

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. Currently, *RhinoBeamTools* is only compatible with ©Steel¹⁾ (Editor: @Bureau Veritas).

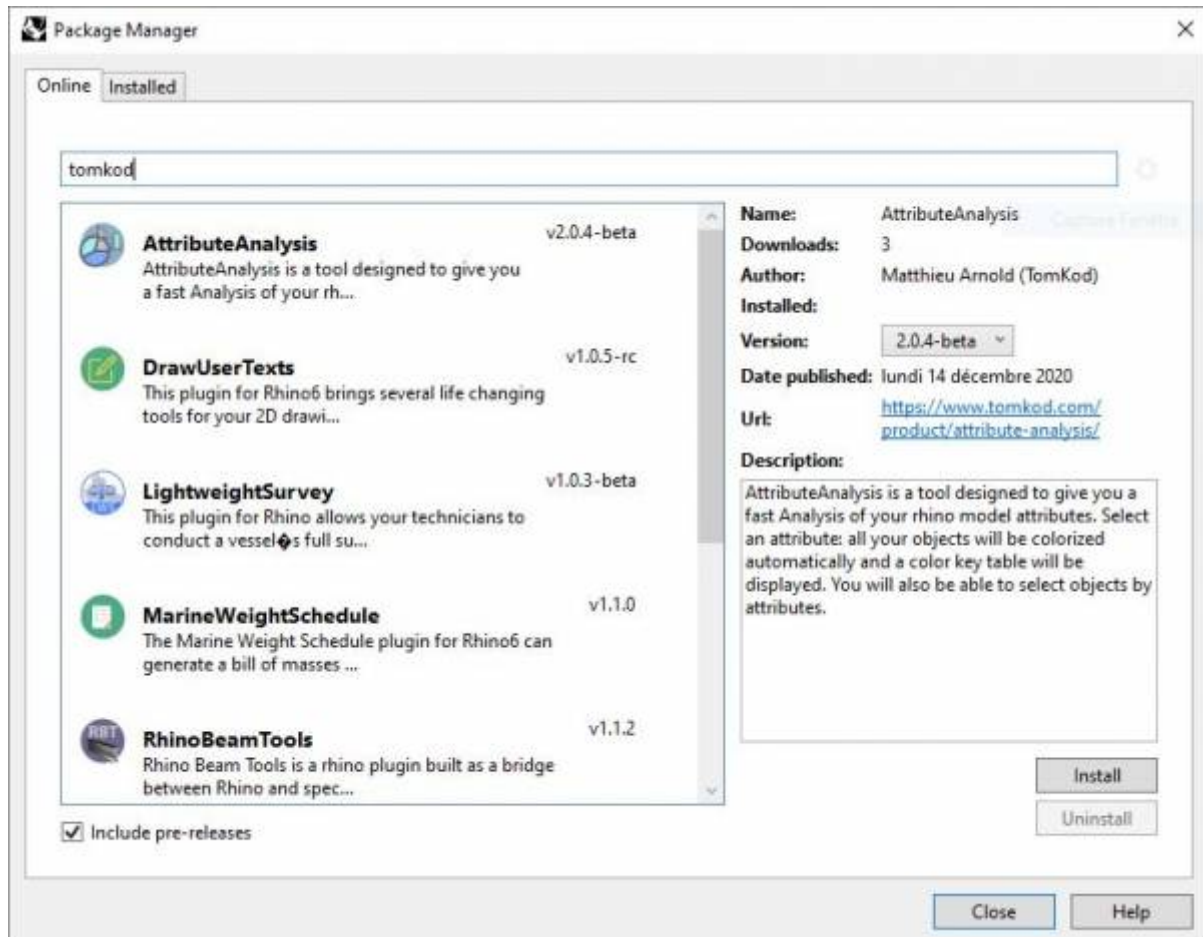
Plugin installation

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 ²⁾, Rhino 6 ³⁾, and Rhino7⁴⁾.

Yak

Our plugins are also compatible with Yak, Rhino's new package manager ⁵⁾, 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 😊



```
C:\WINDOWS\system32\cmd.exe

C:\>"C:\Program Files\Rhino 6\System\Yak.exe" install PluginName
Downloading PluginName (X.X.X)...
Downloaded PluginName (X.X.X)
Installing PluginName (X.X.X)...
Successfully installed PluginName (X.X.X)

C:\>
```

License activation

Prerequisites

The free evaluation can be used once per computer, and requires network access to www.license.tomkod.com

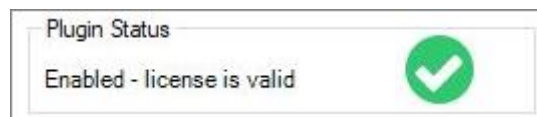
The license activation requires network access to www.tomkod.com

Please check your firewall in case of failure.

