MotionDesk

Scene Creation

For MotionDesk 4.8

Release 2021-A – May 2021

dSPACE

How to Contact dSPACE

Mail:	dSPACE GmbH Rathenaustraße 26 33102 Paderborn Germany
Tel.:	+49 5251 1638-0
Fax:	+49 5251 16198-0
E-mail:	info@dspace.de
Web:	http://www.dspace.com

How to Contact dSPACE Support

If you encounter a problem when using dSPACE products, contact your local dSPACE representative:

- Local dSPACE companies and distributors: http://www.dspace.com/go/locations
- For countries not listed, contact dSPACE GmbH in Paderborn, Germany.
  Tel.: +49 5251 1638-941 or e-mail: support@dspace.de

You can also use the support request form: http://www.dspace.com/go/supportrequest. If you are logged on to mydSPACE, you are automatically identified and do not need to add your contact details manually.

If possible, always provide the relevant dSPACE License ID or the serial number of the CmContainer in your support request.

Software Updates and Patches

dSPACE strongly recommends that you download and install the most recent patches for your current dSPACE installation. Visit http://www.dspace.com/go/patches for software updates and patches.

Important Notice

Contents

About This Document

Contents

This document introduces you to the creation of the scene in MotionDesk. It describes how to built a virtual world using 3-D objects for the animation.

It also describes how to synchronize the scene with a road and its scenery modeled in ModelDesk.

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a hazard that, if not avoided, could result in property damage.
Note	Indicates important information that you should take into account to avoid malfunctions.
Tip	Indicates tips that can make your work easier.
	Indicates a link that refers to a definition in the glossary, which you can find at the end of the document unless stated otherwise.
	Precedes the document title in a link that refers to another document.

Naming conventions

dSPACE user documentation uses the following naming conventions:

%name% Names enclosed in percent signs refer to environment variables for file and path names.

< > Angle brackets contain wildcard characters or placeholders for variable file and path names, etc.

Special folders

Common Program Data folder A standard folder for application-specific configuration data that is used by all users.

`%PROGRAMDATA%\dSPACE\<InstallationGUID>\<ProductName>`

or

`%PROGRAMDATA%\dSPACE\<ProductName>\<VersionNumber>`

Documents folder A standard folder for user-specific documents.

`%USERPROFILE%\Documents\dSPACE\<ProductName>\<VersionNumber>`

Local Program Data folder A standard folder for application-specific configuration data that is used by the current, non-roaming user.

`%USERPROFILE%\AppData\Local\dSPACE\<InstallationGUID>\<ProductName>`

Accessing dSPACE Help and PDF Files

After you install and decrypt dSPACE software, the documentation for the installed products is available in dSPACE Help and as PDF files.

dSPACE Help (local) You can open your local installation of dSPACE Help:

- On its home page via Windows Start Menu
- On specific content using context-sensitive help via **F1**

dSPACE Help (Web) You can access the Web version of dSPACE Help at www.dspace.com/go/help.

To access the Web version, you must have a *mydSPACE* account.

PDF files You can access PDF files via the  icon in dSPACE Help. The PDF opens on the first page.

Basics and Instructions

Where to go from here

Information in this section

Basics of the Scene Editing

Introduction

Provides an introduction to creating and editing MotionDesk scenes.

Where to go from here

Information in this section

Features of Scene Editing

Introduction

To create and edit a scene in the MotionDesk 3-D View, you can use the following features.

Features of Scene Editing

The following features are available to create and edit the scene in the 3-D View:

- Assembling a scene from static and movable 3-D objects, including vehicles, animated characters and scenery objects.
- Positioning, rotating and scaling 3-D objects in each direction using the mouse or by editing the property values.
- A dSPACE objects library containing objects for building a virtual world, for example, ground plates, sky horizons, houses, trees, buildings, and road objects.
- A custom objects library
- Managing the object library by building groups or using keywords
- Selecting a render mode for each object
- Hiding and showing objects in a scene
- Observing a scene from any view point including a bird's eye view

3-D Object Libraries

Introduction

The 3-D object libraries are the starting point for creating a scene. They contain the objects you can combine to create a virtual world.

MotionDesk supports two types of 3-D object libraries: dSPACE objects library and custom objects library.

dSPACE objects library

After installing MotionDesk, you have access to the standard dSPACE objects library. The library contains 3-D objects for visualization in the automotive and robotics fields. You can use these objects in your scene but you cannot modify their settings in the library.

The dSPACE 3-D object library includes a range of road, scenery, and vehicle objects that can be added to a MotionDesk scene. The vehicles include specific models of Mercedes, BMW, Volkswagen, and NCAP global vehicle targets (GVT). Lorries, trailers and roadside assistance and emergency service vehicles are also included. You can add the objects to the scene and assign a motion data stream from the simulation to the movable objects.

If you have the animated characters license, you can also use animated characters, for example, a person walking, running, or cycling. For more information, refer to Basics of Using Animated Characters in the Scene (MotionDesk Scene Animation 🕮).

Custom objects library

You can also use your own 3-D objects in a scene by importing them to the custom objects library.

Supported file formats You can import 3-D objects into the library to create scenes. The following file formats are supported:

- COLLADA (*.dae): Used for 3-D objects since MotionDesk 3.0
- VRML2 (*.wrl): Used in MotionDesk 2.2 and earlier
- MotionDesk export (*.mtx): Used when you export objects in a file since MotionDesk 3.0

Location of the custom objects library During the first start of MotionDesk, you can specify a folder for the custom objects library. This folder is the default folder for all users working with MotionDesk on the host PC. If you skipped the specification or want to specify a different folder, you can use an external tool for this later. Refer to How to Change the Location of the Custom Objects Library (MotionDesk Custom Object Library Management 🕮).

Managing the custom objects library You can manage the custom objects library with the 3-D Library Manager. This component lets you import 3-D objects, specify default values for them, etc. You can also copy objects from the dSPACE objects library and paste them into the custom objects library for further editing. Refer to MotionDesk Custom Object Library Management 🕮.

Related topics

HowTos

How to Insert Movable Objects Into the Scene (MotionDesk Scene Animation 🕮)
How to Insert Static Objects Into a Scene 18

User Interface for Editing a Scene

Introduction

Gives you an overview of the controlbars and commands that are used to create and edit a scene in the 3-D View.

Controlbars

The following controlbars are essential for editing a scene:

Pane	Description
Library Browser	Shows the 3-D objects that are available for the scene. You can filter the objects.
Properties	Displays and lets you edit the property values of the selected 3-D object.
Scene Navigator	Shows a tree with all the objects in the current scene.

The 3-D View is shown in the center pane of MotionDesk. You can select to display up-to four Views of the scene.

Tip

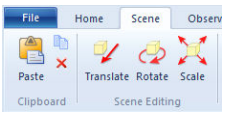
You can switch each element on or off individually, so you can switch off the elements that are not necessary for scene editing. Refer to Switch Controlbars (MotionDesk Basics 🕮).

You can arrange the controlbars/panes as you like, refer to How to Customize the Screen Arrangement (MotionDesk Basics 🕮).

Commands

The Scene ribbon has the necessary commands for editing the scene in the 3-D View:

- Translate, Rotate, and Scale: To move, rotate, and resize the 3-D objects.
- Clipboard: To copy and paste objects in the scene. You can also delete objects.



Related topics

Basics

3-D Object Libraries 11

HowTos

How to Create a Virtual World in MotionDesk 16

Editing a Scene in the 3-D View

Introduction

The following topics show how you can create a virtual world.

Where to go from here

Information in this section

Workflow for Creating a Scene

Introduction

To create a virtual world scene in the 3-D View.

Workflow

To create a virtual world scene in the 3-D View, perform the following tasks:

1. Specify the environment properties for large virtual worlds. You can also add ground plate and horizon dome 3-D static objects into the scene for smaller virtual worlds.

   Refer to How to Create a Virtual World in MotionDesk on page 16.
2. Generate terrain generation for large worlds with ground that has a height profile based on measurement or artificial data.

   Refer to Basics of Terrain Generation (MotionDesk Terrain Generation 🕮).

3. Generate a road, scenery and other objects built around the road using the ModelDesk Road Generator.

   Roads can also be imported as a 3-D object. MotionDesk can also display the routes and position markers you add to the ModelDesk road network. The associated route start and end markers are also displayed.

   Refer to Scene Generation on page 45.
4. Insert additional 3-D static and movable objects in the scene.

   You search and filter for the objects in the dSPACE objects library or the custom objects library.

   - **Static objects**: Add additional 3-D static objects into your scene, for example, traffic signs, houses, road objects, and trees to complement the scenery generated from ModelDesk.

     Refer to How to Insert Static Objects Into a Scene on page 18.
   - **Movable objects**: Add movable objects in the scene, for example, vehicles and tires and animated characters. The object positions are calculated in the simulation model and transferred to MotionDesk via motion data. A simulation data stream from the motion data is assigned to an object in the MotionDesk scene.

     Refer to How to Insert Movable Objects Into the Scene (MotionDesk Scene Animation 🕮).
5. Change the position, orientation, and size of static objects in the scene:
   - How to Resize Objects in the Scene on page 23
   - How to Change the Position of Static Objects on page 24
   - How to Rotate Static Objects on page 26
6. Specify additional properties of the static and movable objects, for example:
   - **Is selectable**: Clear to prevent an object being selected and changed unintentionally.
   - **Cast shadow**: To select if the object casts a shadow.
   - **Visibility filter**: Select if the observer and the sensors that can see the object.

   For more information, refer to Object Properties on page 77.

Large virtual worlds MotionDesk can optimize the generation of large road networks and scenery in complex scenes.

For more information, refer to Road Generation Options Page on page 86.

Note

To work with objects in a MotionDesk **3-D View**, you must learn to work with observers and navigate through the scene. For more information, refer to the following sections:

- Working with Observers (MotionDesk Scene Animation 🕮).
- Navigating Through the Scene with Observers (MotionDesk Scene Animation 🕮).

Related topics

Basics

Basics of Terrain Generation (MotionDesk Terrain Generation 🕮)
Navigating Through the Scene with Observers (MotionDesk Scene Animation 🕮)
Working with Observers (MotionDesk Scene Animation 🕮)

References

Road Generation Options Page 86

How to Create a Virtual World in MotionDesk

Objective

To create a virtual world, you can specify the environment properties for the scene. For example, you can select ground and sky textures. You can also add ground plate and dome static 3-D objects.

Preconditions

A project must have been created and an experiment must be active.

Possible methods

Two methods are available to create a virtual world.

- Use the environment settings to use an endless ground and an endless sky in the virtual world. Refer to Method 1 on page 17.

  The environment settings for the ground and sky are recommended for large and complex virtual worlds. If you use the environment settings, you must not insert a ground plate or dome 3-D object.
- Add static ground and dome 3-D objects for smaller virtual worlds. Refer to Method 2 on page 17.

Note

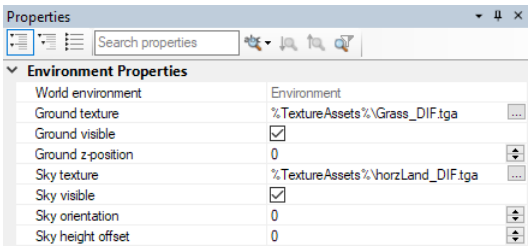
The scene edit mode is no longer available. You can edit the scene, for example, to move, resize, or rotate an object without the dedicated scene edit mode.

Method 1

To create a large virtual world using the environment settings

1 In the Scene Navigator, click Environment.

The Properties pane displays the properties of the environment.



2 Click browse on Ground texture and Sky texture and select an image file for the ground and sky textures.

You can add your own image files as textures or use the files that are installed with MotionDesk in `<MotionDesk_InstallationPath>/MotionDesk/Assets/Textures`.

3 Select Ground visible and Sky visible to use the endless ground and sky environment settings in the large virtual world.

Result

You built an endless virtual world using the environment properties to use as the scene.

Method 2

To create a small virtual world using static 3-D objects

1 In the Library Browser, select a ground plate in the Env_Plates folder.

2 Drag the object into the 3-D View.

3 In the Properties pane, specify the following properties for the ground plate:

- Position and Orientation: Set the values to `0` to place the ground plate at the origin of the coordinate system.
- Z-Position: Set the value to `-0.1`.

  As the roads are placed at the origin, the ground plate must be lowered to avoid overlapping polygons.
- Allow auto placement: Select to allow the placement of other 3-D objects onto it when scenery is automatically generated.

Note

Ground plates and domes must not be scaled, the size of the object in the 3-D Object Library is displayed in the object name, for example, GrassPlate5000 is a ground plate with an area of 5,000 square meters. Select a size that is suitable for your simulation.

4 In the Library Browser, select a dome in the Env_Domes folder, for example, HorzLand5000. The dome should be suitable for the ground plate and your simulation.

5 Drag the object into the 3-D View.

6 In the Properties pane, specify the following properties for the dome:
   - Exclude from collision check: Select to avoid scenery 3-D objects being placed on top of the dome object.
   - Cast shadow: Clear to avoid the dome object casting an unnatural shadow.

7 In the Environment properties, clear Ground visible and Sky visible to use the ground and dome 3-D objects in the small virtual world.

Result

You built a virtual world using 3-D ground and dome objects to use as the scene.

Related topics

References

How to Insert Static Objects Into a Scene

Objective

To search and filter for objects in the Library Browser and insert them in to the MotionDesk 3-D View.

Overview

You can search and filter for objects in the Library Browser to insert them into the scene. You can drag them from the Library Browser and drop them into the scene. You can also copy and paste objects from the Scene Navigator or the 3-D View.

Note

You can only drag one object at a time and drop it into the 3-D View.

Keywords and filtering

- Keywords: You can use keywords to categorize the objects. An object can have more than one keyword.

  Keywords are assigned to the objects in the dSPACE objects library and to objects in the custom objects library during the import process.
- Filtering: Filter the reduce the list of objects using their name, the assigned keywords or both.

Method

To insert static objects into the scene

1. Click Library Browser.
2. To filter in the objects library, select a category to filter Object \ Folder Name, Keyword or Both in the Filter By section of the Library Browser.
3. Enter the filter term in the edit field.

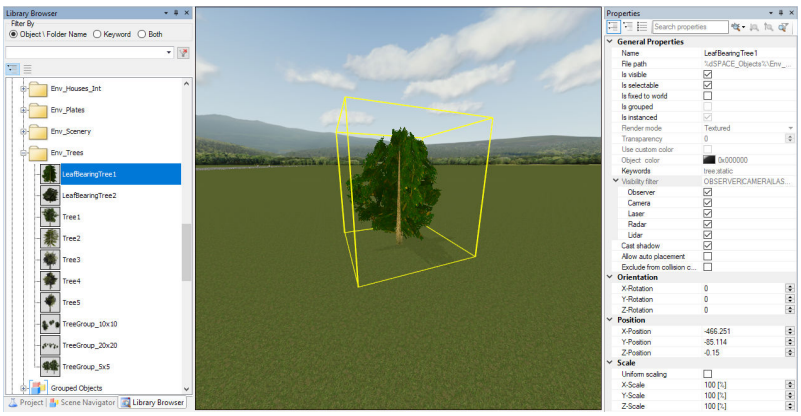
   The objects that match are listed below the filter term entry field. Only the file name of each matching object is listed. You can select one of the objects by clicking it.

   Tip

   - All filter terms remain available after you enter them. You can select them by clicking the arrow icon next to the entry field.
   - To deactivate the filter, click the icon next to the entry field. All available objects are listed in the Library Browser.

4. In the Library Browser, browse to the required object and drag it into the 3-D View.

   MotionDesk inserts the static object at the position where you drop the object. The object's orientation and scaling is specified by the default values and can be modified.



5. Repeat the previous steps for further static objects.
6. Select an object in the Scene Navigator or in the 3-D View, and click Clipboard - Copy.
7. Click Clipboard - Paste to paste a copy of the object in the scene.
8. In the properties pane, you can set a number of properties for each object. For example, you can select if the object casts a shadow or if specific sensors can see the object by setting the visibility filter for sensor simulation.

   For more information on the properties, refer to Object Properties on page 77.

Result

You have searched and filtered for static objects in the Library Browser and inserted them into the scene.

You can now resize, rotate, and change the position of the objects.

