Rhino Beam Tools - User Manual

Introduction

Rhino Beam Tools is a plugin for Rhino 3D, designed to draw mechanical Beams and Nodes in context, then export them in a Beam calculation software. Currenttly, *RhinoBeamTools* is only compatible with ©Steel (Editor: ®Bureau Veritas).
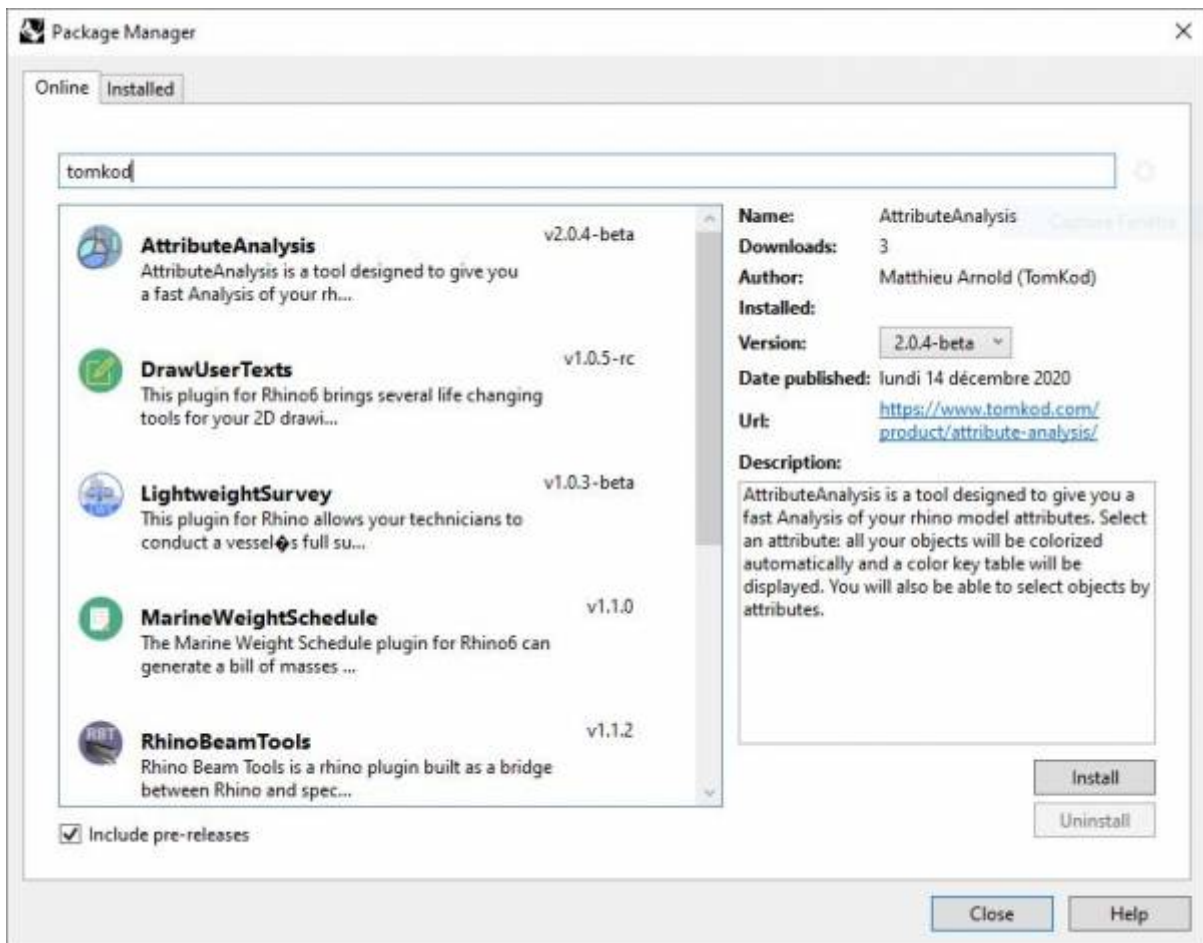
Plugin installation

Overview

The plugin installer can be downloaded at: https://www.tomkod.com/product/rhino-beam-tools/
A free trial is included, and yearly licenses can be purchased on the aforementioned page.
*Rhino Beam Tools* works for Rhino 5 [1], Rhino 6 [2], and Rhino7[3].

