

# DepthQ<sup>®</sup>VR<sup>®</sup>

Lightspeed Design, Inc.

## Reference Manual

for DepthQ<sup>®</sup> Technology Components:

DepthQ<sup>®</sup> VR Player

DepthQ<sup>®</sup> Software License

2016



# Lightspeed Design, Inc.

## Reference Manual for DepthQ® VR 2016

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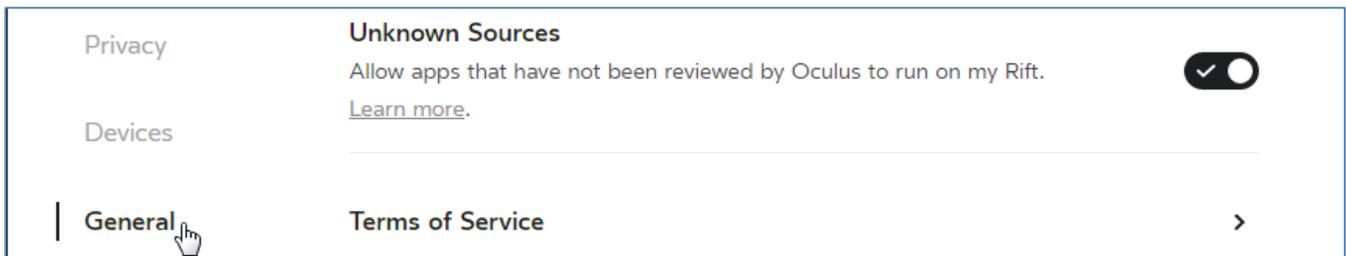
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# Chapter 1: Install and Activation guide

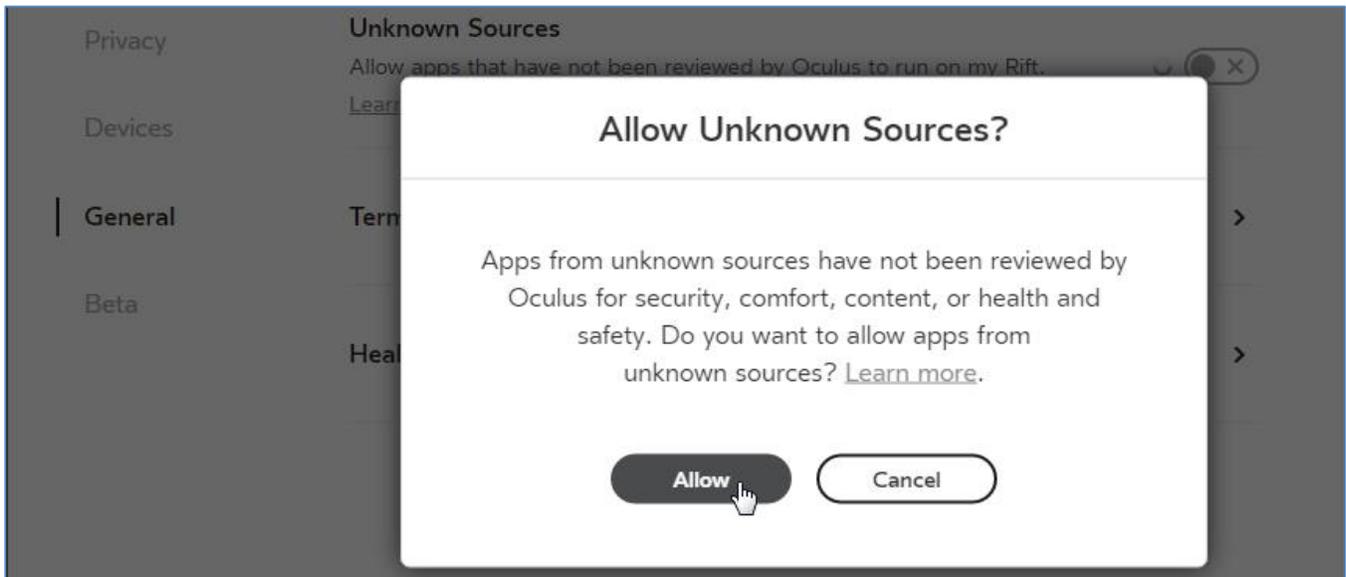
Follow the [separate Install and activation guide](#) for help with installation. It can be viewed from the DepthQ website here: [http://www.depthq.com/pdf/DepthQ\\_VR\\_Player\\_Install\\_Guide.pdf](http://www.depthq.com/pdf/DepthQ_VR_Player_Install_Guide.pdf)

## Oculus Unknown Sources

If you haven't already, be sure to enable the Unknown Sources mode in the Oculus Home settings.



Oculus Home: Settings | General | Unknown Sources



Oculus Home: confirm setting

## Oculus Device Warnings

If you have any device warnings, you might not have a good experience. Some USB3 ports are known to have problems. Sometimes it is best to use a USB3 PCI-express card like the [Inateck Superspeed](#).

Account

Privacy

Devices **2**

General

Beta



### Oculus DK2

- Connected
- ▲ USB driver update recommended

---

Serial #

20ATTQ029SFM

---

Firmware Version

N/A

---

VR Audio Output

Rift headphones ▾  

---

VR Audio Input

Your headset is plugged in correctly. If you encounter tracking issues, updating your driver (Intel) may improve performance.

⚠ USB 3.0 ? 

BETA

Account

Privacy

Devices **2**

General

Beta



### Sensor

- Connected
- ▲ USB driver update recommended

---

Serial #

21ATTQ029SFM

---

Firmware Version

Your sensor is plugged in correctly. If you encounter tracking issues, updating your driver (Intel) may improve performance.

⚠ USB 2.0 ? 

---

Reset Default View in VR >

---

Sensor Support >

BETA

# Chapter 2: DepthQ<sup>®</sup> VR Player

## Overview

**DepthQ VR Player** is a high performance VR media player supporting pixel accurate resolutions and 90 fps playback for the Oculus Rift VR headset.

DepthQ VR Player leverages our custom DQVR codec along with fast CUDA realtime processing to deliver an amazing and fluid VR experience from pre-rendered media files.

## Technical Description

DepthQ VR Player is available in two configurations:

- **Lite** – A free-to-download evaluation version which includes our demonstration sample VR movie. Incorporates watermarks, with restricted play length and playlist functionality. Quick and easy online registration is required to activate the software.
- **Pro** – A licensed professional version without the restrictions of the LITE version.

DepthQ VR Player accepts movies in an Above/Below “skybox” format (described [here](#)) at nearly any resolution and frame rate. Best results are obtained by matching or exceeding the [recommended resolution](#) and exactly matching the frames per second display of your Oculus Rift VR headset. Use of the DQVR codec is required for full bandwidth operation.

