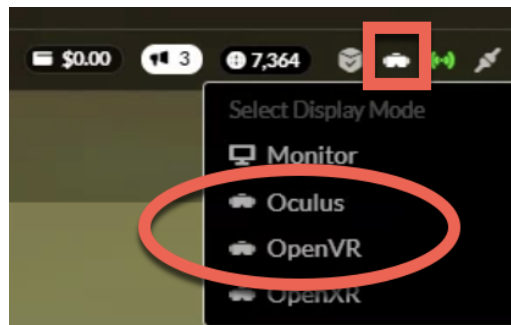# Racelab Virtual Reality v1 Headset Setup

The current VR implementation of Raceab utilizes SteamVR overlay integration. Based on your headset model, please follow the instructions below to setup VR overlays:

System Requirements:
- 32Gb Ram is recommended
- Compatible headset

Initial Setup Requirements:
- Install the latest Racelab software: https://racelab.app/RacelabApps-installer.exe
- Install the latest SteamVR version, and Video Drivers for your graphics card.
- Install the required dependency: https://aka.ms/vs/16/release/vc_redist.x64.exe
- Ensure your iRacing graphics settings are set to underlined windowed bordered mode – Overlays will **NOT** work if in full screen mode. Do not press ALT+ENTER at any time as this will put the iRacing session in full screen mode and hide the overlays.
- Ensure you are launching iRacing with the correct VR mode selected - **choose either Oculus or OpenVR** (if using Oculus you need to also follow the 'Revive Hack' below). As of today, OpenXR is **NOT** supported for Racelab overlays (see screenshot below):
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- Due to current Racelab software limitations, if you have a space in your windows user file path, the current software overlay VR implementation will not work properly. We are aware of this issue and are working on a new VR integration. *EX)* "**C:\Users\Jon Smith**" will be problematic while "**C:\Users\JonSmith**" (no space between the first and last name) will work properly. If you have a space in the path, you have three options:
    - Create a new windows profile with no space.
    - Edit the existing profile with the following instructions: link
    - Utilize *CrewChief* as a 3rd party software to render the RaceLab Overlays (more on this below).
- If you currently run an AMD graphics card, you may also have issues utilizing our native VR implementation to display the overlays. Some users have reported it working as designed, but most have also needed to utilize *CrewChief* to render (more on this below).

HP Reverb G2, Odyssey+, Valve Index, Pixmax, HTC Vive, and other headsets that utilize Windows Mixed Reality (WMR):

- **Why can I not see the overlays?**
  - Ensure you have read and followed the section "**Initial Setup Requirements**" above.
  - Ensure you have opened an overlay and it is visible on the <u>desktop</u> while in a practice/race session.
  - Ensure you have pressed the VR button circled in red (do not perform this step if you need to use CrewChief). The overlay(s) should turn a shade of pink on the desktop when this button is pressed.


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  - Ensure that all the overlays and the iRacing window are not overlapping and placed on the same desktop (shrink the iRacing window down and place it away from the overlays).
  - WMR sometimes creates "Virtual Desktops". These can lead to overlays being placed on virtual windows and not on the same desktop as iRacing. To disable these, please disable the setting in WMR (if available) or disable virtual monitor pre-allocation via a registry key change: link

- **I can see the Overlays, but they show in double vision or are blurry?**
  - Open "Documents\iRacing\rendereDX11OpenVR.ini" and set "Alignmentfix=3" (you can also try 2 as the value) and "FixGetProjectionRawBug=1". Save and relaunch iRacing.

- **I need to use CrewChief as I have an AMD GPU or a space in my profile, what do I do now?**
  - Ensure you follow the instructions above to open and place the overlays on your desktop appropriately. The overlays and the iRacing window must **NOT** overlap or run off the monitor at all or the overlay(s) will disappear.
  - Do **NOT** press the Racelab VR button as instructed above. You want your overlays to be in non-VR mode (no pink border) on your desktop.
  - Open the CrewChief software and click the "Steam VR Overlay Settings" menu by pressing the button on the main screen.

