Managers

This page covers the various managers included in the TopDown Engine and how to tweak them to your needs.

Introduction

The **TopDown Engine** uses managers as **central reference points** for a lot of classes and components. These managers, **always present in your scene**, will remember the current points count, the sounds that are playing, or where to spawn the character.

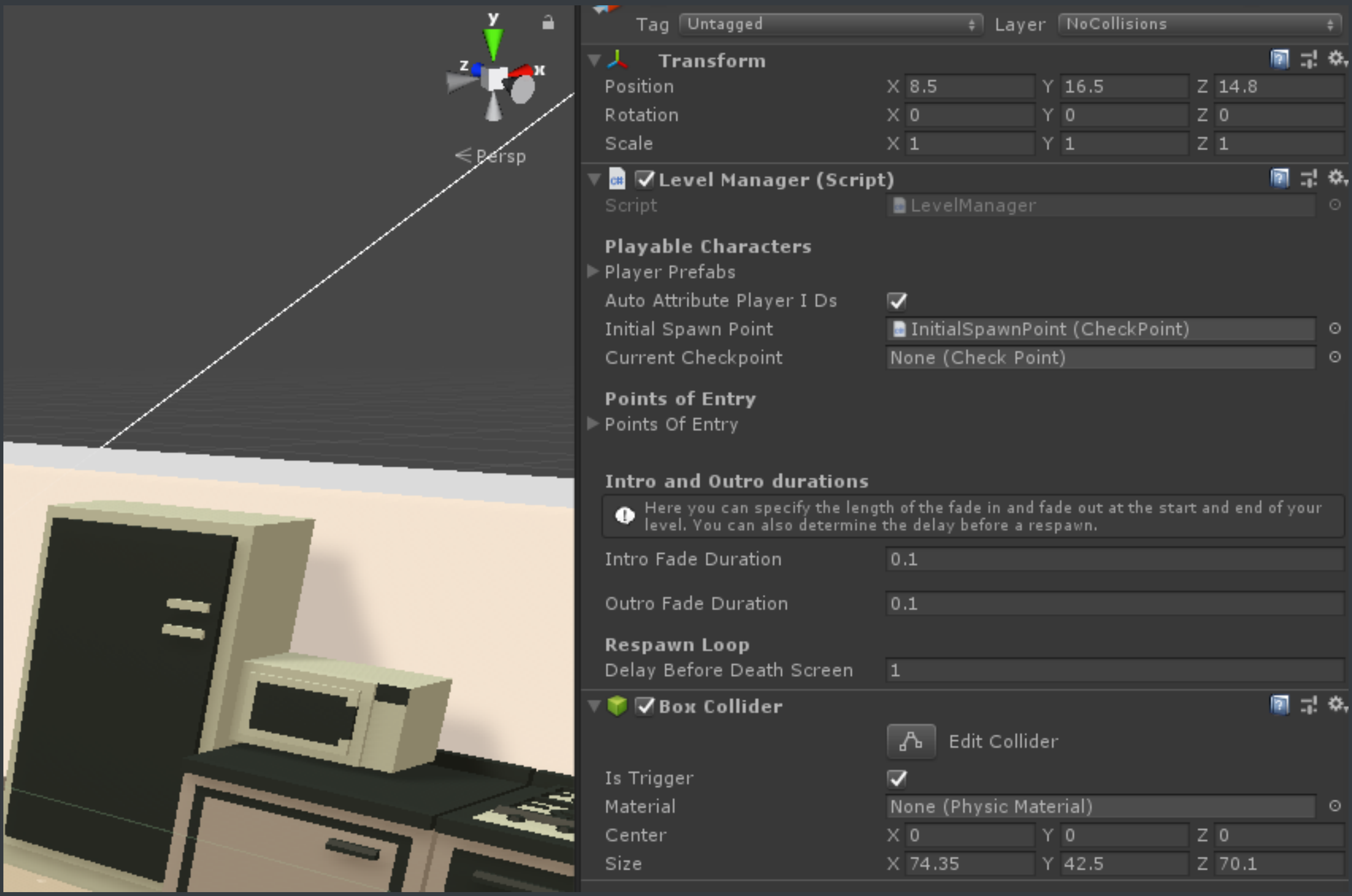
There are a few of them, and in most scenes you'll have a Game, Level, Input, Time and Sound managers present at all time. Usually you'll want to place them on empty gameobjects. Their position in your scene doesn't matter, they're invisible anyway. It's good practice to put them out of the way of your level so you don't delete them by accident.

