LUMISCAPHE

USER MANUAL Accel VR 2020.1

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Table of Contents

1 PRESENTATION

1-1 About Lumiscaphe

Lumiscaphe helps to strategically connect the design and engineering worlds with marketing and sales support by developing and publishing innovative hybrid solutions employing the Digital Aspect Mockup (DAM) and photorealistic, real-time 3D rendering.

Lumiscaphe provides 3D visualization solutions built on solid experience in real-time rendering technology. Lumiscaphe's range of specialized products includes online and offline 3D product configurators, applications and content created for the web and for mobile devices, as well as tools for publishing and sharing. For creators, a software development integration kit is also available.

Lumiscaphe's clients are found in the automotive, aerospace and luxury goods industries, as well as in the architecture world and in the product design community.

Founded in Bordeaux in 2001, Lumiscaphe has become an innovative actor on the worldwide technology market. With offices today in Paris, San Francisco and Tokyo, Lumiscaphe is proud to provide its solutions to its clients directly or through a network of certified partners.

1-2 About This Documentation

This documentation describes the interface and features in Accel VR..

This document is organized by topic. It does not need to be read in order, and you do not need to read it from cover to cover unless you want to. Instead, use the search function (***Ctrl+F***), the table of contents, and the index to help you find what you are looking for. The chapter and first sub-heading are always listed at the top of the page so that you will know where you are.

1-2.1 Interface Text

Text in the interface and shortcut keystrokes are written differently so that they will be easy to see. They appear ***like this*** in the text.

1-2.2 Links

You will also see hyperlinks in the text. This is an example of a link to the index: Index. If you are reading on a screen-based support, you can click on these links to be taken to the related subject. Likewise, the page numbers in the table of contents and the index are links to the pages they indicate. You can click on them to go directly to that page.

1-2.3 Boxes

Red boxes like this one are used to underscore the importance of the information, to provide a warning, or to indicate new features that will be unfamiliar.

Gray boxes provide you with additional information. This may be an related remark, a tip, an example, or an additional explanation. These boxes provide information you might find interesting, but don't necessarily need to understand the operation or interface being described.

1-2.4 Step-by-Step Instructions

When step-by-step instructions are given, they are formatted as a numbered list:

1. This is the first step.
2. This is the second step.
3. This is the final step.

2 ACCEL VR INSTALLATION AND ACTIVATION

2-1 Installation

This process installs Accel VR on the computer of your choice. It creates a shortcut in the ***Start menu*** > ***Programs*** > ***Lumiscaphe*** folder and it places a shortcut an icon on the desktop.

You need the following:

- The administrator status on the computer on which you want to install Accel VR
- The installation .msi file for your software.

It is strongly recommended that you run the installation .msi file locally, that is, by backing it up to the computer on which you want to install the software before launching it. You can place it on the desktop or in any folder on your computer.

1. Double-click on .msi file of Accel VR to start the installation. Click the ***OK*** button.
2. Select the device you want to use in a drop-down menu and click ***Next*** to continue the installation.
3. Click ***Install*** to continue. A window appears asking if you want to run this file (if you have not disabled Windows alerts). Click ***Yes***. The installer checks that there is enough space on your hard disk to install the software.
4. Presentation of End User License Agreement. Read the end user license agreement carefully. You must accept the terms of this agreement and tick the box ***I accept the terms in the License Agreement*** to continue the installation. Click ***Next*** to continue.
5. A status bar keeps you informed of the installation progress. When the installation is complete, click ***Finish*** to close the installation wizard.

2-2 Activation

2-2.1 Launch Accel VR for the first time

The activation wizard starts automatically the first time you launch Accel VR from the ***Start menu*** > ***Programs*** > ***Lumiscaphe*** or from the Accel VRicon of your desktop. You need to activate Accel VR fisrt before using it.

In order to activate your software, you need a license. The following processes show you the steps-by-steps guide to get your license key and activate the software.

Follow the steps below or contact support at license@lumiscaphe.com for assistance. To purchase a license or to get an evaluation copy of Accel VR, the sales team is at your disposal. You can reach it at sales@lumiscaphe.com.

2-2.2 License Activation Wizard

The activation wizard automatically starts when you open Accel VR for the first time. At anytime you can find the activation wizard from

 > ***Change license*** > ***Change license***

The activation wizard shows you the steps to activate Accel VR.

Depending on your case choose the following options:

- ***Create an activation request***,
- ***Activate the product with a license server over the network***,
- ***Use an existing license to activate the product***
- ***Activate the product with tokens license (dongle)***.

2-2.3 Create an activation request

Choose this option if you need to activate Accel VR via a nodelock license or if you have already purchased a nodelock license and you didn't receive the activation key yet.

1. Select ***Create an activation request***, click then on ***Next***.
2. In the next window that shows up, please fill out the empty fields with your full name, the company name and the email address used for the order. With these information we will be abble to identify your request and be abbe to send you the activation key by email. Once the fields have been fully filled out, click the ***Next*** button.

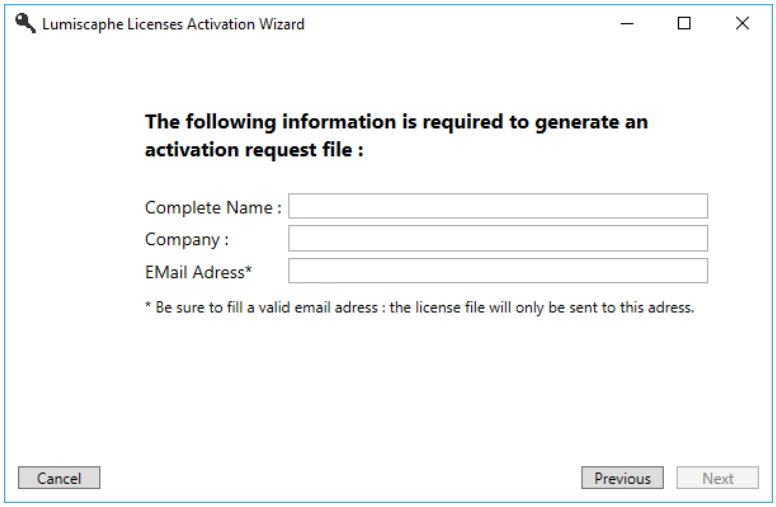


*Figure 1 : **Create an activation request** window*

3. Click the ***Save*** button. Choose the location where the file will be saved. We recommend to save it in the location that is easy to find, for example, the desktop. By default, the file name is as follows: "20190213_Youy Company_vrc_ng.lar". Please, do not change the name of the file.
4. Click ***Finish*** button to close the activation wizard.
5. Please send the file you just saved by email tolicense@lumiscaphe.com.
6. Upon receipt of this file, we will send you your activation key. Once your activation key has been received you can start Accel VRagain. This time, choose the option ***Use an existing license to activate the product*** when the activation wizard shows up.

2-2.4 Activate the product with a license server over the network

Choose this option if you bought a floating license and has already installed it on a RLM server. You computer must be connected at this server via the network. This method is valid with all floating licenses.

1. Select ***Activate the product with a license server over the network*** on the first screen of the activation wizard, and then click

Next.

2. Enter the RLM server name in the empty field. Please contact your system administrator if you do not know its name. Click the ***Next*** button.

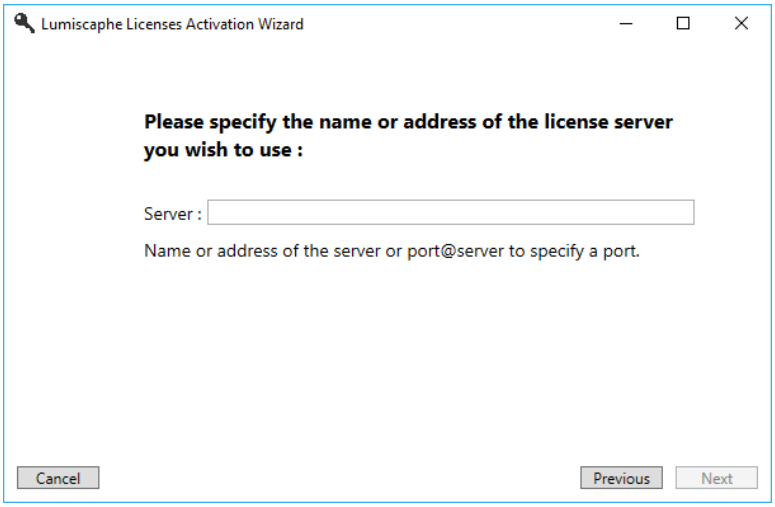


Figure 2 : License activation with a RLM license server

3. Your activation is done. Click the ***Finish*** button.
4. Then, the window as shown below lists all available licenses on your server.

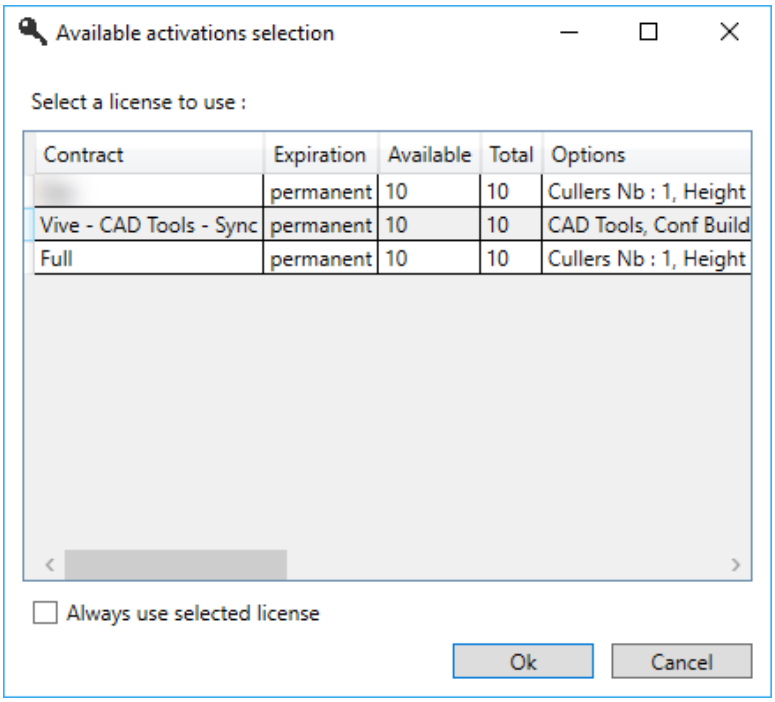


Figure 3 : Example of available licenses on your RLM server.

Click on the license you want to use. If you have one license available on the list and you want to use it next time, just check ***Always use selected license***. If this checkbox is unticked, you will have to select it each time you start Accel VR.

Click then ***OK*** to start Accel VR.

2-2.5 Use an existing license to activate the product

Choose this option if you already have received the activation key. The file format of the activation key will be with the extension like this *.lic.

Select ***Use an existing license to activate the product*** option to use the activation key sent by us by email. This file must be saved on your computer.

1. Select the option ***Use an existing license to activate the product*** when the activation wizard starts, click then ***Next***.
2. A window shows up to browse the activation file that have been sent by us by email and you have saved on your computer. Select it and click ***Open***.
3. Click ***Next***.
4. Your activation process is done. Click ***Finish*** to launch Accel VR.

It is recommended to store your activation file (.lic) in a secure place.*

It can also be used to help us in the event that you encounter a problem during the activation or during a subsequent operation.

2-2.6 Using an activation with tokens license (dongle)

Choose this option if you have a UniKey dongle (USB key) to use Accel VR occasionally. Indeed, the activation of a license token per USB key is valid for 24 hours from the moment of acquisition of the token.

