SDK Documentation

VERSION 1.2

1 Introduction

The Vinyl Reality SDK enables the creation of custom environments for Vinyl Reality inside the Unity Editor. This version of the SDK exposes the following Vinyl Reality features:

- Configuring the user
- Placing and configuring all of the required equipment:
  - Turntables
  - Mixer
  - Record case
  - Streaming console (with spectator cameras)

Future version of the SDK will expose more functionality, including:

- Sound reactive lighting
- LED walls with custom images

A simple example scene is included with the SDK (EntroPi/ SDK/Examples/Environment) which demonstrates how to use all the basic components.

2 Requirements

- Unity Editor version **2018.3.11f1:**
  https://download.unity3d.com/download_unity/5063218e4ab8/Windows64EditorInstaller/UnitySetup64.exe
- Experience with using the Unity editor to create environments
- The latest Steam or Oculus Store version of Vinyl Reality (EA v1.1.6f2 and up)

3 Quick Start Guide

This quick start will guide you through the very basics of setting up your scene and building it for Vinyl Reality. A more detailed step-by-step explanation is provided in the next section.

1. Import the Vinyl Reality SDK unity package into your project
2. Press both the "Fix Project Settings" and "Setup Project Layers" buttons in the SDK Project Settings window that should have appeared after importing the project
3. Add the **SceneDescriptor** prefab (EntroPi/SDK/Prefabs) to your scene
4. Create and configure a **SceneInfo** asset (Create > EntroPi > SDK > Scene Info) and assign it to the "Scene Info" property on the **SceneDescriptor** script component (included in the prefab)
5. Save the scene and select "EntroPi > SDK > Build Active Scene" from the Menu bar
6. Select the folder C:\Users\YourUsername\AppData\LocalLow\EntroPi Games\Vinyl Reality\Environments
7. After the build has finished, start Vinyl Reality and load the environment from the "Load Custom Content" panel in the main menu

4 Detailed Instructions

4.1 Importing the Vinyl Reality SDK unity package

Import the Vinyl Reality SDK unity package into a new or existing Unity project, by using one of the following methods:

- Drag and drop the unity package into the Unity's editor project window
- Right-click in the project window and select Import Package > Custom package
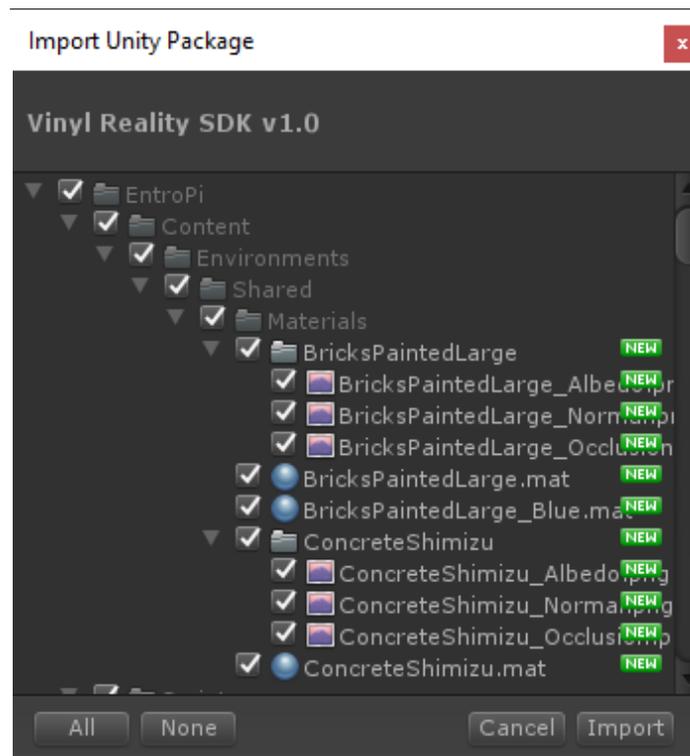
Leave everything selected, press the "Import" button and wait for everything to be imported.

4.1.1 Upgrading an existing project

When upgrading an existing project to a newer version of the SDK, the **EntroPi** and **PostProcessing** folders should be deleted before importing the new Vinyl Reality SDK Unity Package.

