HCA Tech Note 119

Program elements that work with parameters and expressions

Some Visual Program elements can have a program parameter selected to designate the object they operate on. Some elements can use expressions embedded in the text of an element's properties. This technical note can serve as a reference as to which elements operate with parameters and expressions.

Before reading this note, please review the technical notes on creating programs that use parameters and the technical note on expressions and be sure you understand how parameters work and the difference between an "object" parameter and a "value" parameter.

Tech note 103: Expressions
Tech note 107: Programs with Parameters

Use of Embedded Expressions

As described in the expressions technical note, there are properties of some elements where you can embed an expression within a text field used in the element. This expression is parsed and evaluated when the element executes. An expression is embedded in a string by prefixing it with a "%" and suffixing it with a "%". For example:

```
Motion sensor ONs last 24 hours is %firstFloorCount + secondFloorCount%
```

The expression "firstFloorCount + secondFloorCount" is evaluated when the element is executed and, assuming the first floor count is 52 and the second floor count is 83, then the resultant text string is:

```
Motion sensor ONs last 24 hours is 135
```

Note that some elements helpfully have an "Embed expression" button that takes you to the expression editor but not all elements do.

Reference Table for parameters and expressions by element type

The table below shows all the elements that work with object parameters and expressions. In the subsequent section, examples of some of the more complex elements are provided.

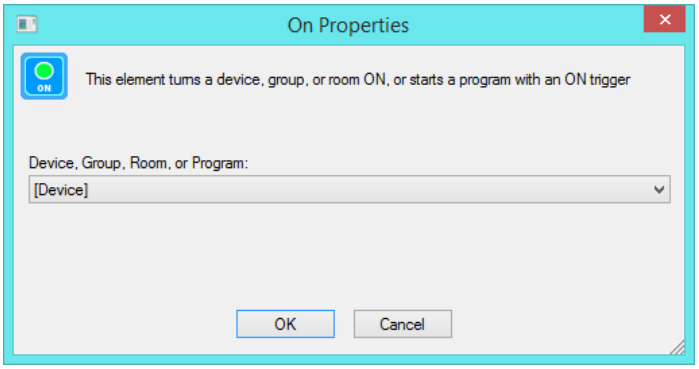
Element	Notes
Add to Log	Log text can contain embedded expressions

Auto Off	Target can select a parameter
Camera	In any operations that takes arguments, those arguments can contain embedded expressions
Change Icon	Target can select a parameter Label text can contain embedded expression
Compute and Compute-Test	Expressions can reference both object and value parameters
Dim	Target can select a parameter
Email / SMS	Subject and body can contain embedded expressions
HTTP	Connect-To, send text, optional headers, optional data can contain embedded expressions
Hue	Target can select a parameter
IR	Target can select a parameter
Multi	Targets can select a parameter
On / Off	Target can select a parameter
Port I/O	Send text can contain embedded expressions
Suspend / Resume	Target can select a parameter
Test	When testing for isOn, IsOff, isDim, or isSuspended, the object being tested can select a parameter
Run	Command line can have embedded expressions
Show Display	Target can select a parameter
Show Message	Text can contain embedded expressions
Speak	Text can contain embedded expressions
Start Program	Arguments to a parameterized program can contain embedded expressions
Stop Program	Target can select a parameter
Thermostat / Thermostat-Test	Target can select a parameter
Update Tile	Tile label, image tile path, and text tile text can contain embedded expressions
Var Set	When the “Assign to” is a variable, the selection includes parameters When the “Assign to” is an expression, an expression can be entered
Var Test	The test value can be an expression

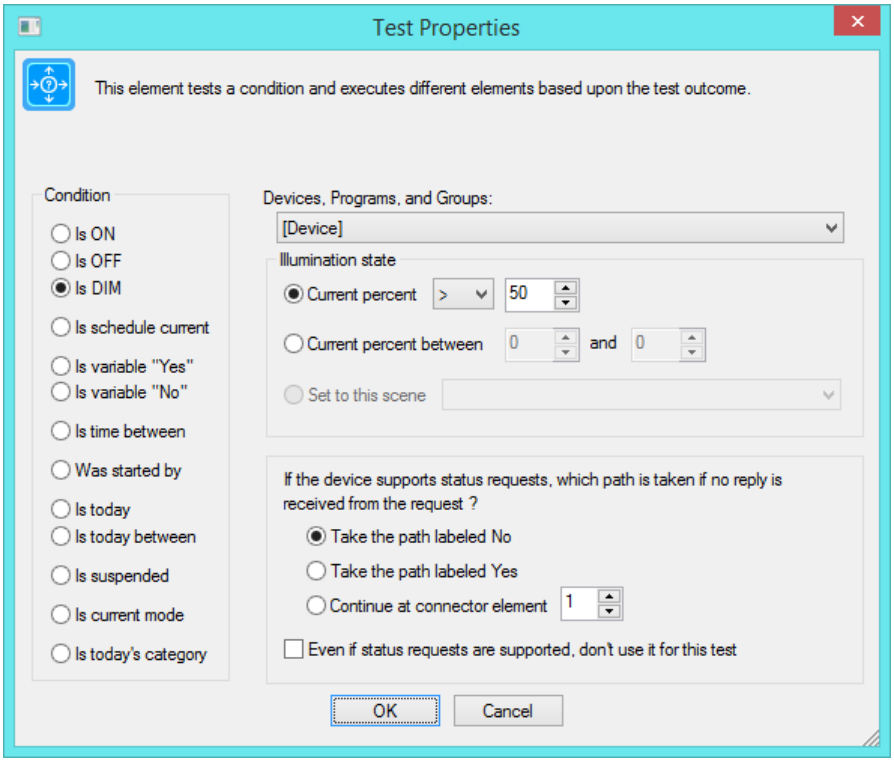
Selected Element Examples

What follows are some – but not all - of the elements that work with parameters and/or expressions and show how a parameter is selected or an expression entered.

The ON element can select as the target of the ON operation an object parameter.



The TEST element for the IsOn, IsOff, IsDim, and IsSuspended conditions, can select an object parameter as the target of the test.