Related topics

HowTos

How to Import Objects into the Custom Objects Library (MotionDesk Custom Object Library Management 🕮)
How to Insert Movable Objects Into the Scene (MotionDesk Scene Animation 🕮)

References

Copy 68
Object Properties 77
Paste 71

How to Create Groups of Static Objects

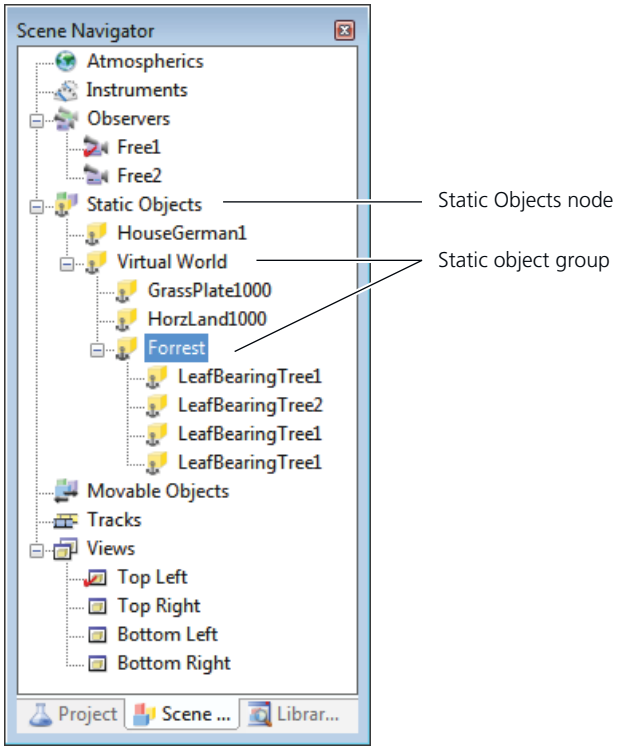
Objective

You can group static objects to structure them hierarchically in the Scene Navigator.

Grouping static objects

You can create groups of static objects under the Static Objects node in the Scene Navigator or in an existing group. You can use this feature to structure the static objects hierarchically in the Scene Navigator and work with static objects more efficiently.

You can set the properties of a group. The properties values are valid for all the members of the group. You can therefore move or resize all the objects of a group at once or enable/disable shadow casting for them.



Method

To group static objects

1. In the Scene Navigator, select the Static Objects node or a group of static objects.
2. Open the context menu and choose Create new Group.

   MotionDesk creates a new group in the Scene Navigator. Now you can move static objects in the scene to the group.
3. In the Scene Navigator, drag static objects to the new group.

   The static objects dragged to the group become members of the group. If you dragged an object to the wrong group, drag it to correct group. If you do not want to group it, drag it to the Static Objects node.

   Now you can modify the properties of the new group. These properties are valid for all the members of the group.
4. Select the new group.

   The Properties pane displays the properties of the group.
5. On the Properties pane, specify the properties of the group, for example, a descriptive name for it.
6. Repeat the steps above to structure the static objects.

Result

The static objects are hierarchically structured in the Scene Navigator.

Related topics

References

Create New Group.....68

How to Delete Objects from the Scene

Objective

To delete 3-D objects from the scene.

Method

To delete objects from the scene

1. In the Scene Navigator, select the object to be deleted.
2. Right-click on the object and select Delete in the context menu.
3. To delete multiple objects, in the Scene Navigator, select the first object to delete.
4. Press and hold the `Shift` key and select the last object to be deleted.
   All the objects in between are selected.
5. In Scene - Clipboard, click the delete icon or click delete on the keyboard.
6. To delete multiple objects in the 3-D View, press and hold the `CTRL` key and select multiple objects in the scene to delete.
   The selected objects are displayed in yellow boxes.
7. In Scene - Clipboard, click the delete icon or click delete on the keyboard.

Note

The Undo and Redo functions are no longer supported

Result

The 3-D objects you selected are deleted from the scene.

Related topics

References

Delete.....69

How to Resize Objects in the Scene

Objective

To resize 3-D objects in the scene.

Overview

Each 3-D object has default dimensions. If these are not suitable, you can use Scale to resize the object.

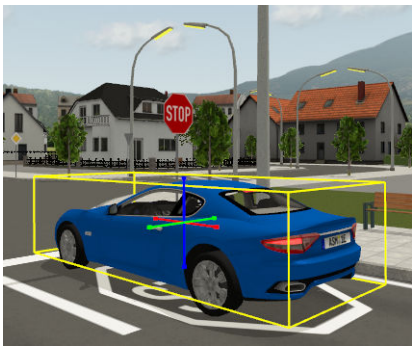
You can resize objects using the following methods:

- Drag the colored axes in the scene using the mouse to resize the object along the selected axes, refer to Method 1 on page 23.
- Edit the Scale percentage properties in the Object Properties pane. The percentages represent the size in relation to the original size. To resize an object and retain the proportions, you can select Uniform scaling before you edit the Scale properties. Refer to Method 2 on page 24.

Method 1

To resize objects using the mouse

1. Select the object in the Scene Navigator or 3-D View.
   The object is displayed inside a yellow box.
2. On the Scene ribbon, click Scale or click **Ctrl+Alt+S**.
   The three scaling movement directions around the -x, -y, and -z axes are displayed as colored lines at the center of the object.



3. To resize the object in a specific direction, move the mouse over one of the colored lines. It changes color to yellow.
   Click and hold the left mouse button and move the mouse in the direction you want to resize the object.
4. Release the mouse button.
   The object is resized in the direction you moved the mouse.
5. To resize the object in another direction, repeat the previous steps and select another of the colored lines.

Result

The object is resized in the direction you moved the mouse and the X-Scale, Y-Scale, or Z-Scale percentage properties change.

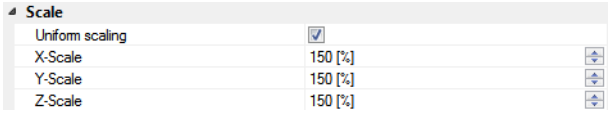
Method 2

To resize objects by editing the properties

1 Select the object in the Scene Navigator or 3-D View.
The object is displayed inside a yellow box.

2 In the Properties pane, select Scale - Uniform scaling to resize the object and keep the original proportions.

3 In the Properties pane, edit one of the X-Scale, Y-Scale, or Z-Scale percentage properties, for example, to `150%`.
The object is resized to `150%` of the original along each of the three axes and all each of the other properties change to `150%`. Therefore, the original proportions of the object are kept.



Result

The object is resized equally in all directions and each of the X-Scale, Y-Scale, or Z-Scale percentage properties change to the same value.

Related topics

References

How to Change the Position of Static Objects

Objective

To change the positions of 3-D static objects in the scene.

Overview

You can change the positions of the 3-D objects in the scene using the mouse or by editing the X Position, Y-Position, and Z-Position properties.

You can move the objects in two ways:

- Drag the colored axes in the scene using the mouse, refer to Method 1 on page 24.
- Edit the Position properties in the Object Properties pane, refer to Method 2 on page 25.

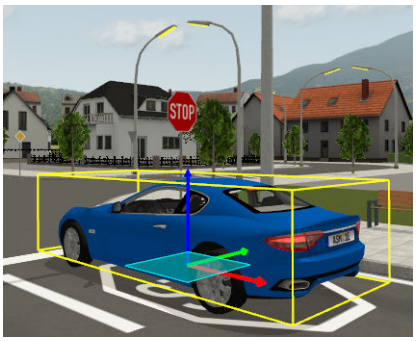
Method 1

To change the position of objects using the mouse

1 Select the object in the Scene Navigator or 3-D View.
The object is displayed inside a yellow box.

2 On the Scene ribbon, click Translate or click **Ctrl+Alt+T**.

The three translate movement directions along the -x, -y, and -z axes are displayed as colored lines from the center point of the object



3 To move the object in a specific direction, move the mouse over one of the colored lines. It changes color to yellow.

Click and hold the left mouse button and move the mouse in the direction you want to move the object.

4 Release the mouse button.

The object is moved in the direction you moved the mouse.

5 To moved the object in another direction, repeat the previous steps and select another of the colored lines.

Result

The object is moved in the direction you moved the mouse and the X-Position, Y-Position, or Z-Position properties change.

Method 2

To change the position of objects by editing properties

1 Select the object in the Scene Navigator or 3-D View.

The object is displayed inside a yellow box.

2 In the Properties pane, edit the values of X-Position, Y-Position, or Z-Position.

The object moves to a new location.

Result

The object is moved in the direction you changed in the X-Position, Y-Position, or Z-Position properties.

Related topics

References

Object Properties....77
Translate....73

How to Rotate Static Objects

Objective

To rotate 3-D static objects in the scene.

Overview

You can rotate 3-D objects in the scene using the mouse or by editing the X-Rotation, Y-Rotation, and Z-Rotation properties.

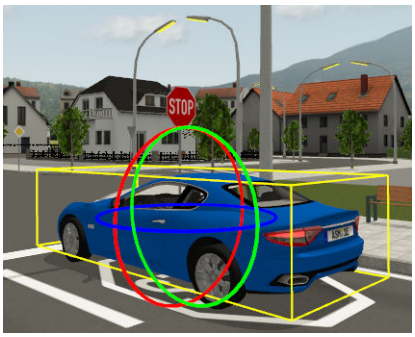
You can rotate the objects in two ways:

- Drag the colored axes in the scene using the mouse, refer to Method 1 on page 26.
- Edit the Orientation properties in the Object Properties pane, refer to Method 2 on page 27.

Method 1

To rotate objects using the mouse

1. Select the object in the Scene Navigator or 3-D View.
   The object is displayed inside a yellow box.
2. On the Scene ribbon, click Rotate or click `Ctrl+Alt+R`.
   The three rotation movement directions around the -x, -y, and -z axes are displayed as colored circles around the object.



3. To rotate the object in a specific direction, move the mouse over one of the colored circles. It changes color to yellow.
   Click and hold the left mouse button and move the mouse in the direction you want to rotate the object.
4. Release the mouse button.
   The object is rotated in the direction you moved the mouse.
5. To rotate the object in another direction, repeat the previous steps and select another of the colored circles.

Result

The object is rotated in the direction you moved the mouse and the X-Rotation, Y-Rotation, and Z-Rotation properties change.

Method 2

To rotate objects by editing the properties

1. Select the object in the Scene Navigator or 3-D View.
   The object is displayed inside a yellow box.
2. In the Properties pane, edit the values of X-Rotation, Y-Rotation, or Z-Rotation.
   The object rotates.

Result

The object is rotated in the direction you changed in the X-Rotation, Y-Rotation, and Z-Rotation properties.

Related topics

References

Configuring Routes and Markers in the Scene

Introduction

You can configure ModelDesk routes, route markers, and position markers and display them in the MotionDesk scene in the 3-D View.

Where to go from here

Information in this section

Basics on Routes and Markers in MotionDesk

Introduction

Routes, route markers, and position markers that you add to a ModelDesk road network can be configured in the MotionDesk and displayed in the 3-D View.

You can view the routes and markers followed by the ASM vehicle and fellows in a simulation in the scene in the 3-D View.

Overview

In ModelDesk, you can configure routes and markers on any road section or junction in a road network.

The routes and markers are displayed on top of the road and junction surface with default color and transparency values. The height profile of the road and junction elements and any additional surface height profiles are also considered so that they remain visible in the 3-D View above the road surface.

You must select to generate the routes and markers in the MotionDesk options. When you download a ModelDesk project to the simulation platform or synchronize the road network and scenery with the MotionDesk project, the routes and markers are displayed in the scene in the 3-D View.

You can select the routes and markers in the MotionDesk 3-D View and in the Scene Navigator - Static Objects folder to configure their properties. For example, you can select a new route color and hide the routes and markers in the 3-D View.

Note

The route lines and markers on the road surface are displayed in the 3-D View. They are not displayed in the sensor composition window and are not visible to the sensors in a sensor simulation.

Routes

The routes are shown as colored lines on the road surface. The routes are configured in ModelDesk to guide the vehicle in the simulation.

The routes can follow the default preferred lane direction (direct or oncoming) as defined in the road element lanes in ModelDesk. For more information, refer to Lanes of a Road Element (ModelDesk Road Creation 🕮).

The routes can also follow trajectories that you added as shapes in the ModelDesk road network and then incorporated into a route. Trajectory shapes that are not added to routes in ModelDesk are not displayed in MotionDesk.

The default routes on a junction are displayed using cubic splines between the routes of adjoining road elements as shown in the following image.

The routes are shown in the following panes:

- **Scene Navigator**: Routes are shown in the **Static Objects - Routes** folder. A subfolder for each route is displayed with the ModelDesk route name.
- **Project**: Routes are shown in the tree in the **Resources - Trajectories** folder.

Each road and junction element in a route is listed once in the tree. The names of the road and junction elements in ModelDesk are used in the tree.

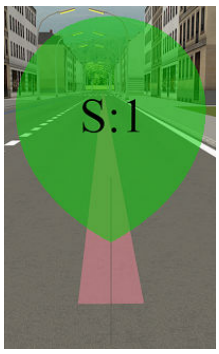
For elements using a default route, the preferred lane direction, direct or oncoming, is also included in the name. Junctions include connection point index numbers. If a trajectory is used in the route, the name of the trajectory is used in place of the road element name.

Route start and end markers Routes also include start and end route markers. The markers are similar to the markers you manually add to the ModelDesk road network.

Route markers help you find the start and end of a route in large and complex MotionDesk scenes.

The start and end markers are also shown in an **End Markers** folder in the route folder in the Scene Navigator. Each route marker has a label that shows if it is a start or end marker and the route number, for example, S:1 and E:1. By default, start markers and green and end markers are red.

When you move around the scene in the **3-D View** and run a simulation, the route markers and the label always face the observer.

Route Start Marker	Route End Marker
	

Note

The route start and end markers are generated if **Generate routes** is selected in the MotionDesk Options - **Road Generation**.
Selecting **Generate markers** only specifies if position markers are generated.

Markers

In ModelDesk, you can add **position markers**, to road elements in a road network. The markers can be used as way markers in your simulation and help you find specific points in large and complex scenes.

The markers are shown as colored flags above the road surface. By default all markers are blue and contain a label that shows the **Marker ID** number that is defined in ModelDesk, for example, **M:5**.

The markers are also shown in the **Scene Navigator** in the **Markers** folder in the **Static Objects** node. Subfolders with the name of each road or junction element contain the markers on the specific road or junction element.

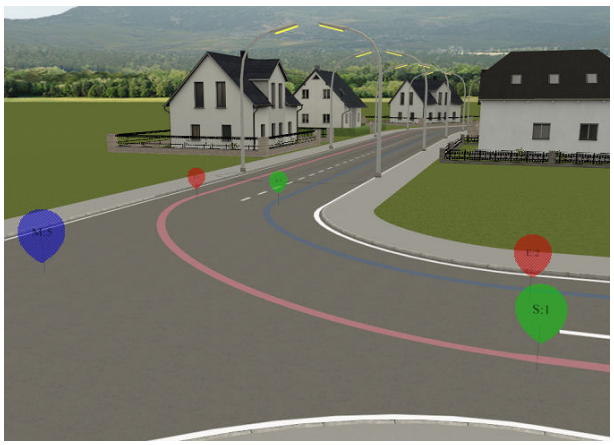
The names are defined in ModelDesk and can be changed in the MotionDesk marker properties.

When you move around the scene in the **3-D View** and run a simulation, the markers and the label always face the observer.

Position Marker

Illustration

The following illustration shows a MotionDesk scene in the **3-D View** with two routes, the route start and end markers, and a position marker in the default position on the junction.



Related topics

Basics

Lanes of a Road Element (ModelDesk Road Creation 🕮)
Position Markers (ModelDesk Road Creation 🕮)
Routes on a Road Network (ModelDesk Road Creation 🕮)
Trajectories (ModelDesk Road Creation 🕮)

HowTos

How to Select the Generation of ModelDesk Routes and Markers..... 52

How to Configure Routes and Markers in MotionDesk

Introduction

In MotionDesk, you can configure the routes, route markers, and position markers that are displayed on the road network in the scene in the **3-D View**.

Overview

All routes and markers that you added to the ModelDesk road network can be synchronized with the MotionDesk project and displayed in the **3-D View**. You can select the road elements or trajectories used in each route and the markers in the **Static Objects** node of the **Scene Navigator** tree and in the **3-D View**.

The routes displayed in the scene in the **3-D View** can use the default preferred lanes of each road element or manually added trajectories.