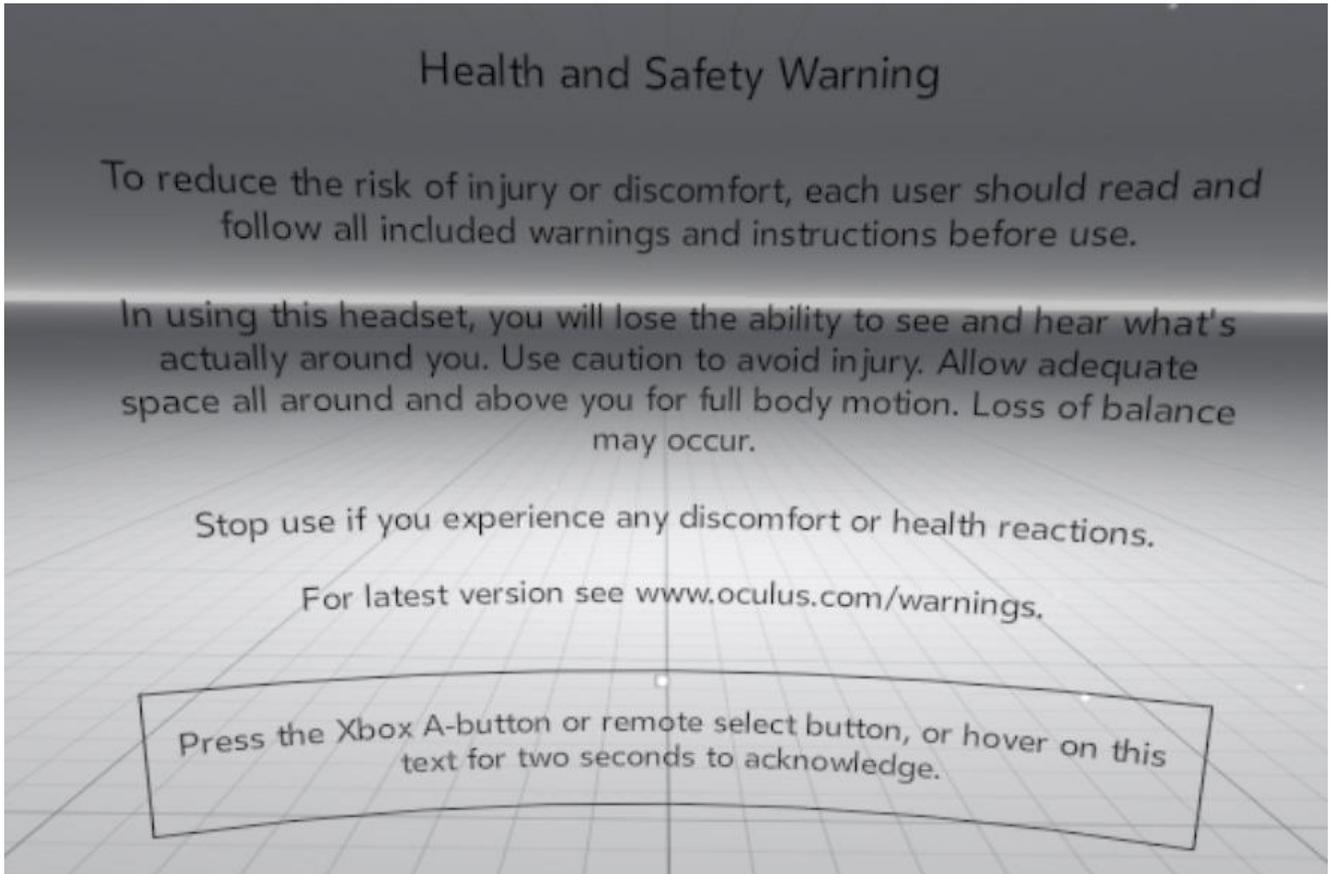
## General System Recommendations

- DepthQ VR Player requires an Oculus CV-1 or DK-2 VR headset.
- All Oculus hardware and software requirements must be met:
- <https://www.oculus.com/en-us/blog/powering-the-rift/>
- An Nvidia graphics card supporting CUDA (<http://www.geforce.com/hardware/technology/cuda/supported-gpus>)
- GeForce GTX 970 or better is recommended. Higher performance cards will provide higher resolutions and image quality
- Windows 7 SP1 or greater
- Dedicated Media SSD is strongly recommended

## Getting Started

### Oculus Health and Safety Warning

When starting DepthQ VR Player you may see the Oculus Health and Safety Warning message. Press the “green A” button on the controller to dismiss this message.



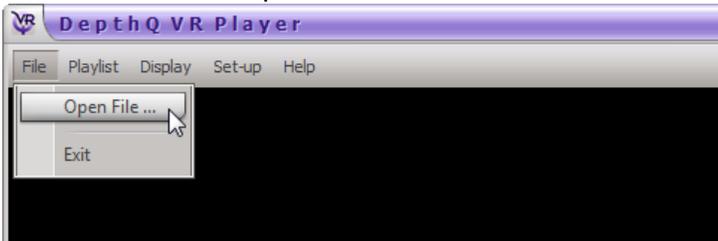
## Getting Started With DepthQ VR Player

### Playing Your First Movie

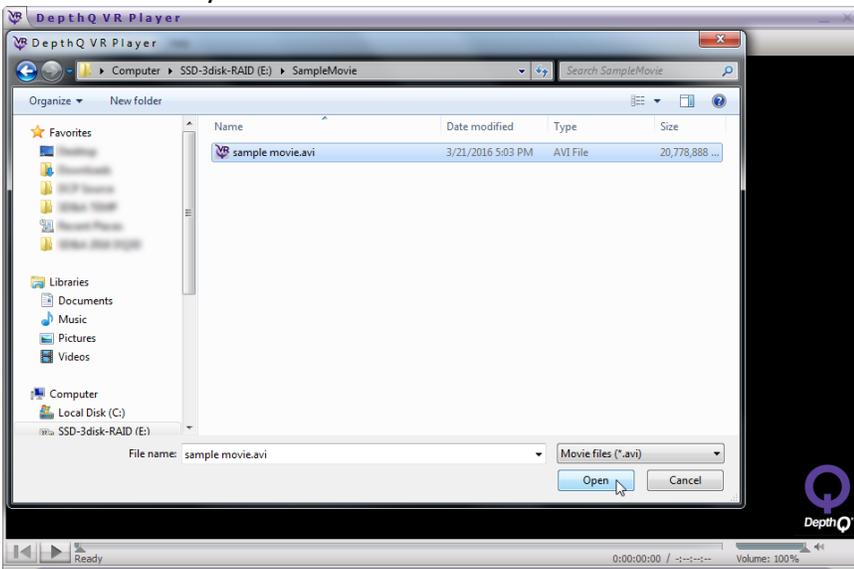
From the desktop icon, start DepthQ VR Player.



Select the file load option from the menu



Select and load your demonstration movie



Click the Open button and the movie will begin playing back. Put on your Oculus and enjoy the VR experience.



*Tip: Playing the “most-recent” movie is as simple as left-clicking in the black media playback area. We have pre-loaded a demo movie into your start-up configuration file, as though it were the last movie you played. Give it a try (or click on the **File Open button** icon or text menu to load a movie manually). Yet another tip: pressing the “L” default key shortcut toggles the **Loop setting** OFF/ON (default is “ON”).*

## Controller Buttons

You can use the four buttons to control the playback. You can reconfigure each button to configure any available player function.

Defaults:

A (green) – jump to next playlist movie

B (red) – play/pause

X (blue) – exit

Y (orange) - jump to previous playlist movie

There are other controller buttons you can make use of:

<u>Number</u>	<u>Button</u>
5	Left Shoulder Button (LB)
6	Right Shoulder Button (BR)
7	Back
8	Start
9	Left stick (push joystick down)
10	Right stick (push joystick down)

## Getting Help - DepthQ.com

Please search this manual and/or visit our [DepthQ VR Player FAQ Page](#) if something is stumping you – your question may already be answered! If you don't find the answer, please feel free to ask us your question via our [DepthQ VR Player Contact Form](#).

