

OZO



OZO+ CAMERA SETUP GUIDE AND REQUIREMENTS

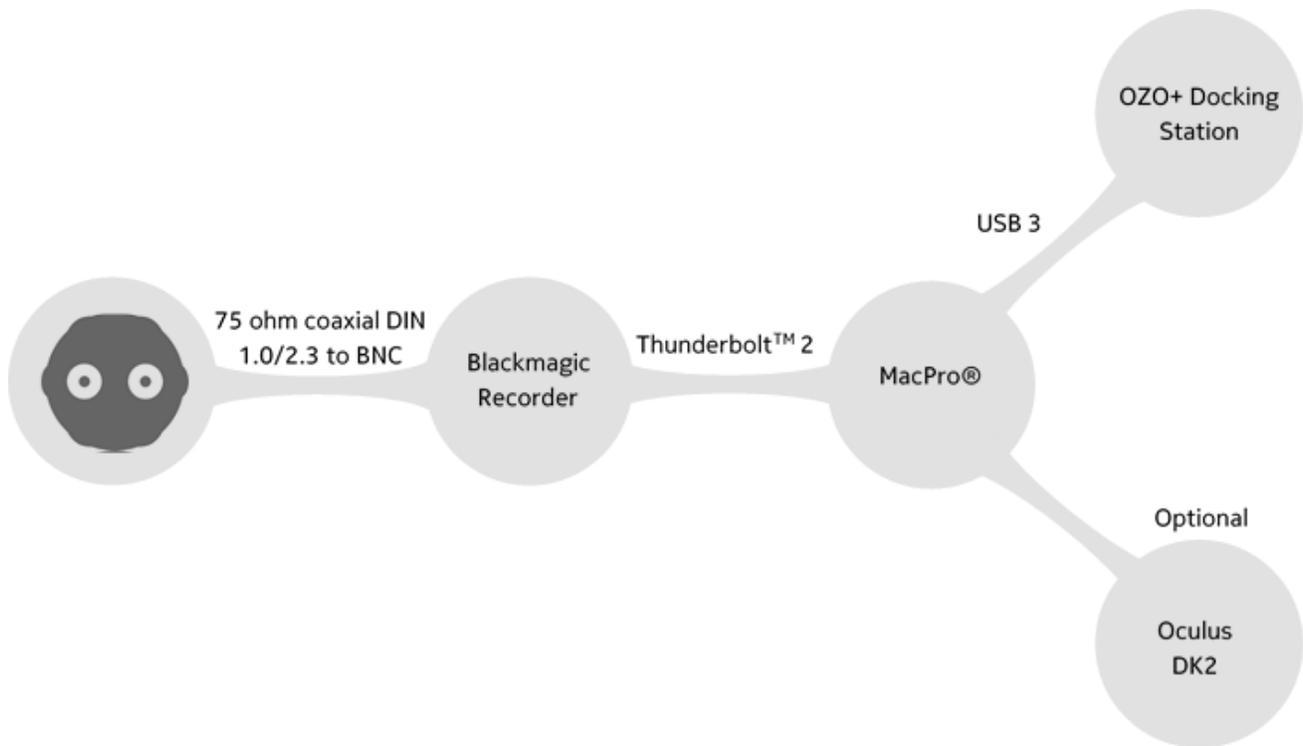
Updated 15th August 2017

References OZO Remote V2.1

Pre-requisites

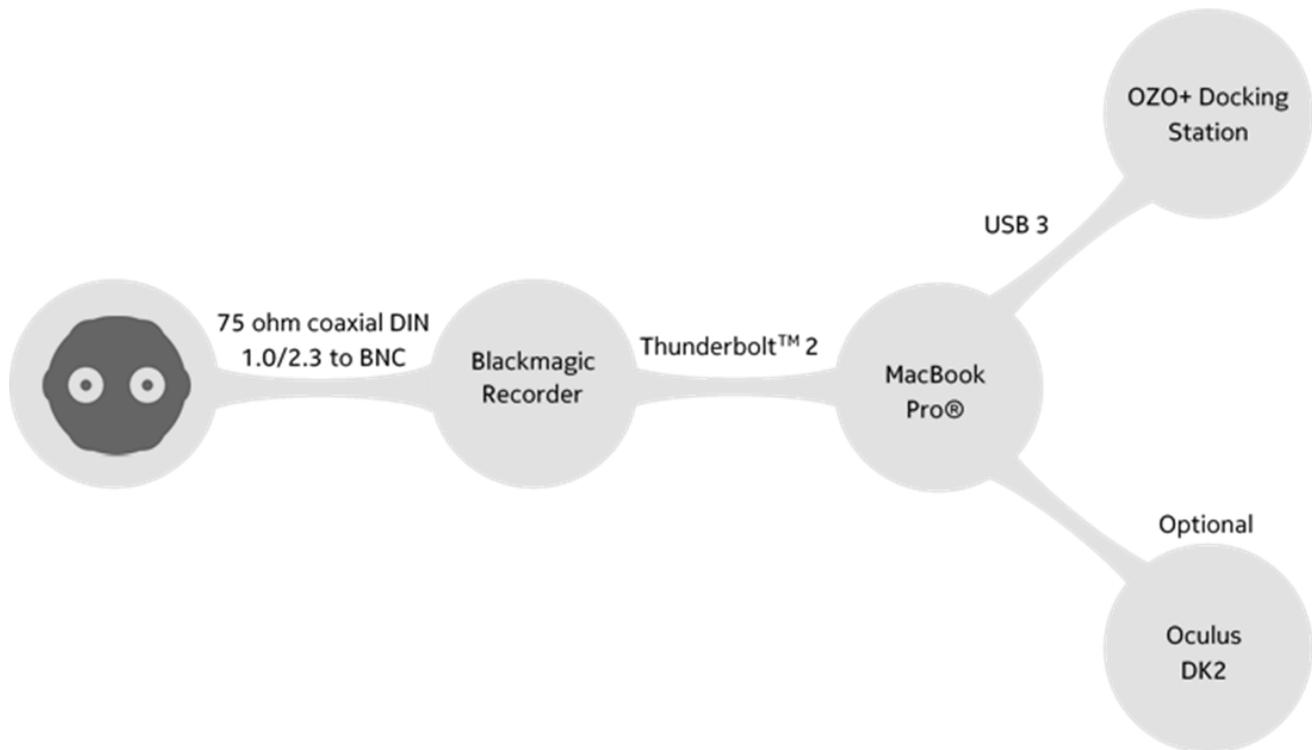
Before starting, you will need to have the following configurations. All software and/or drivers must be installed prior to installing OZO Remote 2.0. See the attached appendices for various guidelines.

For MacPros®:



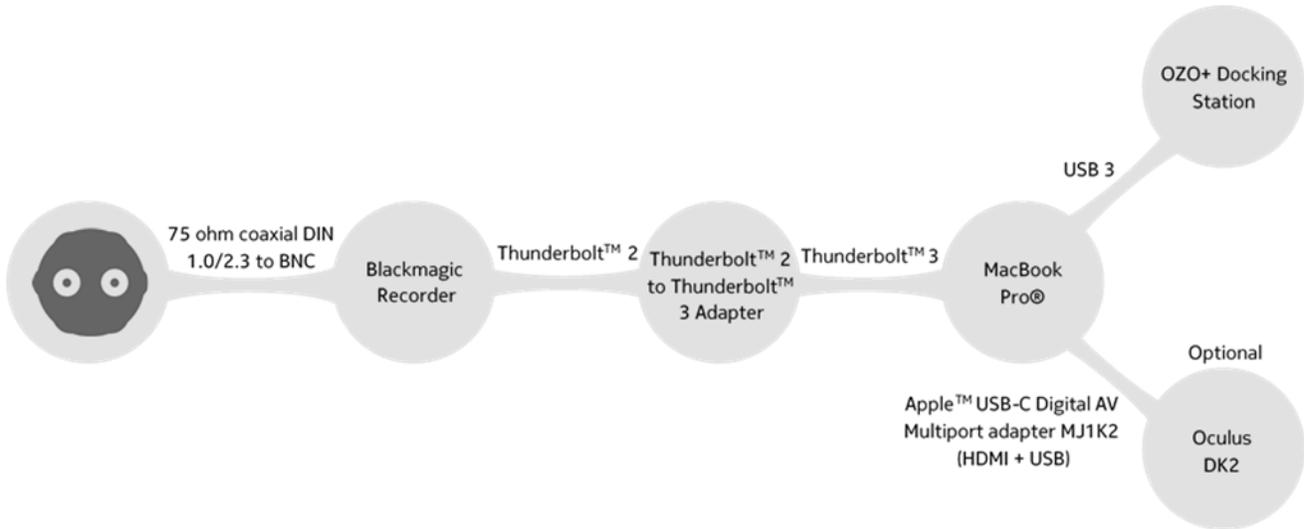
Supported Operating System	Mac OS X® 10.11 El Capitan; macOS™ X® 10.12 Sierra
Supported Hardware	Mac Pro® (Late 2013) with Dual AMD FirePro™ D500 or D700 (recommended)
	Blackmagic Recorder: <ul style="list-style-type: none"> • Blackmagic UltraStudio Mini Recorder (Thunderbolt™ 2) • Blackmagic HyperDeck Studio Pro (Thunderbolt™ 2)
Software requirements	Blackmagic Desktop Video 10.9.5
	Optional: Blackmagic Hyperdeck 5.1
	Oculus Runtime for OS X 0.5.0.1-beta

