

Namespace Axys

Classes

[AxysPlugin](#)

Entry point for the Axys Rhino plug-in. Rhino creates a single instance of this class which manages the plug-in life cycle. The plug-in logs its load and shutdown events using [Logger](#).

[ScriptPipeMeshBlockCommand](#)

Automates the creation of a pipe from selected curves, meshes the result and defines a block instance from those meshes.

Class AxysPlugin

Namespace: [Axys](#)

Assembly: RhinoPlugin.dll

Entry point for the Axys Rhino plug-in. Rhino creates a single instance of this class which manages the plug-in life cycle. The plug-in logs its load and shutdown events using [Logger](#).

```
public class AxysPlugin : PlugIn
```

Inheritance

[object](#) ← PlugIn ← AxysPlugin

Inherited Members

[PlugIn.LoadPlugIn\(string, out Guid\)](#) , [PlugIn.Find\(Assembly\)](#) , [PlugIn.Find\(Guid\)](#) ,
PlugIn.LoadComputeExtensionPlugins() , [PlugIn.GetPluginSettings\(Guid, bool\)](#) ,
[PlugIn.SavePluginSettings\(Guid\)](#) , PlugIn.RaiseOnPlugInSettingsSavedEvent() ,
PlugIn.FlushSettingsSavedQueue() , [PlugIn.Icon\(Size\)](#) , PlugIn.GetCommands() ,
[PlugIn.DisplayHelp\(nint\)](#) , PlugIn.ResetMessageBoxes() , PlugIn.CreateCommands() ,
PlugIn.RegisterCommand(Command) , PlugIn.GetPlugInObject() ,
PlugIn.ShouldCallWriteDocument(FileWriteOptions) ,
PlugIn.WriteDocument(RhinoDoc, BinaryArchiveWriter, FileWriteOptions) ,
PlugIn.ReadDocument(RhinoDoc, BinaryArchiveReader, FileReadOptions) ,
[PlugIn.OptionsDialogPages\(List<OptionsDialogPage>\)](#) ,
[PlugIn.DocumentPropertiesDialogPages\(RhinoDoc, List<OptionsDialogPage>\)](#) ,
[PlugIn.ObjectPropertiesPages\(List<ObjectPropertiesPage>\)](#) ,
PlugIn.ObjectPropertiesPages(ObjectPropertiesPageCollection) ,
PlugIn.GetLicense(LicenseBuildType, ValidateProductKeyDelegate, OnLeaseChangedDelegate) ,
[PlugIn.GetLicense\(LicenseCapabilities, string, ValidateProductKeyDelegate, OnLeaseChangedDelegate\)](#) ,
[PlugIn.SetLicenseCapabilities\(string, LicenseCapabilities, Guid\)](#) ,
[PlugIn.AskUserForLicense\(LicenseBuildType, bool, string, object, ValidateProductKeyDelegate, OnLeaseChangedDelegate\)](#) ,
PlugIn.ReturnLicense() , [PlugIn.GetLicenseOwner\(out string, out string\)](#) , PlugIn.SaveSettings() ,
[PlugIn.CommandSettings\(string\)](#) , [PlugIn.GetPlugInInfo\(Guid\)](#) ,
[PlugIn.PlugInExists\(Guid, out bool, out bool\)](#) , PlugIn.GetInstalledPlugIns() ,
[PlugIn.GetInstalledPlugIns\(bool\)](#) , PlugIn.GetInstalledPlugInNames() ,
[PlugIn.GetInstalledPlugInNames\(PlugInType, bool, bool\)](#) ,
[PlugIn.GetInstalledPlugInNames\(PlugInType, bool, bool, bool\)](#) , PlugIn.GetInstalledPlugInFolders() ,