Yak

Our plugins are also compatible with Yak, Rhino's new package manager [4], which is basically an application store for Rhino. You just need to call Rhino's command *_PackageManager*:

You can also install from the repository with the following command line:

```
"D:\Program Files\Rhino 6\System\Yak.exe" install 'PluginName'
```

If you add this in a batch file (*.bat) at windows startup, it is probably the best way to keep all your plugins up-to date 😊
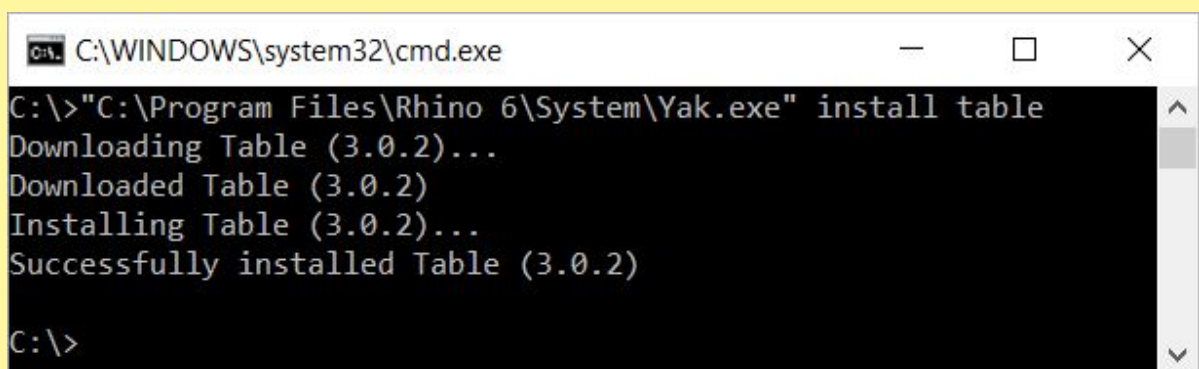
License activation

Prerequisites

The free evaluation can be used once per computer, and requires a network access to
www.license.tomkod.com
The license activation requires network access to www.tomkod.com
Please check your firewall in case of failure.

Activation form

The activation window automatically shows up when the plugin is loading and a valid license or trial is not registered. If you want to see, change or remove your license while the plugin is already loaded, you can use the Rhino commands **PluginName_License**.
An activation status is always visible on the upper right corner of the form, if the icon is green your plugin will be enabled:
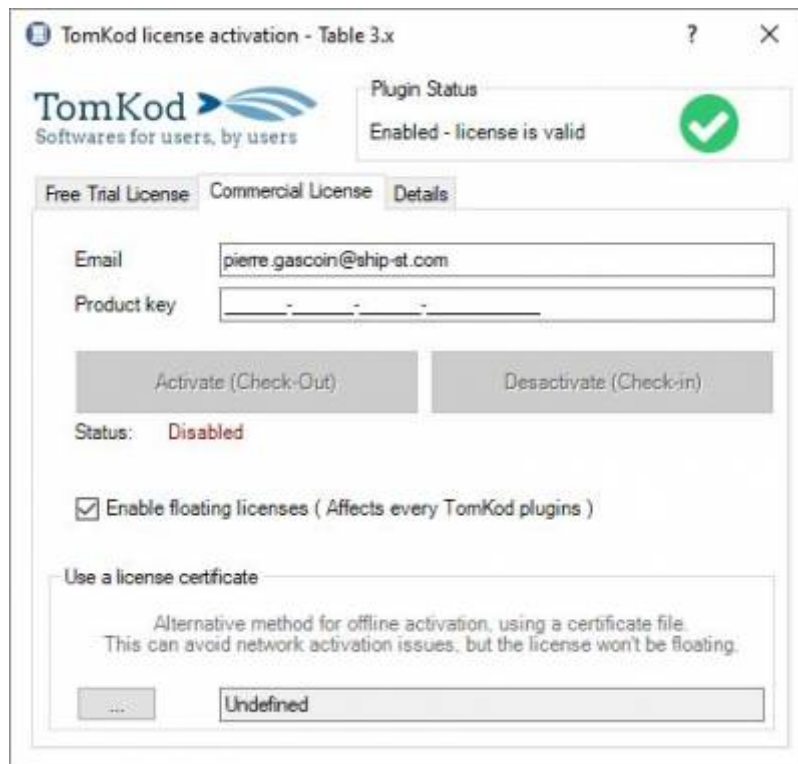