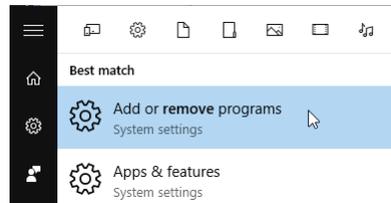
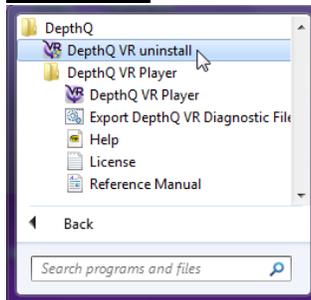


**Note:** The stand-alone DepthQ VR Player pdf manual is also downloadable via a sidebar link in the main [DepthQ VR Player web page](#).

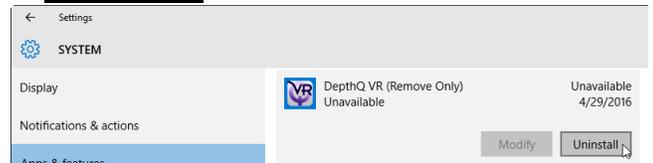
## Removing DepthQ VR Player

Select the “Uninstall DepthQ VR Player” item from the windows start menu.

### Windows 7



### Windows 10



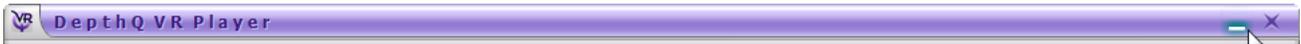
Alternatively, you can select DepthQ VR Player from the Add/Remove programs control panel applet.

## The Interface

### Minimize/Maximize/Close

These top-right controls **Minimize** or **Close** the player.

Minimize Player Control



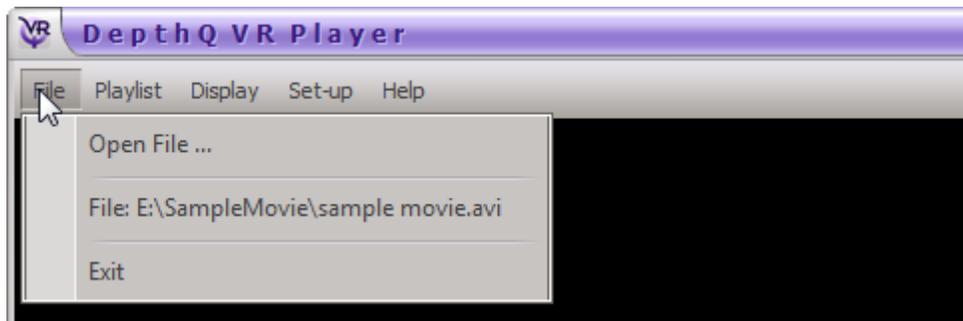
Close Player Control



### File

Clicking **File menu** grants access to the various features consolidated there: **Open File**, **Open Recent File** (your five most recent data sources are listed), and **Exit**.

File Menu



### File Items

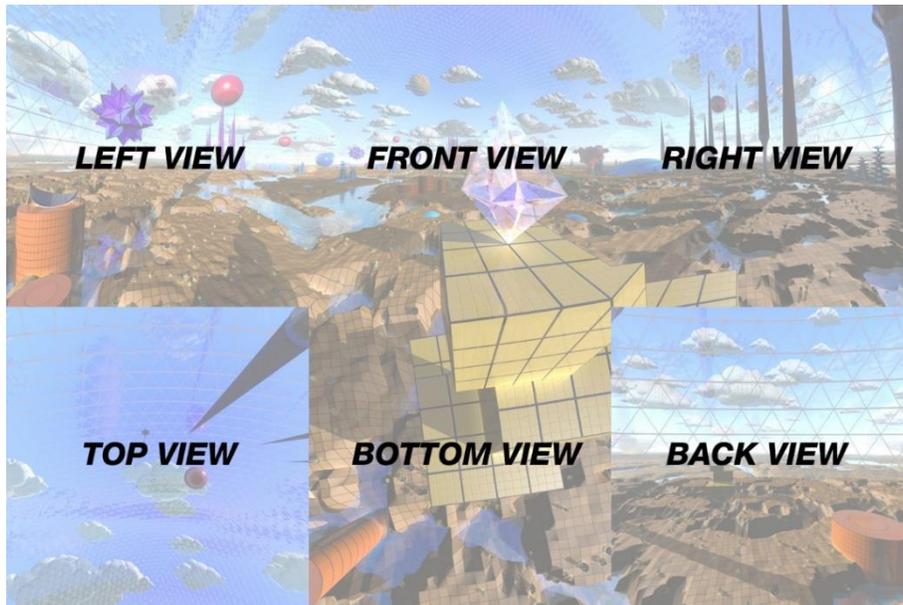
#### Open File

Opens a locally stored, pre-rendered 3D (or 2D) VR media file (in a specifically arranged cube mapped "skybox" format).

## Skybox Format

Cube maps (or skyboxes ) have been used in computer graphics for a long time, and are six-sided cubes mostly used behind the scenes to assist in mapping and reflections. DepthQ VR Player expects to see your movie's cube faces arranged in the following order:

### 2D Skybox Formatting for DepthQ VR Player



If your 360° movie is 2D, the above is all that is required. If your 360° movie is 3D you should use a double-tall canvas with the Left eye views above the Right eye views like this:

### 3D Skybox Formatting for DepthQ VR Player



## Recommended Resolutions

For the best performance possible, we suggest you feed the DQVR codec horizontal and vertical resolutions that are evenly divisible by 64. Also, in order to map into the display of your Oculus Rift VR Headset without losing any perceived sharpness, the minimum recommended resolutions and frames per second for your skybox-arranged 360° movies are as follows:

**Oculus Rift DK2:** 75 FPS; 2D: 2496 W x 1664 H; 3D: 2496 W x 3328 H

**Oculus Rift CV1:** 90 FPS; 2D: 2880 W x 1920 H; 3D: 2880 W x 3840 H

Higher resolutions are perfectly acceptable, and on a system that meets the Oculus specifications, the codec has headroom. 360° 3D movies mastered at 3072 W x 4096 run perfectly without dropped frames or judder, for example. Movies with higher than minimum-required resolution will be scaled down to match the display, so in essence, you are oversampling your content, ensuring maximum perceived sharpness.

## Open Recent

Up to five recently opened media targets are displayed for quick access. These can be **directory listings** as well as **URLs**.

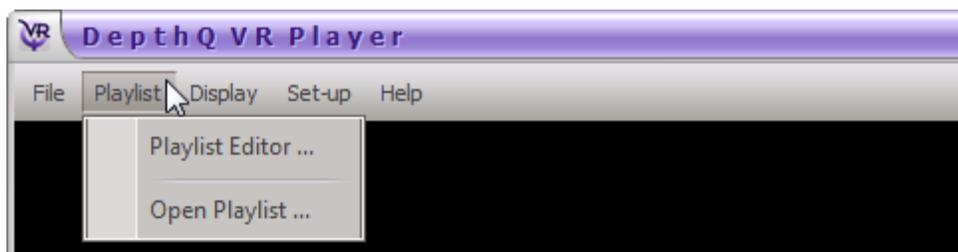
## Exit

Exits the player.

