

Infinadeck Plugin 2.0 for Unity Manual



VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	G. Brunner	10-22-2018	B. Freeman	10-22-2018	Initial Release
1.1	G. Brunner	11-2-2018	B. Freeman	11-2-2018	Updated Supported Unity Versions
1.2	G. Brunner	11-14-2018	B. Freeman	11-14-2018	Clarified Vive Tracker Requirements
1.3	G. Brunner	11-26-2018	B. Freeman	11-26-2018	Unreal Release
1.4	G. Brunner	12-21-2018	B. Freeman	12-21-2018	Clarified Unreal Documentation
1.5	G. Brunner	1-16-2019	B. Freeman	1-16-2019	Separated IK Documentation
2.0	G. Brunner	5-24-2019	B. Freeman	5-24-2019	Separated Engine Documentation

Infinadeck Template Version: 2018-06-20



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1 INTRODUCTION

This guide covers the installation and use of the Infinadeck Plugin for Unity. Implementation of this system into a game will allow said game to be played with the use of an Infinadeck omnidirectional treadmill.

Please make a backup of your game files before you begin implementing our system. While our system is implemented, the game may crash if *Infinadeck.exe* is not running. Follow the Uninstall Guide (see Section 6) to properly remove our system to run the game without *Infinadeck.exe*.

2 REQUIREMENTS

The following hardware and software components are required to run Version 1.5 of the SDK:

- ☐ 1 Vive or Vive Pro Headset (2 Vive Controllers Optional)
- ☐ Unity Version: 2018.3.8 or higher
- ☐ Unity SteamVR Plugin Version: 2.0.1 or higher
- ☐ SteamVR Version: 1.2.10 or higher

3 SOFTWARE DOWNLOAD

There are two software download locations currently available.

3.1 THE COMPLETE INFINADECK SDK

The latest version of the Infinadeck SDK may be found on our [Google Drive Folder](#). Please follow the link to download the latest files. Demo projects and a short video to help with the installation and setup may be found in the same location.

The following items will be included with the download:

- Infinadeck App Installer
- Unity Plugin
- Unreal Plugin
- SDK Documentation

3.2 THE UNITY ASSET STORE

In the future, the Infinadeck Plugin will be hosted on the Unity Asset Store. The Infinadeck App Installer must also be downloaded, and a link to this software may be found in the Unity Store description.

4 INSTALLATION GUIDE

Once you have downloaded the files (see Section 3, Software Download) you are ready to begin the installation process.

4.1 IMPORT TO CURRENT PROJECT

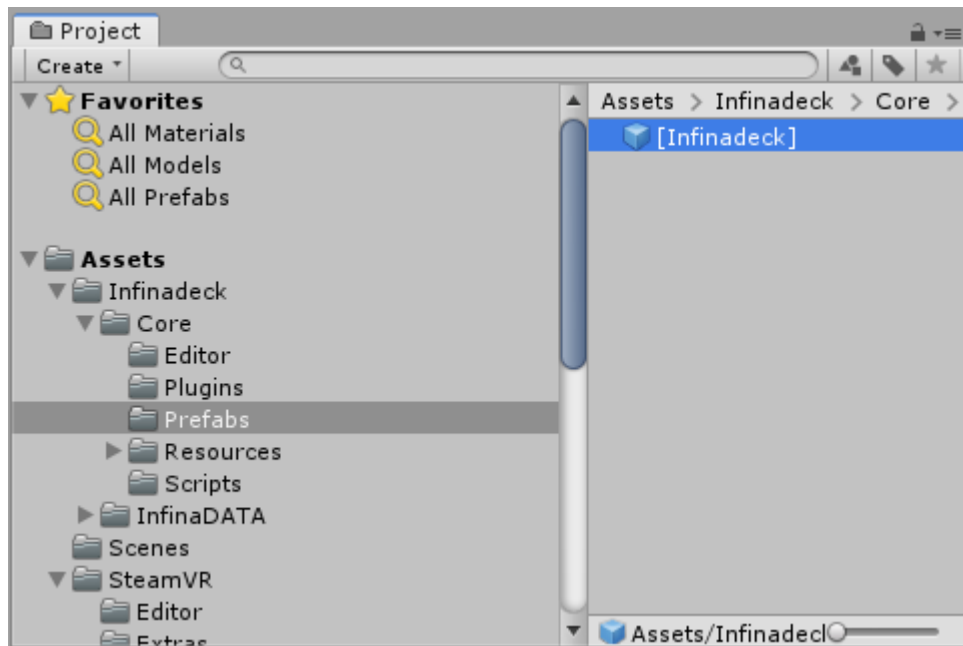
For developers who downloaded the plugin from the Unity Store, do the following.