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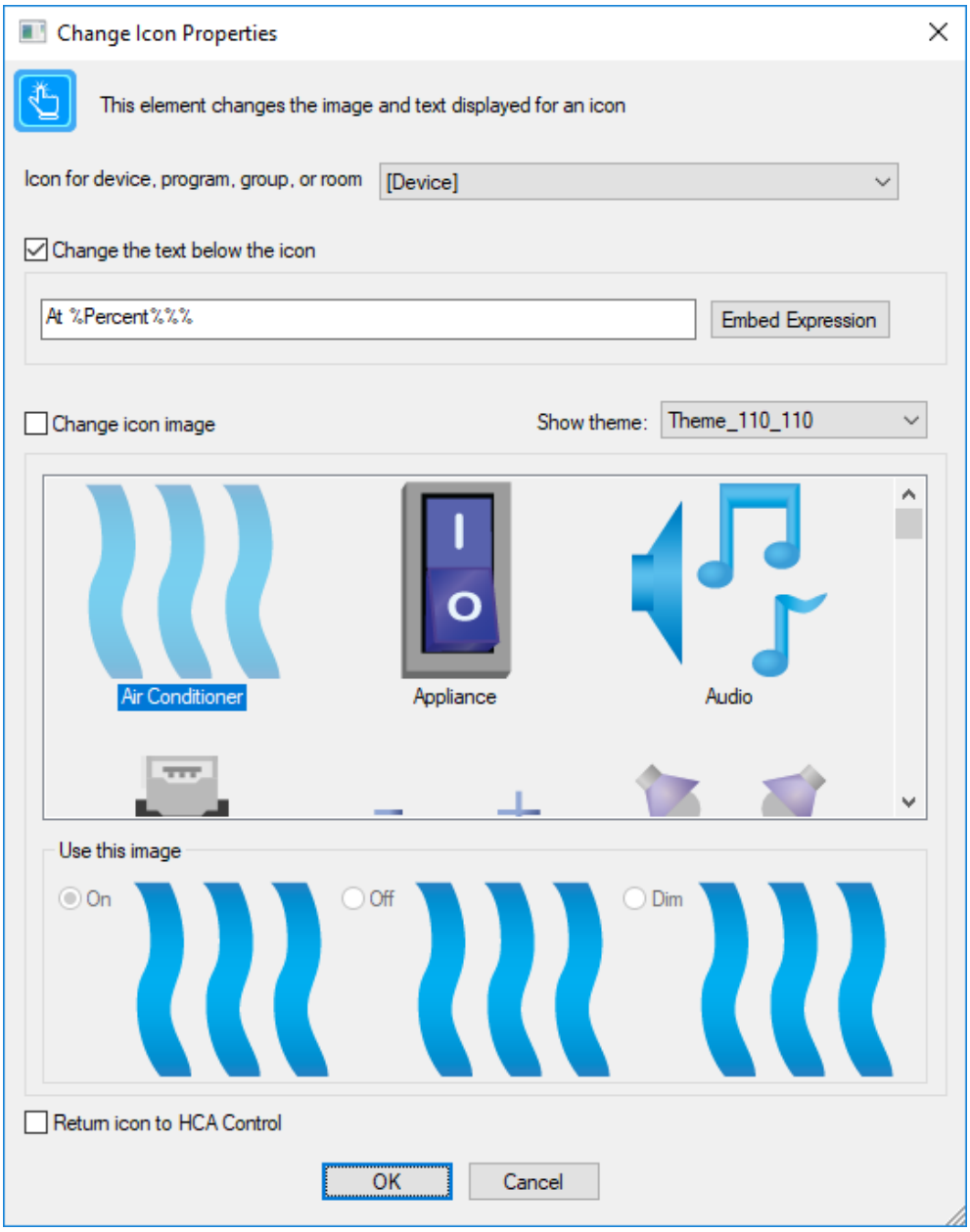
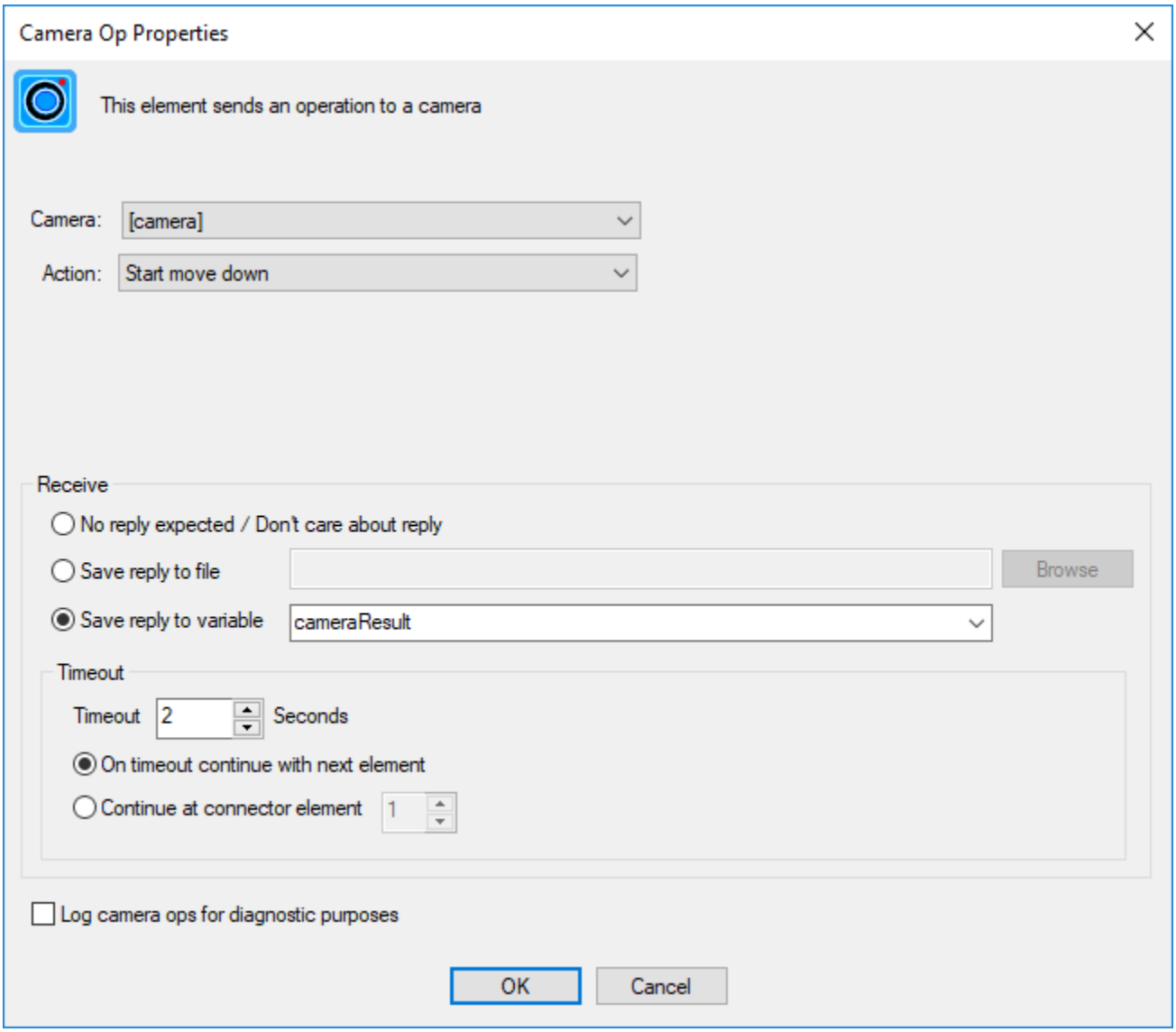
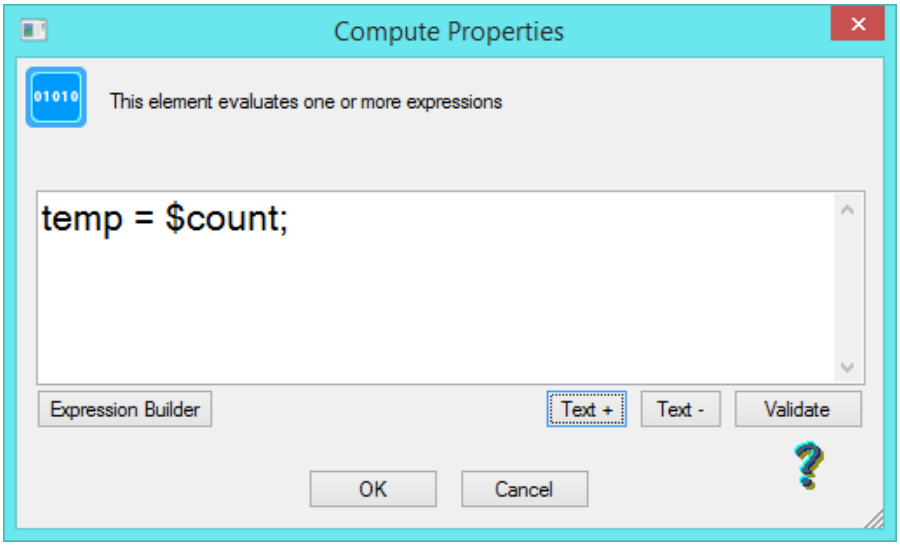
The Change Icon element can select as the target an object parameter. An expression can be embedded in the text used for the icon label.