## Playlist

Clicking the **Playlist menu** grants access to the various features consolidated there: **Playlist Editor**, and **Open Playlist**. The Playlist Editor allows you to select several files to play in the sequence you define, whereas Open Playlist immediately loads and starts playing the selected Playlist.

### Playlist Menu



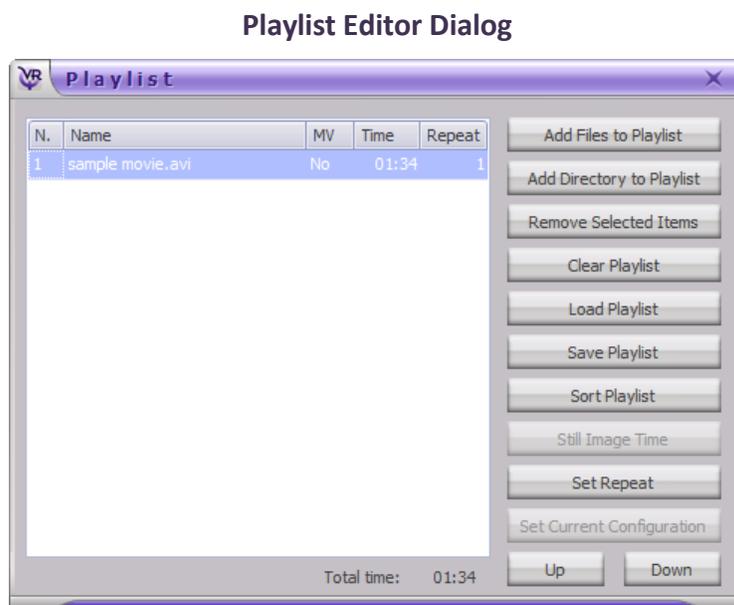
## Playlist Items

### The Playlist Editor

**Playlist** use in DepthQ VR Player is pretty straight-forward. There are buttons to **Add Files to Playlist**, **Add Directory to Playlist**, **Remove Selected Items**, **Clear Playlist**, **Load Playlist**, **Save Playlist**, **Sort Playlist**, plus buttons to allow you to set the **Still Image Time**, and move items **Up** or **Down** in the Playlist order.



**Note:** The use of playlists are disabled in the trial version of (DepthQ VR Player LITE). Contact [sales@depthq.com](mailto:sales@depthq.com) for information about DepthQ VR Player PRO.

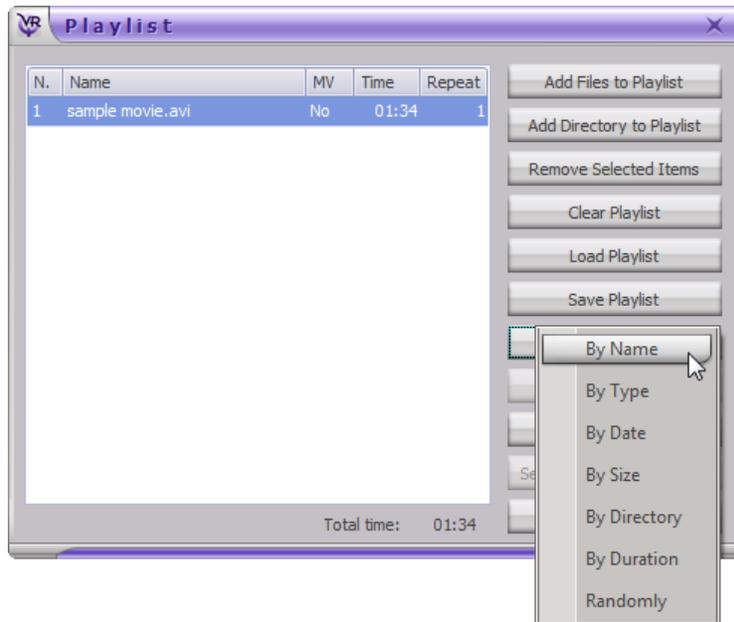


#### General Playlist Guidelines:

- The DepthQ VR Playlist is stored as a **.DPL file**.
- Double-clicking on any list entry will play the selected media.
- Once you've built your playlist, remember to save it using the **Save Playlist** button, then exit the dialog using the **Close Player control button** at the top right.
- Adding a directory will add every media file of known extension within the folder you select (including all files found in underlying directories).
- You can Left-Click *single* items or Shift+Left-Click or Ctrl+Left-Click *multiple* items in the list and delete them from your playlist by clicking the **Remove Selected Items button**.
- When saving playlists the Playlist Editor saves the full path. As such, the Playlist doesn't have to be within the same directory as the files it's pointing to.

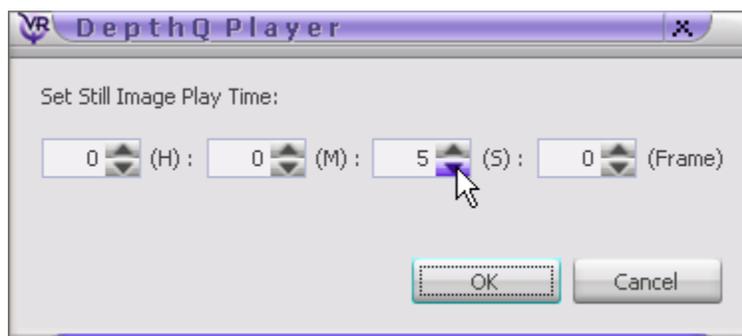
- Clicking the **Sort Playlist button** presents you with a drop-down list of several useful sorting methods, including **By Name**, **By Type**, **By Date**, **By Size**, **By Directory**, **By Duration**, and **Randomly**.

### Sorting Your Playlist



- Each still image (.jpg or .bmp) can be set to have its own duration. Just select your file, click the **Still Image Time button**, and adjust your play time accordingly.

### Still Image Play Time Dialog



- To manually change the order of any item, first click that item in the list to highlight it, then click the **Up** or **Down button** to move it.

Once you've exited the dialog,

- If you have not double-clicked on any of the movies in your playlist while in the Playlist Editor, pressing the **Play** or **Rewind button** (on the player) will start playing all the files in the Playlist from the first entry on the list.
- If you did double click one of the movies in your playlist while in the Playlist Editor, DepthQ VR Player will proceed from this movie upon exiting.
- Hitting the **Rewind button** during playlist playback rewinds to the start of the movie currently playing, not the start of the playlist.
- To skip forward and backwards through your playlist, use the default keyboard commands **Page-up** (previous playlist item) or **Page-down** (next playlist item).
- Once freshly opened from either **File | Open File** or **Playlist | Open Playlist**, a playlist will always proceed from the first entry.

## Open Playlist

This opens a standard **Windows file browser** so you can locate and select the **.DPL file** of your choice for editing in the Playlist Editor.



