

AudioReactive Material Guide

This guide covers setting up and customizing the **AudioReactive** material features in Unreal Engine, allowing you to create dynamic, audio-driven material effects with relative ease.

1. Material Parameter Collection (MPC)

Audio data flows into materials using a **Material Parameter Collection (MPC)**. This is a centralized method for managing and expanding the number of audio stems your materials can respond to.

2. AudioReactive Material Instance Options Explained

Below is an explanation of each available parameter, listed in the order you will see them in your Material Instance settings panel:

- **BaseColor_Enable**
 - Toggles audio reaction on your Base Color parameter.
- **BaseColor_Intensity**
 - Controls how strong the audio reaction affects the Base Color.
- **Displacement_Enable**
 - Toggles AudioReactive displacement
- **Displacement_Intensity**
 - Adjusts how strongly the displacement reacts to audio input.
- **Emissive_Amount**
 - Controls overall strength of emission when responding to audio.
- **Emissive_AddTexture**
 - Enables using a texture map for emission, multiplying your emissive color reaction with texture detail to create more interesting and detailed emission results.
- **Emissive_Color_High**
 - Sets emissive color at higher audio volumes.
- **Emissive_Color_Low**
 - Sets emissive color at lower audio volumes.

These two colors (high and low) blend dynamically based on the audio level.
- **Emissive_Enable**
 - Toggles audio-driven emissive reactions on or off.
- **Emissive_LowHigh_Contrast**
 - Adjusts how sharply or smoothly the transition happens between **Emissive_Color_Low** and **Emissive_Color_High**.
- **Emissive_TextureMultiply**
 - Increases how much the emissive texture is multiplied by the emission color, resulting in stronger contrast and less uniform emissive reactions.

- **EmissiveTexture_Enable**
 - Enables or disables the use of the emissive texture detail altogether.
- **Roughness_Enable**
 - Toggles the audio reaction on the roughness parameter.
- **Roughness_Intensity**
 - Adjusts how strongly the audio reaction affects roughness.
- **WPO_Intensity**
 - Controls intensity of World Position Offset reaction driven by audio input. Be careful when using WPO alongside Displacement, as using both simultaneously can create overlapping, tearing, or unwanted visual results.
- **Audio Stem Selection**
 - Chooses which audio stem (0–5 by default) controls reactions on this specific material instance.
- **Master Gain Control**
 - Adjusts overall audio reaction strength across all enabled effects on this material instance.
- **TextureTiling**
 - Globally adjusts the tiling for texture maps used across your material instance.

3. Using Textures for Detailed Reactions

AudioReactive materials support multiplying audio-driven effects with texture maps. The texture parameters available include:

- **Emission**
- **BaseColor**
- **Displacement**
- **Roughness**

Using textures here allows your reactions to have realistic detail rather than uniform, flat reactions.

4. Nanite Displacement Setup (Important for Displacement)

For the **Displacement** reactions to function properly, you must have **Nanite Displacement** enabled in your Unreal Engine project.

To enable Nanite Displacement, use the following console command:

```
r.Nanite.Tessellation 1
```

To fix choppy raytraced shadows with reactive displacement, try the following two commands.

```
r.RayTracing.Nanite.Mode 1
```