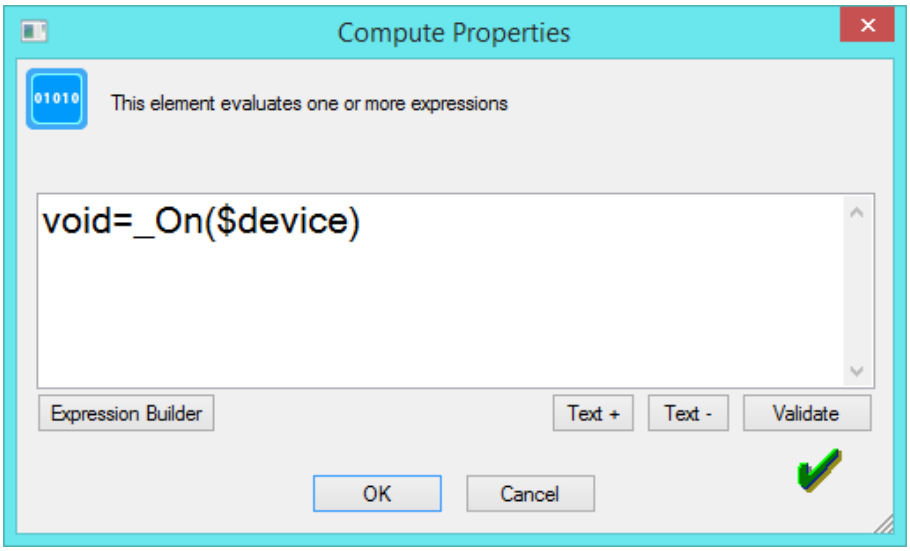
The Camera element can select as the camera device an object parameter. When the element executes, HCA checks that the object passed to the program really is a camera device.



In the Compute and Compute-Test elements, the expression can contain references to parameters. They are referred to by their name prefixed by a $. For example, this element assigns to the “temp” variable the value of the “count” parameter.