- ○ Select the "Steam VR Overlay Settings" window in the list on the left (this is the window that you are looking at) and select "show in VR".
- ○ At this point you may place the VR headset on to see this settings window in the VR goggles and you will now select and position each open Racelab overlay.
- ○ Within the headset, select the overlay name (ex - Relative Overlay) in the list to the left of the settings window. Click "show in VR" and the overlay should appear in the headset.
- ○ Now move the overlay by clicking on the slider bar that you wish to adjust (left/right, up/down, X/Y/Z axis, etc) and using your keyboard arrow keys.
- ○ Complete this process for each of your overlays.
- ○ Press the "Save Changes" button in CrewChief to persist the changes of the overlay position.
- ○ You may now minimize CrewChief.

Oculus CV2, Rift, Rift S, Quest, and Quest 2 Headsets:

- ● **Headset Connection:**
  - ○ For best results use a hardware Oculus link USB 3.0 cable. Using Airlink or other wireless applications is not recommended.
  - ○ For Quest/Quest2 headsets, users have had success with the following 3rd party cable and the OEM Oculus cable - link.

- ● **Oculus Initial Setup:**
  - ○ Ensure you have read and followed the section "**Initial Setup Requirements**" above.
  - ○ Ensure you have installed the latest **Oculus Software** and the OculusSDK is being used. This can be found in Oculus settings (General->Runtime), ensuring it is not using anything other than Oculus SDK.
  - ○ Since the Oculus platform does not utilize SteamVR to display iRacing, we must enable that functionality for the overlays to perform properly. The current recommended workaround is to install a third party app called 'Revive' for the iRacing platform to launch through SteamVR via the Oculus SDK. Please follow the below instructions to install and enable Revive:
    - ■ Install **Revive 1.9.1** (nothing older or newer/do not update) from link
    - ■ Once installed, copy only **5 files**, all **except 'openvr_api.dll'** from "C:\Program Files\Revive\Revive\x64" to "C:\Program Files(x86)\iRacing" (5 total files as seen below - do NOT copy the file with red line through it)
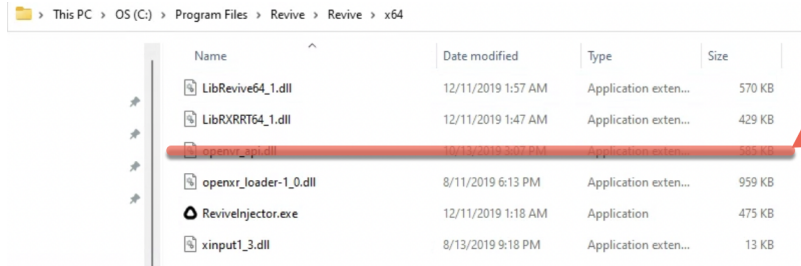
-
- In "C:\Program Files(x86)\iRacing" rename **xinput1_3.dll** to **xinput9_1_0.dll**
- Open "Documents\iRacing\rendererDX11Oculus.ini" and change: **RiftEnabled=1**
- Now open an iRacing session and ensure that it auto launches SteamVR when loading the VR headset session. You can confirm this is true if you see the following popup on your desktop:

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-
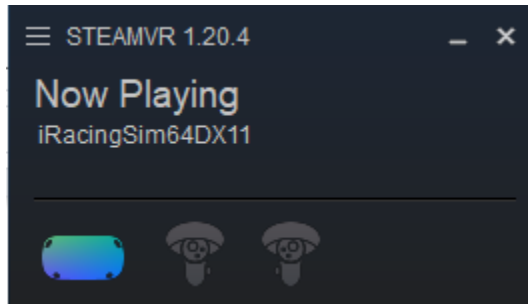
- **Recommended Oculus Software Settings-**
    - Depending on your computer specs and GPU model- we recommend that you set the Oculus device video settings to 90 hz and super sampling at 1.3 or better.