Activation form

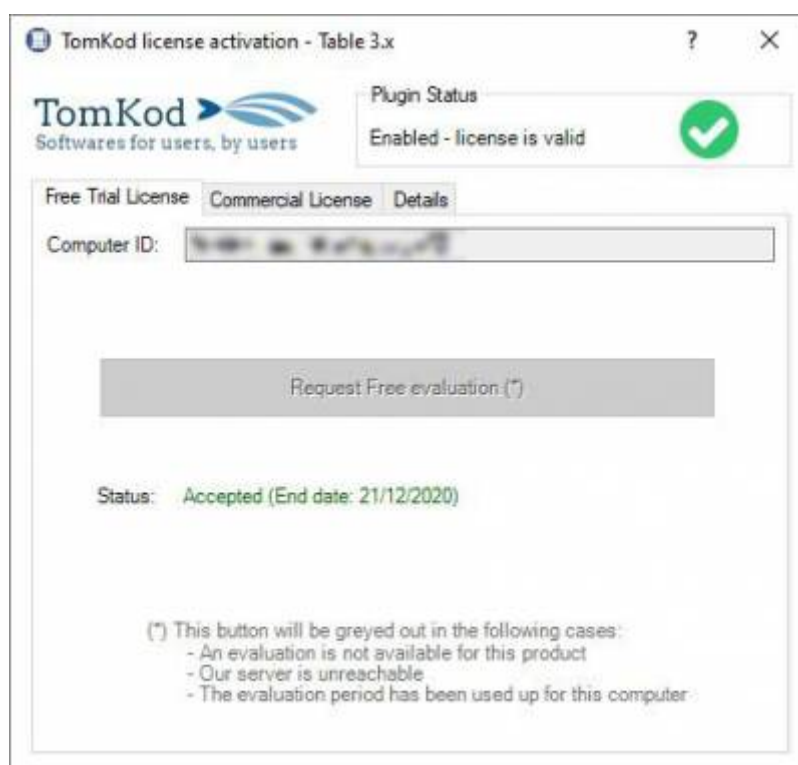
The activation window automatically shows up when the plugin is loading and a valid license or trial is not registered. If you want to see, change or remove your license while the plugin is already loaded, you can use the Rhino commands **PluginName_License**.

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

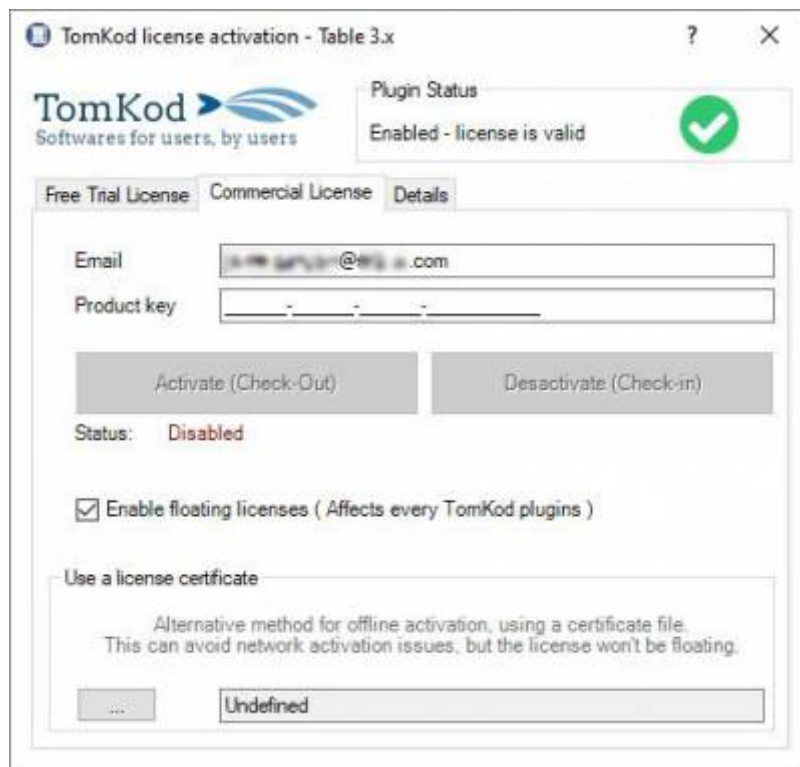
This first tab is dedicated to the trial requests. Your trial status is displayed, and the button is disabled if a trial is not available for your computer (Your trial has already been activated, or the server is unreachable)



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 plugin will try to deactivate 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](#).