[PlugIn.NameFromPath\(string\)](#) , [PlugIn.PathFromName\(string\)](#) , [PlugIn.PathFromId\(Guid\)](#) ,
[PlugIn.IdFromPath\(string\)](#) , [PlugIn.IdFromName\(string\)](#) , [PlugIn.LoadPlugIn\(Guid\)](#) ,
[PlugIn.LoadPlugIn\(Guid, bool, bool\)](#) , [PlugIn.GetEnglishCommandNames\(Guid\)](#) ,
[PlugIn.SetLoadProtection\(Guid, bool\)](#) , [PlugIn.GetLoadProtection\(Guid, out bool\)](#) ,
PlugIn.IsTextureSupported(RenderTexture) , PlugIn.Assembly , PlugIn.Id , PlugIn.LicenseId ,
PlugIn.Name , PlugIn.Version , PlugIn.Description , PlugIn.LoadAtStartup , PlugIn.LoadTime ,
PlugIn.AddToHelpMenu , PlugIn.LocalPlugInName , PlugIn.SettingsDirectoryAllUsers ,
PlugIn.SettingsDirectory , PlugIn.Settings , PlugIn.WindowPositionSettings ,
PlugIn.AskOnLoadProtection , PlugIn.InstalledPlugInCount , PlugIn.UnknownUserData ,
PlugIn.SettingsSaved , [object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) ,
[object.GetHashCode\(\)](#) , [object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) ,
[object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

Constructors

AxysPlugin()

```
public AxysPlugin()
```

Properties

Instance

Gets the singleton instance of the plug-in created by Rhino.

```
public static AxysPlugin Instance { get; }
```

Property Value

[AxysPlugin](#)

Methods

OnLoad(ref string)

Initializes the plug-in when Rhino loads it.

```
protected override LoadReturnCode OnLoad(ref string errorMessage)
```

Parameters

errorMessage [string](#)

Receives a description in case the plug-in fails to load.

Returns

LoadReturnCode

The Rhino.Plugins.LoadReturnCode describing load success.

OnShutdown()

Invoked by Rhino during application shutdown to perform cleanup.

```
protected override void OnShutdown()
```

Class ScriptPipeMeshBlockCommand

Namespace: [Axys](#)

Assembly: RhinoPlugin.dll

Automates the creation of a pipe from selected curves, meshes the result and defines a block instance from those meshes.

```
public class ScriptPipeMeshBlockCommand : Command
```

Inheritance

[object](#) ← Command ← ScriptPipeMeshBlockCommand

Inherited Members

[Command.IsValidCommandName\(string\)](#) , [Command.GetMostRecentCommands\(\)](#) ,
[Command.RunProxyCommand\(Command.RunCommandDelegate, RhinoDoc, object\)](#) ,
Command.OnHelp() , Command.GetCommandStack() , Command.InCommand() ,
Command.InScriptRunnerCommand() , [Command.IsCommand\(string\)](#) ,
[Command.LookupCommandId\(string, bool\)](#) , [Command.LookupCommandName\(Guid, bool\)](#) ,
[Command.GetCommandNames\(bool, bool\)](#) , [Command.DisplayHelp\(Guid\)](#) ,
Command.ReplayHistory(ReplayHistoryData) , Command.LastCommandId ,
Command.LastCommandResult , Command.PlugIn , Command.Id , Command.LocalName ,
Command.Settings , Command.CommandContextHelpUrl , Command.BeginCommand ,
Command.EndCommand , Command.UndoRedo , [object.Equals\(object\)](#) ,
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

Properties

EnglishName

Gets the name of the command. This method is abstract.

```
public override string EnglishName { get; }
```

Property Value

[string](#)

Instance

Singleton instance of the command.

```
public static ScriptPipeMeshBlockCommand Instance { get; }
```

Property Value

[ScriptPipeMeshBlockCommand](#)

Methods

RunCommand(RhinoDoc, RunMode)

Pipes the selected curves, converts them to meshes and creates a block instance.

```
protected override Result RunCommand(RhinoDoc doc, RunMode mode)
```

Parameters

doc RhinoDoc

Active Rhino document.

mode RunMode

Execution mode.