1. In the Unity Editor, pull up the Asset Store Window (under **Window > Asset Store**).
2. Navigate to the **Infinadeck Plugin for Unity** using the Search toolbar.
3. Ensure all boxes are checked to import the entire package.

For developers who want to install the plugin from the Complete Infinadeck SDK, do the following.

1. In the Unity Editor, find **Assets > Import Package > Custom Package**.
2. Navigate to *[Install Location]/InfinadeckSDK/Unity* and click on **InfinadeckUnityPlugin.package**.
3. Ensure all boxes are checked to import the entire package.

4.2 PREFAB ADDITION

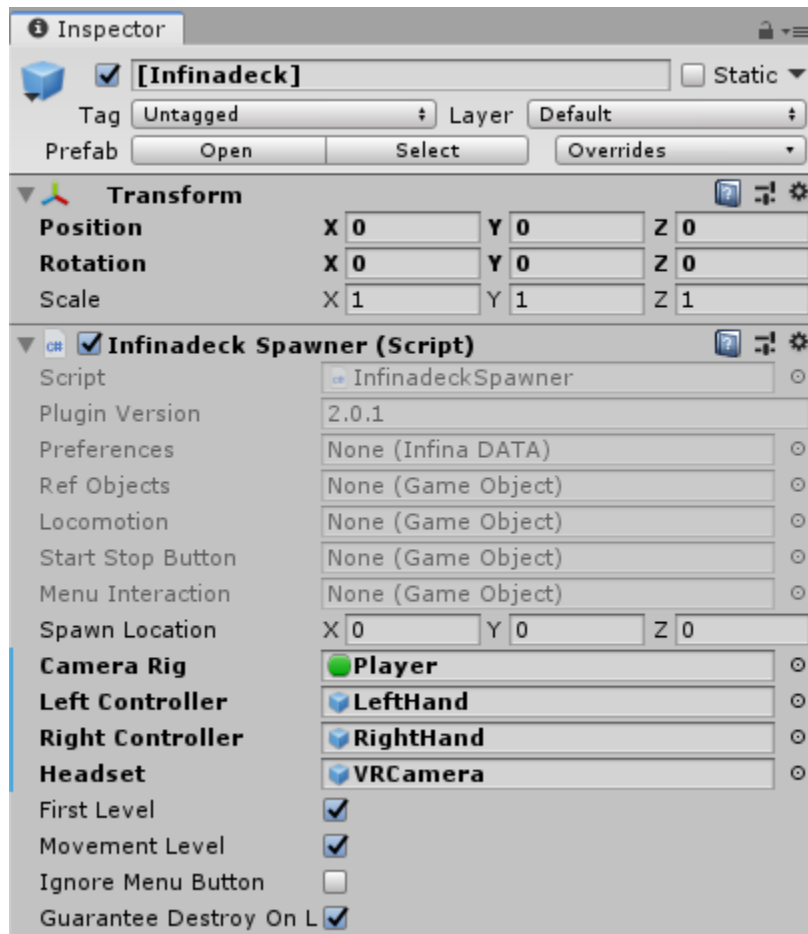


1. After importing, navigate to *Assets/Infinadeck/Core* in your Project tab.
2. In the subfolder Prefabs, find the prefab named [Infinadeck].
3. Grab this prefab and drag it anywhere in your Hierarchy.

4.3 WIRE PREFAB FOR INTERACTION

Under the [Infinadeck] prefab, find the **Infinadeck Spawner** script. Set the component values as follows:

- **CameraRig:** Set this to your VR Camera Rig, as in the effective “Room Setup.” This is used to move the Infinadeck Reference Objects in synchronization with the player as they move through the world space.
- **LeftController:** Set this to your left controller or “left hand.” This is used as a reference point for the left laser pointer used in our various menus, and as a parent for the left button interaction object.
- **RightController:** Set this to your right controller or “right hand.” Mirror of the above.
- **Headset:** Set this to your Headset. This is used to update the virtual button position.



