Qt **DOCUMENTATION**

Qt 设计工作室手册 3.7.0

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Qt设计工作室手册 ❭ .3D

.3D

编辑 3D 场景时，您可以在 **3D** 视图中查看场景。您可以通过在*透视相机*和*正交相机*模式之间切换来更改视图的投影。使用透视相机模式时，远离相机的组件看起来比附近的组件小。在正交相机模式下，无论它们与相机的距离如何，所有组件都以相同的比例显示。它们都是自由格式的相机模式，可用于绕场景运行。

从从 3D 图形工具导出的文件导入 3D 场景时，还会导入场景照相机、光源、模型和材质。如果您的场景不包含它们，则可以从**组件**>添加相应的 Qt 快速 3D 组件 ✛ > **Qt 快速 3D** > **Qt 快速 3D** 组件。

您可以使用工具栏按钮来变换 3D 组件并操作 3D 场景。变换是指元件的移动、旋转或缩放。组件的*透视点*用作转换的原点。您可以在"**属性**"中为组件设置局部透视点偏移量，以围绕组件的本地原点以外的点转换组件。在 **3D** 视图中绘制一条从枢轴点到组件中心的线，以提供它们之间的可视连接。特别是在处理复杂场景时，使用 Navigator 中的显示和隐藏或锁定功能可能会很有用，这样可以避免在编辑场景时错误地变换组件。
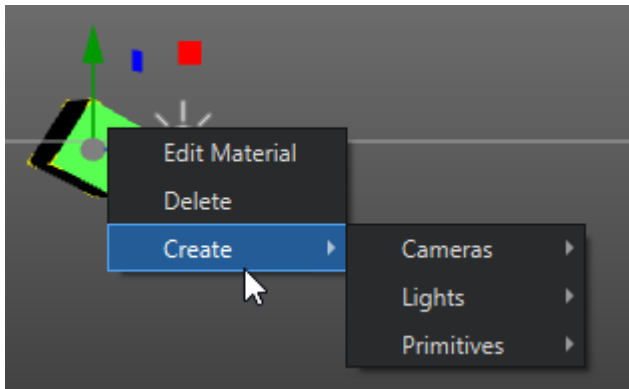
在局部方向和全局方向之间切换，以确定小控件是仅影响组件的局部变换，还是相对于全局空间进行变换。
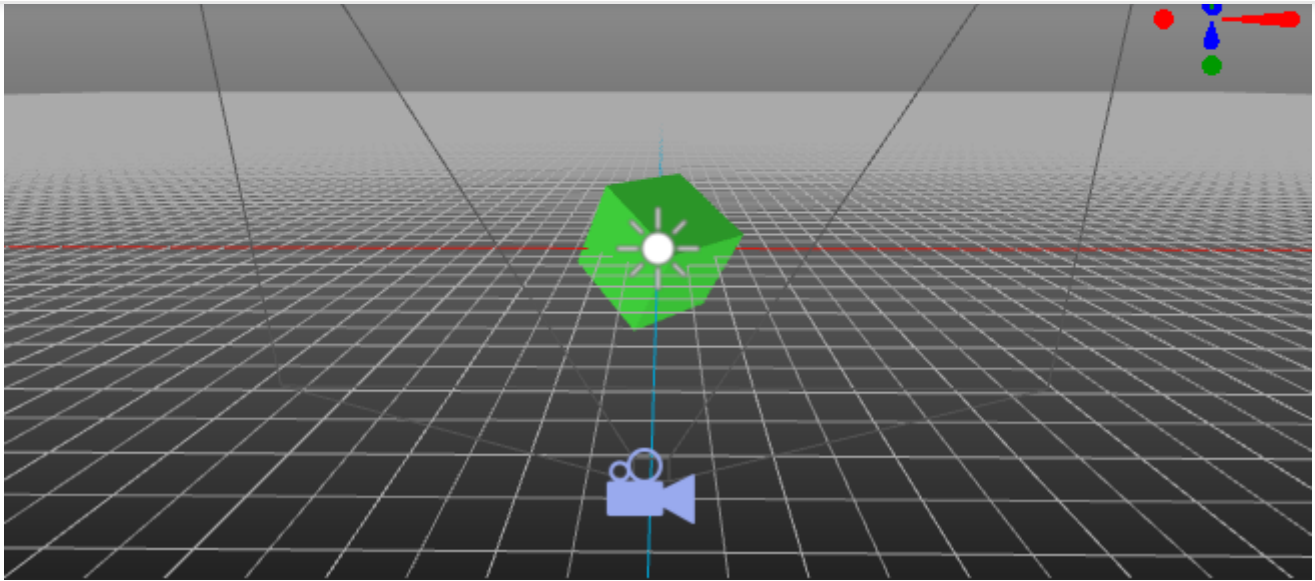
编辑 3D 场景时的另一个有用功能是*编辑光源*，这是一种快速照亮场景的方法。

