

灯

灯光组件是 Qt 设计工作室场景中的主要光源。作为辅助光源，您可以使用[基于图像的照明](#)。

若要将轻型组件添加到 UI，请执行下列操作之一：

- 将光源组件从组件 > Qt 快速 3D 拖动到 3D 视图或“[导航器](#) > [View3D](#) > [场景](#)”。
- 在 3D 视图中单击鼠标右键，然后从上下文菜单中选择 [创建](#) > [光源](#)。

如果在“[组件](#)”中找不到光源组件，请按照添加[和删除](#)模块中的说明将 Qt Quick 3D 模块添加到项目中。

注意：如果在[创建项目](#)时选择 Qt 5 作为目标 Qt 版本，则可用的光源组件及其属性将略有不同。属性在“[属性](#)”视图中的位置也可能不同。

默认情况下，所有导入的场景都是使用一个定向光源创建的。您可以使用以下组件来添加光源：

图标	名字	仅限 Qt 5	更多信息
	定向光		光定向
	点光源		光点
	射灯		光斑
	区域灯	✓	光照区域

注意：每增加一个光线都会对场景的渲染性能产生负面影响。保持场景尽可能简单，并谨慎使用灯光。使用[场景环境](#)组件可以应用基于图像的光照，这些光照可以产生柔和而微妙的光照。

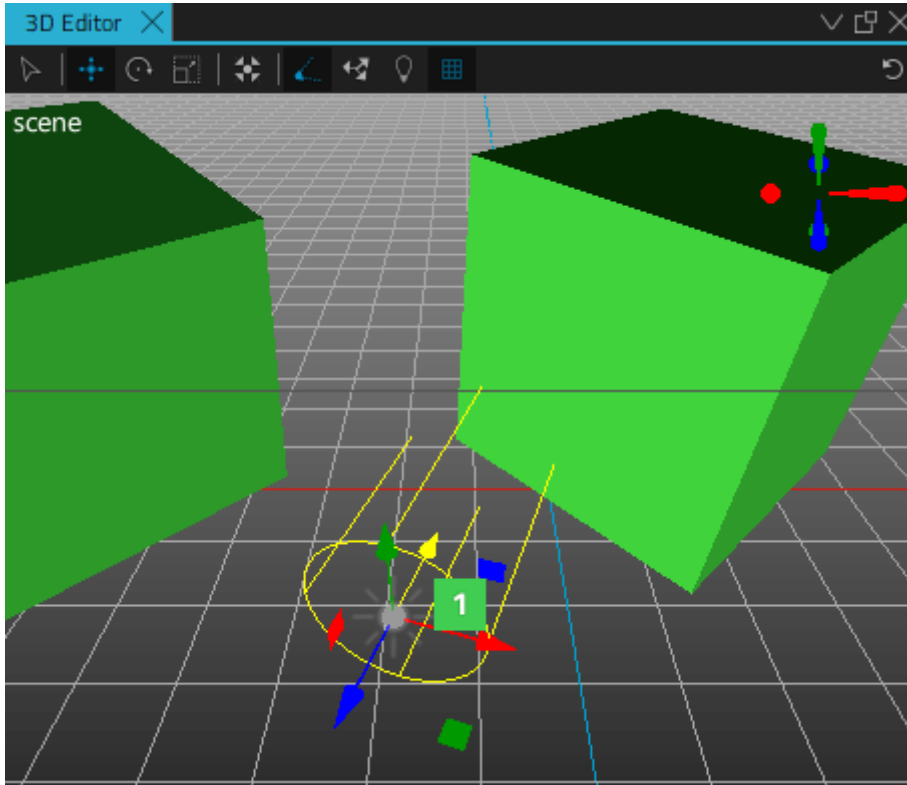
要编辑光源属性，请在“[导航器](#)”或 3D 视图中选择光源组件，然后在“[属性](#)”视图中或通过在 3D 视图中拖动黄色灯光小控件手柄来调整其属性。

若要为灯光组件的效果指定总体乘数，请调整“[亮度](#)”属性。[Scope](#) 属性指定光源照亮哪个组件及其子组件。设置 [Color](#) 属性以指定应用于光源照亮的模型的颜色。设置“[环境色](#)”属性以指定在被灯光照亮之前应用于材质的环境色。

