

# EB GUIDE tutorial

Working with a 3D graphic

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# 1. Tutorial: Working with a 3D graphic

## TIP



### Default window layout

All instructions and screenshots use the default window layout. If you want to follow the instructions, we recommend to set the EB GUIDE Studio or EB GUIDE Monitor window to default layout by selecting **Layout > Reset to default layout**.

EB GUIDE Studio offers the possibility to use 3D graphics in your EB GUIDE model.

The following instructions guide you through the process of adding a 3D graphic to your EB GUIDE model. The instructions show you how to import a 3D graphic and how to modify the appearance of the imported 3D graphic using widget features. For best results, work through the following steps in order presented.

## NOTE



### 3D graphic

To create a 3D graphic file, use third-party 3D modeling software.

Only the renderers for OpenGL ES 2.0 or higher can display 3D graphics. Make sure that your graphics driver is compatible to the version of the renderer. The supported 3D graphic formats are COLLADA (.dae) and Filmbox (.fbx). For best results, use the Filmbox format.

To be able to apply textures to a mesh, a 3D object needs to have texture coordinates. To add texture coordinates, use third-party 3D modeling software.

Approximate duration: 15 minutes.



## Importing a 3D graphic

The following instructions guide you through the process of importing a 3D graphic file to an EB GUIDE project.

Prerequisite:

- The content area displays the **Main** state machine.
- The **Main** state machine contains an Initial state and a View state.
- The Initial state has a transition to the View state.
- A 3D graphic file is available. The file contains a camera, a light source, and one object containing a mesh and at least one material.

### Step 1

In the content area, double-click the View state.

The View is displayed in the content area.

#### Step 2

Drag a Scene graph from the **Toolbox** into the View.

The View displays the empty bounding box.

#### Step 3

Rename the Scene graph to `My3DGraphic`.

#### Step 4

In the **Properties** component, click **Import file**.

A dialog opens.

#### Step 5

Navigate to the folder where the 3D graphic file is stored.

#### Step 6

Select the 3D graphic file.

#### Step 7

Click **Open**.

The import starts.

The **Import successful** or **Import with warnings** dialog is displayed. Here you can check the import log file.

#### Step 8

Click **OK**.

The View displays the 3D graphic. The **Navigation** component displays the imported widget tree with the Scene graph as a parent node. `My3DGraphic` contains a `RootNode` that has at least one Mesh with Material, camera and several other child widgets depending on the content of your 3D graphic file.



### Adding widgets

The following instructions guide you through the process of adding an additional light source to your 3D graphic.

Prerequisite:

- You completed the previous instruction.

#### Step 1

In the **Navigation** component, expand `RootNode`.

#### Step 2

Drag a Directional light from the **Toolbox** to `RootNode`.

You added a Directional light to `My3DGraphic`. You can manipulate and transform this Directional light with the transformation properties of the `RootNode`.

### Step 3

To add the light source and place it with default widget properties different from the `RootNode` Scene graph, do the following:

#### Step 3.1

Drag a Scene graph node from the **Toolbox** to `RootNode`.

#### Step 3.2

Rename the Scene graph node to `MyLight`.

#### Step 3.3

Drag a Directional light from the **Toolbox** to `MyLight`.

You added a Directional light to `My3DGraphic`. To change the placing of the Directional light, change the properties of `MyLight`.



## Changing meshes

Prerequisite:

- You completed the previous instruction.
- The `$GUIDE_PROJECT_PATH/<project name>/resources/<3D graphic name>` folder contains an additional `.ebmesh` file.

### Step 1

In the **Navigation** component, click `Mesh 1`, and go to the **Properties** component.

### Step 2

From the `mesh` combo box select the `.ebmesh` file from the resource folder mentioned above.

The view displays the Scene graph with the new mesh.

### Step 3

Alternatively, drag an `.ebmesh` file from the **Assets** component into the `mesh` drop-down list box.

The View displays the Scene graph with the new Mesh.



## Changing textures

The following instructions guide you through the process of adding and modifying textures of your 3D graphic.

Prerequisite:

- You completed the previous instruction.

- The `$GUIDE_PROJECT_PATH/<project name>/resources/<3D graphic name>` folder contains a `.png` or `.jpg` image file.

#### Step 1

In the **Navigation** component, click the Material, and go to the **Properties** component.

#### Step 2

In the **Widget feature properties** category, click **Add/Remove**.

The **Widget features** dialog is displayed.

#### Step 3

Under **Available widget features**, expand the **3D** category, and select a texture widget feature, for example **Diffuse texture**.

#### Step 4

Click **Accept**.

The related widget feature properties are added to the Material and displayed in the **Properties** component.

#### Step 5

In the **Properties** component, select an image from the `diffuseTexture` combo box.

The view displays a scene graph with the new texture.

#### NOTE



#### Usage of 3D widget features

These instructions are valid for the following widget features from the category **3D**:

- ▶ **Ambient texture**
- ▶ **Diffuse texture**
- ▶ **Base color texture**
- ▶ **Emissive texture**
- ▶ **Light map texture**
- ▶ **Normal map texture**
- ▶ **Opaque texture**
- ▶ **Reflection texture**
- ▶ **Specular texture**
- ▶ **Reflectance texture**



Displaying 3D object several times

The following instructions guide you through the process of adding an additional camera to be able to display the 3D object of your 3D graphic several times. You will be able to have different points of view of the same object.

Prerequisite:

- You completed the previous instruction.

#### Step 1

In the **Navigation** component, click `My3DGraphic` and go to the **Properties** component.

#### Step 2

Enter 800 in the `width` text box and 480 in the `height` text box.

The `My3DGraphic` Scene graph has the size of the view.

#### Step 3

In the **Navigation** component, expand `RootNode` and `Camera001`.

#### Step 4

Click `Camera 1` and go to the **Properties** component.

#### Step 5

In the **Widget feature properties** category, click **Add/Remove**.

The **Widget features** dialog is displayed.

#### Step 6

Under **Available widget features**, expand the **3D** category, and select **Camera viewport**.

#### Step 7

Click **Accept**.

The related widget feature properties are added to `Camera 1` and displayed in the **Properties** component.

#### Step 8

Drag a Camera from the **Toolbox** to the Scene graph node `Camera001`.

You added a second camera.

#### Step 9

Click `Camera 2` and go to the **Properties** component.

#### Step 10

In the `nearPlane`, `farPlane` and `fieldOfView` text boxes enter the same values that `Camera 1` has.

Both `Camera 1` and `Camera 2` have the same viewing position.

#### Step 11

In the **Widget feature properties** category, click **Add/Remove**.

The **Widget features** dialog is displayed.

#### Step 12

Under **Available widget features**, expand the **3D** category, and select **Camera viewport**.

#### Step 13

Click **Accept**.

The related widget feature properties are added to `Camera 2` and displayed in the **Properties** component.

Step 14

In the **Properties** component, enter 100 in viewportX and viewportY text boxes.

In the View, the 3D object is displayed two times with different x-coordinate and y-coordinate.