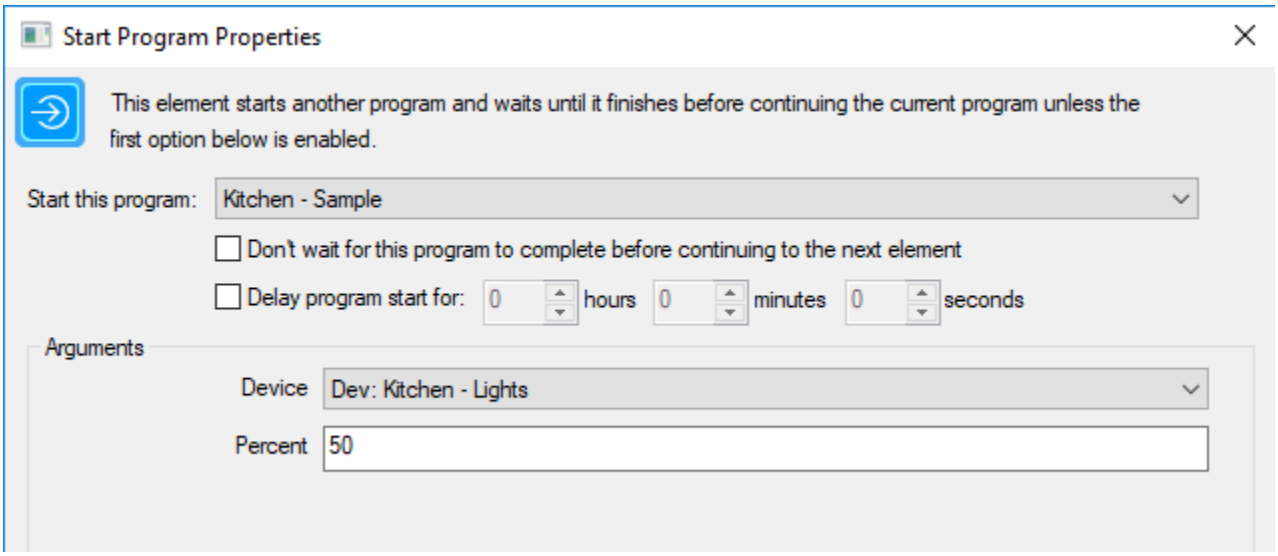


In a Compute and Compute-Test elements you can refer to both object and value parameters. When using an object parameter in an expression, the name of the object is used if needed. For example, if a program has an object parameter called “device” then in a Compute element you can use this:



The _On function is specified to take as the one argument the name of the object to control and supplied as a text string. When an object parameter is used in a Compute or Compute-Test element, the name of that

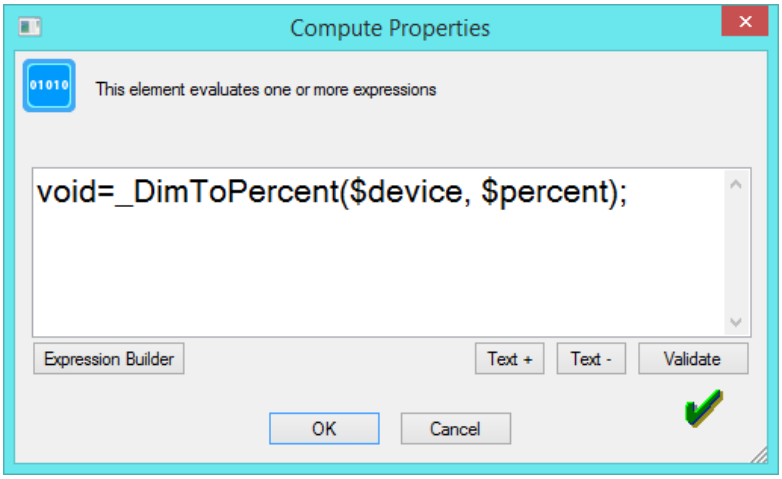
object is used. As an example, here is a Start-Program element that starts the program containing the above Compute element:



When the “Kitche-Sample” program starts and the Compute element is executed, the _On function operates as if this text was entered in the Compute element:

```
Void = _On("Kitchen - Lights")
```

In the Compute and Compute-Test elements both object and value parameters can be used. In this example, an object parameter “device” and the value parameter “percent” are used.



