

# Vive Trackers for Unity3D

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# 1. Unity3D plugin usage

# Unity3D Configuration (development only)

1. Import the SteamVR plugin for Unity in your project:

<https://assetstore.unity.com/packages/tools/integration/steamvr-plugin-32647>

2. If applicable (depends on SteamVR plugin version), uncheck :

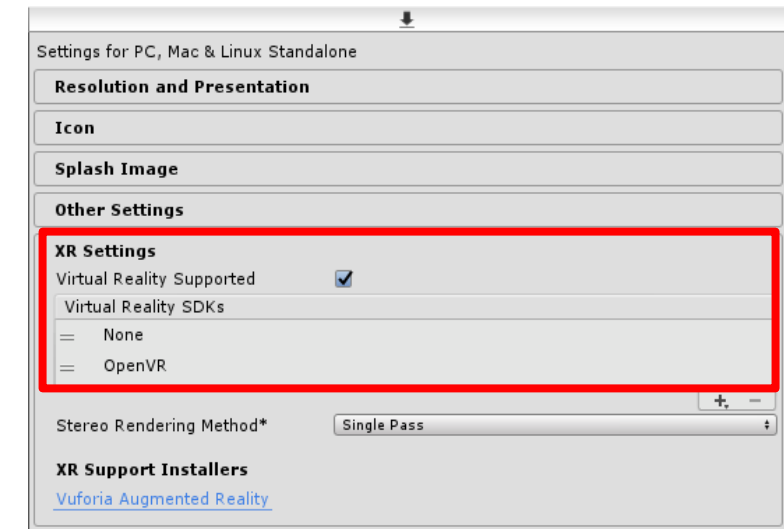
Preferences -> SteamVR -> Automatically Enable VR

3. Check : Project Settings -> Player -> XR Settings > Virtual Reality Supported

- Add VR SDK **None**
- Add VR SDK **OpenVR**

**\*ViveTrackersManager** script automatically initializes OpenVR, so we need to set the primary VR SDK to **None** to prevent Unity3D to initialize OpenVR.

**\*Please look at ViveTrackersTest** script for an example usage.



**NB: the SteamVR application should always run in the background while the Unity3D application (either the UnityEditor or an executable) is running. If not, you should expect Vive Trackers disconnections issues !!!**

# Keep Vive Trackers identification consistent during runtime (development only)

When using Vive Trackers, one problem is to guarantee that a given **Vive Tracker device** is always associated to the same **Vive Tracker virtual object** (e.g. a GameObject with a **ViveTracker** script on it), no matter what are the wireless connections issues during runtime (e.g. in the worst case, a given Vive Tracker device can be disconnected and connected again multiple times).

To guarantee a consistent identification of Vive Tracker devices and no duplicates of the corresponding Vive Tracker virtual objects, we use a configuration file (see **ViveTrackers.csv**) which allows you to define the association between a Vive Tracker device (using its **unique serial number**) and a **unique label** that you can freely define (e.g. « A », « B », « C », ...).

The **ViveTrackersManager** script can use this configuration file to always associate a Vive Tracker device with the same unique Vive Tracker virtual object.

1. To build your own configuration file, you first need to:
  - add your Vive Tracker devices' serial numbers to it : set **logTrackersDetection** field to **true**
  - allow the use of all available connected devices in SteamVR : set **createDeclaredTrackersOnly** field to **false**

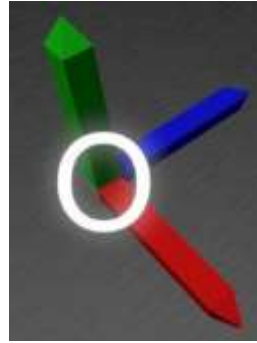
This way, all the connected Vive Tracker devices will get their serial numbers printed in the Unity3D Console, and you can just copy these serial numbers to fill your own configuration file.

2. Once your configuration file is built, you can use it by:
  - setting your configuration file path : set **configFilePath** field
  - enabling the automatic association defined in your configuration file : set **createDeclaredTrackersOnly** field to **true**

# SteamVR Room calibration Vs Vive Trackers calibration

## 1. Vive Trackers calibration in Unity3D

In Unity3D, ViveTracker objects can be calibrated. The **origin reference frame** is used as the default rotation for their calibration.