The markers include the start and end markers for each route and all the position markers that you manually added as shapes to the road elements.

In the properties pane, you can customize the appearance of the routes and markers and hide them in the **3-D View**.

Note

The property changes to the routes and markers are overwritten the next time you synchronize the road with MotionDesk.

For more information on the basics of viewing and configuring routes, route markers, and position markers in MotionDesk, refer to Basics on Routes and Markers in MotionDesk on page 28.

How to configure routes and markers:

- To configure routes and route markers (refer to Part 1 on page 33).
- To configure position markers (refer to Part 2 on page 35).

Prerequisites

To view and configure routes and markers in the MotionDesk scene in the **3-D View**, you must ensure the following:

- Select to generate the routes and markers in the **MotionDesk options - Road Generation**.

  For more information, refer to How to Select the Generation of ModelDesk Routes and Markers on page 52.
- A ModelDesk project with routes and markers must be open and active. For more information on adding routes, trajectories, and markers to a road network, refer to the following topics:
  - How to Specify Routes on Road Networks (ModelDesk Road Creation 🕮)
  - How to Specify Trajectories (ModelDesk Road Creation 🕮)
  - How to Specify Position Markers (ModelDesk Road Creation 🕮)
- You must synchronize the road network that contains the routes and markers with the active MotionDeskproject.

  For more information, refer to How to Synchronize When MotionDesk and ModelDesk Run on the Same PC on page 59.

  You can also download the experiment to the simulation and to MotionDesk.

Part 1

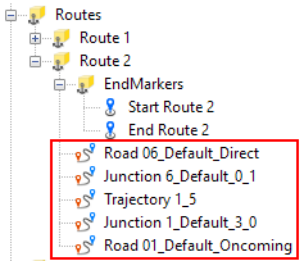
To configure routes and route markers

1 In the **Scene Navigator**, select **Static Objects – Routes**.

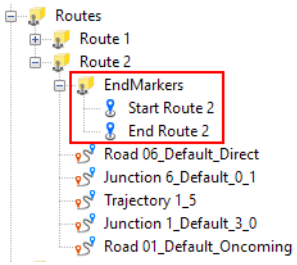
  A folder for each route with the route name is shown in the Routes folder.

2 Select a route, for example, **Route 2**.

  Each road section and trajectory used in the route is displayed in the tree.

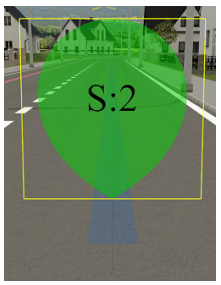


3 Select the **End Markers** folder and double-click the **Start Route** marker.

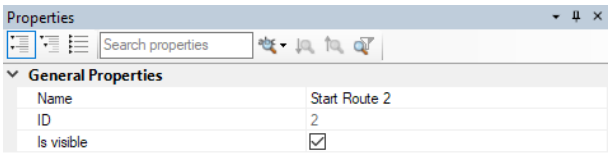


The observer moves to the start of the route in the 3-D View. The green start marker is shown with a label. The yellow selection box is also displayed.

Route 2 - Start Marker



4 In the properties pane, select Is visible to hide and display the start route marker in the 3-D View. You can also edit the name in the Name property. The text in the marker in the 3-D View remains unchanged.



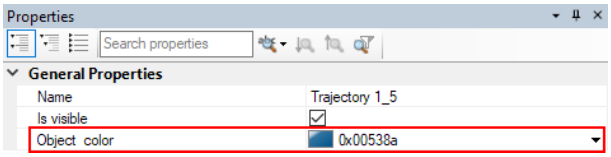
5 In the 3-D View, select the route or trajectory line on the road surface next to the start marker.

6 In the properties pane, select Is visible to hide and display the route or trajectory on that road element in the 3-D View.

Note

MotionDesk generates all the routes in the road network. If you want to visualize only a specific route, select the Route folder of the other routes and clear Is Visible in the properties.

7 Rename the route and change the color in the Object color property. The color of the route or trajectory on the road surface changes for that road element.



8 Run a simulation or play motion player animation to view the ASM vehicle and fellows following the route and passing the route markers in the 3-D View. The route lines on the road surface and the start and end markers are not shown in the sensor composition window.

Note

The route marking in the MotionDesk 3-D View is placed directly on the preferred lane. The lane indexes used in the ModelDesk scenario for the ego and fellow vehicles are not evaluated in MotionDesk.
Therefore if the lateral position of an ego or fellow vehicle in the ModelDesk scenario is specified relative to the preferred lane and the set lane index does not equal zero, the vehicle is placed with a lateral offset to the route in the MotionDesk scene in the 3-D View.

Result

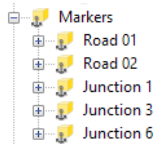
You changed the properties of the routes and route markers.

Part 2

To configure position markers

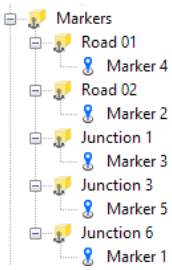
1 In the Scene Navigator, select Static Objects – Markers.

A folder for each road element with the road or junction name is shown in the Markers folder.



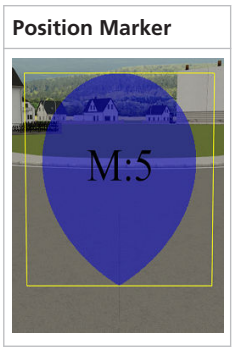
2 Select a road or junction.

Each marker on the road element is displayed in the tree with the name as specified in ModelDesk.

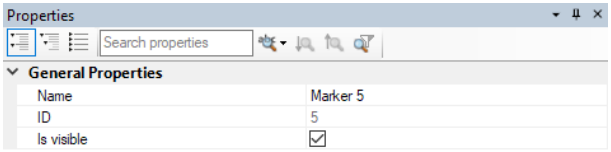


3 Double-click a marker in the tree.

The observer moves to the blue marker in the 3-D View. The marker label is displayed with the ID number, for example, M:5.



4 In the properties pane, select Is visible to hide and display the position marker in the 3-D View. You can also change the name.



5 Select the road element folder that contains the markers, for example, Road 01.

6 In the general properties pane, select Is visible to hide and display all markers on that road element in the 3-D View.

Note

You can also hide all markers. Select the relevant Markers folder that contains all road elements and clear Is Visible in the properties.

7 Run a simulation or play a motion player animation to view the ASM vehicle and fellows passing the markers in the 3-D View. The markers are not shown in the sensor composition window.

Result

You changed the properties of the markers.

Related topics

Basics

Basics on Routes and Markers in MotionDesk 28

HowTos

How to Select the Generation of ModelDesk Routes and Markers 52

References

Object Properties 77

Using the Advanced Lighting Mode

Introduction

The advanced lighting mode improves the lighting effects in the scene so it looks more realistic. MotionDesk uses the deferred shadow technique in this mode.

Where to go from here

Information in this section

Basics of the Advanced Lighting Mode

Introduction

The advanced lighting mode allows for adding light objects to the static and movable objects. This allows for a realistic illumination of the scene.

Advanced lighting mode

The advanced lighting mode improves the lighting effects in the scene to make it look more realistic.

Activating the advanced lighting mode To use the advanced lighting mode, you must activate it on the Render Options page. Refer to Render Options Page (MotionDesk Scene Animation 🕮).

Large number of light sources In this mode, MotionDesk has the ability to render many lights in a scene without significant performance loss.

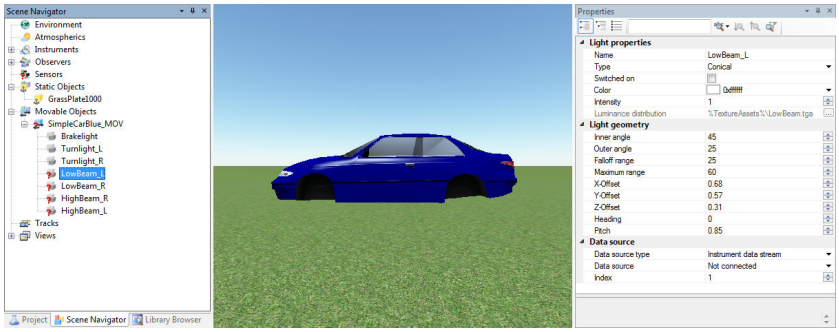
Adding light sources to 3-D objects You can add and delete light objects to static and movable 3-D objects. You can specify the light type, for example, cone or pyramid, the position relative to the 3-D object, and the light data source in the properties pane. The lights can be controlled by the simulation application. Refer to Basics of Light Objects on page 40.

Extended 3-D objects library Many 3-D objects of the dSPACE objects library have light objects. The following illustration displays an example of a 3-D object that has LowBeam_<n> and HighBeam_<n> light objects.

Examples of MotionDesk 3-D objects that include additional advanced lighting objects:

- **All vehicles**: All vehicle objects, for example, vehicles in the ASM Coupe, Truck, Compact, and Combi object groups
- **Sw_Streetlamp**: a street lamp object that includes a conical light.

The lights that are connected to a vehicle, move with the vehicle. You can change the light type, position, and data source for the lights in the **Properties** pane.



Domes and ground plates

In advanced lighting mode, the static objects for domes are not suitable for building the virtual world. Use the endless dome with the `horzLand_AdvancedLighting.tga` sky texture of the environment. Refer to How to Create a Virtual World in MotionDesk on page 16.

Examples

The following illustrations show some examples in advanced lighting mode.

Related topics

HowTos

How to Add Light Objects to 3-D Objects....43

References

Light Properties....76

Basics of Light Objects

Introduction

To improve the scene for driving in the dark, light objects can be added to the scene.

Preconditions

Light sources can only be used in the advanced lighting mode. If the scene contains such light objects and the simple lighting mode is used, the light objects are switched off and cannot be enabled.

Basics of light sources

The light sources are spot lights that you can add to movable and static objects. You can specify their position and orientation relative to the objects to which they are added. This allows you to add headlights to vehicles or bicycles, for example. You can add the light sources to static 3-D objects, for example, street lights or houses, to illuminate the scene from different positions.

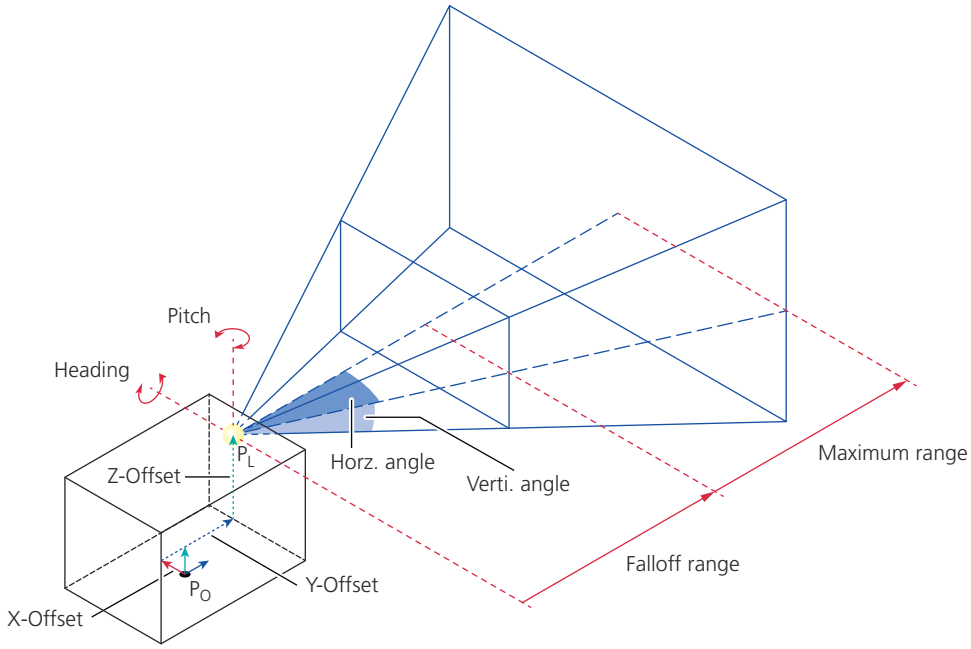
Position and orientation

The absolute position and orientation of the light source depends on its parent 3-D object. The position is specified as offset values to the 3-D object. The orientation is specified as heading and pitch angles.

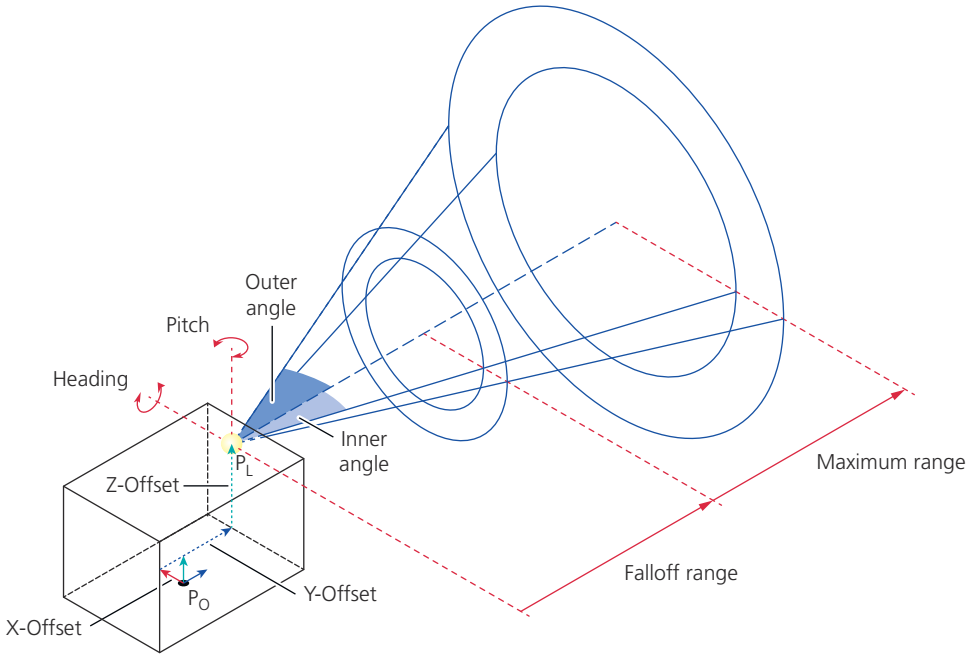
Type of light objects

The light object type describes how the light source illuminates the points on its front. MotionDesk provides two types of light objects: a pyramid light and a conical light. Both light object types specify an area where points are illuminated.

Pyramid lights The pyramid light object is displayed in the following illustration. The box represents the 3-D object to which the light object is added. P_O is the origin of the 3-D object, P_L is the position of the light object.



Conical lights The conical light object is displayed in the following illustration. The box represents the 3-D object to which the light object is added. P_O is the origin of the 3-D object, P_L is the position of the light object.



The intensity of the illumination of the points depends on several properties:

Inner and outer angles The inner and the outer angles describe the area that is illuminated by conical light objects. Points that are inside the inner angle are illuminated with full intensity. The illumination of points that are between the inner and outer angle decreases. Points outside the outer angle are not illuminated.

Horizontal and vertical angles The horizontal and vertical angles describe the area that is illuminated by pyramid light objects. Points that are inside this area are illuminated with full intensity. Points outside the area are not illuminated.

Fall-off range and maximum range The fall-off range and maximum range considers the distance of the light source to the illuminated point. Points that are nearer to the light source than the fall-off range are illuminated with full intensity. Points whose distance to the light source is greater than the maximum range are not illuminated. The illumination of points between the fall-off range and the maximum range decreases linearly.

Light characteristic

You can specify the characteristics of the light source. This allows you to specify the color, intensity, and luminance distribution. This way, you can simulate a real light source from measured data.

For conical lights, the luminance distribution is calculated by MotionDesk using the cosine function.

For pyramid lights, the luminance distribution is either calculated by MotionDesk using the cosine function or is specified by a gray-scale image file. Using an image file allows you to use measured luminance distributions. The gray-scale image file must have TGA, JPG, GIF, or PNG format. The maximum size of the image is 16384 × 16384 pixels but it is recommended to use smaller images, for example, up to 2048 pixels to minimize memory consumption. The following illustration displays an example of an image file.

Controlling the lights

You can switch the light on and off manually using a property.

It is also possible to switch on the light and set the intensity by the simulation model. For this, you must specify a data source that contains the control signal for the light.