Once the license token is activated, it is not necessary to let the USB key (dongle) plugged into your computer. The token remains valid until the 24-hour period is over. When the token is no longer valid, it is necessary to plug the USB key back in to use another one token.

1. There are two possibilities of activation:
   - Via the dongle which is connected to the computer,
   - Via a server or via a network.
     In this case, it is possible to indicate the IP address of the

server in the dedicated field (speeds up the search for the server). If the specified server is not available, it is possible to automatically search for a server on the local network by checking the box.

2. Once you have made your choice, click on ***Next >*** and the wizard will confirm that the activation has been completed.
3. Click on ***Finish***.
4. Accel VR will prompt you to use a new token.

3 NEW FEATURES IN THE 2020.1 VERSION

The Accel VR documentation has an Index (page 69). If you are viewing this document on a computer, clicking either on the page numbers in the index or on the links in the main text will take you to the corresponding page.

3-1 New features

- Addition of the possibility to use a Accel VR license for a day thanks to the token licensing system.
- Addition of the possibility to import a file from Lumis 3D web service into Accel VR.
- Addition of the possibility to simulate and see movements of your body in 3D world.
- Addition of the possibility to simulate the rotation of one or more products on a turntable.
- Addition of the possibility to link a tracker to one or more products.
- Addition of the possibility to target the location from which the shuttle will rotate.

3-2 Improvements

- New User Interface.
- Antialiasing is now available in Pilot's view.

4 INTRODUCING ACCEL VR

4-1 General Description

Accel VR is a virtual reality software solution designed for the visualization of Digital Aspect Mockups on a 1:1 scale on multi-screen immersive systems.

Visualization on a 1:1 scale makes it possible to assess objects with regard to their actual size and complements the photorealistic rendering quality of the Lumiscaphe rendering engine with an extra dimension of realism.

Accel VR conforms to a wide range of configurations. Its use is suited to various visualization profiles and modes, such as multi-screen devices, image walls based on juxtaposed projections, immersive systems of the C.A.V.E. type or Head Mounted Displays.

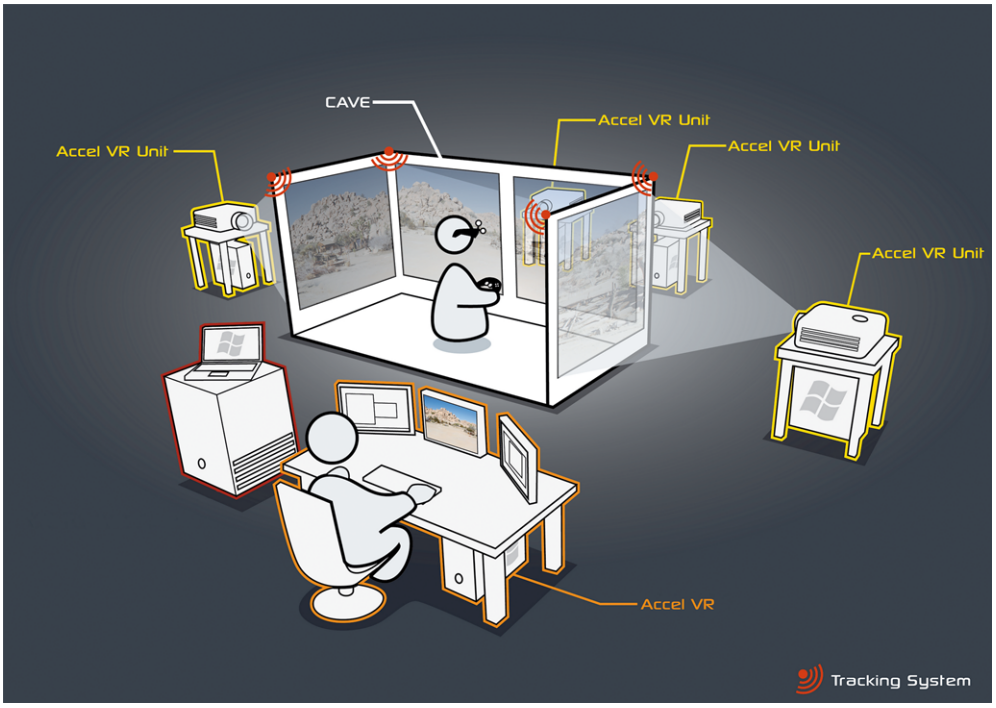


Figure 4 : Overview of a CAVE operating with Accel VR.

Accel VR also supports multiple stereoscopic display modes and can be interfaced with various tracking systems to enhance sensorial experimentation during project review.

4-2 Operating principles

Accel VR works with two different entities: Accel VR Pilot 2020.1 and Accel VR Unit 2020.1.

It is very important to understand the role of each entities for installing the software.

Accel VR Unit 2020.1 calculates images in real time and displays the rendering on a remote screen of the visualization device while Accel VR Pilot 2020.1 manages calculation units that generate images on devices such as a zSpace or a VR headset.

Accel VR Pilot 2020.1 and Accel VR Unit 2020.1 are able to communicate within local network but could be run on a single computer.

There is no order to launch Accel VR Pilot 2020.1 and Accel VR Unit 2020.1. You can launch Accel VR Pilot 2020.1 first and then launch Accel VR Unit 2020.1 and vice versa.

It's recommended to test your infrastructure configuration to be sure entities correctly communicate.

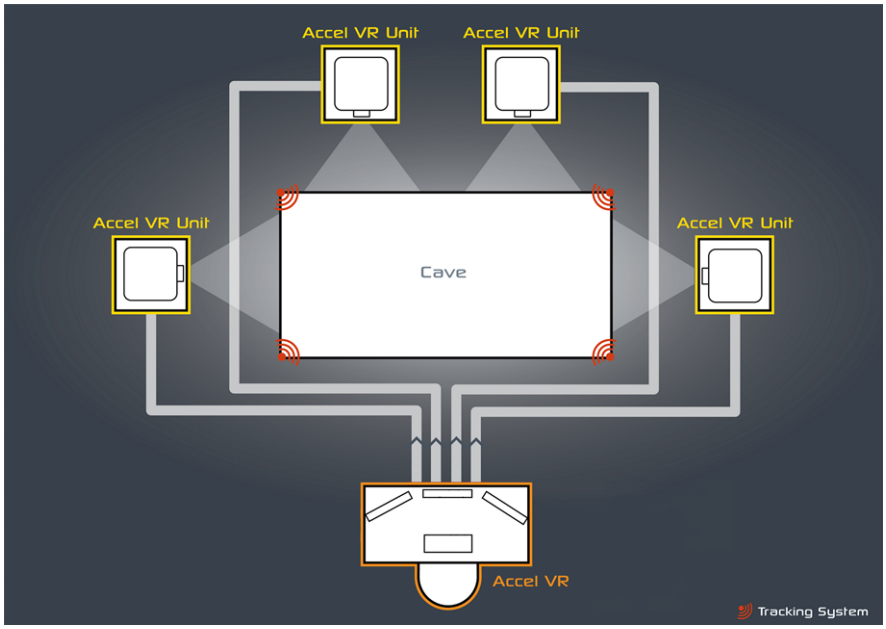


Figure 5 : Accel VR software entities operating principle.

Multi-screen or stereoscopic configurations require a number of computation units to provide optimal rendering fluidity (minimum 30 images per second). Each Accel VR Unit computes the images for one projection surface only. A stereoscopic projection surface will display two separate images and therefore has to be considered as two projection surfaces as far as the system size is concerned.

> *It is best to install as many Accel VR Unit stations as there are projection surfaces in the visualization center. However, a station can render as many monocular projection surfaces as it has GPUs. If necessary, both eyes of a stereoscopic projection surface can be calculated using one GPU only, but the system performances will be reduced by half.*

Each Accel VR Unit 2020.1 station is responsible for its own rendering piece. The final image consisting of all the screens of the visualization device is a mosaic of synchronized renderings.

Accel VR Pilot 2020.1 is the control station, its graphical interface allows an operator to import and manipulate the Digital Aspect Mockups prepared in Patchwork 3D Design or Patchwork 3D Engineering, or layouts produced in Patchwork Explorer.

Accel VR establishes also the link between the computation units, Accel VR Pilot 2020.1, the tracking system, and the various navigation devices (Logitech® gamepads, Xbox 360® gamepad). It distributes the load of the images to be computed to the Accel VR Unit 2020.1 in a synchronized manner.

The two-part architecture of Accel VR makes it possible to manage the singular nature of the various possible hardware configurations and visualization devices.

4-3 Understanding the Exploration Shuttle

Schematically, the installation can be considered as a mobile virtual space (often compared to an exploration shuttle) containing windows that are open on the world (the projection screens, VR headset, zSpace).

The observer can move around in this space and observe the world through these windows.

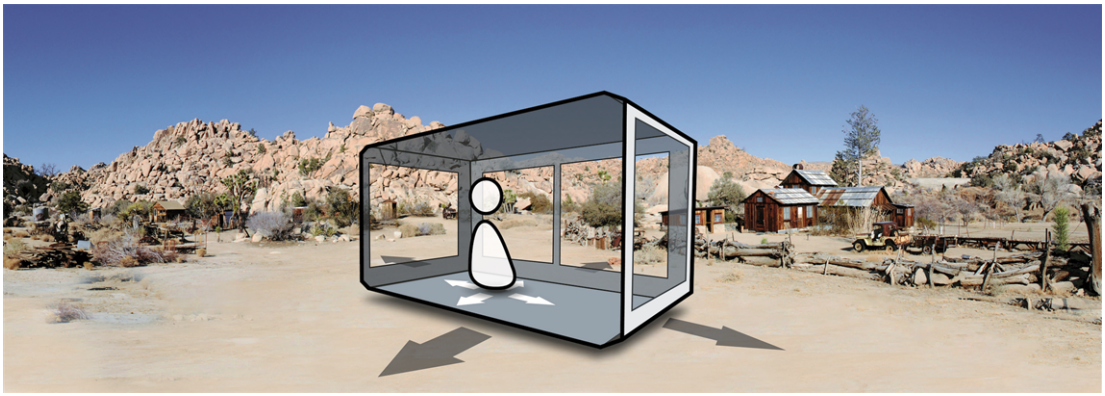


Figure 6 : Exploration shuttle.

4-4 Frames of Reference in Accel VR

The fifth frames of reference used in Accel VR are:

- the world frame,
- the shuttle frame,
- the tracking frame,
- the head frame,
- the frame of the devices (right hand or left hand).

The world frame is the frame used in the database. Its origin is the center of the grid visible in Accel VR Pilot.

The shuttle frame is represented in the following scheme. Setting the origin of the shuttle frame at the center of the room is recommended. Its axes are

positioned so that X and Y axes are collinear to the plane of the main window (front window) and Z axis is orthogonal to it.

The tracking frame and the shuttle frame are superimposed when the tracking system is calibrated according to the recommendations of the configuration assistant.

