

# Nolo OSVR Fusion Configuration v0.2

Thank you for testing the BETA of the Nolo OSVR Fusion Configuration (NOFC)!

**UPDATE NOTICE:** If you have already installed NOFC v0.1, you do not need to follow the SteamVR installation instructions. Simply follow Steps 3 and 4 to update the plugin and choose a configuration file.

## Release Notes:

### v0.2 - September 27, 2018

- **Major head-tracking smoothness improvement** thanks to a workaround that eliminates duplicate reports sent by the firmware.
- **Major controller smoothness improvement** thanks to implementation of the OSVR built-in "one euro" filter.
- **Slight trackpad calibration improvement** - the trackpads should no longer "jump" to zero when you touch the very edge (unless you move your finger so far that it is no longer detected at all.)
- **Server config improvements** - it is now easier to edit the server config files thanks to the use of additional aliases. This means that you can configure NOFC *without* touching anything in the "drivers" section.
  - Want to change the flip button? Just change the path that `/NOFC/flipButton` points to (by default, `/controller/right/menu`). Similar for recenter button and for setting up pitch/yaw/roll for DK2 users.
  - The only time you should have to edit anything in the "drivers" section is if you are not using an HDK2, in which case you may need to adjust the value of alpha in the very first driver entry.
  - As well, for ease of use the contents of the NOFC driver section have been compressed into 3 lines in the provided "direct" config file (with alpha still readily visible.)
    - If you would like to be able to edit these contents, please copy the `drivers` section from the "distv2" config file instead.
- **Headset marker button detection** - the headset marker button is now given a semantic path at `/hmd/button`. Advanced users may find a use for this.

This new configuration combines the Nolo-OSVR plugin, the OSVR-Fusion plugin, and the official SteamVR-OSVR driver for a more enjoyable experience using Nolo hardware with OSVR.

Please note that the dedicated community members working on NOFC have volunteered their time to make these improvements; please respect their efforts. You will *probably* encounter bugs and glitches - please report these on the Reddit thread or in the appropriate GitHub "issues" section for the component in question.

## Advantages of NOFC:

- **Platform agnostic!** This configuration has been tested on both Windows and Linux, and should

**work on Mac.** (We are only distributing Windows binaries at this time, but a Linux build guide and possibly binaries will be coming soon.)

- **No dependence on the Nolo Windows App or on Nolo's fork of SteamVR!** The Nolo-OSVR plugin talks directly to the hardware over USB, and from there OSVR talks to SteamVR using the *official* SteamVR-OSVR plugin.
- **Improved yaw drift with the OSVR HDK!** While the Nolo hardware is still susceptible to some amount of yaw drift, especially in the controllers, this new configuration nearly eliminates yaw drift with the OSVR HDK. If you do experience some drift, you can easily recenter with a simple double-tap of the system (power) button on your controllers.
  - In fact, you should *not* press the button on the headset marker or the "Recenter" button in the HDK Tray App.
- **Better interaction with SteamVR!** No hijacking of the room setup or other issues. Just use Room Setup like you would with a Vive!
- **(Future) Touchpad calibration!** In the future, we will implement some form of auto-calibration or configurable calibration for the touchpads. For now, enjoy the hard-coded remapping which should allow most users to get the full range out of the trackpads (at the cost of some precision.)
- **And of course, it's fully open-source!**

## Installation

### Step 1: De-register any Nolo SteamVR drivers

The first thing you need to do is de-register any SteamVR Nolo drivers. This may include the NOLO\_OSVR\_SteamvrDriver, a Cardboard driver, iVRy, etc. **If you never installed anything Nolo-related before, skip this step.**

1. First, de-register the driver in SteamVR.
  1. Open a Command Prompt.
  2. Navigate to your SteamVR installation directory, then `\bin\win32\`.
    1. For a standard Steam installation, just run this command: `cd C:\Program Files (x86)\Steam\steamapps\common\SteamVR\bin\win32`
  3. Run the following command:
    1. `vrpathreg.exe show`
    2. This will display the currently registered SteamVR drivers.
  4. Now, remove any drivers related to NoloVR.
    1. You can probably just use this command: `vrpathreg.exe removedriver "C:\Program Files\LYRobotix\NOLO_driver_for_windows\nolo"`
    2. If there are any other Nolo-related lines, run the above command but change the path appropriately.
    3. Make sure not to accidentally remove the OSVR driver path registration. We're going to need that.
2. For extra robustness, we will disable the LYRobotix Nolo driver in SteamVR completely. Just to be sure ;)
  1. Open Windows Explorer
  2. Navigate to the `config` directory of your Steam installation, usually `C:\Program Files (x86)\Steam\config`
  3. Open `steamvr.vrsettings` in Notepad or your favorite text editor.
  4. Add the following lines:

```
"driver_nolo" : {  
    "enable" : false  
},
```

*I recommend putting these lines at the very top of the file, just below the very first line, which should be just a curly brace {*

