIP:** For instance, imagine that you want particles spread on a circle, but either at a radius of 1, 2 or 3 meters. You can specify a radius of 3 meters but change the random settings to a discrete distribution which possible values are 1, 2 or 3.

**Note:** A purple border on this button indicates that a custom random setting was chosen by the user.

- 5. **Yaw/Pitch/Roll (checkbox)** - by activating the yaw/pitch/roll checkbox, you can add some additional rotation to your starting set (e.g. a tilted circle or a diagonal rectangle).
- 6. **Yaw/Pitch/Roll** - Three new parameters will appear: yaw, pitch, and roll, which add rotation on the azimuth, elevation and roll.

**TIP:** These 3 parameters can even be automated if you like to change their values through time.

7. You can also select the rotation order according to the x, y, z axis, such as:

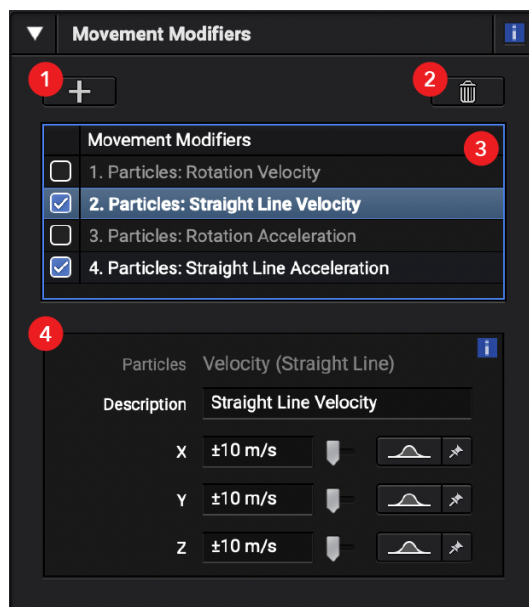
- 7.1. XYZ (Pitch/Yaw/Roll)
- 7.2. YZX (Yaw/Roll/Pitch)
- 7.3. ZXY (Roll/Pitch/Yaw)
- 7.4. XZY (Pitch/Roll/Yaw)
- 7.5. YXZ (Yaw/Pitch/Roll)
- 7.6. ZYX (Roll/Yaw/Pitch)

## 4.8 Modifiers

### 4.8.1 Movement Modifiers

Movement can be obtained by adding movement modifiers or by using automation with the **Starting** settings (Starting panel). You may add as many movement modifiers as you want, including several modifiers of the same type.

#### I. Movement Modifiers Panel



Movement Modifiers Panel

1. + - add a new movement modifier.

**Note:** You may add as many movement modifiers as you want, including several modifiers of the same type.

2. **Trash** - remove the movement modifier.

**Note:** This button is only visible when a movement modifier is selected on the list.

3. **List** - a list with all movement modifiers currently applied to the particles.

**TIP 1:** Select one of the modifiers to see/edit its information.

**TIP 2:** You can **enable** or **disable** the modifiers to try different combinations or to easily disable a modifier from being applied to the respective object.

**Note 1:** Each line has the following syntax: "(Particles/Emitter): (Movement Description)".

**Note 2:** The "Particles" word indicates that the movement is applied to the particles. If using a particle emitter, the "Emitter" word can also be used, to distinguish if the movement is applied to the particles or to the emitter.

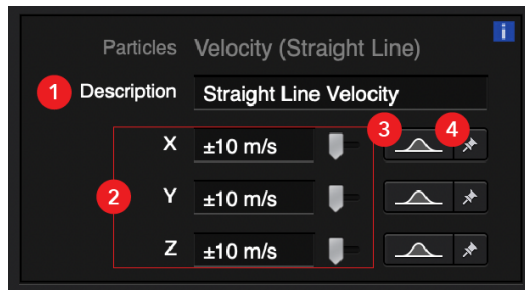
**Note 3:** By enabling or disabling modifiers, you will have to re-render the scene's microphone(s)

4. **Edit Panel** - where you can see and edit all parameters of a movement modifier.

**Note:** This panel is only visible when a movement modifier is selected on the list.

## II. Movement Modifier - Velocity (Straight Line)

This will apply movement to the particles, making them to move on a straight line.



Velocity (Straight Line) Modifier Panel

1. **Description** - a brief description to identify this group.
2. **X/Y/Z** - The velocity within each axis (x, y or z). The x axis corresponds to the left-right direction, the y axis corresponds to the front-back direction, and the z axis corresponds to the up-down direction.
3. **Random Settings Button** - This button allows you to change the random settings of the modifier. By default, the movement modifier will randomly create a velocity value for each particle, with a uniform distribution. You may use these settings to control different velocity distributions.

**Note:** A purple border on this button indicates that a custom random setting was chosen by the user.

4. **Pin Button** - This button allows you to force this value to all particles. Instead of generating random velocities to each particle (within the range you have specified), this will force the same velocity to all particles.

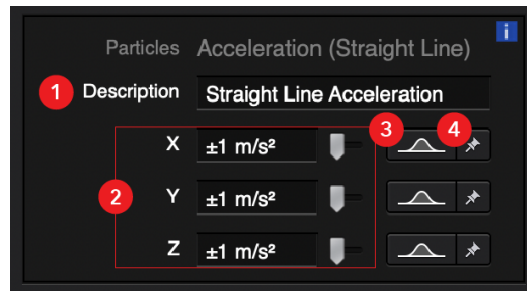
**Example 1** / Moving all particles to the left at 1m/s:  $x=1\text{m/s}$  (pin),  $y=0$ ,  $z=0$

**Example 2** / Moving either to left or right, but each particle with a different velocity (maximum velocity of 1m/s):  $x=1\text{m/s}$ ,  $y=0$ ,  $z=0$

**Example 3** / Moving to any direction, with each particle with a different velocity (maximum velocity of 1 m/s):  $x=1\text{m/s}$ ,  $y=1\text{m/s}$ ,  $z=1\text{m/s}$ , "range from  $[-v, v]$ "

### III. Movement Modifier - Acceleration (Straight Line)

This will apply a straight-line movement to the particles, but instead of a constant velocity, acceleration will gradually add velocity to the particles.



Acceleration (Straight Line) Modifier Panel

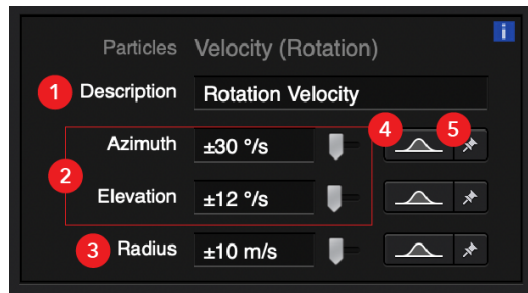
1. **Description** - A short description for this movement.
2. **X/Y/Z** - The velocity within each axis (x, y or z). The x axis corresponds to the left-right direction, the y axis corresponds to the front-back direction, and the z axis corresponds to the up-down direction.
3. **Random Settings Button** - This button allows you to change the random settings of the modifier. By default, the movement modifier will randomly create a velocity value for each particle, with a uniform distribution. You may use these settings to control different velocity distributions.

**Note:** A purple border on this button indicates that a custom random setting was chosen by the user.

4. **Pin Button** - This button allows you to force this value to all particles. Instead of generating random velocities to each particle (within the range you have specified), this will force the same velocity to all particles.

## IV. Movement Modifier - Velocity (Rotation)

This will apply a rotation movement to the particles, making them to move on circles around the origin (0, 0, 0).



Velocity (Rotation) Modifier Panel

1. **Description** - A short description for this movement.
2. **Azimuth/Elevation** - the velocity of rotation – azimuth velocity to control the rotation at the horizontal plane, the elevation velocity to control the vertical movement.
3. **Radius** - the velocity, in terms of distance to the origin.

**TIP 1:** If you want the particles to maintain the same distance to the origin (circle movement), enter 0.

**TIP 2:** If you want particles to move in circles moving away (increasing the radius of their circle), enter a positive value.

**TIP 3:** To approximate, enter a negative value.

4. **Random Settings Button** - this button allows you to change the random settings of the modifier. By default, the movement modifier will randomly create a velocity value for each particle, with a uniform distribution. You may use these settings to control different velocity distributions.

**Note:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

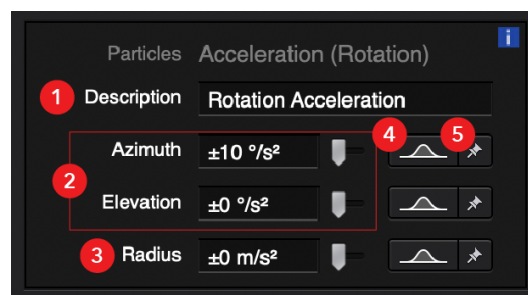
5. **Pin Button** - This button allows you to force this value to all particles. Instead of generating random velocities to each particle (within the range you have specified), this will force the same velocity to all particles.

**Example 1 /** Moving in circles, all with the same direction and the same velocity:  
 $az.=60^\circ/s$  (pin),  $el.=0$ ,  $rad.=0$

**Example 2 /** Moving in circles, different directions and velocities:  $az.=60^\circ/s$ ,  $el.=0$ ,  $rad.=0$

## V. Movement Modifier - Acceleration (Rotation)

This will apply a rotation movement to the particles, making them to move on circles around the origin (0, 0, 0). Instead of a constant velocity, acceleration will gradually add velocity to the particles.



Acceleration (Rotation) Modifier Panel

1. **Description** - A short description for this movement.
2. **Azimuth/Elevation** - this will apply a rotation movement to the particles, making them to move on circles around the origin (0, 0, 0). Instead of a constant velocity, acceleration will gradually add velocity to the particles.
3. **Radius** - The velocity, in terms of distance to the origin.

**TIP 1:** If you want the particles to maintain the same distance to the origin (circle movement), enter 0.

**TIP 2:** If you want the particles to maintain the same distance to the origin (circle movement), enter 0.

**TIP 3:** To approximate, enter a negative value.



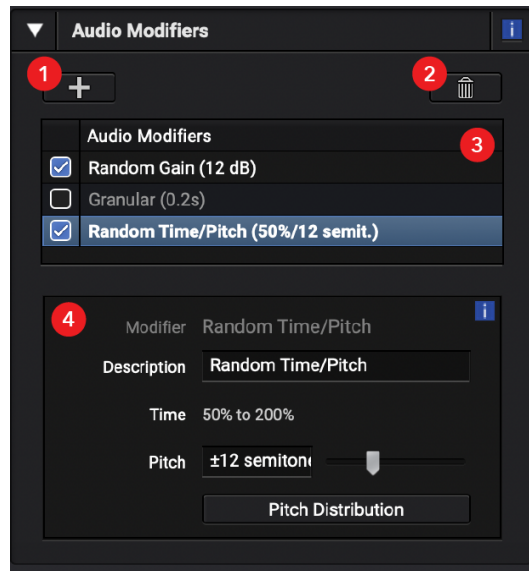
4. **Random Settings Button** - This button allows you to change the random settings of the modifier. By default, the movement modifier will randomly create a velocity value for each particle, with a uniform distribution. You may use these settings to control different velocity distributions.

**Note:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

5. **Pin Button** - This button allows you to force this value to all particles. Instead of generating random velocities to each particle (within the range you have specified), this will force the same velocity to all particles.

### 4.9.1 Audio Modifiers

To add some audio diversity, you can add Audio Modifiers, making each particle sounding slightly different from any other particle (e.g. random frequency response, random gains, etc.).



Audio Modifiers Panel

1. **+** - add a new audio modifier.
2. **Trash** - remove the audio modifier.

**Note:** This button is only visible when an audio modifier is selected on the list.

3. **List** - a list with all audio modifiers currently applied to the particles.

**TIP 1:** Select one of the modifiers to see/edit its information.

**TIP 2:** You can **enable** or **disable** the modifiers to try different combinations or to easily disable a modifier from being applied to the respective object.

**Note:** By enabling or disabling modifiers, you will have to re-render the scene's microphone(s)

4. **Edit Panel** - where you can see and edit all parameters of an audio modifier.

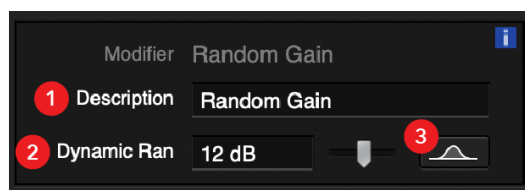
**Note:** This panel is only visible when an audio modifier is selected on the list.

## I. Audio Modifier - Random Gain

This audio modifier will apply a random gain to each particle.

**Note:** Without this audio modifier, all particles emit their sound with the same intensity (“volume”).

**TIP:** By adding this modifier, you get more diversity, in terms of sound intensity.



Random Gain Modifier Panel

1. **Description** - A short description for this audio modifier.
2. **Dynamic Range** - the dynamic range of the random gains.

**TIP:** For instance, by specifying a dynamic range of 20 dB, each particle will receive a random gain that ranges from -20 to 0 dB of attenuation. This value is represented between parentheses on the "Audio Modifiers" list.

3. **Random Settings Button** - this button allows you to change the random settings of the modifier.

**TIP:** By default, each particle will have a random gain with an uniform distribution. You may use these settings to control different distributions (for instance, if you want most particles to have mid-range values).

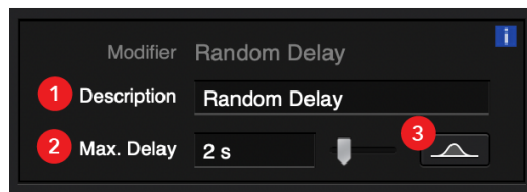
**Note:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

## II. Audio Modifier EQ - Random Delay

This audio modifier will apply a random filter to each particle.

**Note:** Without this audio modifier, all particles start to play their sound at the same time.

**TIP:** By adding this modifier, each particle will have an initial random delay.



Random Delay Modifier Panel

1. **Description** - A short description for this audio modifier.
2. **Max. Delay** - the maximum delay time.

**TIP:** For instance, by specifying a maximum delay of 2 seconds, each particle will have a random delay that ranges from 0 to 2 seconds.

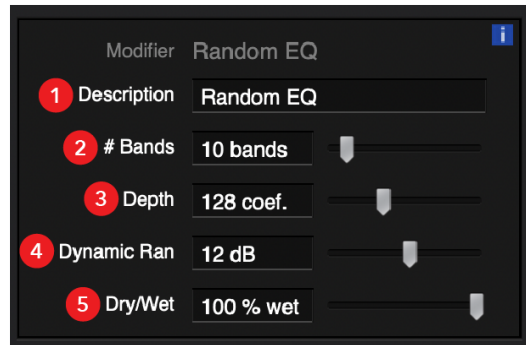
3. **Random Settings Button** - this button allows you to change the random settings of the modifier.

**TIP:** By default, each particle will have a random delay with a uniform distribution. You may use these settings to control different distributions (for instance, if you want most particles to have mid-range values).

**Note:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

### III. Audio Modifier - EQ - Random EQ

This audio modifier will apply a random EQ to each particle, which result in a random frequency response.



Random EQ Modifier Panel

1. **Description** - A short description for this audio modifier.
2. **# of Bands** - the number of bands.

**TIP:** For instance, if you specify 10 bands, the original audio stream will be split in 10 frequency bands, with each particle reproducing one of the available bands.

3. **Depth** - the depth of the filter.

**Note:** Since the system uses a FIR filter, this value corresponds to the number of coefficients of the filter. A higher number creates more complex filters with higher separation between bands, but will increase the complexity of the render process.