Trial Tab

This first tab is dedicaced to the trial requests. Your trial status is displayed, and the button is disabled if a trial is not available for your computer (Your trial has already been activated, or the server is unreachable)
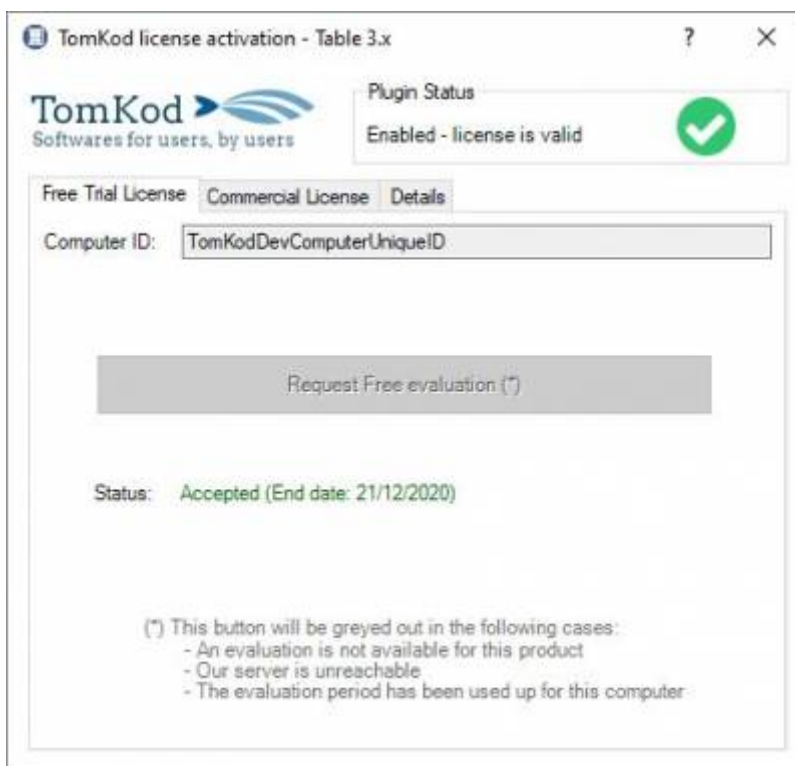
Commercial Tab

This tab's two main buttons let you Check-out (Activate) or Check-in (Desactivate) your license from

our license server.

When the checkbox *"Enable floating licenses"* is checked, every TomKod's plugins will try to desactivate the license automatically when closing (Making it available for another of your computers)

Finally, a license certificate (*.TkLic) can be selected at the bottom of this tab. It allows to activate a license offline, but the license won't be floating anymore. If you need one, contact us at https://www.tomkod.com/contact/

Toolbar

The toolbars for Rhino are always included in your plugins installation directory, or can be downloaded here.
To install them, you just have to drag/drop the file "Tomkod.rui" to a rhino window.

Generalities

Definitions

Nodes

Nodes are custom points with translations and rotation constraints defined on x, y & z axis. Every node in the model is identified by a unique number.