Related topics

HowTos

How to Add Light Objects to 3-D Objects....43

References

Light Properties....76

How to Add Light Objects to 3-D Objects

Objective

You can add lights to static or movable objects.

Preconditions

The advanced lighting mode must be active.

Method

To add light objects to 3-D objects

1. In the Scene Navigator, select the 3-D object to which you want to add the light object.
2. Open the context menu and select Add Light.
   MotionDesk adds a light object.

3 Select the light object.
The **Properties** pane displays the properties of the light object.

4 Specify the properties of the light. Refer to Light Properties on page 76.

Result

You added and specified light objects to 3-D objects.

Related topics

Basics

Basics of Light Objects....40

References

Add Light....66
Delete Light....70
Light Properties....76
Render Options Page (MotionDesk Scene Animation 🕮)

Scene Generation

Introduction

MotionDesk can generate 3-D static road network objects and scenery around the road network automatically. The road and scenery are specified with ModelDesk.

Where to go from here

Information in this section

Basics on Roads

Introduction

A road is a particular static 3-D object type. It is specified in ModelDesk, which generates data for visualizing the 3-D object and data for the simulation model. This ensures that the road model used for simulation is the same as the road visualized in MotionDesk.

Road 3-D objects

Road 3-D objects are based on roads that are specified with the Road Generator of ModelDesk.

With the Road Generator, you can:

- Create roads and specify their characteristics:
  - Horizontal profile
  - Height profile
  - Lateral slope profile
  - Lane sections and lanes (e.g., for modeling different numbers of lanes or road markings)
  - Special surface conditions (e.g., for modeling low µ areas)
  - Additional height profiles (e.g., for modeling a rough road)
  - Surface textures (e.g., arrows or crosswalks)
  - Scenery (e.g., for specifying the environment of a road)
  - Road length is limited only by the available memory
- Create junctions and connect them with roads to build a road network.
- Place static objects on roads or junctions (e.g., traffic signs)
- View roads, junctions, and road networks in a preview.
- Place and define shapes on roads or junctions (e.g., for roadworks):
  - Define additional road markings (e.g., parking lots)
  - Define continuous objects (e.g., concrete barriers)
  - Place repeating traffic objects (e.g., pylons)
- Define routes on road networks for the ASM and fellow vehicles.
- Define the traffic type for a road network.
- Define position markers as trigger points for the movement of the ASM and fellow vehicles on the road network.
- Inspect elements or areas of the generated road network scene in MotionDesk.
- Create the files:
  - For the simulation model of a road network to download them to a real-time application or Simulink
  - For visualization of a road network in MotionDesk

Scenery

Introduction

You can specify scenery type for the road in ModelDesk. MotionDesk can then generate scenery beside the road network. This is a convenient way to create basic scenery, which you can add to and modify in MotionDesk.

Scenery

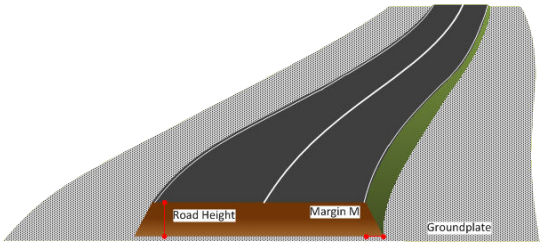
There are different configurations of scenery with different properties to be specified. The margin and scenery of a road element are defined by scenery sections, each of which can have one of these configurations: Batter, Bridge, Country road, City, Alley (tree-lined road), or Highway.

The vehicle can drive on the road scenery. The height of the road margin is calculated according to the scenery configuration. The height outside of the road scenery is zero.

Note that only two scenery configurations are possible for junctions: batter and bridge.

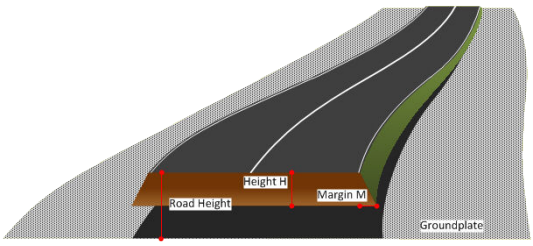
Batter

In a batter configuration the height of the margin is specified by the height of the road (distance of the road to the base plate).



Bridge

In a bridge configuration the height of the margin can be specified to model a bridge with a road. In contrast to a batter, the road section is not connected to the base plate.



Country road

In a country road configuration, there are trees and reflector posts along the scenery section. The following illustration shows an example of a country road in MotionDesk.

City

In a city configuration, there are buildings, sidewalks and street lights along the scenery section. You can specify different types of buildings: rural, urban, or metro. The following illustration shows an example of a rural city in MotionDesk.

The following illustration shows an example of an urban city.

The following illustration shows an example of a metro city.

Tree-lined road

In a tree-lined road configuration, there are lines of trees and reflector posts along the scenery section. The following illustration shows an example of a tree-lined road.

Highway

In a highway configuration, there are noise barriers, guardrails, and reflector posts along the scenery section. The following illustration shows an example of a highway.

Related topics

HowTos

How to Specify Scenery Sections (ModelDesk Road Creation 🕮)

Texture Maps for Roads

Introduction

This topic gives information on specifying areas with special textures for road elements and junctions.

Texture maps

With texture maps you can improve the realism of road elements and junctions. It is possible to visualize road markings like arrows, crosswalks, stop lines, etc. Instead of a monotonous gray surface, the road surface can visualize potholes, gully holes, fatigue cracking, etc.

The texture maps are only visible on the road 3-D object in MotionDesk. They do not influence the simulation model.

The following illustration shows an example of a junction with several textures.

Related topics

Basics

Coordinate System Used by the Road Generator (ModelDesk Road Creation 🕮)

HowTos

How to Specify Areas with Specific Surface Conditions or Textures (ModelDesk Road Creation 🕮)

How to Specify the Accuracy and Complexity of the Road Network

Objective

You can specify the accuracy and complexity of the 3-D object of the road when it is created during scene generation in ModelDesk.

Road geometry accuracy

You can specify the level of detail for the generation of the roads in MotionDesk. The level of detail influences the road geometry when the scene is generated from ModelDesk or via tool automation. Each 3-D object in the scene consists of polygons. The more polygons are used for a 3-D object, the better are the accuracy of the 3-D object's contour. You can influence the accuracy of the road's 3-D object.

The accuracy of the road geometry can be based on the road curvature or the segment types used for the road. If it is based on the segment types, you can specify the accuracy for each segment type. In addition, the accuracy can be further optimized for clothoid and spline segments, so that more polygons are used for stronger curvature.

Note

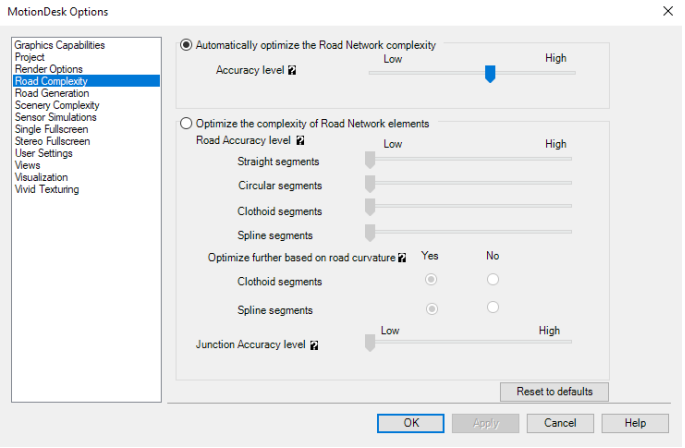
Higher complexity optimization and appearance accuracy of the 3-D objects can reduce the performance due to memory consumption and the calculation power required. The road generation time from ModelDesk also increases.
You must set the road and scenery optimization settings before you generate the scene from ModelDesk to ensure that the tiles are loaded near the observer at run time when playing the animation or moving around the scene.

Method

To specify the accuracy of the road geometry

1 On the File ribbon, click Options to open the MotionDesk Options dialog.

2 Open the Road Complexity page.



3 Select the basis for the accuracy optimization.

4 Specify the accuracy. To get more information on the effect, click the question mark.

5 Click OK to confirm your settings and close the dialog.

Result

In the next scene generation from ModelDesk or via tool automation, the 3-D object of the road is generated with the specified accuracy and complexity.

Related topics

Basics

3-D Objects (MotionDesk Basics 🕮)

References

Road Complexity Options Page.....84

How to Select the Generation of ModelDesk Routes and Markers

Introduction

In the MotionDesk options, you can select to generate the routes, trajectories, route markers, and position markers of a ModelDesk road network. They are displayed in theMotionDeskscene in the 3-D View.

Overview

In ModelDesk, you can create routes using the default road direction or using trajectories you added to the road network. Each route includes a marker at the start and end of the route. You can also add markers to the road network at any position.

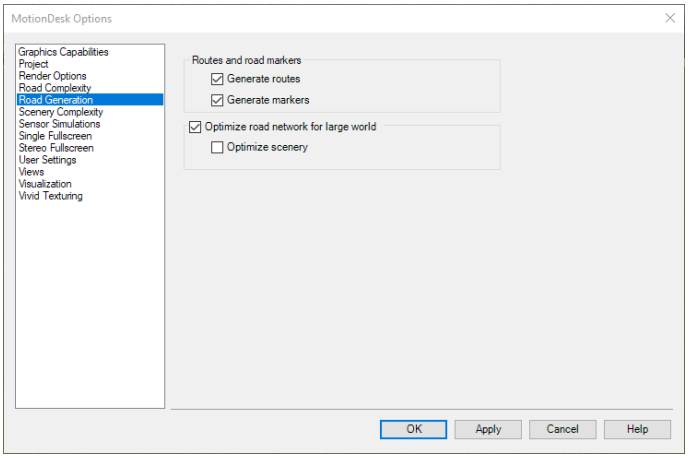
They are displayed in theMotionDeskscene in the 3-D View.

The road network and scenery are generated in graphic tiles. You can also optimize the road network and scenery generation for complex scenes that contain large road networks and detailed scenery. The road and scenery tiling is optimized around the observer during the animation.

Method

To generate ModelDesk trajectories and route markers in MotionDesk

1. On the File ribbon, click Options to open the MotionDesk Options dialog.
2. Open the Road Generation page.



3. Select Generate trajectories to synchronize all of the routes added to the ModelDesk road in the active MotionDesk project.
4. Select Generate markers to synchronize all of the routes added to the ModelDesk road in the active MotionDesk project.
5. Select or clear Optimize road network for large world and Optimize scenery. For more information, refer to Road Generation Options Page on page 86.
6. Click OK to confirm your settings and close the dialog.

Result

You configured MotionDesk to generate the routes and markers of a ModelDesk road. You also selected to optimize the road network and scenery generation for complex scenes that contain large road networks and detailed scenery.

After the next scene generation, the routes and markers will be displayed in the MotionDesk scene in the 3-D View. For more information, refer to How to Synchronize When MotionDesk and ModelDesk Run on the Same PC on page 59.

Related topics

Basics

Basics on Routes and Markers in MotionDesk 28

Using Roads for Simulation and Visualization (ModelDesk Road Creation 🕮)

HowTos

How to Configure Routes and Markers in MotionDesk 32
How to Synchronize When MotionDesk and ModelDesk Run on the Same PC 59

References

Road Generation Options Page 86

Using Scene Generation

Introduction

There are some points to note when you use scene generation.

Elements to be generated

In ModelDesk, you can specify different elements to be visualized as 3-D objects in MotionDesk after road and scenery generation.

Road The road model provides the data for the 3-D object of the road in MotionDesk. This includes the specification of the geometry and the specified lanes, textures, and shapes.

Scenery The scenery provides the data for the 3-D objects next to the road. The kind of 3-D objects that are placed next to the road depends on the scenery type. The objects of the scenery are not evaluated in the simulation.

Static traffic objects Static traffic objects provide the data of 3-D objects that are added to the road as traffic objects or shapes. They can be used to specify elements that sensors can recognize, for example, traffic signs.

Routes using the default directions of the road and trajectories define the path taken by a vehicle through the road network. Position markers can also be added to the road network. To generate routes and markers, refer to How to Select the Generation of ModelDesk Routes and Markers on page 52

The objects are generated and displayed in the MotionDesk scene in the 3-D View and can be evaluated in the simulation.

Traffic objects of traffic scenario The traffic objects that are used in a traffic scenario provide the data for 3-D objects of traffic participants (fellows). The movements of these objects are specified in the traffic scenario and calculated in the simulation.

In ModelDesk, you can start scene generation of all the element types or specific element types.

Road and scenery generation

When you specify a road, you can also specify scenery sections for it. Different types of 3-D objects are automatically placed around the road according to the scenery you select. For example, if you select country road scenery, MotionDesk places trees and reflector posts around the road. Thus, it is not necessary to build the whole virtual world manually.

When MotionDesk generates the scene, it creates a new group of static objects called `<Road Network Name> Scenery`. Below this node, the road elements of the network are listed. Below each road node, scenery sections and the associated scenery elements are listed.

The `<Road Network Name> Scenery` group contains all the 3-D objects that are part of the automatic scenery. The group is managed by the scene generator. If you insert 3-D objects in this group manually, they are deleted when the scenery is updated. If you delete static objects from this group, they reappear when you update the scenery.

MotionDesk can add textures and scenery to the road to make them look more realistic. This is called vivid texturing. Vivid textures are worn out areas, random cracks, and random texture maps on the road surfaces and flowers on the ground. You can specify, which vivid texturing is done. Refer to How to Create the Scene with Vivid Textures on page 58.

The 3-D object of the road geometry consists of a lot of polygons that form road course. Before the road is generated, you can select the accuracy of the road geometry. If you select a low accuracy, few polygons are used for the road. This reduces the required calculation power when MotionDesk displays the 3-D object but the road may look squared. If the accuracy is higher, more polygons are used to form the 3-D object. This increases the required calculation power when MotionDesk displays the 3-D object but the road looks smoother. Refer to How to Specify the Accuracy and Complexity of the Road Network on page 51.

In the MotionDesk options, you can also select the level of detail and complexity used for generating the scenery. For more information, refer to How to Specify the Scenery Complexity Level on page 57.

Tip

Generation can take a lot of time depending on the size of the scenery. Here are some tips for optimizing your work:

- First generate only the road. When it fulfills your requirements, you can continue by generating the road and the scenery.
- If you want to work with different roads, create an experiment for each road. Then you do not have to generate the scenery again when switching to a different road.
- When you generate a scene for a traffic scenario, you might have a high number of fellows. This can lead to a memory problem with the graphics adapter. To avoid this, you can increase the texture compression. Refer to Render Options Page (MotionDesk Scene Animation 🕮).

Setting other static objects

So that MotionDesk is able to place the 3-D objects for the scenery correctly, you must specify two properties for other static 3-D objects.

Allow auto placement If Allow auto placement is selected for a 3-D object, the generated objects are allowed to be placed on the object during automatic scenery generation. This property must be selected for objects such as ground plates and hills.

Exclude from collision check If the Exclude from collision check is selected for a 3-D object, the object is excluded from check whether the automatically generated objects collides with it or not. This property must be selected for domes.

Scene generation with ModelDesk and MotionDesk

Scene generation involves two software tools. You specify all the scene settings in ModelDesk. ModelDesk provides the configuration data to MotionDesk, which generates the scene. Each time you modify the settings, the configuration data is also new and the scene must be synchronized. There are two synchronization methods. The method which is used depends on where ModelDesk and MotionDesk are installed.

ModelDesk and MotionDesk run on the same PC If ModelDesk and MotionDesk run on the same PC, ModelDesk can start scene generation via an automation interface. You must only call a command in ModelDesk and then MotionDesk generates the scene. Refer to How to Synchronize When MotionDesk and ModelDesk Run on the Same PC on page 59.

ModelDesk and MotionDesk run on different PCs In a multi-PC solution, ModelDesk and MotionDesk might not run on the same PC. ModelDesk then cannot use an automation interface to start scene generation but saves the configuration data to a folder instead. This folder must be accessible by all the MotionDesk PCs that have to generate the same scene. The MotionDesk PCs check the folder for new data and start scene synchronization when new data is found. You can let the MotionDesk PCs check the folder automatically at a specified time interval or run the check manually. Refer to How to Synchronize When MotionDesk and ModelDesk Run on Different PCs on page 61.

Related topics

Basics

Basics on Roads 46

HowTos

How to Specify the Scenery Complexity Level 57

How to Specify the Scenery Complexity Level

Objective

You can specify the complexity level used for certain scenery objects during scene generation in ModelDesk.