For MacBook Pros® (Late 2013):



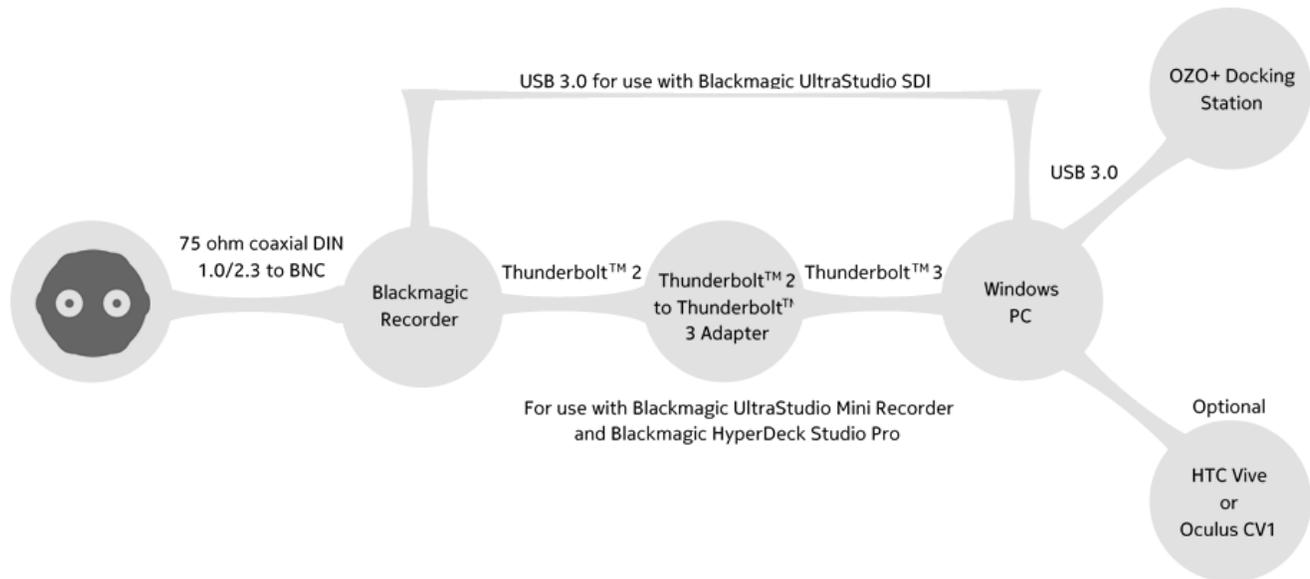
Supported Operating System	Mac OS X® 10.11 El Capitan; macOS™ X® 10.12 Sierra
Supported Hardware	MacBook Pro® (Late 2013) with discrete AMD or Nvidia GPU Blackmagic Recorder: <ul style="list-style-type: none"> • Blackmagic UltraStudio Mini Recorder (Thunderbolt™ 2) • Blackmagic HyperDeck Studio Pro (Thunderbolt™ 2)
Software requirements	Blackmagic Desktop Video 10.9.5 Optional: Blackmagic Hyperdeck 5.1 Oculus Runtime for OS X 0.5.0.1-beta