Beams

Beams are oriented lines located between two nodes [5]. They are represented as an arrow, and have an optionnal angle option. Every beam in the model is identified by a unique number.
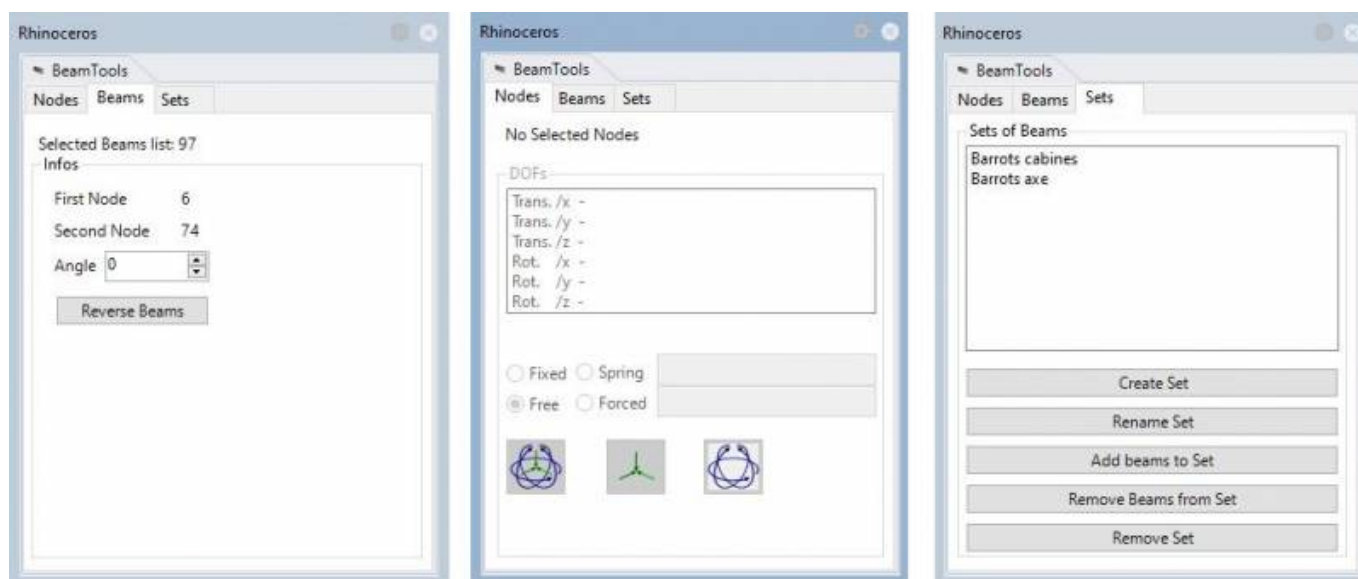
Sets

A set is a group of beams. It is mainly used to easily select beams together.

Interface

Panel

Rhino Beam Tools comes with a user panel to interact with your Beams, Nodes and Sets. The panel display is refreshed in real time. If you select a beam or a node in the model, the panel is automatically displayed.

Annotations

Rhino Beam Tools offer the possibility to display annotations in the model with the every node's settings:

The size, offset and color of these annotations can be edited. The annotations give the following

information:

```
#{Node number} ({Constraints})
```

Constraints can be "Free", "TranslationFixed", "RotationFixed", or Custom.

Custom constraints are defined like this: x , y & z values for translation (t), then x , y & z values for rotation (r).
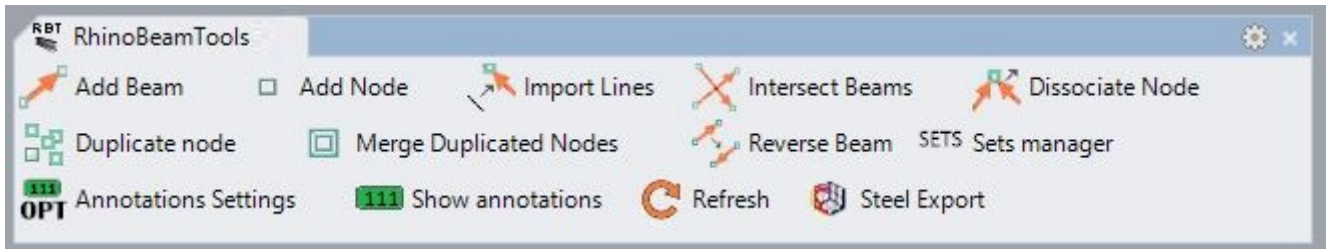The values can be 0=fixed , 1=free, 2=spring, 3=forced.

In the example above, the node *#87* is rotation-Free, with translation-fixed on *x*, translation-spring on *y*, and translation-free on *z*
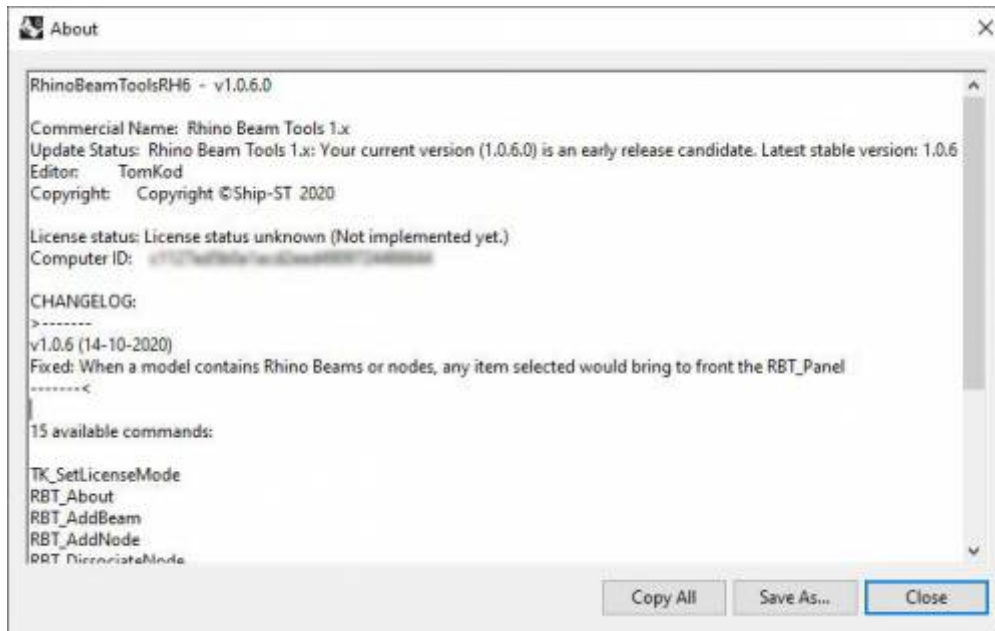
Toolbar