Game Manager

The **Game Manager** is a high level manager that is responsible for setting the target frame rate, the game loop, storing the points or handling the timescale. It can also optionnally handle the lives system, defining how many lives the player can have, and how many it has right now. In this case you'll have to specify a game over screen to redirect the player to in case all lives are lost. In most cases **you won't have to interact with it**, but make sure there's one in your levels. The API documentation is a good place to go to if you want more information about it.

Level Manager

The **Level Manager** is a reference point for a lot of the engine's scripts. It maintains a list of player characters in the game (usually one but you could have more if you want). It's also in charge of spawn and respawn, and checkpoint management.



Tag Untagged Layer NoCollisions

Transform

Position	X 8.5	Y 16.5	Z 14.8
Rotation	X 0	Y 0	Z 0
Scale	X 1	Y 1	Z 1

Level Manager (Script) ✓

Script LevelManager

Playable Characters
Player Prefabs
Auto Attribute Player I Ds ✓
Initial Spawn Point InitialSpawnPoint (CheckPoint)
Current Checkpoint None (Check Point)

Points of Entry
Points Of Entry

Intro and Outro durations
Here you can specify the length of the fade in and fade out at the start and end of your level. You can also determine the delay before a respawn.
Intro Fade Duration 0.1
Outro Fade Duration 0.1

Respawn Loop
Delay Before Death Screen 1

Box Collider ✓

Edit Collider
Is Trigger ✓
Material None (Physic Material)

Center	X 0	Y 0	Z 0
Size	X 74.35	Y 42.5	Z 70.1

The LevelManager's inspector from the Loft demo scene

In most cases you'll want a **LevelManager** in each of your levels. It needs to be on its own gameobject. From its inspector you can (and should) set what prefab to use as the player. To do so, unfold the PlayerPrefabs dropdown if it's folded, and just drag a prefab from your project view into the Element0 field. For more information about the "Auto Attribute Player ID" checkbox, check out the Input page.

Note that the LevelManager also lets you have Player Characters already in the scene. In this case, simply empty the PlayerPrefabs list, and drag your Character(s) from the scene into the SceneCharacters array instead.

You can add a BoxCollider to your LevelManager, which will then automatically act as constraining bounds for your Camera, as long as it's got a CinemachineCameraController on its virtual camera.

From the inspector you'll also be able to specify delays (before the death screen appears, before respawn...) as well as fade settings for fading the whole screen in and out.

Input Manager

The **Input Manager** handles the inputs and sends commands to the player. It's described in more details on the Input page.

⚠️ **This script's Execution Order MUST be -100**, to make sure it always runs first on each Update(), and avoid weird side effects, especially at low framerates. If you've imported the engine into a blank project that should already be the case. You can define a script's execution order by **clicking on the script's file** and then clicking on the **Execution Order button** at the bottom right of the script's inspector. See this page for more details.

Sound Manager

The Engine uses the **MMSoundManager** system to play sounds, whether they're music, sfx or UI sounds.

Its main features are :