Scenery generation

You can specify the complexity level for the generation of the scenery from ModelDesk. This applies to certain scenery elements, for example, guard rails, noise barriers and trees.

You can specify to apply the same level of detail to all of these scenery object types or select different levels of detail for specific groups of scenery objects.

The level of detail for the scenery elements is controlled by the number of polygons used to draw the wireframe of the objects before the rendering. If you have specified a very high complexity, more polygons must be drawn. This has a negative impact on the performance during rendering. The frame rate is lower where a higher number of polygons are drawn.

Each 3-D object in the scene consists of polygons. The more polygons are used for a 3-D object, the better are the accuracy of the 3-D object's contour. You can influence the accuracy of the road's 3-D object.

Note

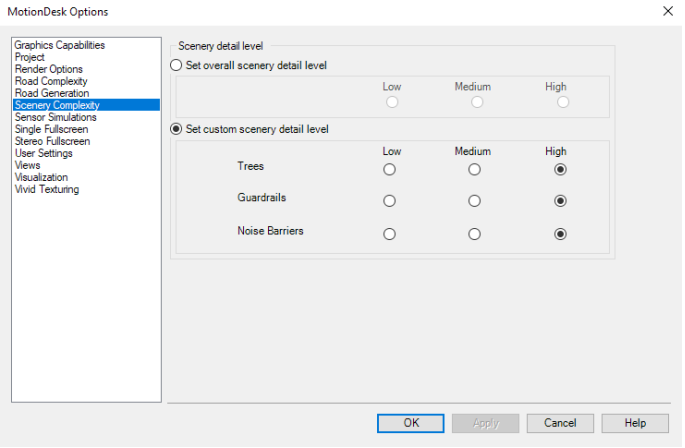
Higher complexity optimization and appearance accuracy of the 3-D objects can reduce the performance due to memory consumption and the calculation power required. The road generation time from ModelDesk also increases.
You must set the road and scenery optimization settings before you generate the scene from ModelDesk to ensure that the tiles are loaded near the observer at run time when playing the animation or moving around the scene.

Method

To specify the scenery complexity level

1 On the File ribbon, click Options to open the MotionDesk Options dialog.

2 Open the Scene Complexity page.



3 Select to set the level of detail for the overall scenery or to customize each group of scenery objects.

4 Select the level of detail for the generation:

- Low
- Medium
- High

5 Click OK to confirm your settings and close the dialog.

Result

In the next scene generation from ModelDesk, the 3-D objects of the scenery are generated with the specified accuracy.

Related topics

References

Scenery Complexity Options Page.....88

How to Create the Scene with Vivid Textures

Objective

MotionDesk can add textures to the road and the scenery to make them look more realistic.

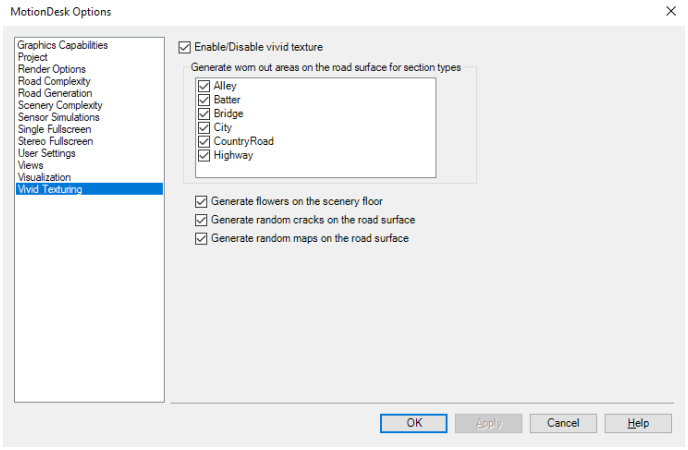
Vivid texturing

Vivid textures are worn out areas, random cracks, and random texture maps on the road surfaces and flowers on the scenery ground. You can enable or disable the generation of vivid texturing.

Method

To create the scene with vivid textures

1. On the File ribbon, click Options to open the MotionDesk Options dialog.
2. Open the Vivid Texturing page.



3. To enable vivid texturing, select Enable/Disable vivid texture. Vivid texturing must be globally enabled before you can select any kind of vivid textures.
4. Select the kind of vivid textures that should be used in scene generation.
5. Click OK to confirm your settings and close the dialog.

Result

In the next scene generation, the road and scenery are generated with the selected vivid textures.

Related topics

References

Vivid Texturing Options Page.....90

How to Synchronize When MotionDesk and ModelDesk Run on the Same PC

Objective

If MotionDesk and ModelDesk run on the same PC, ModelDesk can update the scene in a running MotionDesk session.

Roads in MotionDesk

For basic information on scene generation, refer to Using Scene Generation on page 54.

Tip

Updating road, scenery, or fellow vehicles automatically

ModelDesk can update the road, scenery or fellow vehicles automatically when you download the road or scenario to the simulation platform. To activate the automatic update, you must enable the option in the Scene Synchronization Customization dialog.

Preconditions

- ModelDesk and MotionDesk must be running on the same PC.
- In ModelDesk, the open project and experiment must contain the road that is used in the simulation.
- In MotionDesk, the open project and experiment must contain the scene that is used as the virtual world for the visualization.

Method

To synchronize when MotionDesk and ModelDesk run on the same PC

1 In ModelDesk, activate the road that you want to use in MotionDesk.

2 You can select which kind of 3-D objects are updated. Updating the scenery can be very time-consuming.

To update the scene in MotionDesk, go to the Environment ribbon and click Scene Synchronization and one of the following commands:

Command	Purpose
Complete	To update the road, scenery, and traffic objects.
Fellows	To update only the traffic objects used as fellows in a scenario.
Road – Complete Road	To update the road, static traffic objects, and scenery.
Road – Road with Objects	To update the road and the static traffic objects.
Road – Objects Only	To update only the traffic objects used for the scenery.
Road – Scenery Only	To update only the scenery of the road.

3 To observe a specific area in the scene, open the corresponding preview pane in ModelDesk, move the mouse pointer to the area, and select Show in MotionDesk from the context menu.

The ModelDesk Observer is moved to the corresponding area in MotionDesk.

Result

The scene is updated in the scene of the currently running MotionDesk session.

Tip

Neither the Road Generator nor MotionDesk checks whether manually placed static objects and the road overlap. As static objects are not part of the simulation model, overlapping does not affect the simulation, but the visualization may be affected. In this case, you can move the static objects to other positions.

Related topics

Basics

Basics of Observers and the ModelDesk Observer (MotionDesk Scene Animation 🕮)

References

Complete (ModelDesk Scene Synchronization 🕮)
Complete Road (ModelDesk Scene Synchronization 🕮)
Customize (ModelDesk Scene Synchronization 🕮)
Fellows (ModelDesk Scene Synchronization 🕮)
Objects Only (ModelDesk Scene Synchronization 🕮)
Road with Objects (ModelDesk Scene Synchronization 🕮)
Scenery Only (ModelDesk Scene Synchronization 🕮)
Show in MotionDesk (ModelDesk Road Creation 🕮)

How to Synchronize When MotionDesk and ModelDesk Run on Different PCs

Objective

If MotionDesk and ModelDesk run on different PCs, ModelDesk can provide configuration data for scene generation in MotionDesk. This method can be used to synchronize the scene on several MotionDesk PCs.

Basics

ModelDesk writes the configuration data to a folder. This is read by all the MotionDesk that need the same scene, and they use it to generate the scene. You can start this procedure manually or it is started automatically by MotionDesk.

Note

Whenever the scenery of a road is generated, MotionDesk calculates the positions of static 3-D objects which can therefore vary in the scenes of different MotionDesk sessions.

Working with traffic objects

The Traffic Object Manager must have access to the 3-D object library for specifying traffic objects. If MotionDesk and ModelDesk are installed on different PCs, this is not possible because the 3-D object library is not installed with ModelDesk and you cannot use traffic objects by default. To use traffic objects, you must manually copy the 3-D object library to the ModelDesk PC before. Refer to How to Use the dSPACE Objects Library on a PC Without a MotionDesk Installation (ModelDesk Traffic Object Management 🕮).

Basic scene

Only the road, scenery and fellow vehicles are synchronized. All the other static 3-D objects are not synchronized automatically. You must manually create a basic scene and distribute it to all the involved MotionDesk PCs. You can do this in the following way.

- Define a project and experiment at one MotionDesk PC.
- Create a basic scene. It must have a plate, a dome and the movable objects (for example, chassis, tire). Other static 3-D objects can also be added.
- Create a backup of the project and experiment.
- Copy the backup file to the other MotionDesk PCs and open it there.

Preconditions

- ModelDesk and all the involved MotionDesk PCs must have access to the same folder in the file system.
- The MotionDesk PCs all have the same basic scene (scene without road, scenery, and fellow vehicles).

Workflow

To synchronize when MotionDesk and ModelDesk run on different PCs

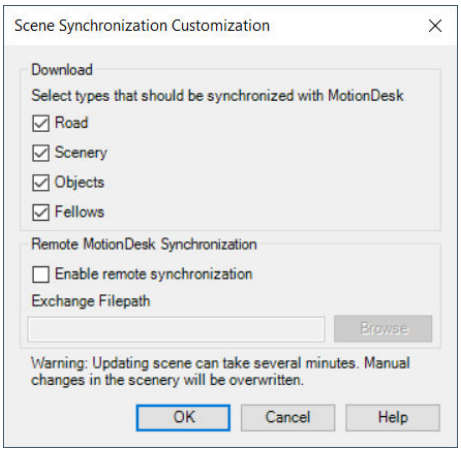
- Use ModelDesk to the create the configuration data, refer to Part 1 on page 62.
- Use MotionDesk to create the scene based on the configuration data, refer to Part 2 on page 63.

Part 1

To create the synchronization data using ModelDesk

1. On the ModelDesk PC, start ModelDesk and load the project and experiment.
2. Activate the road that you want to use in MotionDesk.
3. On the Environment ribbon, click Scene Synchronization – Customize.

The Scene Synchronization Customization dialog opens.



4 Select Enable remote synchronization.

5 In Exchange Filepath, specify the folder for the configuration data and click OK.

6 You can select which kinds of 3-D objects are updated. Updating the scenery can be very time-consuming.

To update the scene in MotionDesk, go to the Environment ribbon and click Scene Synchronization and one of the following commands:

Command	Purpose
Complete	To update the road, scenery, and traffic objects.
Fellows	To update only the traffic objects used as fellows in a scenario.
Road – Complete Road	To update the road, static traffic objects, and scenery.
Road – Road with Objects	To update the road and the static traffic objects.
Road – Objects Only	To update the traffic objects used for the scenery only.
Road – Scenery Only	To update the scenery of the road only.

ModelDesk writes the configuration data to the specified folder.

Result

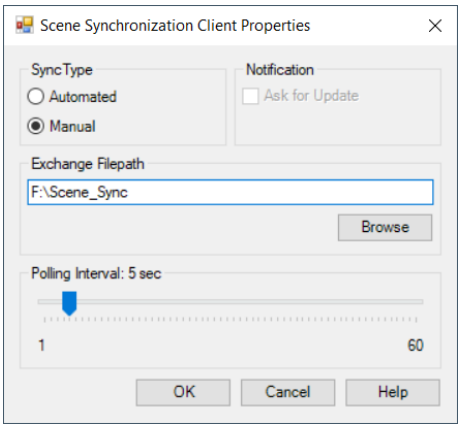
The configuration data is available for the MotionDesk PCs. You must do the following steps at each MotionDesk PC.

Part 2

To create the scenery in MotionDesk by reading the configuration data

1 On a MotionDesk PC, start MotionDesk and load the project and experiment with the basic scene (refer to Basic scene on page 62).

2 In MotionDesk's Home ribbon, click Multi-PC – Customize.
The Scene Synchronization Client Properties opens.



3 In Exchange Filepath, specify the folder containing the configuration data.

4 Specify the other parameters.

5 Click OK.

6 To start scene synchronization manually, go to the Home ribbon and click Multi-PC – Synchronize.

Result

The road is updated in the scenes of the involved MotionDesk session.

Tip

Neither the Road Generator nor MotionDesk checks whether manually placed static objects and the road overlap. As static objects are not part of the simulation model, overlapping does not affect the simulation, but the visualization may be affected. In this case, you can move the static objects to other positions.

Related topics

References

Complete (ModelDesk Scene Synchronization 🕮)
Complete Road (ModelDesk Scene Synchronization 🕮)
Customize (ModelDesk Scene Synchronization 🕮)
Customize (Scene Synchronization Client Properties)..... 93
Fellows (ModelDesk Scene Synchronization 🕮)
Objects Only (ModelDesk Scene Synchronization 🕮)
Road with Objects (ModelDesk Scene Synchronization 🕮)
Scenery Only (ModelDesk Scene Synchronization 🕮)
Synchronize..... 92

Reference Information

Where to go from here

Information in this section

Scene Editing Commands

Where to go from here

Information in this section

Add Light

Access

You can access this command via:

Ribbon	None
Context menu of	▪ Static objects in **Scene Navigator** ▪ Movable objects in **Scene Navigator**
Shortcut key	None
Icon	None

Purpose

To add a light object to a 3-D object in advanced lighting mode.

Result

A light object is added.

Related topics

HowTos

How to Add Light Objects to 3-D Objects....43

References

Delete Light....70
Light Properties....76

Align Free Observer

Access

You can access this command via:

Ribbon	▪ Scene – Observer ▪ Observation – Observer
Context menu of	None
Shortcut key	None
Icon	

Purpose

To align the view of a free observer parallel to the base plate.

Result

The roll and pitch of the active view are set to zero. In other words, the view is parallel to the base plate through all angles of azimuth.

Description

The roll and pitch of observers that are defined as *Free* can be altered freely using the mouse in conjunction with the **Tab** key. If when altering the observer view you lose your orientation in the virtual world, you can quickly realign the view with this command.

Related topics

Basics

Basics of Observers and the ModelDesk Observer (MotionDesk Scene Animation 🕮)
Working with Observers in Zone Navigation Mode (MotionDesk Scene Animation 🕮)

Copy

Access

You can access this command via:

Ribbon	Scene – Clipboard Observation – Clipboard
Context menu of	3-D View
Shortcut key	`Ctrl+C`
Icon	

Purpose

To copy the current selected object, instrument, or observer to the Clipboard.

Result

The object, instrument, or observer is available via the Clipboard.

Related topics

References

Paste.....71

Create New Group

Access

You can access this command via:

Ribbon	None
Context menu of	▪ Static Objects in Scene Navigator ▪ Group of static objects in Scene Navigator
Shortcut key	None
Icon	None

Purpose

To create a new group of static objects.

Description

You can create groups of static objects under the **Static Objects** node in the **Scene Navigator** or in an already existing group. This makes it possible to structure the static objects hierarchically.

To add a static object to a group, drag the object to the group in the **Scene Navigator**.

To remove a static object from a group, drag the static object to another group or to the **Static Objects** node in the **Scene Navigator**.

Result

A new object group is created.

Related topics

HowTos

How to Create Groups of Static Objects 20

Delete

Access

You can access this command via:

Ribbon	Scene – Clipboard
Context menu of	Object in the 3-D View
Shortcut key	`Delete`
Icon	

Purpose

To delete the current selection from the project.

Result

The object is deleted from the project.

Note

The object is not saved in the Clipboard for further use.

Related topics

HowTos

How to Delete Objects from the Scene....22

Delete Light

Access

You can access this command via:

Ribbon	None
Context menu of	Light objects in **Scene Navigator**
Shortcut key	None
Icon	None

Purpose

To delete a light object.

Result

The light object is deleted.

Related topics

HowTos

How to Add Light Objects to 3-D Objects....43

References

Add Light....66
Light Properties....76

Fly to Object

Access

You can access this command via:

Ribbon	None
Context menu of	Static and movable objects folder in **Scene Navigator**

Shortcut key	Ctrl + F
Icon	

Purpose

To move a free observer to the desired object.

Description

You can use this command to quickly locate a static or movable object. The desired object appears in the active view. The command works only for views that are assigned to free observers.

Related topics

HowTos

How to Insert Static Objects Into a Scene..... 18

Paste

Access

You can access this command via:

Ribbon	Scene – Clipboard Observation – Clipboard
Context menu of	3-D View
Shortcut key	**Ctrl+V**
Icon	

Purpose

To paste Clipboard contents into the current window.