Returns

Result

Result of the command execution.

Namespace Axys.Commands

Classes

[ExportToVision](#)

Exports geometry to USDZ format and streams the file to connected Axys clients via WebSocket.

[StartAxysCommand](#)

Rhino command that starts the local WebSocket server allowing external Axys clients to connect and exchange messages.

[TrackObjectCommand](#)

Wraps [ExecuteTrackObjectLogic\(RhinoDoc\)](#) in a Rhino command so object tracking can be invoked interactively.

Class ExportToVision

Namespace: [Axys.Commands](#)

Assembly: RhinoPlugin.dll

Exports geometry to USDZ format and streams the file to connected Axys clients via WebSocket.

```
public class ExportToVision : Command
```

Inheritance

[object](#) ← Command ← ExportToVision

Inherited Members

[Command.IsValidCommandName\(string\)](#) , [Command.GetMostRecentCommands\(\)](#) ,
[Command.RunProxyCommand\(Command.RunCommandDelegate, RhinoDoc, object\)](#) ,
Command.OnHelp() , Command.GetCommandStack() , Command.InCommand() ,
Command.InScriptRunnerCommand() , [Command.IsCommand\(string\)](#) ,
[Command.LookupCommandId\(string, bool\)](#) , [Command.LookupCommandName\(Guid, bool\)](#) ,
[Command.GetCommandNames\(bool, bool\)](#) , [Command.DisplayHelp\(Guid\)](#) ,
Command.ReplayHistory(ReplayHistoryData) , Command.LastCommandId ,
Command.LastCommandResult , Command.Plugin , Command.Id , Command.LocalName ,
Command.Settings , Command.CommandContextHelpUrl , Command.BeginCommand ,
Command.EndCommand , Command.UndoRedo , [object.Equals\(object\)](#) ,
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

Constructors

ExportToVision()

Initializes a new instance of the command and stores it in [Instance](#) for access from script commands.

```
public ExportToVision()
```

Fields

LastExportedUSDZPath

File path of the most recently exported USDZ file.

```
public static string LastExportedUSDZPath
```

Field Value

[string](#)

SelectedObjectId

Identifier of the object last selected for export.

```
public static Guid SelectedObjectId
```

Field Value

[Guid](#)

Properties

EnglishName

Gets the name of the command. This method is abstract.

```
public override string EnglishName { get; }
```

Property Value

[string](#)

Instance

Singleton instance created by Rhino so other classes can invoke the command.

```
public static ExportToVision Instance { get; }
```

Property Value

[ExportToVision](#)

Methods

ExportUSDZ(dynamic)

Handles the `ExportUSDZ` command received from a WebSocket connection.

```
public static Result ExportUSDZ(dynamic message)
```

Parameters

`message` dynamic

JSON payload describing the export request.

Returns

Result

`Rhino.Commands.Result.Success` if the request is dispatched.

Remarks

Execution is marshalled onto the Rhino UI thread.

RunCommand(RhinoDoc, RunMode)

Prompts the user for an object selection and stores the identifier for export. If no object is selected the command attempts to create a pipe → mesh → block and selects the resulting instance.

```
protected override Result RunCommand(RhinoDoc doc, RunMode mode)
```

Parameters

doc RhinoDoc

Active Rhino document.

mode RunMode

Execution mode.

Returns

Result

Rhino.Commands.Result.Success when an object is selected.