For MacBook Pros® (Late 2016):



Supported Operating System	Mac OS X® 10.12 Sierra
Supported Hardware	MacBook Pro® 15" (Late 2016) with discrete AMD Radeon™ Pro GPU Apple Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter or StarTech Thunderbolt™ 3 to Thunderbolt™ 2 Adapter (TBT3TBTADAP) Blackmagic Recorder: <ul style="list-style-type: none"> • Blackmagic UltraStudio Mini Recorder (Thunderbolt™ 2) • Blackmagic HyperDeck Studio Pro (Thunderbolt™ 2) Apple USB-C Digital AV Multiport adapter, MJ1K2 (HDMI + USB)
Software requirements	Blackmagic Desktop Video 10.9.5 Optional: Blackmagic Hyperdeck 5.1 Oculus Runtime for OS X 0.5.0.1-beta

For Windows desktops:

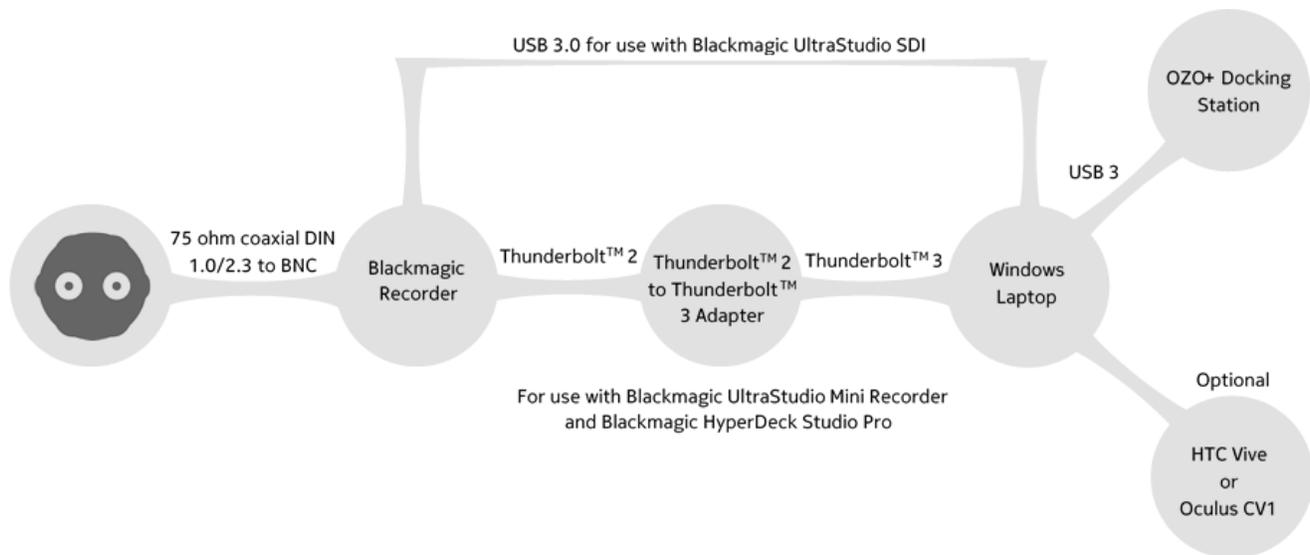


Supported Operating System	Windows 10
Supported Hardware	CPU: Intel Quad Core i7
	RAM: 16 GB
	For maximum performance: NVIDIA GTX 1080 (X 2) or AMD RX 480 8GB (x 2) For limited performance: NVIDIA GTX 1080 (X 1) or AMD RX 480 8GB (x 1)
	Blackmagic Recorder: <ul style="list-style-type: none"> • Blackmagic DeckLink (4K) Mini Recorder PCIe card (install in desktop) • Blackmagic UltraStudio Mini Recorder (Thunderbolt™ 2) • Blackmagic HyperDeck Studio Pro (Thunderbolt™ 2) • Blackmagic UltraStudio SDI (USB 3.0)
	Apple Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter or StarTech Thunderbolt™ 3 to Thunderbolt™ Adapter (TBT3TBTADAP).
	Wi-Fi antenna
Software requirements	The latest Nvidia drivers installed (NVIDIA GTX 1080) or the latest Radeon™ drivers installed (AMD RX 480 8GB)
	Blackmagic Desktop Video 10.9.5
	Optional: Blackmagic Hyperdeck 5.1 (for use with the Hyperdeck Studio Pro)
	For CV1 - Oculus App; For HTC Vive - Vive Setup Tool and Steam VR
	Windows power management set to High Performance Nvidia power management set to Maximum

