

# PropertyWizard Help

Release Notes V1-4-3

PropertyWizard is an add-in for Autodesk® Revit® that allows you to control project parameters with formulas, in the same way as you can control family parameters with formulas.

For example, with PropertyWizard you can:

- Set the Sheet Number of all the sheets from their other parameters.
- Set the Door Numbers of all the doors, using data from the door's Level and Type.
- Set visible properties for X and Y location on all pile foundations so you can schedule them.

And best of all, because PropertyWizard is linked into Revit's parametric change engine, the parameter values are kept up-to-date all the time. No need to repeatedly run Dynamo scripts to update the parameters. #ReviseInstantly

Each PropertyWizard formula has 3 parts:

1. The Category of element that you want to apply it to.
2. The Target Property you want to set.
3. The Formula you want to use.

The Category can be any Revit Category. The formula will apply to all elements in the Category (you can use filtering in the formula to affect just a subset). Target Property has to be an Instance Property in this version, and can be any of these types: Number, Integer, Length, Area, Text, Yes/No or Angle.

The Formula language is an extension of the normal Revit family formula language, so if you can write Revit family formulas, you can write PropertyWizard formulas. The extensions include string manipulation and concatenation (which you don't have in family formulas), access to hidden properties from the Revit API, properties from linked elements, and Project Information properties.

PropertyWizard gives you control of your Revit data, so you can place it just where you need it to be, and generate your data and drawing outputs efficiently, without having to run Dynamo scripts or manually copy data.

## Support

There is more help on the website at [www.davidwooddesign.co.uk](http://www.davidwooddesign.co.uk), including examples and walkthroughs.

I want you to get the most out of PropertyWizard, so please, if you need any help or advice in using it, get in touch with me at [support@davidwooddesign.co.uk](mailto:support@davidwooddesign.co.uk).

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## Installation

### Uninstall the Beta version

If you have a Beta version of PropertyWizard, you have to uninstall it to enable the new version to work. Download the uninstaller from:

<http://www.davidwooddesign.co.uk/uninstall-propertywizard-beta/>

To manually uninstall, delete the *PropertyWizard.addin* files and the *DWD* folders from each of the version folders 2016 to 2019 in C:\ProgramData\Autodesk\Revit\Addins.

### Autodesk App Store downloads

If you downloaded PropertyWizard from the Autodesk App Store, follow the instructions that came with the package.

### DavidWoodDesign downloads

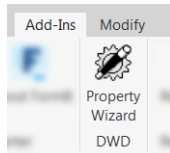
If you downloaded PropertyWizard from [www.davidwooddesign.co.uk](http://www.davidwooddesign.co.uk):

1. Close any Revit sessions before you start.
2. If you received a zip file, unzip it to reveal the installation exe file.
3. Run the InstallPropertyWizard\_V1-4-3.exe file. The installer will go through a couple of dialogs and then unpack the PropertyWizard components. It may need admin permission.

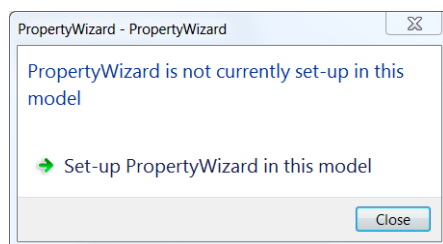
## Getting Started

### A. Your first formula: Hello Wall

- A.1 Open a new Revit model.
- A.2 Draw some walls.
- A.3 Click the PropertyWizard button. It's on the Add-Ins tab:

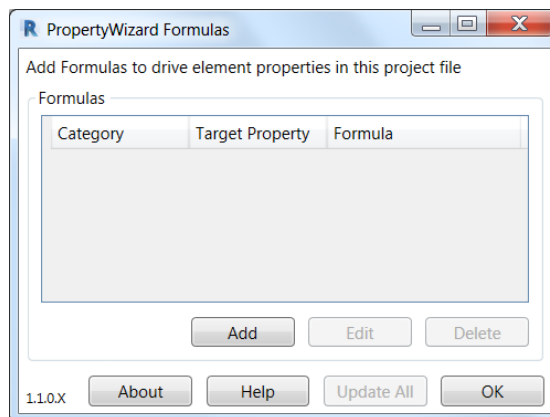


This will show the Set-up dialog:

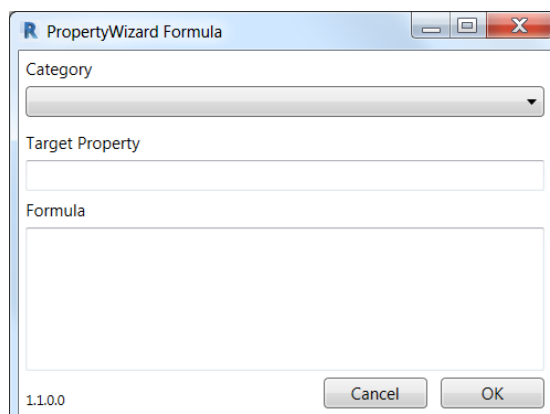


- A.4 Select *Set-up PropertyWizard in this model*.

PropertyWizard will get set up and then open the main PropertyWizard window:



- A.5 Click *Add* to start adding a new Formula. This will open the Formula window.



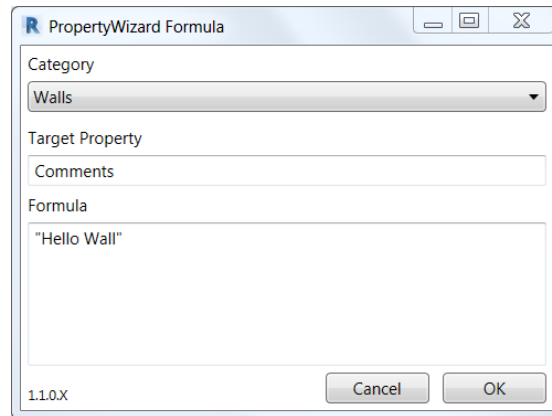
- A.6 Select *Walls* in the Category drop-down. You can type *w...* to select the value quickly.
- A.7 Type *Comments* in the Target Property box.
- A.8 Type "Hello Wall" (including the quote marks) in the Formula box.

Your formula should look like this:

Category: Walls

Target Property: Comments

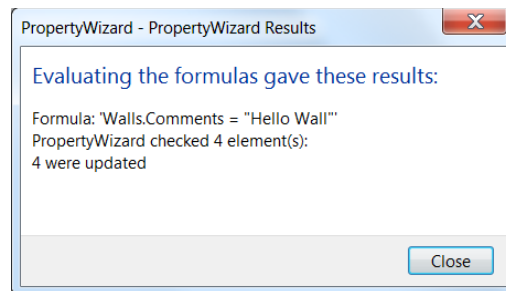
Formula: "Hello Wall"



- A.9 Click *OK* in the Formula window and then click *Update All* in the main PropertyWizard window.

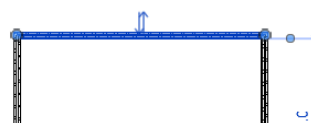
This will update your walls' Comments property using your formula.

PropertyWizard will show a results dialog like this:



The first line of the result shows the formula. The second line shows how many elements (walls) were checked, and the remaining lines will show how many elements were up-to-date, updated, or had errors.

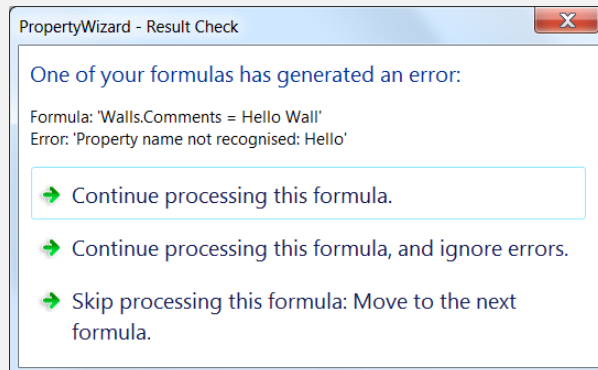
- A.10 Close the results dialog, click *OK* to close the main PropertyWizard Window, and check the properties of your walls:



Every wall in your project now has its Comments set to *Hello Wall*.