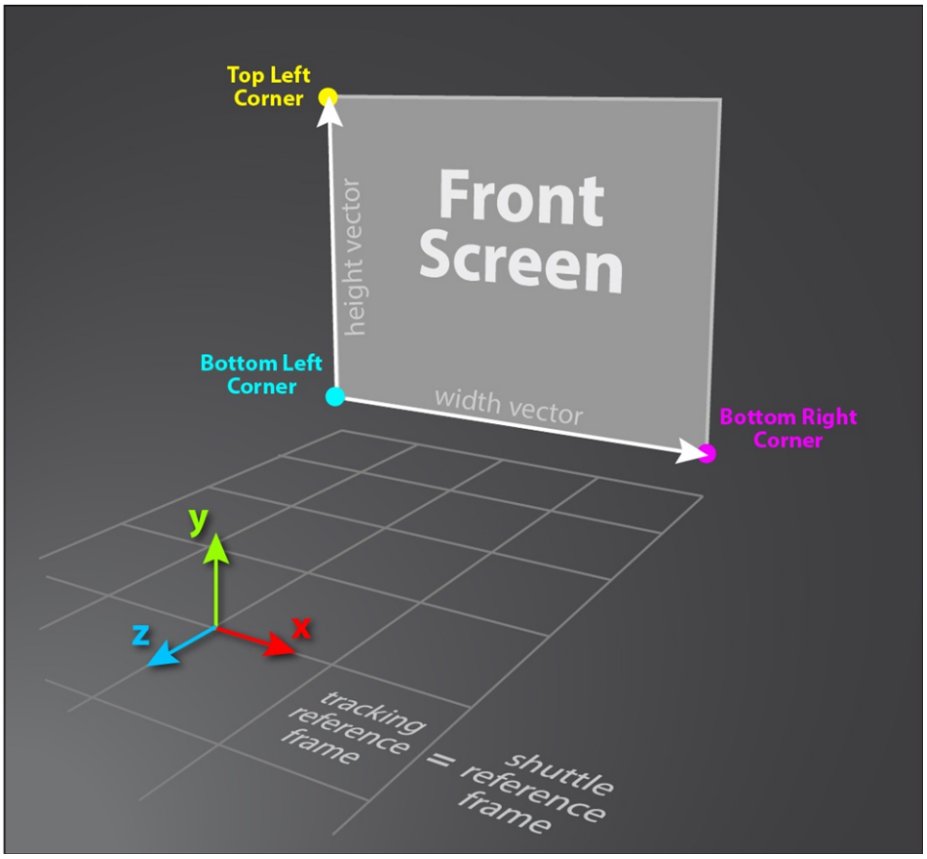


Figure 7 : Shuttle and tracking frames of reference.

The head frame is controlled by the Head Manipulator.

- In the case of using a CAVE with tracked glasses, its origin is at the center of mass of the tracking targets or on one of them.
  It is highly important that in the tracking software, the frame is oriented so that the X axis points to the right (when looking through the glasses) and either Y or Z is vertical (based on the overall vertical of the tracking system). The position of each pupil center is defined with regard to this origin.
- In the case of using a VR headset, this frame of reference is provided by the headset software (HTC VIVE® or Oculus Rift®). Please follow the calibration process of Steam VR room.

- In the case of using a zSpace, please follow the VR glasses calibration process of the manufacturer.

5 ACCEL VR

5-1 Interface description

Accel VR Pilot 2020.1 is the command post used by the operator of the Accel VR system. From Accel VR Pilot 2020.1, the operator loads databases and models, adjusts system settings, chooses rendering options, establishes and manages connections, and handles the monitoring of the user in the immersive environment.

> *If you want to change to another preset, please refer to the* *Advanced System Configuration (page 45)* *chapter.*

The interface of Accel VR consists of three distinct areas.

Figure 8 : Accel VR Pilot interface.

5-1.1 The View

A: The View is the visualization space in which the content of the scene is represented.

This space acts as a remote control screen. A remote operator can thus manipulate the camera in this 3D scene without taking the place of the observer interacting with the main 1:1 scale visualization device.

> ***Ctrl*+*Spacebar*** *sets the center of interest in the scene where the mouse cursor is. The focus is automatically repositioned at the center of the View.*

5-1.2 The Toolbar

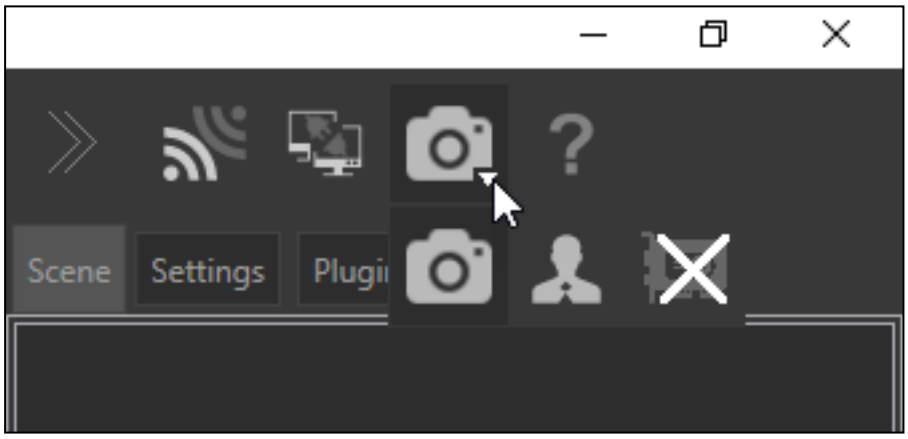


Figure 9 : The toolbar

B: The toolbar gives access to:

1.  Activate/deactivate Accel VR Pilot 2020.1 connection to Accel VR Unit 2020.1 to run rendering.
2.  Connect and synchronize pilot with other instances of Accel VR. (Requires a license option.) See details to add other immersive systems in the Peers (page 37) paragraph.
3.  Display a scene in VR according to the pilot point of view.
    Display a scene in VR according to the operator point of view.

 Hide a scene in the View. This feature is useful for saving resources for example.

4.  Give all the information to know the software: version number, user manual, license change, version changes and license contract.

5-1.2.1 The Configuration Browser

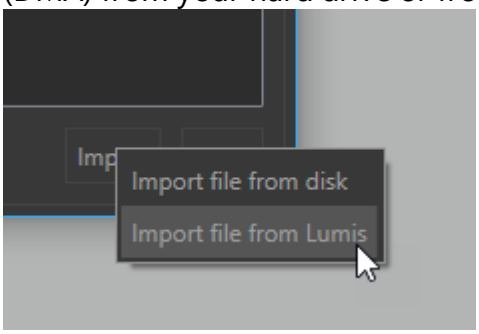
NEW FEATURES IN ACCEL VR 2020.1.

 : The ***Configuration Browser*** can be used to import, open a Digital Aspect Mockup and browse among the imported products.

It provides constant access to the most common tools to configure :

- one or more Digital Aspect Mockups (DAMs),
- the positioning of one or more DAMs in the environment,
- the environment,
- scene rendering by the main computer (pilot),
- remote rendering units,
- synchronization with other immersive devices.
- import and open a Digital Aspect Mockup (DAM).

  Click on this icon  to open the ***Repository*** browser. It is necessary to import a DMA into the repository browser to visualize it in immersion. To do this, click ***Import*** button at the bottom right of the window. You will have the choice between importing a file (DMA) from your hard drive or from Lumis 3D.



  a. If you choose to import a file from your hard drive, just browse the content of your computer, select the file you want to import and then click ***Open***.
  b. If you choose to import a file from Lumis 3D you will be prompted to sign in to Lumis 3D by using your user login and password. Browse the Lumis 3D content and then

select the file you want to import by double clicking it (or single click on it and then ***Open***).

*Hold down the **Shift** key or the **Ctrl** key and click to select and open multiple databases at once.*

Depending on the database weight, the import can take several seconds.

The repository browser allows you to manage DAMs. At anytime you can delete a useless database by clicking on this icon .

Accel VR offers the possibility to reduce the Configuration browser to maximize the View while letting the main configuration tools of your model at your disposal.

Figure 10 : Accel VR with the Configuration browser collapsed

It consists of three different tabs.

5-1.2.1.1 The Scene tab

The ***Scene*** tab consists of four different accordion menus.

Icon	Action	Description
	Show	Shows the selected product.

Icon	Action	Description
	***Hide***	Hides the selected product.
	***Duplicate***	Duplicates the selected product(s).
	***Delete***	Deletes selected product(s) in View. *Hold down the **Shift** key or the **Ctrl** key and click to select multiple product instances you want to delete at once.*
	***Delete all***	Deletes all products at once.

5-1.2.1.1.1 Configuration

Bookmarks allows you to run and combine different bookmark configurations.

*Your database must contain configuration bookmarks set up prior to export and created in the **Library** tab of the **Create Configurations** editor in Patchwork 3D.*

5-1.2.1.1.2 Timelines

Timelines allows to animate your model with the commands below.

Icon	Navigation Mode	Description
	***Go to start***	Launches the animation in reverse mode.
	***Play***	Plays the animation.
	***Pause***	Pauses the animation.
	***Stop***	Stops the animation.

It is also possible to control the animation with the slider.

5-1.2.1.1.3 Transformation

Transformation allows you to position, resize and configure your product instance in the View with the X, Y and Z axis.

5-1.2.1.1.4 Cameras

This section allows you to display camera bookmarks and add new ones by clicking this icon  . You can edit  each camera bookmark you have created in Accel VR by renaming them and changing their position.

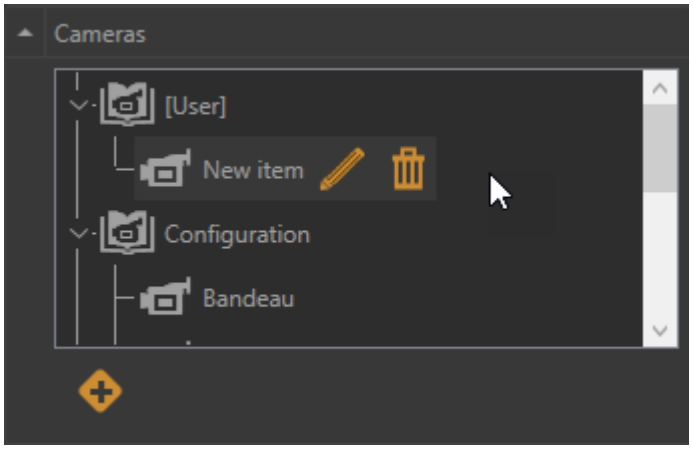


*Figure 11 : The **Cameras** accordion menu with a camera bookmark created by the user.*

5-1.2.1.2 The Plugins tab

The ***Plugins*** tab lists manipulators and plugins used with your device depending on the license your bought.

For more details for how manipulators work, please refer to the Manipulators tab (page 48) of the ***Advanced System configuration***.

Here below the list of the available plugins:

5-1.2.1.2.1  Clipping planes management

The clipping planes plugin allows you to section the object of the scene in a pre-designated plane in order to see its interior.

Accel VR allows the management and the display of three ***Clipping planes*** simultaneously.

With the accordion menu  you can directly:

- show (***Active***)  or hide  the clipping planes.
- move  a clipping plane depending on X,Y,Z axis chosen.
- rotate  a clipping plane depending on X,Y,Z axis chosen

Find below the clipping planes settings available from this icon  .