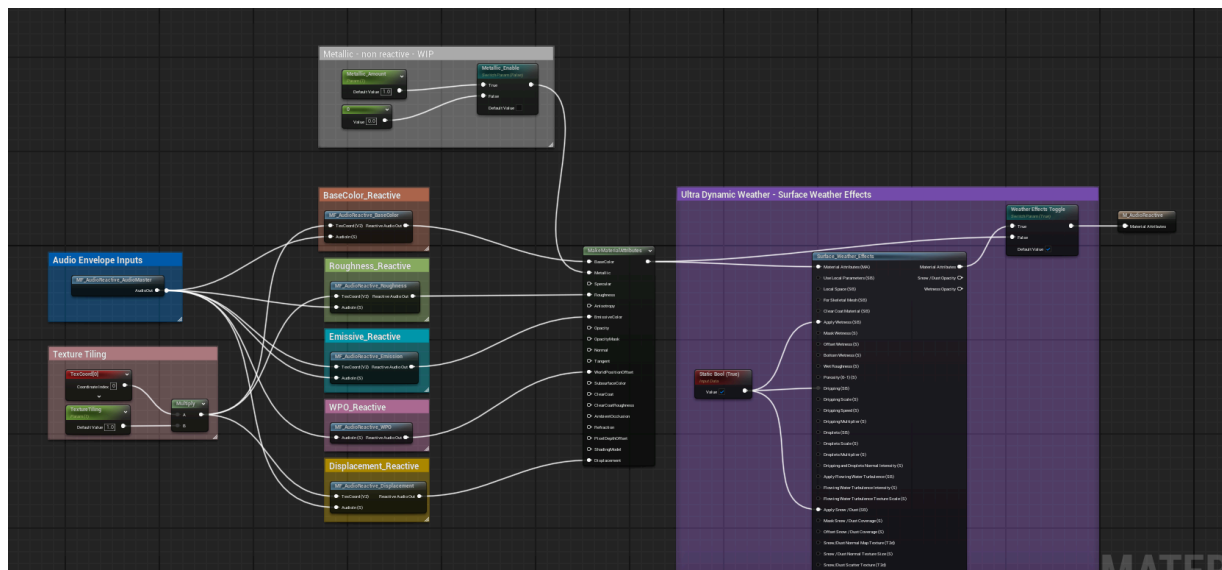
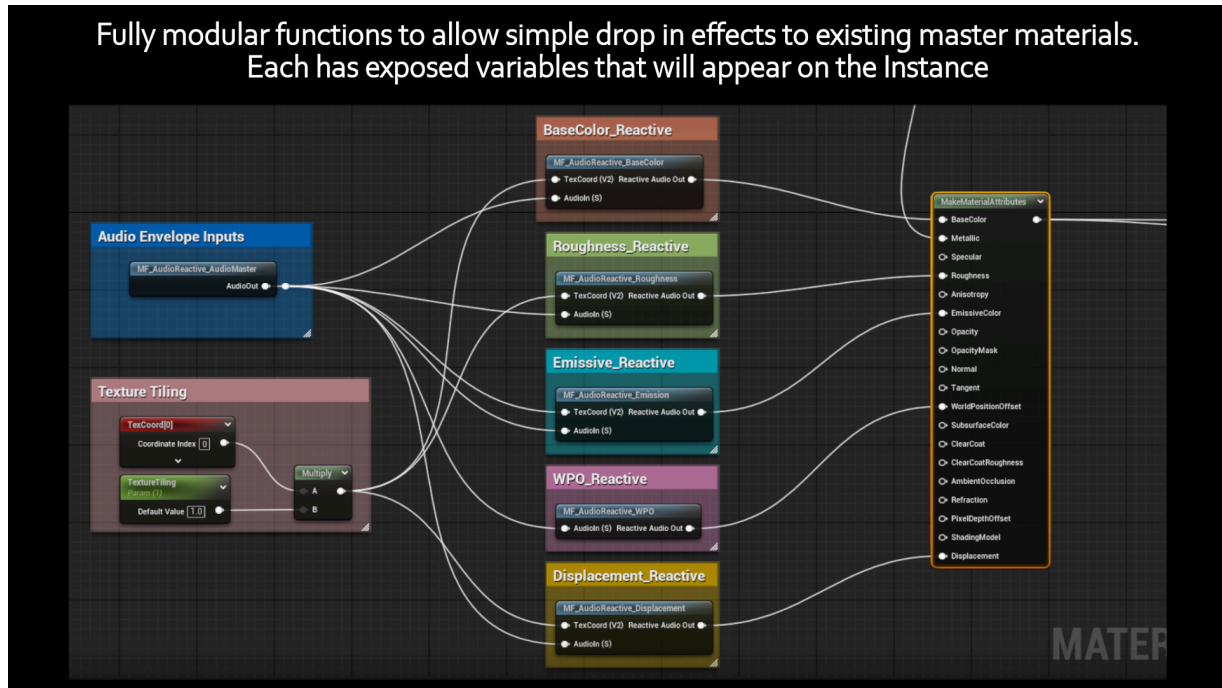
```
r.RayTracing.NormalBias 1
```

Don't forget to ensure **tessellation** is enabled on your Master Material details panel. The included **M_AudioReactive** master material already has tessellation enabled.