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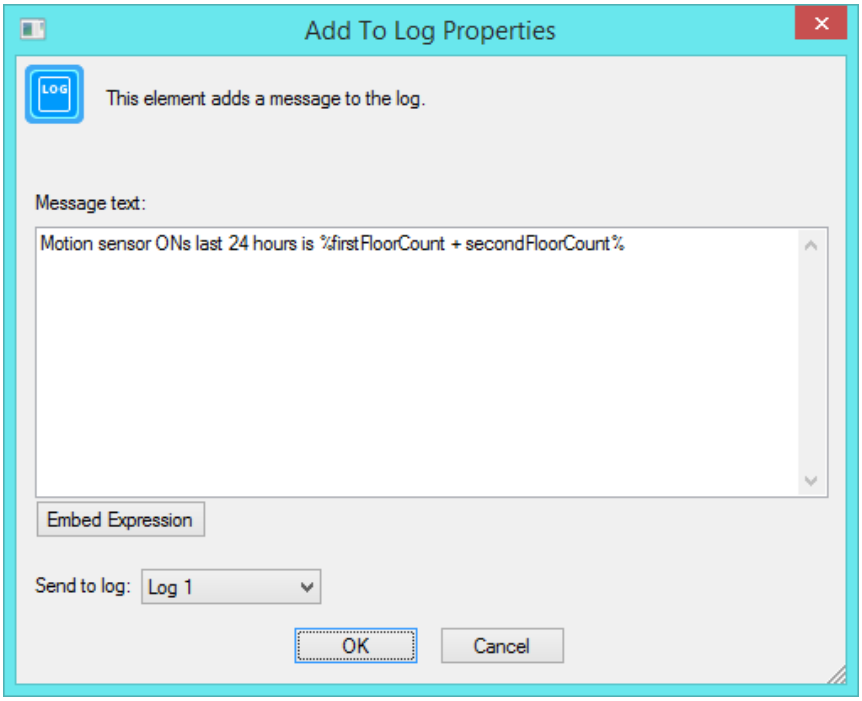
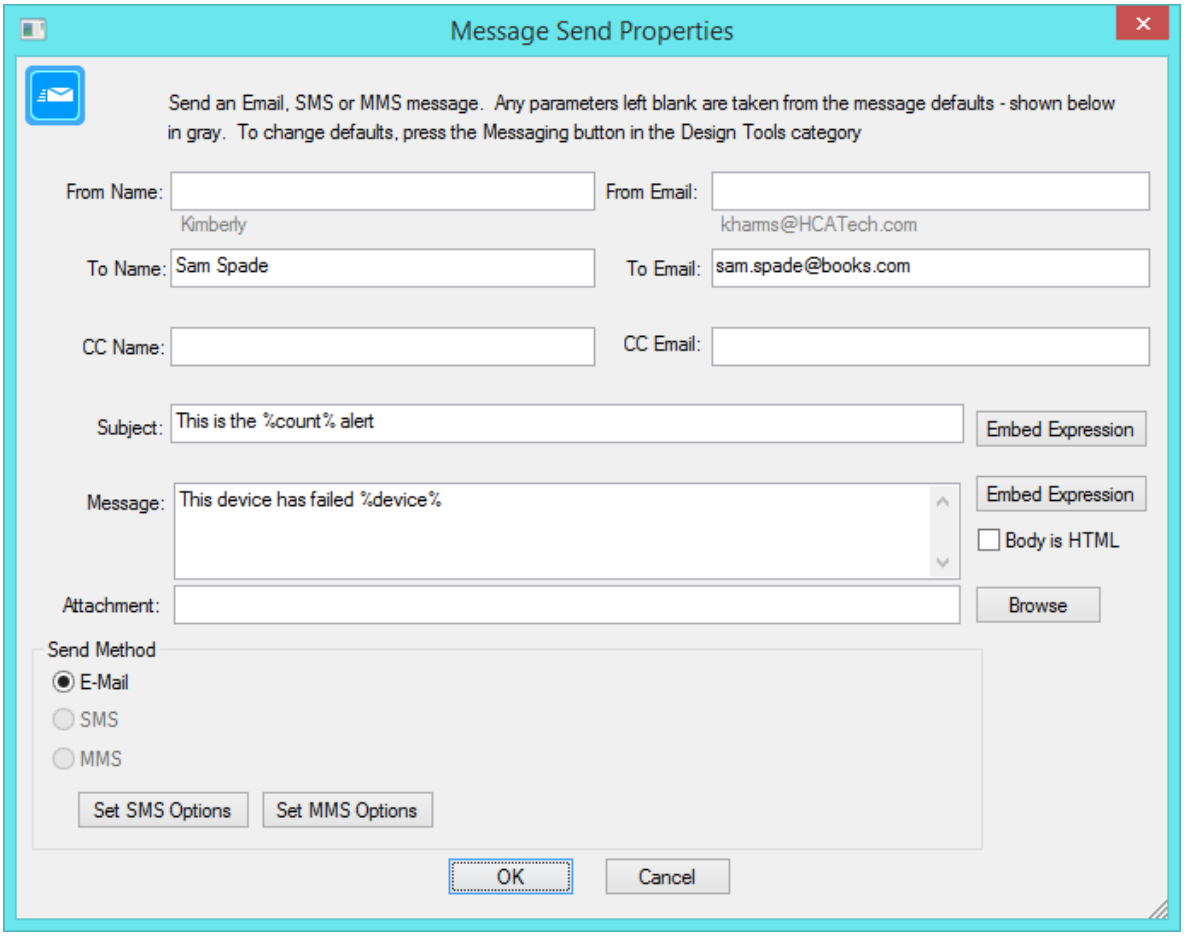
The Add-to-log message text can contain embedded expressions. When this element is executed, the expression within the %'s is evaluated and the final string constructed and used. In this example, if the variable firstFloorCount is 10, and secondFloorCount is 12, then the log entry written contains this text:
"Motion sensor Ons in last 24 hours is 22"



The Email/SMS element can contain embedded expressions in both the subject and message.