4.4 TEST IMPLEMENTATION

The system is now ready to run. To test run the software:

1. Open **Infinadeck.exe** in *[Install Location]/InfinadeckSDK/App* and run your game.
2. With your game window visible, click back on **Infinadeck.exe**, and move over to the **Test** tab. Click the **Start** button. When you move the gray circle in the Infinadeck window, the movement should translate to motion in the game.

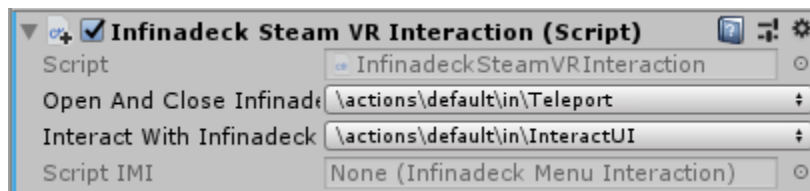
4.5 SET AXIS MULTIPLIERS

This is a future functionality that will be implemented in a later release.

4.6 (OPTIONAL) STEAMVR CODE SETUP

In order to interact with the Infinadeck Menus in game, the following steps must be taken.

1. Wire the system per SteamVR 2.0's full tutorial documentation:
https://valvesoftware.github.io/steamvr_unity_plugin/tutorials/SteamVR-Input.html
2. Add two "In" Actions to the SteamVR Input Window: InfMenuToggle and InfMenuUse. Both should have localized strings of the same name and be set as suggested booleans.
3. Bind InfMenuToggle to the Menu Button (the one with the ≡ symbol) for On Click.
4. Bind InfMenuUse to the Triggers for On Click.
5. Under the [Infinadeck] prefab in the game, add the InfinadeckSteamVRInteraction script.
Under the InfinadeckSteamVRInteraction script on [Infinadeck], scroll to OpenAndCloseInfinadeckConfigMenus and InteractWithInfinadeckMenus and set them to "InfinadeckMenuToggle" and "InfinadeckMenuClick" respectively.





5 TROUBLESHOOTING

The following table outlines common installation issues and solutions:

Installation Issue	Solution
Unity Won't Run Post Plugin Installation	Check your console window and follow through with the problems you encounter.
The Game Crashes	Open <i>Infinadeck.exe</i> and let it run idly in the background.
The Scene Seems to Reload Itself	DemoMode is most likely active. Set the demo mode to false using <code>SETDEMOMODE()</code> .
The Virtual Button Doesn't Respond to My Controllers	Wire the system per SteamVR 2.0's full tutorial: https://valvesoftware.github.io/steamvr_unity_plugin/tutorials/SteamVR-Input.html . Otherwise, alter the Button Sensitivity under <i>Assets/Infinadeck/Core/inf_preferences.ini</i> .
I Can't Access the Configuration Menu	Make sure that IgnoreDeckConfigControllerKeybind is unchecked in [Infinadeck] .

If you have additional questions, please email info@infinadeck.com with the words "PLUGIN HELP REQUESTED" in the subject line.



6 UNINSTALL GUIDE

To remove each of the components of the system:

1. Delete the [Infinadeck] prefab instance in the game scene.
2. Delete the **Infinadeck/Core** folder under your **Project** tab.



7 USAGE

There are several ways to interface with the Infinadeck system once it's been installed (see Section 4) both inside and outside of the game.

1.1 PREFAB SETTINGS

There are several values you can change within your prefab to make the system function as desired. Separate prefabs from the default system may be saved.

- **FirstLevel(bool)**: Set to TRUE if this is your initial spawn in-scene. This will spawn an InfinadeckSplashscreen with important spec information about the treadmill being used and give awareness that the plugin is hooked into the game. Otherwise, this can be set to FALSE.
- **MovementLevel(bool)**: Set to TRUE if this is a level where the user needs to be capable of walking. It should be set to FALSE for menu screens where the character is incapable of moving.
- **IgnoreMenuButton(bool)**: Set to TRUE if you do not want the Menu Button on the Vive Controllers to pull up the menu. This can be useful to move access to the configuration menu to a sub-menu or disable the configuration menu entirely. Otherwise, this can be set to FALSE.
- **GuaranteeDestroyOnLoad(bool)**: Set to TRUE if you want to make sure the Infinadeck instance destroys itself on load. This will prevent the spawning of multiple instances of the Infinadeck in situations where DontDestroyOnLoad is used on the CameraRig. Otherwise, this can be set to FALSE.
- **SpawnLocation(Vector3)**: Set to the desired spawn vector for the treadmill. In most scenarios, this can be left at (0,0,0).