\*during runtime,  
the **origin reference frame**  
can also be used to apply an offset  
(3D Position & Rotation) to all the trackers.



## 2. SteamVR Room calibration

If you need to get a **perfect match between your virtual world and your real world** (e.g. going towards a direction in the real world applies the exact same direction in the virtual world), you should make the **SteamVR reference frame** aligned with the **desired forward axis in your real space**.

**NB :** each time a SteamVR Room calibration is done, the application using the Vive Trackers should be restarted (e.g: UnityEditor).



## 2. SteamVR configuration

# Running SteamVR with Vive Trackers only (no HMD)

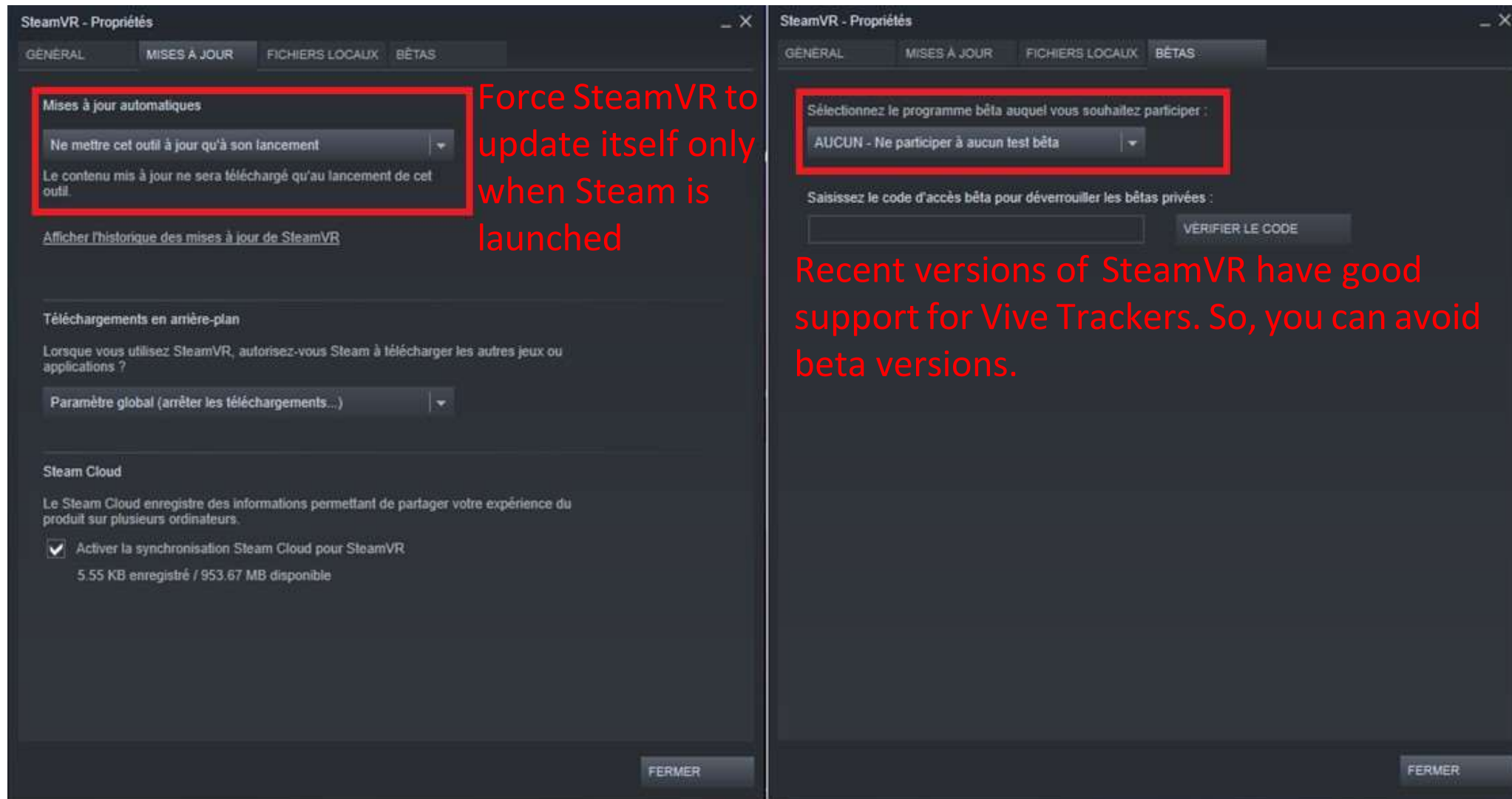
Modify these SteamVR configuration files:

- SteamFolder/steamapps/common/SteamVR/drivers/null/resources/settings/default.vrsettings
  - > set **enable** to **true**
- SteamFolder/steamapps/common/SteamVR/resources/settings/default.vrsettings
  - > set **requireHmd** to **false**
  - > set **forcedDriver** to **null**
  - > set **activateMultipleDrivers** to **true**

**More informations:**

<https://www.notion.so/yeove/Using-SteamVR-without-a-VR-headset-f7ed4268708a42c787d1628768e61d35>

# Set SteamVR properties in Steam



**NB : Be careful when Steam performs a SteamVR update : default.vrsettings files could be overridden with new ones !!!**



3. Optimize tracking reliability

# Tracking Setup

**1. Bluetooth dongles should be setup the farthest away from each others.** This is the most influencing parameter to get good tracking results. We advise to use usb cables with 2m as minimum length, to avoid radio interferences between your Bluetooth dongles.

**2. Remove light reflection sources as possible in your tracking area (e.g : windows, mirrors, and other reflective surfaces).** Lighthouse tracking is really sensible to reflections (more information : <https://xinreality.com/wiki/Lighthouse>).

**3. Base stations should be setup not too far away from each others.**

- When using 2x Base stations, use HTC recommendations :  
[https://www.vive.com/fr/support/vive/category\\_howto/tips-for-setting-up-the-base-stations.html](https://www.vive.com/fr/support/vive/category_howto/tips-for-setting-up-the-base-stations.html)
- When using 4x Base stations, use this process to place your base stations to get a good tracking quality :
  - **Physically place your Base stations as a rectangle shape** (e.g the 4 corners of a room)
  - do the **SteamVR Room calibration using the 4 corners technic**
  - mark each Room's corner taking care to physically **place your Vive Controller just below each Base station** (the Vive controller position and the Base station position should be the same 2D position on the SteamVR calibration 2D view).
  - when the 4 corners are defined, **SteamVR calibration should produce a rectangle with every angles corresponding exactly to the base stations' positions** (as you defined previously). If one of the rectangle's angle is not located at its corresponding Base station position, it means the corresponding Base Station is too far away from the others Base stations : you have to physically move it closer.

# Configure Windows Power Options

The image shows the Windows 'Modifier les paramètres du mode de gestion de l'alimentation' window. The main window is titled 'Modifier les paramètres du mode : Performances élevées' and instructs the user to choose sleep and display parameters. It shows two settings: 'Éteindre l'écran : Jamais' and 'Mettre l'ordinateur en veille : Jamais'. Below these are links for 'Modifier les paramètres d'alimentation avancés' and 'Rétablir les paramètres par défaut pour ce mode'. At the bottom right are buttons for 'Enregistrer les modifications' and 'Annuler'.

An inset window titled 'Options d'alimentation' is open, showing the 'Paramètres avancés' tab. It instructs the user to select a power management mode and then choose parameters. The 'Performances élevées [activé]' mode is selected. A list of parameters is shown, with two items highlighted by red boxes:

- Paramètres des cartes sans fil**: Mode économie d'énergie. Paramètre : Performances maximales.
- Paramètres USB**: Paramètre de la suspension sélective USB. Paramètre : Désactivée.

Other visible parameters include 'Paramètres d'arrière-plan du Bureau', 'Veille', 'Boutons d'alimentation et capot', 'PCI Express', and 'Gestion de l'alimentation du processeur'. A 'Restaurer les valeurs par défaut' button is at the bottom of the list. The inset window has 'OK', 'Annuler', and 'Appliquer' buttons at the bottom.

# Set SteamVR settings