- **Additional Oculus Settings-**
    - Set your Oculus Debugging Tool ("C:\Program Files\Oculus\Support\oculus-diagnostics\OculusDebugTool.exe") to the following settings:
        - Asynchronous Spacewarp (ASW) = Disabled (you need to set this every time you open the Oculus software/reboot the PC or use a 3rd party tool to set it on startup - link)
        - Distortion Curvature = Low
        - Encode Bitrate = 350 to 500 (trial an error on what works best for you)
        - Link Sharpening = Enabled
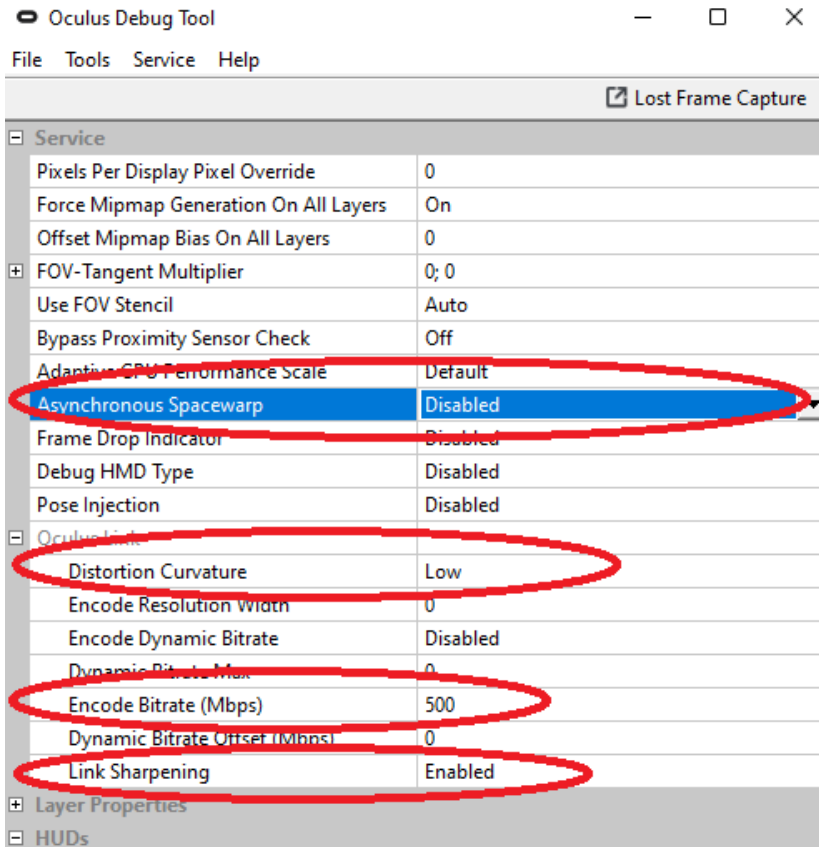
- ■ Close the window to save the values set.
  - ○
- ● **Why can I not see the overlays?**
  - ○ Ensure you have read and followed the section "**Initial Setup Requirements**" above.
  - ○ Ensure you followed the "**Oculus Initial Setup**" section above.
  - ○ Ensure you have opened an overlay and it is visible on the <u>desktop</u> while in a practice/race session.
  - ○ Ensure you have pressed the VR button circled in red (do not perform this step if you need to use CrewChief). The overlay(s) should turn a shade of pink on the desktop when this button is pressed.


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- Ensure that all the overlays and the iRacing window are not overlapping and placed on the same desktop (shrink the iRacing window down and place it away from the overlays).