Class StartAxysCommand

Namespace: [Axys.Commands](#)

Assembly: RhinoPlugin.dll

Rhino command that starts the local WebSocket server allowing external Axys clients to connect and exchange messages.

```
public class StartAxysCommand : Command
```

Inheritance

[object](#) ← Command ← StartAxysCommand

Inherited Members

[Command.IsValidCommandName\(string\)](#) , [Command.GetMostRecentCommands\(\)](#) ,
[Command.RunProxyCommand\(Command.RunCommandDelegate, RhinoDoc, object\)](#) ,
Command.OnHelp() , Command.GetCommandStack() , Command.InCommand() ,
Command.InScriptRunnerCommand() , [Command.IsCommand\(string\)](#) ,
[Command.LookupCommandId\(string, bool\)](#) , [Command.LookupCommandName\(Guid, bool\)](#) ,
[Command.GetCommandNames\(bool, bool\)](#) , [Command.DisplayHelp\(Guid\)](#) ,
Command.ReplayHistory(ReplayHistoryData) , Command.LastCommandId ,
Command.LastCommandResult , Command.PlugIn , Command.Id , Command.LocalName ,
Command.Settings , Command.CommandContextHelpUrl , Command.BeginCommand ,
Command.EndCommand , Command.UndoRedo , [object.Equals\(object\)](#) ,
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

Properties

EnglishName

Gets the name of the command. This method is abstract.

```
public override string EnglishName { get; }
```

Property Value

[string](#)

Instance

Singleton instance created by Rhino so the command can be executed programmatically.

```
public static StartAxysCommand Instance { get; }
```

Property Value

[StartAxysCommand](#)

Methods

RunCommand(RhinoDoc, RunMode)

Starts the WebSocket server on the local machine.

```
protected override Result RunCommand(RhinoDoc doc, RunMode mode)
```

Parameters

doc RhinoDoc

Active Rhino document.

mode RunMode

Command run mode.

Returns

Result

Success if the server was started.

Class TrackObjectCommand

Namespace: [Axys.Commands](#)

Assembly: RhinoPlugin.dll

Wraps [ExecuteTrackObjectLogic\(RhinoDoc\)](#) in a Rhino command so object tracking can be invoked interactively.

```
public class TrackObjectCommand : Command
```

Inheritance

[object](#) ← Command ← TrackObjectCommand

Inherited Members

[Command.IsValidCommandName\(string\)](#) , [Command.GetMostRecentCommands\(\)](#) ,
[Command.RunProxyCommand\(Command.RunCommandDelegate, RhinoDoc, object\)](#) ,
Command.OnHelp() , Command.GetCommandStack() , Command.InCommand() ,
Command.InScriptRunnerCommand() , [Command.IsCommand\(string\)](#) ,
[Command.LookupCommandId\(string, bool\)](#) , [Command.LookupCommandName\(Guid, bool\)](#) ,
[Command.GetCommandNames\(bool, bool\)](#) , [Command.DisplayHelp\(Guid\)](#) ,
Command.ReplayHistory(ReplayHistoryData) , Command.LastCommandId ,
Command.LastCommandResult , Command.PlugIn , Command.Id , Command.LocalName ,
Command.Settings , Command.CommandContextHelpUrl , Command.BeginCommand ,
Command.EndCommand , Command.UndoRedo , [object.Equals\(object\)](#) ,
[object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) , [object.GetType\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) , [object.ToString\(\)](#)

Properties

EnglishName

Gets the name of the command. This method is abstract.

```
public override string EnglishName { get; }
```

Property Value

[string](#)

Instance

Singleton instance created by Rhino.

```
public static TrackObjectCommand Instance { get; }
```

Property Value

[TrackObjectCommand](#)

Methods

RunCommand(RhinoDoc, RunMode)

Executes the tracking routine and sends object information over WebSocket.

```
protected override Result RunCommand(RhinoDoc doc, RunMode mode)
```

Parameters

doc RhinoDoc

Active Rhino document.

mode RunMode

Execution mode.

Returns

Result

Result of the tracking operation.

Namespace Axys.Managers.Geometry

Classes

[ExportHelpers](#)

Helper routines used during USDZ export operations.

[GeometryConversion](#)

Utility methods that convert Rhino geometry into forms suitable for USDZ export.

Structs

[ExportHelpers.ExportResult](#)

Result information returned from an export operation.