**Note:** *Until you have actually saved and re-opened a playlist, it will not appear in the list of most recently loaded files. Nonetheless, as long as you have not manually opened any other media before quitting, a Left-Click in the black media playback area of a freshly-launched player will start playing the entire playlist from the top, as it will still be present in the Playlist Editor.*

## Display

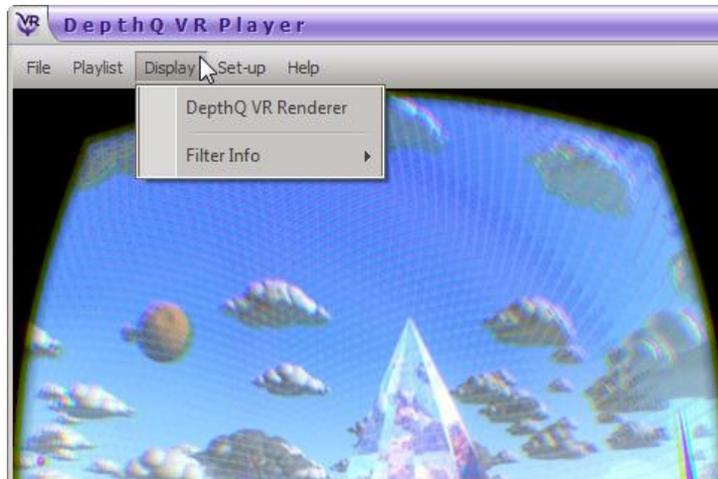
Clicking the **Display menu** grants access to the various features consolidated there:

In Advanced Mode the options are **DepthQ VR Renderer**, and **Filter Info**.



**Note:** *Some features will remain grayed out and inaccessible until a media file has been opened.*

## Display Menu



### Display Items

#### DepthQ VR Renderer

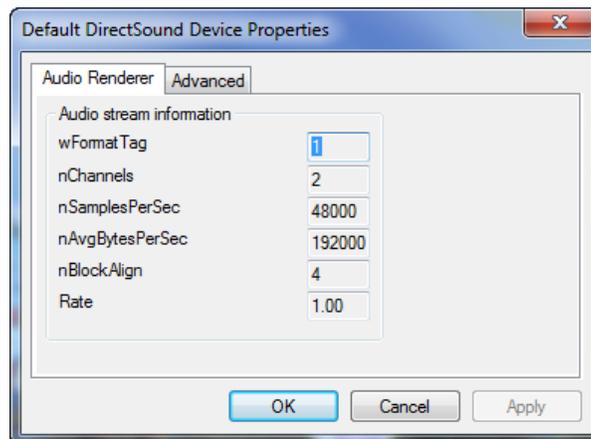
If you have already opened a VR media file, clicking this item will open the current **DepthQ VR Renderer Dialog**, which allows you to view **statistics** and **about**.

Until a stereoscopic media file has actually been loaded, this item will remain grayed out.

#### Filter Info

Clicking this item accesses the various **audio and video filters** being used by the current media file, e.g. the **DirectSound Device Properties**, the **DepthQ Filter**, and others:

#### DirectSound Audio Renderer Dialogs

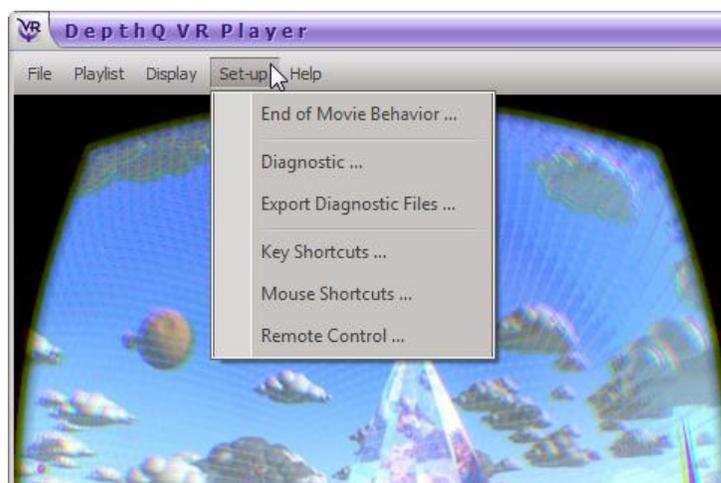




## Set-up

Clicking the **Set-up** menu grants access to the various features consolidated there: **End of Movie Behavior**, **Diagnostic**, **Export Diagnostic File**, **Key Shortcuts**, **Mouse Shortcuts**.

### Set-up Menu



## Set-up Items

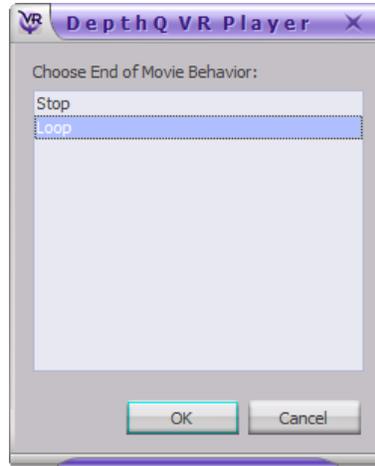
### End of Movie Behavior

Determines the behavior desired at the **end of the movie**. Choices are **Stop** or **Loop**.



*Tip: pressing the "L" default key shortcut toggles the **Loop setting** OFF/ON (default is "ON").*

## End of Movie Behavior Dialog



## Diagnostic Level

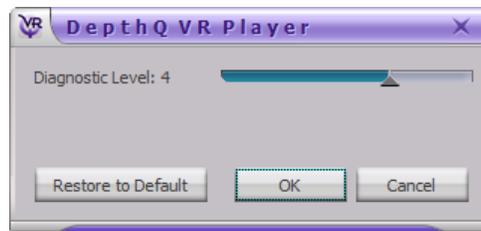
Determines the **Diagnostic Level** for error reporting. Choices are **0-10**. Upon the event of an error, a log file (DepthQ\_Player.log) is generated. The level of detail in that log is determined by the Diagnostic level. The default is 4, and higher levels will affect performance, so we recommend keeping this set to 4.

*You will only ever need to access this dialog in the event that Lightspeed is troubleshooting a specific event on your system with you.*



**Note:** *In the event that an error occurs please report it to us and attach the log file in an email, as it will help us improve DepthQ VR Player for all users.*

## Diagnostic Level Dialog

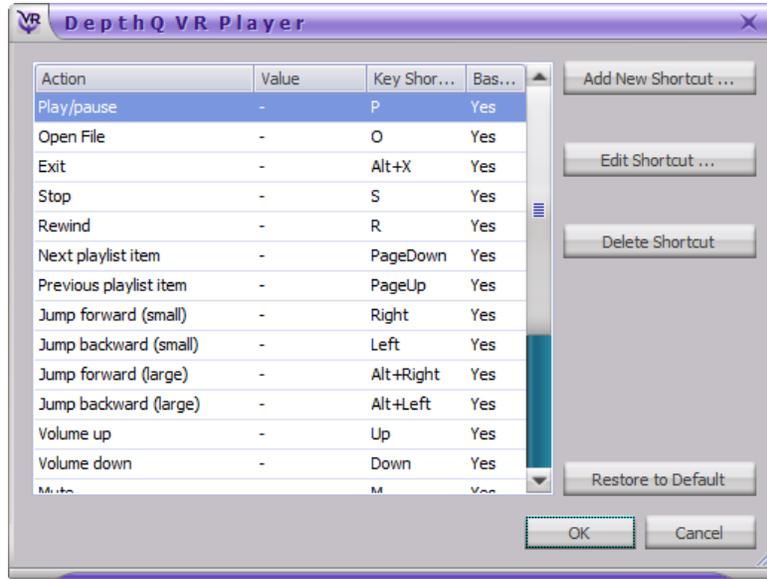


Please report any player errors you encounter to [dgerror@lightspeeddesign.com](mailto:dgerror@lightspeeddesign.com).