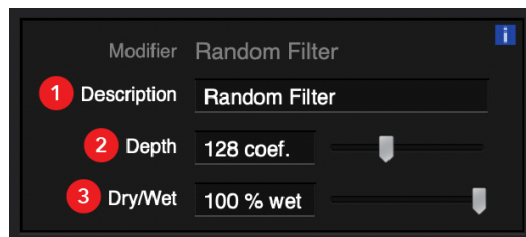
**TIP:** Low complexity filters will have around 20 coefficients, medium complexity filters will have around 100 coefficients, and high complex filters will have around 500 coefficients.

4. **Dynamic Range** - the maximum variation in each EQ band.
5. **Dry/Wet** - the impact of the defined random band.

**TIP:** The higher its value, the more impact it has, and vice-versa.

## IV. Audio Modifier - EQ - Random Filters

This audio modifier will apply a random filter to each particle, which result in a random frequency response.



Random Filters (EQ) Modifier Panel

1. **Description** - A short description for this audio modifier.
2. **Depth** - the depth of the filter.

**Note 1:** Since the system uses a FIR filter, this value corresponds to the number of coefficients of the filter.

**Note 2:** A higher number creates more complex filters with higher impact and higher slopes, but will increase the complexity of the render process.

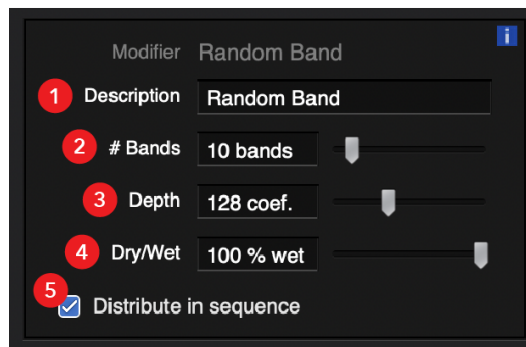
**TIP:** Low complexity filters will have around 20 coefficients, medium complexity filters will have around 100 coefficients, high complex filters will have around 500 coefficients.

3. **Dry/Wet** - the impact of the defined random filter.

**TIP:** If you choose "100%", it will play the filtered audio in its entirety, and "0%" will cancel the filter and will only play the original sample. In-between values will render a mix result between the filtered and the original audio sample.

## V. Audio Modifier - EQ - Random Bands

This audio modifier will apply a random filter to each particle, which result in a random frequency response.



Random Bands (EQ) Modifier Panel

1. **Description** - a short description for this audio modifier.
2. **# of Bands** - the number of bands.

**TIP:** For instance, if you specify 10 bands, the original audio stream will be split in 10 frequency bands, with each particle reproducing one of the available bands.

3. **Depth** - the depth of the filter.

**Note:** Since the system uses a FIR (Finite Impulse Response) filter, this value corresponds to the number of coefficients of the filter. A higher number creates more complex filters with higher separation between bands, but will increase the complexity of the render process.

**TIP:** Low complexity filters will have around 20 coefficients, medium complexity filters will have around 100 coefficients, and high complex filters will have around 500 coefficients.

4. **Dry/Wet** - the impact of the defined random band.



**TIP:** If you choose "100%", it will play the filtered audio in its entirety, and "0%" will cancel the filter and will only play the original sample. In-between values will render a mix result between the filtered and the original audio sample.

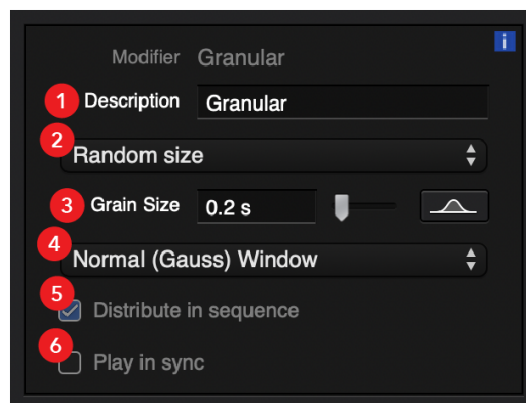
5. **Distribute in Sequence** - to obtain a better distribution, this feature will distribute the available bands in sequence.

**Note 1:** If checked (blue light), the system will distribute bands in sequence – the first particle will get the first band, the second particle will get the second band, and so on.

**Note 2:** If unchecked (black), each particle will get a random band, which could result in some bands being reproduced by much more particles than others.

## VI. Audio Modifier - Granular Synthesis

This audio modifier allows you to use granular synthesis. Each particle will only reproduce a small fragment (grain) of the audio file, instead of the entire audio file.



Granular Synthesis Modifier Panel

1. **Description** - a short description for this audio modifier.
2. **Size** - this popup button allows you to choose from:
  - 2.1. **"Fixed size"** - all particles will have the same grain duration.
  - 2.2. **"Random size"** - each particle will have a random duration.
3. **Grain Size** - the duration of each grain.

**Note 1:** If a “Random size” is selected, this value represents the maximum grain size.

**Note 2:** By default, each particle will have a random grain with a uniform distribution. You may use these settings to control different distributions (for instance, if you want most particles to have mid-range values).

**Note 3:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

4. **Window** - several windows are supported, to smooth the attack and the release part of each grain:

- 4.1. [Rectangle window \(instant attack/release\)](#)
- 4.2. [Normal \(Gauss\) window](#)
- 4.3. [Hann window](#)
- 4.4. [Triangle window](#)
- 4.5. [Tukey window](#)

5. **Distribute in Sequence** - instead of random grains, the “Distribute in Sequence” feature will start to distribute the available grains in sequence.

**Note 1:** If checked (blue light), the system will distribute grains in sequence – the first particle will get the first grain, the second particle will get the second grain, and so on.

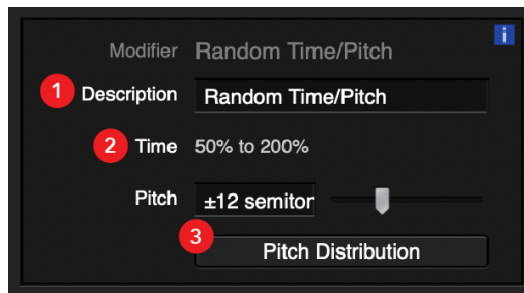
**Note 2:** If unchecked (black), each particle will get a random grain.

6. **Play in sync** - this feature will add an additional delay to each particle, equal to the start time of its grain. This creates a jumping effect, almost like an audio stream that is jumping from particle to particle.

**Note:** for Particle Emitters, this parameter is disabled since the emitter itself equally delays particles between them.

## VII. Audio Modifier - Random Time/Pitch

This audio modifier will change the speed of the audio stream, changing both time and pitch (varispeed).



Random Time/Pitch Modifier Panel

1. **Description** - A short description for this audio modifier.
2. **Time** - The interval of the possible time changes to the audio sample

**Note:** This parameter is affected by the Pitch parameter below.

**TIP 1:** A value higher than 100% will **speed up** audio and **increase pitch**.

**TIP 2:** A value lower than 100% will **slow down** audio and **decrease pitch**.

3. **Pitch** - The range of the pitch variation.

**Note:** By changing this parameter, the speed parameter will also change accordingly.

**TIP:** This range is, by default, symmetric, meaning that, e.g., "12 semitones" means that the pitch will range between -12 and +12 decibels.

4. **Random Settings Button** - This button allows you to change the random settings of the modifier.

**Note 1:** By default, each particle will have a random time/pitch value with a uniform distribution.

**Note 2:** A [purple border](#) on this button indicates that a custom random setting was chosen by the user.

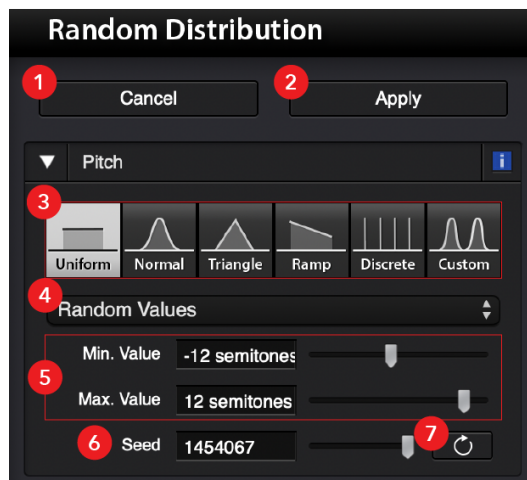
**TIP:** You may use these settings to control different distributions (for instance, if you want most particles to have mid-range values).

## Chapter 5

# Random Distribution

## 5.1 Distribution Settings

This will control how random values will be generated for this specific property (e.g. the azimuth of a circle).



Random Distribution Panel

1. **Cancel** - ignore any changes and return to the previous screen.
2. **Apply** - use the new generated set of values.
3. **Distributions** – different random distributions you can choose from:
  - 3.1. **Uniform Distribution** - with a uniform distribution, each random value will be generated anywhere in the range between the minimum value and the maximum value.
  - 3.2. **Normal Distribution** - with a normal distribution, each random value will have a higher probability to be generated near a specific value.

3.2.1. **Mean** - where do you want more values to be created near?

3.2.1.1. **Standard Deviation** - how near do you want to create those values?

**TIP 1:** Higher value tends to generate numbers almost uniformly between minimum and maximum values.

**TIP 2:** A lower value tends to generate numbers only very near the “mean” value.

3.2.2. **Minimum value** - what is the lowest possible value?

3.2.3. **Maximum value** - what is the highest possible value?

3.3. **Triangle Distribution** - with a triangle distribution, each random value will have a higher probability to be generated near a specific value, but with a different behavior.

3.3.1. **Minimum value** - what is the lowest possible value?

3.3.2. **Middle value** - where do you want more values to be created near?

3.3.3. **Maximum value** - what is the highest possible value?

3.4. **Ramp Distribution** - with a ramp distribution, the probability decreases near one of the edges and increases near the other edge.

3.4.1. **Minimum value** - what is the lowest possible value?

3.4.2. **Maximum value** - what is the highest possible value?

3.4.3. **Slope** - a value between -1 and 1, indicating the slope of the distribution ramp.

3.5. **Discrete Distribution** - with a discrete distribution, you specify all the possible values.

3.5.1. **Possible Values** - write the possible values, using a blank space to separate them.

**TIP:** For instance, if you specify 0 and 10, the random generator will only create 0's or 10's (no values in-between).

3.6. **Custom Distribution** - the custom distribution is a mix of discrete and normal distributions. Instead of specifying only one central value (normal distribution), you specify several discrete values, and the random

generator will create random values on the neighborhood of each discrete value.

**3.6.1. Main values** - several central values (separated by blank spaces).

**3.6.2. Std. Deviation** - how near do you want to create values? A higher value tends to generate values almost uniform. A lower value tends to generate values only very near one of the main values.

**3.6.3. Left margin/right margin** - the range before and after the central value.

**TIP 1:** A higher value tends to generate values almost uniform.

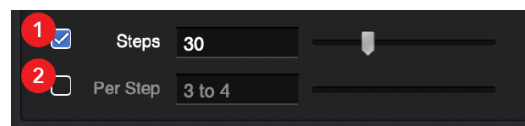
**TIP 2:** A lower value tends to generate values only very near one of the main values.

**4. Random/Sequence Values** - it is possible for you to choose how to randomize the particles within the distribution you are defining:

**4.1. Random Values** - allows you to select a range of Seeds (a total of 2097153 seeds) where each one is a different possible combination for the particles' displacement.

**TIP 1:** Each Seed is a unique one, meaning that if you were to open a different project, and apply the same modifier, you would just need to insert the same Seed number from the previous project.

**4.2. Sequence Values** - allows you to distribute the particles in even parts within the range you defined in your distribution mode, and you can choose between:



The image shows a dark-themed UI with two settings. Setting 1, labeled 'Steps', has a checked checkbox and a value of '30'. Setting 2, labeled 'Per Step', has an unchecked checkbox and a value of '3 to 4'. Both settings have a slider bar to their right.

“Steps” and “Per Step” parameters

**4.2.1. (1) No. of Steps** - how many sections you want to divide your distribution (this value will divide the number of particles of your Group/Emitter, affecting how many Particles Per Step there are).

**Note:** This value will divide the number of particles of your Group/Emitter, affecting how many Particles Per Step there are.

4.2.2. (2) **Particles Per Step** - how many particles per step there are.

**Note:** This value will divide the number of particles of your Group/Emitter, affecting how many Steps there will be.

5. **Parameters** – depending on the distribution you select; its respective parameters will appear in this area.
6. **Seed** – by default, “Random Values” is active, showing this “Seed” parameter for you to choose one (see step 4.1).
7. **Recreate new values** - completely recreate a new set of random numbers.

## 5.2 Probability Distribution

This view presents the probability distribution of the generated random values for this property:



*Probability Distribution Panel*

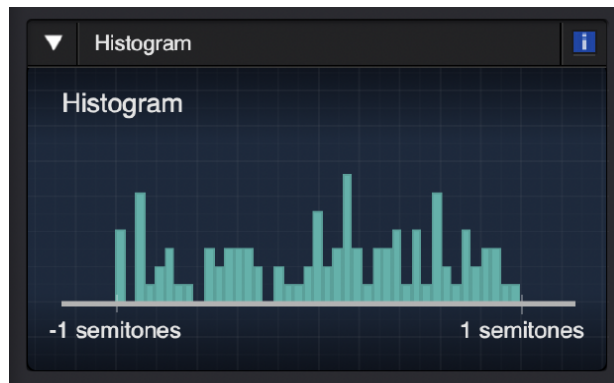
**Note:** This is a theoretical point-of-view, which may not correspond to the actual generated values, especially if the number of particles is low. Nevertheless, it shows what would be the expected distribution between the minimum and maximum values.



**TIP:** A higher value in some range means that the probability of generating values on that range is higher.

## 5.3 Histogram

This view presents the histogram of the generated random values for this property:



*Distribution Histogram Panel*

**Note:** A bar graph shows how the values are actually distributed between the minimum and maximum values.

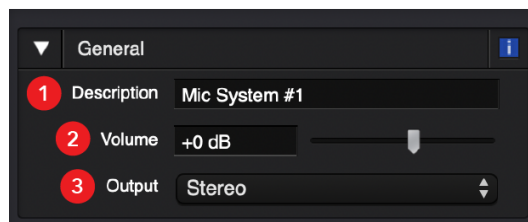
**TIP:** A higher bar means that more values exist on that range.

## Chapter 6

# Microphones

## 6.1 Overview

The virtual microphones of Sound Particles allow you to capture the surrounding events surrounding them on the 3D scene. Various types of microphones are available.



*Microphones General Panel*

1. **Description** - a short description of this microphone.
2. **Volume** - the volume of the render of the microphone.

**Note:** the applied Volume change will affect the volume of the exported render file.

3. **Output** - the output type of the microphone/

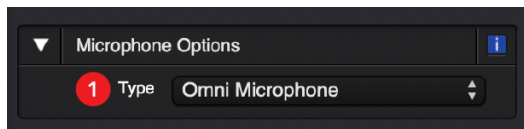
**Possible values:**

- 3.1. **Mono** - for single microphones.
- 3.2. **Stereo** - for stereo pairs and arrays.
- 3.3. **Ambisonics** - up to 6th order Ambisonics.
- 3.4. **Multichannel** - for complex multichannel setups (5.1, etc).

## 6.2 Microphone Options

Depending on the chosen microphone (output type), different options are available.