If you get any compilers after upgrading your project from an older Unity version, make sure the **Scripting Runtime Version** (Project Settings > Player > Other Settings) is set to **.NET 4.x Equivalent.**

4.2 Project Settings

Once the SDK package has been imported, the "SDK Project Settings" window should pop-up.
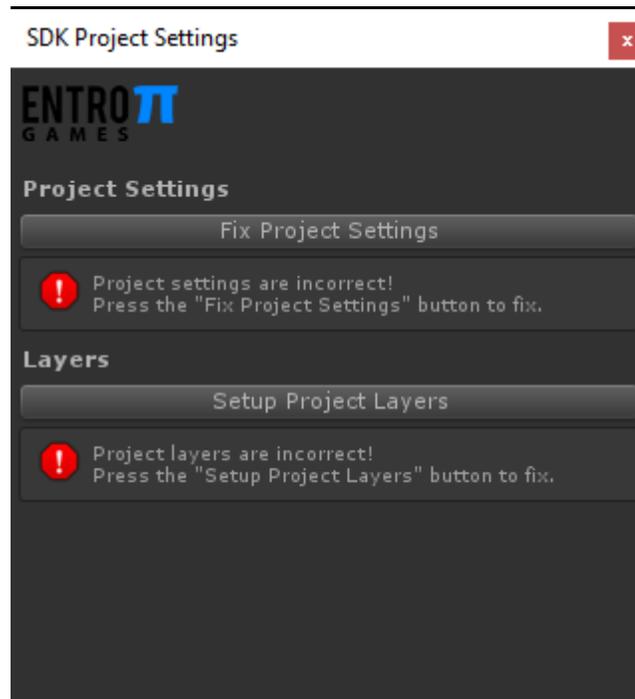
If the window is not visible you can open it from the editor's Menu bar by selecting "EntroPi > SDK > Project Settings."

Press both the "Fix Project Settings" and "Setup Project Layers" buttons in the SDK Projects Settings window. Afterwards both error messages should have been resolved and the window can be closed.

4.3 Setting up your scene

Open the scene you want to build for Vinyl Reality. A couple of scripts need to be added to your scene so that it can be loaded into Vinyl Reality.

4.3.1   Adding the SceneDescriptor prefab to your Scene

The *SceneDescriptor* prefab determines where the user and the DJ equipment will be created.
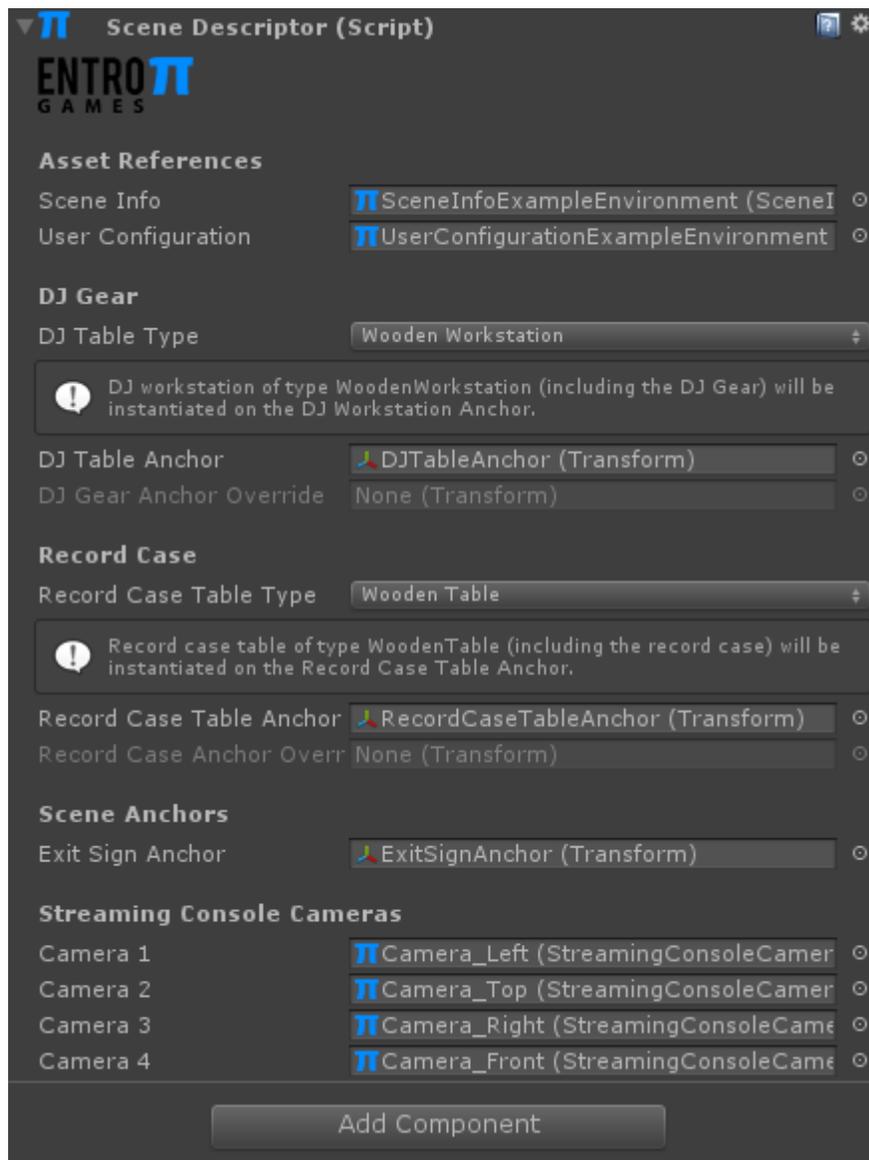
The DJ equipment anchors in the prefab are already positioned correctly relative to the user, but you can move the entire prefab to control where the user will spawn.

