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 ©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 <u>Yak</u>, Rhino's new package manager ⁵⁾, which is basically an application store for Rhino. You just need to call Rhino's command **_PackageManager**:

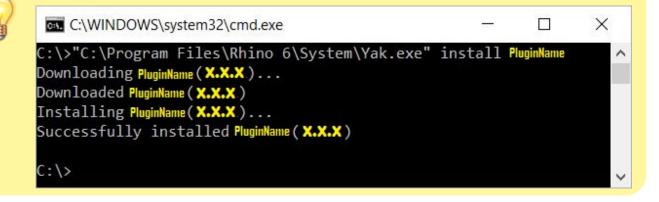
Last

Package Manager × Online Installed tomkod AttributeAnalysis Name: v2.0.4-beta **AttributeAnalysis** Downloads: AttributeAnalysis is a tool designed to give you Author: Matthieu Arnold (TomKod) a fast Analysis of your rh... Installed: 2.0.4-beta ~ Version: v1.0.5-rc DrawUserTexts Date published: Jundi 14 décembre 2020 This plugin for Rhino6 brings several life changing https://www.tomkod.com/ tools for your 2D drawi... Url: product/attribute-analysis/ Description: v1.0.3-beta LightweightSurvey AttributeAnalysis is a tool designed to give you a This plugin for Rhino allows your technicians to fast Analysis of your rhino model attributes. Select conduct a vessel os full su... an attribute: all your objects will be colorized automatically and a color key table will be displayed. You will also be able to select objects by v1.1.0 attributes. MarineWeightSchedule The Marine Weight Schedule plugin for Rhino6 can generate a bill of masses ... v1.1.2 RhinoBeamTools Rhino Beam Tools is a rhino plugin built as a bridge Install between Rhino and spec... Uninstall ✓ Include pre-releases Close Help

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

upuate: 2021/02/09 start:plugins:rhinobeamtools:rbt-usermanual https://wiki.tomkod.com/doku.php?id=start:plugins:rhinobeamtools:rbt-usermanual&rev=1612864426 10:53

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:

| Plugin Status | |
|----------------------------|--------|
| Enabled - license is valid | \sim |

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)

| TomKod license activation - Tab | ble 3.x | ? | × |
|--|---|---|---|
| TomKod > Softwares for users, by users | Plugin Status Enabled - license is valid | Ø |) |
| Free Trial License Commercial Lice Computer ID: | nse Details | | - |
| | | | |
| Reque | ist Free evaluation (*) | | |
| Status: Accepted (End date | e: 21/12/2020) | | |
| | | | |

Commercial Tab

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

our license server.

| TomKod licens | e activation - Table | : 3.x | | ? | > |
|----------------------------|-------------------------|-----------------------------------|------------------|-----------------|---|
| FomKod oftwares for use | | Plugin Status Enabled - licens | e is valid | Ø | |
| Free Trial License | Commercial Licens | e Details | | | |
| Email | and an order | com. | | | 1 |
| Product key | | | | | ļ |
| Activ | rate (Check-Out) | - 3 | Desactivate (C | heck-in) | |
| Status: Dis | abled | | | | |
| Enable floa | ating licenses (Affe | cts every TomKo | d plugins) | | |
| Use a license ce | artificate | | | | |
| | anti-in mathead for all | fline activation u | sing a certifica | te file | |
| Alter This can a | void network activa | tion issues, but th | e license won | 't be floating. | |

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 tro display settings.

| Sets of Beams | December disculation |
|---|---|
| Test1 Test2 Create Set Rename Set Add beams to Set Remove Beams from Set Remove Set | Beams display ☐ Enable oriented preview ☐ Enable local axes display ☐ Enable annotations ☐ Show Nodes Labels ☑ Show node constraints Text height 11.000 Text offset 16 ☐ Annotation colors: Fixed nodes Rotation-fixed nodes Translation-fixed nodes Free nodes |
| | Create Set Rename Set Add beams to Set Remove Beams from Set |

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

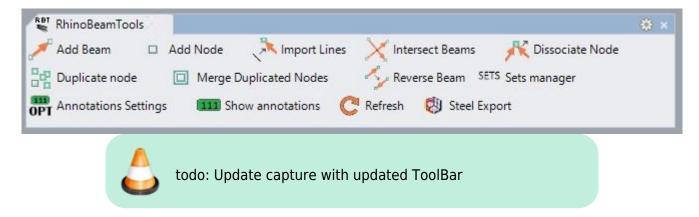


The display settings can be edited from RhinoBeamTools' panel's *Display* tab. These settings are immediately applied when their values is changed, and are saved in the plugin.