Class ExportHelpers

Namespace: [Axys.Managers.Geometry](#)

Assembly: RhinoPlugin.dll

Helper routines used during USDZ export operations.

```
public static class ExportHelpers
```

Inheritance

[object](#) ← ExportHelpers

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

CalculateBlockInstanceOrigin(RhinoObject)

Calculates the origin point of a block instance by combining the bounding boxes of its contained geometry.

```
public static Point3d CalculateBlockInstanceOrigin(RhinoObject obj)
```

Parameters

obj RhinoObject

The instance object to evaluate.

Returns

Point3d

Center point of the block instance or Rhino.Geometry.Point3d.Unset on failure.

ExportSelectedObjectToUSDZ(RhinoDoc, GeometryBase, Guid)

Exports the specified geometry to a temporary USDZ file.

```
public static ExportHelpers.ExportResult ExportSelectedObjectToUSDZ(RhinoDoc doc,  
GeometryBase preparedGeometry, Guid objectId)
```

Parameters

doc RhinoDoc

Active Rhino document.

preparedGeometry GeometryBase

Geometry already prepared for export.

objectId [Guid](#)

Identifier of the object being exported.

Returns

[ExportHelpers.ExportResult](#)

Information about the exported file.

Struct ExportHelpers.ExportResult

Namespace: [Axys.Managers.Geometry](#)

Assembly: RhinoPlugin.dll

Result information returned from an export operation.

```
public struct ExportHelpers.ExportResult
```

Inherited Members

[ValueType.Equals\(object\)](#) , [ValueType.GetHashCode\(\)](#) , [ValueType.ToString\(\)](#) ,
[object.Equals\(object, object\)](#) , [object.GetType\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

Fields

Path

Location of the generated file.

```
public string Path
```

Field Value

[string](#)

Success

Whether the export succeeded.

```
public bool Success
```

Field Value

[bool](#)

Class GeometryConversion

Namespace: [Axys.Managers.Geometry](#)

Assembly: RhinoPlugin.dll

Utility methods that convert Rhino geometry into forms suitable for USDZ export.

```
public static class GeometryConversion
```

Inheritance

[object](#) ← GeometryConversion

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

ConvertMultipleCurvesToJoinedPipe(List<Curve>, RhinoDoc, double)

Converts a collection of curves to pipe Breps and joins them into one Brep.

```
public static Brep ConvertMultipleCurvesToJoinedPipe(List<Curve> curves, RhinoDoc doc, double pipeRadius)
```

Parameters

curves [List](#)<Curve>

Curves to pipe.

doc RhinoDoc

Active Rhino document.

pipeRadius [double](#)

Radius of the pipe.

Returns

Brep

Joined Brep of all pipes or `null` if conversion fails.

ConvertPolyCurveToBrep(PolyCurve, RhinoDoc, double)

Creates a Brep pipe along each segment of a polycurve and joins them into a single Brep.

```
public static Brep ConvertPolyCurveToBrep(PolyCurve polyCurve, RhinoDoc doc,  
double pipeRadius)
```

Parameters

`polyCurve` PolyCurve

The polycurve to convert.

`doc` RhinoDoc

Active Rhino document.

`pipeRadius` [double](#)

Radius of the generated pipes.

Returns

Brep

A joined Brep representing the pipe or `null` on failure.

PrepareGeometryForExport(RhinoDoc, RhinoObject)

Converts the selected object into geometry that can be exported as USDZ. Handles curves, blocks, extrusions and meshes.

```
public static GeometryBase PrepareGeometryForExport(RhinoDoc doc,  
RhinoObject selectedObj)
```

Parameters

doc RhinoDoc

Active Rhino document.

selectedObj RhinoObject

Object chosen for export.

Returns

GeometryBase

Geometry ready for export or **null** if conversion fails.

Namespace Axys.Managers.Networking

Classes

[MessageHandler](#)

Provides helper methods for creating JSON messages exchanged via WebSocket.

[USDZExportManager](#)

Sends exported USDZ files to connected clients in chunks over WebSocket.

