# User manual addons

Addons are completely separated from the main asset Spline Architect. You can delete them from the addons folder if you so want to. But remember that all the data they had will be lost.

## Installation

> ⚠️ You need to have Spline Architect installed before installing any addon.

Go to Window → Package Manager → My Assets, install your Spline Architect addon, and you're done.

If you've moved the main Spline Architect folder, you will get some errors. This is because the addon assumes the SplineArchitect folder is located in the Assets folder. You can easily fix this by moving the addon from Assets/SplineArchitect/Addons/YourAddon to Assets/YourPath/SplineArchitect/Addons/YourAddon.

## Updating

> ⚠️ If you get errors after updating an addon, remember to also check for updates to the base Spline Architect package.

To update, open Unity and go to Window → Package Manager → My Assets, then update the related package.

## Terrain Tools

The terrain tools addon has 3 main features.

- Deform terrain.
- Paint terrain.

- Instantiate objects along a spline.

Terrain deformation and object instantiation has an indestructible work flow. Meaning you can always revert back to how it was before.

You can easily create whole worlds by creating mountains, rivers and path in this indestructible workflow. You do that by combining different noise layers and applying that to your terrain deformation, terrain painting and object instantiation.

## Menus

When you install the Terrain tools addon you will get access to 3 sub menus for the spline.

## Terrain deformation
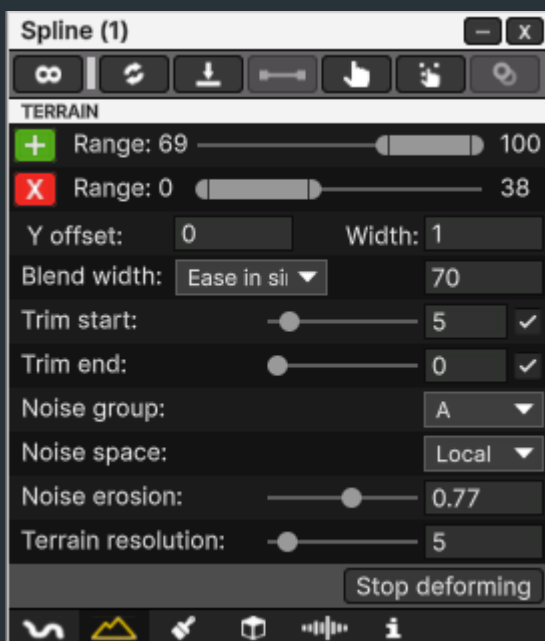


You start deforming the terrain by pressing the "Start deforming" button inside the spline menu, now the terrain will update when you do any changes to the spline. To stop deform, press the same button again.

If you deform a mountain along with different paths on it, you can parent the splines that deform the paths to the spline that deforms the mountain. By doing this, all the paths will update correctly whenever the mountain is moved or changed.

> **!** Deforming terrain at the bottom can cause unwanted deformation build-up. When creating a new terrain, you will be prompted with a window that helps fix this issue. You can also fix it manually by increasing the height of the entire terrain by around 100 meters.

- **Range** | The range of the spline that should deform the terrain. You can have up to 8 range values on the same spline.
- **Width** | Width for the terrain deformation.
- **Blend width** | Determines the horizontal extent of terrain deformation, defining the transition area where the terrain shifts from its original to its deformed state. You can also change its curvature by setting different easings.
- **Trim start** | Trims the size of the start of the terrain deformation.
- **Trim end** | Trims the size of the end of the terrain deformation.
- **Height offset** | Extra height added between the spline and terrain (can be negative).
- **Noise group** | The noise group you want to be applied to the terrain deformation.
- **Noise space** | What space the noise should originate from.
- **Noise erosion** | Warps the noise in an erosion-like way, either to the right (positive values) or to the left (negative values). This is not a true erosion simulation, but it can produce visually similar results with virtually none of the performance cost of a real calculation.
- **Terrain resolution** | Increase the quality of terrain deformations. Try increasing this value if you get unwanted behaviours when deforming terrain.

## Terrain deformation effects



Selecting control points give you access to the menu above, where you can apply different behaviours for each control point on how you want to deform the terrain.