You just have to drag/drop the file “Tomkod.rui” to a rhino window to install them.

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 ⁶⁾. They are represented as an arrow, and have an optionnal angle option. Every beam in the model is identified by a unique number.

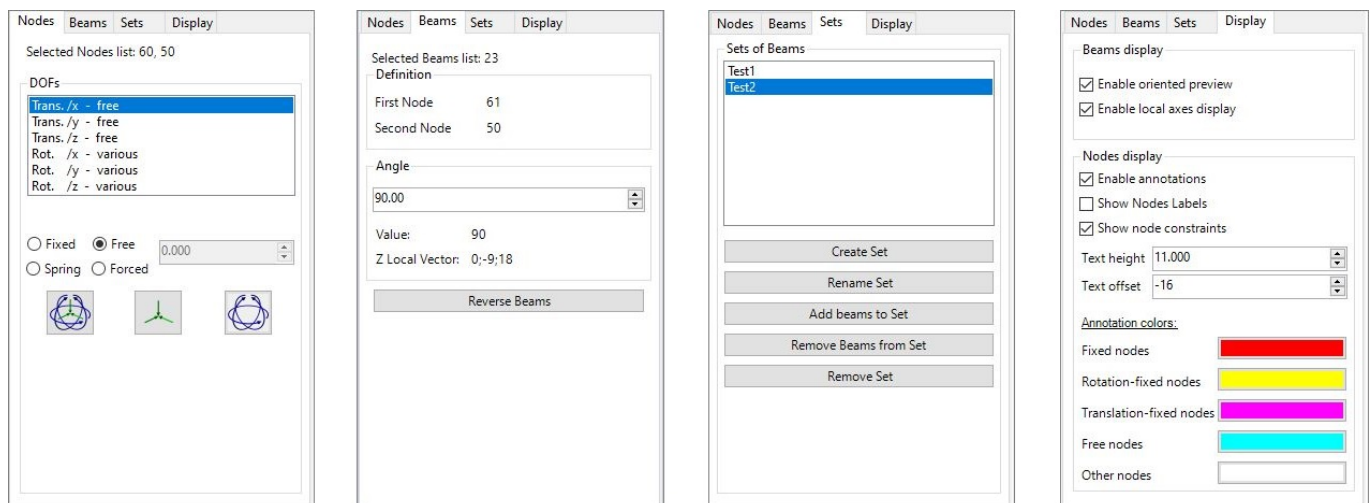
Sets

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 enabled and the appropriate tab is opened. The *Display* tab offers quick access to display settings.



Annotations

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



The content, size, offset and color of these annotations can be edited in the RhinoBeamTools' panel's *Display* tab. *Constraints* can be "Fixed", "Free", "TranslationFixed", "RotationFixed", or Custom.

Custom constraints are displayed 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.