[WebSocketServerManager](#)

Manages the WebSocket server used for communicating with Axys clients.

Class MessageHandler

Namespace: [Axys.Managers.Networking](#)

Assembly: RhinoPlugin.dll

Provides helper methods for creating JSON messages exchanged via WebSocket.

```
public class MessageHandler
```

Inheritance

[object](#) ← MessageHandler

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

CreateAndSerializeMessage(string, string)

Creates a [WebSocketMessage](#) and serializes it to JSON.

```
public static string CreateAndSerializeMessage(string type, string description)
```

Parameters

type [string](#)

Message type such as [info](#) or [error](#).

description [string](#)

Human readable message text.

Returns

[string](#)

JSON encoded message.

Class USDZExportManager

Namespace: [Axys.Managers.Networking](#)

Assembly: RhinoPlugin.dll

Sends exported USDZ files to connected clients in chunks over WebSocket.

```
public static class USDZExportManager
```

Inheritance

[object](#) ← USDZExportManager

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

ExecuteExportAsync(byte[], string)

Streams a USDZ file to all connected clients.

```
public static Task ExecuteExportAsync(byte[] fileBytes, string filePath)
```

Parameters

fileBytes [byte](#)[]

Contents of the USDZ file.

filePath [string](#)

Original path to the file on disk for metadata.

Returns

[Task](#)

Class WebSocketServerManager

Namespace: [Axys.Managers.Networking](#)

Assembly: RhinoPlugin.dll

Manages the WebSocket server used for communicating with Axys clients.

```
public static class WebSocketServerManager
```

Inheritance

[object](#) ← WebSocketServerManager

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

BroadcastBinary(byte[])

Sends raw binary data to all connected WebSocket clients.

```
public static Task BroadcastBinary(byte[] data)
```

Parameters

data [byte](#)[]

Byte array to transmit.

Returns

[Task](#)

BroadcastMessage(string)

Sends a text message to all connected WebSocket clients.

```
public static void BroadcastMessage(string message)
```

Parameters

`message` [string](#)

UTF-8 encoded text message.

GetLocalIPAddressOfSelf()

Attempts to determine a non-loopback IPv4 address for this machine.

```
public static string GetLocalIPAddressOfSelf()
```

Returns

[string](#)

IP address string.

Exceptions

[Exception](#)

Thrown if no suitable address is found.

IsServerRunning()

Determines whether the server is active and has connected clients.

```
public static bool IsServerRunning()
```

Returns

[bool](#)

True if at least one WebSocket connection is available.

ProcessUpdateMessage(string)

Processes a position update message received from a client. Moves the referenced Rhino object to the specified coordinates.

```
public static void ProcessUpdateMessage(string json)
```

Parameters

json [string](#)

JSON update payload.

StartServer()

Starts the WebSocket server and begins listening for client connections.

```
public static void StartServer()
```

Namespace Axys.Managers.ObjectHandling

Classes

[MaterialManager](#)

Utility functions for assigning and selecting materials on Rhino objects.

[ObjectPositionManager](#)

Provides helper methods for querying and modifying object positions within the Rhino document.

[SelectionObjectManager](#)

Helper methods for selecting geometry and resolving instance definitions.

Class MaterialManager

Namespace: [Axys.Managers.ObjectHandling](#)

Assembly: RhinoPlugin.dll

Utility functions for assigning and selecting materials on Rhino objects.

```
public class MaterialManager
```

Inheritance

[object](#) ← MaterialManager

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

ApplyMaterialIfMissing(RhinoObject, RhinoDoc, int)

Applies a material to the given object if it does not already have one.

```
public static void ApplyMaterialIfMissing(RhinoObject rhObj, RhinoDoc doc,  
int materialIndex)
```

Parameters

rhObj RhinoObject

Rhino object to modify.

doc RhinoDoc

Active Rhino document.

materialIndex [int](#)

Index of the material to assign.