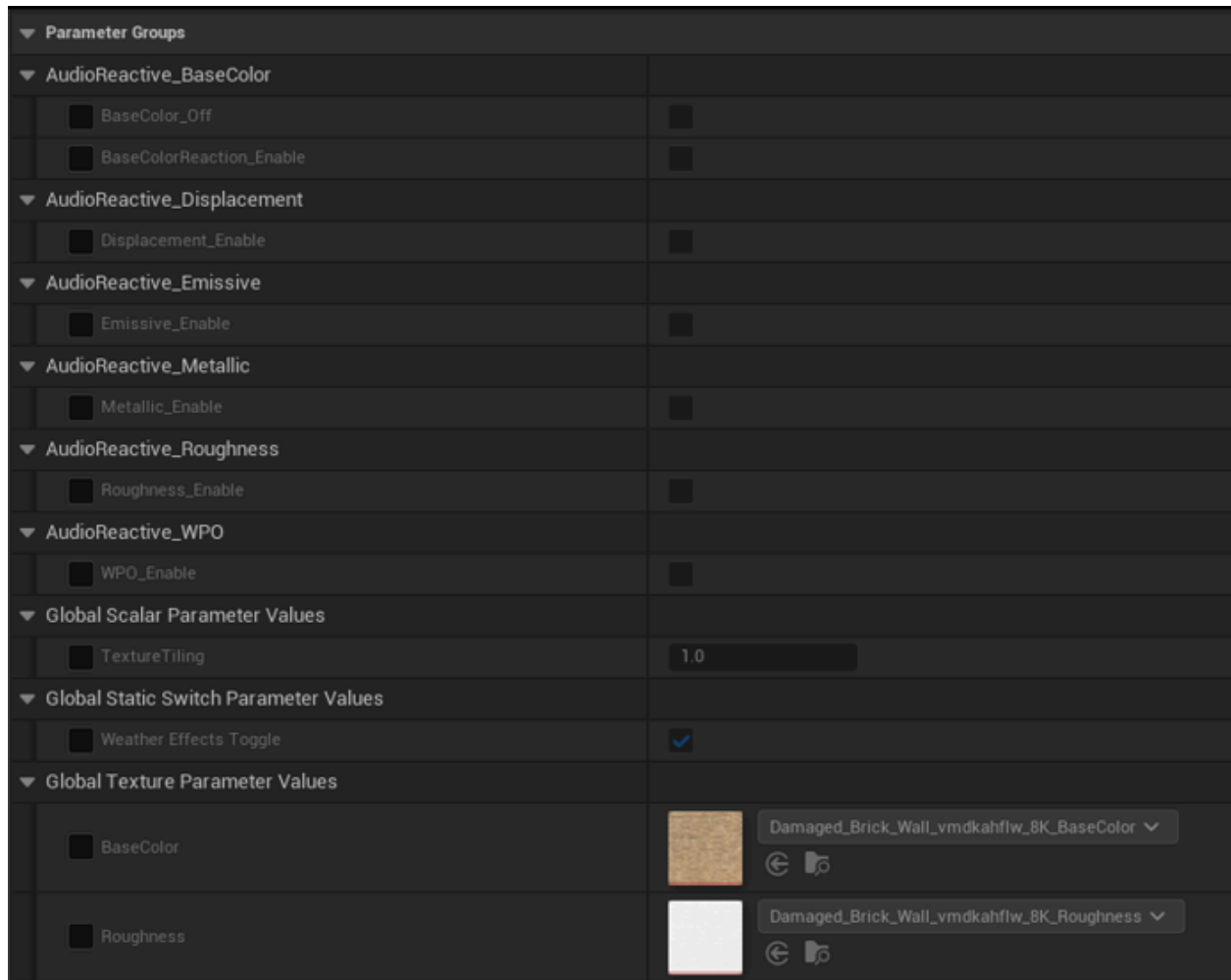
5. Copying Material Effects into your own master material.

To add any individual, or multiple parameter effects into your own master material, you'll need to copy the Blue “Audio Envelope Inputs” comment, and any/all of the commented parameters you would like to bring into an existing material. You should also copy the Texture Tiling to have access to tile-able materials across several reactive channels. *(You don't need the texture tiling if you only plan to use simple emissive effects).*

Top Image - **M_AudioReactive**. Bottom Image - **M_AudioReactive_UDS** (Ultra Dynamic Sky)



The Purple comment on the right is the **Ultra Dynamic Sky and Weather** controls. This will make sure meshes are affected by your chosen weather presets in the AudioReactive blueprint details. *(snow/rain/dust)*



If you wanna get super fancy, you can duplicate the blue input audio box, override the incoming stem number, and use different stems to drive different parameters on the same material..Mind blown right?

With the **Material Reactions**, you have the amazing ability to **adjust them live** while your level/track is playing/simulating. Object reactions can only be adjusted in editor, but materials can be tweaked live, letting you craft the material reactions in real-time.

Become the DJ of your world!

Any/All variables can be exposed to sequencer, allowing custom animation of all parameters for true control and added custom animation as desired.