A toolbar is included in Tomkod's toolbar group, with buttons available for most commands:

Commands

RBT_About

This command can be used only from the command line prompt. It displays the plugin's current revision and license status.
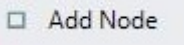
RBT_License

This command can be used only from the command line prompt. It displays the plugin's activation form.

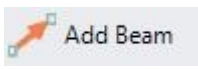See license_activation.

RBT_AddNode

 This command adds a node to the model.

Walkthrough

1. Pick a location
2. The node is created without constraints (Free)
3. === Options ===

No option available.

RBT_AddBeam

 This command adds a beam to the model.

Walkthrough

1. Pick two nodes
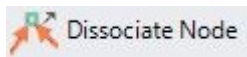2. The beam is created from the first node to the second node.

Preselection

Preselection is allowed, but the nodes order will be random. If more than two nodes where preselected, the beam will randomly be created between two nodes.

Options

No option available.

RBT_DissociateNode

 This command allows to separate two beams with a common node by duplicating the node.

Walkthrough

1. Select the beam that should be dissociated (The one that will be linked to a new node)
2. Select which node should be dissociated: *StartNode* or *EndNode*
3. Choose if the node constraints should be duplicated [6]. If *No* is selected, the new node will be unconstrained (Free).
4. Pick the new node location

Preselection

Preselection is allowed if only one beam is preselected

Options

- *StartNode* or *EndNode*
- *Duplicate the node constraints*

RBT_ImportLines

Import Lines This command can convert lines and curves into beams and nodes.