- **I need to use CrewChief as I have an AMD GPU or a space in my profile, what do I do now?**
  - Ensure you follow the instructions above to install Revive/SteamVR and open and place the overlays on your desktop appropriately. The overlays and the iRacing window must NOT overlap or run off the monitor at all or the overlay(s) will disappear.
  - Do **NOT** press the Racelab VR button as instructed above. You want your overlays to be in non-VR mode (no pink border) on your desktop.
  - Open the CrewChief software and click the "Steam VR Overlay Settings" menu by pressing the button on the main screen.
  - Select the "Steam VR Overlay Settings" window in the list on the left (this is the window that you are looking at) and select "show in VR".
  - At this point you may place the VR headset on to see this settings window in the VR goggles and you will now select and position each open Racelab overlay.
  - Within the headset, select the overlay name (ex - Relative Overlay) in the list to the left of the settings window. Click "show in VR" and the overlay should appear in the headset.
  - Now move the overlay by clicking on the slider bar that you wish to adjust (left/right, up/down, X/Y/Z axis, etc) and using your keyboard arrow keys.
  - Complete this process for each of your overlays.
  - Press the "Save Changes" button to persist the changes of the overlay position.
 - You may now minimize CrewChief.
-

General VR Headset FAQ's:

- **Why do I see a drop in my iRacing Frames per Second (FPS)?**
  - We recommend turning OFF Hardware Acceleration in Racelab. This can be found in settings of the application:
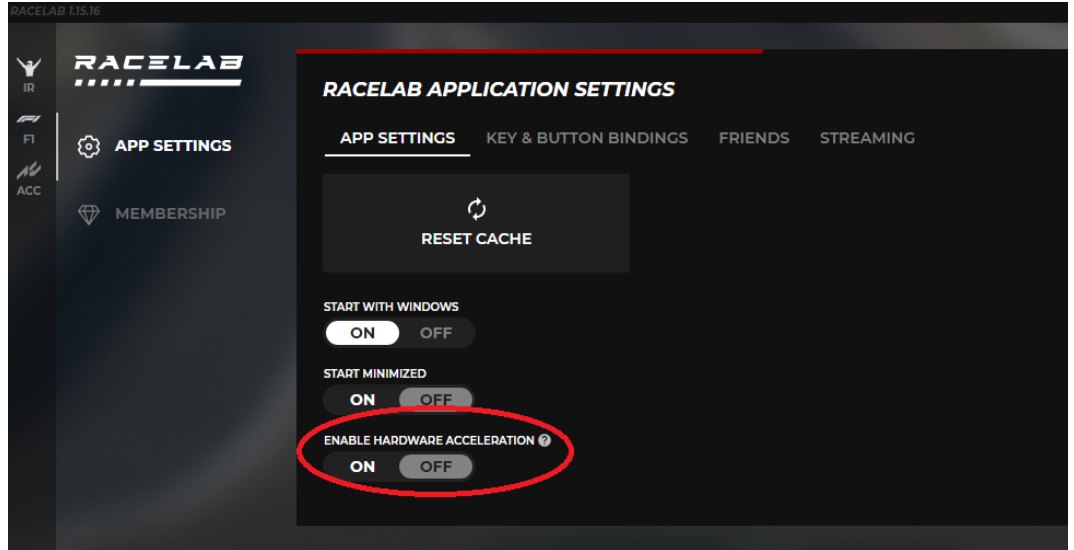
- ■
- ■ We recommend to turn <u>OFF</u> **Advanced Supersample Filtering** AND **Motion Smoothing** (if available) in SteamVR settings:
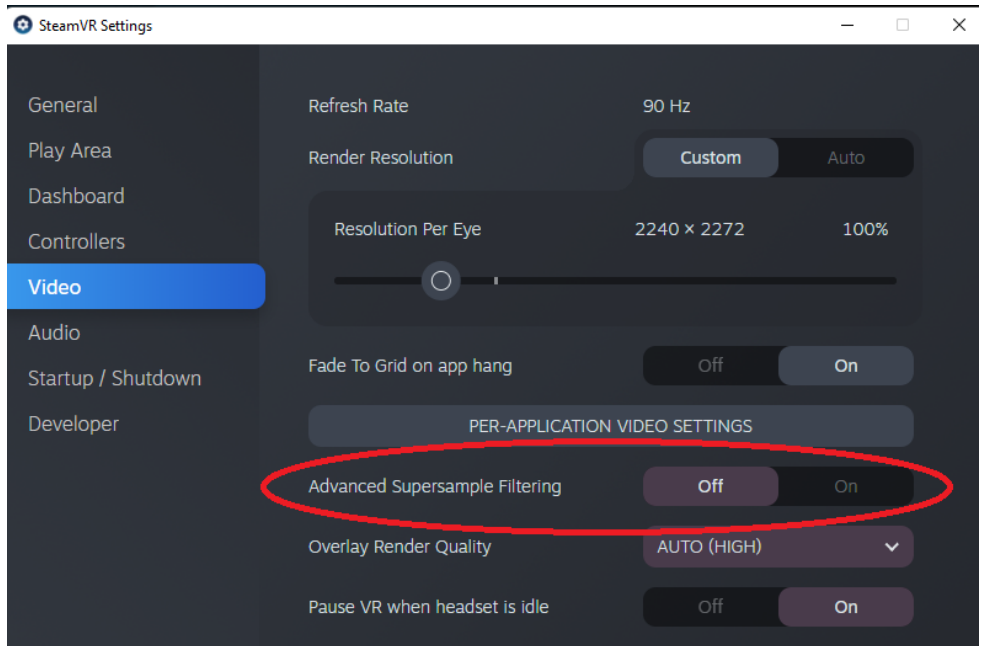