Result

The content of the Clipboard is added into the current window.

Related topics

References

Copy..... 68

Rotate

Access

You can access this command via:

Ribbon	Scene - Scene Editing
Context menu of	3-D View
Shortcut key	**Ctrl+Alt+R**
Icon	

Purpose

To rotate an object.

Description

Select an object in the 3-D View, and click Rotate or press **Ctrl+Alt+R**. The three rotation movement directions around the -x, -y, and -z axes are displayed as colored circles around the object.

To rotate the object, move the mouse over one of the circles. It changes color to yellow. Click and hold the left mouse button and move the mouse in the direction you want to rotate the object. You can also rotate an object by entering numerical values in the Orientation properties.

Related topics

HowTos

How to Rotate Static Objects....26

References

Object Properties....77

Scale

Access

You can access this command via:

Ribbon	Scene - Scene Editing
Context menu of	3-D View
Shortcut key	**Ctrl+Alt+S**
Icon	

Purpose

To scale an object.

Description

Select an object in the 3-D View, and click Scale or press **Ctrl+Alt+S**. The three scaling movement directions around the -x, -y, and -z axes are displayed as colored lines at the center of the object.

To resize the object, move the mouse over one of the lines. It changes color to yellow. Click and hold the left mouse button and move the mouse in the direction you want to resize the object.

You can also resize an object by entering percentages in the Scale properties. You can also keep the original proportions by selecting Uniform scaling before you change the scale properties in the Properties pane for the object.

Related topics

HowTos

How to Resize Objects in the Scene....23

References

Object Properties....77

Translate

Access

You can access this command via:

Ribbon	Scene - Scene Editing
Context menu of	3-D View
Shortcut key	**Ctrl+Alt+W**
Icon	

Purpose

To move an object.

Description

Select an object in the 3-D View, and click Translate or press **Ctrl+Alt+T**. The three translate movement directions along the -x, -y, and -z axes are displayed as colored lines from the center point of the object.

To move the object, move the mouse over one of the lines. It changes color to yellow. Click and hold the left mouse button and move the mouse in the direction you want to move the object. You can also move an object by entering numerical values in the Position properties.

Related topics

HowTos

How to Change the Position of Static Objects....24

References

Object Properties....77

Scene Properties

Where to go from here

Information in this section

Environment Properties

Purpose

To change properties of the environment.

Description

When you click the Environment node in the Scene Navigator, you can specify its properties.

Environment properties

Ground texture Lets you specify the texture for the ground plate. When you click the Browse button, a dialog opens that lets you select an image file to be used as texture. You can use image files in the TGA, PNG, and JPG format.

Ground visible Lets you specify to use the ground plate of the environment. You can also use a static 3-D object as ground plate instead of the ground plate of the environment.

Ground z-position Lets you specify the z-position of the ground plate. You can use this property to adjust the ground plate to the road.

Sky height offset Lets you specify an offset for the height of the dome. You can use this property to adjust the dome to the ground plate.

Sky orientation Lets you specify the orientation of the dome around the z-axis.

Sky texture Lets you specify the texture for the dome. When you click the Browse button, a dialog opens that lets you select an image file to be used as texture. You can use image files in the TGA, PNG, and JPG format.

Sky visible Lets you specify to use the dome of the environment. You can also use a static 3-D object as dome instead of the dome of the environment.

World environment Displays the name of the environment.

Related topics

HowTos

How to Create a Virtual World in MotionDesk 16

Light Properties

Purpose

To change properties of a light object added to static or movable objects.

Description

In the advanced lighting mode, you can add light objects to static and movable objects. You can specify the characteristics of each light object using the following properties.

Light properties

Color Lets you specify the color of the light.

Luminance distribution Lets you specify the luminance distribution of the light to simulate a real light source from measured data. The distribution is specified by a gray-scale image file in TGA, JPG, GIF, or PNG format. The maximum size of the image is 16384 × 16384 pixel, but it is recommended to use smaller images, for example, up to 2048 pixels to minimize the memory consumption.

Name Lets you specify the name of the light object.

Intensity Lets you specify the intensity of the light.

Switched on Lets you specify whether the light is on or off.

Type Lets you specify the type of the light object. MotionDesk supports a pyramid and a conical light type. Refer to Basics of Light Objects on page 40.

Light geometry

Falloff range Lets you specify the range of the light from which the light's intensity falls off to zero at maximum range.

Heading Lets you specify the heading of the light direction in degrees.

Inner angle or horiz. angle Lets you specify the inner angle or horizontal angle of the light. This is the inner angle of the cone light, where light is emitted at full intensity. If the light is a pyramid light, it is the horizontal angle.

Maximum range Lets you specify the maximum light range, from which light intensity falls off to zero.

Outer angle or vert. angle Lets you specify the outer angle or vertical angle of light. This is the cutoff angle of the cone light, which defines the outer boundary of the light. If the light is a pyramid light, it is the vertical angle.

Pitch Lets you specify the pitch of the light direction in degrees.

X-Offset Lets you specify the offset of the light source in the x direction in meters.

Y-Offset Lets you specify the offset of the light source in the y direction in meters.

Z-Offset Lets you specify the offset of the light source in the z direction in meters.

Data source

Data source Lets you specify which type of data source is used for controlling the light.

Data source type Lets you specify the name of the data source for controlling the light.

Index Lets you specify the index of the data source for controlling the light.

Related topics

Basics

Basics of Light Objects....40
Basics of the Advanced Lighting Mode....38

HowTos

How to Add Light Objects to 3-D Objects....43

References

Render Options Page (MotionDesk Scene Animation 🕮)

Object Properties

Purpose

To change properties of a selected 3-D object.

Description

The object property values are displayed in the object properties window. You can also change some properties (translation, rotation, scaling) using the mouse.

General properties

Allow auto placement Lets you allow other 3-D objects to be placed onto the object when scenery is automatically generated for a road. This property must be selected for ground plates. For more information, refer to Basics on Roads on page 46.

Cast shadow Lets you enable shadow casting for the 3-D object if shadows are globally enabled. Shadow casting can be disabled only in the custom atmospherics mode.

Exclude from collision check Lets you ignore the object in z-position calculation in automatic scenery generation. This property must be selected for domes. For more information, refer to Basics on Roads on page 46.

Fellow index Displays the index of a fellow vehicle.

File path Displays the location of the 3-D object in the 3-D library.

dSPACE objects are stored in a default folder.

Custom objects are stored in a user-defined folder. Refer to How to Change the Location of the Custom Objects Library (MotionDesk Custom Object Library Management 🕮).

ID Some static properties contain an ID, for example, markers that are added to the ModelDesk road and generated in the MotionDesk scene.

The ID is defined in ModelDesk and is a display field in the MotionDesk properties.

Is fixed to world Lets you specify to fix the 3-D object to the world. Fixing a 3-D object protects it against unintentional moving. If the option is activated, the object is fixed.

Is grouped Indicates whether the 3-D object is a member of a group.

Is Instanced Displays whether hardware instancing is used accelerate object rendering.

Is selectable Lets you specify whether the object is selectable. When an object is selectable, you can cut, copy, and paste it in the 3-D View. When created, objects are selectable by default. You can ensure that they cannot be selected individually by clearing the option to prevent the object from being selected unintentionally.

Is visible Lets you specify whether the object is visible or invisible in the scene. 3-D objects are visible by default. You can make them invisible individually by clearing the checkbox.

Keywords Displays the keywords assigned to the object. You assign keywords to objects during the import process. Keywords can be used to filter objects in the library.

Motion Data Lets you choose the motion data for the currently selected object. The motion data names are held in the MDF file or defined in the MD_Object block of the simulation model. Refer to MD_Object (MotionDesk Calculating and Streaming Motion Data 🕮)). If a 3-D object is not connected to motion data, that is, you selected **Not connected**, a red question mark is

displayed next to its name in the **Scene Navigator**. This field is hidden for static objects.

Tip

Another way to assign motion data to movable objects is to drag it from the **Data Stream Selector** to the **Scene Navigator**. For more information, refer to Data Stream Selector (MotionDesk Scene Animation 🕮).

Name Lets you specify the name of the object.

The names of 3-D objects in the scene do not have to be unique. Names must consist of alphanumeric characters. Using underline characters and blanks is allowed but special characters are not recommended.

Object color Lets you select a custom color for the parts of a 3-D object that has no texture. You can select a color in the color range, edit the RGB or HEX values, or drag the color picker to the scene to apply a new color.

For many objects, you must enable the **Use Custom Color** property (see Use custom color on page 80). Route colors can be changed without this property.

Render Mode Lets you specify the render mode of the object. The render mode affects how detailed and realistic objects are. There are several render modes for 3-D objects.

Mode	Description
Textured	The object is textured. Rendering with texture mapping requires a long processing time even if you use modern hardware-accelerated graphics cards. It is the technique with the most realistic effect available in MotionDesk.
Transparent	The object is transparent. This option corresponds to the **Transparency** property. The value of the **Transparency** can be edited only if the render mode option is set to transparent.
Wireframe	The object is wireframed. This mode displays all the edges of the model's polygons. It is the fastest rendering method, but the 3-D object is not very realistic.

Visibility filter Lets you specify if the 3-D object or animated character is displayed in the observer view and select from which sensors the object is visible.

- Observer
- Camera and Fish-eye
- Laser
- Radar
- Lidar

Transparency Lets you specify the transparency of the 3-D object. The transparency value can be edited only if the render mode is set to **Transparent**. The value can be between 0 and 100. Zero transparency results in an opaque object. A value of 100 results in a transparent object.

Note

Transparent Objects

Transparent objects placed inside other transparent objects can disappear in Simple Lighting mode. Weather conditions, for example, rain, and snow can also be hidden behind transparent objects. This is due to a graphics limitation.

You can switch Advanced Lighting. For troubleshooting, refer to Transparent Objects and Weather Conditions are Hidden on page 122.

Use custom color Lets you enable the use of a custom color. If enabled, the color that is specified by the Color property is used for the 3-D object (see Object color on page 79).

Orientation

X-Rotation Lets you specify the rotation of the 3-D object around its x-axis in degrees in the range -360° to 360°.

Y-Rotation Lets you specify the rotation of the 3-D object around its y-axis in degrees in the range -360° to 360°.

Z-Rotation Lets you specify the rotation of the 3-D object around its z-axis in degrees in the range -360° to 360°.

Position

X-Position Lets you specify the position of the 3-D object in the x-direction in meters to its original position when generated in the scene.

Y-Position Lets you specify the position of the 3-D object in the y-direction in meters to its original position when generated in the scene..

Z-Position Lets you specify the position of the 3-D object in the z-direction in meters to its original position when generated in the scene..

Scale

Uniform scaling Lets you resize or scale an object while maintaining the object proportions. When you select Uniform scaling and change the individual X-Scale, Y-Scale, and Z-Scale properties, the other properties also change. The three axes can also be scaled individually if Uniform scaling is not selected.

X-Scale Lets you specify a scaling factor for the 3-D object in its x-direction.

Y-Scale Lets you specify a scaling factor for the 3-D object in its y-direction.

Z-Scale Lets you specify a scaling factor for the 3-D object in its z-direction.

Related topics

HowTos

How to Insert Static Objects Into a Scene.....18

References

Subobject Properties

Purpose

To change properties of a selected 3-D subobject.

Description

The subobject property values are displayed in the object properties window.

Subobject properties

Axis (Only valid if the Matrix accessor property is 'DoubleColumn') Lets you specify the axis for which the values of the selected double column are used.

Current state Lets you specify the current state of the subobject manually. This value is overwritten when a simulation or a replay is started.

The values which are selectable depend on the kind of object and subobject. The following table shows an example of different objects of the dSPACE objects library with their subobjects and selectable current state values.

Object	Subobject	Current State
ASM_Truck	Brakelight	Current state specifies the lighting of the brake light. Values: default, on, off
	Turnlight_L	Current state specifies the lighting of the left turn light. Values: off, light_on, on
	Turnlight_R	Current state specifies the lighting of the right turn light. Values: off, light_on, on
	Tire_FL	Current state specifies the rolling of the front left tire. Values: still, roll
	Tire_FR	Current state specifies the rolling of the front right tire. Values: still, roll
	Tire_RL	Current state specifies the rolling of the rear left tire. Values: still, roll
	Tire_RR	Current state specifies the rolling of the rear right tire. Values: still, roll
Horse	Animation	Current state specifies the kind of motion. Values: idle, stand, walk, run
	Appearance	Current state specifies the appearance. Values: horse_black, horse_white, horse_brown

Object	Subobject	Current State
Female_Casual_1	Animation	Current state specifies the kind of motion. Values: idle, stand, walk, stroll, walk fast, jog, run, passenger
	Clothing	Current state specifies the clothing. Values: casual_1, … casual_9
	Ethnical Look	Current state specifies the ethnical look. Values: white, black, asian, hispanic, white2
State_Arrow_BlueY	Force	Current state specifies whether data is applied for the object. Values: apply_data
State_Sensor_Green	Hit point	Current state specifies whether data is applied for the object. Values: apply_data

Simulation mode Lets you select the simulation mode.

Value	Description
Instrument data type	The subobject is connected to an instrument data stream. The signals must be calculated in the simulation and sent to MotionDesk via the MD_Instrumentation block. The signal is selected in the Data stream property.
Internal simulation	(Only valid for chassis with wheels objects in the current MotionDesk version) The state of the subobject is calculated by MotionDesk. For example, when you enable Internal simulation for tires, the rotation of the wheels are calculated from the velocity of the corresponding chassis.
Motion data stream	(Only valid for state arrows and sensor points) Normally, a motion data stream contains 12 values for specifying the position and orientation of a movable object in each frame. Refer to Structure of the Motion Data File (MotionDesk Scene Animation 🕮). The motion data stream can be used to transfer data for state objects. To get values for state objects, the 12 values can be interpreted as 4 column vectors (4 · 1 x 3) or 2 double columns (2 · 2 x 3).

Data stream Lets you select one of the signals in the data stream to feed the subobject with data when the simulation mode is an instrument data type.

Matrix accessor (Only valid if the Simulation mode property is 'Motion data stream') Lets you specify how to interpret the 12 values of a frame.

Value	Description
Column	The values are interpreted as 4 column vectors with 3 elements each.
DoubleColumn	The values are interpreted as 2 double column vectors with 3 elements each. The values are interpreted as 2 double columns. One double column has 6 elements (1 vector (x, y, z) and 3 forces (F_x, F_y, F_z))

Matrix column (Only valid if the Matrix accessor property is 'Column') Lets you specify the column that contains the values for the state object.

Matrix double column (Only valid if the Matrix accessor property is 'DoubleColumn') Lets you specify the double column that contains the values for the state object.

Name Displays the name of the subobject.

Related topics

Basics

Basics of Using State Objects in the Scene (MotionDesk Scene Animation 🕮)

HowTos

How to Use State Objects in MotionDesk (MotionDesk Scene Animation 🕮)

Dialogs and Pages

Where to go from here

Information in this section

Road Complexity Options Page

Access

This page is part of the MotionDesk Options dialog.

Purpose

To specify the complexity and detail accuracy of roads generated from ModelDesk.

Description

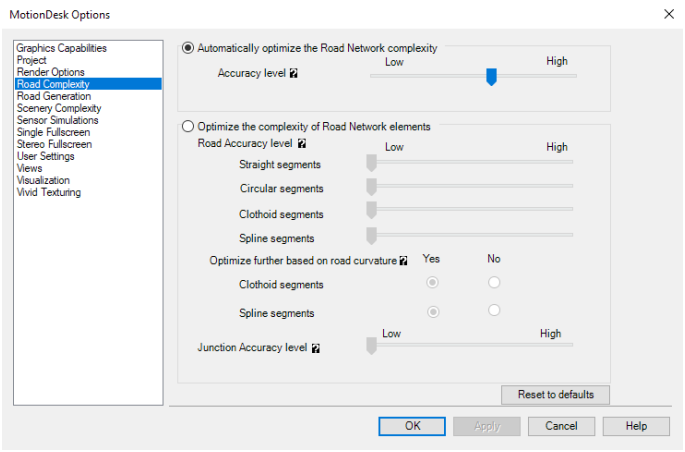
To specify the complexity and detail accuracy of roads generated from ModelDesk.

If the accuracy is low, as few polygons as possible are used to form the 3-D object of the road.