### 6.2.1 Mono

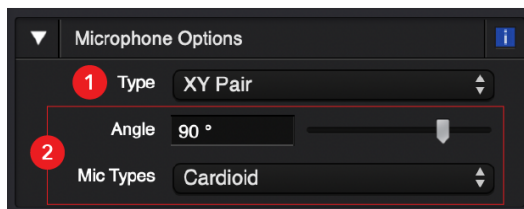


*Microphone Options of a Mono Microphone*

**For a mono microphone, you can choose the type (1) of microphone:**

- Omnidirectional
- Figure-of-eight
- Cardioid
- Hypercardioid

### 6.2.2 Stereo



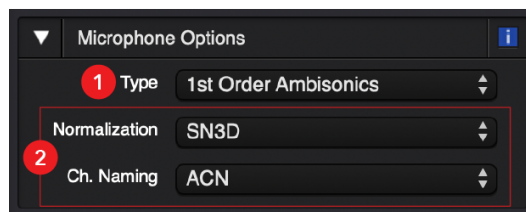
*Microphone Options of a Stereo Microphone*

**For a stereo pair/array, several types (1) are available, each one with its own set of parameters (2):**

- Mid/Side pair
  - Mid/Side
  - Left/Right
- XY pair
  - Angle
  - Type
- Blumlein pair
- AB pair
  - Distance between microphones

- Types
- **ORTF pair**
  - Distance between microphones
  - Angle
  - Types
- **Decca Tree**
  - Front distance (distance between the front mic and the line of the side mics)
  - width (distance between left and right mic)
  - angle (between left/right mics)
  - output format (left/right; center/left/right)
  - Type

### 6.2.3 Ambisonics



*Microphone Options of an Ambisonics Microphone*

**For an Ambisonics microphone, you may choose its type (1) and edit its parameters (2):**

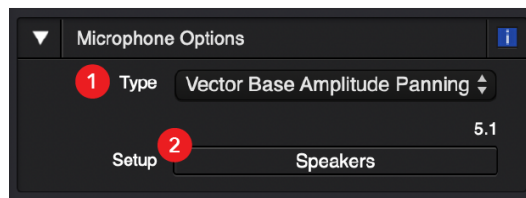
- **Soundfield Microphone (A format)**
  - Type of microphone capsules
    - Cardioid
    - Hypercardioid
    - Subcardioid
  - Distance
- **1st order Ambisonics**
- **2nd order Ambisonics**
- **3rd order Ambisonics**
- **4th order Ambisonics**
- **5th order Ambisonics**
- **6th order Ambisonics**

**Note 1:** For the regular Ambisonics, you can specify: the normalization method (N3D, SN3D, maxN, FuMa) and the naming/order convention (ACN, FuMa, SID).

**Note 2:** For Ambisonics of 4th order or above, only ACN naming/ordering are available.

**Note 3:** The default values are SN3D normalization and ACN naming.

## 6.2.4 Multichannel



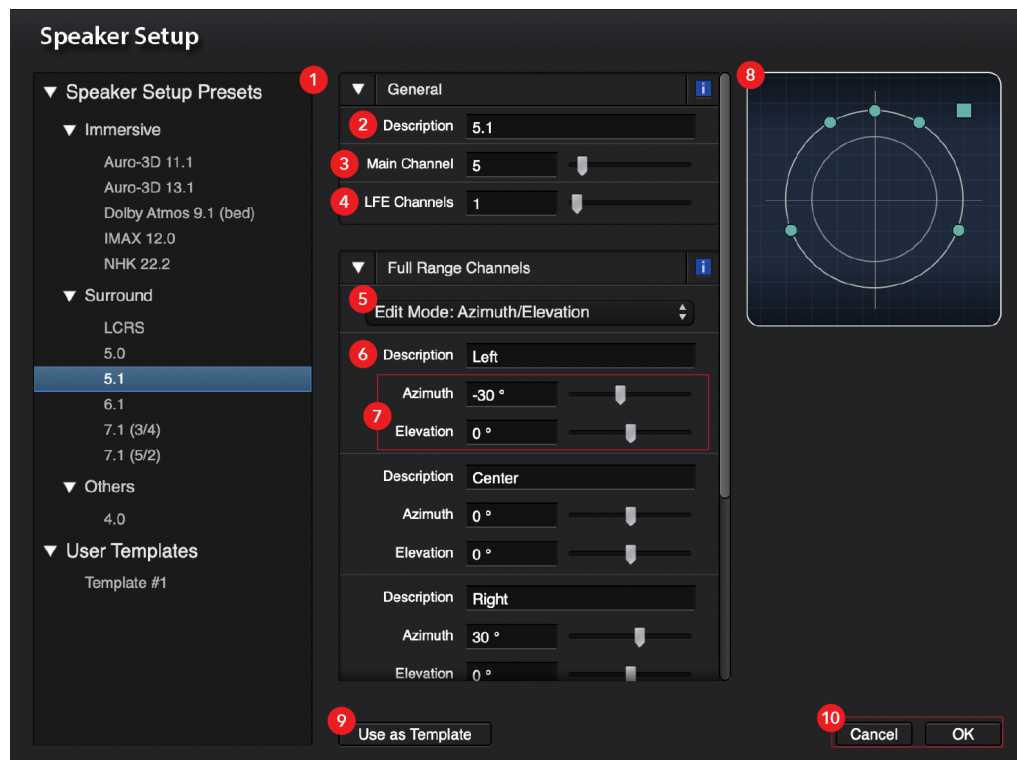
*Microphone Options of a Multichannel Microphone*

**For multichannel, the system uses “Vector Base Amplitude Panning (VBAP)”, which is capable of complex setups.**

**Note:** The “Speakers” button (2) allows you to enter a speaker setup dialog, where you can choose one of the available speaker templates or create your own speaker setup.

## 6.3 Speaker Setup

On the Speaker Setup panel, you can use the default or create your own custom setup of speakers, allowing you to define the number of main speakers, LFE channels and their characteristics, such as position and angle of capture.



Multichannel Setup Panel

1. **Speaker Presets** - here you can find both the default and the user created setups.
2. **Description** - a short description for this speaker setup.
3. **Main Channels** - the number of full range channels (number of outputs, excluding LFE/Sub-woofers).
4. **LFE Channels** - the number of LFE/Sub-woofer Channels.
5. **Edit Mode** - You may edit speakers using 3 possible modes:
  - 5.1. **Azimuth**
  - 5.2. **Azimuth/Elevation**
  - 5.3. **XYZ**
6. **[Speaker] Description** - a short description for the speaker.

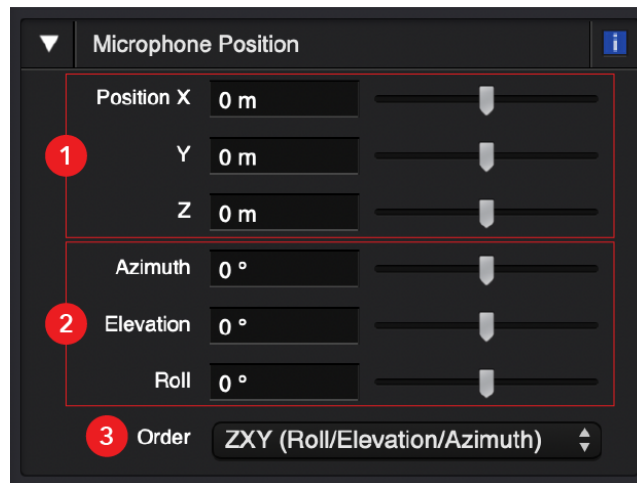
**Note:** Positive values to the left and negative values to the right.

**7. Azimuth/Elevation/XYZ** - in this area, you can edit the different parameters referred on step 5:

- 7.1. **Azimuth** - The azimuth of the speaker, i.e., the angle between the speaker and the front position, considering the horizontal plane (positive values to the left and negative values to the right).
- 7.2. **Elevation** - The elevation of the speaker, i.e., the angle between the speaker and the horizontal plane (positive values above; negative values below).
- 7.3. **XYZ** - The XYZ coordinates of the speaker, considering a central position at (0,0,0).

## 6.4 Microphone Position

The location and direction of the virtual microphone:



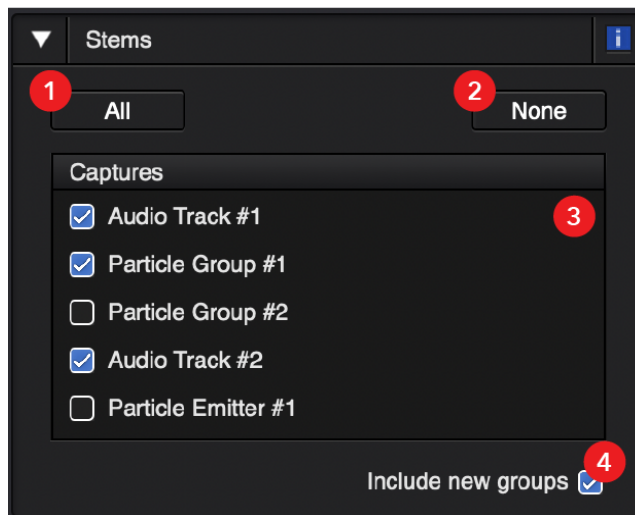
*Microphone Position Panel*

- 1. X (Azimuth), Y (Elevation), Z (Distance)** - location of the microphone.
- 2. Azimuth / Elevation/ Roll** - change the direction of the microphone:
  - 2.1. **Azimuth** - rotation over the z axis (left/right).
  - 2.2. **Elevation** - rotation over the x axis (up/down).
  - 2.3. **Roll** - rotation over the y axis (spin in its own axis).
- 3. Order** - Change the rotation order of your microphone between:

- 3.1. [XYZ \(Elevation/Azimuth/Roll\)](#)
- 3.2. [YZX \(Azimuth/Roll/Elevation\)](#)
- 3.3. [ZXY \(Roll/Elevation/Azimuth\)](#)
- 3.4. [XZY \(Elevation/Roll/Azimuth\)](#)
- 3.5. [YXZ \(Azimuth/Elevation/Roll\)](#)
- 3.6. [ZYX \(Roll/Azimuth/Elevation\)](#)

## 6.5 Stems

This feature allows you to create stems, indicating if the microphone should capture every particle group or only some groups (using other microphones to capture the remaining groups/sources).



Microphone Stems Panel

1. **All** - press this button to activate all groups (capturing the sound of everything).
2. **None** - Press this button to deactivate all groups (the microphone will not capture any groups/sources).

**TIP:** This button acts as a quick shortcut to disable all groups before you activate the few desired groups.

**Note 1:** Having a microphone with all groups disabled will be useless, since it will not capture anything.

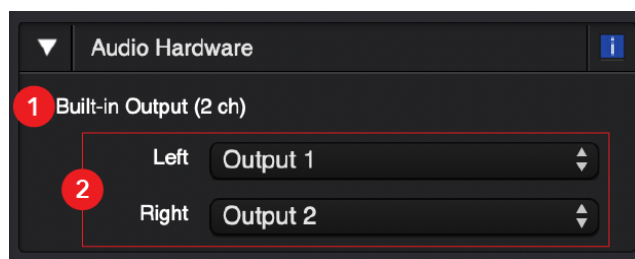
**Note 2:** Pressing this button will also deactivate the "Include new groups" checkbox.



3. **Groups** - a list of all existing particle groups is presented, allowing you to enable/disable the groups that you want to capture with the current microphone.
4. **Include new groups** - this checkbox gives information about the desired behavior if a new group is added latter on (should it be also captured by the microphone or not?).

## 6.6 Audio Hardware

This panel maps the output of the virtual microphone with the outputs of your audio interface.



*Microphone Audio Hardware Panel*

1. **Device name:** this small label reminds you what is the current selected audio device.

**TIP:** You may choose a different audio interface on the “I/O” menu.

2. **Channels:** for each output of your virtual microphone, a pop-up button is presented that allows you to select which output from your audio interface should be used to reproduce audio.

**TIP:** An “off” choice is also available, if you do not want to reproduce some channels of your virtual microphone.

## Chapter 7

# Render

## 7.1 Overview

After constructing your scene and creating all the tracks and microphone(s) you require, it's time to render it all up so that you can listen to the audio of your project.

You can render your scene within two possible ways: Auto-Render or manual Render.

## 7.2 Auto-Render

Newly to Sound Particles 2, with this mode active (see Chapter 3, Section 3.3), you can render your scene while playing it back in real-time, allowing you to listen to your scene as the software renders it.

**TIP:** Ideal to make quick/small changes and for simple projects (few particles) ...

**Note:** ... but not for highly complex scenes, as it is a heavy CPU processing component.

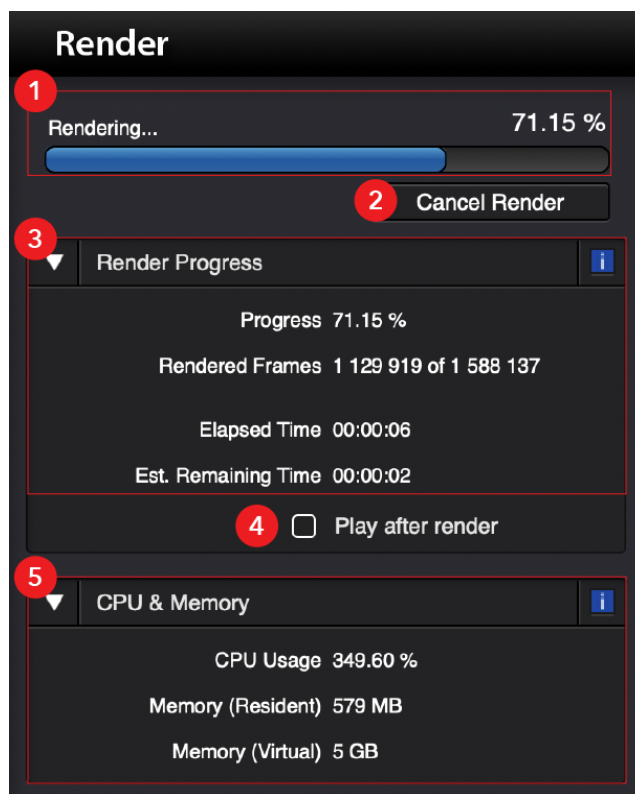
## 7.3 Render (Manual)

If either you will not be available to listen to your scene or it is too heavy and complex to process in real-time, you can opt for starting a manual render process (see Chapter 3, Section 3.3).

**TIP:** While rendering, you can listen to sections that were already rendered.

**Note 1:** you cannot edit your scene while this render is processing.

**Note 2:** this mode opens its own Inspector (see below).



Render Inspector

1. **Render Progress (simple)** - a simple illustration of the progression of the current render, with only a percentage and a progress bar.
2. **Cancel Render** - cancels the current render process.

**Note:** canceling a render does NOT erase any sections that were already render, meaning they will still be listenable.

3. **Render Progress (full)** - a more detailed information regarding the progress of the render. It displays:

- 3.1. **Progress** - the percentage of render completion.
- 3.2. **Rendered Frames** - how many frames were rendered of the total number of frames of your project.

**Note:** The number of frames goes accordingly to the Sample Rate of your project (see Chapter 13, Section 13.2), meaning that, e.g., if you have 1 million total frames with 48 kHz of Sample Rate, you will then have 2 million total frames with 96 kHz.

- 3.3. **Elapsed Time** - how much time has passed since the render was initiated.
- 3.4. **Estimated Remaining Time** - how much time it's expected for the render to finish.

4. **"Play after render"** - if you wish to, check this box if you want the scene audio playback to start automatically when the render finishes.

5. **CPU & Memory** - information regarding the CPU and Memory usage during the render process:

- 5.1. **CPU Usage** - the percentage of the total CPU being used onto the Render.