- ●
- ■ We recommend that you turn <u>OFF</u> SteamVR Home from the SteamVR Settings to save GPU memory:
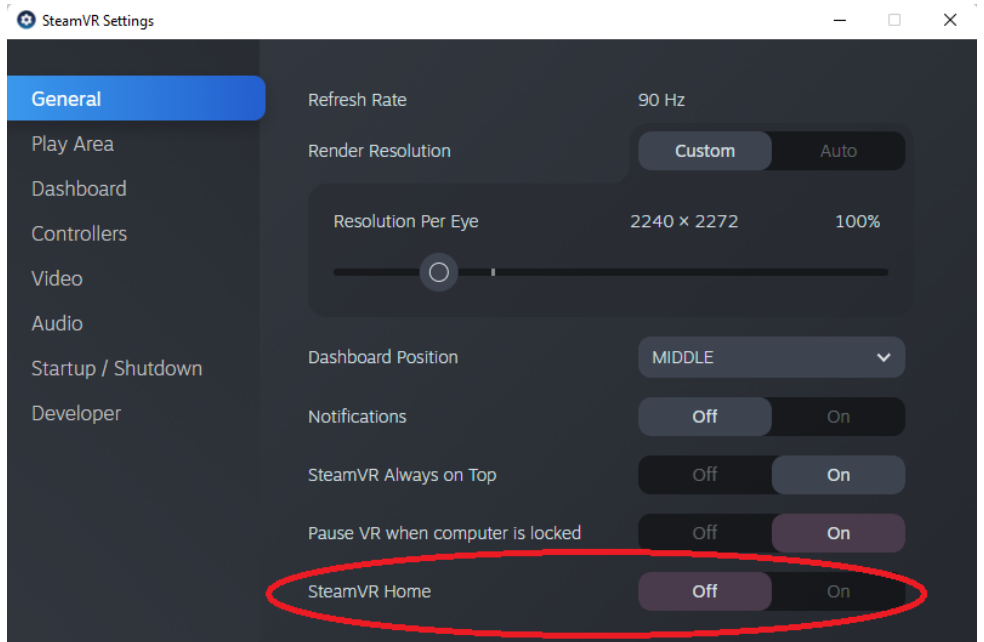
- ■ If you are running Discord, we recommend that you disable Hardware Acceleration in settings.
- ■ We recommend that you <u>disable</u> Windows Game Mode.
- ■ We recommend that you <u>stop and disable</u> the "SysMain" service in windows services (start->run->services.msc)
- ■ We recommend that you ensure your iRacing graphics settings are optimized for your hardware. We found this guide to be very thorough - link
- ■ Users have had a great boost in FPS from installing vrperfkit and enabling fixed foveated rendering (FFR). Download the zip from the link above, extract the two files (`dxgi.dll` and `vrperfkit.yml`) and copy them to "Program Files(x86)\iRacing". Now edit the vrperfkit.yml with a text editor to find "fixedFoveated" and set enabled: **true**. Save the .yml file, then press ALT+F1 while in the iRacing sim (on track/garage) to turn FFR off or on. You can see the FPS change instantly when it is enabled. Further discussion can be seen here.