1.2 CONFIGURATION FILE SETTINGS

There are several values you can change within your prefab to make the system function as desired. Separate prefabs from the default system may be saved.

- **buttonTrackingRate(float, bounded 0 to 1)**: The rate at which the button attempts to catch up to the user's position. Higher values make the button move faster.
- **buttonPressSensitivity(float)**: The frame-to-frame positional difference at which the button will be considered pressed. Higher values make the button harder to press.
- **buttonAngleRange(float, bounded 0 to 1)**: The range of impact angles at which the button will be considered pressed. Higher values make the button harder to press.
- **ringVisibility(float)**: Whether the deck ring can be seen in the game during runtime.
- **edgeVisibility(float)**: Whether the deck edge can be seen in the game during runtime.
- **centerVisibility(bool)**: Whether the deck center can be seen in game during runtime.
- **centerModel(int)**: The ID of the deck center model being used by the game.



1.3 IN-GAME USAGE

You have access to several in-game features.

1.3.1 Virtual Start/Stop Button

In any scene where the deck is active and the APILock is disengaged, there will be a button that hovers in front of you to enable you to start and stop the deck. Its position is based off of the headset. When pressing the button from `DECKSTATE == OFF` the calibrate function will always run; this may change in future releases when mid-runtime calibration is less required. Pressing the button during `DECKSTATE == ON`, will *always* stop the deck and this will never change.

1.3.2 In-Game Infinadeck Menu

The menu is currently to the Menu Button (\equiv on the Vive Controller). When this menu is opened, the APILock will be engaged; when it is closed, the APILock will be disengaged.

Note: This menu cannot be accessed in demo mode.

This menu gives you access to numerous helpful features:

- Toggle Ring Display
- Toggle Deck Edge Display
- Toggle Centering Mark Display (always visible during calibration)
- Change Centering Mark
- Close Menu and Return to Game



8 ADVANCED DOCUMENTATION

The following subsections go in-depth for more sophisticated concepts than those covered elsewhere in this guide. They exist to give creators a better understanding of how our system works so that they may better interface and work with our system.

1.4 REFERENCE POINTS

There are a couple critical reference points that users need to have visible to help ground the use to the real world while in virtual reality.

1.4.1 Ring

The virtual ring serves two primary purposes for the user. First, it is a physical object that any user who is feeling afraid, unsafe, or unstable can grab onto. Second, the ring serves as a visual grounding point. Whenever the deck speed is at a mismatch to the user, the user gains a greatly increased chance of nausea that is mitigated by the existence of the ring. As the ring is tied to the deck and not the user, the brain can easily see how much mismatch exists between the deck and the user, and thus prevent any locomotion-based nausea.

1.4.2 Deck Edge

The deck edge serves a very similar purpose to the ring, functionally being a less-critical floor-based reference point. Given that the system has a speed limit, users can look to see exactly where their stride lands, so that they comfortably and intuitively know the system's limits.

1.4.3 Center Mark

The center mark, which is always visible during calibration, lets users know both how far they are from center, along with where the system wants them to be during calibration. Standing directly above this symbol will minimize the amount of movement that occurs during the calibration segment.

1.4.4 Avatar

Requires use of the InfinaSKIN plugin. When properly calibrated, the user avatar lines up with the user's real body. This allows the user to see exactly where their limbs are, which is critical to user comfort and familiarity.



9 KNOWN BUGS

Below are a list of Known Bugs and Fixes we are currently working on. Please contact us at info@infinadeck.com with the words "PLUGIN BUG DISCOVERED" in the subject line if you find any additional bugs or encounter any issues.

- The ring position does not always save properly, leading to scenarios where ring calibration must be completed while the game is running to guarantee the ring appears in the right spot in the game. Please let us know if you spot the issue in our code.
- Some of the extra functions used in the Infinadeck API have not been added to the Unreal function library. These will be integrated in a future version.