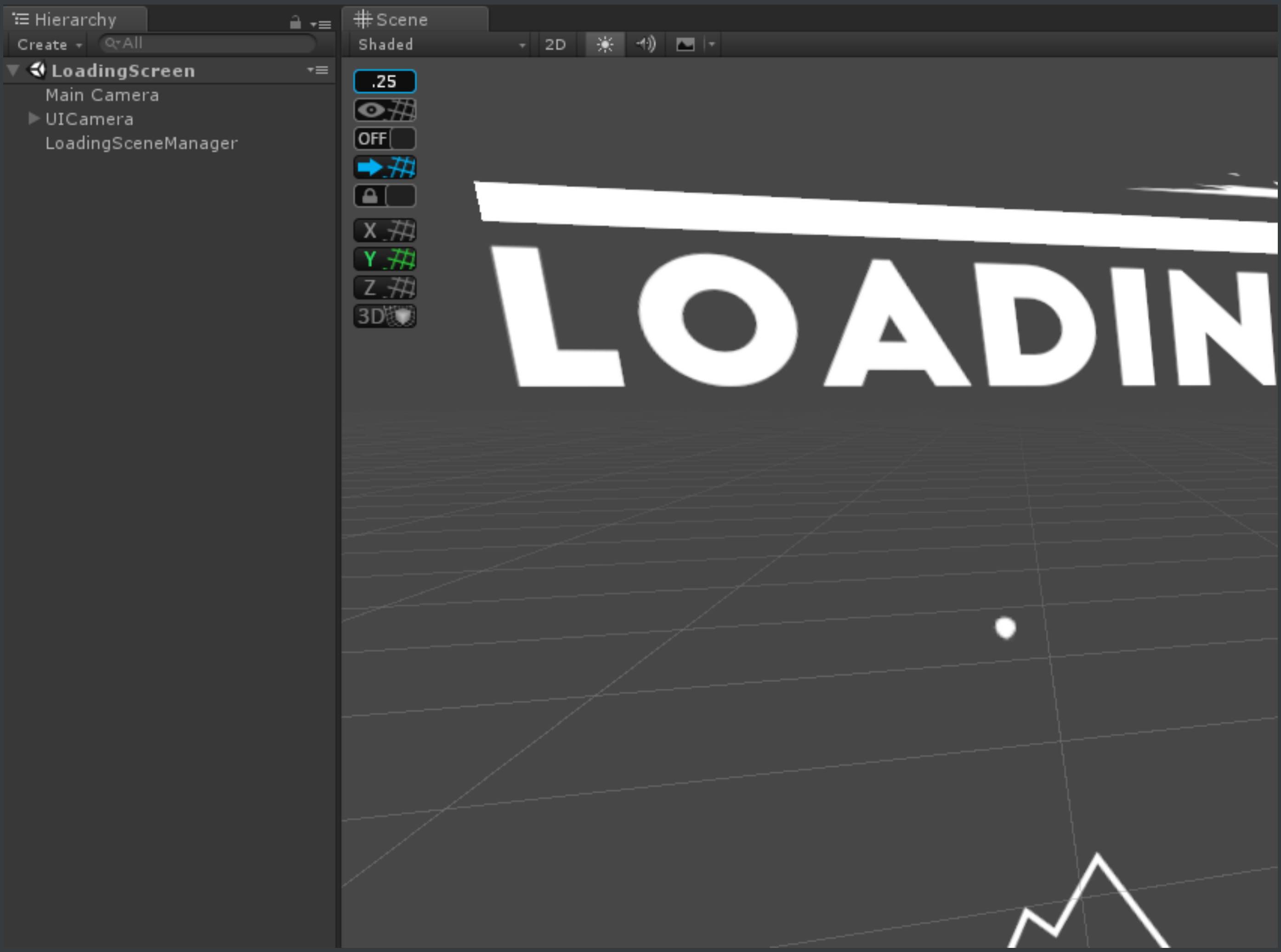
- play / stop / pause / resume / free sounds
- play with full control : loop, volume, pitch, pan, spatial blend, bypasses, priority, reverb, doppler level, spread, rolloff mode, distance
- 2D & 3D spatial support
- Built-in pooling, automatically recycle a set of audio sources for maximum performance
- Built in audio mixer and groups, with ready-made tracks (Master, Music, SFX, UI), and

options to play on more groups if needed
- Stop/pause/resume/free entire tracks
- Stop/pause/resume/free all sounds at once
- Mute / set volume entire tracks
- Save and load settings, with auto save / auto load mechanics built-in
- Fade in/out sounds
- Fade in/out tracks
- Solo mode : play a sound with one or all tracks muted, then unmute them automatically afterwards
- PlayOptions struct for clean API calls
- Option to have sounds persist across scene loads and from scene to scene
- Inspector controls for tracks (volume, mute, unmute, play, pause, stop, resume, free, number of sounds)
- retrocompatibility with older MM systems and events, like MMSfxEvents
- MMSoundManagerEvents : mute track, control track, save, load, reset, stop persistent sounds

You can learn more about the MMSoundManager in its dedicated documentation.