## Step 2: Install the latest SteamVR-OSVR driver

You now must uninstall the NOLO\_OSVR\_SteamvrDriver and install the latest SteamVR-OSVR driver. We're going to do this all in one step. If you never installed the NOLO\_OSVR\_SteamvrDriver, don't worry: it won't matter, but we do still need to update SteamVR-OSVR

1. Open Windows Explorer
  1. Navigate to your HDK-Software-Suite installation.
    1. This is most likely `C:\Program Files\HDK-Software-Suite\`
  2. Create a COPY of the OSVR-SteamVR folder.
  3. Rename the copy of your OSVR-SteamVR folder to OSVR-SteamVR-bak.bak
    1. We're creating a backup just in case. If you want to go back to Nolo's driver, you can change the name of your OSVR-SteamVR folder to something else, rename the backup to OSVR-SteamVR, and then follow the steps above for `vrpathreg` but use `adddriver` instead of `removedriver`. Then go back to your `steamvr.vrsettings` file and remove those new lines we added.
  4. Copy and paste the contents of the OSVR-SteamVR folder in this download into the OSVR-SteamVR folder in your HDK Software Suite directory.

## Step 3: Install Nolo-OSVR and OSVR-Fusion

Next we need to install the Nolo-OSVR plugin so the Nolo devices can talk to OSVR, and a new version of OSVR-Fusion to get good performance out of it.

1. Open Windows Explorer
  1. Navigate to your HDK-Software-Suite installation.
  2. Copy and paste the contents of the OSVR-Core folder in this download into the OSVR-Core folder in your HDK Software Suite directory.
    1. If it asks "Do you want to merge?" or "Do you want to overwrite" for any folders or files, say Yes To All

## Step 4: Choose a server configuration

1. Extract one of the server config files from this download, and put it somewhere convenient (such as your desktop, or My Documents.)
2. Right click on your HDK Tray App (open it if it's not running)
3. Select Options -> OSVR Server -> Custom...
4. Navigate to the directory that contains the extracted config file and select it.
5. **Note for non-HDK and extended mode users:** There are two included server config files: one for the HDK 2.0 in direct mode, and one for the HDK 2.0 in direct mode using the new "v2" distortion profile, available [here](#).
  1. If you want to use NOFC with extended mode, or with an Oculus DK2, or some other

configuration, you will have to copy the key components from the server config file.

2. The key components to copy are the "driver" and "aliases" sections. You will need to update the first entry in the "driver" section to use a different tracker for pitch/roll/yawFast if you are not using the HDK.
3. If you develop an alternative config file that might be useful to others, please share it in the Reddit thread!

## Using with OSVR Apps

Below is the best process I've found for starting up Nolo and OSVR.

1. First, start up all your Nolo devices and your HDK.
  1. Make sure the headset marker has power.
  2. Make sure the OSVR Server is not running.
  3. Make sure the Windows Nolo Desktop App, if installed, is not running.
    1. The Windows Nolo Desktop App will actually interfere with your SteamVR Room Setup. Make sure it does not start on Windows startup. We recommend only using the Windows Nolo Desktop App for NoloVR firmware updates.
2. Open the HDK Tray App and start the OSVR Server.
3. Put the headset on, face the base station, then hold the controllers up in front of you, tops pointed toward the base station.
4. Double-tap the power button on both of the Nolo controllers to recenter.
  1. **NOTE:** Do NOT press "Recenter" in the HDK Tray App or run `osvr_reset_yaw.exe`. This will misalign your headset, since it does not apply any transformations to the controllers.
  2. **Only use the Nolo power buttons to recenter!**
  3. It is very important that you press *both* system(power) buttons on the Nolo controllers at the same time. This will ensure a "snappy" recentering. If you recenter using the left-hand controller and not the right-hand controller, you may experience a slow, nauseating recentering.
5. Enjoy native OSVR Nolo content!
6. At any time, double-tap the right-hand controller's menu button to instantly flip your view 180 degrees so that you can interact with objects "behind" you.
  1. You can change the button assigned to this behavior by changing the "flipButton" property in your server config. It will always require a double-press.

If you ever feel that the system is "drifting", e.g. the controllers are rotated incorrectly, repeat steps 3 and 4!

## Using with SteamVR

Below is the best process I've found for starting up Nolo and OSVR when playing SteamVR games.

1. Do steps 1-4 from *Using with OSVR Apps* above.
2. Start SteamVR
3. (First time only) Run SteamVR Room Setup to ensure your room and height are configured properly, and to optionally set up Chaperone.
4. At any time, double-tap the right-hand controller's menu button to instantly flip your view 180 degrees so that you can interact with objects "behind" you.
  1. You can change the button assigned to this behavior by changing the "flipButton" property in your OSVR server config. It will always require a double-press.

If you ever feel that the system is "drifting", e.g. the controllers are rotated incorrectly, repeat steps 3 and 4 in the section above.

## Source Code

Please note that some of the plugins in this BETA have not yet had their source code merged into the master fork of their respective repositories, but they will soon. You can access the development source for each at the following URLs:

- <https://github.com/nanospork/nolo-osvr>
- <https://github.com/nanospork/OSVR-fusion/tree/flip-180>
- <https://github.com/Conzar/SteamVR-OSVR>