## Key Shortcuts

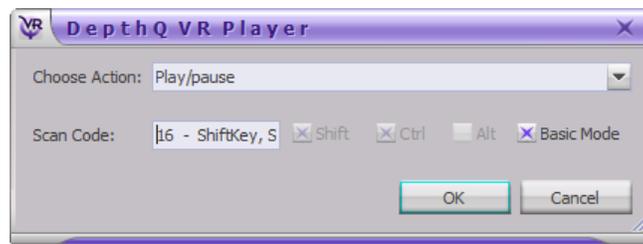
Clicking this item accesses the **Key Shortcuts Dialog**, which allows customization of the **keyboard shortcuts**.

## Key Shortcuts Dialog



Clicking the **Edit Shortcut button** brings up a dialog which allows changing of the keyboard shortcut for any available action. Simply click in the **Scan Code input box** and press any key. The scan code for that key is automatically entered for you. Include **Shift**, **Ctrl** and/or **Alt** keys by enabling them individually.

### The Key Shortcuts | Edit Shortcut Dialog

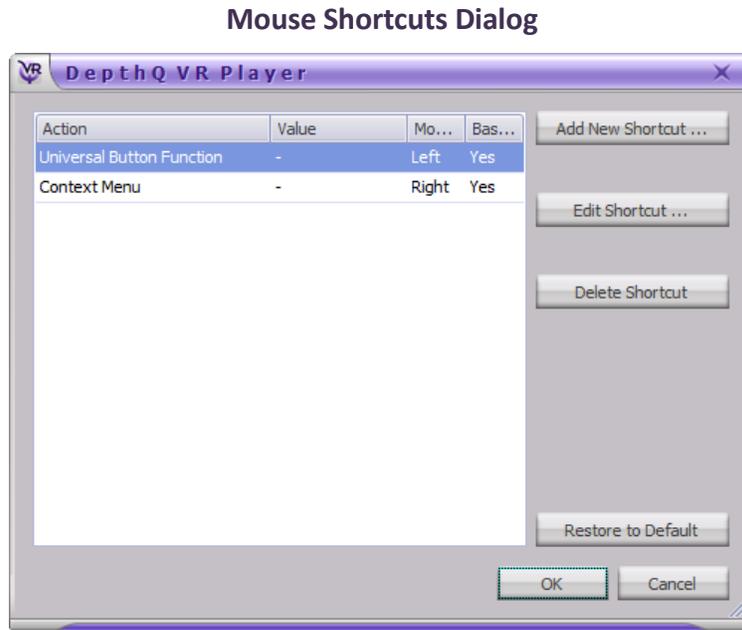


### Available Shortcut Actions and their Default Key Shortcuts:

Action	Value	Key Short...	Basi...
Play/pause	-	P	Yes
Open File	-	O	Yes
Exit	-	Alt+X	Yes
Stop	-	S	Yes
Rewind	-	R	Yes
Next playlist item	-	PageDown	Yes
Previous playlist item	-	PageUp	Yes
Jump forward (small)	-	Right	Yes
Jump backward (small)	-	Left	Yes
Jump forward (large)	-	Alt+Right	Yes
Jump backward (large)	-	Alt+Left	Yes
Volume up	-	Up	Yes
Volume down	-	Down	Yes
Mute	-	M	Yes
Loop Movie	-	L	Yes
Open Video Render Dialog	-	Q	Yes
Context Menu	-	C	Yes
Keyboard Shortcuts List	-	K	Yes
Open Playlist Editor	-	Alt+P	Yes

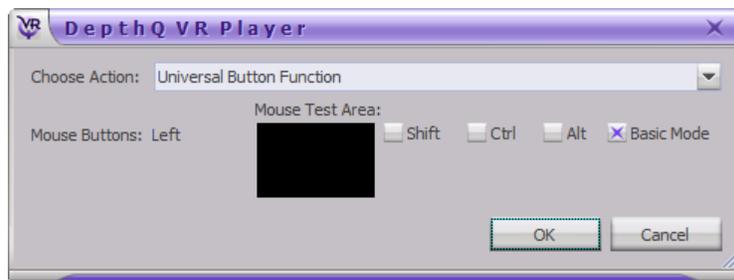
## Mouse Shortcuts

Clicking this item accesses the **Mouse Shortcuts dialog**, which allows customization of the **mouse shortcuts**.



Simply pick a mouse action that you want to apply a shortcut to, and click the **Edit Shortcut button** to choose an available action from the drop-down list. Include **Shift**, **Ctrl** and/or **Alt** keys by enabling them individually.

### Mouse Shortcuts | Edit Shortcut Dialog



The action **Universal Button Function** is a **Pause/Play toggle** when the assigned mouse button is clicked inside the **media playback area** (with a movie loaded), as well as a **Play Most Recent File command** when the assigned mouse button is clicked inside a *blank* media playback area.

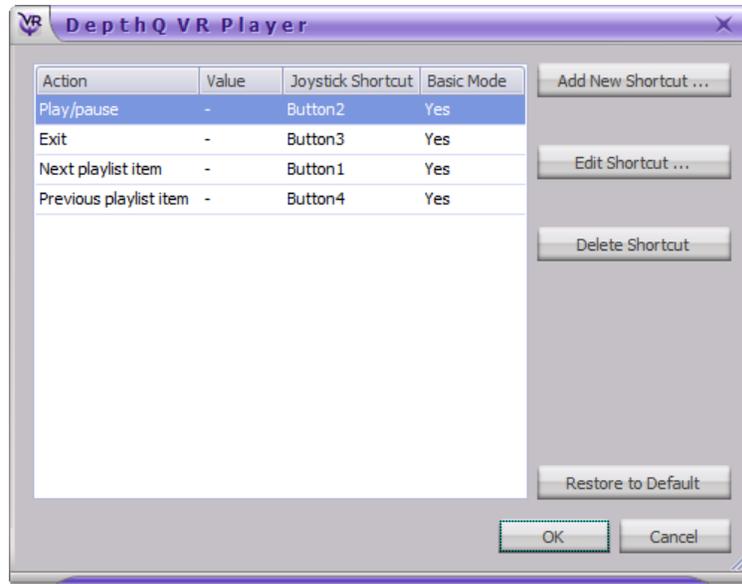


**Note: Modifying the keyboard and mouse shortcuts will produce different key and mouse behavior than that described in this document.**

## Joystick Shortcuts

Clicking this item accesses the **Joystick Shortcuts dialog**, which allows customization of the **joystick button shortcuts**.

## Joystick Shortcuts Dialog



Pick a joystick button action that you want to apply a shortcut to, and click the **Edit Shortcut button** to choose an available action from the drop-down list. Include **Shift**, **Ctrl** and/or **Alt** keys by enabling them individually.

## Joystick Shortcuts | Edit Shortcut Dialog

## Remote Control

Clicking this item allows the user to configure **remote control** of the DepthQ VR Player interface.

