Infinadeck Plugin 2.0 for Unreal 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 Unreal. 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)
- Unreal Version: 4.19
- 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 UNREAL ENGINE 4 MARKETPLACE

In the future, the Infinadeck Plugin will be hosted on the Unreal Engine 4 Marketplace. The Infinadeck App Installer must also be downloaded, and a link to this software may be found in the Unreal Marketplace description.
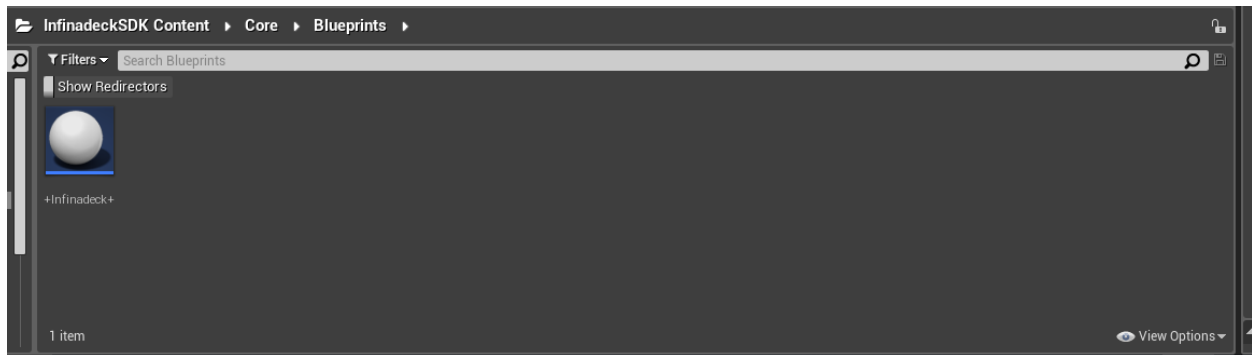
4   INSTALLATION GUIDE

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

1. Add the Infinadeck SDK folder from the Unreal subfolder into the Plugin folder in your game files.
2. Enable the plugin under Edit/Plugins.

4.2   BLUEPRINT ADDITION

1. After importing, navigate to *InfinadeckSDK Content/Core* in your Content Browser.
2. In the subfolder Blueprints, find the blueprint named +Infinadeck+.
3. Grab this blueprint and drag it anywhere in your game.