## Fixing errors

If PropertyWizard finds an error while processing your formula, it will show a dialog like this:



You can choose to continue processing this formula for the remaining elements, or to stop processing this formula and skip the remaining elements.

If you get an error, check your typing and try again. Be sure to target *Comments* (not *comments* or *Comment*) and include straight (not curly) quotes around "Hello Wall". In this example, I've forgotten to put quote marks around the *Hello Wall*.

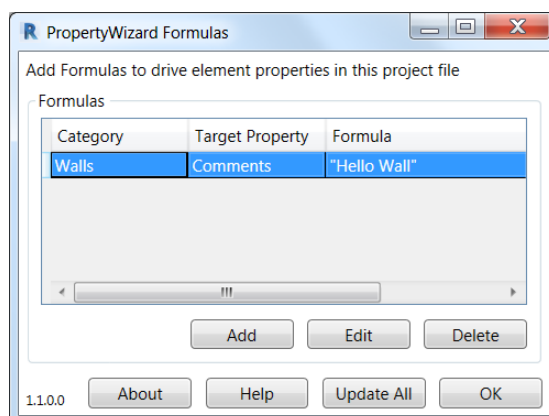
There are more examples of common errors below in 'Dealing with Errors'.

## B. Using properties in formulas

Your first formula used the static text "Hello World" for every element.

You can *element properties* instead of static text, so that each element gets the relevant property value:

- B.1 Open the PropertyWizard main window by clicking the PropertyWizard button (on the Add-Ins tab).
- B.2 Click your formula to select it:



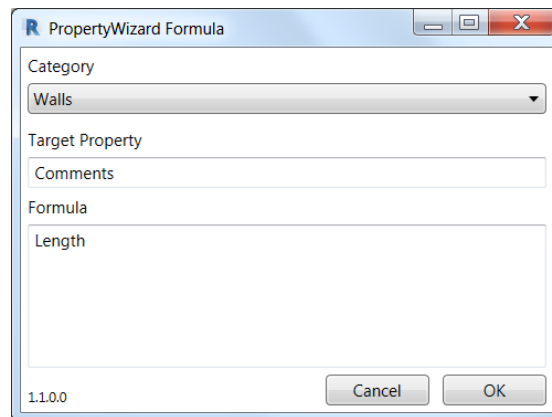
- B.3 Click the Edit button to open the Formula window.

B.4 Edit the formula to use the wall's Length property:

Category: Walls

Target Property: Comments

Formula: Length

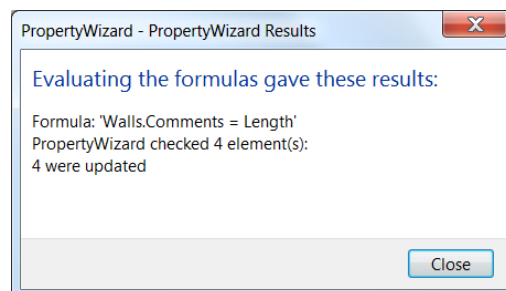


The PropertyWizard Formula dialog box is shown. It has a title bar with a blue icon and the text 'PropertyWizard Formula'. Inside, there are three sections: 'Category' with a dropdown menu set to 'Walls', 'Target Property' with a text box containing 'Comments', and 'Formula' with a text box containing 'Length'. At the bottom left is the version number '1.1.0.0', and at the bottom right are 'Cancel' and 'OK' buttons.

This formula is going to get each wall's Length, format it using the project units, and put the resulting text into the wall's Comments property.

B.5 Click OK in the Formula window to close it, and then OK again in the main window.

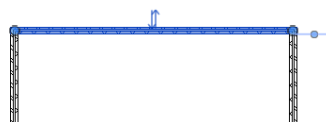
PropertyWizard will show a results dialog like this:



The PropertyWizard - PropertyWizard Results dialog box is shown. It has a title bar with a blue icon and the text 'PropertyWizard - PropertyWizard Results'. Inside, it says 'Evaluating the formulas gave these results:' followed by 'Formula: 'Walls.Comments = Length'', 'PropertyWizard checked 4 element(s):', and '4 were updated'. At the bottom right is a 'Close' button.

B.6 Close the results dialog and check the properties of your walls:

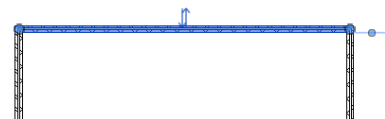
Dimensions	
Length	11200.0
Area	91.920 m <sup>2</sup>
Volume	26.657 m <sup>3</sup>
Identity Data	
Image	
Comments	11200



All the walls are reporting their Length, using the project's current units setting (mine is set to millimetres for the UK).

B.7 Change the length of some of your walls, and check the properties.

Dimensions	
Length	13190.0
Area	107.840 m <sup>2</sup>
Volume	31.274 m <sup>3</sup>
Identity Data	
Image	
Comments	13190



As you add and edit your walls, PropertyWizard updates their Comments. This is the power of PropertyWizard: once you have set up your formulas, it will quietly and efficiently keep your properties up-to-date.

### C. Joining text together

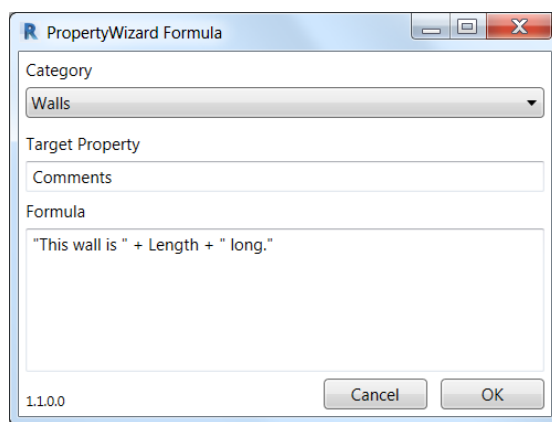
The wall length on its own is not very descriptive. But there are lots of ways you can calculate and combine property values in PropertyWizard. In this case, let's concatenate the Length with some text values using the + operator:

C.1 Open the PropertyWizard main window and Edit your Comments formula:

Category: Walls

Target Property: Comments

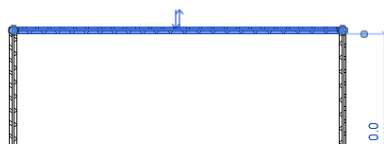
Formula: "This wall is " + Length + " long"



This formula uses two + operators to sandwich the Length value between the pieces of static text. I've included spaces within the quotes, either side of the Length, so that I get spaces next to the length in the output.

C.2 Click OK in the Formula window to close it, and then OK again in the main window. Then check the Comments on your walls:

Walls (1)		Edit Type
Dimensions		
Length	13190.0	
Area	107.840 m <sup>2</sup>	
Volume	31.274 m <sup>3</sup>	
Identity Data		
Image		
Comments	This wall is 13190 long.	
Mark		



You can use the + operator to concatenate any number of text values, like this BS 1192 sheet numbering example: <http://www.davidwooddesign.co.uk/2018/08/06/how-to-use-propertywizard-for-sheet-numbers/>. If your formulas include non-text values (number values, lengths, and areas) PropertyWizard will convert them into text before concatenating them.

The + operator is the simplest of the text (string) operators: PropertyWizard has several useful string functions as well, detailed in the reference section.



## D. Calculated values

Your formulas can include mathematical calculations as well as text manipulations. You can calculate with number values, lengths, and areas, and then assign the result to a property with a matching value type.