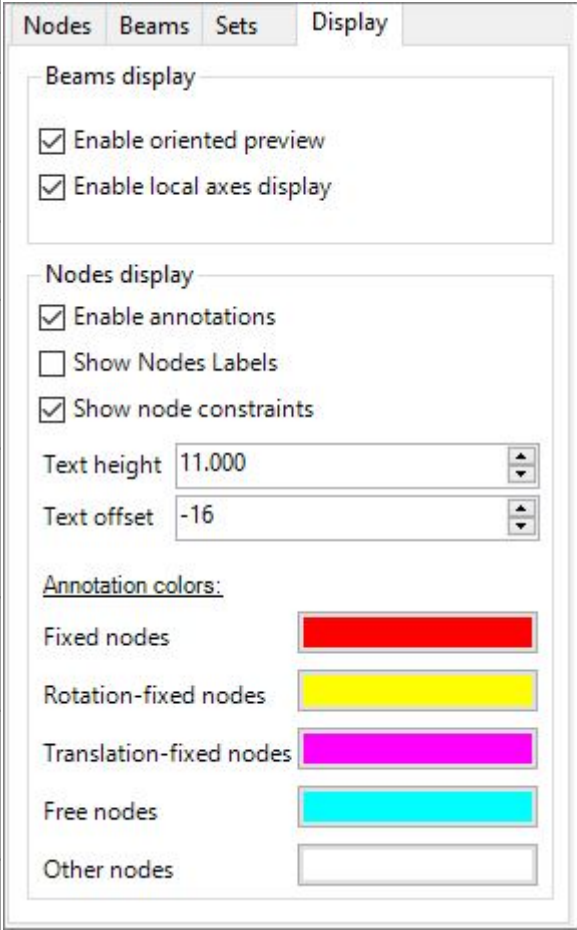


In the example above, the node #87 is rotation-Free, with translation-fixed on x, translation-spring on y, and translation-free on z

Display settings

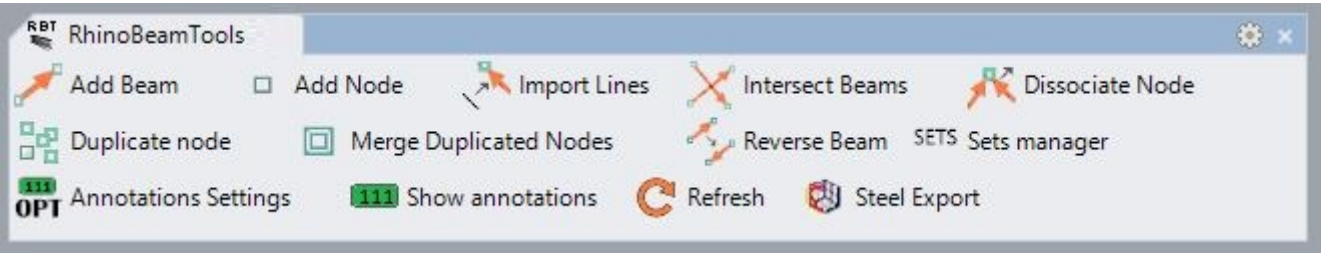


The display settings can be edited from RhinoBeamTools' panel's *Display* tab. These settings are immediately applied when their values is changed, and are saved in the plugin.

	Name	Description	
Beams display settings	Enable oriented preview	Shows or hides 3D H - shaped beams to make it easier to understand the beams orientation.	
	Enable local axis	Shows or hides the beams' local x, y & z axis, taking in account the beams' angle values.	
Nodes display settings	Enable annotations	Shows or hides the nodes annotations.	
	Show nodes labels	If enabled, the nodes annotations content will include the nodes' labels. (IDs)	
	Show nodes constraints	If enabled, the nodes annotations content will include the nodes' constraints.	
	Text height	Sets the nodes annotations' display height. If too small this option might be ignored.	
	Text offset	Sets the nodes annotations' display offset. The offset if oriented in the screen vertical direction.	
	Annotation colors	Clicking on these buttons opens a dialog form to set custom display colors for particular node constraints.	