**Note:** For every 100%, that means the 1 core is being additionally used (e.g: 200% = 2 cores; 400% = 4 cores; 1000% = 10 cores; etc.).

- 5.2. **Memory (Resident)** - the current memory usage of RAM that's being used for rendering.
- 5.3. **Memory (Virtual)** - the whole memory usage (RAM + Disk) being used for rendering.

## Chapter 8

# Export

After your scene is all rendered through the microphones, you may then export the rendered audio onto the system.

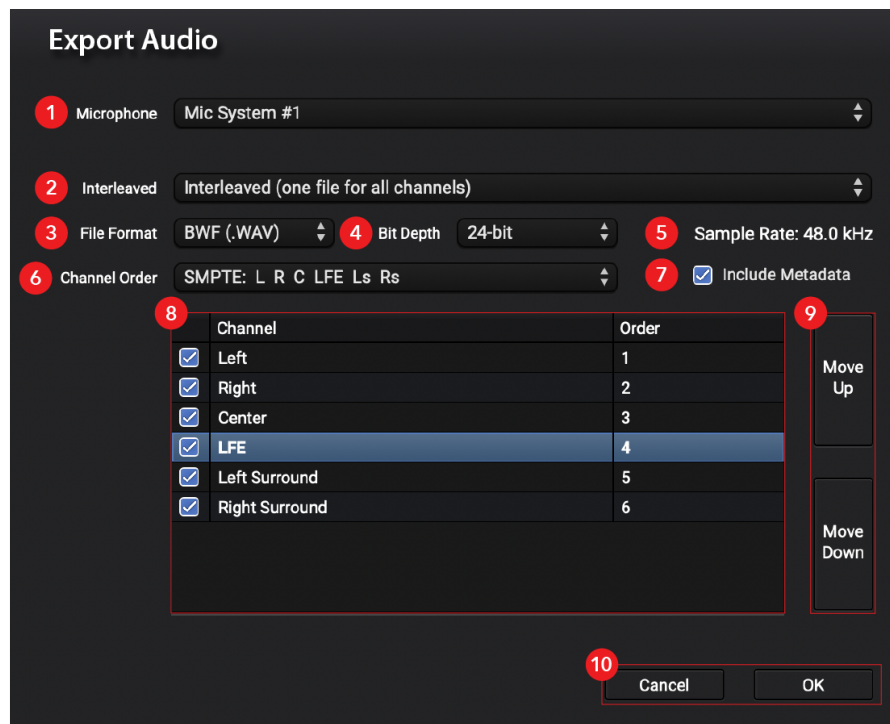
To do that, you can open the “Export Audio” panel either through “File -> Export -> Export Audio...” or by opening the context menu (secondary mouse button) above one of the microphones and clicking “Export Audio...”.

**TIP:** By clicking on “Export Audio...” through a microphone’s context menu, the Export window will immediately have that same mic selected for exporting.

**Note:** The microphone you want to export from has to be rendered.

## 8.1 Export Audio

The “Export Audio” window lets you to configure how you want to export the audio from a microphone of your scene, from the mic’ to export, interleaving mode, file format, bit depth, metadata inclusion and also channel order and selection.



Export Audio Window

- 1. Microphone** - the microphone to export the audio from.
- 2. Interleaved** - choose how you want to export your audio:
  - 2.1. **Interleaved** - one single file with all the selected channels on it.
  - 2.2. **Non-Interleaved** - each selected channel will be exported to its own audio file.
- 3. File Format** - the format that the file(s) will be exported:
  - 3.1. **BWF (.WAV)**
  - 3.2. **AIFF (.AIFF)**
  - 3.3. **FLAC (.FLAC)**
- 4. Bit Depth** - The bit depth of the export audio file(s):
  - 4.1. **16-bit**
  - 4.2. **24-bit**
  - 4.3. **32-bit (float)**

**TIP:** The higher the Bit Depth, the better quality the audio file will have (but will also be larger).

- 5. Sample Rate** - the Sample Rate at which the audio file(s) will be exported.

**Note:** This value is affected by the Sample Rate chosen on the “Project Settings” (see Chapter 13, section 13.2). If you wish to export to a different Sample Rate, you'll have to change your project's Sample Rate and re-render the microphone again.

- 6. Channel Order** – the channel order that the channels will have when exporting the audio file(s). You can choose from:

**6.1. SMPTE**

**6.1.1. 5.1:** L R C LFE Ls Rs

**6.1.2. 7.1 (3/4):** L R C LFE Lss Rss Lsr Rsr

**6.2. Film**

**6.2.1. 5.1:** L C R Ls Rs LFE

**6.2.2. 7.1 (3/4):** L C R Lss Rss Lsr Rsr LFE

**6.3. Custom:** a custom channel order.

**Note:** This option is only available when the default 5.1 / 7.1 (3/4) setups are applied on the respective microphone.

- 7. Include Metadata** - check this box if you want to include Metadata information on the audio file(s), such as the project “Title”, “Artist”, “Copyright”, etc. (see Section 8.1.1).

**Note 1:** This checkbox will become disabled if you select “FLAC” or “AIFF” on “File Format”.

**Note 2:** This checkbox is “checked” and locked if you are running the Trial version.

- 8. Channel List** - this list displays all the channels from your microphone, including with their names and order, and also checkboxes for you to select which channels you want to export.
- 9. Move Up/Down** - use these buttons if you want to move up or down a channel on the list.

**Note:** this value is affected by the Sample Rate chosen on the “Project Settings” (see Chapter 13, section 13.2). If you wish to export to a different Sample Rate, you’ll have to change your project’s Sample Rate and re-render the microphone again.

10. **Cancel/OK** - cancel the export process or accept the changes and go to the file explorer / Metadata screen (if “Include Metadata” is selected).

### 8.1.1 Include Metadata

If you checked the “Include Metadata” checkbox on the “Export Audio” window, the window of same name will appear after Export process is proceeded. On this window, you will be able to edit many labels regarding your project, from its “Title”, “Artist”, “Keywords” and others.

**Include Metadata**

1	<input checked="" type="checkbox"/>	Title	My Project
2	<input checked="" type="checkbox"/>	Artist	John Doe
3	<input checked="" type="checkbox"/>	Copyright	(c) Copyright MyCompany 2019
4	<input type="checkbox"/>	Date	2019-10-31
5	<input checked="" type="checkbox"/>	Software	Sound Particles 2.0
6	<input type="checkbox"/>	Keywords	
7	<input type="checkbox"/>	Comments	

8 Cancel 9 OK

Include Metadata Window

1. **Title** - the given title of the project.
2. **Artist** - the original artist of the project.
3. **Copyright** - copyright information you may require for the project.
4. **Date** - a date you may want to identify the project with (e.g: when it was started, when is to be released, etc.)
5. **Software** - the software you used for the project.
6. **Keywords** - keywords that might help you or your team to identify/sort the project.
7. **Comments** - additional comments to the project that may be useful.
8. **Cancel** - cancel the export process and return to your project window.



9. **OK** - accept the “Include Metadata” changes and open your OS file explorer/finder.

After concluding the “Include Metadata” process, the OS file explorer will open, and you will be able to select where you want to save and what name should the file have.

**Note:** Closing the OS window with “Cancel” will only return you to the Project Window, and you will have to restart the Export process again if required.

## Chapter 9

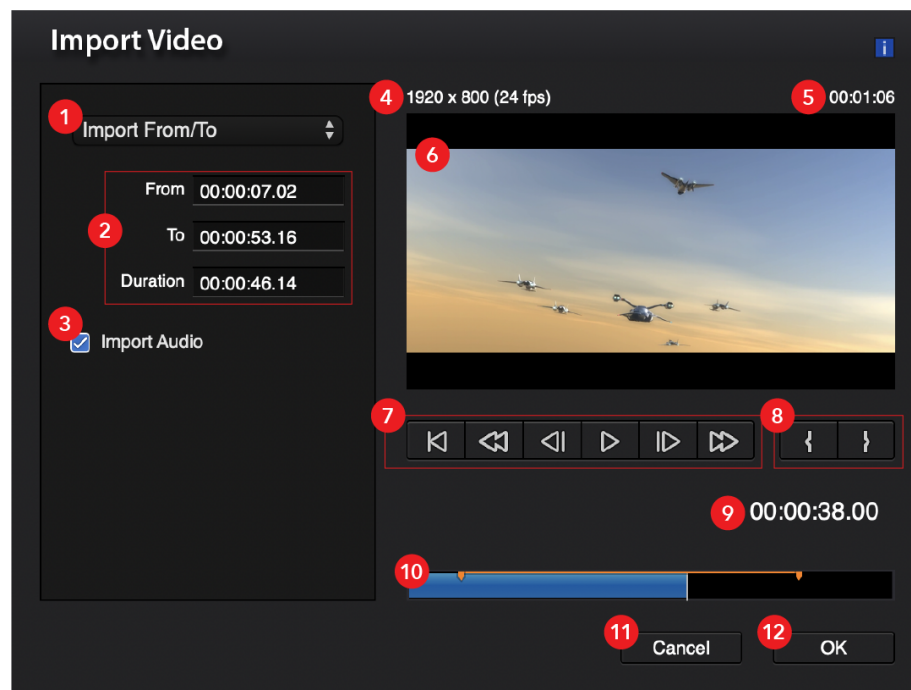
# Video

In Sound Particles, you can import a Video Reference for your project to help working on your scene with a visual aid, both for plain or 360°/VR image references.

### 9.1 Importing a video

You can start importing a video by going to the “Add” button on the Transport (see Chapter 3, Section 3.3) or by going through “File -> Import -> Import Video...” on the Menu Bar above (see Chapter 15).

That will open the “Import Video” panel, and you can use that panel to import a video reference file to your project, allowing you to specify if you want to import the entire file or only a fragment of it.



Video Import Setup Panel

1. **Import Entire Video/ From To** - use this popup button to specify if you want to import the entire video or only a part of it.
2. **From/To/Duration** - If you choose to import only a part of the video, these will specify the start frame, the end frame and the duration of it.

**Note 1:** All fields are only enabled if the "Import From To" choice is selected.

**Note 2:** All fields use the SMPTE format (hours:minutes:seconds:frames).

3. **Import Audio** - leave this checkbox checked if you want to import the audio from the video. The audio from the video will then be played when you play your project.

**Note:** The video's audio will not appear on any exported render.

4. **Resolution/Frame Rate** - the resolution and frame rate of the original video file.
5. **Duration** - the duration of the original video file.
6. **Video Preview** - the video preview allows you to watch the video as you define your import settings.

**TIP:** Above the video preview, you can see the image characteristics (resolution and frame rate) and duration of the original video file.

7. **Transport** - use the transport buttons to control the video preview.
8. **Mark In/Mark Out** - set the start and the end of the imported clip.

**Note:** Using these buttons will automatically activate the "Import From To" mode.

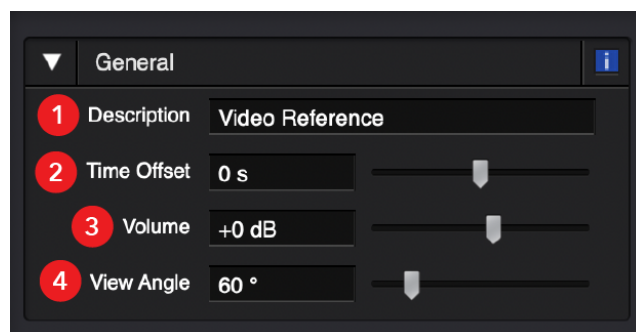
9. **Current Time** – the current time of the video playback.
10. **Play Bar** - use the play bar to quickly navigate through the video file.

**Note:** the "From/To" points will appear in orange markers.

11. **Cancel** - cancel the video import.
12. **OK** - import the video with the changes done on the panel.

## 9.2 Inspector - General

After importing a video, the "Video" inspector will open and will give you access to certain parameters and information regarding the imported video. This inspector can then be accessed by clicking on the video track on you Time Editor.



Video General Panel

1. **Description** - a small description for this video track.
2. **Time Offset** - the time offset of the video clip.

**TIP:** For instance, a time offset of 30 seconds means that the video clip will only start reproducing at the time of 30 seconds. A time offset of -30 seconds means that the video will start 30 seconds earlier (the first 30 seconds of the video will not be shown since the timeline starts at zero seconds).

3. **Volume** - the volume (gain) of the audio track of the video.

**TIP:** Increase this value to make the audio sound louder or decrease this value to make the audio sound softer.

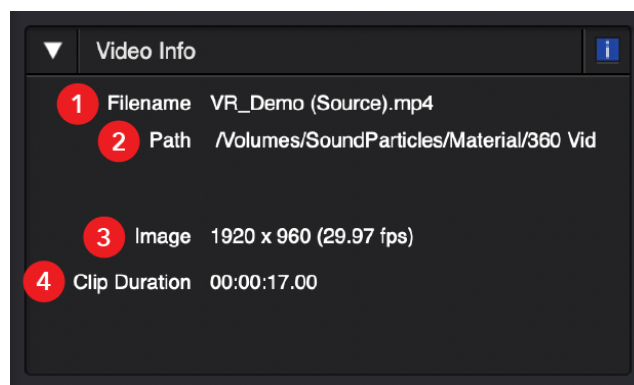
4. **View Angle** - if you are using a spherical view, this defines the width of the video.

**Note:** By default, it has a value of 60 degrees.

**TIP:** If you are working with virtual reality videos, change this to 360 degrees.

## 9.3 Inspector – Video Info

Some information about the video clip.



Video Info Panel

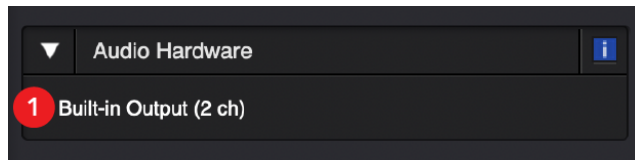
1. **Filename** - the name of the video file.
2. **Path** - the complete path of the video file.

3. **Image** - the image characteristics of the video, including the image resolution and the video frame rate.
4. **Clip Duration** - the duration of the imported clip.

**Note:** The original video could have had a larger duration, but this value only represents the duration of the video segment that was imported into the project.

## 9.4 Inspector – Video Audio Hardware

This panel maps the output of the stereo audio tracks with the outputs of your audio interface.



*Video Hardware Panel*

1. **Device name** - this small label reminds you what is the current selected audio device.

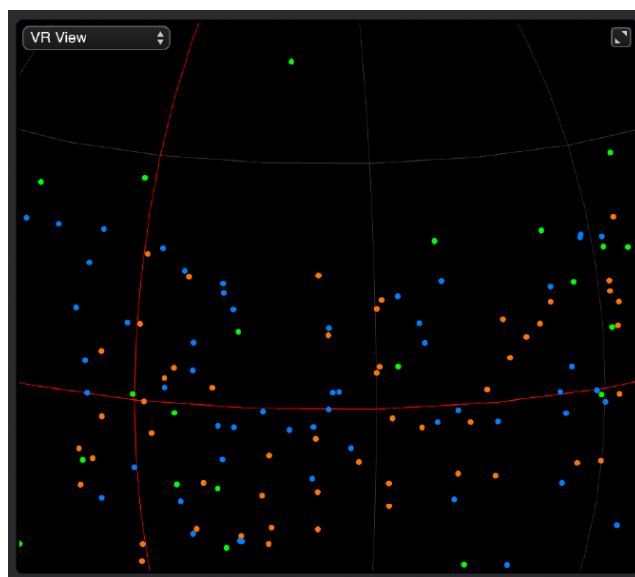
## Chapter 10

# VR

With Sound Particles, you can test your VR-designed projects with our VR tools, such as the VR View or the VR Client mobile application.