Loading Scene Manager

With Unity, usually when you want to go to another scene (in a menu, or to go from one level to the next for example), you'd use the **SceneManager API**, and probably the SceneManager.LoadScene() method. Personnally I think that this method doesn't provide visual feedback to the player, and scene loading on mobile for example can be a few seconds long, so just having a black screen there **isn't really good looking**. The engine comes with its own scene change API, that you're completely free **not to use** if you don't like it.



The LoadingScene in scene view

If you want to provide a better experience to your player, you can use the **Loading Scene Manager** :

- it can be called from **anywhere**, you don't have to have a LoadingSceneManager in your scene
- it handles loading (as the name implies), showing an **animation** and a **progress bar**
- it's completely **customizable**, just edit the Common/LoadingScene scene's contents. You can easily add your own logo, change the look of the progress bar, what animation is playing, etc.
- it's pretty **simple** to use

To use the LoadingSceneManager API, when you want to change level, just call the LoadingSceneManager.LoadScene (string sceneToLoad) method. The string parameter you pass must of course **match** the name of the scene you're trying to load. So if you were to load the Koala Dungeon level for example, you'd use :

```
LoadingSceneManager.LoadScene ("KoalaDungeon");
```

And the engine will take care of the rest 🚀

Save & Load Manager

The engine comes with a simple class to handle basic save and load needs.
The **MMSaveLoadManager** is a static class that allows the save and load of objects in a specific folder and file. It will let you save and load any object to a file. You can find examples of it in action in the Inventory and MMAchievementManager classes, for example.

To save an object, simply call :

```
MMSaveLoadManager.Save(TestObject, FileName+SaveFileExtension,
FolderName);
```

Then to load it :

```
TestObject =
(YourObjectClass)MMSaveLoadManager.Load(typeof(YourObjectClass),
FileName + SaveFileExtension, FolderName);
```

There are also helper methods to delete saves, save folders, etc. Don't hesitate to check out the class, it's fully commented, as usual. You can also specify what IMMSaveLoadManagerMethod the system should use. By default it's binary but you can also pick binary encrypted, json, or json encrypted. You'll find examples of how to set each of these in the MMSaveLoadTester class

Extending a manager

If for some reason you want to modify a manager's behaviour, the best way to do so is to extend it. That way, you won't lose your changes if you update the asset. Extending a manager is fairly easy. All you have to do is create a new class, that inherits from the manager whose behaviour you want to change, like so :

```
using UnityEngine;
using System.Collections;
using MoreMountains.Tools;
using System.Collections.Generic;

namespace MoreMountains.TopDownEngine
{
  public class NewGameManager : GameManager
  {
    protected override void Start()
      {
      base.Start();
      MMDebug.DebugLogTime("new game manager");
      }

    public override void Pause()
    {
      base.Pause();
      MMDebug.DebugLogTime("new game manager pause");
    }

    public override void AddPoints(int pointsToAdd)
    {
      base.AddPoints(pointsToAdd);
      MMDebug.DebugLogTime("new game manager add points");
    }
  }
}
```

In this example, a new GameManager is created, and a few of its methods are overridden. They don't do much, they just do what the base class does, and then output a debug message. Of course, you could have them do much more. All you have to do then is to place that new manager in your scene on an object, and remove the base one.

You can also decide to add new features to your extended version of a manager. Like so, for example :

```
using UnityEngine;
using System.Collections;
using MoreMountains.Tools;
using System.Collections.Generic;

namespace MoreMountains.TopDownEngine
{
  public class NewGameManager : GameManager
  {
    public virtual void Hello()
    {
      MMDebug.DebugLogTime("hello!");
    }
  }
}
```

In that case, if you want to call that Hello() method from another class using the singleton pattern, remember to cast appropriately, like this :

```
(NewGameManager.Instance as NewGameManager).Hello();
```