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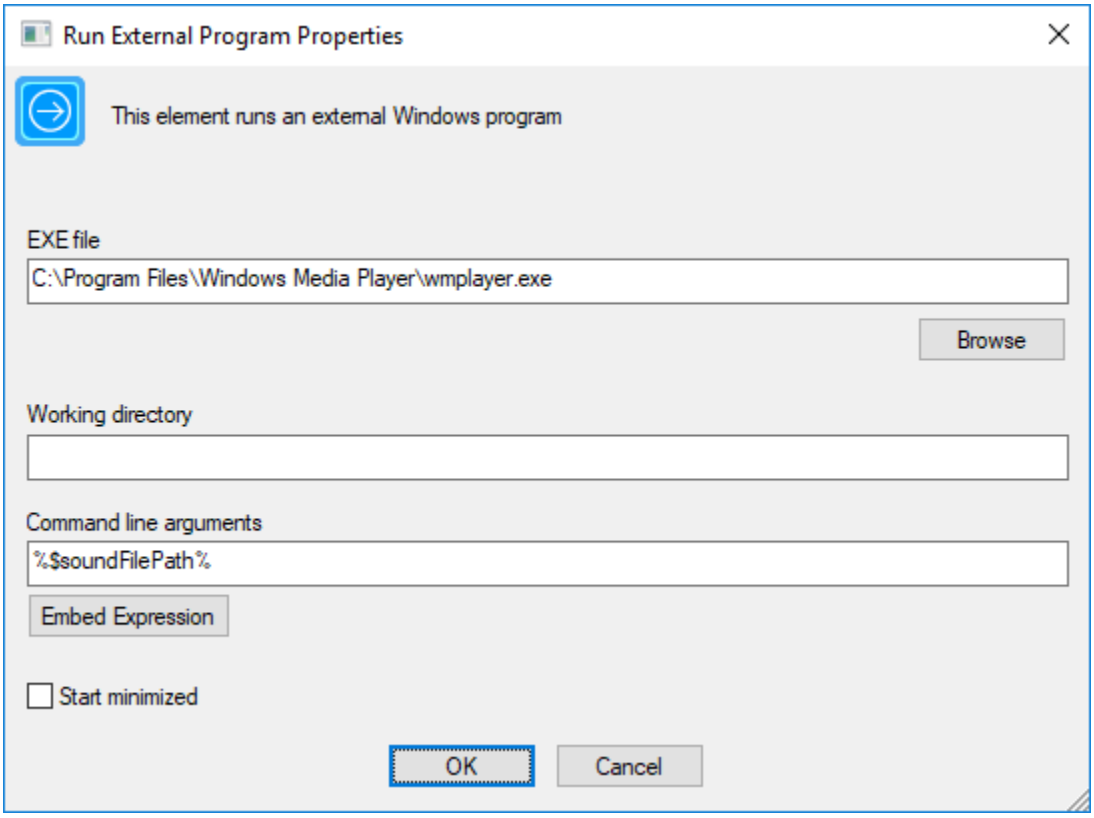
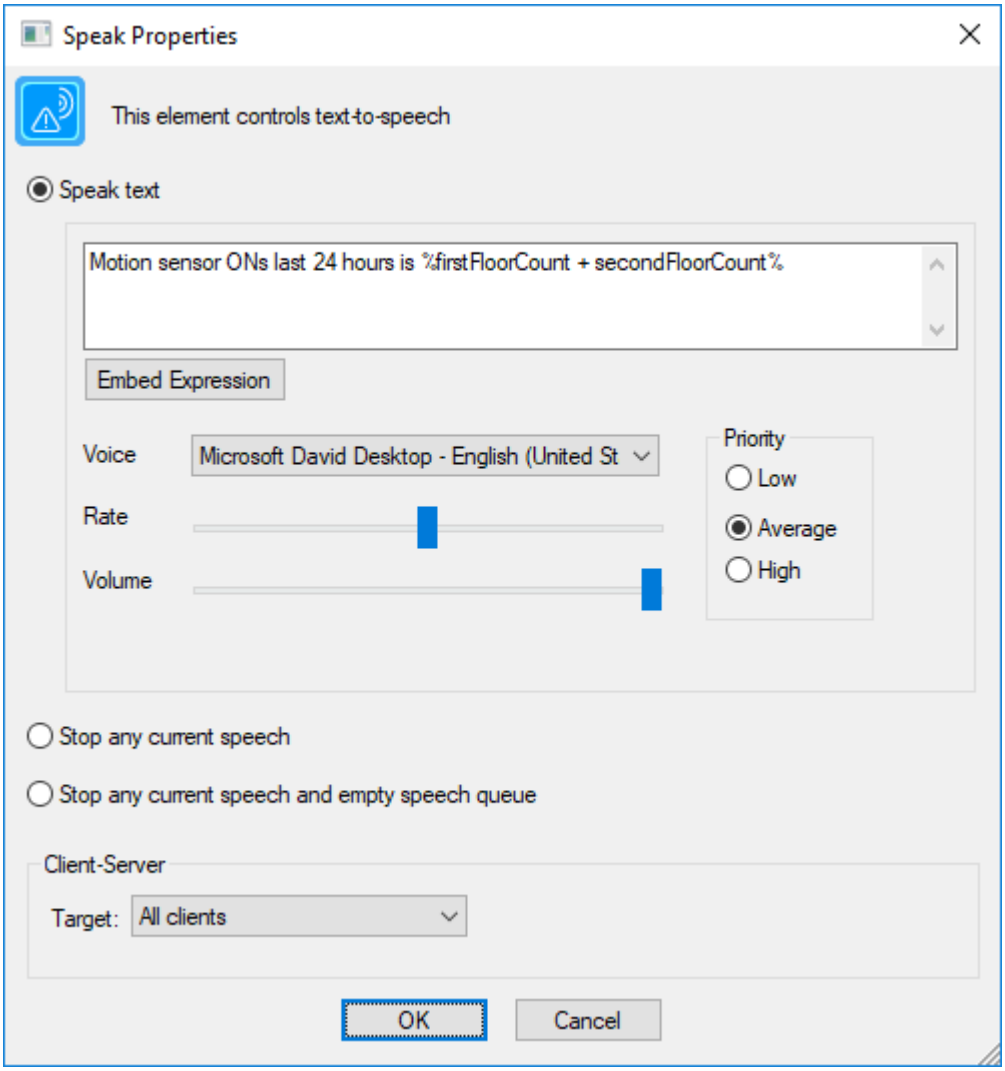
The Run-Program element command line can contain embedded expressions



The Speak element text can contain embedded expressions:



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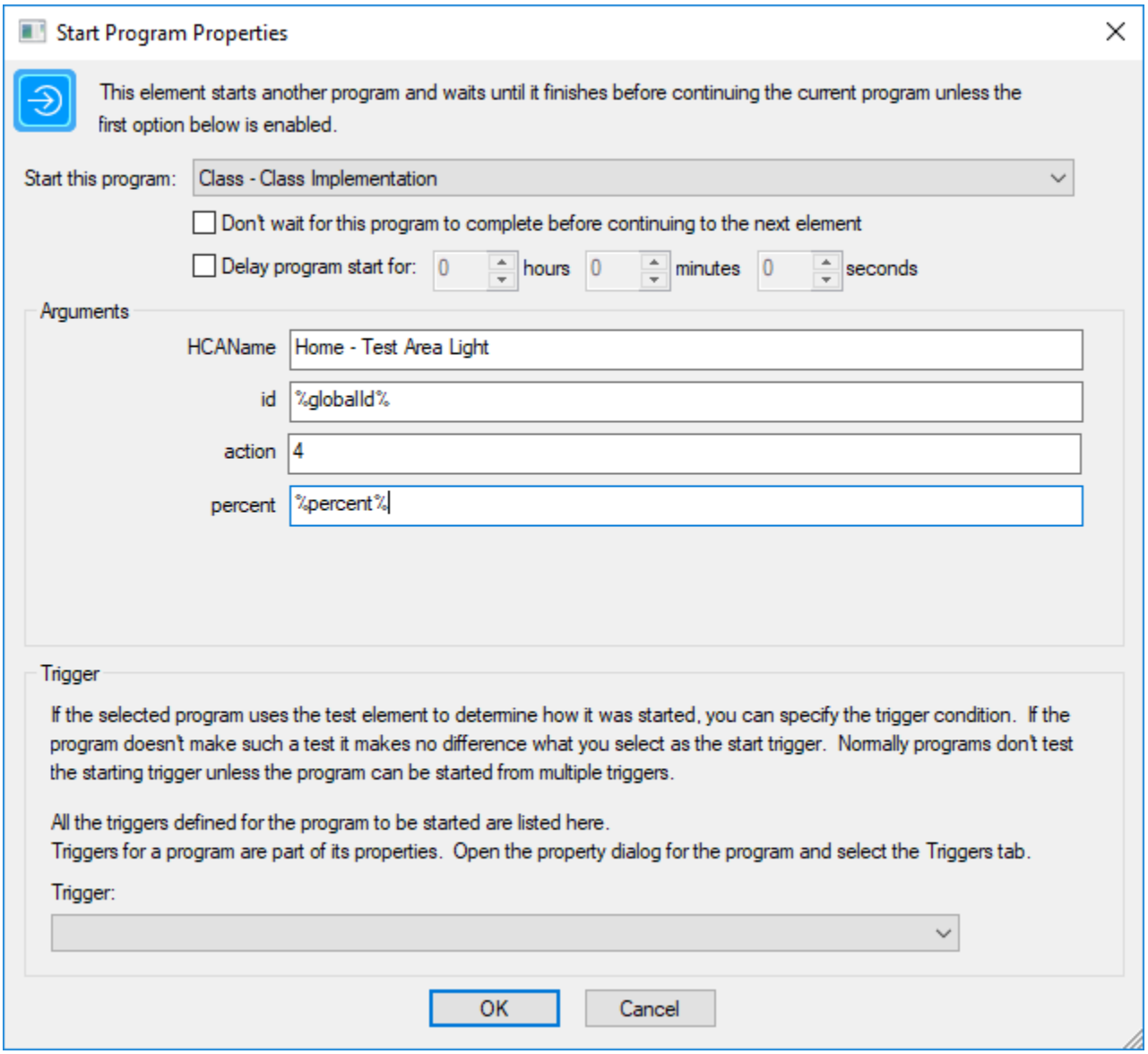
The Start-Program element, when starting a parameterized program, can contain embedded expressions in its arguments. Note that there is no “Embed Expression” button but it is correct to use them in the arguments. The expressions are evaluated, the argument strings constructed, and the named program is started.