Walkthrough

1. Select the line and curves that should be imported
2. Choose if the original lines should be removed
3. For each non linear curve, a segment count option is shown to split the curve in several lines. The current view is zoomed in and the current curve is highlighted.
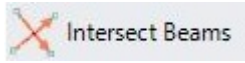4. Every beams and nodes are created, duplicated nodes are removed and intersecting beams are splitted.
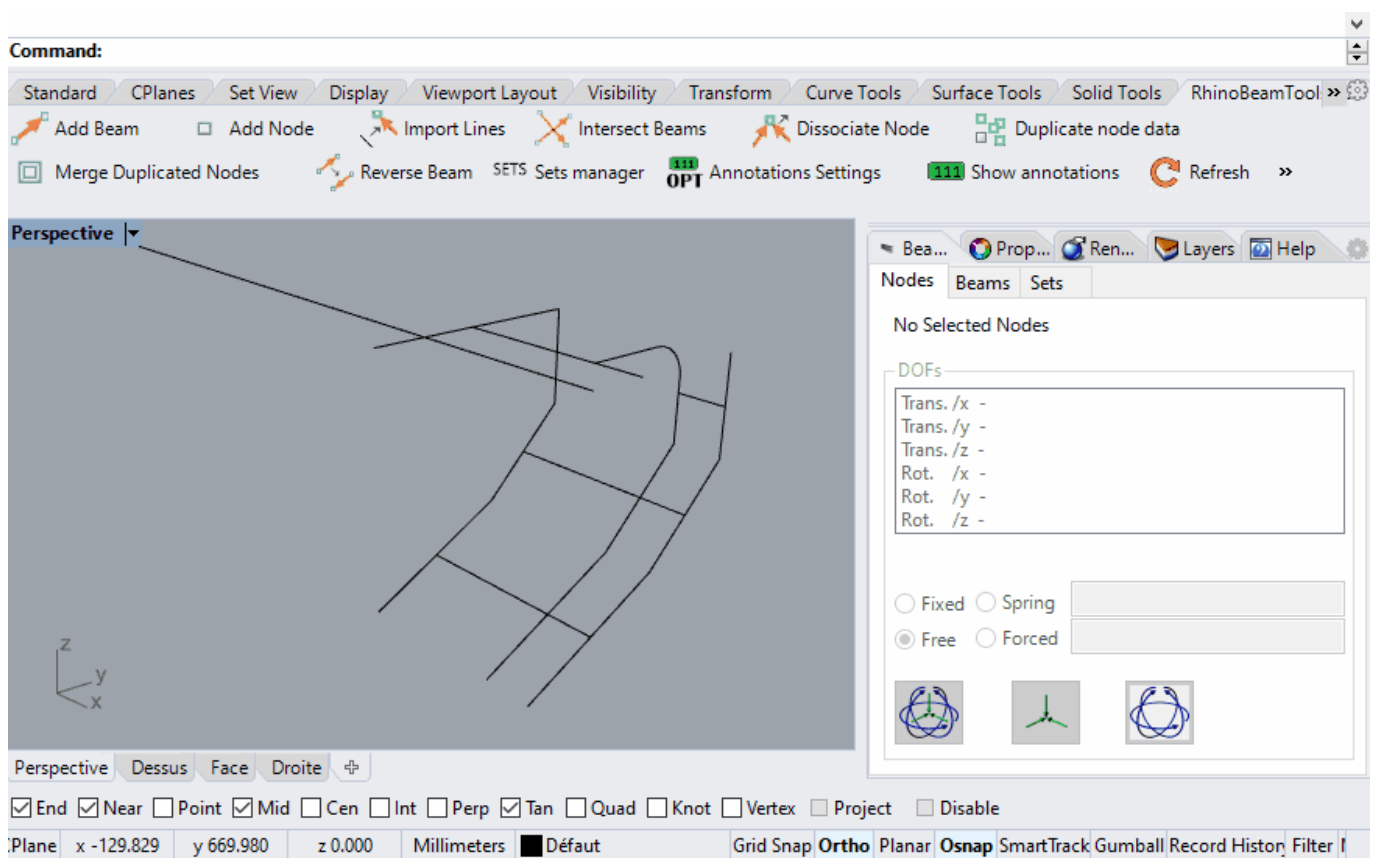
Preselection

Preselection is allowed.

Options

- *Delete original lines* : Select wether or not the original curves should be removed from the model upon completion.
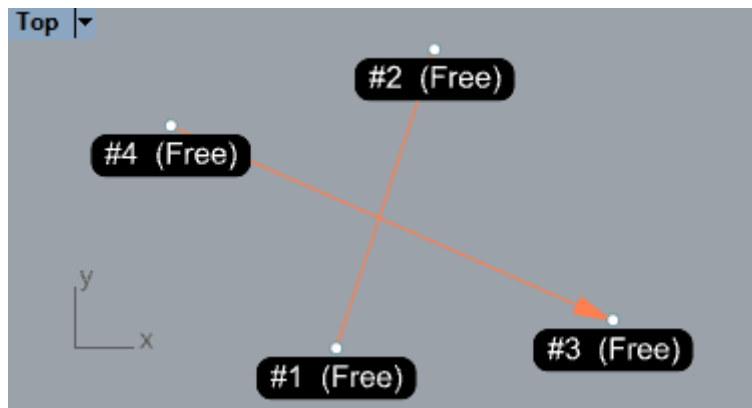
RBT_IntersectBeams

 This commands check the whole model and adds node at beams intersections.
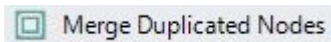
Walkthrough

Launch the command and that's it!

Options

No option available.

RBT_MergeDuplicateNodes

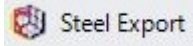 This command merge node with the same location.

Walkthrough

1. Set the tolerance (Default 0.001)
2. Every duplicated nodes are merged in the model

Options

- *Tolerance* : in model unit, maximum distance to consider two nodes duplicated.

RBT_SteelExport

Steel Export Exports your beams, nodes and sets to ©Steel, ®*Bureau Veritas*' beam calculation software.