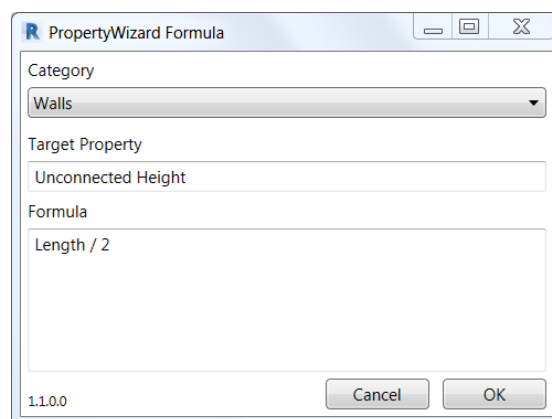
For example, let's control the Unconnected Height of our walls:

D.1 Open the PropertyWizard main window and Add a new formula:

Category: Walls

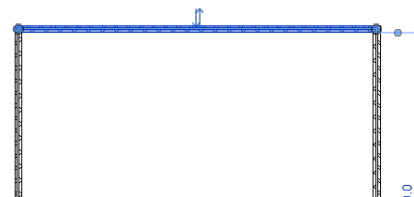
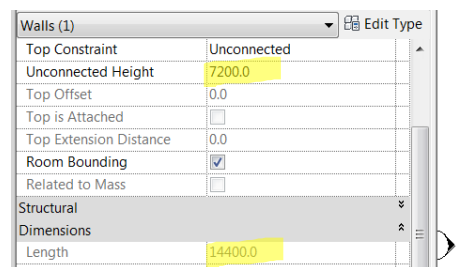
Target Property: Unconnected Height

Formula: Length / 2



This formula sets the wall's Unconnected Height equal to half the Length of the wall.

D.2 Click OK in the Formula window to close it, and then OK again in the main window. Then check the Unconnected Height of your walls:



Unless the tops of your walls are constrained (by being connected to a Level or attached to a Floor), you should see that they alter to match the Unconnected Height. You're using a PropertyWizard formula to control the geometry of your model!

D.3 Change the lengths of your walls and watch how their heights change automatically.

This blog post describes a similar formula, keeping the wall areas fixed by controlling the Unconnected Height: <http://www.davidwooddesign.co.uk/2018/08/22/walls-with-fixed-area/>

Of course, not all properties can be written to: some are 'read-only' like Reporting Parameters. And, just as with family formulas, the value your formula produces has to match the kind of value the target property expects: otherwise you will get the equivalent of an 'Inconsistent Units' error.

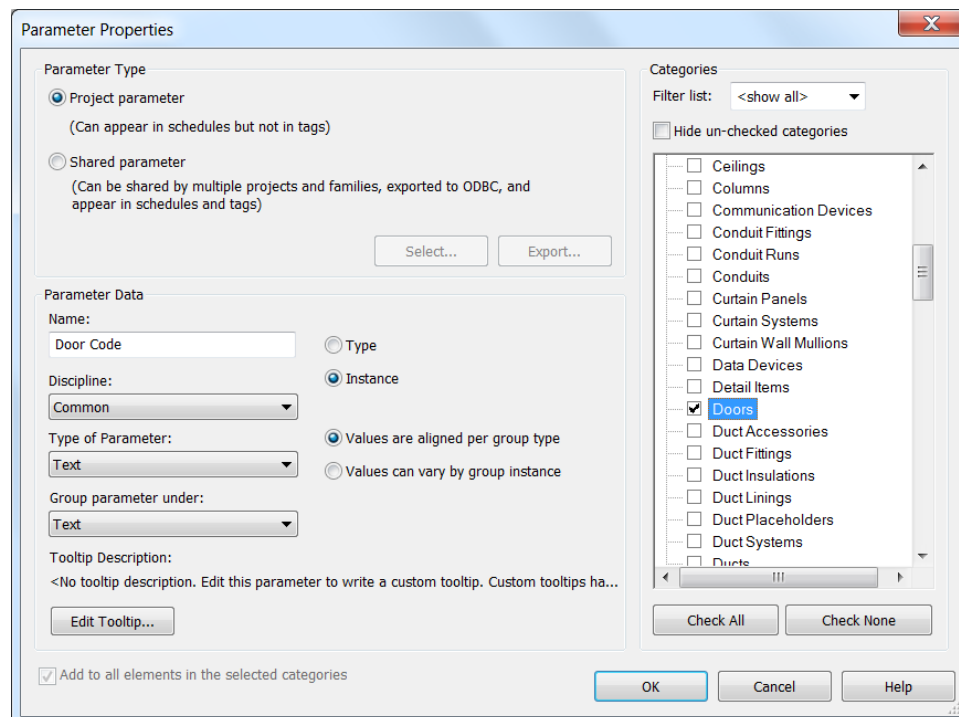
## E. More properties

In the last few examples you have used the wall's Length, which is an Instance property. The next few examples show you how to access other kinds of property, including Type properties, API properties and Project Information properties.

As a vehicle for this set of examples, we will create a Door Code property that brings together some location data for doors:

E.1 Add some doors to your project.

E.2 Create a new project parameter in the project. It should be a text parameter, and it should apply to Doors. Name the new parameter *Door Code*.

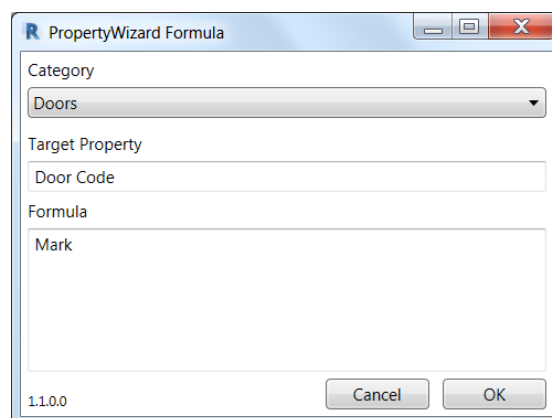


E.3 Open the PropertyWizard main window and Add a new formula:

Category: Doors

Target Property: Door Code

Formula: Mark



#### E.4 Update All to run the formula on each of your doors.

This formula simply copies each door's Mark value into your new property. Over the next few examples, we will add more fields to the Door Code.

### F. Type properties

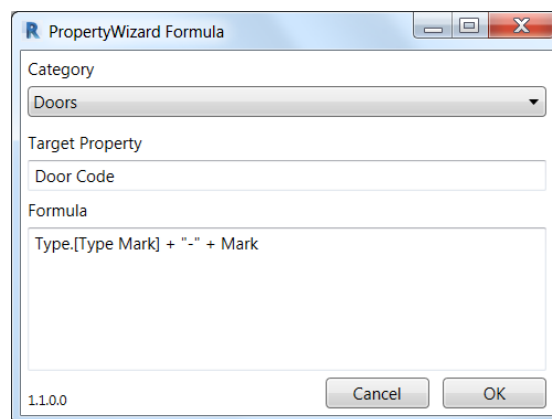
Most of the properties you have been using have been Instance properties. But you can also access Type properties:

#### F.1 Edit the formula to access the door Type Mark:

Category: Doors

Target Property: Door Code

Formula: Type.[Type Mark] + "-" + Mark



To access this Type property you just put the word 'Type', then a full-stop (period), and then the name of the property you want to access.

This is an example of a *Nested Property*, where you can access the *property of a property*. This works because each door has a built-in property named Type that points to the door's Type. And once you have the door's Type, you can access any of that Type's properties.

All nested properties can be accessed using this *dot notation*: Start with the name of the property on the element, then put a dot (full-stop/period), then the name of the nested property. You can access any depth of nested property using this dot notation.

In this case, as an extra complication, the property name *Type Mark* contains a space, so you need to wrap it in square brackets. If the name didn't contain a space, you would just type it straight after the dot.

New in version V1.4.0, you can set Type properties using PropertyWizard – see Getting Started section M.

### G. Custom Properties

You can also access custom properties (project parameters or shared parameters) using PropertyWizard:

G.1 Create a new, text, project parameter on Levels. Name the new parameter *Level Code*:

Parameter Properties

Parameter Type

☒ Project parameter  
(Can appear in schedules but not in tags)

☐ Shared parameter  
(Can be shared by multiple projects and families, exported to ODBC, and appear in schedules and tags)

Select... Export...

Parameter Data

Name: Level Code

Discipline: Common

Type of Parameter: Text

Group parameter under: Text

Tooltip Description:  
<No tooltip description. Edit this parameter to write a custom tooltip. Custom tooltips ha...

Edit Tooltip...