- ● **How do I position my overlays in the headset when using the Racelab VR button?**
  - ○ Once you have entered an iRacing session with your headset on and the overlays are visible, press the TAB key 2x quickly (if not working try 3-5x quickly). This will highlight the first overlay with a yellow border and put you into EDIT mode.
  - ○ While the overlay is highlighted, by using the mouse you can:
    - ■ Press and hold the LEFT button to move the overlay.
    - ■ Press and hold the RIGHT button to enter RESIZE mode with a blue border to make your overlay bigger and smaller

- ■ Press and hold the MIDDLE(scroll) button to rotate the overlay on its X & Y Axis
- ■ Press and hold both the LEFT & RIGHT buttons together with an Orange border for you to change the depth of the overlay within your VR head space
- ■ Rotate the Scroll Wheel is to edit the transparency
- ○ If you are not seeing the yellow border/EDIT mode after pressing TAB, ensure iRacing is not capturing the TAB key for another keyboard shortcut. If still not working, Delete "Documents\RaceLabApps\OverlayConfig.xml" and then close and reopen Racelab to regenerate a new XML file. **NOTE** - this will set all previous VR positions/settings back to defaults.

- ● **My overlays are not highlighting in the VR headset when pressing TAB 3-5x?**
  - ○ Check you do not have Crewchief VR options enabled
  - ○ Close Racelab and then rename your OverlayConfig.xml file located in "Documents\RaceLabApps". Reopen Racelab and try again.

- ● **Why are my overlays not saving their position in VR?**
  - ○ Check you do not have crewchief VR options enabled
  - ○ Once your overlays are placed in VR (by pressing TAB 3-5x and moving them), you must ensure that you have cycled through the remaining overlays so that the yellow border is no longer visible on any overlay. This will write the positions to the "Documents\RaceLabApps\OverlayConfig.xml" file and save their location.