Walkthrough

1. Ordered List ItemSelect a save path to create the ©Steel file (*.stw)
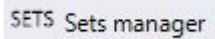2. The file is created, then RBT attemps to open it with windows default program for this extension.

Scripted mode

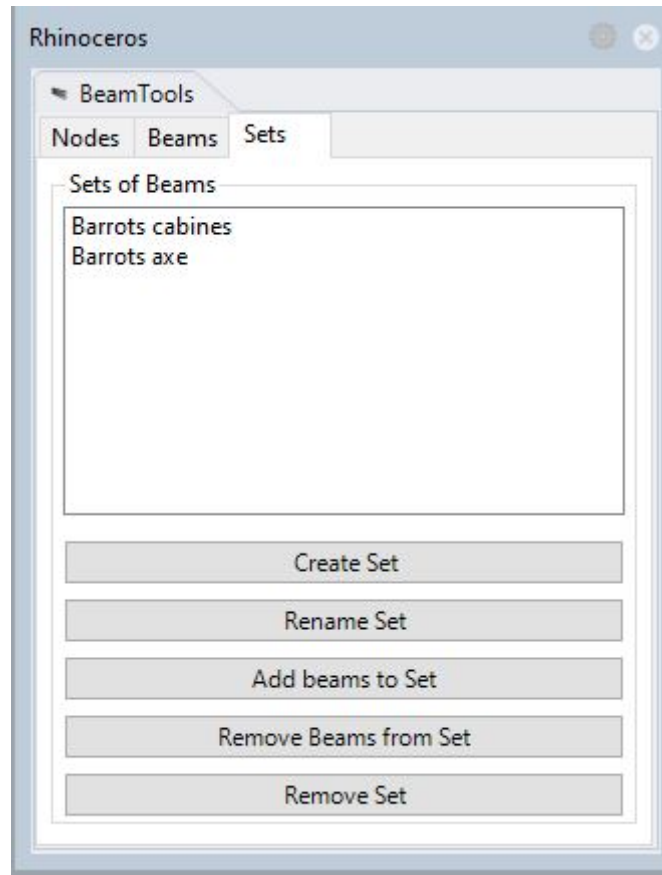In scripted mode, the program attempts to save the file as "C:\BVData\Steel\UnsavedDoc.stw" [7)](#)

Options

No option available.

RBT_SetManager

SETS Sets manager This command opens the *Rhino Beam Tools* panel on the *Sets* tab.

Options
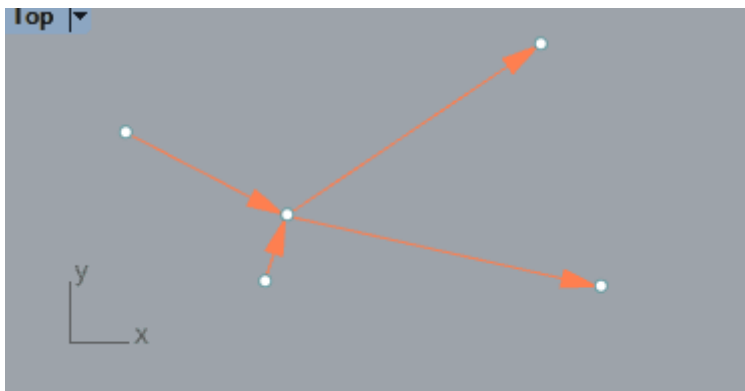
No option available.

RBT_ReverseBeam

 This command reverses the beam's first and second node.

Walkthrough

1. Select the beams
2. The beams nodes are swapped. The arrow orientation are refreshed as well as the node infos.

Preselection

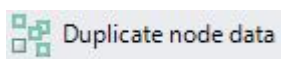Preselection is allowed, every selected beams will be reversed.

Options

No option available.

Alternative

A *"Reverse beam"* button is available on the panel's Beams tab. It does the same thing but does not allow to reverse several beams at the same time.
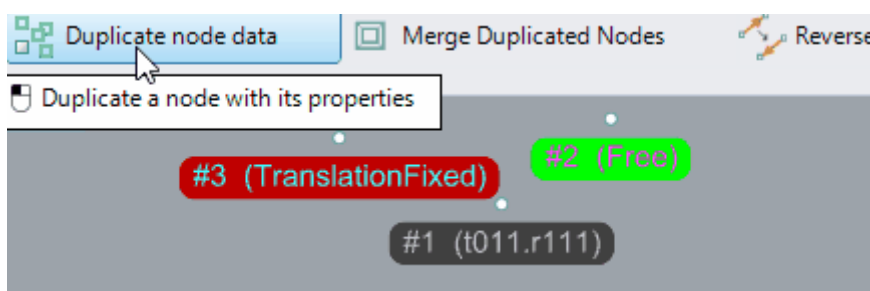

RBT_DuplicateNodeData

 This command copies a node's constraints to another.