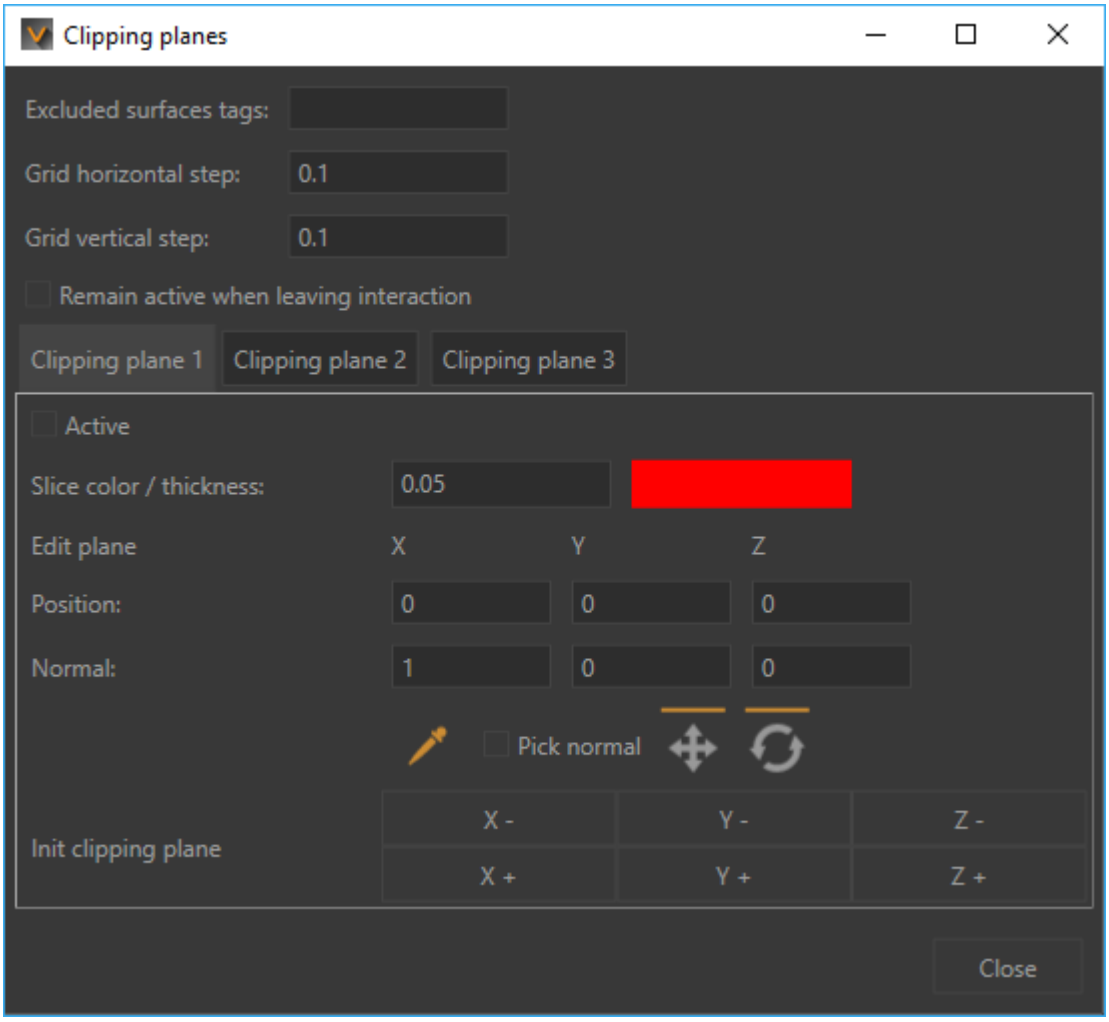


Figure 12 : Clipping planes windows

Tags used in Patchwork 3D to exclude surfaces from the clipping planes must be titled the same way in Accel VR.

For more information, please refer to the Clipping Planes (Editor) chapter in the Patchwork 3D documentation. Accel VR excludes by default the label with the title ***NoClip***.

Clipping planes are positioned in the world. Consequently, moving a product in the world will not move the plane. The position at which the plane clips the product will be modified.

You can set the horizontal and vertical grid spacing by entering a numerical value, or by using the up and down arrows of the keyboard.

Active clipping planes are visible in all open View and will clip through all products.

Check ***Remain active when leaving interaction***, if you plan to combine the use of clipping planes with other interactions.

*Be sure **Active** checkbox is ticked to display a clipping plane.*

However, you can exclude certain surfaces from the clipping planes by entering in the ***Excluded surfaces tags*** field the surface tag you want to exclude. If you have several surfaces to exclude use semicolons between each tag.

You can choose the color of the slicing-edge and modify the ***Slice thickness*** of the line by entering a numerical value, or by using the up and down arrows of the keyboard.

 Selects a point of the surface which the clipping plane passes through the surface that you want to section. The clipping plane orientation will be perpendicular to the normal of the selection (***Pick normal*** checked).

Figure 13 : Clipping planes example with 1 section

Figure 14 : Clipping planes example with 2 sections

5-1.2.1.2.2  Interest point management

Interest point plugin allows you to point an area that you need to focus on like a pointer during a slide presentation.

You can directly chosse the color of the pointer by collapsing the accordion menu  or by clicking on this icon  .

> *Be sure that **Interest point management** checkbox is ticked in Pilot configuration tab (page 45) to see all changes in the View.*

5-1.2.1.2.3  Measure tool management

The ***Measure Tools*** shows the distance between two points that you have chosen. This distance between these two points may thus be represented

visually in the active view.

With the accordion menu  you can directly:

- measure the length between two points
- compute an angle

Measure a length

1. Click on the eyedropper  and select your starting point (Point A) in the View.
2. Then, click on the end point (Point B) to measure the length between the two points.
3. The result is directly displayed in the View or in the field named ***Length AB***.

If you want to measure another length, just click the eyedropper again to restart the procedure described above.

Compute an angle

This option allows you to display the value of an angle between two segments.

Proceed as follows to do this:

1. Check ***Compute angle***, the following fields ***Length BC*** and ***Length ABC*** will appear.
2. Click on the eyedropper  and select your starting point (Point A) in the View.
3. Then, click on the intermediate point (Point B) to measure the length between the two points (***Length AB***).
4. Click on the end point (Point C) to measure the length between the intermediate point and the end point. You automatically have the length of the second segment (***Length BC***) and the value of that angle (***Angle ABC***).

Restart the procedure from point 2 each time you want to measure an angle.

In a case you realize that you need to change the position of one point, instead of restarting the measurement process you can change its position individually. To do that, click on this icon

 and select the point to be changed with the eyedropper. You can repeat this measurement as much as you want. The lengths and the ABC angle will be updated with the new values accordingly.

In addition to that, the ***Measure tool management*** window gives you:

- the position of each point with its coordinates
- the length of each segments
- the value of the ABC angle

5-1.2.1.2.4  Spotlight management

The ***Spotlight*** allows you to illuminate your model.

With the accordion menu  you can directly:

- select the spotlight color (***White***, ***Hot***, ***Cold***)
- change the light radius (***Low***, ***Standard***, ***High***)

Find below the spotlight settings window available from this icon  .

You can activate or deactivate the spotlight, adjust its intensity with the slider and choose the lighting color. You can also adjust the light reflection intensity (***Specular intensity***) and its radius. The more the cursor moves to the right, the more the setting is magnified.

Gizmos below allow you to:

Icon	Action	Description
	***Move***	Moves the spotlight depending on X,Y,Z axis chosen.
	***Rotate***	Rotates the spotlight depending on X,Y,Z axis chosen.

5-1.2.1.2.5  Snapshot management

The Snapshot plugin allows you to snapshot a scene in VR according to the operator point of view.

With the accordion menu  you can directly set the folder where snapshots will be saved.

Width and ***Height*** set the capture dimensions, while ***Snapshot FOV*** is the point of view angle.

5-1.2.1.2.6  Mannequin

NEW FEATURES IN ACCEL VR 2020.1.

The mannequin allows you to simulate and see movements of your body in 3D world.

With the accordion menu  you can directly:

- display the mannequin skeleton
- display/hide the mannequin's head
- activate the advanced tracking mode (five trackers are required)

Vive Trackers configuration:

If you are not using the ***Advanced Tracking Mode*** of the mannequin, your trackers will be placed on your feet and your waist.
If you do, you will have to place an additional tracker on each forearm of your body (as close of your wrists as possible).

1. Start by pairing your first Vive Tracker using SteamVR (SteamVR > “Device” > “Pair Controller”).
2. Use your headset, navigate to the “Manage Vive Trackers” section in settings (“Settings” > “Manage Vive Trackers”).
3. Use the table below to associate your tracker with the corresponding role. Be aware that these roles will not be reset after your session.

   We recommend you to write down the roles of each tracker to easily identify them. Steam VR associates the serial number of the tracker with the role.

4. Follow this process for each of your Vive Trackers.

Body Part	Role

Foot (left/right)	(Left/Right) Foot
Waist	Waist
Wrist (left/right)	(Left/Right) Shoulder

How to use in Accel VR:

It takes 2 steps to setup the Mannequin tool in Accel VR.

Size Calibration

1. Once all of your Vive Trackers are connected, select the Mannequin Tool.
2. Stand straight and trigger the interaction. If you see a Mannequin, then you can go to the next section. If not, make sure that all your trackers are connected and that you are not using the "Advanced Tracking Mode" with only 3 Vive Trackers.

Vive Tracker Calibration

1. Stand in the Mannequin's shape and try to make your body fit as much as possible.
2. Trigger the interaction once more.

You can now use the Mannequin Tool which will simulate your body in VR.

5-1.2.1.2.7  Turntables

NEW FEATURES IN ACCEL VR 2020.1.

Turntables simulate the rotation of one or more products on a turntable. For example, they make it possible to visually compare several configurations of the same product from different angles.

With the accordion menu  , you can directly control turntables by playing with the rotation direction (clockwise and counterclockwise) or pausing the animation.

Find below the proximity warning settings available from this icon  .

In the ***Turntables*** window that shows up adjust quantities **+** and **-** of the products you want to add into the scene, select then the ***Product Spacing*** and click on ***Start*** button to start the turntable(s).

The rotation is performed only along the axis of the rotation which is specific to the product.

5-1.2.1.2.8  Links

NEW FEATURES IN ACCEL VR 2020.1.

The ***Links*** plugin lets you link a tracker to one or more products. With this feature you can imagine moving a product naturally according to the movements of your members for example.

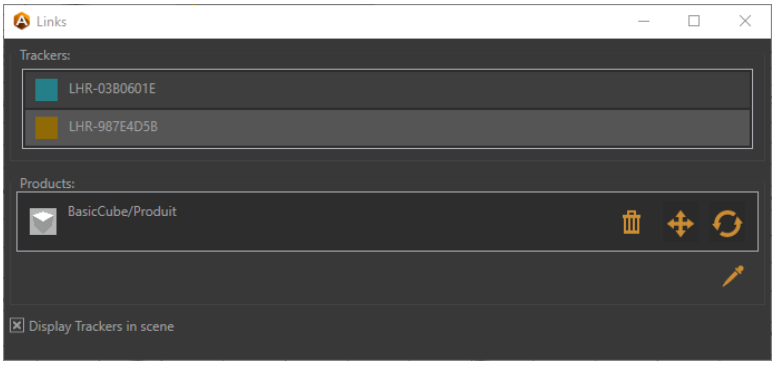


Figure 15 : Links window

You can select and configure trackers listed in ***Trackers*** box by expanding the accordion menu  (***Open advanced config***) or by clicking on this icon  .

Follow these steps to link a tracker at one or more products.

1. In the ***Links*** window select a tracker in the list.
2. Then with the eyedropper  pick the reference point onto the product. This allows you to link the tracker to the product.

To link a tracker to multiple products, restart at step 1 (describes above) by using the same tracker but by selecting a different product at step 2.

At anytime you can break the tracker's link of the product by cliscking this icon  . Use the following gizmos to translate  or rotate  to change the position of the reference point.

5-1.2.1.3 The Settings tab

This tab consists of eight different accordion menus.

5-1.2.1.3.1 System configuration

This section displays information about the windows status such as the shuttle coordinates (X, Z, Y axis), the ground angle and the FPS (Frame Per Second).

You can reach ***Advanced System Configuration*** window by clicking this icon  .

Please refer to the dedicated chapter called Advanced System Configuration (page 45) for more details.

5-1.2.1.3.2 Head manipulator

To understand how to operate the Head manipulator and configure it, please refer to the Head manipulator (page 48) paragraph of the ***Advanced System Configuration***.