此外，您还可以切换 3D 场景中网格、选择框、图标小控件和照相机视锥体的可见性。

3D 视图中有一个上下文菜单。要打开它，请在 **3D** 视图中单击鼠标右键。从上下文菜单中，您可以：

❭ 创建摄像机、光源和模型。

❭ 打开**材质编辑器**并编辑材质。

❭ 删除组件

要刷新 **3D** 视图的内容，请按 P 或选择 ↺ （**重置视图**）按钮。

3D Editor - Qt Design Studio

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以下视频演示了在 **3D** 视图中导航和使用工具栏：

Controlling the 3D View Camera

To switch to perspective camera mode, select ✎ (**Toggle Perspective/Orthographic Edit Camera**). To switch to orthographic camera mode, select ✎ . You can also Toggle the camera mode by using the keyboard shortcut **T**.

You can navigate the scene by panning, rotating, and zooming the 3D view camera:

› To pan, press **Alt** (or **Option** on macOS) and use the middle mouse button to click and drag anywhere in the rendered view to slide the view around.

Note: It is not possible to pan using Magic Mouse.

› To orbit, press **Alt** and click and drag anywhere in the rendered view to rotate the view.

› To zoom, use the mouse wheel or press **Alt** and right-click anywhere in the rendered view to zoom the view in or out as you drag up or down.

To zoom and focus the 3D view camera on a selected component, select ✥ (**Fit Selected**) or press **F**.

camera at the opposite direction of the axis. If no component is selected, the camera is pointed at the world origin. This does not affect the camera zoom level.
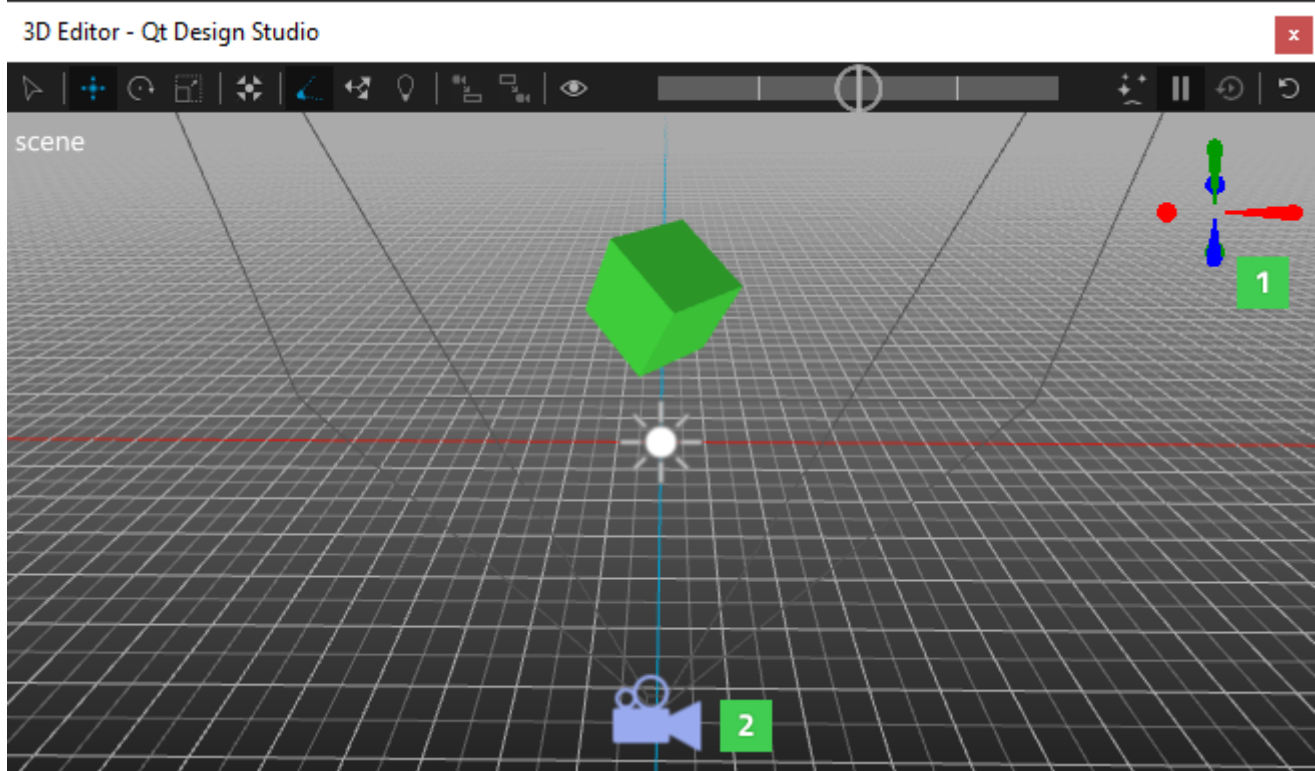
You can use scene cameras (2) to view the **View3D** component from a specific angle in the 2D view while editing scenes. Different types of cameras are available in **Components** > **Qt Quick 3D** > **Qt Quick 3D**. For more information about using cameras in the scene, the available camera types, and their properties, see Cameras.