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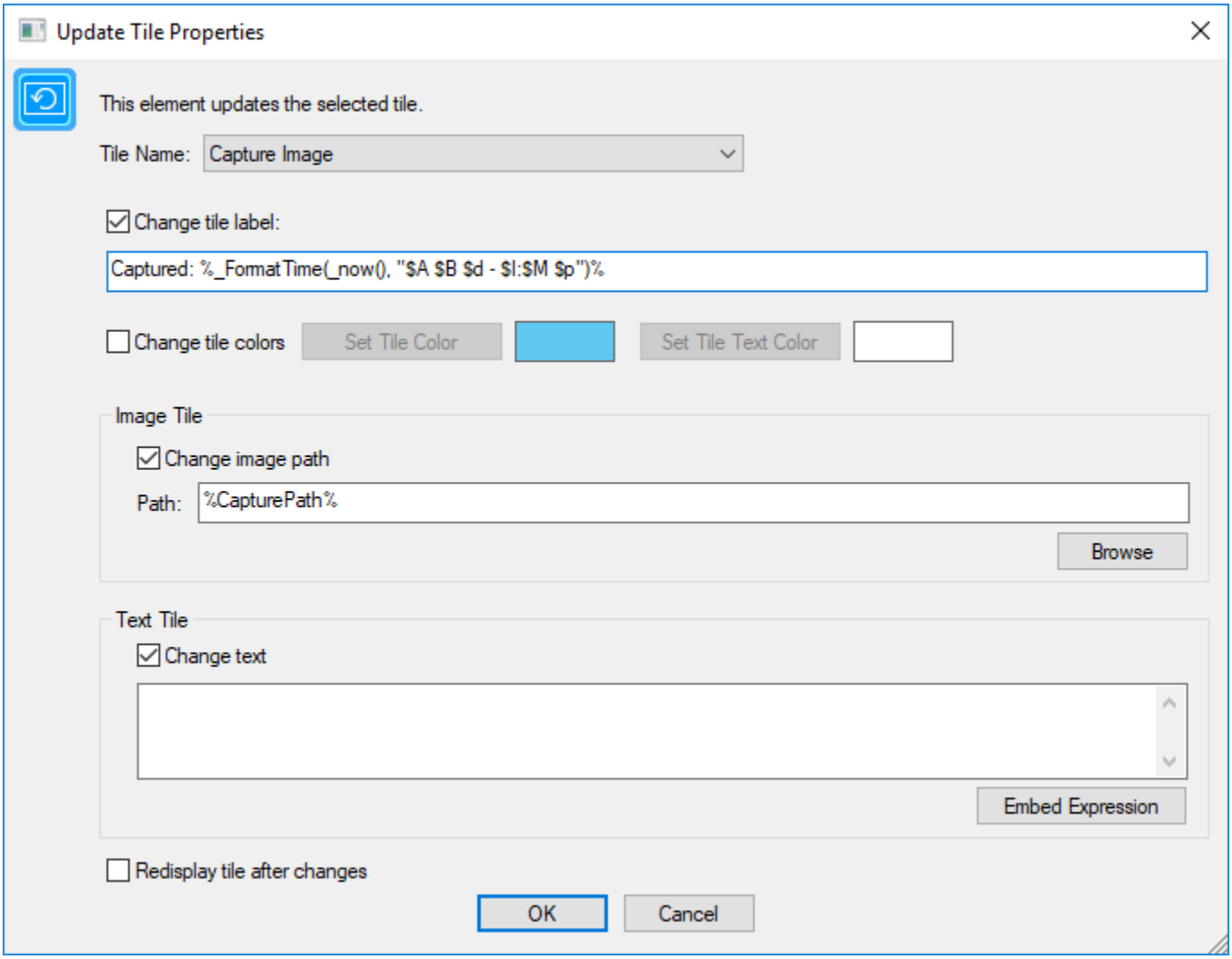
The Update-Tile element can have an embedded expression in the tile label, image path, and text for a text tile. Note that there is no “Embed expression” button for the tile path and label, but using an expression there is allowed.