5-1.2.1.3.3 Device manipulator

To understand how to operate the Device manipulator and configure it, please refer to the Device manipulator (page 49) paragraph of the ***Advanced System Configuration***.

5-1.2.1.3.4 Interaction manipulator

To understand how to operate the Interaction manipulator and configure it, please refer to the Interaction manipulator (page 50) paragraph of the ***Advanced System Configuration***.

5-1.2.1.3.5 Shuttle manipulator

To understand how to operate the Shuttle manipulator and configure it, please refer to the Shuttle manipulator (page 52) paragraph of the ***Advanced System Configuration***.

5-1.2.1.3.6 Windows

This section allows you to configure features you desire to render in your immersive system.

Icon	Action	Description
	***Hide rendering window units***	Hides the window of each rendering unit (gray icon) to configure their graphics card for example. *The window of each rendering unit is displayed by default.*
	***Unit window always on top***	Keeps the window of the rendering unit in foreground of any windows of the Microsoft Windows® operating system. *Disable by default*
	***Eye***	In the event that your views rendered by a projector are reversed for each eye (frequent with some stereoscopic configurations), click on to swap the display from left eye to right. *Disable by default*

Find below the ***Advanced System Configuration*** window available from this icon  .

Depending on your requirements you can select or unselect parameters below to improve rendering performance for the rendering units:

- ***Mirrors***
  Displays the reflections of other geometries in the scene in planar mirrors. This option can greatly increase the number of elements to be rendered in a scene. To save ressources this option is disable by default. You can disable it in order to increase rendering fluidity.
- ***Post-processes***
- ***Background***

- ***Overlay***[1]
- Change the representation of the model to be displayed in the View (***Material***, ***Color***, ***LightMaps***, ***Wireframe***).

As needed you can also choose to overwrite your background by a one color background or by a gradient background. Just click on ***Overwrite background*** checkbox to make your choice.

Accel VR can automatically display the available windows of the shuttle over the network.

Click on this icon to choose each window you want to use. The icon of the selected window becomes orange to inform the user that the window has been added to the list. Question mark disappears. You can now close the ***Advanced System Configuration*** window.

Back to the ***Windows*** accordion menu you will see a brief description of the Window you have just added such as its name or its IP.

This icon means that the window of the shuttle is not yet added in the list. It is unknown.
This icon means that the dedicated calculation unit to the window of the shuttle is not available over the network despite the fact it is added in the list.

5-1.2.1.3.7 Peers

This feature requires a license option.

This section shows the status of the added remote peers.

Find below the ***Advanced System Configuration*** window available from this icon  .

Accel VR can automatically display available peers over the network.

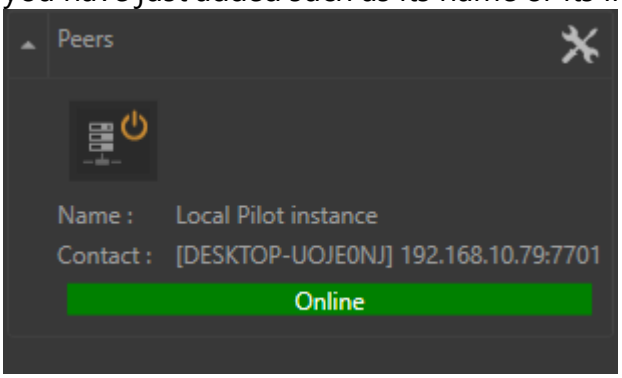
You can also manually add a peer that is on a remote network by clicking on  and entering its IP address and Port.

[1] An overlay is a 2D image (often a logo) that is displayed in front of the objects in the 3D world. It does not move when you navigate in the 3D world, but remains stationary with regard to the screen.

We recommend you to choose a different color for each peer to simplify the identification.

Click on this icon to choose each peer you want to use. The icon of the selected peer becomes orange to inform the user that the peer has been added to the list. Question mark disappears. You can now close the ***Advanced System Configuration*** window.

Back to the ***Peers*** accordion menu you will see a brief description of the peer you have just added such as its name or its IP.



This icon means that the peer is not yet added in the list. It is unknown.
This icon means that the peer is not available over the network despite the fact it is added in the list.

5-1.2.1.3.8 Zspace management

With the accordion menu you can ***Active*** the zSpace or ***Invert eyes*** to swap the display from left eye to right in the event that your views rendered by your glasses are reversed for each eye.

Find below the zSpace settings available from this icon .

This window allows you to render or not the background, mirrors and overlays. This will be helpful to improve rendering performance in the View of Accel VR.

5-1.2.1.3.9  HMD management

With the accordion menu  you can optimize the rendering by checking or unchecking the parameters below:

- ***Render in HMD*** (to display the rendering in a VR headset). By default the display of the rendering is projected in a VR headset. To help the system in calculation, you can also choose to deactivate the display here or select this icon  from the Accel VR toolbar.
  If you don't want to display the rendering in a VR headset (HMD), uncheck this checkbox.
- ***Render mirrors in HMD***
- ***Render post-processes in HMD***

Find below the HMD settings window available from this icon  .

This window gives you details if the VR headset is correctly recognized by Accel VR with its manufacturer's name and its model.

HMD render scaling slider is useful to zoom out the world to fit your model with the zSpace screen.

5-1.2.1.3.10  VRPN devices management

The ***VRPN device management*** allows you to add, configure and delete a VRPN device.

Accel VR supports ART, VICON, and NaturalPoint tracking systems.

Accel VR Pilot 2020.1 establishes the link between the rendering units and the tracker, gamepads, etc. The connection is made via a local server.

Install the ART or VICON hardware according to the manufacturer’s recommendations. Accel VR Pilot 2020.1 must be linked to the machine on which the ART or VICON VRPN server is installed.

The important parameters to note concerning VRPN server are its IP address, the name of the main tracker (regarding glasses) and its index.

The VRPN server needs to receive information from the tracker (see manufacturer’s documentation).

Figure 16 : 3D glasses

In order to use peripherals for navigating in the 3D scene (Logitech® gamepads, Xbox 360® controller for Windows®…), simply connect them to the computer running Accel VR Pilot 2020.1 and install the peripheral drivers. A space mouse may also be used too.

Figure 17 : SapceMouse® Pro

This icon  does the same action than the button named ***Open advanced config*** from the accordion menu  . It opens the settings window of VRPN devices management plugin.

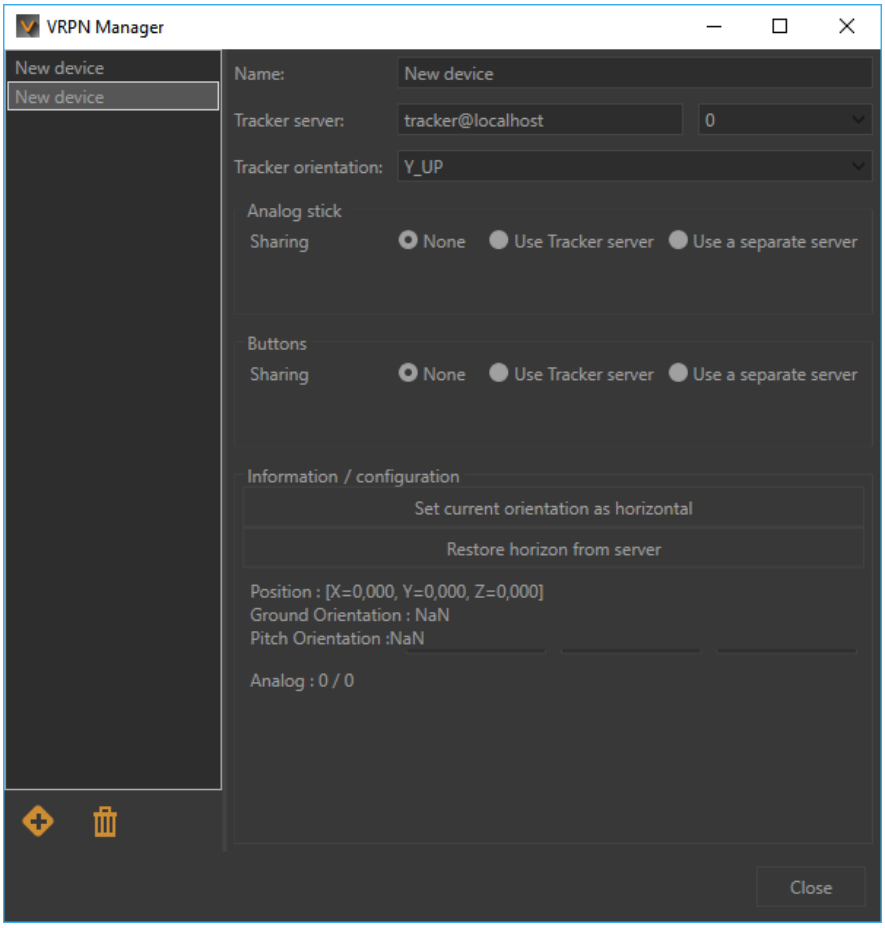


Figure 18 : VRPN Manager

VRPN Manager consists of two parts:

1. The left part to add or delete a VRPN device.
2. The right part to configure a device.

Please refer to the manufacturer documentation of the selected device to know the IP address of the ***Tracker Server***.

The following accordion menu 0 provides to Accel VR Pilot 2020.1 by VRPN protocol the current position of the tracked devices.
The digit represents the sensor ID of ART tracking systems. It is normally ***0*** with Vicon systems.

Select the tracker orientation with the following arguments (***Y_UP***, ***Z_UP_X_LEFT***, ***Z_UP_X_RIGHT***, ***Z_UP_Y_LEFT***, ***Z_UP_Y_RIGHT***) depending on the manufacturer specifications. If the ***Y_UP*** convention is not used by default by the tracking system, data provided will be converted by the tracking framework.

If your VRPN device has an analog stick or buttons, ***Analog stick*** and ***Buttons*** will allow you to configure them.
Select ***Use tracker server*** radio button if your device is communicating on the

same tracking server configured earlier in the VRPN manager.
On the other hand, if your VRPN device has not analog stick and buttons like tracked glasses, select ***None*** in the two boxes.

In case your device does not communicate on the same tracking server, then you need to associate an analog stick and buttons on the separe server. To do this select Use a separate server and then enter the server address in a ***Dedicated server*** field.

Information / configuration box allows you to set the device horizontal orientation or to adjust it with ***X***, ***Y***, ***Z*** coordinates.

> Once a VRPN device has been configured you will be able to select it in Manipulators field from the Advanced System Configuration (page 45), the Advanced System Configuration (page 45) or from the Advanced System Configuration (page 45)

5-1.2.1.3.11  Calibration management

With the accordion menu  you can directly calibrate the projection areas of the CAVE.

See details in the Operating principles (page 16) chapter to understand how Accel VR works with a CAVE.

In the toolbar click on this icon  to display the rendering on your immersive system.

Click then on the ***Start warping*** button.

A test pattern is projected by all render units in the system.

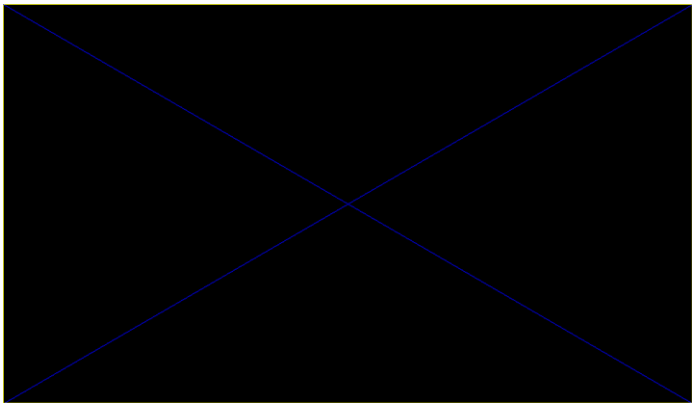


Figure 19 : Sample test pattern projected during calibration procedure for the projection areas.