☒ Type  
☒ Instance

☒ Values are aligned per group type  
☐ Values can vary by group instance

Categories

Filter list: <show all>

☐ Hide un-checked categories

- ☐ Electrical Fixtures
- ☐ Entourage
- ☐ Fire Alarm Devices
- ☐ Flex Ducts
- ☐ Flex Pipes
- ☒ Floors
- ☐ Furniture
- ☐ Furniture Systems
- ☐ Generic Models
- ☒ Grids
- ☐ HVAC Zones
- ☒ Levels
- ☐ Lighting Devices
- ☐ Lighting Fixtures
- ☐ MEP Fabrication Containm...
- ☒ MEP Fabrication Ductwork
- ☐ MEP Fabrication Hangers
- ☒ MEP Fabrication Pipework
- ☐ Mass

Check All Check None

☒ Add to all elements in the selected categories

OK Cancel Help

This will allow you to record a short code for each Level, and use it in the Door Code.

G.2 Set the value of the new Level Code for each of the Levels in your project.

In my case, I have Levels 0 and 1, so I have used Level Codes L0 and L1:

<Level Schedule>		
A	B	C
Name	Elevation	Level Code
Level 0	0	L0
Level 1	4000	L1

G.3 Edit your formula to access the Level Code property:

Category: Doors

Target Property: Door Code

Formula: Level.[Level Code] + "-" + Type.[Type Mark] + "-" + Mark

PropertyWizard Formula

Category: Doors

Target Property: Door Code

Formula: Level.[Level Code] + "-" + Type.[Type Mark] + "-" + Mark

1.1.0.0

Cancel OK

Again, you use dot notation to access the property. And again, because the property name contains a space, you have to wrap it in square brackets.

As you place doors on different levels, their Door Codes will fill-in with the correct Level Codes.

## H. Project Information properties

You can use a shortcut to access Project Information properties. This can be useful if you need to code elements in your model according to the zone, block or volume that the model file represents:

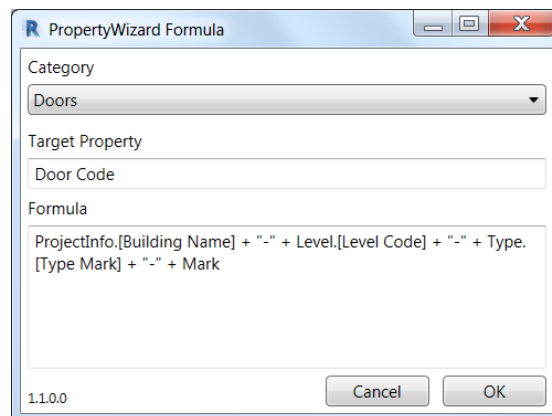
H.1 Set the value of the Building Name parameter in Project Information. I used the value *B1*.

H.2 Edit your formula to access the Building Name parameter from Project Information:

Category: Doors

Target Property: Door Code

Formula: `ProjectInfo.[Building Name] + "-" + Level.[Level Code] + "-" + Type.[Type Mark] + "-" + Mark`



This uses the shortcut *ProjectInfo* to access the project's Project Information, followed by a dot and then the property name in the usual way.

That completes the Door Code: Now, it identifies the Building, Level and Door Type that the door belongs to, as well as reporting the door's unique Mark.

## I. Choosing between results

Moving on to look at some other ways of using formulas, you can use an `if()` function to make a formula that chooses between two results:

I.1 Draw a new wall about 20 metres (say 60 feet) long.

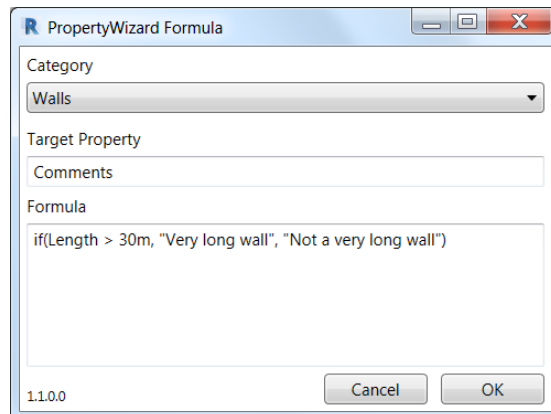
I.2 Open the PropertyWizard main window and Edit your Comments formula.

It's important that you Edit the existing formula (or Delete it and Add a new formula). Otherwise you will have two formulas that are trying to set the same Target Property, which can lead to the infinite loop error (for more details, see the *Dealing with errors* section, below).

Category: Walls

Target Property: Comments

Formula: `if(Length > 30m, "Very long wall", "Not a very long wall")`



If you prefer, you can use 100ft rather than 30m. PropertyWizard will work with either.

Your new wall's Comments will now read *Not a very long wall*.

- I.3 Drag the end of the wall to make it more than 30m long.

The wall's Comments will change to *Very long wall*.

The `if()` function has three inputs: The test, and two results. In this case the test is *Length > 30m*, which is true if the wall's Length is greater than 30m and false otherwise. The `if()` returns the first result if the test is true, and the second result if the test is false.

## J. Filtering

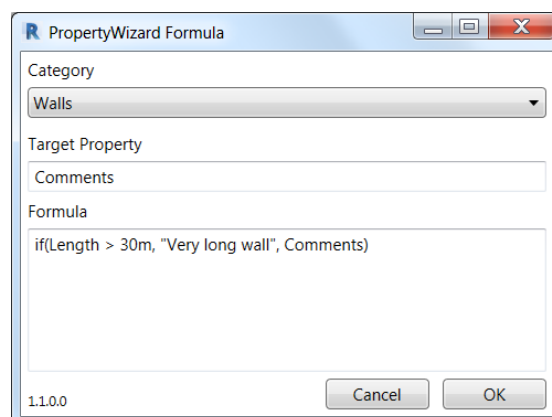
What if you want to set the target property if the test is true, and leave it alone otherwise?

- J.1 Edit your Comments formula to use *Comments* as the second result of the `if()`:

Category: Walls

Target Property: Comments

Formula: `if(Length > 30m, "Very long wall", Comments)`



This formula will only set the Comments property if the wall is longer than 30m. Otherwise, it will leave the Comments property unchanged.

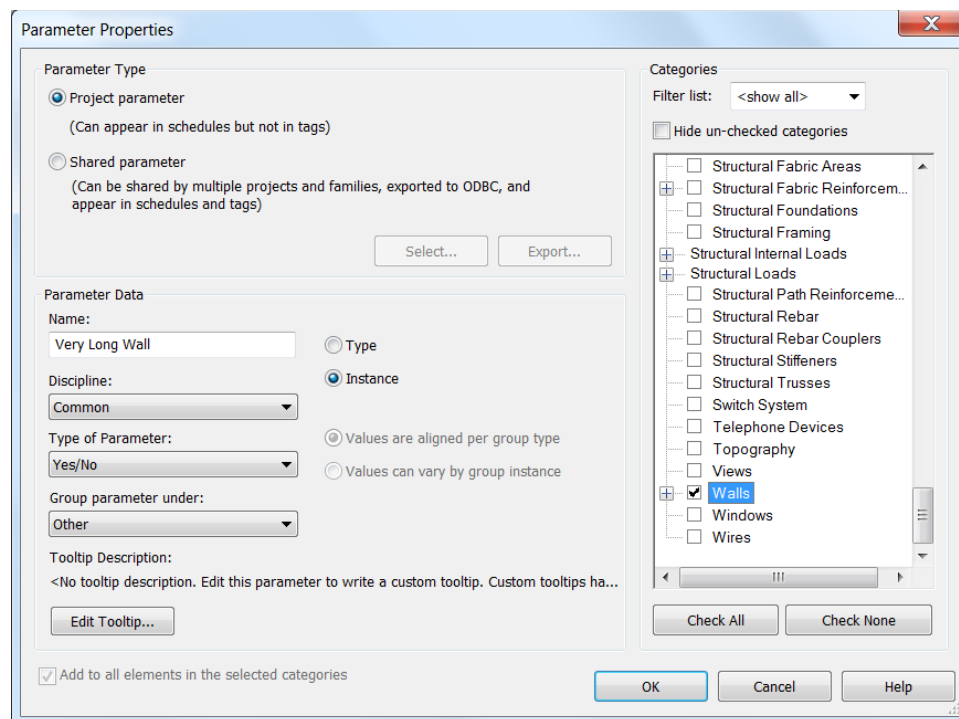
- J.2 Change the Comments on a wall shorter than 30m: Your change will 'stick', because the formula is no longer controlling the Comments value.
- J.3 Change the Comments on a wall longer than 30m: The value will be reset to *Very Long Wall* automatically by the formula.