You can also change the position of the individual anchors, but to make sure your environment can be played by users with a small VR play area, it is recommended to keep them as close to their original position as possible.

To setup the *SceneDescriptor* prefab, follow these steps:

1. Add the *SceneDescriptor* prefab, located in the *EntroPi/SDK/Prefabs* project folder, to your scene, by dragging it from the project window into the root of your scene's hierarchy window
2. Right click in the project window and select *Create > EntroPi > SDK > Scene Info* to create a new Scene Info asset
3. Configure the newly created Scene Info asset. For more information on how to setup the Scene Info asset, refer to the Scene Info asset overview.
4. Assign the Scene Info asset to the "Scene Info" property on the *SceneDescriptor* script component attached to the prefab you added to the scene in step 1
5. Save your scene

4.4 Adding spectator cameras to the streaming console

The *SceneDescriptor* prefab already has 4 spectator cameras setup by default.

The position and properties (ex: Field of View, Clipping planes, etc...,) of the cameras in the prefab can be changed to better match the scene. If needed, a Post Processing Behaviour component can also be added to the cameras.

Each camera has a *StreamingConsoleCameraDescriptor* attached. When the Follow DJ Gear Anchor property is enabled, the camera will follow the movement of the DJ Gear when the user adjusts the height or angle.

The streaming console can only be used when the *SceneDescriptor* is configured to instantiate one of the built-in DJ tables.

To Disable the streaming console cameras, simply delete the SpectatorCameras GameObject.

4.5 Building your scene

After you've finished setting up your scene, you need to build it before being able to load it in Vinyl Reality.
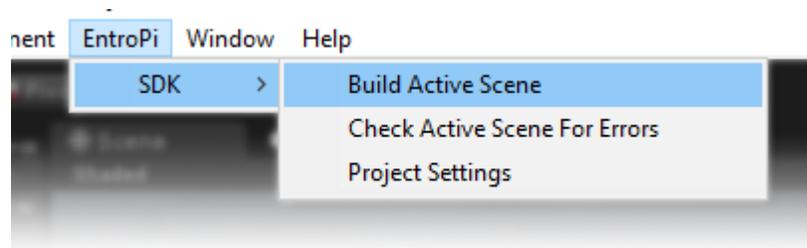
To build and export your environment to Vinyl Reality, follow these steps:

1. Open the scene you want to export
2. Select **EntroPi > SDK > Build Active Scene** from the Menu bar
3. Navigate to C:\Users\YourUsername\AppData\LocalLow\EntroPi Games\Vinyl Reality
4. Select or Create the folder named **Environments** and press "Select Folder"
5. Wait for the build to finish

If the build fails, check the console window for error or warning messages and fix them before trying to build again.

4.6 Loading your environment in Vinyl Reality

After you've exported your environment, start Vinyl Reality, and in the main menu open the **Load Custom Content** panel.

If everything went well, your environment should be listed. Click the Icon to load the level.

If the environment won't load inside Vinyl Reality, check the **output_log.txt** (located in C:\Users\YourUsername\AppData\LocalLow\EntroPi Games\Vinyl Reality) file for any errors starting with **[SDK]**

5 Component Overview

This section provides an overview of all the SDK's script components and it properties.

Inside the Unity Editor, you can hover over any property label to display a tool tip that describes the property and how to use it.

5.1 Scene Descriptor

The **SceneDesciptor** script component allows you to define where the user and all of the required DJ equipment will be instantiated when the scene is loaded in Vinyl Reality.

A warning will be displayed in the inspector window if a property is not assigned.