**Note:** To take advantage of the full VR workflow, an Ambisonics microphone must be used in order for the Binaural mode to work with the VR functionalities.

### 10.1 VR View



VR View

With the VR View (see Chapter 3, section 3.2.2-IV), you can control, with your mouse, the camera orientation as if you were simulating using VR goggles, and with the Binaural mode “On” and importing a 360° video (see Chapter 9, section 2), you can already have a coherent simulation of your final 360°/VR project.

However, there’s also the possibility to connect Sound Particles to the Sound Particles VR android app client, which allows you to use your mobile device, maybe with an additional pair of goggles, for the best preview of your VR/360°.

## 10.2 VR Client - Connection

### I. Mobile App

On the “VR” inspector, accessed through the Transport (see Chapter 3, Sector 3.3), you can connect to your Sound Particles VR Client, an Android app that can be used to test your VR projects.

**Note 1:** You can download the app at

<https://play.google.com/store/apps/details?id=com.soundparticles.vrclient.soundparticles.vr>

**Note 2:** The connection with the app is done by a password-protected wireless network.

**TIP:** To use this, connect the headphones on the computer, while video is shown on the smartphone app.

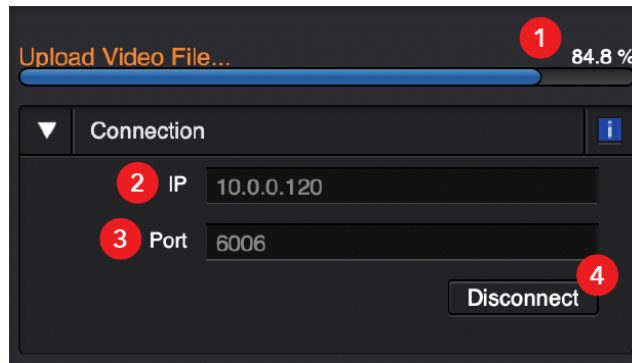


Sound Particles VR Client App - Connection Screen



## II. Desktop App

Through the Inspector, you have the “Connection” section that will help you on getting your desktop app being connected to the mobile app.



VR Client Connection Panel

1. **Video Uploading Progress** - the status of the upload of the video you have on your project.

**Note:** There must be a video on your scene for this progress bar to appear.

2. **IP** - the IP address of the VR Client (4 numbers, e.g. 10.0.0.1).

**TIP:** This information appears on the main screen of your VR Client app.

3. **Port** - The port of the VR Client (one number, e.g. 6006).

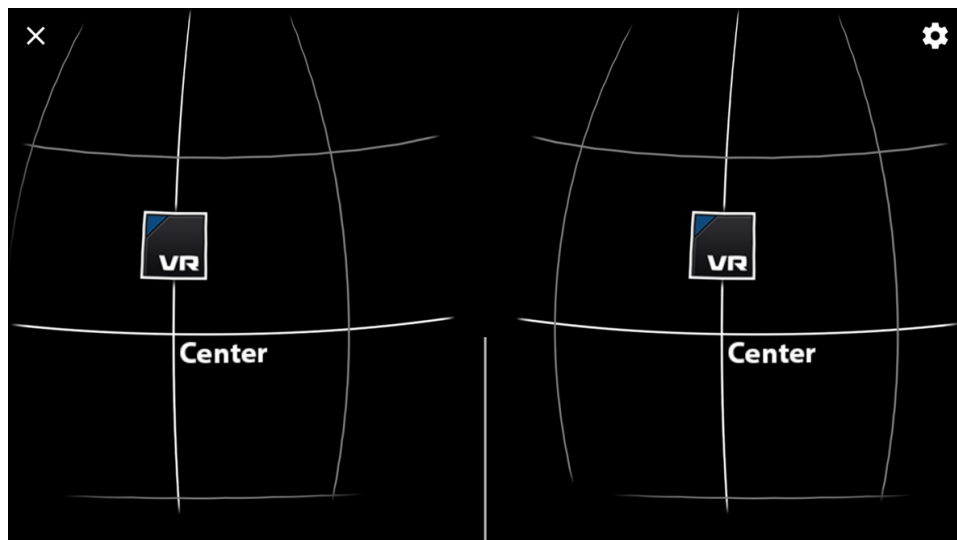
**TIP:** This information appears on the main screen of your VR Client app.

4. **Connect/Disconnect** - use this button to connect or disconnect to the VR client.

## 10.3 VR Client – Headset

### I. Mobile App

After successfully connecting with the mobile app, you will immediately see on it a 360° grid, alongside a “VR” icon with the label “Center”, which represents the center point of the view, in case you need to reorient yourself through your VR scene.

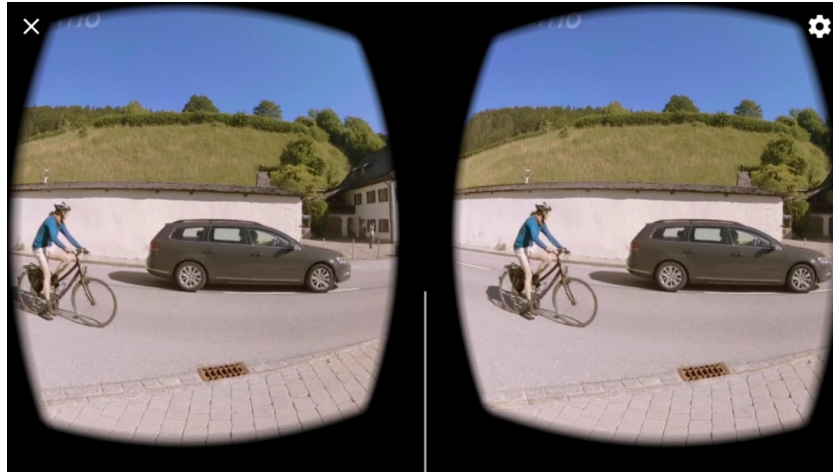


*Sound Particles VR Client App – 360° View Grid*

Also, by moving your device around, you will immediately notice that both the view on your device and on the VR View move as you do with it.

As stated before, if you have a rendered Ambisonics microphone on your scene, and activate the Binaural mode, starting the playback will immediately have an effect within the VR app, as moving the device around will track the camera’s orientation and the audio output will be affected respectively, adjusted to where you’re looking onto the scene.

If you happen to have a Video Reference (see Chapter 9, Section 9.1) on your project, the desktop VR Client will immediately start to upload the same video to the mobile VR client. After it is successfully uploaded (see 10.3 – II – 1-1.3), you will be able to see your video within the 360° view on the mobile app.

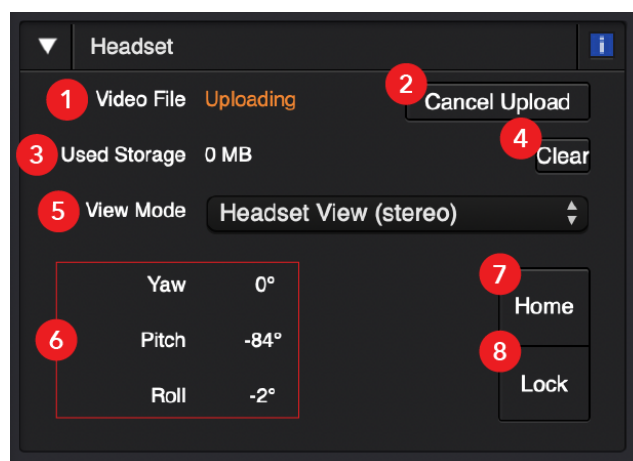


Sound Particles VR Client App – 360° Video running in-app with Dual View

**TIP:** If you have a pair of VR goggles, you can place your device on them and use that to control the device around with your head. Combining with your headphones connected to your computer, you will then experience your project in a full 360° experience.

## II. Desktop App

On the VR Client inspector, use the “Headset” panel to control the headset or to get information from it.



VR Headset Info Panel

## 1. Video File

**This shows the current status of the video file on the smartphone:**

- 1.1. **None** - the current project doesn't have a video track.
- 1.2. **OK** - the video is loaded on the VR client.
- 1.3. **Uploading** - the video is being uploaded at the moment.
- 1.4. **Missing** - the video is not loaded on the VR client (cancelled upload, deleted cache, etc.).

**TIP:** If “Missing”, use the Upload button (next to it) to re-upload the video.

2. **Upload Video/ Cancel Upload** - use this button to re-upload the video file or to cancel the current upload.

**Note:** These buttons only appear if you have a video file that, by some reason, was not uploaded automatically (cancelled upload, deleted cache, etc.) or during the upload process, respectively.

3. **Used Storage** - all video files are uploaded to the smartphone, and stored in a cache directory.

**TIP:** This allows you to see the amount of storage currently in use by the VR Client.

4. **Clear Cache** - use this button to remove all video files from VR client cache folder.

**TIP:** The contents of the cache folder of the smartphone can also be deleted by the smartphone system, if storage is required for other apps/system.

5. **View Mode (mobile app)** - use this pop-up button to select between:

- 5.1. **Single View** - a single, full screen view of the world.
- 5.2. **Headset View (stereo)** - a dual view (one for each eye).

**TIP 1:** Use “Single View” when using the VR client without a headset (e.g. holding the phone on your hand).

**TIP 2:** Use “Headset View (stereo)” when using the VR client with a headset.

6. **Yaw/Pitch/Roll** - you can see the Yaw (azimuth), Pitch (elevation) and Roll angles of the head position of the VR headset.
7. **"Head" (button)** - force the system to use the home position (0,0,0) instead of the current VR position.
8. **"Lock" (button)** - force the system to maintain the last VR position.

## Chapter 11

# CGI Import

A newcomer to Sound Particles 2.0, now it's possible to import CGI animation files to Sound Particles.

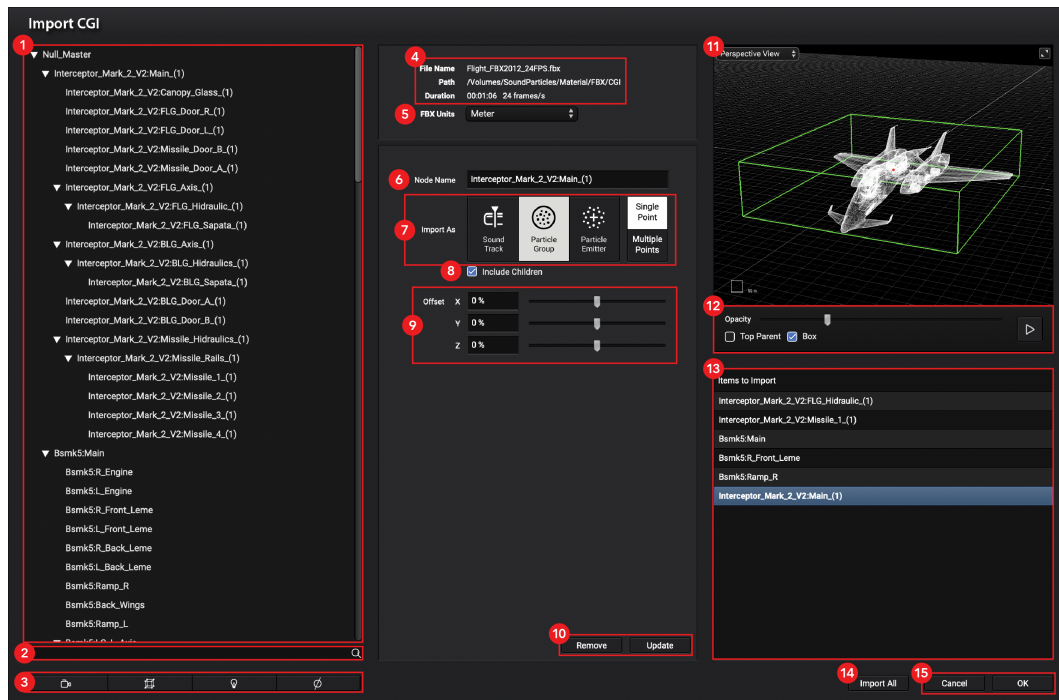
With this new feature, you can select any 3D Model of the scene, or even only a section of the model (e.g.: a wing of an airplane), to be transformed into any particle objects, and you can also import the scene's Cameras as microphones. All of this process will then import every inherent automation(s) that every object had when animated originally.

This feature, combined with the Video Import, can help you in working on your animation projects much more efficiently, as you won't need to manually create and automate the particles over a 2D Video Reference.

**Note:** Only FBX files are accepted.

## 11.1. Import CGI Window

You can start the CGI Import process by going to “File -> Import -> Import CGI...” on the top Menu Bar, opening the CGI Import window with information regarding your file and how to import it.



Import CGI window

1. **Mesh List** - a list of all the meshes of the selected FBX file.

**TIP:** you can filter this list by using the buttons on point 3

2. **Search Bar** - a search bar that allows you to find objects faster by writing down keywords or part of keywords.
3. **List Filters** – this are the filters for the object list, only showing objects that correspond to the respective selected filter(s):
  - 3.1. **Cameras**
  - 3.2. **Objects**
  - 3.3. **Lights**
  - 3.4. **Null Objects**
4. **File Info** – information regarding the FBX file, containing its: filename; path on the computer; duration and frame rate.

5. **Measurement Units** – the unit of measurement at which the original ones will be transformed into when put on the project scene.

**TIP:** for example, if you worked with an object with 10 meters of length, and choose “Inches”, it will turn its length, on the Sound Particles scene, to 10 inches.

6. **Name** – the name given to the selected object when imported.
7. **Import as & Single/Multiple Point** – select what kind of particle object you want the selected model to become when select what kind of particle object you want the selected model to become when imported:

7.1. **Audio Track** – one single Audio Track point that only plays one audio file.

7.2. **Particle Group** – a single point or multiple points Particle Group.

**TIP:** working with a single point Particle Group is ideal for you to try out different configurations over time over the Group, as with different forms, modifiers, etc.)

7.3. **Particle Emitter** – a single or multiple points that have emitters that spawn particles.

You will then be able to select if you want to only have a Single Point or Multiple Points assigned to the model:

7.4. **Single Point** – only one point is created within the model. You then can edit its Offset from the center of the model itself, distributing it through the XYZ axis.

**Note:** Single Point is the default mode when importing as an Audio Track.

7.5. **Multiple Point** – here, you will create various points (particles) through the 3D model, and you can select how you want the points distribution to be:

**Note:** the “Single/Multiple Points” only appear when Particle Group or Emitter are selected.



8. **Include Children** – check this box if you also want to import any children that a currently selected mesh has.

**TIP:** you can see that a mesh has children if there's a triangle at the left of its name on the Mesh List

9. **Parameters** – for each Single/Multiple Points mode, each will display its own set of parameters to edit:

9.1. **Single Point** – in Single Point mode, you can edit the **Offset** of the respective point, changing where the object is placed within the 3D model when imported to the scene.

9.2. **Multiple Point** – in Multiple Point mode, you can work within two **Convert Methods**:

9.2.1. **Use Vertices as particles** – choose the number of particles that will be created for each available vertex on that model.

**Note:** the number of particles per vertex will be divide with the total number of vertices, also meaning that the maximum number of particles per vertex that you can choose is equal to the total number of vertices.

9.2.2. **Random points in mesh lines** – choose how much particles per mesh line (between two vertices) you want to be created.

10. **Add/Remove/Update Mesh** – these buttons allow you to interact with the placement of meshes on the “To import” list (#13).

10.1. **Add to list** – add the current selected meshed to the “To import” list.