Note:

- The Blackmagic DeckLink (4K) Mini Recorder PCIe card is installed in the desktop and connects directly to the camera.
- A USB 3.0 connection is required when connecting the desktop to the Blackmagic UltraStudio SDI.
- Apple Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter or StarTech Thunderbolt™ 3 to Thunderbolt™ Adapter (TBT3TBTADAP) is required when using Blackmagic UltraStudio Mini Recorder and Blackmagic HyperDeck Studio Pro.

For Windows laptops



Supported Operating System	Windows 10
Supported Hardware	Asus ROG-G752VS with NVIDIA GTX 1070 GPU MSI GT83VR SLI laptop with dual GTX 1080 8GB Apple Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter or StarTech Thunderbolt™ 3 to Thunderbolt™ Adapter (TBT3TBTADAP)
	Blackmagic Recorder: <ul style="list-style-type: none"> • Blackmagic UltraStudio Mini Recorder (Thunderbolt™ 2) • Blackmagic HyperDeck Studio Pro (Thunderbolt™ 2) • Blackmagic UltraStudio SDI (USB 3.0)
Software requirements	Nvidia drivers installed (latest) Blackmagic Desktop Video 10.9.5 Optional: Blackmagic Hyperdeck 5.1 (for use with the Hyperdeck Studio Pro) For CV1 - Oculus App; For HTC Vive - Vive Setup Tool and Steam VR Windows power management set to High Performance Nvidia power management set to Maximum

Note:

- A USB 3.0 connection is required when connecting the laptop to the Blackmagic UltraStudio SDI.
- Apple Thunderbolt™ 3 (USB-C) to Thunderbolt™ 2 Adapter or StarTech Thunderbolt™ 3 to Thunderbolt™ Adapter (TBT3TBTADAP) is required when using Blackmagic UltraStudio Mini Recorder and Blackmagic HyperDeck Studio Pro.
- The HMD HDMI cables must plug into the ports on your graphics card. Adaptors may be required, depending on the make/model of your computer. For example, if connecting the CV1 to the MSI GT83VR SLI laptop with dual GTX 1080 8GB, a 4K compatible HDMI to mini Display Port adaptor is required.

Procedure

- Use the diagrams to connect the camera to your work station (MacPro®, MacBook Pro®, Windows PC, or Windows laptop) and follow the manufacturer’s installation instructions. **Caution: Connect (or disconnect) the coax cable to the SFP+ module with care. It is also recommended to secure the coax cable to the camera support, for example, tripod or c-stand, with some cable slack to avoid accidental pulling on the SFP+ module.**

Additional considerations:

For Windows desktop. Please note the following:

- Ensure that the Oculus Rift and the PC monitor are connected to the same GPU.
- Ensure that the Oculus Rift USB cables are connected as far away as possible from the Wi-Fi antenna and mouse USB adaptor.

For both Windows desktops and laptops:

- Remove/disable the SLI bridge if present
- Download the latest version OZO Remote for your system (Mac or Windows) from the Nokia OZO website, ozo.nokia.com.
- Navigate to the installation file and double click on it to start the installation process.
- Follow the prompts to complete the installation process.
- Note the serial number of the camera you are trying to connect to. The serial number can be found inside the tail of the camera. If the digital cartridge is installed, remove it and the serial number will be visible.



