

ModelDesk

Scene Synchronization

For ModelDesk 5.5

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About This Document

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This document introduces you to scene synchronization that allows to create a scene in MotionDesk on basis of the configuration in ModelDesk.

Symbols

dSPACE user documentation uses the following symbols:

Symbol	Description
	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	Indicates a hazard that, if not avoided, could result in property damage.
	Indicates important information that you should take into account to avoid malfunctions.
	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>

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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

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Basics of Synchronizing the Scene in MotionDesk

Introduction

ModelDesk provides the configuration data to MotionDesk for generating 3-D objects of a scene.

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 \(MotionDesk Scene Creation !\[\]\(34b4f260a8587d2e97eeaee361cc357b_img.jpg\)](#)). 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.



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 10.

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 12.

How to Start MotionDesk Using a User Function

Objective	You can create a user function to start MotionDesk and load a project and experiment with one click in ModelDesk.
User functions	<p>Using user function, you can start other tools by simply clicking a button in the ribbon of ModelDesk. This feature can be used to start MotionDesk and load the project and experiment that is associated with your ModeDesk project.</p> <div> <p>Tip</p> <p>To create the user function, you must specify the complete path to MotionDesk.exe and an argument containing the project path, project name, and experiment name. These values can be copied from a Windows shortcut to the MotionDesk project and experiment that you can create in MotionDesk. Refer to Create Shortcut (MotionDesk Project and Experiment Management) )</p> </div>
Preconditions	<ul style="list-style-type: none"> ▪ ModelDesk and MotionDesk must be installed on the same PC. ▪ The MotionDesk project and experiment must exist.
Method	<p>To start MotionDesk using a user function</p> <ol style="list-style-type: none"> 1 On the Automation ribbon, click User Functions – Customize. The User Functions dialog opens. 2 To create a new user function, click . A new item is created in the list. 3 Specify a name for the user function, for example, MotionDesk - Project <n>. 4 In the Command edit field, enter the complete path to the MotionDesk.exe. 5 In the Arguments edit field, enter the argument for the MotionDesk start: "Complete_Project_Path / Project_Name / Experiment_Name" 6 Click OK. 7 To test the user function, go to the Automation ribbon and click User Functions – Customize – MotionDesk - Project <n>. MotionDesk starts and loads the specified project and experiment. 8 If MotionDesk does not start, check the entry in the Command edit field. 9 If MotionDesk starts but the project and experiment is not loaded, check the entry in the Arguments edit field.

Result You can start MotionDesk in ModelDesk.

Related topics

Basics

[Basics on User Functions \(ModelDesk Basics !\[\]\(0f848bbd71cef6b345273b16f905912a_img.jpg\)\)](#)

References

[Create Shortcut \(MotionDesk Project and Experiment Management !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)\)](#)

[Customize \(User Functions\) \(ModelDesk Basics !\[\]\(de95854c7ee024cfadc48187bbb781b2_img.jpg\)\)](#)

[Execute \(User Function\) \(ModelDesk Basics !\[\]\(3211b5d1d968fc1665909b34f9f16010_img.jpg\)\)](#)

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 Roads for Simulation and Visualization \(ModelDesk Road Creation !\[\]\(9c2e8d1b5bd77cb5c9f83b7a9cff79fd_img.jpg\)\)](#).

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.


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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 !\[\]\(c694a3ff3b077d76910920a6a1593ab4_img.jpg\)](#)).

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).

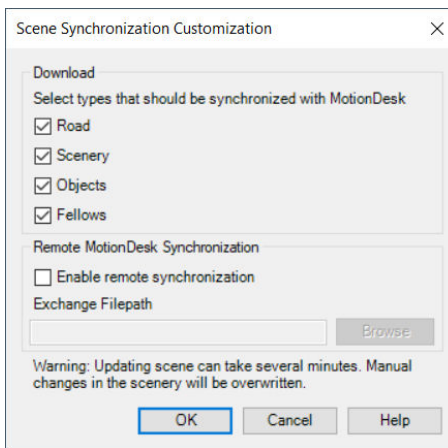
Workflow

To synchronize when MotionDesk and ModelDesk run on different PCs

- Use ModelDesk to create the configuration data, refer to [Part 1](#) on page 13.
- Use MotionDesk to create the scene based on the configuration data, refer to [Part 2](#) on page 14.

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.

Command	Purpose
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.

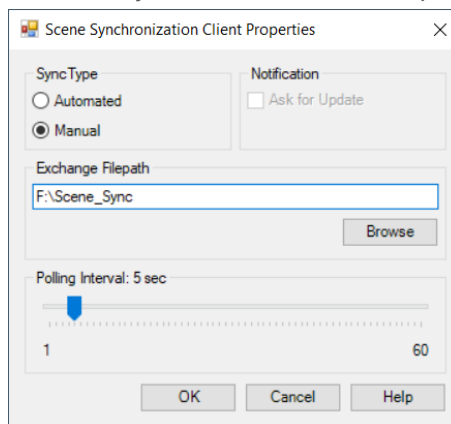
Result

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 12).
- 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.

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To update only the scenery of the active road in the open MotionDesk scene.	

Complete

Access

You can access this command via:

Ribbon	Environment – Scene Synchronization
Context menu of	None
Shortcut key	None
Icon	

Purpose

To update the active road, scene, traffic objects and fellows in the currently open MotionDesk scene.