- ● **Why is my Overlay transparent or showing my desktop behind it when using the Racelab VR button?**
  - ○ You can control the alpha and opacity of any overlay by performing the following actions:
    - ■ Select the overlay while in the headset by pressing TAB 3-5x quickly. Once the overlay is highlighted with a yellow border, scroll the center mouse wheel up (forward) and down (backward) to control the alpha value.
    - ■ If you have subscribed to PRO, you may also change the Opacity valve in each overlay settings section:
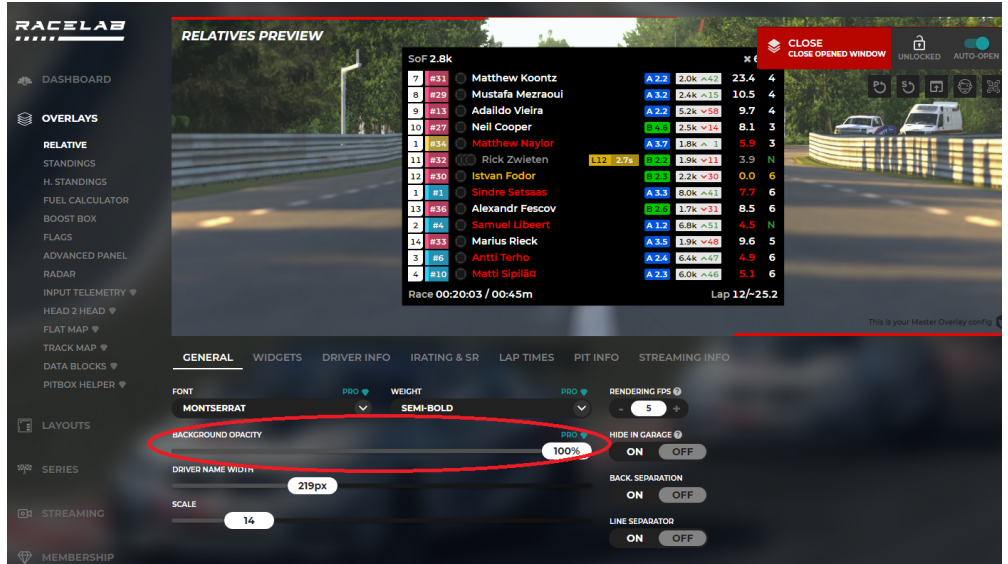
-
- **Why are my Overlays too large/small/zoomed/cut off in the headset when using the Racelab VR button?**
    - The Racelab VR integration assumes that you have windows scaling/UI set to 100%. At this time, the windows display setting must be 100% to fully utilize the overlay display properly.
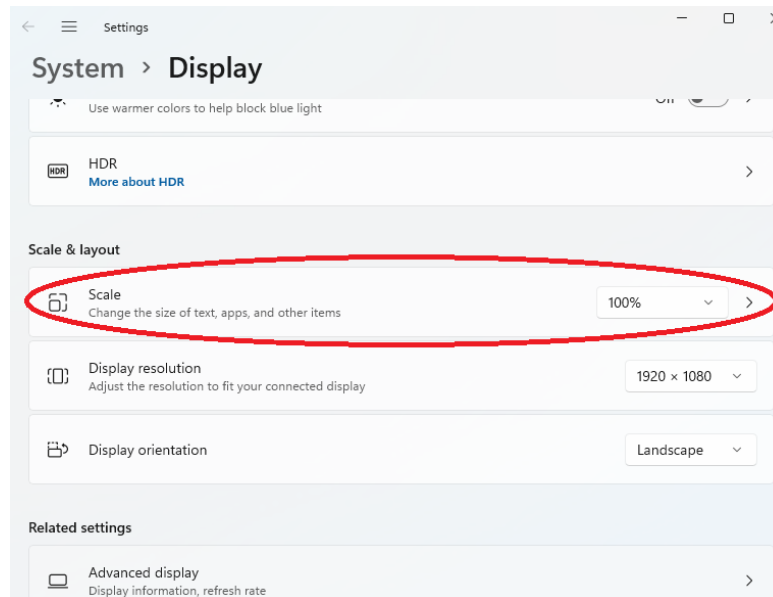
    -
    - You can have windows change this by going to RLapp properties and clicking "Change High DPI Settings" then updating the values (see screenshots below). This is a workaround if you have your windows zoom set to something higher than 100% (normally this happens when using a TV or large screen monitor).
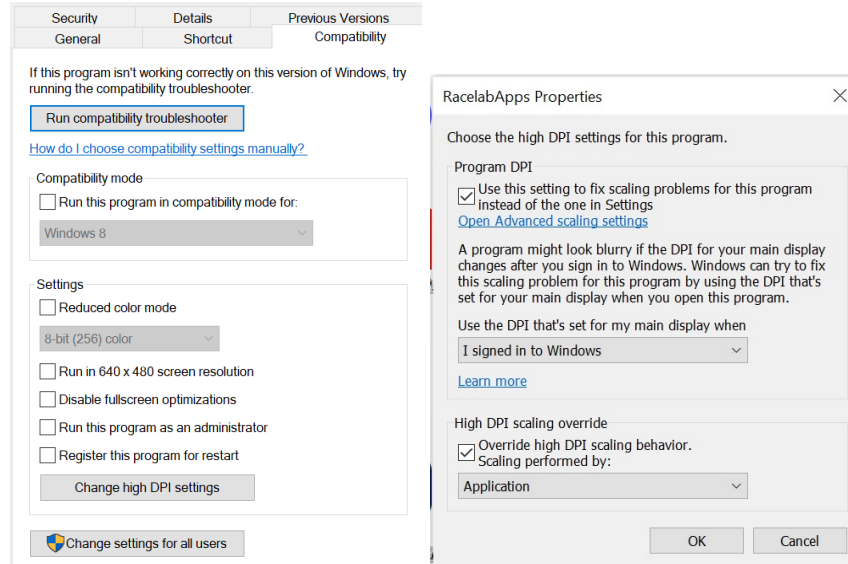
- **Certain overlays are missing and will not show or load on the desktop?**
  - Close Racelab and then rename your OverlayConfig.xml file located in "Documents\RaceLabApps". Reopen Racelab and try again.
  - Once familiar looking around this file you may work out how to re-instate certain overlays saved position by the text content; by copying and pasting from the renamed overlayconfig to the new one.