This filtering formula works because before PropertyWizard sets the Target Property, it checks whether the new value is different from the existing. If the two are the same, it does nothing. One way of ensuring that the value of your formula is equal to the Target Property (in your chosen conditions) is by including the Target Property name in an if() function as you did here.

## K. Setting Yes/No parameters

You can set Yes/No parameters using a logical (true/false) value from PropertyWizard:

- K.1 Create a new Project Parameter in the project. It should be a Yes/No parameter, and it should apply to Walls. Name the new parameter *Very Long Wall*.

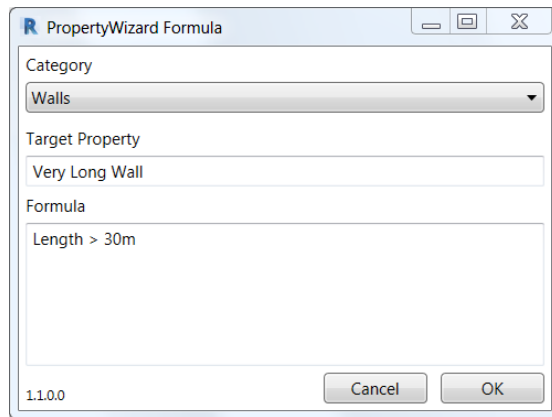


- K.2 Create a new formula to set your new parameter:

Category: Walls

Target Property: Very Long Wall

Formula: Length > 30m



This will set your new property to Yes (true) on the very long walls, and No (false) for the shorter ones. And as you alter the lengths of the walls, the property will update automatically.

## L. Using Element Id

You can easily access the Element Id property, which can be useful for Warnings workflows:

- L.1 Create a new Project Parameter in the project. It should be a Text parameter, and it should apply to Walls. Name the new parameter *ElementId*

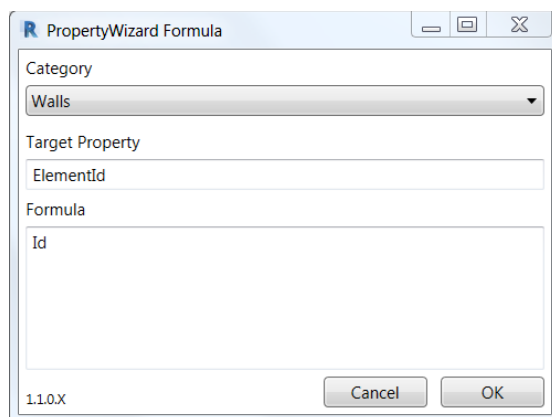
It is important not to name your new project parameter as *Id*, to avoid the problem described under Duplicate Properties in the *Dealing with errors* section below.

- L.2 Create a new formula to set your new parameter:

Category: Walls

Target Property: ElementId

Formula: Id



This will set your new ElementId property on all the walls in your project.

## M. Setting Type Properties (New in V1.4.0)

You can now set Type properties using PropertyWizard. Just write the name of the type property in the Target Property box, prefixed with 'Type.' (including the dot).

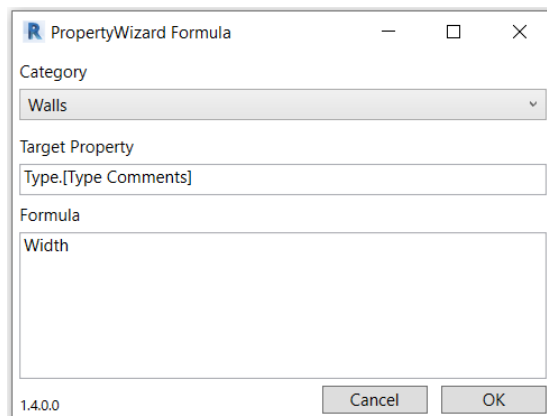
- M.1 Create a formula to copy the Width of each wall type into the Type Comments:



Category: Walls

Target Property: Type.[Type Comments]

Formula: Width



The image shows a 'PropertyWizard Formula' dialog box. It has three main sections: 'Category' with a dropdown menu set to 'Walls', 'Target Property' with a text box containing 'Type.[Type Comments]', and 'Formula' with a text box containing 'Width'. At the bottom, there are 'Cancel' and 'OK' buttons, and a version number '1.4.0.0'.

All the wall types in the project will have their Type Comments set to match their Width. If you change the wall build-up, the Type Comments will change to match.

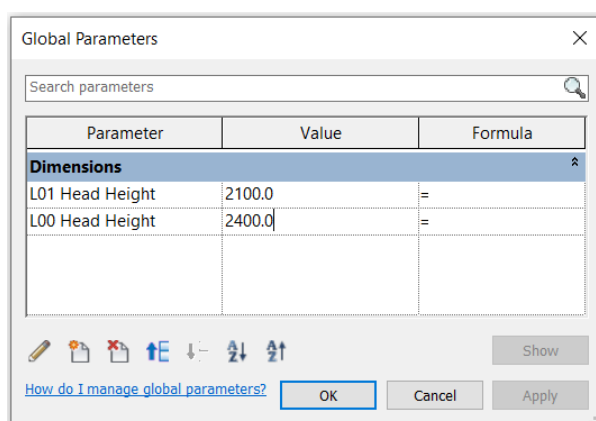
Note: The square brackets around 'Type Comments' are not essential – You don't need to use square brackets in the Target Property box, even if the property name includes a space.

## N. Global Parameters (New in V1.4.0)

Also new in version V1.4.0, you can use global parameters in your formulas. Access them by writing 'GlobalParameter.' and then the name of the global parameter.

In this example, we're going to use global parameters to control the head heights of windows on two different levels of the building.

N.1 Create two global parameters, one for each level. These are Length parameters, and I've set them to two different values :



The image shows a 'Global Parameters' dialog box. It has a search bar at the top. Below it is a table with three columns: 'Parameter', 'Value', and 'Formula'. The table has a section header 'Dimensions' and two rows: 'L01 Head Height' with value '2100.0' and 'L00 Head Height' with value '2400.0'. At the bottom, there are icons for editing, a 'Show' button, and 'OK', 'Cancel', and 'Apply' buttons. A link 'How do I manage global parameters?' is also present.

Parameter	Value	Formula
<b>Dimensions</b>		
L01 Head Height	2100.0	=
L00 Head Height	2400.0	=

N.2 Write a PropertyWizard formula that controls the Head Height of Windows:

Category: Windows

Target Property: Head Height

Formula: `if(Level.Name == "Level 0", GlobalParameter.[L00 Head Height],GlobalParameter.[L01 Head Height])`

PropertyWizard Formula

Category: Windows

Target Property: Head Height

Formula:

```
if(Level.Name == "Level 0", GlobalParameter.[L00 Head Height], GlobalParameter.[L01 Head Height])
```

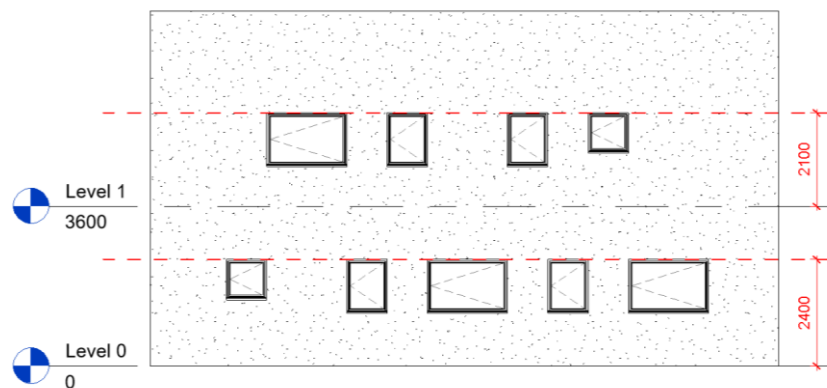
1.4.0.0

Cancel OK

Breaking the formula down, it uses an 'if' function – which works just like the if function in standard Revit formulas and in Excel. It has three inputs – a condition and two possible results. If the condition is true, it returns the first result; and if false, the second.