Toolbar

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

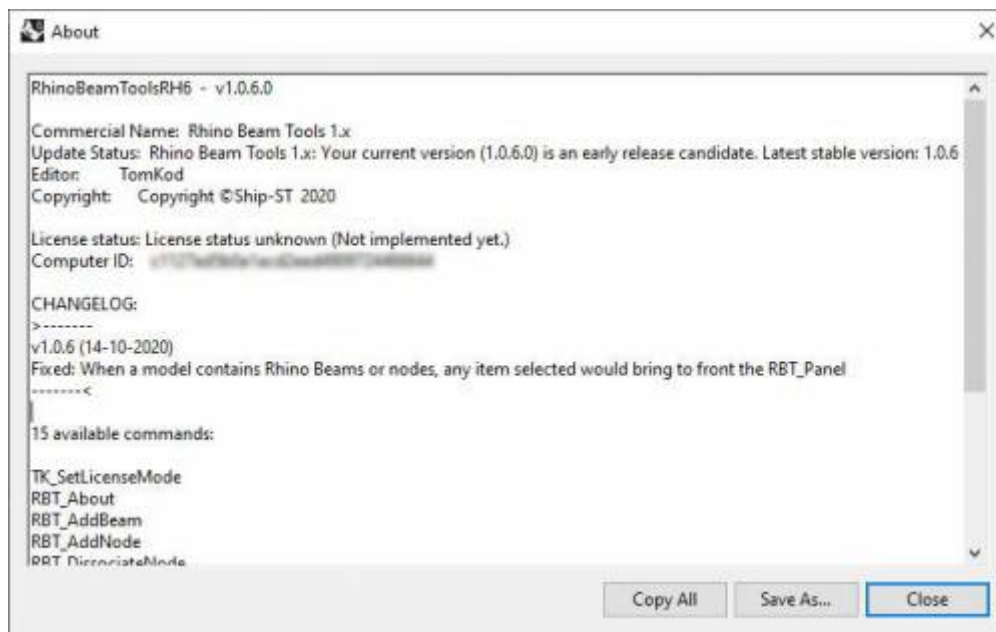


todo: Update capture with updated ToolBar

Commands

RBT_About

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

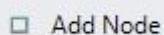


RBT_License

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.

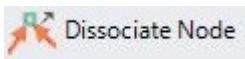
Preselection

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 ⁷⁾. 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*

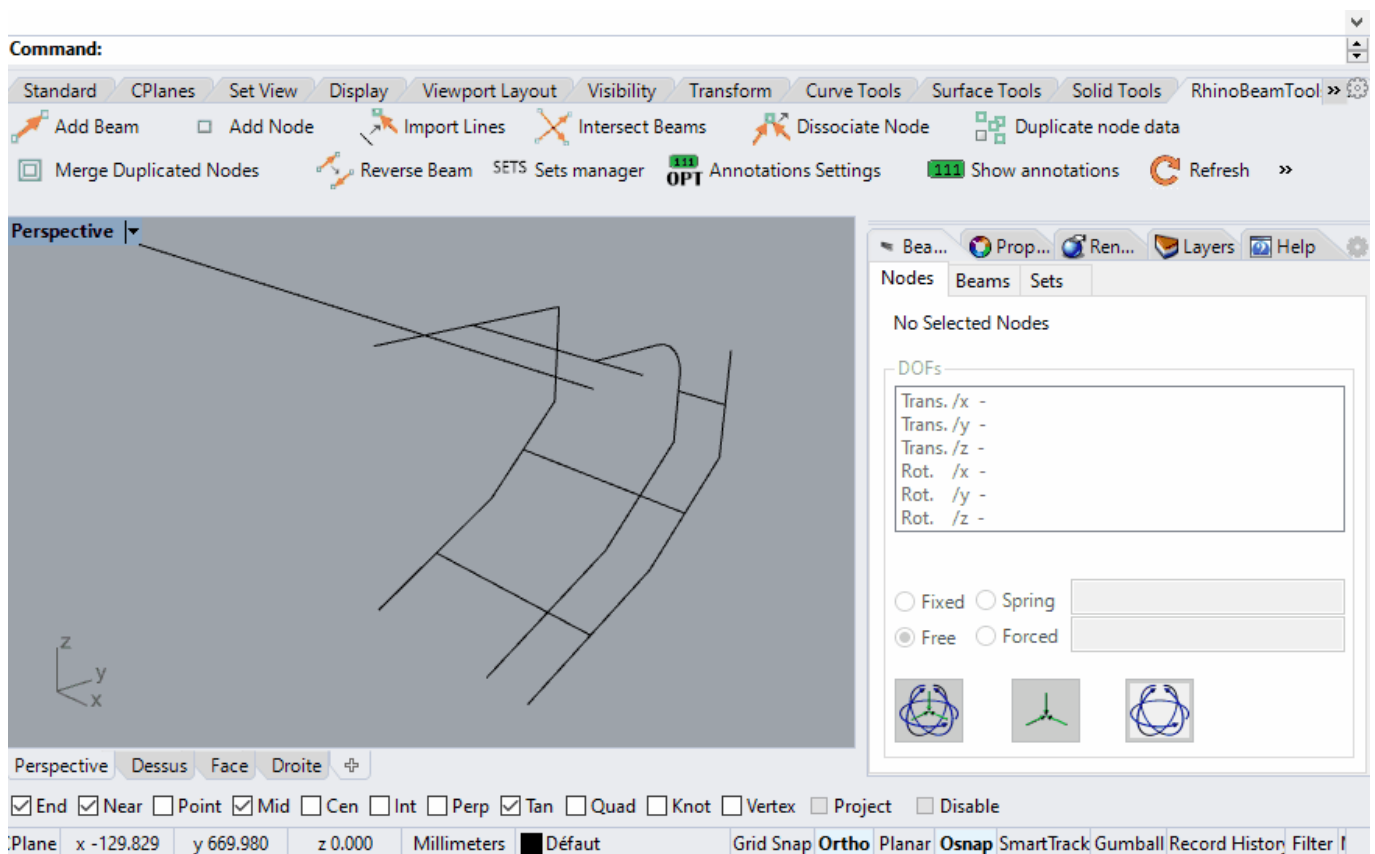
RBT_ImportLines



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.