- **Why do certain VR overlays show a partial pink area/outline where the pixels should be transparent and clean in my headset (TrackMap, Fuel, Radar, etc.)?**
  - This is a known issue with the current VR implementation. Officially some overlays are not supported in VR (but can still work using the below script), and others capture some of the Pink/Purple color that shows on your desktop when you press the VR button. This can be corrected with the following user script (which needs to be run via powershell and after every update of the Racelap software): **NOTE** - if you have modified your Overlayconfig.xml file the script may not fix this file for you and you will need to update each overlay to the correct RGB value for the "ColorMask" attribute.
    - **Download Script:**
      https://drive.google.com/file/d/1YyOod9TJKqnhSC7JfzCum9ZJC8ParZ5O/view?usp=sharing

- **What do the parameters in the OverlayConfig.xml mean?**
  - Position X Y Z: The position of the window while seated. Coordinate, X,Y is horizontal/vertical, and Z is the depth (closer or further from the seated position).
  - Yaw/Pitch: The rotation of the windows in radians.
  - Size: width of the overlay, measured in meters.
  - Alpha: Global transparency of the overlay window.

- ○ AlphaTransparency: Transparency of the Overlay background (recommend to always have the background opacity set to 100%, otherwise it captures what is behind the 2D overlay when showing VR mirroring)
- ○ Crop Left Right Top Bottom: number of pixels to crop from the overlay, default is 5 pixels on the right and bottom.
- ○ ColorMask R G B A: Color to detect to replace with Black full transparent (0,0,0,0), by default it's Pink (255,0,255,255)
- ○ ColorBackground R G B A: Color to detect with background to change for the background transparency level (0,0,0,AlphaTransparency), by default it's Black (0,0,0,255)
- ○ WindowName: A case sensitive substring of the overlay window to capture.
- ○ Show: "true" or "false" to indicate if we should show the overlay in VR. When set to false, the app will not use any CPU on this window.
- ○ RefreshRate: a number of Hz the overlay window is refreshed (lower uses less CPU).
- ○ HideNoLooking: "true" or "false" to indicate if we should hide the overlay in VR when you are not looking at it.
- ○ NoLookingRefreshRate: for each overlay you can set a lower refresh rate when not looking at the overlay in the headset to save CPU.

- **How do I autostart applications on reboot?**
  - ○ Open the windows run dialogue box (windows key + R).
  - ○ Type "shell:startup" with no quotes and press the ENTER key.
  - ○ Copy and paste any software shortcuts you wish to autolaunch on reboot (ex - iRacing UI, Crewchief, etc.)