定向光

定向光从无限远的无法识别的光源向一个方向发射光。这类似于阳光。

使用灯光小控件（1）的“亮度”手柄调整任何灯光组件的“亮度”属性。



如果启用了“**投射阴影**”属性，则阴影将平行于光源方向放置。定向光具有无限的范围并且不会减少。

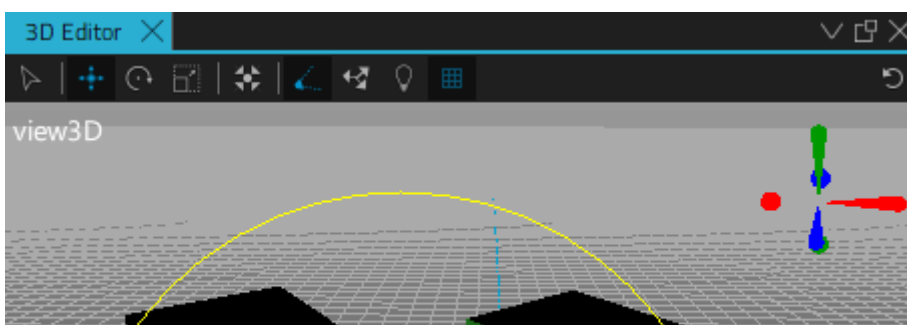
移动定向光没有任何效果。光将始终沿光的 z 轴方向发射。沿其 x 或 y 轴旋转光将改变光的发射方向。

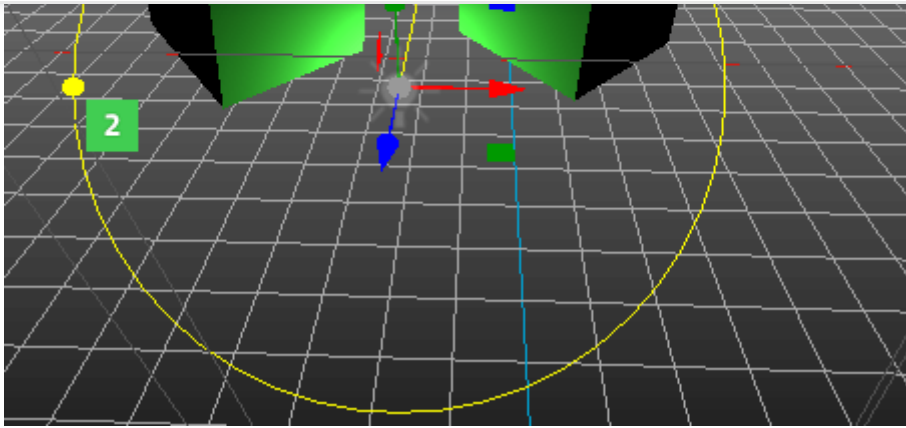
缩放定向光源仅在以下情况下有效：

- › 如果 z 刻度设置为负数，则光将沿相反方向发射。
- › If the scale of any axis is set to 0, the light will be emitted along the world's z axis. Rotating the light has no effect.

Point Light

A point light can be described as a sphere that emits light with equal strength in all directions from the center of the light. This is similar to the way a light bulb emits light.





Lighting is applied outwards from the center of a point light, becoming increasingly dim away from the center. Moving a point light changes the position from where the light is emitted. Rotating or scaling a point light does not have any effect.

To control the fade-off and range of a point light, set the **Constant fade**, **Linear fade**, and **Quadratic fade** properties. Constant fade is the constant factor of the *attenuation* term of the light. Attenuation refers to the reduction in the intensity of light as it travels through a medium due to absorption or scattering of photons.

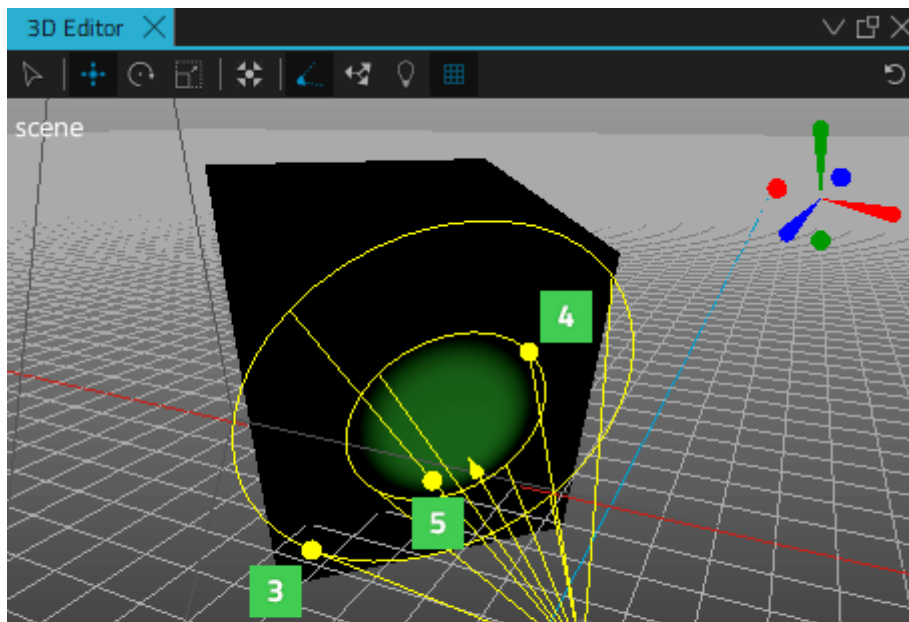
Turn up the linear fade value to increase the rate at which the lighting effect dims the light in proportion to the distance to the light. The value 0.0 means that the light doesn't have linear fade.