| | Name | Description | |
|---------------------|---------------------------|--|--|
| Beams | Enable oriented preview | Shows or hides 3D H - shaped beams to make it easier to understand the beams orientation. | Nodes Beams Sets Display |
| display settings | Enable local axis | Shows or hides the beams' local x, y & z axis, taking in account the beams' angle values. | Beams display Enable oriented preview Enable local axes display |
| | Enable annotations | Shows or hides the nodes annotations. | Nodes display |
| | Show nodes labels | If enabled, the nodes annotations content will include the nodes' labels. (IDs) | Enable annotations Show Nodes Labels Show node constraints |
| Nodes | Show nodes constraints | If enabled, the nodes annotations content will include the nodes' constraints. | Text height 11.000 |
| display settings | Text height | Sets the nodes annotations' display height. If too small this option might be ignored. | Fixed nodes |
| | Text offset | Sets the nodes annotations' display offset. The offset if oriented in the screen vertical direction. | Translation-fixed nodes |
| | Annotation colors | Clicking on these buttons opens a dialog form to set custom display colors for particular node constraints. | Other nodes |

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.

| About | | | > |
|--|------------------------------|-----------------------|---------------|
| RhinoBeamToolsRH6 - v1.0.6.0 | | | ^ |
| Commercial Name: Rhino Beam Tools 1.x Update Status: Rhino Beam Tools 1.x: Your current version (1.0.6.0) Editor: TomKod Copyright: Copyright ©Ship-ST 2020 |) is an early release candio | date. Latest stable v | ersion: 1.0.6 |
| License status: License status unknown (Not implemented yet.) Computer ID: | | | |
| CHANGELOG: | | | |
| > | | | |
| v1.0.6 (14-10-2020) | | | |
| Fixed: When a model contains Rhino Beams or nodes, any item sel | ected would bring to from | at the RBT_Panel | |
| 15 available commands: | | | |
| TK_SetLicenseMode | | | |
| RBT_About | | | |
| RBT_AddBeam | | | |
| RBT_AddNode RRT_DisconisteMode | | | ~ |

RBT_License

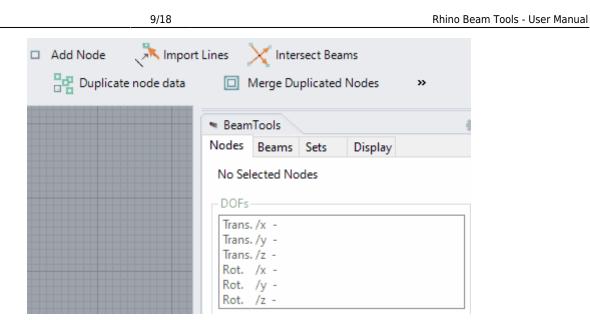
This command can be used only from the command line prompt. It displays the plugin's activation form.

See license_activation.

RBT_AddNode

Add Node This command adds a node to the model.

- 1. Pick a location
- 2. The node is created without constraints (Free)



No option available.

RBT_AddBeam

⁷ Add Beam This command adds a beam to the model.

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

| 📌 Add Beam | 🗆 Add Node 🛛 🔭 Impor | rt Lines 🛛 🗙 Intersect Beams |
|--------------------|----------------------------|---|
| 代 Dissociate No | de 🛛 🛱 Duplicate node data | Merge Duplicated Nodes » |
| Гор - | Free | 💌 BeamTools |
| | • | Nodes Beams Sets Display |
| Free | ⊳ | No Selected Nodes |
| | | Trans. /x - Trans. /y - Trans. /z - |
| у | | Rot. /x - Rot. /y - Rot. /z - |

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

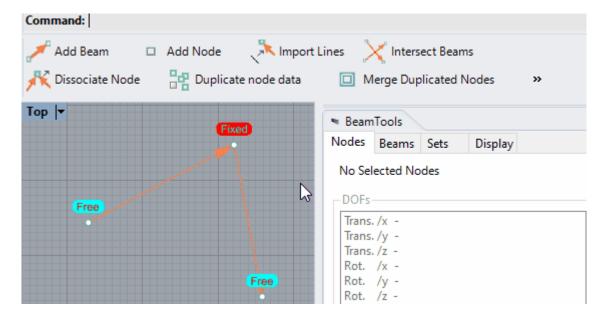
No option available.