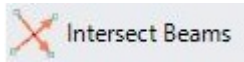
Preselection

Preselection is allowed.

Options

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

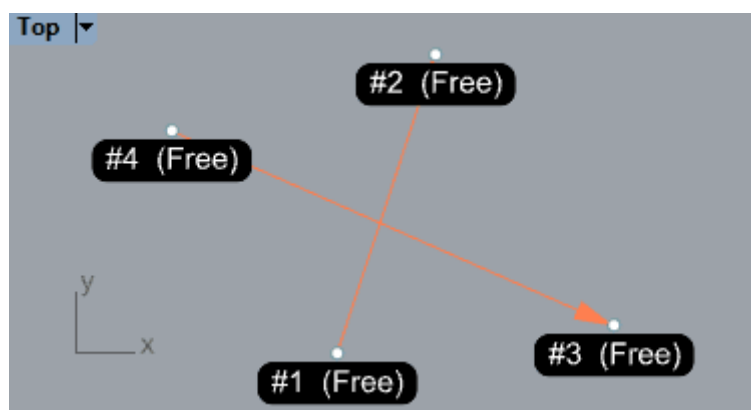
RBT_IntersectBeams



This command checks the whole model and adds nodes at beam intersections.

Walkthrough

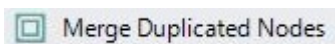
Launch the command and that's it!



Options

No option available.

RBT_MergeDuplicateNodes



This command merges nodes with the same location.

Walkthrough

1. Set the tolerance (Default 0.001)
2. Every duplicated node is merged in the model

Options

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

RBT_Export



Todo: Add the new icon

Exports your beams, nodes and sets to ©Steel⁸⁾ or RDM7.

Walkthrough

1. Launch the command
2. Select a file path and extension to export the model to ©Steel3 (*.stw*), ©Steel4 (*.steel*), or RDM6-7 (*.por*)
3. The file is created, then RBT attempts to open it with windows default program for this extension.

Scripted mode

No Scripted Mode

Options

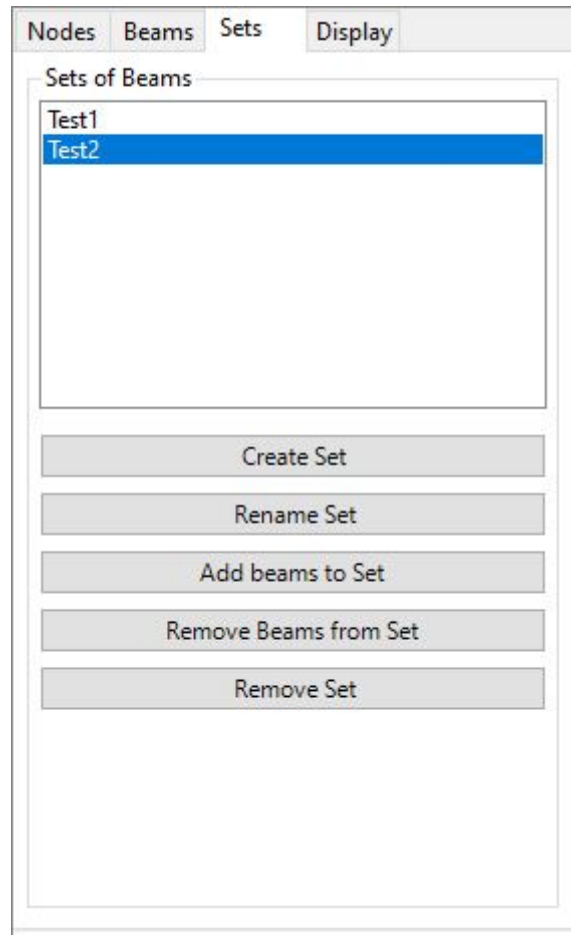
No option available.