## Default Remote Control Dialog



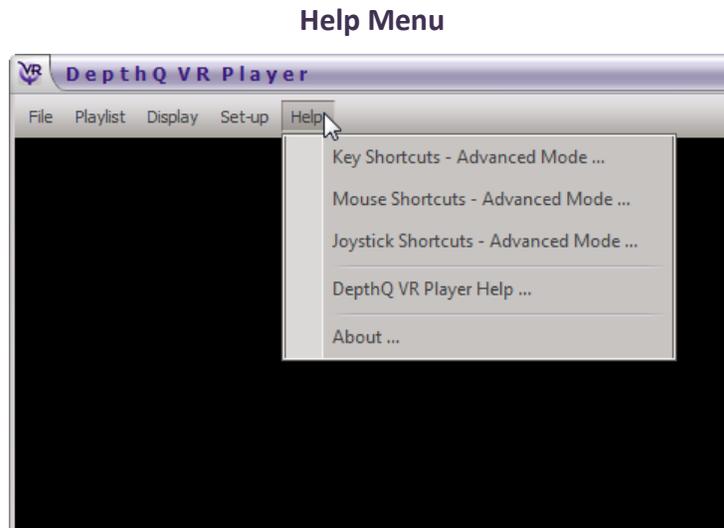
Clicking the **Start button** enables the remote control features of DepthQ VR Player. Clicking the **Stop Button** disables the remote control features of DepthQ VR Player. Checking the **Auto Start on Startup box** will cause the **Remote State** to be **Online** immediately when DepthQ VR Player starts.



**Enabling auto start can cause DepthQ VR Player to take extra time at startup; especially if the remote control application is not present.**

## Help

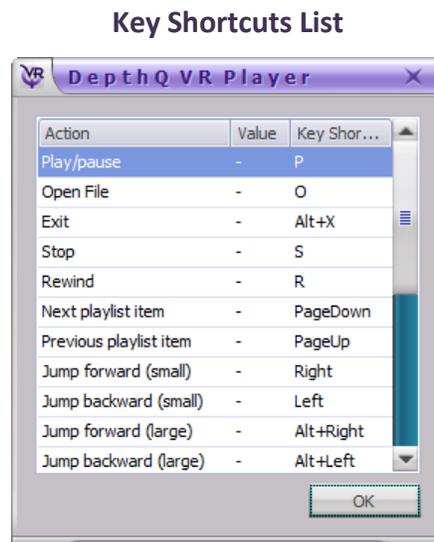
Clicking the **Help** menu grants access to the various features consolidated there: **Key Shortcuts**, **Mouse Shortcuts**, **Joystick Shortcuts**, **DepthQ VR Player Help** (opens the help file in PDF form), or **About**.



## Help Items

### Key Shortcuts

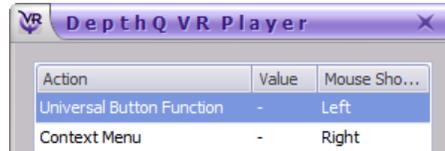
Displays a list of the available **Keyboard Shortcuts**.



### Mouse Shortcuts

Displays a list of the available **Mouse Shortcuts**.

## Mouse Shortcuts List



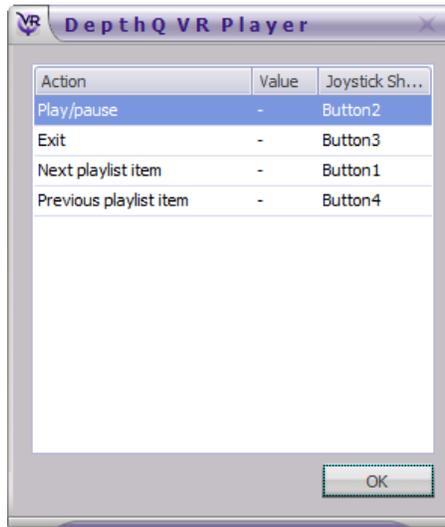
The screenshot shows a dialog box titled "DepthQ VR Player" with a table of mouse shortcuts. The table has three columns: "Action", "Value", and "Mouse Sho...".

Action	Value	Mouse Sho...
Universal Button Function	-	Left
Context Menu	-	Right

## Joystick Shortcuts

Displays a list of the available **Mouse Shortcuts**.

## Joystick Shortcuts Dialog



The screenshot shows a dialog box titled "DepthQ VR Player" with a table of joystick shortcuts. The table has three columns: "Action", "Value", and "Joystick Sh...".

Action	Value	Joystick Sh...
Play/pause	-	Button2
Exit	-	Button3
Next playlist item	-	Button1
Previous playlist item	-	Button4

An "OK" button is located at the bottom right of the dialog box.

## DepthQ VR Player Help

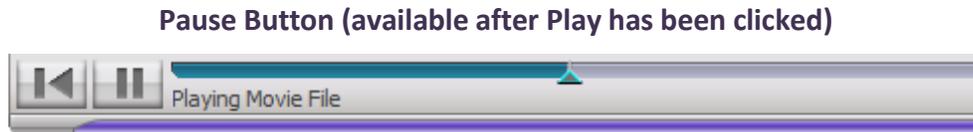
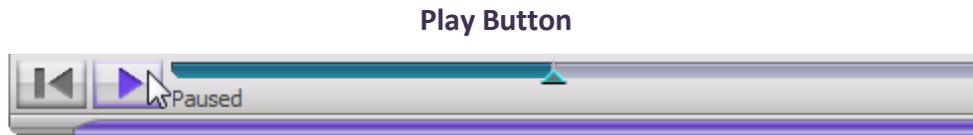
Opens this help file in PDF format. The same document can be found on the web via a link on [the DepthQ VR Player Web Page](#).

## About

This menu item displays information about the DepthQ VR Player software.

## Play / Pause Button

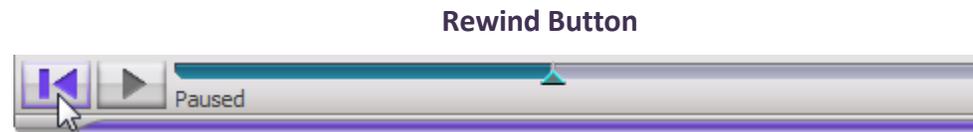
Clicking the **Play button** plays the movie that has been loaded. The user may then toggle between **Play** and **Pause**:



*Tip: Once a movie has been loaded, a left click (the default button behavior) in the media playback area will also toggle between Play and Pause.*

## Rewind Button

Clicking the **Rewind button** causes the movie to start playing from the beginning of the movie. The behavior is the same regardless if the movie was playing or was paused.



## Media Position Control / Progress Bar

Indicates the current time position within a movie, and allows interactive random access. As the file plays, the **Media Position Control** will move from left to right and a teal bar will fill in the space behind it. When the bar is completely filled in, the movie is complete.

Directly clicking and dragging the Media Position Control allows the user to randomly access any point in the movie. Clicking any point IN the **Progress Bar** left or right of the Media Position Control moves the player directly to that point in time.



## Volume

Clicking and dragging the **Volume Control** alters the volume level of playback. Clicking anywhere in the **Volume Control Bar** left or right of the Volume Control directly alters the volume to that level.

### Volume Control



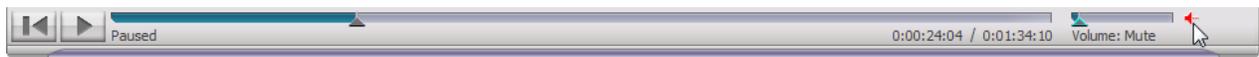
*Tip: once the volume control has focus, the mouse's scroll wheel controls volume.*



## Mute Toggle

Clicking the **Mute toggle** mutes/un-mutes the audio, setting the playback volume to 0% or returning it to its last used level.

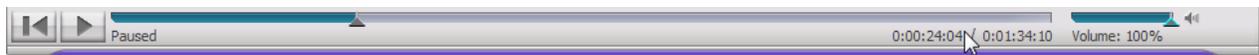
### Mute Toggle



## Current Time / Duration Indicator

When playing, the **Current Time/Duration Indicator** displays the current time and movie duration in hours:minutes:seconds:frames.