5.1.1 Script Properties

- **Scene Info:** Reference to a Scene Info asset
- **User Configuration:** Reference to a User Configuration asset
- **User Anchor:** Reference to a Transform which determines where the user will be spawned
- **DJ Table Type:** Select which type of DJ table to instantiate, or set to *None* if you want to position the DJ gear manually
- **DJ Table Anchor:** Reference to a Transform which determines where the DJ table will be instantiated
- **DJ Gear Anchor Override:** Reference to a Transform which determines where the DJ Gear will be instantiated, when no DJ table is used
- **Record Case Type:** Select which type of record case table to instantiate, or set to *None* if you want to position the record case manually
- **Record Case Anchor Override:** Reference to a Transform which determines where the Record Case will be instantiated
- **Exit Sign Anchor:** Reference to a Transform which determines where the Exit Sign will be instantiated
- **Streaming Console Cameras:** References to StreamingConsoleCameraDescriptor scripts. Camera 1 corresponds to the first camera button on the Streaming Console.

If you want to share your environment with other users, it is **highly recommended** to use the adjustable DJ and record case tables (instead of using the anchor overrides), as users have very different preferences for the height and angle of their equipment.

5.2 Streaming Console Camera Descriptor

The **StreamingConsoleCameraDescriptor** script component exposes the properties needed to configure the Streaming Console Cameras.

5.2.1 Script Properties

- **Follow DJ Gear Anchor:** Set if the camera should follow the movement of the DJ Gear when the user adjusts the height or angle.

6 Asset Overview

This section provides an overview of all the SDK's scriptable objects and it properties. Assets need to be created in the project window, and can't be added to GameObject's directly.

Inside the Unity Editor, you can hover over any property label to display a tool tip that describes the property and how to use it.

6.1 Scene Info

The **SceneInfo** asset is used to load the environment in Vinyl Reality, and contains information that will be displayed in the main menu of the application.

To create the asset, simply right click in the Project window and select: Create > EntroPi > SDK > Scene Info.

6.1.1 Asset Properties

- **Environment Name:** Name that will be displayed in the main menu
- **Environment Description:** Short description of the environment that will be displayed in the main menu when the environment's tile is highlighted
- **Author:** Name or nickname of the creator of the map

6.2 User Configuration

The **UserConfiguration** asset is used to control the properties of the user (including the camera) that will automatically be instantiated once the scene is loaded in Vinyl Reality.

To create a User Configuration asset, simply right click in the Project window and select: Create > EntroPi > SDK > User Configuration.

6.2.1 Asset Properties

- **Background color:** Clear color for the user's camera if no skybox is used
- **Near Clipping plane:** Distance from the user's camera to start rendering
- **Far Clipping plane:** Distance from the user's camera to stop rendering. Best kept as small as possible.
- **Shadow distance:** Distance from the user's camera to stop rendering real-time shadows. Should be less or equal to the Far Clipping Plane.
- **Post Processing Profile:** Default post processing profile for the user's camera.
- **Post Processing Profile Overrides:** Override the post processing profile for a specific VR headset.

7 Performance Tips

7.1 Lighting

Since Virtual Reality applications are very prone to performance issues, it's crucial to always keep performance in mind when designing an environment. One aspect that can hugely impact the time it takes to render an environment is lighting.

For Vinyl Reality environments it's recommended to bake all the lighting for level geometry into light maps and only use dynamic lighting for the objects close to the player (DJ workstation, equipment, records, etc…).

In general it is best to mark all level geometry, and the lights that illuminate it, as static and to set the lighting mode to "Baked" or "Mixed". Only lights that need to illuminate the DJ equipment should be set to "Mixed" or "Realtime", but the number of realtime lights should be kept to an absolute minimum.

In most cases a single directional light or spot light, should be sufficient to light the DJ equipment in realtime.

Be sure to also add at least one baked reflection probe and a light probe group to the scene to correctly light dynamic objects. The Example environment included with the SDK can be used as a reference for setting up the lighting.

7.2 Realtime Shadows

Realtime shadows have a high rendering overhead, so they should be used very sparingly. It is highly recommend to only use a single light with realtime shadows enabled.

7.3 References

For more information about setting up lighting in Unity, be sure to consult the online manual: https://docs.unity3d.com/2017.4/Documentation/Manual/LightingOverview.html

8 Limitations

8.1 Custom scripts

Only the scripts that are included with the Vinyl Reality SDK can be included in the scene.

When a scene is build, it is exported as a Unity asset bundles, which doesn't support the loading of custom scripts.

9 Sharing your environments

To share an environment you've created with other people, just zip the 3 files with the same filename as your environment.

In the future a platform will be developed to share your environments with the Vinyl Reality community, but in the mean-time you can upload the zip file online and share the link on Discord or the Steam forums.

10 Support

If you need help with using the SDK, there's a dedicated channel for all SDK related questions on the Vinyl Reality Discord server: https://discord.gg/ZEJR8tU