10.2. **Remove** – remove the selected mesh of the “To Import” list.

10.3. **Update** – if you need to change anything on a mesh you've already placed on “To Import”, just select it there, do the changes, and click on this button.

11. **Mesh View** – allows you to see the selected mesh within the different 3D perspectives (see Chapter 3, Sector 3.2). It works as a regular View, allowing you to move around, zoom, rotate, and also allows to maximize the View for a better insight.

**12. View Controls** – these elements allow you to configure how the Mesh View is presented:

**12.1. Top parent** – shows the selected mesh in yellow within its top-parent mesh (the furthest mesh without a parent).

**12.2. Show box** – shows the box of the volume/area occupied by the mesh.

**TIP:** the box margins correspond to the Single Point Offset limits, giving you a better insight on where and how further the point was/can be moved.

**12.3. Mesh Opacity (slider)** – this slider allows you to adjust the opacity of the mesh on the View.

**TIP:** different opacities may work differently from monitor to monitor, so, level it out until you reach a comfortable state.

**12.4. Pause/Play** – this button allows to stop/resume the camera rotation around the mesh on the Mesh View.

**13. Items to Import** – this list includes all the meshes that you previously edited and will import to the scene.

**14. Import All** – a shortcut to add all the FBX meshes and objects to the “Items to Import” window.

**15. Cancel/OK** – cancel the import/import the “Items to Import” objects.

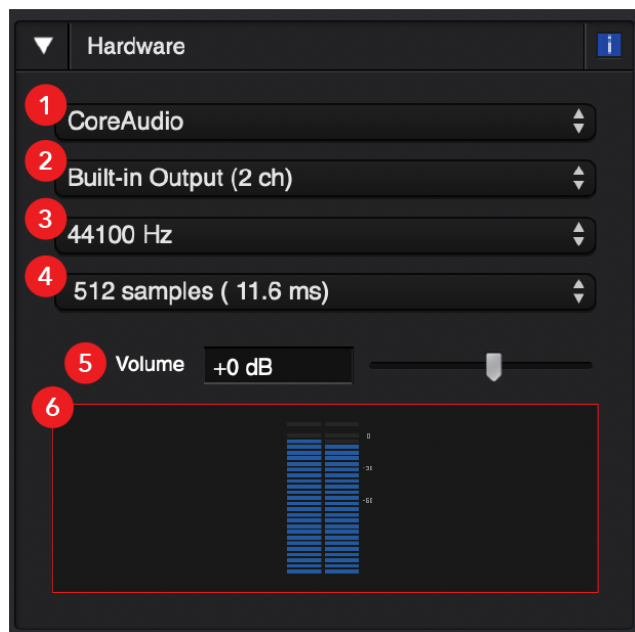
## Chapter 12

# I/O

The I/O menu allows you to manage configurations and modes related to your connected/available output(s).

### 12.1 Hardware

With this panel, you can select which and how your output is configured, also displaying visual information on the volume coming out through your output.



I/O Hardware Panel

1. **Audio API/ Engine** - a list of the available audio APIs/engines of your computer.

2. **Audio Interface** - a list of the available audio interfaces of your computer (including the number of output channels of each device).

**TIP:** You can choose the interface that you want to use with your projects.

**Note:** If you have an Avid interface, make sure Pro Tools is closed before launching Sound Particles.

3. **Sample Rate (hardware)** - shows the sample rate used by the selected audio interface.

**Note:** The audio interface may use a sample rate that is different from the sample rate of your project. If that is the case, Sound Particles will automatically resample the output audio streams before sending them to the outputs.

4. **Buffer Size** - since the CPU cannot be interrupted to process each sample, the audio interface will group as many samples together to be processed as a block.

**Note:** The higher the block size, the lower the risk of getting audio glitches or similar issues. The only downside is that higher block sizes will have a higher latency, shown in milliseconds (but which is not an issue with Sound Particles, since it doesn't process input hardware audio).

5. **Volume** - the volume of the hardware output.

**Note:** This doesn't affect the audio that is saved on file - it only affects the listened audio that you output on the audio interface.

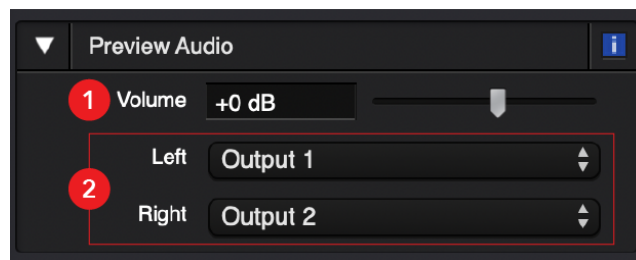
6. **VU Meters** - a visual representation of the output signal on each hardware output.

**TIP:** You may reset them by clicking on top of them, or right-click and choose "Clear clip light".

**Note:** A red clipping indicator light will appear each time a clipping situation exists.

## 12.2 Preview Audio

Sometimes you need to preview some audio material: listen to a file before importing it, listening a specific file you have already imported, listening to template audio (original vs. template). This panel allow you to config how do you want to route that audio into your audio hardware: which output channels to use and their volume.



*I/O Preview Audio Panel*

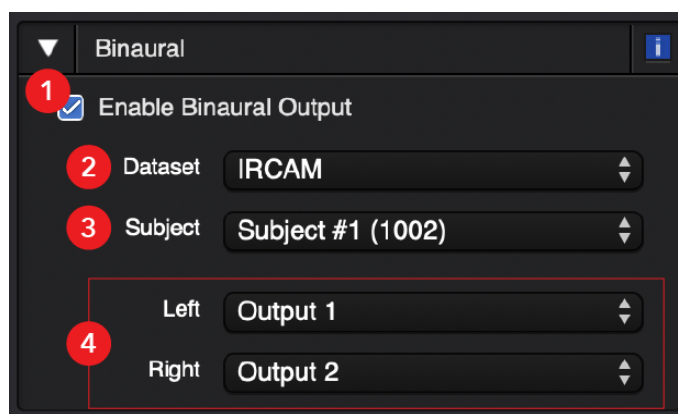
1. **Volume** - Applies some volume to the preview audio, which could be useful if you are working on a dubbing stage, and you don't want to listen to full scale audio material.
2. **Left/Right** - Which hardware channel do you want to use for audio output (left and right channels)?

**Note:** As mentioned before, these channels will only be used for previewing (any playback outside the main time editor).

## 12.3 Binaural

If you are using headphones, you can use binaural audio to simulate 3D sound over headphones.

**Note:** only effective for Ambisonics or multichannel virtual microphones.



I/O Binaural Setup Panel

1. **Enable Binaural Audio** - activates the binaural audio output, and disables the regular audio output, sending audio only in 2 channels.
2. **Dataset/Subject** - Sound Particles has several HRTF datasets, and each dataset includes measurements for several individuals or manikins.

**TIP:** Since each person has different ears, test between different datasets and subjects, until you find the one that feels more natural to you.

3. **Left/Right** - which hardware channel do you want to use for audio output (left and right channels)?

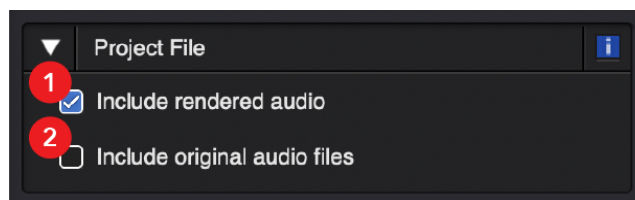
## Chapter 13

# Project Settings

On the Project Settings, you can configure certain aspects regarding your project(s), from what is saved on the “Save” file, what is the project sample rate and the physical behavior of sound in your scene.

## 13.1 Project Settings - Project File

What do you want to include on your project file?



*Project File Panel*

1. **Include Rendered Audio** - by default, this feature is enabled, which means that all rendered audio is stored on the project file.

**TIP:** If you disable this, the saved file will be smaller, but you will need to re-render the project again to be able to listen to it.

2. **Include Original Audio Files** - by default, this feature is disabled, which means that your project file will only save the file locations of each original audio file (the files you use to assign audio to the particles).

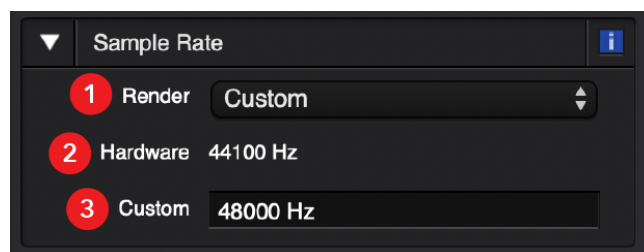
**TIP:** by enabling it, you add all input audio files on the saved file, increasing its size, but allowing you to easily move the project to another computer without worrying about file locations.

## 13.2 Sample Rate

The sample rate of your project will define the sample rate of your final render.

**Note:** Any input audio file that presents a different sample rate, will be automatically resampled (done in memory – Sound Particles never changes the content of input audio files).

**TIP:** Take into consideration that as you increase the sample rate value, you also increase the render complexity – doubling a sample rate value will double the time needed to render the project.



*Project Sample Rate Panel*

1. **Render** - choose the sample rate of your final render.

**The following choices are available:**

- 1.1. 44 100 Hz
- 1.2. 48 000 Hz
- 1.3. 88 200 Hz
- 1.4. 96 000 Hz
- 1.5. 192 000 Hz
- 1.6. Custom



**Note 1:** The default value is 48 000 Hz.

**Note 2:** If there is a difference (sample rate of the render vs. sample rate of the hardware), the system will automatically resample the output audio streams before sending them to the audio hardware.

2. **Hardware** - this label allows you to see what the current sample rate of your hardware, which could be different from the sample rate of your project (render).

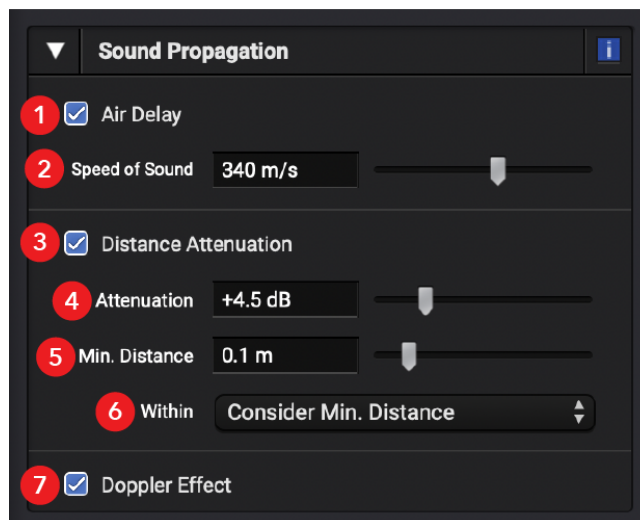
**TIP:** For instance, you may work on a 192 kHz project, but with an audio interface that only supports up to 96 kHz.

3. **Custom** - besides the standard sample rate values, you can use a custom sample rate value.

**Note:** This field only appears when the user selects “Custom” from the sample rate popup menu.

## 13.3 Sound Propagation

These settings will define the behavior of sound propagation between the particles and the virtual microphones.



Project Sound Propagation Panel

1. **Air Delay** - sound takes some time to travel between points.

**TIP 1:** A checked value (blue light) will **add some delay** between the moment the particle starts to reproduce sound and the moment that sound is captured by the virtual microphone (the amount of delay depends on the distance between the particle and the microphone).

**TIP 2:** An unchecked value (black) will consider an **instantaneous traveling between particles and microphones**. Eventually, you may uncheck this, if you have particles at different distances from the microphone that you want to capture perfectly in sync.

**Note:** The default value is **checked**.

2. **Speed of Sound** - the speed of sound slightly depends on the temperature and it usually varies between 330 and 340 meters per second.

**TIP:** You can specify a different speed value for any creative reasons.

**Note 1:** The default value is **340 m/s**.

**Note 2:** This parameter only appears if the “Air Delay” is checked.

3. **Distance Attenuation** - sound suffers attenuation as it travels through the air.

**TIP 1:** If checked (blue light), the distance between the particle and the microphone **will control the amount of the attenuation** applied to the sound.

**TIP 2:** If unchecked (black), the distance **will not affect the attenuation of sound**. Consider disabling this, if you want all particles to reach the microphone with the same strength, regardless of its distance.

**Note:** The default value is **checked**.

4. **Attenuation** - what is the amount of dB attenuation that is applied to the sound as the distance doubles?

**Note 1:** This is a **very important parameter**, as it controls the relation between the foreground sounds (near the microphone) and the background sounds (further away), acting almost like a depth-of-field parameter.

**TIP 1:** For instance, a 6 dB attenuation means that a particle located at 8 meters from the microphone will have a sound 6 dB weaker when compared with a 4 meter distance, or a 12 dB weaker when compared with a 2 meter distance, or 18dB weaker when compared with a 1 meter distance.

**TIP 2:** Increase this value if you want to **attenuate the background (distant) sounds**, or decrease this value (near zero) if you want to **increase the impact of the background (distant) sounds**.

**Note 2:** The default value is **+4.5 dB**.

**Note 3:** This parameter only appears if the “Distance Attenuation” is checked.

5. **Min. Distance** - As you decrease the distance between the particle and the microphone, the intensity of the captured sound increases. As the distance value gets near a zero value, the increase of intensity gets near infinity, which will create problems. Even with the normalization process that prevents clipping, such increase of intensity will result in full attenuation of all other sounds.

To prevent strange results, this “minimum distance” parameter exists – if the distance between the particle and the microphone reaches a value that is lower than this “min. distance”, the render process will not continue to increase its strength.

**Note 1:** The default value is **0.1 meter**.

**Note 2:** This parameter only appears if the “Distance Attenuation” is checked.

6. **Within** - if the distance between the particle and the microphone reaches the “min. distance” value, you can specify 2 possible behaviors:

- 6.1. **Consider Min. Distance:** the render engine will use the “min. distance” value (instead of the actual distance) to calculate the gain/attenuation of its signal.
- 6.2. **Mute Particle:** the render engine will mute the particle, as long the particle is within the min. distance.

**Note 1:** The default value is “**Consider Min. Distance**”.

**Note 2:** This parameter only appears if the “Distance Attenuation” is checked.

7. **Doppler** - changes of movement between the sound source and the listener result in frequency changes. This is called the “Doppler effect”, and it is the responsible for the passing-by type of sound.

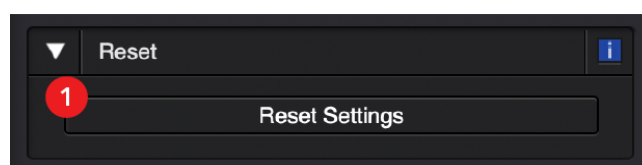
**TIP 1:** If checked (blue light), the render will **take movement into consideration**, applying the corresponding Doppler effect on the output result.

**TIP 2:** If unchecked (black), no **audio changes occur** due to movement between particles and microphones (the original delay on the start of sound reproduction by the particle will continue during the entire life of the particle). You may want to uncheck this, if you don’t want pitch variations due to movement (for instance, flying violins that don’t have their pitch changed due to movement).

**Note:** The default value is **checked**.

## 13.4 Reset

Press the “Reset Settings” button to reset the project settings to their default values.