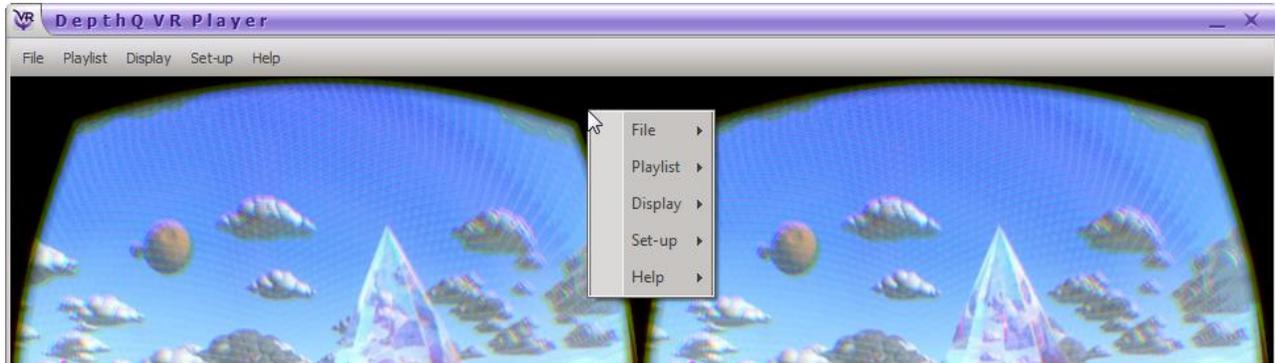
### Current Time / Duration Indicator



## Right-Click Context Menu

A Right-Click (default mouse action) in the media playback area brings up a floating **Context Menu**, allowing convenient access to the menu items available to the user.

## Right-Click Context Menu



## On Screen Display (OSD)

Certain actions, such as **Play**, **Pause**, **Stop**, etc. can be momentarily displayed in the upper right hand corner of the media playback area by activating the **OSD**.

### The OSD Indicating the Exact Moment Movie Was Paused



## DepthQ VR Renderer Properties Dialog

This dialog window allows you view real-time statistics and program information.

### Accessing the DepthQ VR Renderer Dialog

There are three ways to access this dialog window:

- 1) Through the icon or text menu item [Display | DepthQ VR Renderer](#), or
- 2) Through the text menu item [Display | Filter Info | DepthQ VR Renderer](#)
- 3) Via the "Q" default key shortcut (after a movie is loaded).

## Methods of Accessing the DepthQ OpenGL Renderer Dialog

### Advanced Mode Access 1



### Advanced Mode Access 2



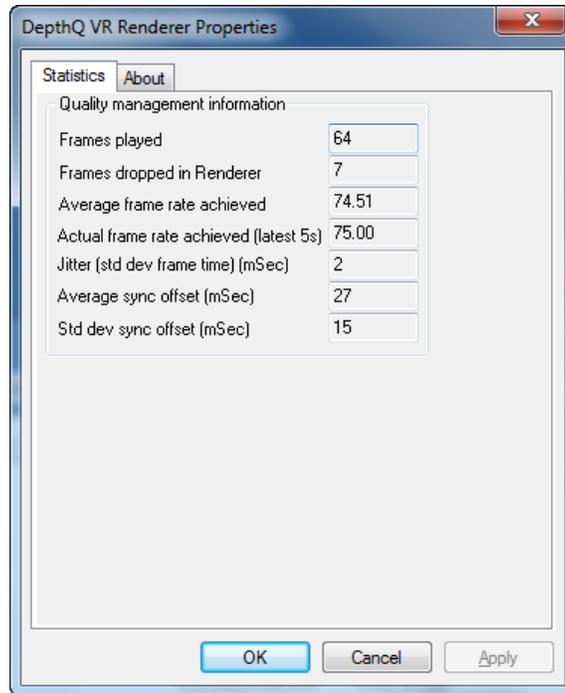
## Renderer Dialog Control Tabs

### Statistics Control Tab

This tab displays various playback statistics reflecting the current performance of DepthQ VR Player. This information can be useful in determining the ability of your hardware configuration to play back a given movie properly.

With this tab selected, a default left click in the media playback area will start playing your movie and gathering data. If your End of Movie Behavior is set to **None** rather than **Loop** (the "L" default keyboard shortcut toggles between them), you can let the movie play through to the end. When it stops, the full tallied results will be displayed (the results are updated as the movie plays, but infrequently). If you **Pause** the movie anywhere (another default left click in the media display area) you will then get a tally of the results between the time you hit **Play** and **Pause**.

## The Statistics Control Tab



### Quality Management Information Control Group

Sampled data includes:

#### *Frames Played*

The total frames played between the time you hit **Play** and the movie was either paused or it ended naturally.

#### *Frames Dropped in Renderer*

The total frames dropped between the time you hit **Play** and the movie was either paused or it ended naturally.

#### *Average Frame Rate Achieved*

The average frame rate displayed between the time you hit **Play** and the movie was either paused or it ended naturally.

#### *Actual Frame Rate Achieved (latest 5s)*

The average frame rate displayed during the last five seconds of play.

### *Jitter (Std Dev Frame Time) (mSec)*

The amount of variation in the frame timing in milliseconds. In our context, jitter is the delay between the invocation of the next frame task, and its release (when it actually starts to execute). The number displayed is +/- milliseconds within one standard deviation, meaning approximately 68% of the measured jitter was within this range.

### *Average Sync Offset (mSec)*

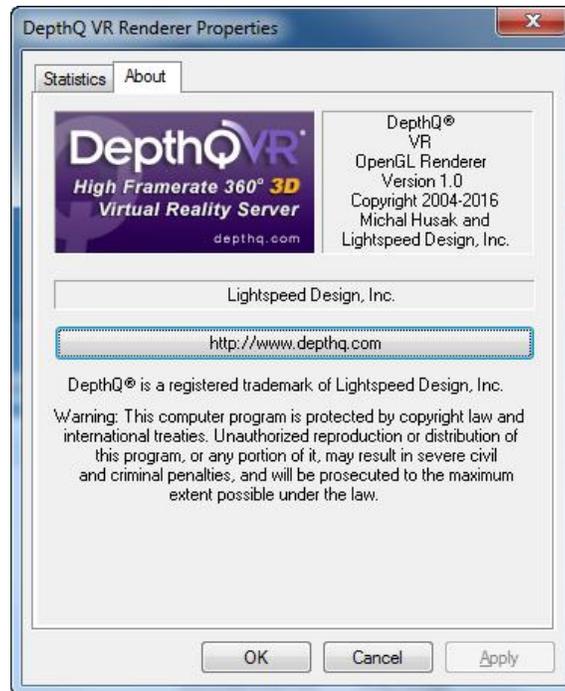
The average amount of sync offset in milliseconds between the time you hit **Play** and the movie was either paused or it ended naturally.

### *Std Dev Sync Offset (mSec)*

The sync offset, measured in +/- milliseconds within one standard deviation, meaning approximately 68% of the measured synch offset was within this range.

### **About Control Tab**

This menu item displays information about the **DepthQ® Filter**.



# **Chapter 3: DepthQ<sup>®</sup> Software License**

## **DepthQ<sup>®</sup> VR Software License Agreement**

DepthQ<sup>®</sup> VR™

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