If the accuracy is high, many polygons are used to form the 3-D object of the road.

Note

Higher complexity optimization and appearance accuracy of the 3-D objects can reduce the performance due to memory consumption and the calculation power required. The road generation time from ModelDesk also increases.
You must set the road and scenery optimization settings before you generate the scene from ModelDesk to ensure that the tiles are loaded near the observer at run time when playing the animation or moving around the scene.



Dialog settings

Automatically optimize the road network complexity You can select to automatically optimize the complexity of the whole road network while generating the scene from ModelDesk. The closer the slider is set to **High**, the more polygons are used in the drawing of all sections of the road network when downloading the scene from ModelDesk.

Optimize the complexity of the road network elements You can select to optimize the complexity of each segment type used in the road network while generating the scene from ModelDesk. The closer the slider is set to **High** for each segment type, the more polygons are used in the drawing of the segments when downloading the scene from ModelDesk.

Road accuracy level Identifies segment types to optimize the complexity level by setting the accuracy level individually:

- Straight segments
- Circular segments
- Clothoid segments
- Spline segments

Optimize further based on road curvature Lets you specify to further optimize the complexity of the clothoid and spline segments. MotionDesk uses many polygons for strong curvatures and few polygons for low curvatures.

These segment types usually have a varied curvature that can be optimized by using a different number of polygons depending on the degree of curvature.

Segment types to optimize individually:

- Clothoid segments
- Spline segments

Junction accuracy level Move the slider to adjust the complexity level of the junctions.

Reset to defaults Lets you reset the settings to the default values.

Related topics

Basics

Using Scene Generation 54

HowTos

How to Specify the Accuracy and Complexity of the Road Network 51

References

MotionDesk Options (MotionDesk Basics 🕮)
Road Generation Options Page 86

Road Generation Options Page

Access

This page is part of the MotionDesk Options dialog.

Purpose

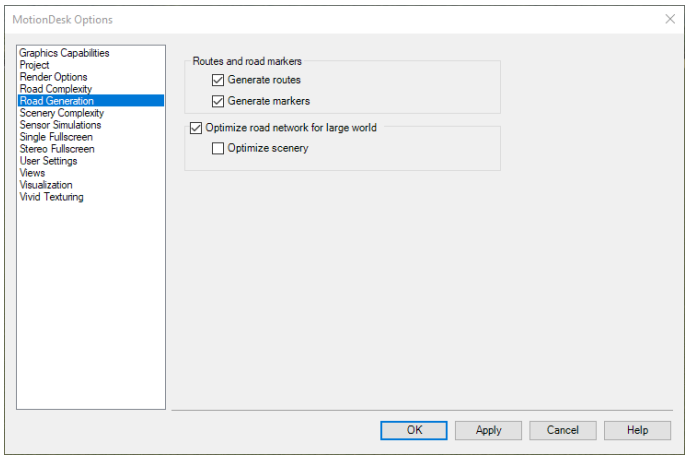
To specify if the ModelDesk routes, route start and end markers, and position markers are generated and displayed in the MotionDesk scene.

Description

In ModelDesk, you can create routes including trajectories and add route markers. You can also add position markers as shapes to the road network elements.

In the MotionDesk options, you can select to generate routes and markers in the MotionDesk scene. They are displayed in the 3-D View. They are not included in the sensor data or displayed in the sensor composition window in sensor simulation.

You can also optimize the road network and scenery generation for complex scenes that contain large road networks and detailed scenery.



Dialog settings

Routes and road markers You can select to generate the routes and markers separately when downloading or synchronizing the scene from ModelDesk to MotionDesk.

- Generate routes: Lets you generate and display the routes, including any trajectories, that are added in the ModelDesk road network to the MotionDesk project. The route start and end markers are also generated if generate routes is selected.
- Generate markers: Lets you generate and display the position markers that are added as shapes in the ModelDesk road network to the MotionDesk project.

Note

Generate routes and Generate markers are not selected by default when upgrading MotionDesk.

Optimize road network for large world Lets you select to optimize the road network when generating larger and more complex road networks in a scene without reducing the performance of the animation or the observer navigation in the scene.

The road network is generated in graphic tiles. When optimized is selected, the tiles are dynamically loaded near the observer during animation and when moving the observer in the scene. In addition, only the geometries/polygons around the observer view are drawn in greater detail.

The rendering engine then renders the polygons. You can also set the rendering options. Refer to Render Options Page (MotionDesk Scene Animation 🕮).

Optimize scenery Lets you optimize the scenery to dynamically generate the graphic tiles of the scenery objects around the observer. You must first select to Optimize road networks for large worlds to also optimize the scenery.

Related topics

Basics

Basics on Routes and Markers in MotionDesk....28
Using Scene Generation....54

HowTos

How to Select the Generation of ModelDesk Routes and Markers....52

References

MotionDesk Options (MotionDesk Basics 🕮)
Road Complexity Options Page....84

Scenery Complexity Options Page

Access

This page is part of the MotionDesk Options dialog.

Purpose

To specify the complexity and accuracy of sceneries generated from ModelDesk.

Description

To specify the complexity and accuracy of sceneries generated from ModelDesk. You can specify to set a level of detail across all scenery elements or for each of the individual elements of the scenery.

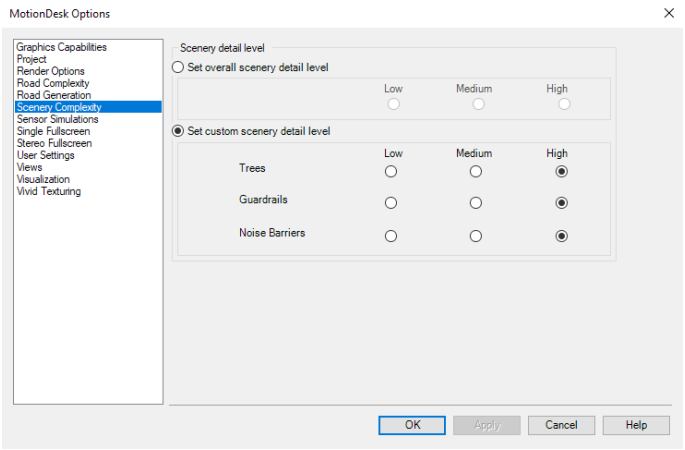
If the accuracy is low, as few polygons as possible are used to form the 3-D object of the road.

If the accuracy is high, many polygons are used to form the 3-D object of the road.

Note

Higher complexity optimization and appearance accuracy of the 3-D objects can reduce the performance due to memory consumption and the calculation power required. The road generation time from ModelDesk also increases.

You must set the road and scenery optimization settings before you generate the scene from ModelDesk to ensure that the tiles are loaded near the observer at run time when playing the animation or moving around the scene.



Dialog settings

Set overall scenery detail level You can set the level of detail for the generation of the scenery during scene animation.

You can select Low, Medium, or High for the level of detail that applies to all elements of the scenery during the scene generation.

Set custom scenery detail level You can set a level of detail for the generation of each element of the scenery.

You can select Low, Medium, or High for the level of detail for the generation of each of the following elements of the scenery during scene animation:

- Trees: Applies to forests and roadside tree lines.
- Guardrails: Applies to rails, posts, and guards.
- Noise barriers

Related topics

Basics

Using Scene Generation 54

HowTos

How to Specify the Scenery Complexity Level 57

References

MotionDesk Options (MotionDesk Basics 🕮)

Vivid Texturing Options Page

Access

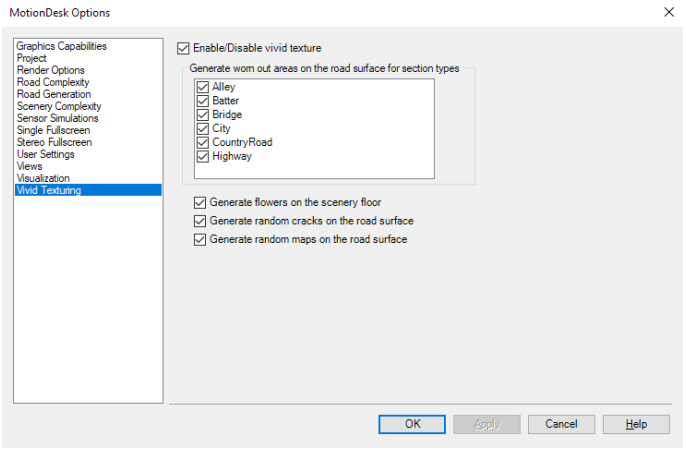
This page is part of the MotionDesk Options dialog.

Purpose

To enable/disable the appearance of vivid texturing.

Description

When you use vivid texturing, the textures of the scenery become more detailed to make the scene look more realistic. You can select the elements that are improved. It is possible to visualize flowers on the ground, worn-out areas, random cracks, or random texture maps on road surfaces.



Dialog settings

Enable/Disable vivid texture Lets you enable or disable the generation of vivid textures.

Generate worn out areas on the road surface for section types Lets you select the section types for which worn-out areas on road surfaces are generated.

Generate flowers on the scenery floor Lets you specify whether to generate flowers on the ground of the scenery.

Generate random cracks on the road surface Lets you specify whether to generate random cracks on the road surface.

Generate random texture maps on the road surface Lets you specify whether to generate random texture maps on the road surface.

Related topics

Basics

Using Scene Generation 54

HowTos

How to Create the Scene with Vivid Textures 58

References

MotionDesk Options (MotionDesk Basics 🕮)

Scene Synchronization Commands

Introduction

The following topics provide information on commands and dialogs for scene synchronization from a ModelDesk session running on another PC.

Where to go from here

Information in this section

Information in other sections

Synchronize

Access

You can access this command via:

Ribbon	Home – Multi-PC
Context menu of	None
Shortcut key	None
Icon	

Purpose

To start scene synchronization manually.

Result

The scene is updated based on a configuration file written by ModelDesk.

Description

The command starts scene synchronization based on the configuration data stored in a specified folder. It is only necessary to use the command when ModelDesk runs on another PC and cannot access MotionDesk to start the synchronization. It is possible to let MotionDesk start synchronization automatically. The synchronization type and the folder are specified in the Scene

Synchronization Client Properties dialog. Refer to Customize (Scene Synchronization Client Properties) on page 93.

Related topics

HowTos

How to Synchronize When MotionDesk and ModelDesk Run on Different PCs..... 61

Customize (Scene Synchronization Client Properties)

Access

You can access this command via:

Ribbon	Home – Multi-PC
Context menu of	None
Shortcut key	None
Icon	

Purpose

To specify the settings for scene synchronization.

Result

Scene generation is synchronized automatically or manually.

Description

The command opens the Scene Synchronization Client Properties dialog for you to specify the type of scene synchronization and the settings for automatic scene synchronization.

Dialog settings

Sync Type Indicates whether scene synchronization is started automatically or manually.

- Automated: Scene synchronization is started automatically. If Ask for Update is selected, you must confirm the synchronization before it is started. In Polling Interval you can specify the time interval at which MotionDesk checks for new configuration data.
- Manual: The synchronization is started manually by using the Synchronize command.

Ask for Update Lets you select whether you must confirm the scene synchronization if automatic synchronization is selected.

Exchange Filepath Lets you specify the folder for the configuration data. The same folder must be specified in ModelDesk.

Polling interval Lets you specify a time interval in which MotionDesk checks for new configuration data.

Related topics

HowTos

How to Synchronize When MotionDesk and ModelDesk Run on Different PCs..... 61

Automation

Where to go from here

Information in this section

Information in other sections

Introduction to the MotionDesk Automation Interface (MotionDesk Automation 🕮)
Introduces the MotionDesk automation interface and the required user experience.

Features of MotionDesk Automation Interface (MotionDesk Automation 🕮)
Describes the features of the MotionDesk automation interface.

Overview of the Object Model (MotionDesk Automation 🕮)
Shows you the object dependencies, object attributes and methods in the MotionDesk object model at a glance.

Example of Automating MotionDesk with a Python Script (MotionDesk Automation 🕮)
Code examples demonstrate how you can automate MotionDesk with a Python script.

Classes for Scene Creation

Where to go from here

Information in this section

MovableObject

Purpose

To specify a movable object.

Class Description (MovableObject)

Syntax

```
MovableObject = MovableObjects.Item()
```

Purpose

To specify a movable object.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
Children	MovableObjectManager[1)]	To get a child object.
CustomIdentifier	String	To get the identifier.
FellowIndex	Integer	To get/set the index of the fellow.
GeometryFilePath	String	To get/set the path of the geometry file.
IsGrouped	Boolean	To check whether the object is grouped.
IsVisible	Boolean	To get/set the visibility of the object.
MotionDataID	Integer	To get/set the ID of the motion data assigned to the object.
MotionDataStream	String	To get/set the motion data stream.
Name	String	To get/set the name of the object.
RenderMode	RenderModes[2)]	To get/set the render mode.
Subobjects	SubObjectManager[3)]	To get all the subobjects of the object.
Transparency	Double	To get/set the transparency of the object in transparent render mode.
XPosition	Double	To get/set the position of the object in x direction.
XRotation	Double	To get/set the rotation of the object in x direction.
XScale	Double	To get/set the scale value of the object in x direction.
YPosition	Double	To get/set the position of the object in y direction.
YRotation	Double	To get/set the rotation of the object in y direction.
YScale	Double	To get/set the scale value of the object in y direction.
ZPosition	Double	To get/set the position of the object in z direction.
ZRotation	Double	To get/set the rotation of the object in z direction.
ZScale	Double	To get/set the scale value of the object in z direction.
UniformScaling	Boolean	To get/set uniform scaling value of the object.

1) Refer to MovableObjectManager on page 98.
2) Refer to RenderModes on page 118.
3) Refer to SubObjectManager on page 115.

Methods

–

Related topics

References

MovableObjectManager

Purpose

To handle the movable objects of a MotionDesk experiment.

Where to go from here

Information in this section

Class Description (MovableObjectManager)

Syntax

Is not created directly.

```
VisualizationManager = Experiment.VisualizationManagement
MovableObjects = VisualizationManager.MovableObjects
```

Purpose

To handle the movable objects of a MotionDesk experiment.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
Count	Integer	To get the number of movable objects in the collection.

Methods

The class contains the following methods:

Method	Purpose
Add	To add an object to the collection. Refer to Add on page 99.
Item	To access an object of the collection. Refer to Item on page 100.
Remove	To remove an object from the collection. Refer to Remove on page 101.

Related topics

References

Class Description (Experiment) (MotionDesk Project and Experiment Management 🕮)
Class Description (VisualizationManager) (MotionDesk Scene Animation 🕮)

Add

Class

MovableObjectManager

Syntax

```
MyMovableObjects.Add(elementType, libraryElementRelPath,
ObjectNameInScene)
```

Purpose

To add a movable object to the collection.

Parameters

The method uses the following parameters:

Parameter	Type	Description
elementType	LibraryElementTypes[1)]	Library that contains the object to be added.
libraryElementRelPath	String	Path and name of the object which you want to add from the library. You must specify the path to the object as you see it in the Library Browser.
ObjectNameInScene	String	Name of the object in the scene

1) LibraryElementTypes is a constant specifying the library, refer to LibraryElementTypes on page 119.

Return value

The method returns the following parameter:

Type	Description
MovableObject[1)]	The specified movable object.

1) Refer to MovableObject on page 96.

Example

If you want to add 'Car_Combi' from the dSPACE objects library, you must call

```
MovableObjects.Add(0, r"Car_Combi\Car_Combi", "Chassis")
sleep(2)
```

The `sleep` command ensures that the object is completely added before it is accessed by another method. This is especially required if the object has a large geometry.

Related topics

References

Class Description (MovableObjectManager)..... 98

Item

Class

MovableObjectManager

Syntax

```
MyMovableObjects.Item(ObjectIdentifier, IdentifierType)
```

Purpose

To access a movable object of the collection by its name or index.

Parameters

The method uses the following parameters:

Parameter	Type	Description
ObjectIdentifier	Object	Specifies the identifier of the object. The identifier can be a name or an index. This is specified by the `IdentifierType` parameter.
IdentifierType	IdentifierTypes[1)]	Specifies the type of the identifier: ▪ 0: Identifier is a name ▪ 1: Identifier is an index

1) Refer to IdentifierTypes on page 118.

Return value

The method returns the following parameter:

Type	Description
MovableObject[1)]	The specified movable object.

1) Refer to MovableObject on page 96.