## Terrain data

Spline Architect generates binary files during terrain deformation. These files store terrain data, allowing you to work with a non-destructive workflow. If you delete this data, you may experience unwanted terrain build-up. These binary files are located inside the 'SplineArchitect-YourSceneName' folder. This folder will automatically be created when necessary.
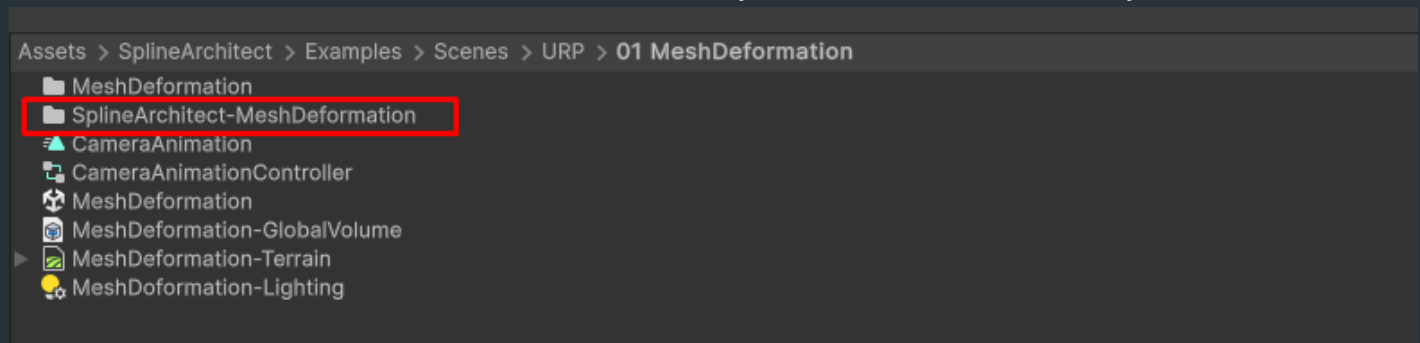


> ❗ If you rename your scene file you need to rename the SplineArchitect data folder to 'SplineArchitect-YourNewSceneName'.

## Terrain painting

You can have up to 16 paint layers for each spline. The order of each layer matters where the layer 1 will be painted first, 2 will be painted second and so on. You can order them by pressing any of the arrow keys on the specific layer. You need to have one or more layer palettes assigned to the terrain for creating layers.
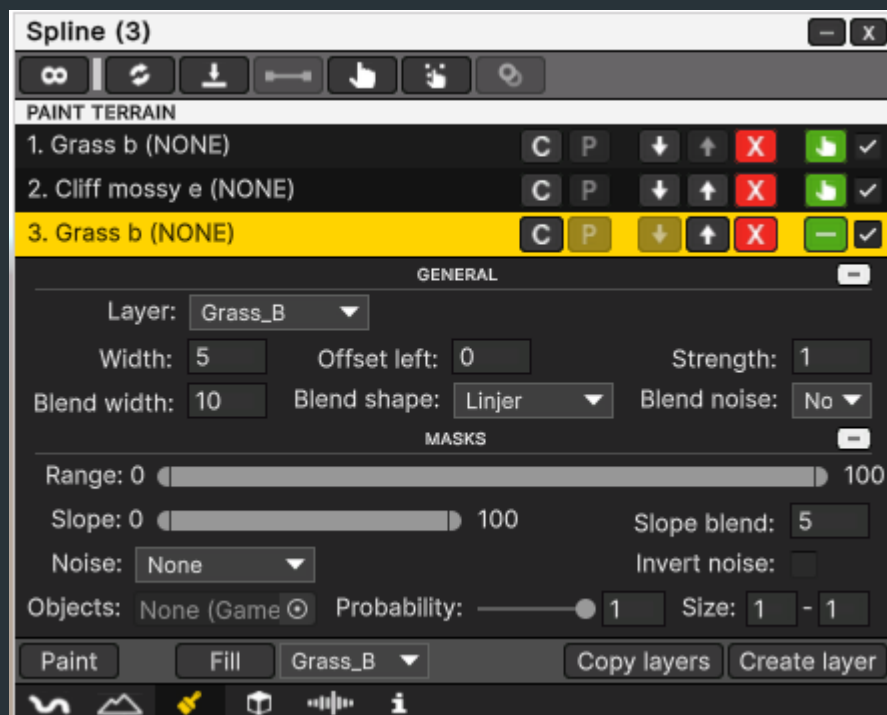
## General

- **Layer** | The terrain layer pallet you want to paint with.
- **Width** | The painted width that originates from the spline.
- **Offset left** | Offset the painting to the left or right by adding a negative or positive value (the offset is in Unity meters).
- **Strength** | The strength of the layer palette related to other palettes. The value can be above 1 and some times this is preferable.
- **Blend width** | The painted blend width that originates from the spline.
- **Blend shape** | Applies an easing function that modifies the shape of the blend width.
- **Blend noise** | Applies a noise pattern to the blend width, causing it to vary based on the noise value.