Using Global and Local Orientation

To switch between local and global orientation, select ⬨ or ⬨ (**Toggle Local/Global Orientation**) or press **Y**.

In global orientation mode, transformation of a selected component is presented with respect to the global space. For example, while the move tool is selected, selecting a cube will show its move gizmo aligned with the axes of global space. Dragging on the red arrow of the gizmo moves the component in the global x direction.

In local orientation mode, the position of a selected component is shown according to local axes specific to the selected component. For example, selecting a rotated cube will show its axes rotated, and not aligned with the axes of global space. Dragging on the red arrow of the gizmo moves the component in the local x direction in relation to the component.

Using Edit Light

The edit light is an extra point light that can be used to illuminate the scene. To toggle the edit light on and off, select 🔦 or 💡 (**Toggle Edit Light**) or press **U**.

For more information about the available scene light types and their properties, see Lights.
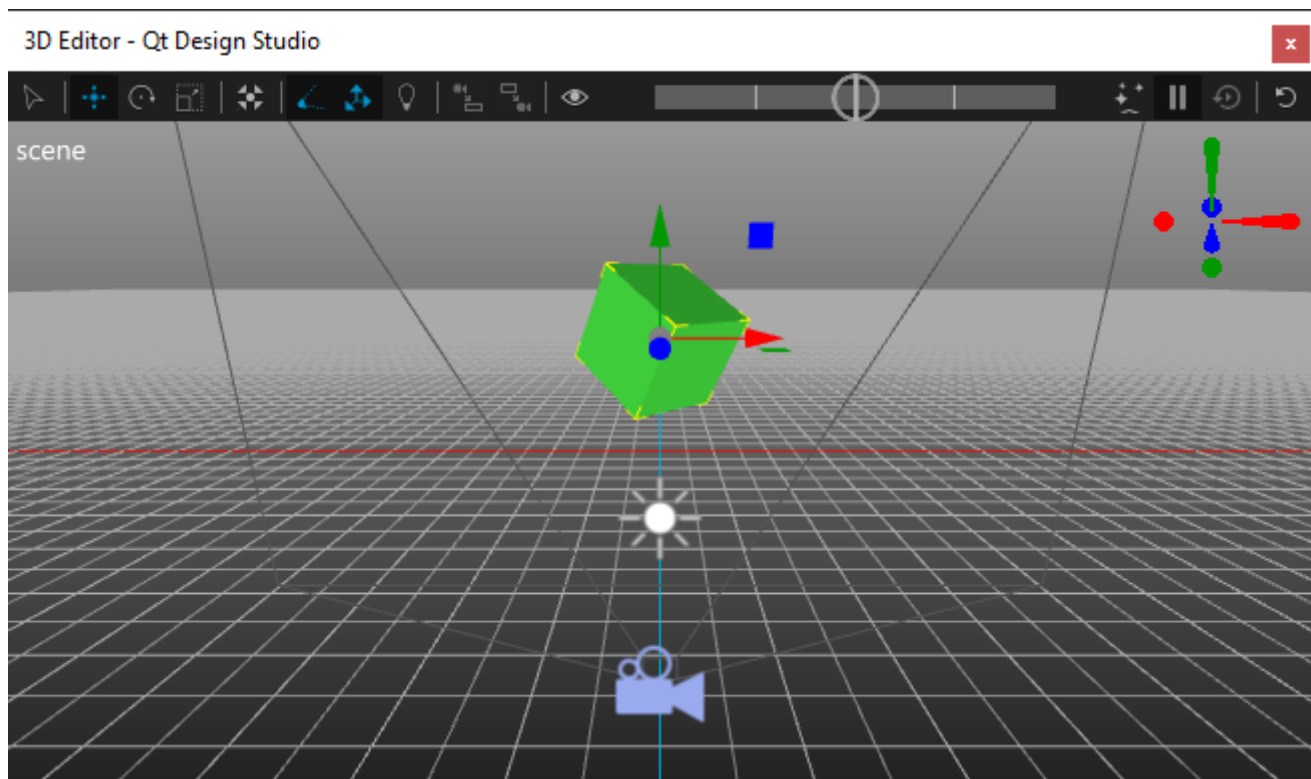
Selecting Components

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> In the ▷ (**Single Selection**) mode, a single component is selected.

> In the ▶ (**Group Selection**) mode, the top level parent of the component is selected. This enables you to move, rotate, or scale a group of components.

To toggle the selection mode, press **Q**.

To multiselect, hold **Ctrl** and click the components you wish to select.

After selecting a component, you can apply the usual keyboard shortcuts applicable to your operating system, for example, **Ctrl+C** and **Ctrl+V** on Windows to copy-paste components.

Moving Components

You can move components in relation to their coordinate system, along the x, y, or z axis or on the top, bottom, left, and right clip planes of the the **3D** view.

To move components, select ✛ or press **W**:

> To move components along the axes of the move gizmo, click the axis, and drag the component along the axis.

> To move components on a plane, click the plane handle and drag the component on the plane.