Walkthrough

1. Pick the original node to duplicate its constraints
2. Pick one or several nodes that need to be changed
3. The selected nodes are updated with the original node's constraints

Preselection

Preselection is enabled if one and anly one node is preselected.
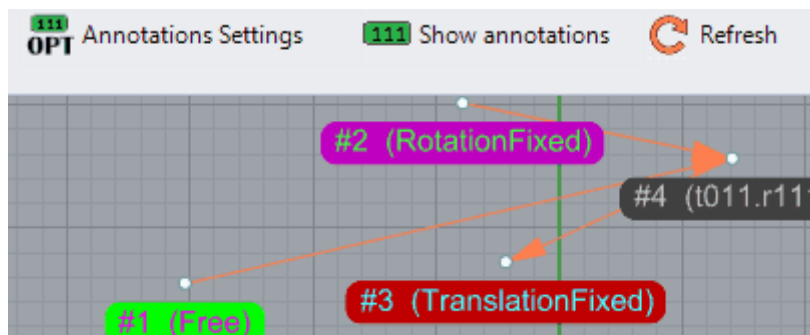
Options

No option available.

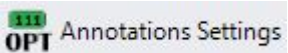
RBT_ShowAnnotations

 Show annotations

Walkthrough

1. Launch the command.
2. If annotations were visible, they are hidden, if they were hidden they will be shown


Options

No option available.

RBT_AnnotationsSettings

 This command gives the possibility to change the annotations' display settings.

Walkthrough

1. Enter the annotation text height (Press enter to keep current value)

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2. Enter the annotation offset [8] (Press enter to keep current value. - A value *"> Text height"* is recommended)
3. Pick a color for free nodes (Press enter to keep current value)
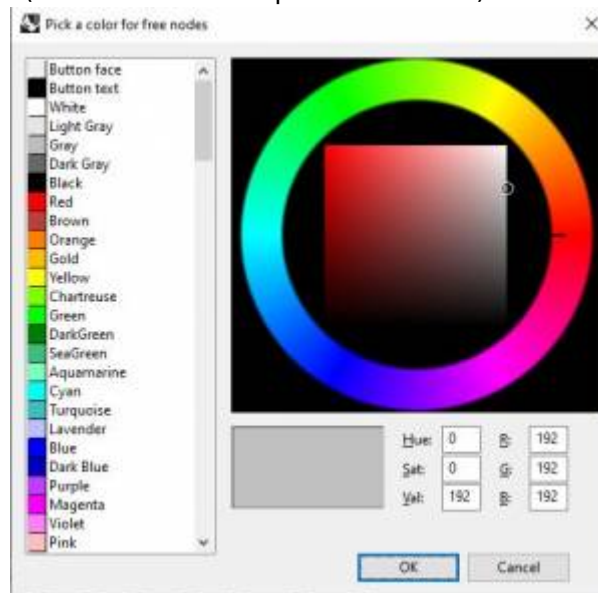
4. Pick a color for translation-constrained nodes (Press enter to keep current value)
5. Pick a color for rotation-constrained nodes (Press enter to keep current value)
6. Pick a color for other nodes (Press enter to keep current value)
7. The model's annotations are redrawn with the new settings.

RBT_Refresh
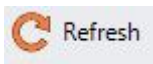
 This command forces a display update:

- Overlapped nodes are merged
- Beam errors are detected
- Beam positions are fixed
- Rhino views are redrawn

Normally you don't need to use this command.

Options

No option available.

[1)](){}
Rhino 5.12 or later
[2)](){}
Rhino 6.15 or later
[3)](){}
Tested up to Rhino 7.1
[4)](){}
Rhino 6 or later only, graphic user interface for Rhino7 only
[5)](){}
More specifically, two node definition numbers

[6)](#)

default value = true

[7)](#)

This is ©Steel's default directory

[8)](#)

The annotations can be offsetted not to hide the nodes.

From:
https://wiki.tomkod.com/ - **TomKod knowledge base**

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