SelectMaterial(RhinoDoc)

Displays a Rhino UI prompt allowing the user to choose a material. Creates a default material when none exist.

```
public static int SelectMaterial(RhinoDoc doc)
```

Parameters

doc RhinoDoc

Active Rhino document.

Returns

[int](#)

Index of the chosen material.

Class ObjectPositionManager

Namespace: [Axys.Managers.ObjectHandling](#)

Assembly: RhinoPlugin.dll

Provides helper methods for querying and modifying object positions within the Rhino document.

```
public class ObjectPositionManager
```

Inheritance

[object](#) ← ObjectPositionManager

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Constructors

ObjectPositionManager(RhinoDoc)

Initializes a new instance bound to the specified document.

```
public ObjectPositionManager(RhinoDoc doc)
```

Parameters

doc RhinoDoc

Active Rhino document.

Methods

CreateObjectData(Guid)

Builds a [RhinoObjectData](#) structure describing a single object.

```
public RhinoObjectData CreateObjectData(Guid objectId)
```

Parameters

objectId [Guid](#)

Identifier of the object.

Returns

[RhinoObjectData](#)

Serialized data for sending over WebSocket.

CreateObjectDataBatch(List<RhinoObjectData>)

Packages multiple [RhinoObjectData](#) entries into a batch message.

```
public RhinoObjectDataBatch CreateObjectDataBatch(List<RhinoObjectData>  
objectDataList)
```

Parameters

objectDataList [List](#)<[RhinoObjectData](#)>

Objects to include in the batch.

Returns

[RhinoObjectDataBatch](#)

Batch container object.

GetAbsolutePosition(Guid)

Calculates the absolute world position of an object.

```
public Point3d GetAbsolutePosition(Guid objectId)
```

Parameters

objectId [Guid](#)

Object identifier.

Returns

Point3d

World coordinate of the object center or Rhino.Geometry.Point3d.Unset if not found.

MoveObject(Guid, Point3d)

Moves an object to the given position in world coordinates.

```
public bool MoveObject(Guid objectId, Point3d newPosition)
```

Parameters

objectId [Guid](#)

Identifier of the object to move.

newPosition Point3d

Target world position.

Returns

[bool](#)

True if the move succeeded.

Class SelectionObjectManager

Namespace: [Axys.Managers.ObjectHandling](#)

Assembly: RhinoPlugin.dll

Helper methods for selecting geometry and resolving instance definitions.

```
public static class SelectionObjectManager
```

Inheritance

[object](#) ← SelectionObjectManager

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

EnsureObjectIsSelected(RhinoDoc, Guid)

Ensures an object is selected, optionally prompting the user.

```
public static Guid EnsureObjectIsSelected(RhinoDoc doc, Guid currentId)
```

Parameters

doc RhinoDoc

Active Rhino document.

currentId [Guid](#)

Pre-selected object identifier.

Returns

[Guid](#)

The confirmed object identifier or [Empty](#) if selection failed.

FindInstanceDefinitionByGuid(RhinoDoc, Guid)

Retrieves an instance definition by Guid to avoid name collisions.

```
public static InstanceDefinition FindInstanceDefinitionByGuid(RhinoDoc doc,  
Guid id)
```

Parameters

doc RhinoDoc

Active Rhino document.

id [Guid](#)

Identifier of the instance definition.

Returns

InstanceDefinition

The instance definition or null if not found.

ProcessInstanceReference(InstanceReferenceGeometry, RhinoDoc, List<Brep>, List<Mesh>, List<Curve>)

Expands an instance reference and collects its geometry into separate lists.

```
public static void ProcessInstanceReference(InstanceReferenceGeometry instanceRef,  
RhinoDoc doc, List<Brep> breps, List<Mesh> meshes, List<Curve> curves)
```

Parameters

instanceRef InstanceReferenceGeometry

Reference geometry pointing to the block instance.

doc RhinoDoc

Active Rhino document.

breps [List ↗](#)<Brep>

Collection receiving Brep geometry.

meshes [List ↗](#)<Mesh>

Collection receiving Mesh geometry.

curves [List ↗](#)<Curve>

Collection receiving Curve geometry.