Serial and Pin numbers located in the 'tail' of the OZO +

- Either connect the camera to a power supply using the provided 12V adapter or insert the rechargeable Li-Ion battery into the tail of the OZO+ (please refer to the Quick Guide for further details).
- Switch on the camera and wait until it completes the boot up sequence. This is indicated when the Power LED turns solid white, the Wi-Fi LED continuously flashes white, and the Record LED continuously flashes red.
- Remove the lens protective cover

- If using a Hyperdeck Studio Pro, switch it on and ensure the following:
 - The selected codec is Uncomp 10-bit.
 - The Input/Output is SDI - SDI
- Press the 'Input' button. Data should be seen on the Hyperdeck Studio Pro screen
- On the work station, double click the OZO Remote icon to start the software
- OZO Remote will detect the camera via the serial number. The serial numbers of all cameras that are switched on in the immediate vicinity of the workstation are displayed in the top left of the screen. To establish Wi-Fi connectivity, click on the serial number of the camera.
- OZO Remote will display that it is connected once Wi-Fi connectivity is established.
- If the camera requires a firmware or calibration update, a pop up window may appear indicating that a new version of firmware or calibration file is available. If this window appears, click update to update the firmware or calibration files. This may take a few minutes.

Once a connection is establish, data from the camera will appear on the left hand side of the screen and an image will appear from all eight sensors, see picture below:



OZO Remote V2.1 UI showing images from the 8 cameras

1	Camera serial numbers	13	Audio monitoring
2	Broadcast/Capture status	14	SDI or WiFi selection for broadcasting
3	Time Lapse mode	15	Camera level indicator
4	HDR Bracketing mode	16	Image rotation
5	Exposure controls including Exposure Assist	17	Freeze image
6	Exposure Assistance settings	18	Preview Illuminant controls
7	4 sensor or 8 sensor selection	19	Clipping indicator controls
8	Illuminant settings	20	View mode
<u>9</u>	<u>HDR recovery</u>	<u>21</u>	<u>Left eye or Right eye selection</u>
<u>10</u>	Power status	22	Seams view
11	Storage status	23	Image zoom
12	Temperature status	24	Sensor images

Appendix A

Blackmagic software and drivers

At Nokia, we endeavor to test the OZO+ ecosystem with the latest Blackmagic software and drivers. We recommend downloading Blackmagic Desktop Video 10.9.5. However, if you have any questions concerning driver compatibility with the OZO+ ecosystem please contact the Customer Care team by clicking *Product Support* with the *Support > Contact us* page on the Nokia OZO+ website.

Although not required, if using the Hyperdeck Studio Pro, it is also recommended to install the HyperDeck 5.1 Update and use it to update the firmware on the recorder.

To download Desktop Video:

- Navigate to the Blackmagic design support website and click on Capture and Playback
- Scroll through the latest Downloads column (located to the left of the screen) to find Desktop Video 10.9.5
- Click on the link to download the file for your operating system
- A pop up window will appear where you can either register your details and download or simply download the software
- Follow the prompts to install the software on your workstation

To download Hyperdeck 5.1 Update:

- Navigate to the Blackmagic design support website and click on Disk Recorders
- Scroll through the latest Downloads column (located to the left of the screen) to find HyperDeck 5.1 Update.
- Click on the link to download the file for your operating system.
- A pop up window will appear where you can either register your details and download or simply download the software.
- Follow the prompts to install the software on your workstation.
- If using the Hyperdeck Studio Pro and you have used the Hyperdeck software to perform firmware updates, reboot the workstation before starting OZO Remote.

Appendix B

Nvidia drivers

At Nokia, we endeavor to test the OZO+ ecosystem with the latest Nvidia and Radeon drivers.

It would be worth checking periodically if Nvidia or Radeon updates are available.

For systems with Nvidia GTX 1080s or 1070s

- Go to Nvidia's website and search for the latest drivers for your video card and operating system.

For systems with AMD RX 480 8GB

- Go to AMD's website and search for the latest drivers for your video card and operating system.

We recommend downloading the latest drivers. However, if you have any questions concerning driver compatibility with the OZO+ ecosystem, please contact the Customer Care team by clicking *Product Support* with the *Support > Contact us* page on the Nokia OZO+ website.

Appendix C

Connecting to HMDs

Setting up Oculus Rift CV1 for use with the OZO+ ecosystem

Follow the instructions below to set up the Oculus Rift CV1.