RBT_DissociateNode

Mode 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

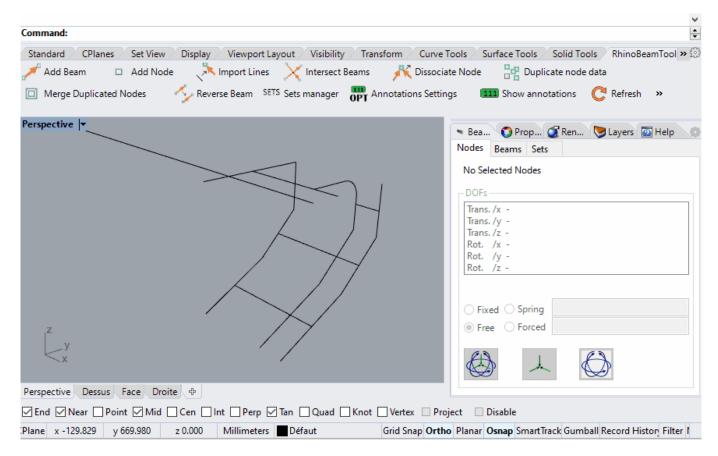
- *StartNode* or *EndNode*
- Duplicate the node constraints

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.

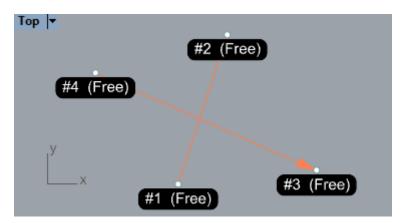
• *Delete original lines* : Select wether or not the original curves should be removed from the model upon completion.

RBT_IntersectBeams

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

Walkthrough

Launch the command and that's it!



Options

No option available.

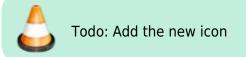
RBT_MergeDuplicateNodes

Merge Duplicated Nodes This command merge node with the same location.

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

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

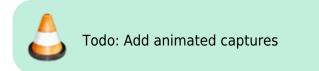
RBT_Export



Exports your beams, nodes and sets to $\[mathbb{C}Steel^{\[mathbb{B}]\]}$ or RDM7.

Walkthrough

- 1. Launch the command
- 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.

| Nodes | Beams | Sets | Display | |
|--------|---------|----------|--------------|---|
| Sets o | f Beams | | | |
| Test1 | | | |] |
| Test2 | | | | ł |
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| | | Crea | te Set | l |
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| | | Add bea | ms to Set | |
| | Ren | nove Bei | ams from Set | ľ |
| | | Remo | ove Set | ľ |
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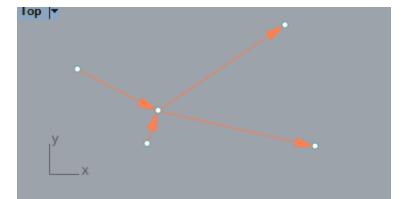
Options

No option available.

RBT_ReverseBeam

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

- 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.

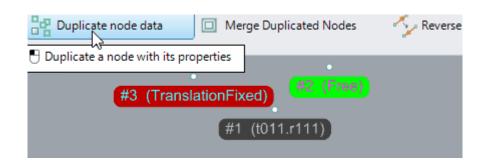
Alternative

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.

- 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

111 Show annotations

Walkthrough

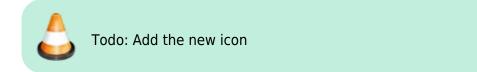
- 1. Launch the command.
- 2. If annotations were visible, they are hidden, if they were hidden they will be shown

| OPT Annotations Settings | 111 Show annotations 🛛 📿 Refresh |
|--------------------------|-------------------------------------|
| | #2 (RotationFixed) #4 (t011.r111 |
| #1 (Free) | #3 (TranslationFixed) |

Options

No option available.

RBT_DisplaySettings



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.

17/18

| Nodes | Beams | Sets | Display | |
|---------------------------|----------------------|------------|---------|---|
| Beams | display | | | |
| Enat | ole orien | ted prev | view | |
| 🗹 Enat | ole local | axes dis | splay | |
| Nodes | display | | | |
| Enat | ole anno | tations | | |
| Show | w Nodes | s Labels | | |
| Show | w node | constrai | nts | |
| Text he | ight 11 | .000 | | • |
| Text of | fset -1 | 6 | | * |
| | ion color | <u>'5:</u> | | |
| Annotat | | | | |
| <u>Annotat</u> Fixed n | odes | | | _ |
| Fixed n | odes n-fixed | nodes | | |
| Fixed n Rotatio | | | 5 | |
| Fixed n Rotatio | n-fixed tion-fixe | | 5 | |

RBT_ImportSteel4File

This command is a beta prototype. It might have unwanted behaviours and we will decline any responsability 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.

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

RBT_Refresh

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/doku.php?id=start:plugins:rhinobeamtools:rbt-usermanual&rev=1612864426

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