In this case, the condition tests whether the Name of the Window's Level is equal to "Level 0", and the results are the values of the two global parameters.

If you now change the values of the global parameters, the heights of the windows on the two floors will change to match.



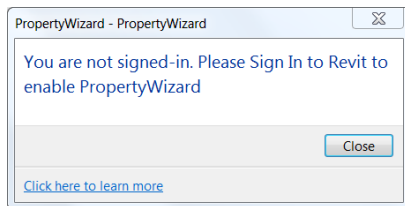
## Dealing with errors

### Licensing errors

PropertyWizard licensing should 'just work'. But occasionally you may encounter problems. This page lists the most likely problems and solutions, but if your problem is not listed here, please get in touch: [support@davidwooddesign.co.uk](mailto:support@davidwooddesign.co.uk)

#### *Not Signed In*

Your PropertyWizard license is linked to your Autodesk Account. To use PropertyWizard, you have to be signed in to your Autodesk Account in Revit. If you are not signed in, PropertyWizard will show this dialog:

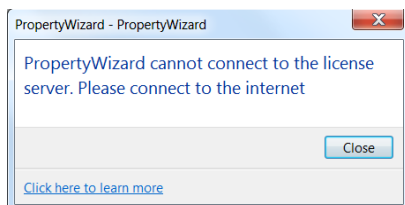


Fix this problem by signing in to Revit using the button at the top-right of the Revit window:



#### *No Network*

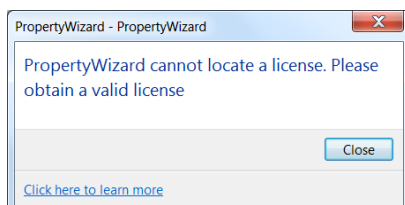
Your PropertyWizard license is stored on Autodesk's cloud server. If PropertyWizard cannot contact the server (for example, if you are not connected to the internet), PropertyWizard will not be able to access your license and will show this dialog:



Fix this problem by connecting to the internet.

#### *No License*

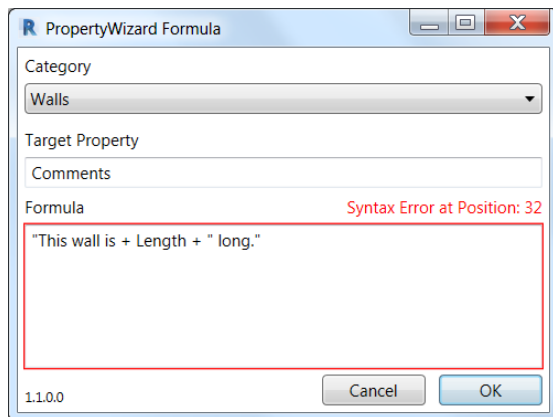
You need a license to use PropertyWizard. If the license server does not contain a license matching your Autodesk Account, PropertyWizard will show this dialog:



Fix this problem by assigning a valid PropertyWizard license to your Autodesk Account.

## Syntax errors

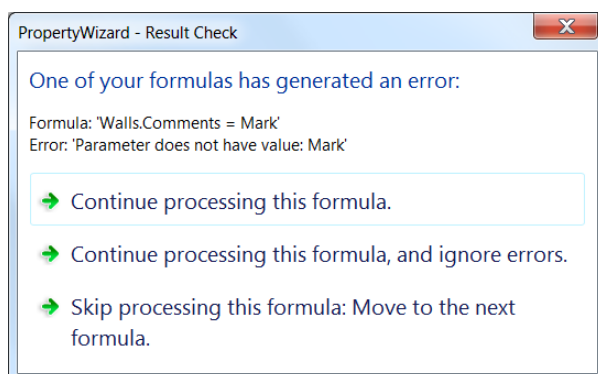
When you type in a formula, PropertyWizard checks that the syntax is correct, i.e. that the formula makes sense in the formula language. If your formula has a syntax error, PropertyWizard will highlight the location of the error like this:



In this case the syntax check found an error after the 32<sup>nd</sup> character in the formula. Sometimes it is easy to see what has gone wrong. Other times, you have to check your formula very carefully (and maybe break it down into pieces) to find where the fault lies.

## Formula errors

When your formula syntax is correct, PropertyWizard will try to run the formula on all the relevant elements. If one of the elements generates an error, PropertyWizard will show a dialog box like this:



The dialog gives you three options:

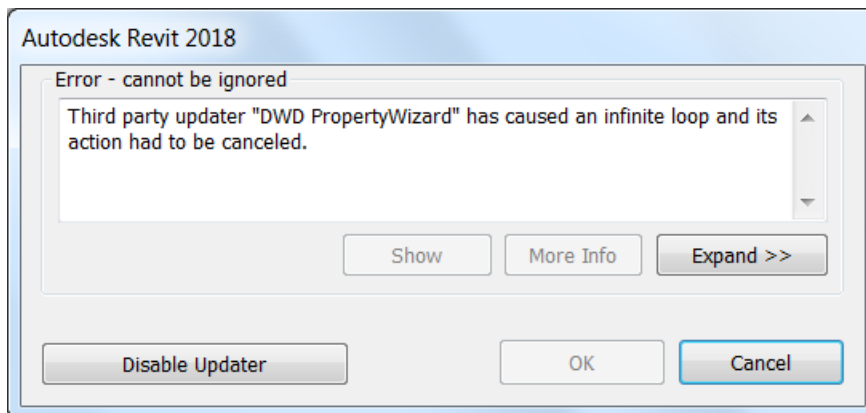
If you choose the first option, *Continue processing this formula*, PropertyWizard will stop processing this element and move on to the next. If the next element also generates the error, PropertyWizard will show the dialog again. This can get tedious if you have a lot of elements to process.

If you choose the second option, *Continue processing this formula, and ignore errors*, PropertyWizard will carry on processing the rest of the elements without reporting any errors. This is useful if the problem only affects some of the elements, and you want PropertyWizard to process the ones it can.

If you choose the third option, *Skip processing this formula...* PropertyWizard will stop processing this formula and move immediately to the next formula (if any). This is useful if you have made a mistake and want to fix your formula before running it any further.

## Infinite loop error

If you create two formulas that try to set the same Target Property, it's likely that you will get this Infinite Loop Error:

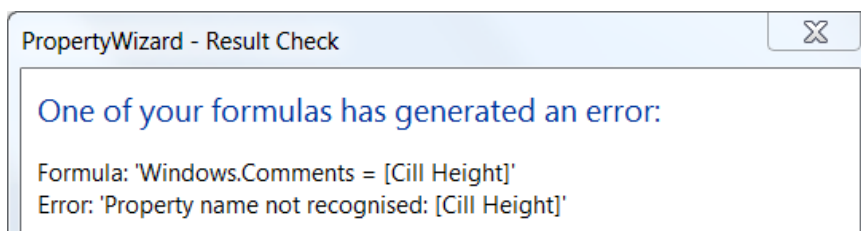


This is not the end of the world. Just click the Cancel button and Edit one of the conflicting formulas to fix the problem.

## Property name not recognised

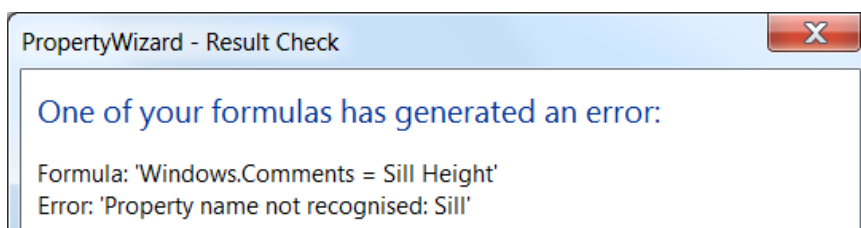
This must be the most common error I get in PropertyWizard. It means that there isn't a property called 'whatever' on the element. And the key to fixing the problem is to look carefully at the name PropertyWizard thinks it's looking for ('whatever'), and ask yourself if that's really the property name you want.