Namespace Axys.Models

Classes

[Center](#)

[RhinoObjectData](#)

[RhinoObjectDataBatch](#)

[RhinoObjectInfo](#)

Lightweight container used to expose basic object information to clients.

Class RhinoObjectInfo

Namespace: [Axys.Models](#)

Assembly: RhinoPlugin.dll

Lightweight container used to expose basic object information to clients.

```
public class RhinoObjectInfo
```

Inheritance

[object](#) ← RhinoObjectInfo

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Properties

Id

Unique identifier of the object.

```
public Guid Id { get; set; }
```

Property Value

[Guid](#)

Name

Display name.

```
public string Name { get; set; }
```

Property Value

[string](#) ↴

ObjectType

Type of Rhino object.

```
public string ObjectType { get; set; }
```

Property Value

[string](#) ↴

Namespace Axys.Utilities

Classes

[CommandUtilities](#)

Shared command implementations that can be invoked from multiple entry points.

Class CommandUtilities

Namespace: [Axys.Utilities](#)

Assembly: RhinoPlugin.dll

Shared command implementations that can be invoked from multiple entry points.

```
public static class CommandUtilities
```

Inheritance

[object](#) ← CommandUtilities

Inherited Members

[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.GetType\(\)](#) , [object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#) ,
[object.ToString\(\)](#)

Methods

ExecuteTrackObjectLogic(RhinoDoc)

Tracks selected objects and broadcasts their positions via WebSocket.

```
public static Result ExecuteTrackObjectLogic(RhinoDoc doc)
```

Parameters

doc RhinoDoc

Active Rhino document.

Returns

Result

Command result indicating success or failure.

Namespace RhinoPlugin

Classes

[GeometryProcessingException](#)

Thrown when geometry processing fails during export or conversion.

[GeometrySelectionException](#)

Thrown when geometry cannot be selected or resolved.

Class GeometryProcessingException

Namespace: [RhinoPlugin](#)

Assembly: RhinoPlugin.dll

Thrown when geometry processing fails during export or conversion.

```
public class GeometryProcessingException : Exception, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← GeometryProcessingException

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

Constructors

GeometryProcessingException(string)

```
public GeometryProcessingException(string message)
```

Parameters

message [string](#)

GeometryProcessingException(string, Exception)

```
public GeometryProcessingException(string message, Exception innerException)
```

Parameters

message [string](#)

innerException [Exception](#)

Class GeometrySelectionException

Namespace: [RhinoPlugin](#)

Assembly: RhinoPlugin.dll

Thrown when geometry cannot be selected or resolved.

```
public class GeometrySelectionException : Exception, ISerializable
```

Inheritance

[object](#) ← [Exception](#) ← GeometrySelectionException

Implements

[ISerializable](#)

Inherited Members

[Exception.GetBaseException\(\)](#) , [Exception.GetObjectData\(SerializationInfo, StreamingContext\)](#) ,
[Exception.GetType\(\)](#) , [Exception.ToString\(\)](#) , [Exception.Data](#) , [Exception.HelpLink](#) ,
[Exception.HResult](#) , [Exception.InnerException](#) , [Exception.Message](#) , [Exception.Source](#) ,
[Exception.StackTrace](#) , [Exception.TargetSite](#) , [Exception.SerializeObjectState](#) ,
[object.Equals\(object\)](#) , [object.Equals\(object, object\)](#) , [object.GetHashCode\(\)](#) ,
[object.MemberwiseClone\(\)](#) , [object.ReferenceEquals\(object, object\)](#)

Constructors

GeometrySelectionException(string)

```
public GeometrySelectionException(string message)
```

Parameters

message [string](#)

GeometrySelectionException(string, Exception)

```
public GeometrySelectionException(string message, Exception innerException)
```

Parameters

message [string](#)

innerException [Exception](#)