Pre-requisites

Before starting, you will need to:

- An Oculus account
- Internet access
- The latest version of OZO Remote already installed on computer and the camera's firmware updated
- Windows PC as per Nokia's recommended specifications.

Procedure

- Go to Nvidia's site and download the latest drivers for your video card. Please note that downloading GeForce Experience is optional (see Appendix B).
- Go to [Oculus.com/setup](https://www.oculus.com/setup).
- Download the Oculus setup tool and install.
- Create or sign in to the existing Oculus account.
- The Facebook option, profile picture and payment method are not required for this installation.
- Follow the setup instructions and ensure that all cables are securely connected.
- Update the Rift CV1 firmware.
- Follow instructions to position the sensor and test with the Oculus Rift CV1.

This completes the installation of the Oculus Rift CV1.

Use the following instructions to enable the Oculus to work with OZO Remote:

- In the Oculus software, click on Settings (the “gear” icon)
- Click on General
- Enable “Unknown Sources.”
- With the OZO+ ecosystem switched on, switch to HMD viewing by clicking on the HMD icon in OZO Remote
- Confirm that the video can be viewed and the audio can be heard using the Oculus Rift CV1

Setting up Oculus Rift DK2 for use with OZO+ ecosystem

Follow the instructions below to set up the Oculus Rift DK2.

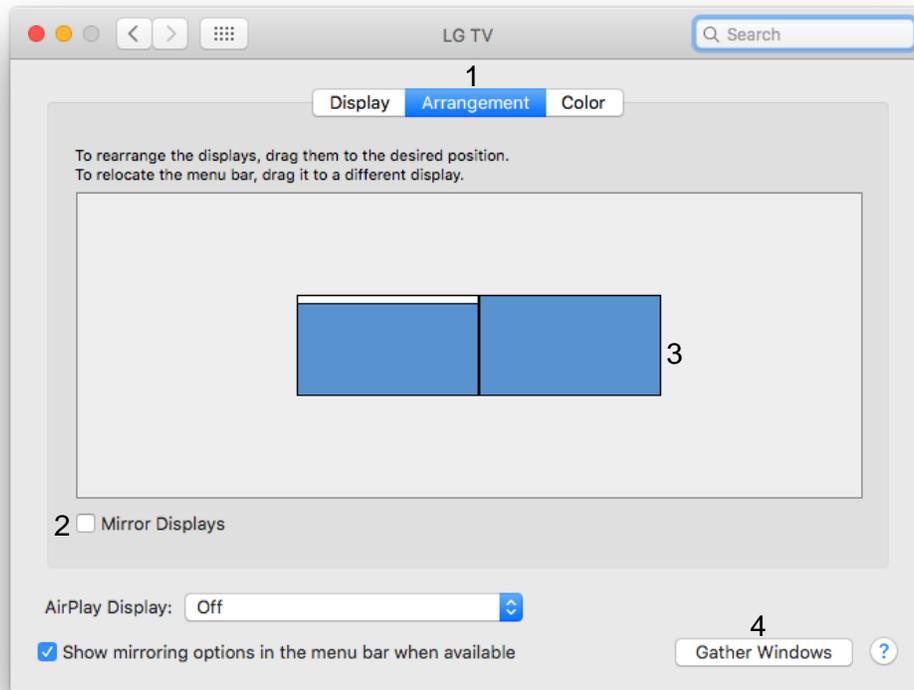
Pre-requisites

Before starting, you will need:

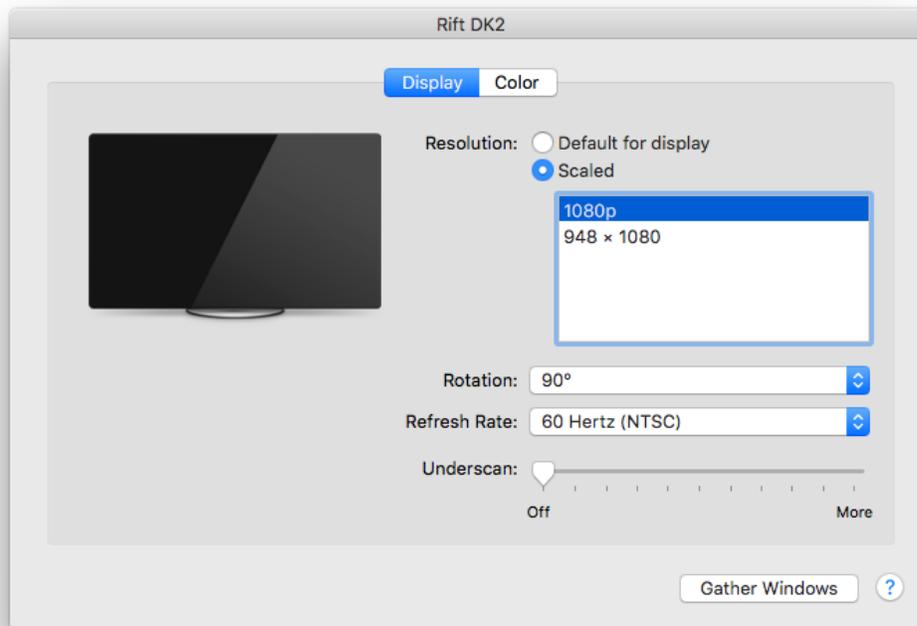
- An Oculus account
- Internet access
- The latest version of OZO Remote already installed on computer and the camera’s firmware updated
- MacPro® or MacBook Pro® as per Nokia’s recommended specifications.

Procedure

- Download and install Oculus Runtime for OS X version of 0.5.0.1 beta from:
<https://developer.oculus.com/downloads/package/oculus-runtime-for-os-x/>
- After installing the Runtime program, connect the Oculus DK2 HDMI and USB cables to the Mac
- Having connected the DK2, open the Display settings from the System Preferences (click the Apple logo in the top left corner of your display).
- Do the following:
 1. Select the Arrangement tab.
 2. Ensure that the Mirror Displays checkbox is unchecked.
 3. Ensure that the Rift DK2 display is positioned on the right side of the main display. The size of the main display may vary depending on your display resolution.
 4. Click the Gather Windows button to bring the Rift DK2 settings window to the main display.
 5. Apply the following settings:
 - Rotation: 90°
 - Refresh Rate: 60 Hertz



The Arrangement tab



The Display tab

Setting up HTC Vive for use with the OZO+ ecosystem

Pre-requisites

Before starting, you will need:

- An HTC Vive account
- A Steam account
- Internet access
- The latest version of OZO Remote already installed on computer and the camera's firmware updated
- Microsoft .NET Framework 4.6 (or later) installed on the workstation
- Windows PC as per Nokia's recommended specifications.

Procedure

- Go to Nvidia's site and download the latest drivers for your video card. Please note that downloading GeForce Experience is optional (see Appendix B).
- Go to <https://www.vive.com/us/setup/> .
- Download the Vive setup tool and install.
- Run the installer and follow the onscreen setup.
- Create or sign in to the existing HTC Vive account
- After VIVE has installed it will install Steam
- Create or sign in to the existing Steam account
- After the installer has finished, it will go to the hardware setup.
- Again follow onscreen instructions carefully to connect all the hardware and setup the room space.
- Check the Steam VR control panel to ensure that the Vive icons are green. This indicates that the hardware has been installed correctly.
- Once this is done, launch preview.
- Press the HMD button, or press 'H' key
- Steam VR dashboard will start and shown the video playback in the HMD.

Appendix D

Connecting to and controlling the camera with a mobile device

Please use the following instructions to connect to and control the camera using a mobile device, for example, a mobile phone or tablet.

- Install the latest version of OZO Remote and upgrade the firmware on the camera.
- Connect to the camera's Wi-Fi (click on access point Wi-Fi) via your mobile phone. This will appear as OZO_camera serial number. The serial number can be found inside the camera tail. For example, if the serial number of the camera is PC012345678, then the camera's Wi-Fi will appear as OZO_PC012345678.
- To login, type PIN_6 character PIN. The 6 character pin can be found in the camera's tail. For example, if the pin number in the camera is ABCDEF, then the password will be PIN_ABCDEF.
- Using the mobile phone browser, type "192.168.0.1" in the URL field
- The serial number of the camera, the status, and some basic controls should now be seen.

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