Often, I find that I've mis-spelled the property name – In this case, I've typed 'Cill' instead of 'Sill':



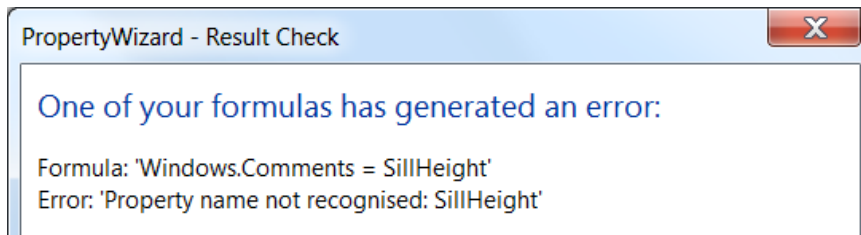
Double-check the name of the property in the Properties box or in RevitLookup.

Other times, I've forgotten that the property name contains a space – property names that contain spaces or special characters have to be enclosed in square brackets:



You can see that PropertyWizard has only found the first part of the name, stopping at the space, and of course there isn't a property called 'Sill' on the element.

Still other times, I've accidentally missed out the space altogether, and typed 'SillHeight'. Again, there's no such property:

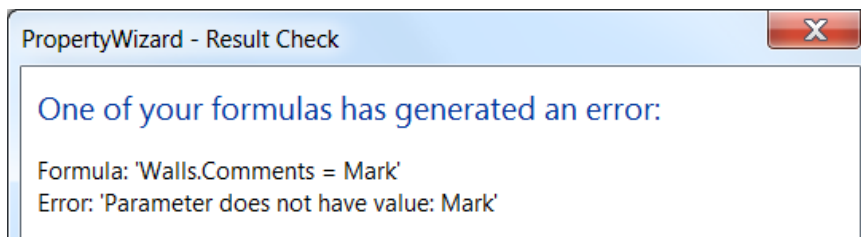


And finally, I sometimes forget that a property is a type property, and so don't prefix the property name with 'Type.'

So, there are plenty of ways you can type a property name wrong in your formulas, and only one way to type it right. But PropertyWizard's error message tells you how it has interpreted your typing, and from that you can usually work out what to fix.

### Parameter does not have value

Revit optimises its memory usage by only generating element properties when they are needed. So occasionally you will come across properties that do exist, but don't have a value:



Very often, the property will have a value for some of your elements, but not for all. So you want to run the formula on the valid elements and highlight the elements that don't have values. The `try()` function lets you do that.

Please note that most formulas do not need this level of control, because most properties do have values. I would only implement the steps in this section if you find properties that don't return values. And be careful, because `try()` will catch all errors, not just *Parameter does not have value*. So if you use `try()` indiscriminately, it will catch and hide formula errors that you should really fix.

The `try()` function has two inputs: The expression to try, and the value to return if the expression returns an error. For example:

```
try(Mark, "NO_MARK")
```

In this case, the `try()` expression is `Mark`, and the formula will return the text `NO_MARK` if the `Mark` property does not have a value. If you just want to return an empty string instead, use two double-quotes: `""`: you can use any value you like as the default.

### Duplicate Properties

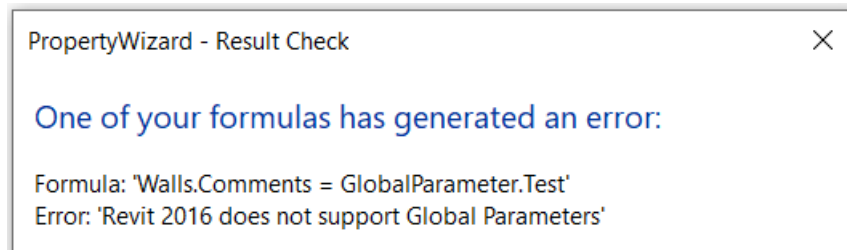
It is possible to have several Revit properties with the same name on the same category of elements. PropertyWizard can only access the first of these duplicate properties on each element, and it always searches for parameter properties first and API properties second.

So in the Element Id example above, if you created a new project parameter called `Id`, and referenced `Id` both in your formula, and as the Target Property, both those references would be pointing at your new project parameter and not at the underlying API property.

This can be the cause of some perplexing behaviour, so if your formula is not doing what you expect it is worth checking which properties you're really referencing.

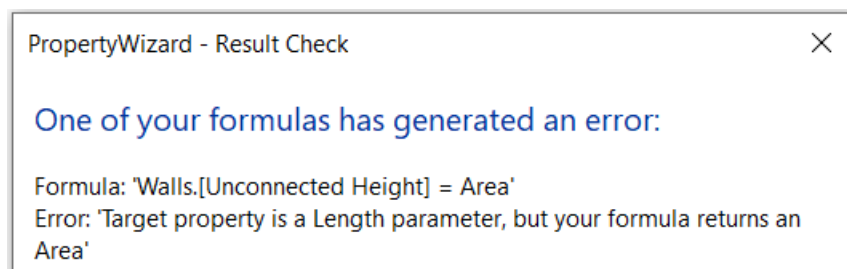
### **Global Parameters are not available in Revit 2016 (New in V1.4.0)**

PropertyWizard still runs fine in Revit 2016, but global parameters are not available. If you write a formula containing global parameters, the result check dialog will show an error message:



### **Type mismatch errors (New in V1.4.0)**

V1.4.0 has tightened up the code that handles measurement units (Lengths, Areas, etc), and now shows an error if the formula units do not match the target property units. So if you are setting a length parameter, your formula has to generate a length value:

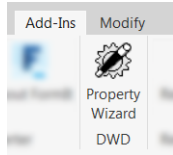


## Reference

This section provides reference material.

### Running PropertyWizard

PropertyWizard adds one button to a panel on the Add-Ins toolbar:

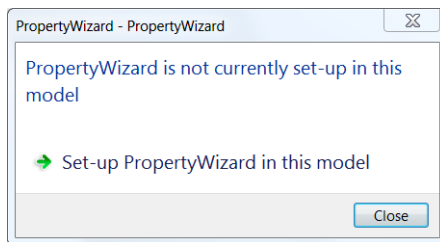


The button allows you to activate PropertyWizard and create formulas.

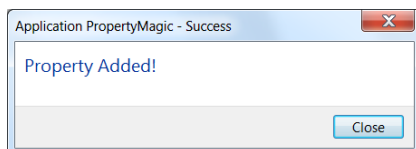
### Activating PropertyWizard in a project

PropertyWizard will do nothing until you activate it.

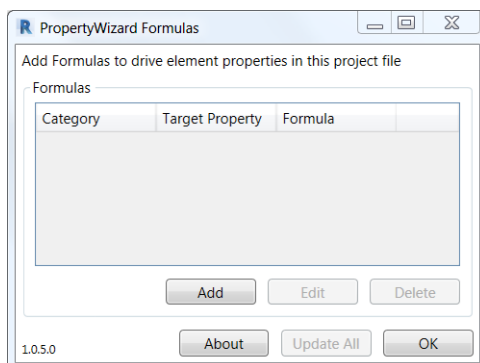
You activate it for each Revit .rvt file individually: just click the PropertyWizard button. In a new project, you will get this dialog:



Click *Set-up PropertyWizard in this model* to set up PropertyWizard in the project file. This will add PropertyWizard's shared parameter to the model.



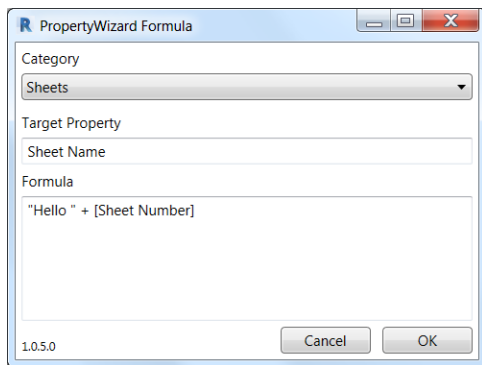
The button will also launch the PropertyWizard main window, which lists the formulas you have in the project:



From here you can add new formulas, and edit and delete your existing ones.