Project Settings Reset

## Chapter 14

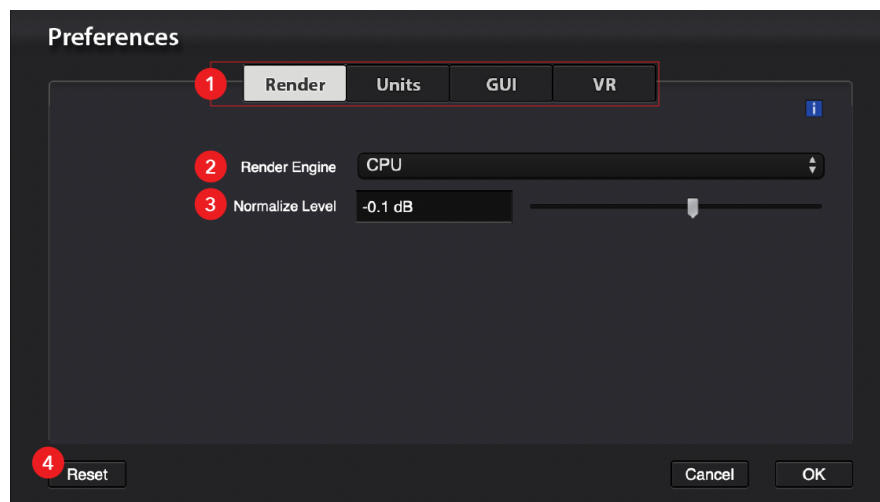
# Preferences

On the Preferences, you can find mostly Graphical User Interface (GUI) and User Experience (UX) related configurations, such as the units of measurement, Views and particles sizes, window color and resizing memory, and more. Also, preferences for your Render processes are also available

## 14.1 Render

Preferences regarding the render process.

**Note:** This will be the first window to appear when you open the Preferences for the first time, so, some common items throughout the preferences will be reference ahead.



Render Preferences

1. **Navigation Panel** – navigate through the different Preferences categories.
2. **Rendering Engine** - currently, only the CPU can be used for rendering audio. In the future, other devices could be added (GPU, DSP, etc.).
3. **Normalize Level** - Sound Particles requires a very high dynamic range, since it could be used for capturing the sound of a near explosion or a faraway whisper. As such, a normalization process is implemented on the end of the render process.

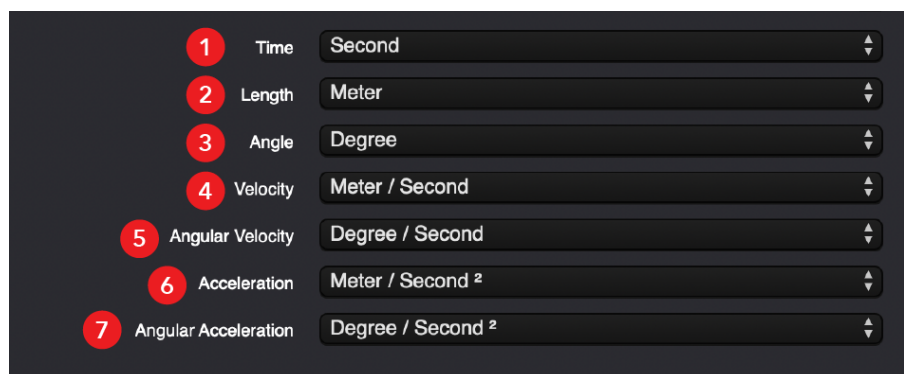
**Note:** This value defines the maximum peak value of the final result.

4. **Reset** – resets ALL the preferences, including the ones not visible on the current panel.

## 14.2 Units

You can choose your favorite units to work with, which will be used to present the values to you.

**TIP:** Nevertheless, all other units are still valid when entering values, as long you specify the unit itself (e.g. “2 km”; “10ft”).



Units Settings

1. **Time:** Unit used to specify time.

**The available units are:**

- 1.1. **Second (s)**
- 1.2. **Millisecond (ms)**

**Note:** The default value is “**Second**”.

**2. Length:** unit used to specify length (distances, positions, etc.).

**The available units are:**

- 2.1. Meter (m)
- 2.2. Millimeter (mm)
- 2.3. Kilometer (km)
- 2.4. Inch (in)
- 2.5. Foot (ft)
- 2.6. Yard (yd)
- 2.7. Mile (mi)

**Note:** The default value is “**Meter**”.

**3. Angle:** unit used to specify angles.

**The available units are:**

- 3.1. Degree (°)
- 3.2. Radian (rad)
- 3.3. Pi radian ( $\pi$  rad)
- 3.4. Rotation (rot) \*

\* One rotation equals to 360°, i.e., a full turn.

**Note:** The default value is “**Degree**”.

**4. Velocity:** unit used to specify velocity.

**The available units are:**

- 4.1. Meter/second (m/s)
- 4.2. Kilometer/hour (km/h)
- 4.3. Inch/second (in/s)
- 4.4. Foot/second (ft/s)
- 4.5. Yard/second (yd/s)
- 4.6. Mile/Hour (mi/h)

**Note:** The default value is “**Meter/Second**”.

5. **Angular Velocity:** unit used to specify angular velocity.

**The available units are:**

- 5.1. Degree/second ( $^{\circ}/s$ )
- 5.2. Degree/hour ( $^{\circ}/h$ )
- 5.3. Radian/second ( $\text{rad}/s$ )
- 5.4. Radian/hour ( $\text{rad}/h$ )
- 5.5. Pi radian/second ( $\pi \text{ rad}/s$ )
- 5.6. Pi radian/hour ( $\pi \text{ rad}/h$ )
- 5.7. Hertz (Hz) \*
- 5.8. Rotation/second ( $\text{rot}/s$ ) \*
- 5.9. Rotation/minute (rpm)

\* Both "Hertz" and "Rotation/second" correspond to the same numeric values. The difference it's only a matter of unit.

**Note:** The default value is "Degree/Second".

6. **Acceleration:** unit used to specify acceleration.

**The available units are:**

- 6.1. Meter/second<sup>2</sup> ( $\text{m}/s^2$ )
- 6.2. G (G)
- 6.3. Foot/second<sup>2</sup> ( $\text{ft}/s^2$ )

**Note:** The default value is "Meter/Second2".

7. **Angular Acceleration:** unit used to specify angular acceleration.

**The available units are:**

- 7.1. Degree/second<sup>2</sup> ( $^{\circ}/s^2$ )
- 7.2. Radian/second<sup>2</sup> ( $\text{rad}/s^2$ )
- 7.3. Pi radian/second<sup>2</sup> ( $\pi \text{ rad}/s^2$ )

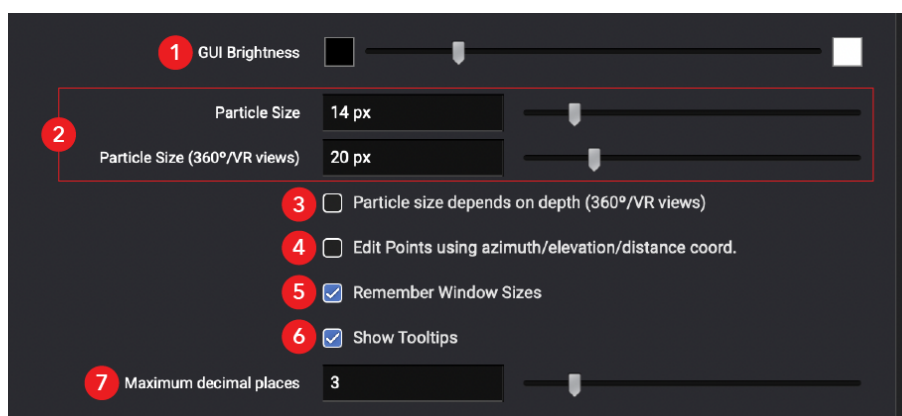
**Note:** The default value is "Degree/Second2".



## 14.3 GUI

In here, you can change your preferences regarding the Graphical User Interface (GUI).

**Note:** None of these settings have impact on the audio.



GUI Settings

1. **GUI Brightness** - you can use this slider to control the brightness of the Graphical User Interface, making it darker or lighter.
2. **3D View - Particle Size** - the size, in pixels, of each particle, within the 3D views.

**TIP:** You can specify a different value for the 360°/VR views.

**Note 1:** Greatly increasing the size of particles may affect their shape depending on the machine specifications and operating system.

**Note 2:** The default value is 1px; 2px for 360°/VR.

3. **3D View - Particle size depends on depth** - within the 360°/VR views, instead of a fixed particle size, you can enable this checkbox to have a better representation of depth.

**TIP:** When enabled, the visual size of each particle will depend on the distance to the origin (depth) - closer particles will be bigger, and distant particles will be smaller.

**Note:** The default value is **disable**.

4. **Edit Points using azimuth/elevation/distance coord.** - by default, you specify points using a XYZ coordinate system (left/right, front/back, top/down). By activating this checkbox, you use spherical coordinates instead: Azimuth, Elevation and Distance.

**TIP:** **Azimuth** represents the angle on the horizontal plane; **Elevation** represents the angle on the vertical plane; **Distance** represents the distance between the point and the origin (0,0,0).

**Note:** The default value is **disable**.

5. **Remember Window Sizes** - by enabling the "Remember Window Sizes", each time you resize a window, Sound Particles will remember the new window size and apply it when you create new projects, allowing the windows of the new projects to use a similar size.

**Note:** The default value is **enabled**.

6. **Show Tooltips** - With this option activated, tooltips will appear after a while after you place your mouse cursor on top of certain visual elements (buttons, text fields, checkboxes, etc.), giving a short description of the effect of the respective element.

**Note:** The default value is **enabled**.

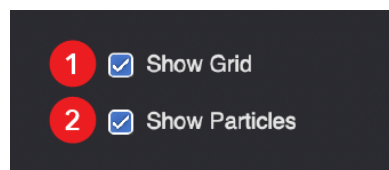
7. **Maximum decimal places** – allows you to select how many decimal places are to be visible on decimal numbers

**Note:** this will not affect the precision of inputted values with more decimal places than the ones defined on this parameter, only rounding them up to the respective maximum visible decimal places.

## 14.4 VR

Here, you can change your preferences regarding the Virtual Reality 3D view, a special view (like Top or Perspective) that allow you to see a 360° video as a desktop VR image.

**Note:** None of these settings have impact on the audio.



VR Settings

1. **Show Grid** - if enabled, Sound Particles will draw a grid on top of the video image on the VR 3D view.

**Note:** The default value is **enable**.

2. **Show Particles** - if enabled, Sound Particles will draw particles and microphones on top of the video image on the VR 3D view.

**Note:** The default value is **enable**.

## Chapter 15

# Other Features

### 15.1 Track Presets

With Track Presets, you can instantly apply a preset to a track, while maintaining its audio files, allowing you to easily tests different parameters and exploring new possibilities for your audio material.

You can create presets from the following objects:

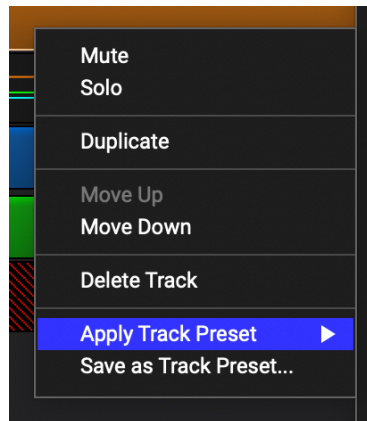
- Audio Tracks
- Particle Groups
- Particle Emitters
- Microphones

#### 15.1.1 Applying Track Presets

There are two ways that you can load a Track Preset:

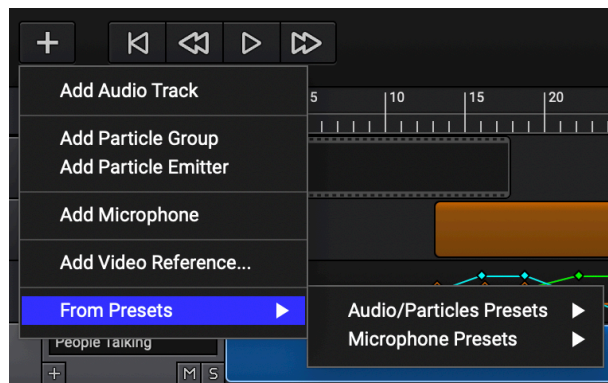
- **Apply a preset to an existent track:** by opening the context menu (secondary mouse button) over one track, you can apply a compatible preset for that same track by selecting on “Apply Track Preset”, overriding the previous one with the new preset.

**Note:** you can only see and apply presets over compatible tracks, meaning that you will only be able to apply Audio/Particle Presets over Audio Tracks, Particle Groups and Particle Emitters tracks, and apply Microphone Presets over Microphone tracks



*"From Presets" menu located on the Add menu of the Transport window*

- **Creating a new track based on a preset:** on the Add (+) menu of the Transport, you have the "From Presets" menu that allows you to add a new, single Audio/Particles or Microphone preset tracks.

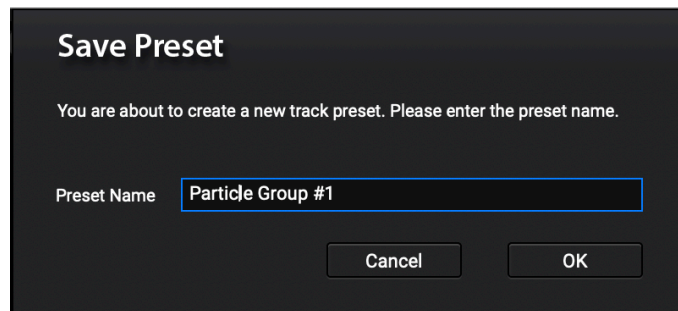


*"From Presets" menu located on the Add menu of the Transport*

**TIP:** Several Track Presets are available on the software by default, both from tracks of the Project Templates and also newly customized ones.

### 15.1.2 Saving Track Presets

To save a track preset, you can click over it with your secondary mouse button, and then clicking “Save as Track Preset...”, opening then the “Save Preset” window on top of your project window (you can also open the window by going on the “Track” menu, above on the Menu Bar, and activate the same option).



Save Track Preset window

On the window, you can define the **Preset Name** and clicking “OK” to complete its saving.

**Note 1:** The Preset Name will NOT affect the track’s saved Description and vice-versa.

**Note 2:** Currently, it’s not possible to delete a preset or overwrite one over another with the same name, displaying the respective warning message. If you intend to delete an existent present, go to “~/Library/Application Support/Sound Particles/Sound Particles” on MacOS or C:\Users\[Username]\AppData\Roaming\Sound Particles\Sound Particles on Windows, and delete the intended presets on the “TrackGroupTemplates” or “TrackMicTemplates” folders.