> To move an component freely in the 3D view, click and drag the gray handle at the center of the move gizmo.
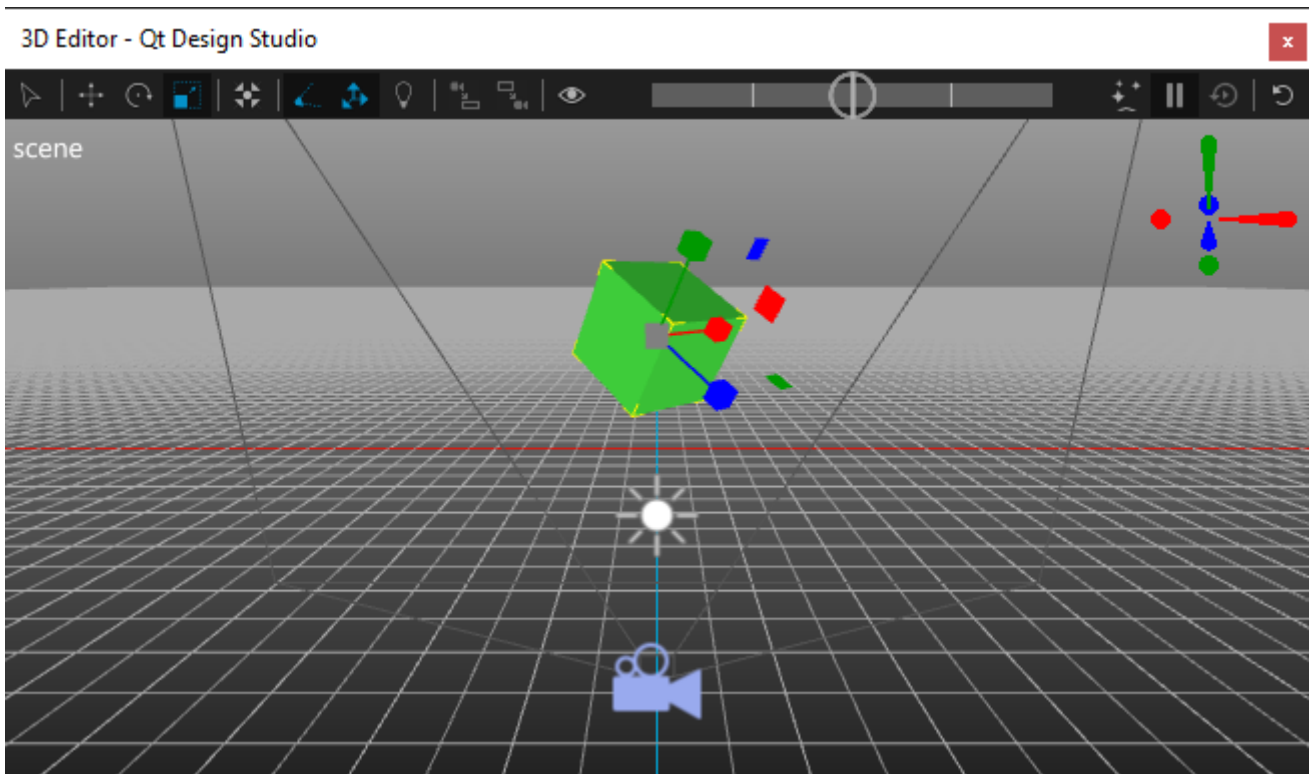
Rotating Components
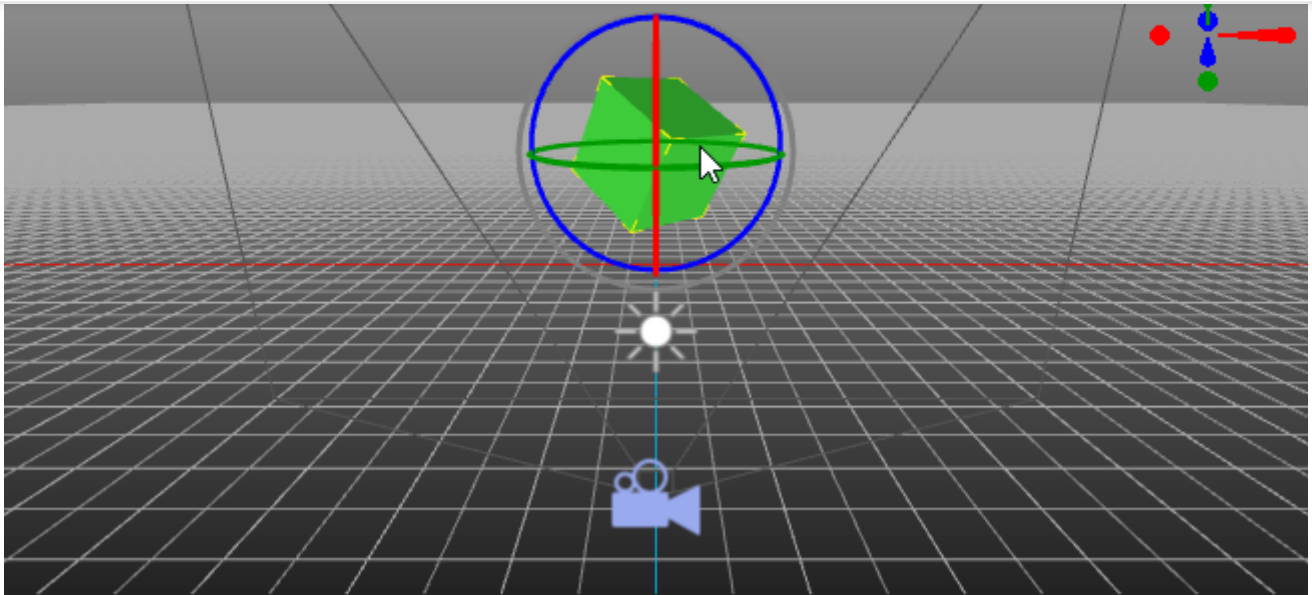
To rotate components, select ⟳ or press **E**:

› To rotate a component around its rotation gizmo, click the axis ring and drag in the direction you want to rotate the component in.