Result

All 3-D objects are updated in MotionDesk.

Description

The Road Generator updates the 3-D objects of the road, its scenery, traffic objects, and fellows in the currently running MotionDesk session.

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Complete Road




Access

You can access this command via:

Ribbon	Environment – Scene Synchronization
Context menu of	None
Shortcut key	None
Icon	

Purpose	To update the active road and its scenery in the currently open MotionDesk scene.
Result	The 3-D objects of the road and its scenery are updated in MotionDesk.
Description	The Road Generator updates the 3-D objects of the road and its scenery in the scene of the currently running MotionDesk session.
Related topics	<p>HowTos</p> <p>How to Synchronize When MotionDesk and ModelDesk Run on Different PCs..... 12</p> <p>How to Synchronize When MotionDesk and ModelDesk Run on the Same PC..... 10</p> <p>References</p> <p>Complete..... 18</p> <p>Fellows..... 21</p> <p>Road with Objects..... 22</p>

Customize

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Ribbon	Environment – Scene Synchronization								
Context menu of	None								
Shortcut key	None								
Icon									
Purpose	To specify the automatic synchronization of road, scenery, traffic objects, or fellow vehicles and the settings for remote MotionDesk synchronization.								
Description	<p>You can specify scene synchronization settings in MotionDesk in the Scene Synchronization Customization dialog.</p> <p>Download Lets you synchronize the road, scenery, objects, or fellows with MotionDesk. If an option is set and a road is downloaded to the simulation platform, the object is also updated in the scene in MotionDesk.</p>								

Remote MotionDesk synchronization If you have several MotionDesk PCs connected in a multi-PC solution, you can enable remote synchronization. ModelDesk writes the configuration data for the scene to the specified folder. Each MotionDesk PC which can access the folder can generate the scenery from this data (see [Customize \(Scene Synchronization Client Properties\) \(MotionDesk Scene Creation !\[\]\(21199eb166cc97331a0c54c649195dcc_img.jpg\)](#))).

Result

The scene synchronization is specified.

Scene Synchronization Customization dialog

Road Lets you specify to update the road 3-D objects in MotionDesk whenever you download the road to the simulation platform.

Scenery Lets you specify to update the scenery of a road 3-D object in MotionDesk whenever you download the road to the simulation platform.

Note

Note that scene generation can take a lot of time depending on the size of the scenery.

Objects Lets you specify to update the traffic objects in MotionDesk whenever you download the road to the simulation platform.

Fellows Lets you specify to update the fellows in MotionDesk whenever you download the road to the simulation platform.

Enable remote synchronization Lets you enable remote synchronization. You can use this option to get the same scenery in all the MotionDesk PCs in a multi-PC solution.

Exchange Filepath Lets you specify the path file where the files for remote synchronization are stored. Use a folder that can be read by all the MotionDesk PCs in the multi-PC solution.


Related topics**HowTos**

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Fellows

Access

You can access this command via:

Ribbon	Environment – Scene Synchronization
Context menu of	None
Shortcut key	None
Icon	

Purpose

To update the fellows of a traffic scenario in the currently open MotionDesk scene.

Result

The 3-D objects of the fellows are updated in MotionDesk.

Description

The Road Generator updates the 3-D objects of the fellows in the scene of the currently running MotionDesk session.

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Objects Only




Access

You can access this command via:

Ribbon	Environment – Scene Synchronization – Road
Context menu of	None
Shortcut key	None
Icon	

Purpose	To update only the static traffic objects in the open MotionDesk scene.
Result	The traffic objects of the road are updated in the scene.
Description	The Road Generator updates the specified traffic objects in the scene of the active MotionDesk session.
Related topics	<p>HowTos</p> <p>How to Synchronize When MotionDesk and ModelDesk Run on Different PCs..... 12</p> <p>How to Synchronize When MotionDesk and ModelDesk Run on the Same PC..... 10</p> <p>References</p> <p>Complete..... 18</p> <p>Complete Road..... 18</p> <p>Follows..... 21</p> <p>Road with Objects..... 22</p> <p>Scenery Only..... 23</p>

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Access	<p>You can access this command via:</p> <table border="1"> <tr> <td>Ribbon</td><td>Environment – Scene Synchronization – Road</td></tr> <tr> <td>Context menu of</td><td>None</td></tr> <tr> <td>Shortcut key</td><td>None</td></tr> <tr> <td>Icon</td><td></td></tr> </table>	Ribbon	Environment – Scene Synchronization – Road	Context menu of	None	Shortcut key	None	Icon	
Ribbon	Environment – Scene Synchronization – Road								
Context menu of	None								
Shortcut key	None								
Icon									
Purpose	To update only the active road and traffic objects in the currently open MotionDesk scene.								
Result	The 3-D object of the road is updated in the scene.								
Description	The Road Generator updates the road 3-D object and the specified traffic objects in the scene of the currently running MotionDesk session.								

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Scenery Only

Access

You can access this command via:

Ribbon	Environment – Scene Synchronization – Road
Context menu of	None
Shortcut key	None
Icon	

Purpose

To update only the scenery of the active road in the open MotionDesk scene.

Result

The scenery is updated in the scene.

Description

The Road Generator updates the scenery of the road in the scene of the active MotionDesk session.

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