On each unit, proceed as below (assuming you will use a gamepad for the calibration process):

Press **A** button of the gamepad to configure the bottom edge. Using the joystick or the paddle (for the pixel precision) of the gamepad, reposition this edge so that its projection overlaps the bottom of the corresponding screen. Then press the **B** button on the gamepad to select the lower right corner and repeat the setting to place the corner so that its projection overlaps the bottom right of the corresponding screen.

Do this for all corners and edges that require adjustment in the order of the buttons shown in the table below.

A	**B**	**B**	**Y**	**Y**	**X**	**X**	**A**
Lower edge	Lower right corner	Right edge	Upper right corner	Top edge	Upper left corner	Left edge	Lower left corner

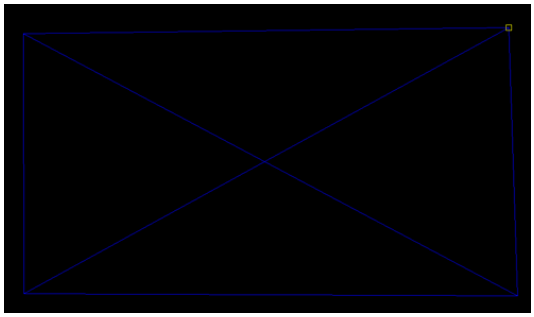


Figure 20 : Positioning the upper right corner with the joystick of the gamepad.

When an image is rendered, Accel VR will distort it in order to compensate for the keystone projection resulting from the position of the projector. The model's normal proportions will be restored on the projection areas.

Areas outside of the test pattern will always be displayed in black in order to restrict the projection to the intended screen.

*Accel VR stores **Calibrate Projection Areas** configuration in memory. You can change the calibration at any time by repeating steps 4 and 5.*

5-1.2.1.3.12  Proximity Warning management

In an immersive system using walls, the observer is often unaware of the edges of the observation area and of the placement of the screens. To prevent the observer from running into the screens, a proximity warning is available.

With the accordion menu  you can directly activate/deactivate proximity warning option.

Find below the proximity warning settings available from this icon  .

The proximity warning colors the display and shows a grid with the color of your choice whenever an obstacle (the screen) is detected within a defined zone around the observer's head (***Minimum distance*** and ***Maximum distance***). This zone is defined in terms of the distance from the center of the observer's head.

5-2 Advanced System Configuration

The ***Advanced System Configuration*** window  helps you to configure secondary settings.

The Advanced System Configuration window is composed of five different tabs.

5-2.1 Global tab

This tab allows you to configure Accel VR global settings:

Setting	Default Value	Definition
Hardware anti-aliasing	4	Allows you to smooth the rendering. Max value can be 8.
Language	en	Allows you to change the language to another one.
Distance units	Meter	Allows you to change the distance units to centimeter or millimeter.
Angle units	Degrees	Allows you to change the angle units to radians.
Scaling units	Percent	Allows you to change the scaling unit to a factor.

The ***Hardware anti-aliasing*** parameter is particularly effective in the case of sharp borders and strong contrast between the start and end colors of gradients. The more the default value is high, the longer the rendering will be.

5-2.2 Pilot configuration tab

Depending on your requirements you can select or unselect features below to improve rendering performance in the View of Accel VR Pilot 2020.1:

- ***Grid***
- ***Referential***
- ***Mirrors***
  Displays the reflections of other geometries in the scene in planar mirrors. As this option can greatly increase the number of elements to be rendered in a scene, you can disable it in order to increase rendering fluidity.

- ***Post-processes***
- ***Background***
- ***Overlay***[1]
- Modify the representation of the model to be displayed in the View (***Material***, ***Color***, ***LightMaps***, ***Wireframe***).

As needed you can also choose to overwrite your background by a one color background or by a gradient background. Just click on ***Overwrite background*** checkbox to make your choice.

5-2.3 Avatar tab

Thanks to the Avatar plugin you can visualize your interaction devices as well as those of your coworkers. See details in the paragraph named Peers (page 37)

Simply choose in the list below the device you'll use for the immersion.

[1]An overlay is a 2D image (often a logo) that is displayed in front of the objects in the 3D world. It does not move when you navigate in the 3D world, but remains stationary with regard to the screen.

Figure 21 : Select your device

5-2.4 Mouse manipulation tab

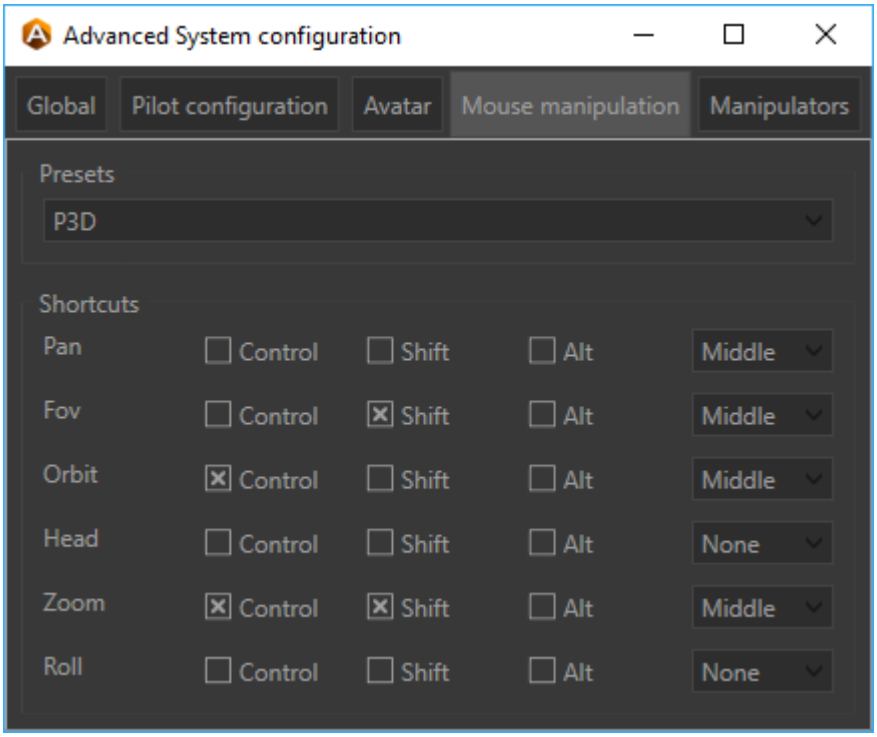


Figure 22 : Mouse manipulation tab

You can apply the keyboard shortcuts of your favorite CAD software in Accel VR.

To do that, just select in the ***Preset*** drop-down menu, the shortcut presets of the software you want to use in Accel VR.

Preset drop-down menu lists the keyboard shortcuts of the following software:

- 3ds Max
- Alias
- Maya
- P3D (Patchwork 3D)
- SolidWorks
- Custom

If you change the selected keyboard shortcuts preset by modifying one or more shortcuts, it will automatically switch in ***Custom***.

5-2.5 Manipulators tab

*Manipulators listed in this tab are in relation to the **Settings** tab of the Configuration browser. That means all changes made in this tab will be applied to the **Settings** tab of the Configuration browser.*

At the first installation of Accel VR the following drop-down menus ***Head***, ***Shuttle***, ***Interaction*** and ***Device*** are automatically filled out with the detection of your device.

You can also change the manipulator of your device to another one after the first installation of Accel VR .

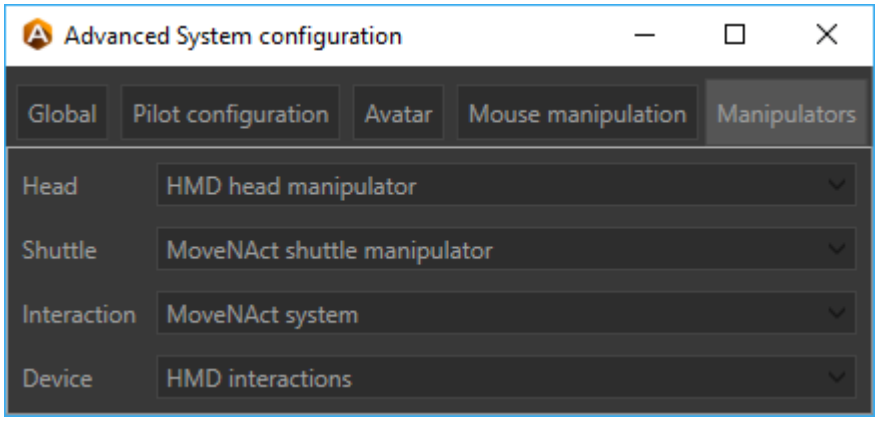


Figure 23 : Example with Accel VR configured with an htc VIVE.

Find below the list of available manipulators imaginable.

5-2.5.1 Head manipulator

The ***Head*** drop-down menu allows you to choose the manipulator to control the head.

*In the paragraph below we grouped together with the operation of the **Manipulators** tab and the **Settings** tab of the Configuration browser because they work closely.*

The head can be controlled by the following devices:

- a zSpace > ***ZSpace head manipulator*** (Nothing to configure here).
- a VR headset > ***HMD head manipulator*** (Nothing to configure here).

- a VRPN device > ***VRPN head manipulator***
  Set the tracker's name and its orientation.
  Select the configuration of the device that had already done in the VRPN devices management (page 39) from the ***Settings*** tab of the Configuration browser.

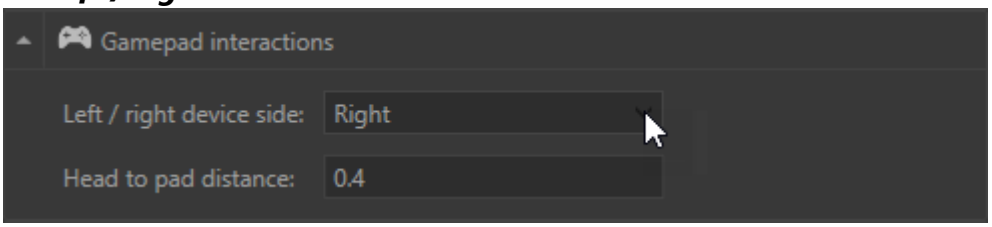
5-2.5.2 Device manipulator

*In the paragraph below we grouped together with the operation of the **Manipulators** tab and the **Settings** tab of the Configuration browser because they work closely.*

From the ***Settings*** tab of the Configuration Browser you can configure the following devices :

- a VR headset > ***HMD interactions***
  This parameter has in common the parameter with the following section: The shuttle is controlled by a VR headset.

- a gamepad > ***Gamepad interactions***
  If you have selected a gamepad as a manipulator, it will be necessary to choose on which side the interactive menu will appear.
  Cf. ***Left / right device side***.



  Head to pad distance sets the position of the interactive menu (the pad).

- a VRPN device > ***VRPN intercations***
  Select the configuration of the device that had already done in the VRPN devices management (page 39) in addition to the names of the VRPN left and right instance.

5-2.5.3 Interaction manipulator

Interactions can be used through a VR device using one of the following interactive menu called "systems":

- the ***PieMenu***
- the ***MoveNAct***

> *The operating mode of the interactive menu depends on the used device and the possibility to use one hand (gamepad, Apex in a CAVE, zSpace stylus) or two hands (VR controllers).*

5-2.5.3.1 PieMenu

From the ***Settings*** tab of the Configuration browser you will see the accordion menu below.

