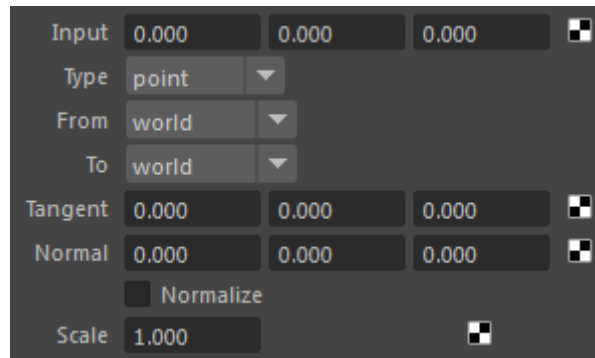


# Space Transform



Convert the *Input* coordinates from one space to another:

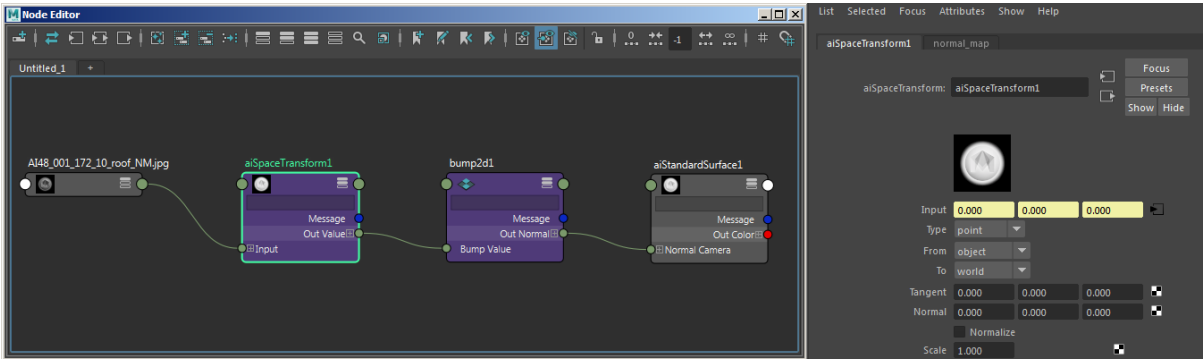
- **World:** Absolute world coordinates.
- **Object:** Local coordinates.
- **Camera:** Defined such that +x is right, +y is up and looks down -z.
- **Screen:** Defined such that +x is right, +y is up and looks down +z.
- **Tangent:** Defined by a tangent reference frame that is built based on the input *Tangent* vector and the shading normal. If *Tangent* is 0, the shader attempts the following actions to build the frame:
  1. Look for vector user data named "tangent" and "bitangent".
  2. Use the UV derivatives.
  3. Build its own local frame.

*Input* is interpreted according to *Type* when transformed:

- **Point:** input is a position in space.
- **Vector:** input is a direction, the translation part of the transformation is left out.
- **Normal:** input is a normal, transformed by the inverse transpose of the transform to preserve its angle to the surface.

The input channels can be shuffled (*Order*) and inverted (*Invert X*, *Invert Y*, *Invert Z*). Also, they can be remapped to the [-1, 1] range, for instance when the input is an 8-bit map to be used as signed normal or vector displacement map.

The output vector is scaled by *Scale* and can be set as the shading normal (*Set Normal*).



**Space Transform** used to transform normal map space