Both Add and Edit buttons open the Formula Edit window:



### Creating a formula

Each formula has three parts:

1. Select the Category – the formula will apply to all elements of this category.
2. Type in the name of the Target Property – the parameter you want to set.
3. Type in the Formula.

### Target Properties

New in V1.4.0, this can be a Type or an Instance property.

For Instance properties, just enter the property name. For Type properties, enter 'Type', followed by a dot and then the property name.

In this version, Target Property can be any of these data types:

- Number and Integer
- Length
- Area
- Volume
- Text
- Yes/No
- Angle
- Currency

### Formulas

In the formula, you can type in:

- Operators and Functions, like +, sin() and if().
- Numbers and Integers. Numbers have a decimal point, Integers are whole numbers.
- Lengths (using the suffixes *mm*, *m* or *ft*).
- Areas (using the suffixes *sq m* or *sq ft*).
- Volumes (using the suffixes *cu m* or *cu ft*)
- Text strings, delimited by double-quotes.
- The literal values *true* and *false*.
- Names of source properties. The formula will use the value of the property.

## Source Properties

You can refer to:

- Properties of the target element.
- Nested properties of the target element (e.g. properties of a Door's Level or a Wall's Type).
- API properties of the target element or nested elements (i.e. properties from the Revit API).
- Project Information parameters, by using `ProjectInfo.parametername`
- Global Parameters, by using `GlobalParameter.parametername`

Properties of the target element are just referred to by their name as seen in the Revit Properties window, for example, *Level*. If the name includes spaces or special characters, then it should be enclosed with square brackets like this: *[Sheet Name]*.

Nested properties are referenced by 'dot notation' as used in Dynamo. So the name of a Door's Level can be referred to as *Level.Name*. There is no limit to the depth of nesting, but all the properties except the last must be Elements or ElementIDs in this version.

API properties are the 'behind the scenes' properties exposed in the Revit API. For example, the *Location* property of a Structural Pile. To find the correct names, I use a combination of the RevitLookup add-in (compiled versions available from Harry Mattison's Boost Your BIM site <https://boostyourbim.wordpress.com/2020/04/15/revit-lookup-install-for-revit-2021/>), and the official Revit API Help (downloadable from Autodesk, or online at Gui Talarico's <http://www.revitapidocs.com/>). For more details on installing and using RevitLookup:

<http://www.davidwooddesign.co.uk/2018/08/19/how-to-install-revitlookup/>

<http://www.davidwooddesign.co.uk/2018/08/27/what-properties-can-you-use-in-propertywizard-formulas/>

## Operators and Functions

	Format	Notes
<b>Number operators</b>		
Multiply	<code>a * b</code>	
Divide	<code>a / b</code>	
Add	<code>a + b</code>	+ also provides string concatenation.
Subtract	<code>a - b</code>	
<a href="#">Exponentiation</a>	<code>a ^ b</code>	a to the power b.
<b>Number functions</b>		
Square Root	<code>sqrt(a)</code>	<code>sqrt(4) == 2</code>
<a href="#">Logarithm</a> base 10	<code>log(a)</code>	
<a href="#">Exponentiation</a> base 10	<code>exp(a)</code>	
Absolute value	<code>abs(a)</code>	
Sine	<code>sin(a)</code>	
Cosine	<code>cos(a)</code>	
Tangent	<code>tan(a)</code>	
Arcsine	<code>asin(a)</code>	
Arccosine	<code>acos(a)</code>	
Arctangent	<code>atan(a)</code>	
PI	<code>pi()</code>	
Round	<code>round(a)</code>	

	<b>Format</b>	<b>Notes</b>
Roundup	roundup(a)	
Rounddown	rounddown(a)	
<b>Logical functions</b>		
And	and(a, b...)	True only if both a and b are true.
Or	or(a, b...)	True if either a or b is true.
If	if(a, b, c)	If a is true, then b, else c.
<b>Flow control functions</b>		
Try	try(a, b)	Tries a. If a throws an error, returns b
<b>Logical operators</b>		
And	a && b	True only if both a and b are true.
Or	a    b	True if either a or b is true.
Not	!a	True if a is false.
Equal	a == b	True if a is equal to b.
Not equal	a != b	True if a is not equal to b.
Greater than	a > b	True if a is greater than b.
Less than	a < b	True if a is less than b.
Greater than or equal to	a >= b	True if a is greater than, or equal to, b.
Less than or equal to	a <= b	True if a is less than, or equal to, b.
<b>String Functions</b>		
String concatenation	strcat(a, b,...)	strcat("bow", "tie") == "bowtie"
String length	strlen(a)	
Sub-string	substr(a, b, c)	substr("tree", 1, 2) == "re"
String find	instr(a, b)	instr("tree", "re") == 1 returns -1 if not found
String format	format(a, b...)	Implements .Net String.Format
<b>Units</b>		
Millimetres	a mm	
Metres	a m	
Feet	a ft	
Square metres	a sq m	
Square feet	a sq ft	
Cubic metres	a cu m	
Cubic feet	a cu ft	
<b>Coordinates</b>		
Internal -> Shared	internaltoshared(a)	Converts a Revit database XYZ value into shared coordinates
Shared -> Internal	sharedtointernal(a)	

## Release Notes (What's New)

### Compatibility

If you are sharing a file between users, I recommend that all users who are working on the same Revit model use the same version of PropertyWizard.

Each new version of PropertyWizard is designed to work properly with Revit files that contain formulas from previous versions. Also, the current version is file-compatible with previous versions of PropertyWizard, meaning the PropertyWizard data stored in the Revit model file has not changed. Of course, if you write formulas using features from new versions of PropertyWizard, those formulas will not work in older versions.

#### V1-4-3 New Features

- Bugfix – Hyphens in parameter names.
- Bugfixes and stability improvements.

#### V1-4-2 New Features

- Bugfix – CheckoutElementsRequestTooLarge exception in Revit 2021 with BIM 360.
- Bugfixes and stability improvements.
- Versions for Revit 2016 and 2017 not updated (will be removed in a later version)

#### V1-4-0 New Features

- Formulas can now target Type parameters by using `Type.parametername`.
- Formulas can now read Global Parameters by using `GlobalParameter.parametername`.
- Added more checks around mismatched units.
- Bugfixes and stability improvements.

#### V1-3-0 New Features

- Revit 2021 version added.
- Privacy Policy links added.

#### V1-2-5 New Features

- Bugfixes and stability improvements.

#### V1-2-4 New Features

- Bugfixes and stability improvements.

#### V1-2-3 New Features

- Bugfixes and stability improvements.

#### V1-2-2 New Features

- Synchronisation updates.
- Bugfixes and stability improvements.

#### V1-2-1 New Features

- Quickfix to synchronisation speed.
- Bugfixes and stability improvements.

#### V1-2-0 New Features

- Volume units added.
- Installation size reduced.
- Bugfixes and stability improvements.

#### V1-1-0 New Features

- Revit 2020 version added.
- Sqft unit added.
- Length and Area string formatting matches Revit Project Units setting.
- Help button added to main window.
- Bugfixes and stability improvements.

#### V1-0-5 New Features

- Bugfixes and stability improvements.

#### V1-0-4 New Features

- Feedback window clarified.
- About window updated.
- Bugfixes and stability improvements.

#### V1-0-3 New Features

- Improved handling of incompatible formulas.
- Improved UX for licensing.
- Improved UX for logging.
- Bugfixes and stability improvements.

#### V1-0-2 New Features:

- Improved reporting of formula errors.
- Bugfixes and stability improvements.

#### V1-0-1 New Features:

- Bugfixes and stability improvements.
- Preview version for Autodesk App Store.

#### V1-0-0 New Features:

- Preview version for Autodesk App Store.

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