You can change the settings of the PieMenu by clicking on accordion menu or by cliking ont this icon  .

The PieMenu system use the followings tree tabs to be configured:

- ***PieMenu orders*** tab lists available interactions on the left and displays interactions you want to use on the right. To add an available action in the ***Actions in use*** box, click the arrow [>] or [>>] to add them all. In order to remove a used action , click the arrow [<] or [<<] to remove all of them.

  > *Be sure you have at least one action in **Available actions** box to interact with your 3D model.*
  > *Depending on the selected interaction, the color of the laser pointer may change to inform the operator that an action is available.*

- ***PieMenu bindings*** tab allows you to set an action to each button of the interaction device (gamepad, HMD controllers, zSpace stylus, etc...)
  To map an action to a button of the interaction device, just click on ***Set*** button and then push on interaction device button. Accel VR Pilot 2020.1 record it automatically.
  If you make a mistake to record an action just click on ***Unbind***

button to delete the configuration. Click again on ***Set*** button to restart the record.

- ***PieMenu configuration*** tab allows you to configure the aspect of the interactive menu.
  With the ***Interaction side*** drop-down menu, you can assign the interaction to the right or the left side of your VR gamepad. ***Screen position*** allows you to set the interactive menu to the VR controller you want (right or left).
  Depending your choice you can assign interactions and the interactive menu to the same VR controller by selecting ***Right*** and ***Right*** in the corresponding drop-down menu. You can also differentiate interactions to the interactive menu by selecting ***Right*** and ***Left***. With this configuration the operator uses the right hand to target an object to interact with it, the left hand is used to display the interactive menu. You can also do the opposite configuration by assigning interactions to the left hand and the interactive menu to the right hand.
  If the PieMenu is to close to the operator's hand you can move it in any direction you want with parameters: ***depth***, ***height***, and ***lateral move***.
  You can also change the color of the PieMenu with the following parameters: ***back color***, ***text color***, and ***icon color***.

5-2.5.3.2 MoveNAct

From the ***Settings*** tab of the Configuration browser you will see the accordion menu below.

You can change the settings of the PieMenu by clicking on this icon  .

The MoveNAct system use the followings tree tabs to be configured:

- ***Move and Act Orders*** tab lists available interactions on one side and displays the interactions you want to use on the other. To add an available action in the ***Actions in use*** box, click the arrow [>] or [>>] to add them all. In order to remove a used actions , click the arrow [<] or [<<] to remove all of them.

Be sure you have at least one action in Available actions box to interact with your 3D model. Depending on the selected interaction, the color of the laser pointer may change to specify to the operator that an action is available.

- The ***Move and Act bindings*** tab allows you to set a move to each button of the selected device.
  To assign a move to a button, just click on ***Set*** and then push on the controller button. Accel VR record it automatically.
  If you make a mistake during assignment, just click on ***Unbind*** button to delete the configuration. Click again on ***Set*** button to restart the assignment.

  This icon  enables or disables the immediate assignment of a one-touch interaction. It is a sort of shortcut. Once activated, the immediate assignment executes the interaction directly when the button is pressed. You do not need to use the other device to perform the interaction. This frees the other device and allows you to combine another interaction.
- ***Move and Act display configuration*** tab modifies the look of the interactive menu by selecting the color of each element (text, icons).
  Attached side allows you to select in which hand (right or left controller) you want to display the interactive menu.
  By default ***Display mode*** is set to ***World*** mode which is suitable for the MoveNAct use with a full-range immersion device such as an HTC VIVE® or Oculus Rift® headset. We recommend the ***Screen*** mode if you combine the use of the Move and Act in a CAVE or a Powerwall. This makes it easy to use the menu by displaying it in 2D on a remote screen.
  Scale factor, ***Menu orientation*** and ***Menu translation*** are the parameters for changing the size and position of the interactive menu.

5-2.5.4 Shuttle manipulator

The ***Shuttle*** drop-down menu allows you to choose the manipulator to control the shuttle.

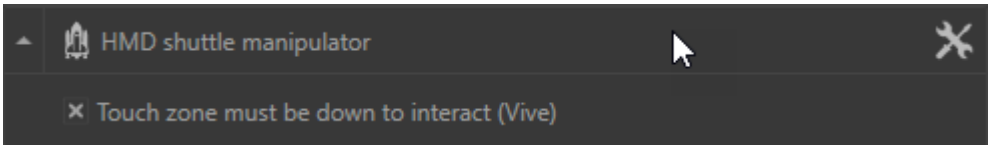
The shuttle can be controlled by the following systems:

- a VR headset > ***HMD shuttle manipulator***
- a gamepad > ***Gamepad shuttle manipulator***

- a VR mouse > ***SpaceMouse shuttle manipulator***
- a VR device > ***Device Shuttle manipulator***

5-2.5.4.1 The shuttle is controlled by a VR headset

From the ***Settings*** tab of the Configuration browser you will see the accordion menu below.

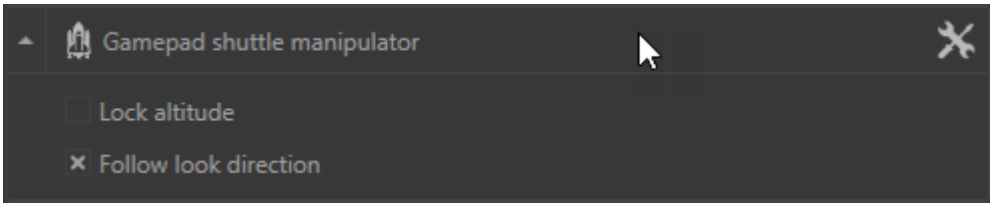


If the HMD default preset do not match your needs, you can change it by modifying the values for ***Planar Speed*** and ***Rotation Speed*** by clicking on this icon  .

Touch zone must be down to interact (VIVE) is selected by default to avoid undesirable movements induced by controller touchpad. This feature is useful for a HTC VIVE controller that has a touchpad. On the other hand, uncheck this feature for an Oculus Rift controller.

5-2.5.4.2 The shuttle is controlled by a gamepad

From the ***Settings*** tab of the Configuration browser you will see the accordion menu below.



Devices with two navigation sticks, such as a gamepad, can be used to move the shuttle in the 3D world. One stick is used to drive movement on the horizontal plane. The other allows you to pivot and to move up or down, if the altitude is not locked.

> ***Lock Altitude*** *and* ***Follow look direction*** *are only available for gamepad configuration.*

Lock Altitude checkbox limits shuttle movements on the horizontal plane. When this checkbox is ticked, the shuttle's altitude remains stable, despite any modifications to the position of the product.

Follow look direction checkbox synchronizes head movements with the direction taken by the shuttle..

You can change the gamepad settings with this icon  such as the ***Planar Speed***, the ***Height Speed*** and the ***Rotation Speed***.

5-2.5.4.3 The shuttle is controlled by a SpaceMouse

From the ***Settings*** tab of the Configuration browser you will see the accordion menu below.

You can change the SpaceMouse settings by clicking on this icon  .

To manipulate the SpaceMouse, Accel VR uses two different modes:

- ***OriginFocus*** mode moves the shuttle around the center of the world.
  Avoid crossing ground checkbox prevents the operator to move the shuttle under the ground.
- ***Helicopter*** mode moves the shuttle as a flying helicopter. The displacement follow moves applied to the SpaceMouse axis.
  Lock horizon checkbox stabilizes the movement of the shuttle by locking the horizon.

In both modes you can fine-tune the moving controls of the SpaceMouse by changing moves factors with: ***Movement Speed***, ***Rotation speed*** and ***Dead Zone*** sliders.

If your settings aren't usable, you can reset them by clicking on ***Reset*** button.

5-2.5.4.4 The shuttle is controlled by a device

This icon  does the same action than the button named ***Open advanced config*** from the accordion menu  . It opens the settings window of the

Device Shuttle Manipulator.

Options box allows you to choose the ***Interaction side*** (left, right), to adjust the ***Planar speed***, the ***Height speed*** and the ***Rotation speed*** that will control the shuttle.

Bindings box allows you to assign the shuttle moves to the device buttons. Please refer to the binding process describe in the Device Manipulator to setup buttons of your device.

5-3 Interaction in the Immersive 3D World

This section covers the ergonomics of immersive environments available to a user in such an environment, without using the interface of Accel VR Pilot 2020.1 or VSN player.

5-3.1 Creating an Immersive Sensation

Multiple elements work together to create a sensation of immersion for a user, including:

- System calibration,
- Shuttle position,
- Use of tracking devices,
- Appropriate preparation of the database to be used.

The user in an immersive environment is particularly sensitive to the position of his feet with regard to what he perceives as the ground in the virtual world. Make certain that his feet are on the same level as the virtual ground by positioning the exploration shuttle at the level of the ground.

5-3.2 Camera Animations

Camera animations, when they are available in your database, can be used to increase the immersive sensation in multiple ways. Depending on the experience you are aiming to create, different locks and camera animation options will be required.

5-3.3 Interaction Devices

Different devices help to improve your ability to interact with your surroundings as a user in an immersive environment.

It is possible to add in the immersive system a device that lets you interact with the virtual world such as a Fly Stick or the Apex by VICON. These devices allow surfaces to be indicated with a virtual laser beam. Based on the active

interaction mode, you can then use the device's buttons to interact with the indicated surface or object.

For this to work, three conditions must be met:

- The model must have first been correctly configured in Patchwork 3D to have interactive components.
- A tracking system of the position and the orientation of the user's head.
- One or two tracked interaction devices (left hand and right hand).

*If your device is not tracked such as a gamepad, please use the **Gamepad interactions** in the **Device** field from the The shuttle is controlled by a VR headset (page 53) in the **Manipulators** tab.*
You can then define your interaction device as being positioned 40cm below the head tracker, which will place it approximately as through it were held at stomach-level by an adult user.

5-3.4 Using the Interactive Menu

The operating mode of the interactive menu depends on the used device and the possibility to use one hand (gamepad, Apex in a CAVE, zSpace stylus) or two hands (VR controllers).

Using PieMenu system
Use the assigned button to display a menu in the 3D environment. The PieMenu is displayed one meter in front of the interaction device, in the direction that the device is pointing.

Two configuration options are possible:

1. Assign the interactive menu and interactions to the same VR controller.
2. Assign the interactive menu to a VR controller (right or left) and assign the interaction to another (right or left).

Use the buttons or the axis (triggers or sticks) you previously set up in the VRPN devices management (page 39) in order to:

- go to the next interaction,
- go to the previous interaction,
- choose the options,
- start an interaction.

Using the MoveNAct menu

The operation of the ***MoveNAct*** menu has been designed for two-handed use.

The immediate assignment allows you to combine multiple interactions at the same time. Please see Move and Act bindings tab for more information.

Whatever the chosen interactive menu (***PieMenu*** or ***MoveNAct***) all possible interactions are present.

Navigate through the menu and select features below.

5-3.4.1  Configuration

Functions available in the floating menu are:

- Apply Similar Products (On/Off)
- Cycle bookmarks (On/Off)

5-3.4.2  Animation

When ***Play Reverse*** function is on, you can interact with animation to play it in reverse mode (animation return to its initial state).

See details in the Timelines (page 25) section.

5-3.4.3  Interest point

Interest point allows you to point an area that you need to focus on like a pointer during a slide presentation.

See details in the section of the Interest point management (page 29).

5-3.4.4  Grab world

Grab world allows to move the world with a VR controller.