Turn up the quadratic fade to increase the rate at which the lighting effect dims on surfaces that are far away from the light. The value 1.0 means that the point light fade exactly follows the inverse square law. For example, when the distance to a component doubles, the light intensity decreases to one fourth. Adjust the **Quadratic fade** in the Properties view, or by using the light gizmo handle (2).

Aside from fade, a point light has the same properties as a directional light.

Spot Light

A spot light emits light towards one direction in a cone shape. The light intensity diminishes when approaching the value of the **Cone angle** property. The angle at which the light intensity starts to diminish is defined by the **Inner cone angle** property. Both angles are defined in degrees in the **Properties** view. Use the Properties view or the light gizmo handles to adjust the **Cone angle** (3), **Inner cone angle** (4), and **Quadratic fade** (5) properties.



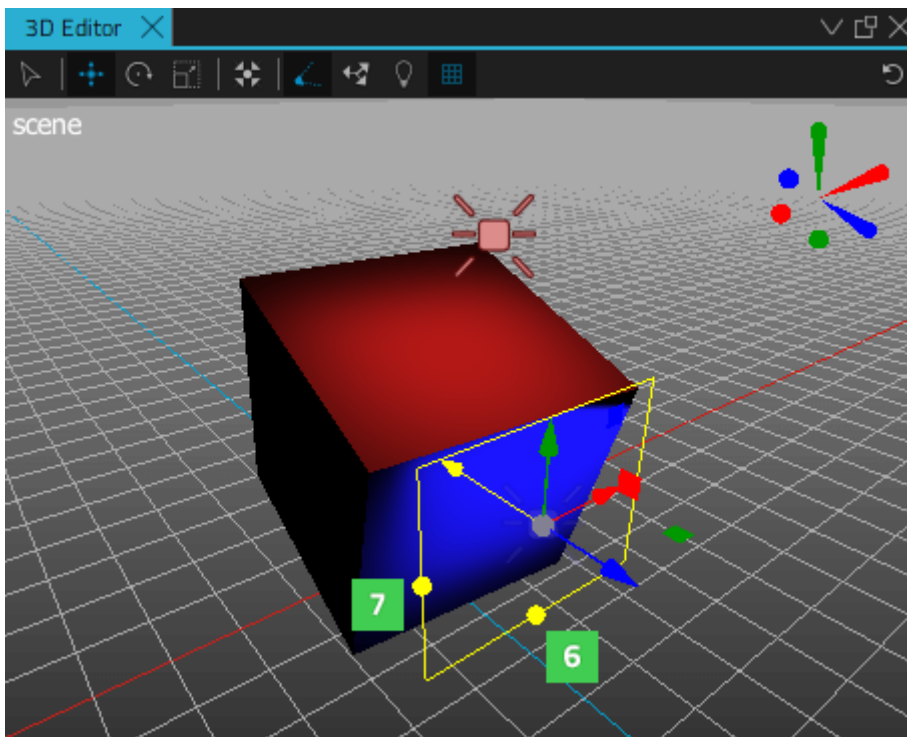


Inside the inner cone angle, the spot light behaves similarly to the point light. There the light intensity diminishes according to inverse-square-law. However, the fade-off (and range) can be controlled with the **Constant fade**, **Linear fade**, and **Quadratic fade** properties.

Area Light

Note: The **Area Light** component is only available in Qt 5.

An area light is similar to the directional light. However, instead of emitting an equally bright light across the whole scene, the area light emits directional light from a rectangle shaped component. Use the light gizmo or the **Properties** view to set the **Width** (6) and **Height** (7) properties to determine the size of the area light.



Aside from the size, an area light has the same properties as a directional light.

The image below shows an example on how to light a component with different colors using two different area lights.

You can rotate, scale, and move area lights.

Shadows

To simulate shadows using this light, enable the **Cast shadows** check box. Cast shadows work best with area or point lights.

To specify the darkness of the shadows, set the **Shadow factor** property. The value 0 means no shadows are cast.

To specify the amount of blur applied to the shadows, set the **Shadow filter** property.

To specify the quality of the shadow map created for shadow rendering, set the **Shadow map quality** property. Lower quality uses less resources, but produces lower quality shadows, while higher quality uses more resources to produce better quality shadows.

To specify the maximum distance for the shadow map, set the **Shadow map far** property value. Using smaller values may improve the precision and effects of the map.

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