RBT_SetManager

This command⁹⁾ is a direct link to the *Rhino Beam Tools* panel's *Sets* tab

Walkthrough

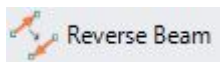
1. Launch the command
2. RhinoBeamTools' panel¹⁰⁾ will be opened, with the *Sets* tab selected.



Options

No option available.

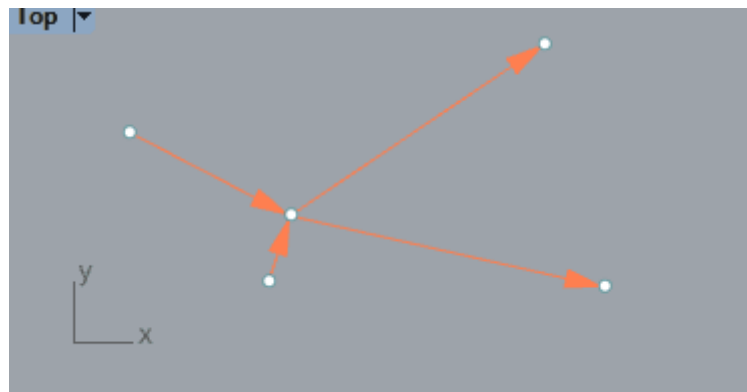
RBT_ReverseBeam



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.

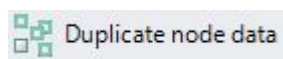
Options

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

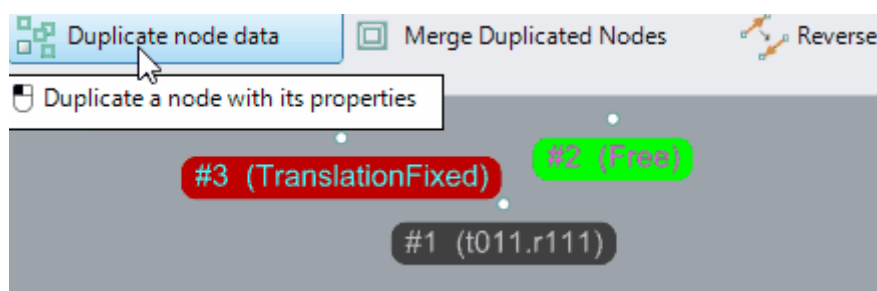


Duplicate node data

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 only one node is preselected.

Options

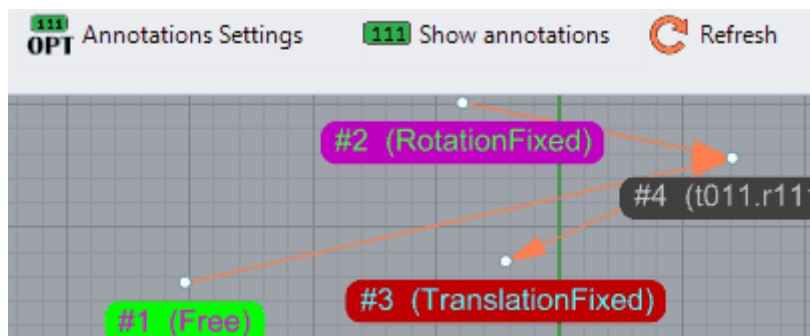
No option available.

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_DisplaySettings



Todo: Add the new icon

This command¹¹⁾ is a direct link to the panel's *Display* tab

Walkthrough

1. Launch the command
2. RhinoBeamTools' panel¹²⁾ will be opened, with the *Display* tab selected.



Todo: Add capture

RBT_ImportSteel4File



This command is a beta prototype. It might have unwanted behaviours and we will decline any responsibility if it causes damages to your model. TomKod may or may not publish a proper version at a later date.

Attempts to import a *Steel (*.steel)* project beams' and nodes' in your Rhino models.

Walkthrough

1. Launch the command
2. Select the file to import
3. Nodes are imported with their constraints
4. Beams are imported

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)

v3 or v4

2)

Rhino 5.12 or later

3)

Rhino 6.15 or later

4)

Tested up to Rhino 7.1

5)

Rhino 6 or later only, with graphic user interface for Rhino7 only

6)

More specifically, two node definition numbers

7)

default value = true

8)

® *Bureau Veritas*' beam calculation software

9) 11)

,

Formerly named RBT_AnnotationsSettings

10) 12)

,

See [interface](#)

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<https://wiki.tomkod.com/> - TomKod knowledge base

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