## 15.2 Batch Processing

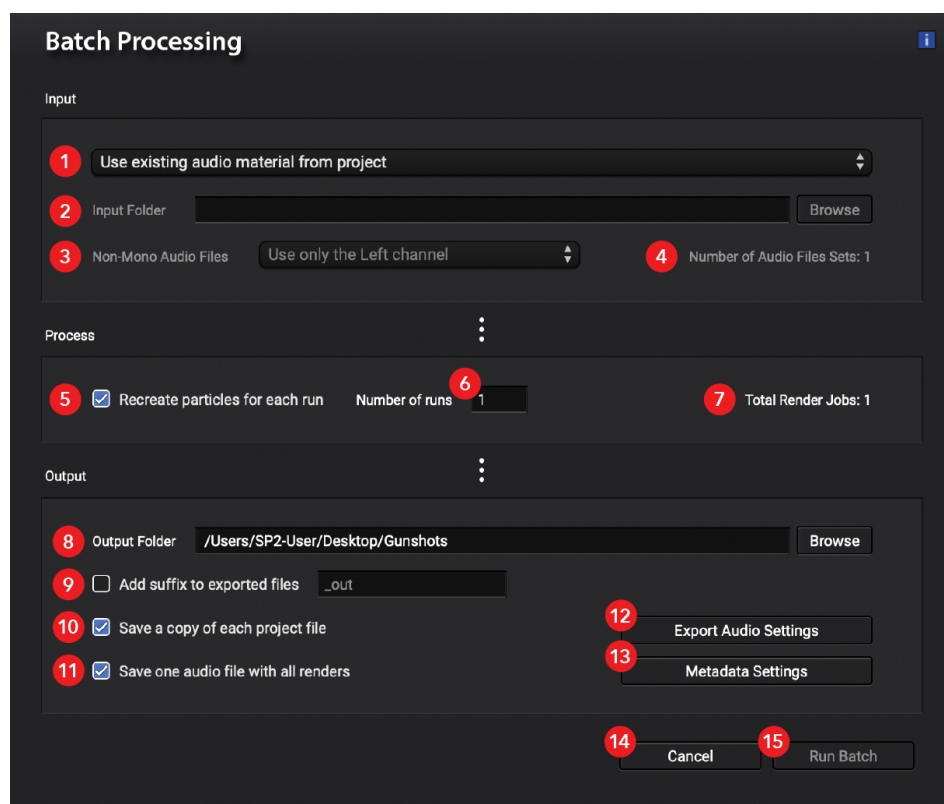
The Batch Processing feature allows you to automatically generate multiple renders using different audio material, which can be used to achieve

- Create 50 variations of the same sound.
- Render the same project using a different original sound for each project.
- Render the same project using different groups of sounds, organized in different folders.

- All the above together.

In terms of workflow, for the current project:

1. You select the input folder, making a different render for each sound or for each sub-folder of sounds.
2. Eventually re-render the same project more than once, recreating new particles in each render, to obtain different audio “takes”.
3. Exporting all the audio files to specific folder with additional suffixes.



Batch Processing

1. **Audio Material Source** – select how you want the Batch Processing to place audio onto the project or track(s). You can opt for several options:
  - 1.1. **Use existing audio material from project** – each render process utilizes the already imported audio files on each available track.
  - 1.2. **Import new audio material on track # x (“[Name of track]”)** – new files from the Input Folder will be imported to the selected track.

**TIP:** if your project has more than 1 track, you can individually select which track you want to be processed with the new audio.

**Note:** a path from your computer/network must be defined to use this option.

- 1.3. **Import new audio material on all tracks** – all the tracks from your project will have every audio file from the Input Folder imported to them and then subsequently rendered with those files.

**Note 1:** this option is only available when your project has more than 1 track.

**Note 2:** a path from your computer/network must be defined to use this option.

2. **Input Folder** – the path of the folder that contains the audio file(s) and/or sub-folder(s) you want to use on the runs.

**Note 1:** For every file or sub-folder that exists on the selected Input Folder, the software will count each one for every run, as shown on the “Number of Audio Files Sets”.

**WARNING:** The Input Folder **cannot** be the same one as the Output Folder.

**TIP:** You can either manually write down the path or you can use the “Browse” button to use the file explorer.

3. **Non-Mono Audio Files** – select how you want the software to import non-mono audio files (e.g.: Stereo, 5.1, etc.). You can select from:
  - 3.1. **Use only the Left channel** – only imports the Left channel of the audio file(s).
  - 3.2. **Use only the Right channel** – only imports the Right channel of the audio file(s).
  - 3.3. **Convert to Mono** – mixes and imports all the channels of the audio file(s) into a Mono audio stream.



- 3.4. **Use all channels as different streams** – imports all of the channels of the audio file(s) into different streams.

- 4. **Number of Audio Files Sets** – displays the number of the audio file sets (audio files + sub-folders) to be used on the Batch's runs.
- 5. **Recreate particles for each run** – activating this option makes that, for every executed run, all the particles Groups/Emitters will be recreated.

**TIP:** Using this option allows for more diverse renders between the imported audio file(s)/sub-folder(s).

- 6. **Number of runs** – how many runs you want the software to run for each imported audio file/sub-folder.

**Note:** this parameter is only enabled if “Recreate particles for each run” is enabled.

- 7. **Total Render Jobs** – the total number of renders of the executed Batch (Number of Audio File Sets x Number of runs).
- 8. **Output Folder** – the folder where the runs will be exported to.

**TIP:** You can either manually write down the path or you can use the “Browse” button to use the file explorer.

**Note:** The Output Folder **cannot** be the same one as the Input Folder.

- 9. **Add suffix to exported files** – if enabled, you can write down a suffix to be added to the exported file's name.
- 10. **Save a copy of each project file** – if enabled, for every executed run, its respective project file will be saved alongside it.
- 11. **Save one audio file with all renders** – if enabled, this will save all the renders into a single file. If disabled, each render will be saved into its own file.
- 12. **Export Audio Settings** – opens the “Export Audio” window, allowing you to configure the export parameters of each microphone (see Chapter 8, section 8.1).

- 13. Metadata Settings** – opens the “Metadata” window, allowing you to edit the respective Metadata information of the save files (see Chapter 8, section 8.1.1).

**Note:** This button will become disabled if you select “FLAC” or “AIFF” as “File Format” on the “Export Audio Settings” window.

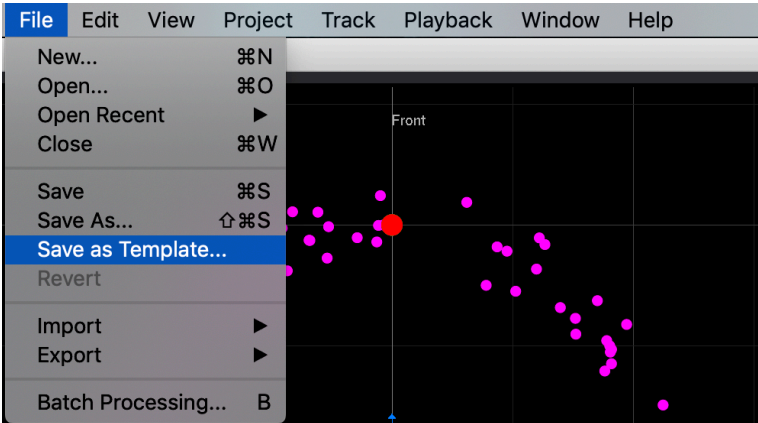
- 14. Cancel** – cancels the Batch Processing and closes its window.
- 15. Run Batch** – runs the Batch with the defined configurations.

### 15.3 User Project Templates

It is possible for you to save a project as a Project Template, adding it to the Project Templates list, allowing you to reuse when needed for future projects.

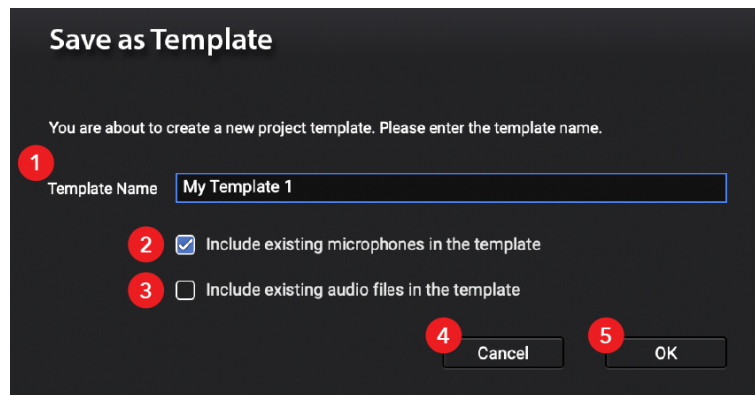
#### 15.3.1 Creating a Project Template

You can start creating your Project by going on the “File” menu, of the Menu Bar, and clicking “Save as Template...”.



“Save as Template” location on the Menu Bar

The “Save as Template” window will then appear:



“Save as Template” window

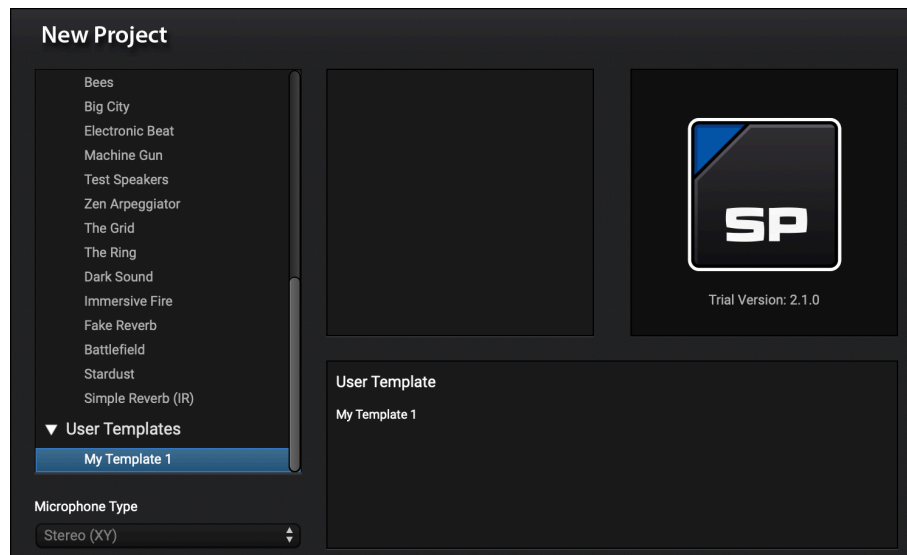
1. **Template Name** – the name of your Project Template.

**Note:** You cannot create a Template with the same name as of another one already existent.

2. **Include existing microphones in the template** – if enabled, the microphones of your project will be included on the saved template, being present on it when opening.
3. **Include existing audio files in the template** – saves the imported audio of your project into the template, meaning that the next time you load the template, the respective audio files will already be present on their assigned tracks.
4. **Cancel** – cancels the template creation.
5. **OK** – creates the User Template with the respective configurations on the Project Template’s list on the “New Project” window.

### 15.3.2 Loading a Project Template

To create a new project using one User Project Template, you can find the create User Templates created at the bottom of the Project Templates list of the “New Project” window



The User Templates location on the “New Project” window

**Note:** it's not possible to select a Microphone Type when opening a User Template, even if the “Include existing microphones in the template” option, upon saving, was deactivated

### 15.4 Slider Controls

You can control certain parameters with a Slider Control, allowing you to easily achieve an intended value more rapidly.

You can use certain key combinations alongside a mouse click to achieve certain effects when controlling a slider:

- **Alt + Primary Mouse Button:** resets the parameter value and places the slider accordingly.
- **Ctrl + Primary Mouse Button:** makes the slider move slower, allowing you to pick a value more precisely.
- **Shift + Primary Mouse Button:** only available for parameters with a Degree unit, this allows you to instantly loop its value around when one of the tips is reached.

## Chapter 16

# Shortcuts

## 16.1 Views Navigation

3D Navigation	Mac	Windows
Translate View	Mouse Drag	Mouse Drag
Zoom View	Ctrl + Mouse Drag	Ctrl + Mouse Drag
Rotate View	⌘ + Mouse Drag	Alt + Mouse Drag

## 16.2 Time Editor

Tracks	Mac	Windows
Duplicate Track	⌘ + D	Ctrl + D

Automation	Mac	Windows
Create Keyframe	Double Click on Line	Double Click on Line
Add/Remove Keyframe to Selection	⌘ + Primary Mouse Button (on keyframe)	Ctrl + Primary Mouse Button (on keyframe)
Drag Keyframe(s)	Shift + Primary Mouse Button (drag)	Shift + Primary Mouse Button (drag)
Drag Keyframe(s) Horizontally	Shift + Alt + Primary Mouse Button (drag)	Shift + Alt + Primary Mouse Button (drag)
Drag Keyframe(s) Vertically	Shift + ⌘ + Primary Mouse Button (drag)	Shift + Ctrl + Primary Mouse Button (drag)

Zoom	Mac	Windows
Zoom+ Horizontally	+	+
Zoom- Horizontally	-	-
Zoom+ Vertically	⌘ +	Ctrl +
Zoom- Vertically	⌘ -	Ctrl -

## 16.3 Menu Bar & Shortcuts

File	Mac	Windows
New Project	⌘ + N	Ctrl + N
Open Project	⌘ + O	Ctrl + O
Open Recent		
Close Current Project	⌘ + W	Ctrl + W
Save Current Project	⌘ + S	Ctrl + S
Save Current Project as...	⇧ + ⌘ + S	Shift + Ctrl + S
Revert		
Import		
Import Audio		
Import Video		
Import CGI		
Export		
Export Audio		
Batch Processing	B	B
Setup/Manage Account		
[Windows] Exit Sound Particles		Alt + F4

Edit	Mac	Windows
Cut	⌘ + X	Ctrl + X
Copy	⌘ + C	Ctrl + C
Paste	⌘ + V	Ctrl + V
Select All	⌘ + A	Ctrl + A
[Windows] Preferences	⌘ + ,	Ctrl + ,

View	Mac	Windows
3D Views		
Transport	⇧ + ⌘ + T	Shift + Ctrl + T
Time Editor	⌘ + T	Ctrl + T

<b>Inspector</b>	⌘ + I	Ctrl + I
<b>Single View</b>	Q	Q
<b>Dual View</b>	W	W
<b>Left View</b>		
Top View	1	1
Front View	2	2
Left View	3	3
Right View	4	4
Perspective View	5	5
Video View	6	6
360° View	7	7
VR View	8	8
Maximize	0	0
<b>Right View</b>		
Top View	⌘ + 1	Ctrl + 1
Front View	⌘ + 2	Ctrl + 2
Left View	⌘ + 3	Ctrl + 3
Right View	⌘ + 4	Ctrl + 4
Perspective View	⌘ + 5	Ctrl + 5
Video View	⌘ + 6	Ctrl + 6
360° View	⌘ + 7	Ctrl + 7
VR View	⌘ + 8	Ctrl + 8
Maximize	⌘ + 0	Ctrl + 0
<b>Autofit (3D Views)</b>	F	F
<b>Enter Full Screen</b>	⌘ + F	Ctrl + F

<b>Project</b>	<b>Mac</b>	<b>Windows</b>
<b>Render</b>	R	R
<b>Clear Render</b>	⌘ + ⌫	Ctrl + Backspace
<b>Recreate All Particles</b>	⇧ + V	Shift + V
<b>Add</b>		
Audio Track	⌘ + 1	Alt + 1
Particles Group	⌘ + 2	Alt + 2

Particles Emitter	⌘ + 3	Alt + 3
Microphone	⌘ + 4	Alt + 4
Video Reference		
<b>Project Settings</b>	S	S

Track	Mac	Windows
Multichannel Setup		
Normalize Mic	⌘ + ⬆ + N	Shift + Alt + N
Normalize All Mics	⬆ + N	Alt + N
Recreate Particles	V	V
Color		
Stems		
Capture All		
Capture None		
Add		
Add...		
Add Impulse		
Remove		
Duplicate	⌘ + D	Ctrl + D
Delete	⌘ + X	Backspace
3D Manipulator	M	M

Playback	Mac	Windows
Play	Space	Space
Reset Position	⬆ + ⬅	Shift + ⬅
Rewind	⌘ + ⬅	Ctrl + ⬅
Forward	⌘ + ➡	Ctrl + ➡
I/O		



Window	Mac	Windows
Minimize	⌘ + M	Ctrl + M
Zoom		

Miscellaneous	Mac	Windows
Preferences	⌘ + ,	Ctrl + ,
Hide Sound Particles	⌘ + H	
Hide Others	⇧ + ⌘ + H	
Quit Sound Particles	⌘ + Q	
Exit		Alt + F4

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