## Masks

- **Range** | The range of the spline that should be painted.
- **Slope** | Will only paint within this slope value.
- **Slope blend** | How strong the blending of the slope painting will be.
- **Noise** | Applies a noise mask.
- **Invert noise** | Inverts the noise mask.
- **Objects** | Assign a GameObject to this field. All of its child objects will act as a mask, restricting painting to their positions.
- **Probability** | The likelihood that a mask object's position will be used.
- **Size** | Random size for all object masks. The final size also scales with the original object's transform.
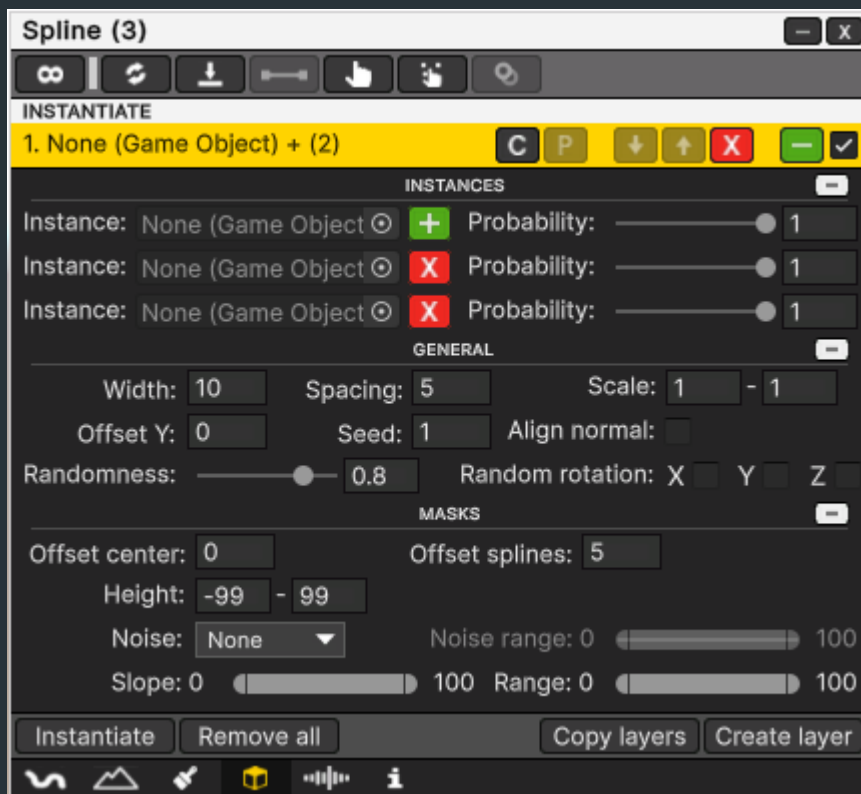
## Terrain painting effects



Selecting control points give you access to the menu above, where you can apply different behaviours for each control point on how you want to paint the terrain.

# Object instantiation

You can have up to 16 instantiate layers for each spline. The order of each layer does not matter. But you can change order if you want.



## Instances

- **Instance** | Drag a prefab or any GameObject in the hierarchy you want to instantiate. You can create up to 16 instance fields in each layer.
- **Probability** | The probability setting for each instance field. 1 is the highest, if you set it to 0 it will never be instantiated.

## General

- **Width** | The width of the instantiate are. Originates from the spline.
- **Spacing** | The spacing between each instance.
- **Scale** | Random scale for instances.
- **Offset Y** | Offsets all instances in the Y axel, can be negative.
- **Seed** | A number that controls all randomness. Using the same seed will always generate the same result. Changing the seed produces a different random arrangement.
- **Align normals** | Will align the instance transform with the terrain or whatever the GameObjecet should be instantiated on.
- **Randomness** | The randomness factor.
- **Random rotation** | Random rotation for specific axels.

**Masks**

- **Offset from center** | Skip instancing in a set distance from the center of the spline. Can be useful if you want to deform a path in the terrain, but only want to instantiate trees (for example) on the side of the path.
- **Offset from splines** | Of close instances can be other other splines (not the one your instancing from) in the scene.
- **Height** | The height range instances can spawn within. Originates form the spline.
- **Noise** | The noise group you want to use for all instances.
- **Noise range** | The range of the noise value where instances can spawn.
- **Slope** | What slope value instances can be spawned on. Having for example 0 to 20, will only spawn instances on nearly flat to flat ground.
- **Range** | The range of the spline, instances can be spawned from.

**Object instantiation effects**



Selecting control points give you access to the menu above, where you can apply different behaviours for each control point on how you want to instantiate objects along the spline.

# Object Cloning

The Object Cloning menu can be accessed from a selected SplineObject, and the SplineObject must be of type "Deformation".

You can clone any deformation or follower, either to the end of the spline or by specifying a fixed number of clones. You can also clone a sequence of deformations and/or followers. When not cloning a specific amount, the cloning continues to the end of the spline, and the number of clones will automatically update.

If you enable the "Snap End" feature, the last clone will snap to the end of the spline and completely fill it, as long as the first deformation is aligned with the start of the spline.

To clone, start by creating an empty GameObject and parent it to a spline. Then parent any followers or deformations to this empty GameObject. Next, open the Object Cloning submenu for the empty GameObject and press "Clone Children".