Related topics

References

Class Description (MovableObjectManager)..... 98

Remove

Class

MovableObjectManager

Syntax

```
MyMovableObjects.Remove(ObjectName)
```

Purpose

To remove an object from the collection.

Parameters

The method uses the following parameters:

Parameter	Type	Description
ObjectName	String	Name of the object to be removed.

Return value

The method returns the following parameter:

Type	Description
Boolean	True if the object is removed.

Related topics

References

Class Description (MovableObjectManager)..... 98

SceneManager

Purpose

To manage the scene.

Where to go from here

Information in this section

Class Description (SceneManager)

Syntax

```
SceneManager = Experiment.SceneManagement
```

Purpose

To manage the scene.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
IsLoadingSceneCompleted	Boolean	To get information whether the scene is completely loaded.

Methods

The class contains the following method:

Method	Purpose
GenerateScene	To generate a new scene. Refer to GenerateScene on page 103.
GenerateSceneExtended	To start the automatic scene generation. Refer to GenerateSceneExtended on page 104.
ReloadScene	To reload the scene. Refer to ReloadScene on page 105.
ReplaceScene	To replace the current scene by another scene. Refer to ReplaceScene on page 105.
SceneState	To check the state of the scene. Refer to SceneState on page 106.
SynchronizationMode	To check the synchronization mode. Refer to SynchronizationMode on page 107.
SynchronizationState	To check the synchronization state. Refer to SynchronizationState on page 107.
UpdateFellows	To update the 3-D objects in the scene. Refer to UpdateFellows on page 108.

Related topics

References

Class Description (Experiment) (MotionDesk Project and Experiment Management 🕮)

GenerateScene

Class

SceneManager

Syntax

```
MySceneManagement.GenerateScene(roadNetworkFilePath)
```

Purpose

To generate a new scene.

Parameters

The method uses the following parameters:

Parameter	Type	Description
roadNetworkFilePath	String	Path to the file of the road model to be generated.

Return value

–

Related topics

References

Class Description (SceneManager)..... 102

GenerateSceneExtended

Class

SceneManager

Syntax

```
MySceneManagement.GenerateSceneExtended(roadNetworkFilePath, flags)
```

Purpose

To generate a road with or without scenery in the scene automatically.

Description

MotionDesk can generate 3-D static road network objects and scenery around the road network automatically. The road and scenery are specified with ModelDesk. The `GenerateSceneExtended` method starts the automatic scene generation.

Parameters

The method uses the following parameters:

Parameter	Type	Description
roadNetworkFilePath	String	Path to the file of the road model to be generated.
flags	GenerationFlags[1)]	Flag to define the part of the road model that is generated ▪ `Road`: Generates only the road ▪ `Environment`: Generates only the scenery ▪ `Traffic`: Generates the traffic objects ▪ `Road|Environment`: Generates the road and the scenery ▪ `Road|Traffic`: Generates road with traffic objects

1) Refer to GenerationFlags on page 117.

Return value

–

Related topics

Basics

Scene Generation 45

References

Class Description (SceneManager) 102

ReloadScene

Class

SceneManager

Note

This function is no longer supported.
If you try to use this function, a warning message is displayed.

Syntax

```
MySceneManagement.ReloadScene()
```

Purpose

To reload the scene.

Parameters

–

Return value

–

ReplaceScene

Class

SceneManager

Note

This function is no longer supported.
If you try to use this function, a warning message is displayed.

Syntax	`MySceneManagement.ReplaceScene(string sceneFilePath)`
Purpose	To replace the current scene by another scene.
Parameters	–
Return value	–
Related topics	References Class Description (SceneManager)..... 102

SceneState

Class	SceneManager
Syntax	`State = MySceneManagement.SceneState()`
Purpose	To check the state of the scene.
Parameters	–
Return value	The method returns the following parameter:

Type	Description
SceneStates[1)]	The state of the scene.

1) Refer to SceneStates on page 118.

Related topics	References Class Description (SceneManager)..... 102

SynchronizationMode

Class

SceneManager

Syntax

```
Mode = MySceneManagement.SynchronizationMode()
```

Purpose

To check the synchronization mode.

Parameters

–

Return value

The method returns the following parameter:

Type	Description
SynchronizationModes[1)]	The synchronization mode.

1) Refer to SynchronizationModes on page 118.

Related topics

References

Class Description (SceneManager)..... 102

SynchronizationState

Class

SceneManager

Syntax

```
State = MySceneManagement.SynchronizationState()
```

Purpose

To check the synchronization state.

Parameters

–

Return value

The method returns the following parameter:

Type	Description
SynchronizationStates[1)]	The synchronization state.

1) Refer to SynchronizationStates on page 118.

Related topics

References

Class Description (SceneManager)..... 102

UpdateFellows

Class

SceneManager

Syntax

```
MySceneManagement.UpdateFellows(string trafficFellowsFilePath)
```

Purpose

To update the 3-D objects in the scene.

Parameters

The method uses the following parameters:

Parameter	Type	Description
trafficFellowsFilePath	String	Path of the file containing the traffic fellows descriptions.

Return value

–

Related topics

References

Class Description (SceneManager)..... 102

StaticObject

Purpose To specify a static object.

Class Description (StaticObject)

Syntax

```
StaticObject = StaticObjects.Item()
```

Purpose To specify a static object.

Attributes The class contains the following attributes:

Attributes	Type	Purpose
Children	StaticObjectManager[1)]	To get a child object.
CustomIdentifier	String	To get the identifier.
GeometryFilePath	String	To get/set the path of the geometry file.
IsVisible	Boolean	To get/set the visibility of the object.
Name	String	To get/set the name of the object
IsGrouped	Boolean	To check whether the object is grouped.
RenderMode	RenderModes[2)]	To get/set the render mode.
Subobjects	SubObjectManager[3)]	To get all the subobjects of the object.
Transparency	Double	To get/set the transparency of the object in transparent render mode.
XPosition	Double	To get/set the position of the object in x direction.
XRotation	Double	To get/set the rotation of the object in x direction.
XScale	Double	To get/set the scale value of the object in x direction.
YPosition	Double	To get/set the position of the object in y direction.
YRotation	Double	To get/set the rotation of the object in y direction.
YScale	Double	To get/set the scale value of the object in y direction.
ZPosition	Double	To get/set the position of the object in z direction.
ZRotation	Double	To get/set the rotation of the object in z direction.

Attributes	Type	Purpose
ZScale	Double	To get/set the scale value of the object in z direction.
UniformScaling	Boolean	To get/set uniform scaling value of the object.

1) Refer to StaticObjectManager on page 110.
2) Refer to RenderModes on page 118.
3) Refer to SubObjectManager on page 115.

Methods

–

Related topics

References

StaticObjectManager

Purpose

To handle the static objects of a MotionDesk experiment.

Where to go from here

Information in this section

Class Description (StaticObjectManager)

Syntax

```
VisualizationManager = Experiment.VisualizationManagement
StaticObjects = VisualizationManager.StaticObjects
```

Purpose

To handle the static objects of a MotionDesk experiment.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
Count	Integer	To get the number of static objects in the collection.

Methods

The class contains the following methods:

Method	Purpose
Add	To add an object to the collection. Refer to Add on page 111.
AddGroup	To add a group of static objects. Refer to AddGroup on page 112.
Item	To access an object of the collection. Refer to Item on page 113.
Remove	To remove an object from the collection. Refer to Remove on page 114.

Related topics

References

Class Description (Experiment) (MotionDesk Project and Experiment Management 🕮)
Class Description (VisualizationManager) (MotionDesk Scene Animation 🕮)

Add

Class

StaticObjectManager

Syntax

```
MyStaticObjects.Add(elementType, libraryElementRelPath,
ObjectNameInScene)
```

Purpose

To add a static object to the collection.

Parameters

The method uses the following parameters:

Parameter	Type	Description
elementType	LibraryElementTypes[1)]	Library that contains the object to be added (`dSPACE` or `Customer`).
libraryElementRelPath	String	Path and name of the object which you want to add from the library. You must specify the path to the object as you see it in the Library Browser.
ObjectNameInScene	String	Name of the object in the scene

1) `LibraryElementTypes` is a constant specifying the library, refer to LibraryElementTypes on page 119.

Return value

The method returns the following parameter:

Type	Description
StaticObject[1)]	The specified static object.

1) Refer to StaticObject on page 109.

Example

If you want to add 'GrassPlate1000' from the dSPACE objects library, you must call

```
StaticObjects.Add(0, r"Env_Plates\GrassPlate1000", "Grass Plate")
sleep(2)
```

The `sleep` command ensures that the object is completely added before it is accessed by another method. This is especially required if the object has a large geometry.

Related topics

References

Class Description (StaticObjectManager)..... 111

AddGroup

Class

StaticObjectManager

Syntax

```
MyStaticObjects.AddGroup(GroupedObjectName)
```

Purpose

To add a group of static objects to the collection.

Parameters

The method uses the following parameters:

Parameter	Type	Description
GroupObjectName	String	Name of the group

Return value

None

Related topics

References

Class Description (StaticObjectManager)..... 111

Item

Class

StaticObjectManager

Syntax

```
MyStaticObjects.Item()
```

Purpose

To access a static object of the collection by its name or index.

Parameters

The method uses the following parameters:

Parameter	Type	Description
ObjectIdentifier	Object	Specifies the identifier of the object. The identifier can be a name or an index. This is specified by the `IdentifierType` parameter.
IdentifierType	IdentifierTypes	Specifies the type of the identifier: ▪ 0: Identifier is a name ▪ 1: Identifier is an index

Return value

The method returns the following parameter:

Type	Description
StaticObject[1)]	The specified static object.

1) Refer to StaticObject on page 109.

Related topics

References

Class Description (StaticObjectManager)..... 111

Remove

Class

StaticObjectManager

Syntax

```
MyStaticObjects.Remove(ObjectName)
```

Purpose

To remove an object from the collection.

Parameters

The method uses the following parameters:

Parameter	Type	Description
ObjectName	String	Name of the object to be removed.

Return value

The method returns the following parameter:

Type	Description
Boolean	True if the object is removed.

Related topics

References

Class Description (StaticObjectManager)..... 111

SubObjectManager

Purpose

To handle the subobjects of a static or movable object.

Where to go from here

Information in this section

Class Description (SubObjectManager)

Syntax

```
SubObjects = StaticObject.SubObjects
SubObjects = MoveableObject.SubObjects
```

Purpose

To handle the subobjects of a static or movable object.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
Count	Integer	To get the number of subobjects.

Methods

The class contains the following methods:

Method	Purpose
Item	To access a subobject. Refer to Item on page 116.

Related topics

References

Item

Class

SubObjectManager

Syntax

```
SubObjectManager.Item(object ItemIdentifier)
```

Purpose

To access a subobject.

Parameters

The method uses the following parameters:

Parameter	Type	Description
ItemIdentifier	object	Identifier of the subobject. The identifier can be specified as string (subobject name) or integer (index)

Return value

The method returns the following parameter:

Type	Description
SubObject[1)]	The specific subobject.

[1)] Refer to SubObject on page 116.

Related topics

References

Class Description (SubObjectManager)..... 115

SubObject

Purpose

To specify a subobject.

Class Description (SubObject)

Syntax

```
SubObject = StaticObject.SubObjects.Item()
SubObject = MoveableObject.SubObjects.Item()
```

Purpose

To specify a subobject.

Attributes

The class contains the following attributes:

Attributes	Type	Purpose
CurrentState	String	To get/set the current state.
DataStream	String	To get/set the data stream.
Name	String	To get the name of the subobject.
SimulationMode	SimulationModes[1)]	To get/set the simulation mode.

1) Refer to SimulationModes on page 118.

Methods

–

Related topics

References

Class Description (MovableObject)..... 96
Class Description (StaticObject)..... 109

Enumerations

Enumerations for Scene Creation

Introduction

You can use predefined constants in the tool automation.

Enumerations

The following constants can be used for tool automation.

GenerationFlags Constants to specify scene generation.

Value	Description
Road = 0x1	Generates the road static object
Environment = 0x2	Generates the scenery of a road static object
Traffic = 0x4	Generates the scenery such as fellows, for a traffic scenario

You can combine the flags. For example, to generate road and its scenery, use `Road|Environment`.

IdentifierTypes Constants to identify objects.

Value	Description
ByName	Object is identified by its name.
ByIndex	Object is identified by its index.
ByCustomIdentifier	Object is identified by a custom identifier.

RenderModes Constants to specify the render mode of a 3-D object:

Value	Description
Textured	The 3-D object has the textured render mode.
Wireframe	The 3-D object has the wire-frame render mode.
Transparent	The 3-D object has the transparent render mode.

SceneStates Constants to specify states of the scene.

Value	Description
NotLoaded	No scene is loaded.
Unloading	The scene is unloaded.
Loading	The scene is loading.
Loaded	The scene is loaded.

SimulationModes Constants to specify the simulation mode:

Value	Description
InstrumentDataStream	The subobject is connected to an instrument data stream.
InternalSimulation	The state of the subobject is calculated by MotionDesk. This is only valid for chassis with wheels objects in the current MotionDesk version.
MotionDataStream	The subobject is connected to a data stream selected from the motion data.

SynchronizationModes Constants to specify the synchronization mode.

Value	Description
NoSynchronization	No synchronization.
Local	The scene of MotionDesk on the same PC is synchronized.
Remote	The scene of MotionDesk on remote PCs are synchronized.

SynchronizationStates Constants to specify states of the synchronization.

Value	Description
NoSynchronization = 1	No synchronization.
RoadUpdating = 2	The road is updated.
SceneryUpdating = 4	The scenery is updated.
FellowUpdating = 8	The fellows are updated.

You can combine the flags. For example, to check whether road and its scenery is updated, use `RoadUpdating|SceneryUpdating`.

LibraryElementTypes Constants to specify the library of a 3-D object.

Value	Description
dSPACE	3-D object is from the dSPACE objects library.
Customer	3-D object is from the custom objects library.

Related topics

References

Enumerations for Handling MotionDesk (MotionDesk Basics 🕮)
Enumerations for Scene Animation (MotionDesk Scene Animation 🕮)

Troubleshooting (Scene Creation)

Where to go from here

Information in this section

Information in other sections

Troubleshooting (General) (MotionDesk Basics 🕮)

Troubleshooting (Scene Animation) (MotionDesk Scene Animation 🕮)

MotionDesk Crashes When Creating a Scene

Problem	MotionDesk crashes when you start creating a scene.
Reason	The graphics driver may be out-of-date.
Solution	Install the latest graphics driver for your graphics card. The manufacturer of the MotionDesk PC may provide a suitable graphics driver.

Movable Object is Static

Problem	An object which should be movable is assigned to the static objects.
Reason	The object was created as a static object.
Solution	Create the object as a movable object in the scene: 1. Delete the static object from the scene. 2. Drag the object with the right mouse button pressed to the scene again. A dialog opens for you to set the object as a movable object.
Related topics	HowTos How to Insert Movable Objects Into the Scene (MotionDesk Scene Animation 🕮)

Transparent Objects and Weather Conditions are Hidden

Problem	Transparent objects hide other transparent objects and weather atmospherics, for example, snow and rain when using simple lighting.
Reason	In the MotionDesk 3-D View, transparent objects are not correctly displayed as transparent, for example: ▪ Weather atmospherics, such as snow and rain are hidden behind transparent objects, for example, a car that is partly transparent. ▪ Transparent objects that are drawn inside other transparent objects are hidden, for example, a transparent steering wheel or seat that is placed inside a partly transparent car. The condition is limited to the MotionDesk **Simple Lighting** mode. It does not affect the **Advanced Lighting** mode. For more information of advanced lighting, refer to Basics of the Advanced Lighting Mode on page 38.

Solution

To display the transparent objects and weather conditions correctly, you can use MotionDesk in **Advanced Lighting** mode.

1. In **MotionDesk Options**, and select **Render Options** in the dialog.
2. Select **Advanced** in the **Lighting Mode** category.
3. Save, close and reopen your MotionDesk project.

In advanced lighting mode, snow and rain are visible through the transparent object. Any transparent objects drawn inside another transparent object are also visible.

Related topics

HowTos

How to Adjust Movable Objects (MotionDesk Scene Animation 🕮)
How to Insert Movable Objects Into the Scene (MotionDesk Scene Animation 🕮)

References

Object Properties..... 77

Numerics

A

B

C

D

E

F

G

L

M

O

P

R

S

T

U

V

W