Functions available in the floating menu are:

- Lock Altitude (On/Off)
- Lock Horizon (On/Off)

5-3.4.5  Spotlight

The interaction device functions as a spotlight to light the shadowed areas of your models. Point at the dark areas to shine the light at them.

Functions available in the floating menu are:

- Color (White, Hot, Cold)
- The radius of the lighting (small, medium

5-3.4.6  Manage clipping planes

Functions available in the floating menu are:

- Manage clipping plane (Plane 1)
- Manage clipping plane (Plane 2)
- Manage clipping plane (Plane 3)
- Free mode (On/Off) lets you move the clipping plane in the space without any axis restrictions.

See details in the the Clipping planes management (page 26) section.

5-3.4.7  Snapshot

This interaction allows you to snapshot a scene in VR according to the operator point of view.

See details in the Snapshot management (page 31) section to configure it.

5-3.4.8  Measure tools

Measure tools function allows you to measure the distance between two points and compute an angle.

Compute angles allows you to calculate an angle between two opposite points.

Please refer to Measure tool management (page 29) section for more details about its operating mode.

5-3.4.9  Turntables

NEW FEATURES IN ACCEL VR 2020.1.

Turntables in VR have the same actions than the Pilot View. Please refer to the Links (page 34) for more information.

5-3.4.10  Targeted navigation

NEW FEATURES IN ACCEL VR 2020.1.

Targeted navigation allows you to target the location from which the shuttle will rotate.

Functions available in the floating menu are:

- the direction of the rotation (***Clockwise***, ***Anticlockwise***)
- the rotation speed (***Slow***, ***Moderate***, ***Fast***)

6 ACCEL VR UNIT

Each Accel VR Unit 2020.1 is generally installed on its own dedicated machine. The Accel VR Unit 2020.1 stations are synchronized computation units. The efficiency of their hardware configuration has a considerable influence on the rate and fluidity of navigation in the real time scene.

Each station with Accel VR Unit 2020.1 installed must therefore have the best possible hardware configuration. The latest generation professional graphics cards with dedicated memory greater than 2 GB are recommended.

Stations with several GPUs can be used to calculate the images of several windows.

When the Accel VR Unit 2020.1 application is launched, a command prompt window opens. The station is then ready to receive instructions from the Accel VR Pilot 2020.1 to compute the images invoked and display them in real time on the visualization devices.

7 SUPPORT

For any additional information concerning Accel VR please contact our support department by email: support@lumiscaphe.com.

8 APPENDIX

8-1 Preparing a database

In order to use all the functions of Accel VR, databases must be prepared correctly.

The software supports KDR databases exported from Patchwork 3D.

Make sure that your KDR database is compatible with the performances of your device.

8-2 Linking a Configuration Option to a Surface

Surfaces used as triggers for configuration options are set in Patchwork 3D.

Use the tag system available via the ***Tag Manager*** editor (***Shaper*** > ***Surfaces*** menu > ***Tag Manager***) to add a tag corresponding to the partition of the configuration you want to use, and assign the tag to the trigger surfaces. To add a configuration rule of the `partition` type, add a tag "`partition`". To add a configuration rule of the `partition.value` type, add a tag "`partition`".

EXAMPLES

Type	***Configuration Symbol***	***Tag to Apply***	***Result***
partition	*armrest*	*armrest*	*shows/hides the armrests*
partition.value	*material.wood*	*material*	*displays the different values (wood, marble...) one by one*
partition.value	*material.marble*	*material*	*displays the different values (wood, marble...) one by one*

Additional information is available in the Patchwork 3D user documentation.

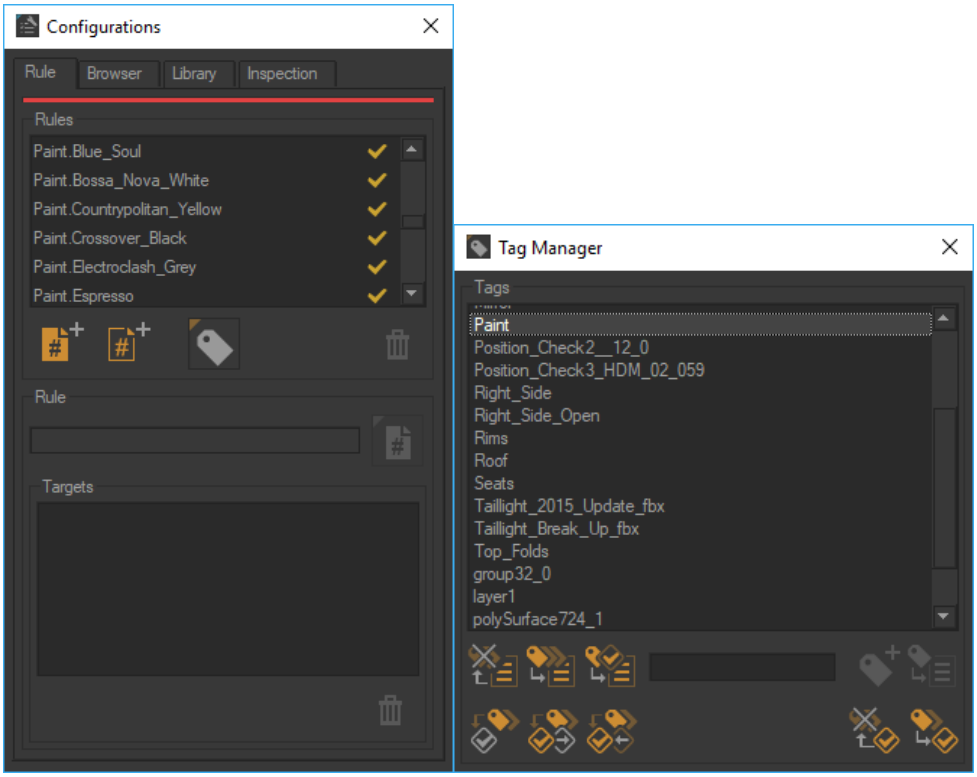


*Figure 24 : Left: defining `paint.valeur` type rules in the **Create Configurations** editor.*

*Figure 25 : Right: Creating a `paint` tag in the **Tag Manager** and assigning it to a selected surface.*

8-3 Creating Animation

Animations are created in the ***Timelines*** editor in Patchwork 3D. Only the first timeline in the database can be viewed in the Oculus Rift.

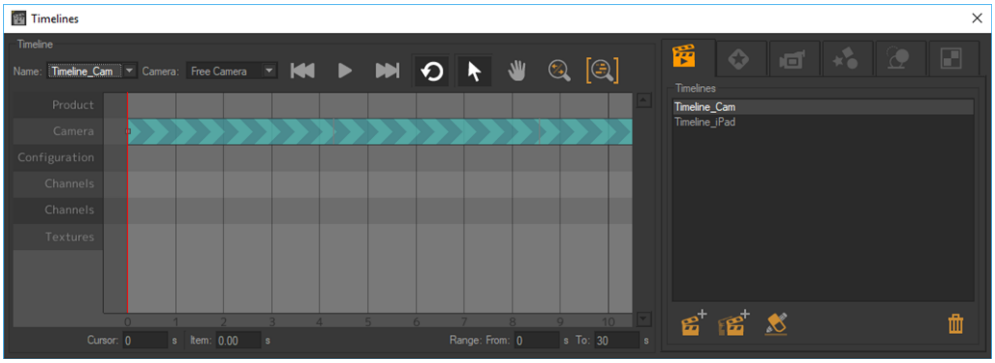


Figure 26 : Timelines editor

8-4 Creating Configuration Bookmarks

Configuration bookmarks are available in the application Accel VR. They are set up in Patchwork 3D, from the ***Library*** tab of the ***Create Configurations*** editor.

This tab includes tools for updating a configuration saved as a bookmark and for managing the list by adding or deleting bookmarks.

To create a configuration bookmark, begin by setting the configuration you want to save using the ***Configuration Browser***. This tool is also available from the ***Browser*** tab of the ***Create Configurations*** editor.

Then, in the ***Library*** tab of the ***Create Configurations*** editor, click on the  button to create a new bookmark using the current configuration.

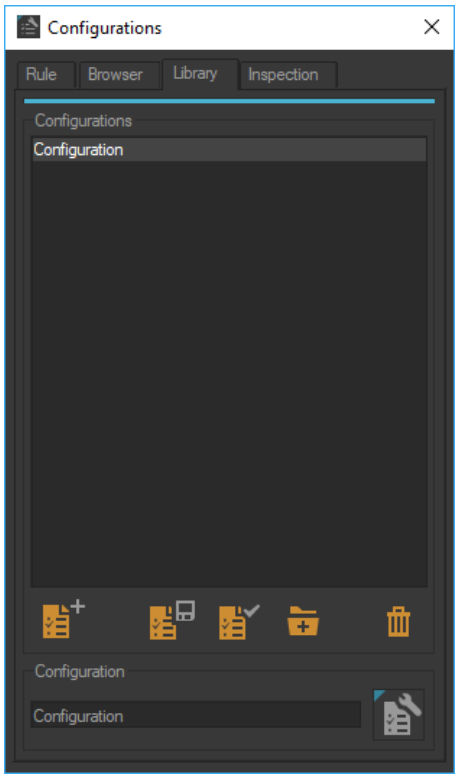


Figure 27 : Configurations editor

8-5 Creating Camera Bookmarks

Camera positions set in Patchwork 3D are used as camera bookmarks by the application Accel VR.

Manage your cameras in the ***Cameras*** editor.

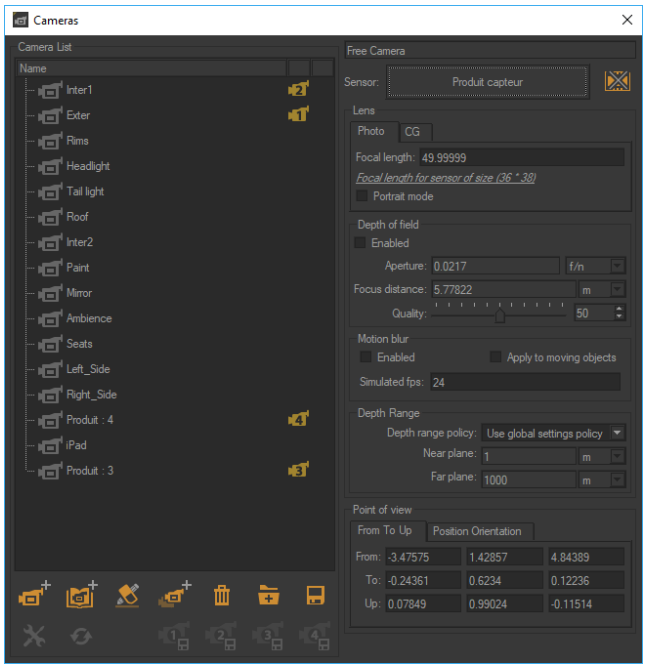


Figure 28 : Cameras editor

8-6 Exporting the Database in the KDR Format

Export your database as a KDR file such as the screenshot below.

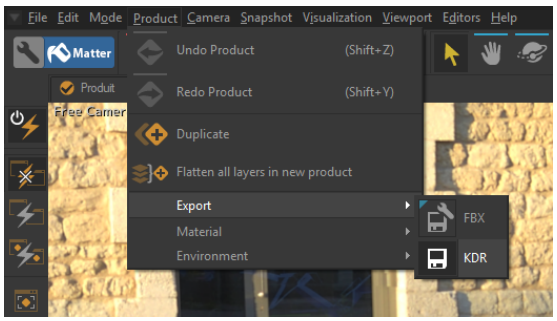


Figure 29 : Export a database as a KDR format.

9 INDEX