4.3   WIRE BLUEPRINT FOR INTERACTION

Open up the +Infinadeck+ blueprint. Set the initial parameters (as found in the big yellow comment box) 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.
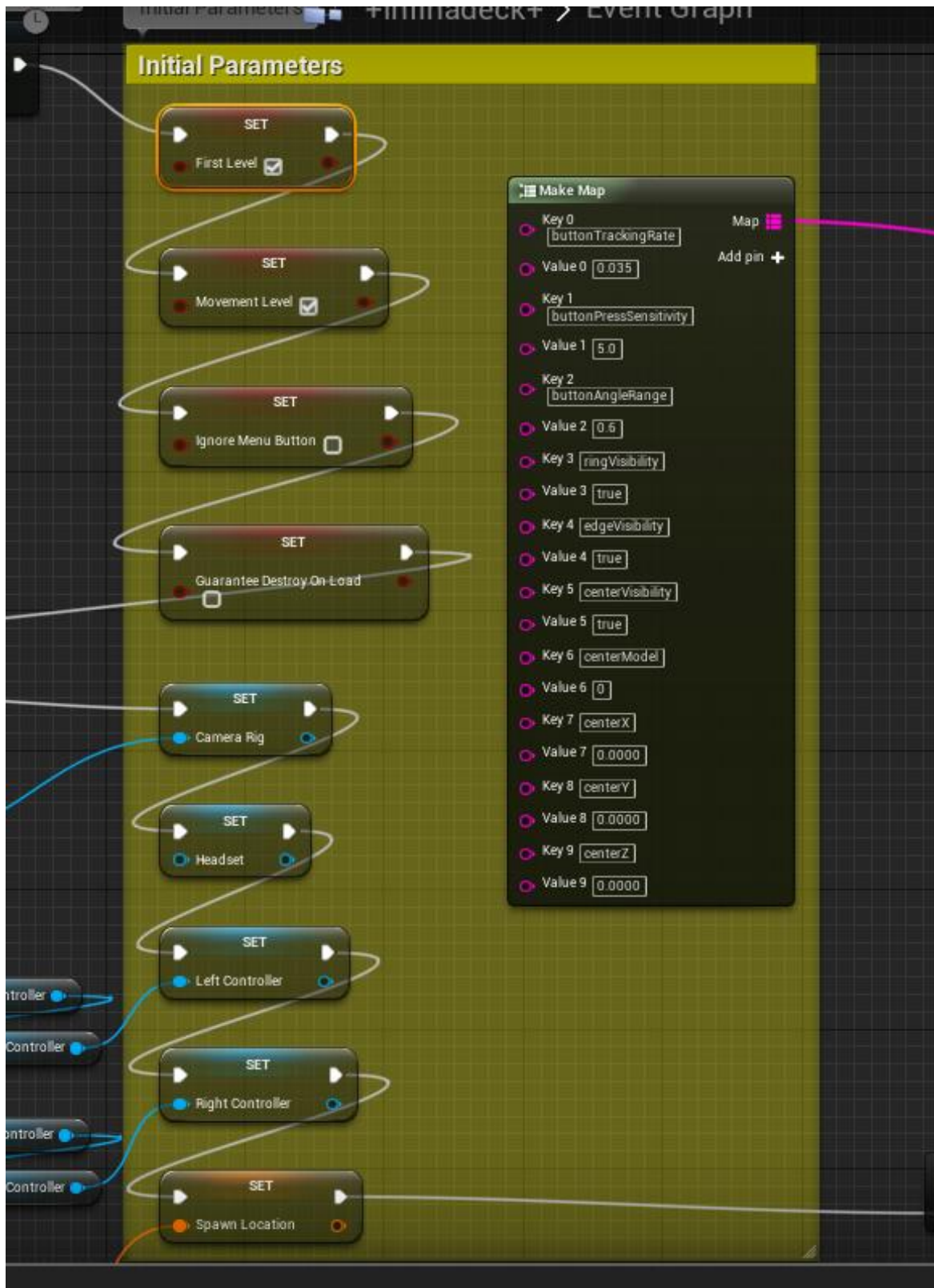
4.4 TEST IMPLEMENTATION

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.

5   TROUBLESHOOTING

The following table outlines common installation issues and solutions:

Installation Issue	Solution
Unreal Won't Run Post Plugin Installation	Check your console window and follow through with the problems you encounter.
The Game Crashes	Open *Infinadeck.exe* and let it run idly in the background.
The Virtual Menu Buttons Doesn't Respond to My Controllers	Make sure those inputs are not being consumed elsewhere in your game (Check for any instance of the broken input within the project, and make sure Consume Input is not selected).
The Virtual Start Stop Button Doesn't Respond to My Controllers	Alter the ButtonPressAngle and ButtonPressSensitivity under +Infinadeck+'s preferences dictionary.
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+ blueprint instance in the game scene.
2. Disable the plugin under Edit/Plugins.
3. Delete the **InfinadeckSDK** folder from the Plugin folder in your game files.

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 BLUEPRINT 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.
- **SpawnLocation(**Transform**):** Set to the desired spawn vector for the treadmill. In most scenarios, this can just be set to the location of the CameraRig.

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 sued 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 (≡ 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

While INFINADECK does not supply a tool for avatar creation and management, support exists to use such a feature. INFINADECK recommends the use of the Vive Mocap Kit on the Unreal Engine 4 Marketplace (https://www.unrealengine.com/marketplace/en-US/slug/vive-mocap-kit) for enabling a full body avatar. 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.
- The external load and save functions (those in InfinaDATA) have been disabled in this version, due to an error from accessing global ini files. This functionality will be fixed in the future.