› To freely rotate the component, click and drag the inner center circle of the gizmo.

Scaling Components

You can use the scale handles to adjust the local x, y, or z scale of a component. You can adjust the scale across one, two, or three axes, depending on the handle.

To scale components, select ▣ or press **R**:

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> To uniformly scale a component across all axes, click and drag the gray handle at the center of the component.

Aligning Views and Cameras

To align a camera to the **3D** view:

1. Select a camera in the **3D** or **Navigator** view.

2. In the **3D** view, select ⬚.

This moves and rotates the camera so that the camera shows the same view as the current view in the **3D** view.

To align the the **3D** view to a camera:

1. Select a camera in the **3D** view or **Navigator**.

2. In the **3D** view, select ⬚.

This copies the position as well as x and y rotation values from the camera and applies them to the **3D** view.

Toggling Visibility

To toggle the visibility of objects in the **3D** view, select 👁 in the toolbar. This opens a menu with the following options:

Show Grid	Toggles the visibility of the helper grid.
Show Selection Boxes	Toggles the visibility of selection boxes for selected 3D objects.
Show Icon Gizmos	Toggles the visibility of icon gizmos for object such as cameras, lights, and particle systems.
Always Show Camera Frustums	Toggles between always showing the camera frustum and showing it only for cameras selected in the **3D** view.
Always Show Particle Emitters and Attractors	Toggle between always showing the particle emitter and attractor visualizations and only showing them when the emitter or attractor is selected in the **3D** view.

Changing Colors

To change the **3D** view background or grid color, select ⚙ in the toolbar. This opens a menu with the following options:

Select Background Color	Select a color for the background.
Select Grid Color	Select a color for the grid.
Use Scene Environment Color	Sets the 3D view to use the scene environment color as background color.
Reset Colors	Resets the background and grid colors to the default colors.

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The particle editor tools help you preview your particle systems in the **3D** view. You can select one particle system to preview at a time.

To preview a particle system in the **3D** view:

1. Select a particle system in the **Navigator** or **3D** view.

2. In the **3D** view, select ⚅ to activate particle animation. Now you can see the particle animation in the **3D** view.

You can pause the particle animation by selecting ⚅ . When the animation is paused, you can use ▬▬▬◆▬▬ to manually seek forward or backward in the particle animation.

Summary of the 3D View Toolbar Buttons

The **3D** view toolbar contains the following buttons:

Button	Tooltip	Keyboard Shortcut	Read More
▶ ▷	Toggle Group/Single Selection Mode	Q	Selecting Components
✛ ✛	Activate the Move Tool	W	Moving Components
↻ ↻	Activate Rotate Tool	E	Rotating Components
⬚ ◨	Activate Scale Tool	R	Scaling Components
✥	Fit Selected Object to View	F	Controlling the 3D View Camera
✎ ✎	Toggle Perspective/Orthographic Edit Camera	T	Controlling the 3D View Camera
⤧ ⤧	Toggle Global/Local Orientation	Y	Using Global and Local Orientation
♀ ♀	Toggle Edit Light On/Off	U	Using Edit Light
⬚	Align Selected Cameras to View		Aligning Views and Cameras
⬚	Align View to Selected Camera		Aligning Views and Cameras
👁	Visibility Toggles		Toggling Visibility
⚙	Background Color Actions		Changing Colors
▬▬◆▬▬	Seek Particle System Time		Particle Editor
⚅🎇	Toggle Particle Animation	V	Particle Editor
▶ ⏸	Play/Pause Particles	,	Particle Editor
⟲	Restart Particles	/	Particle Editor
↺	Reset View	P	

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