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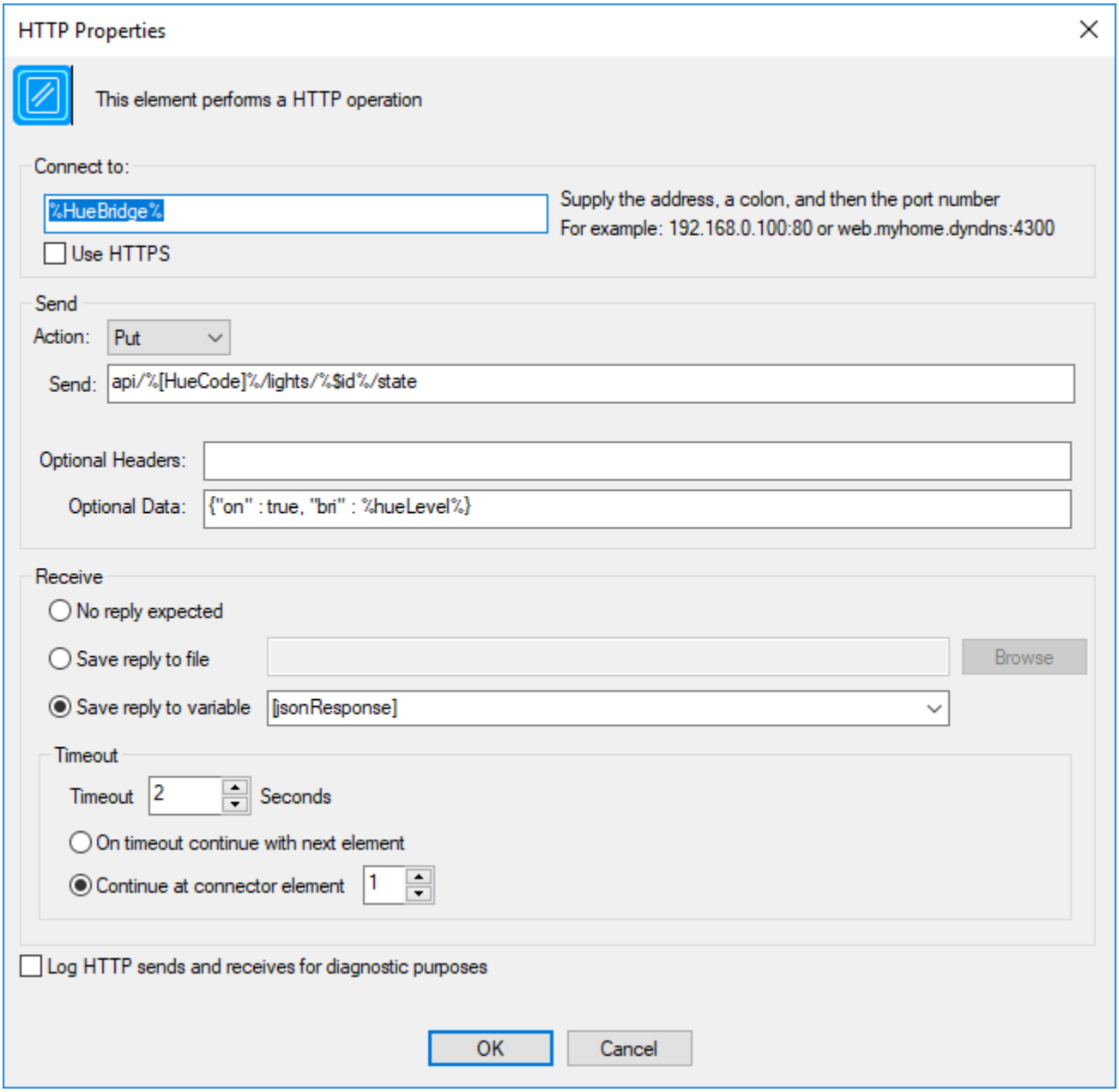
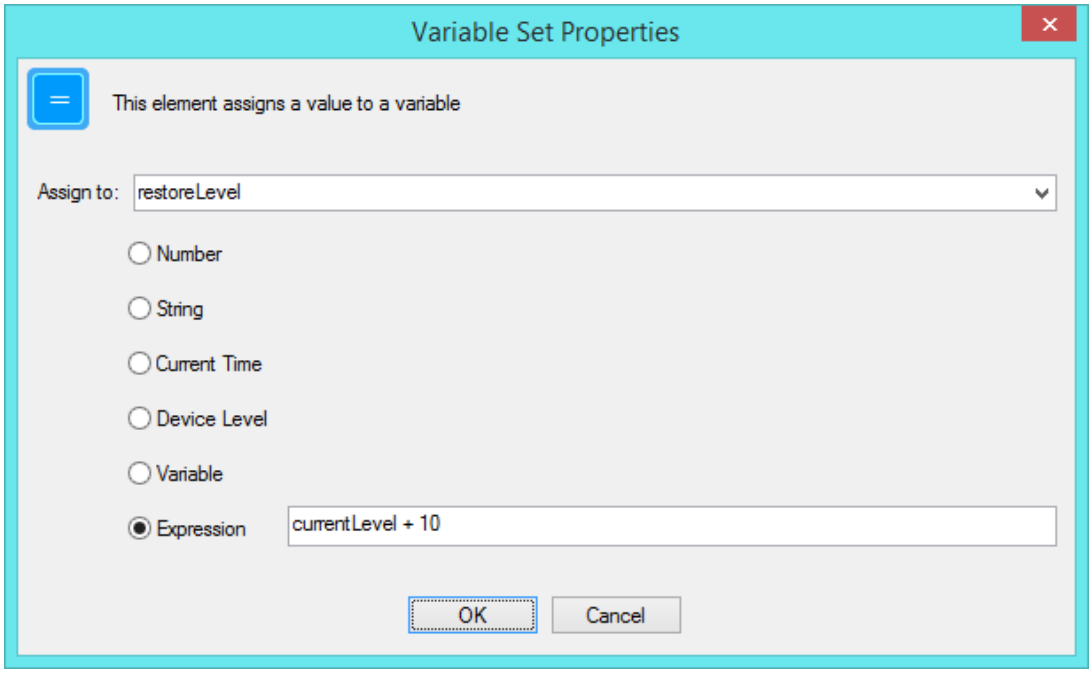
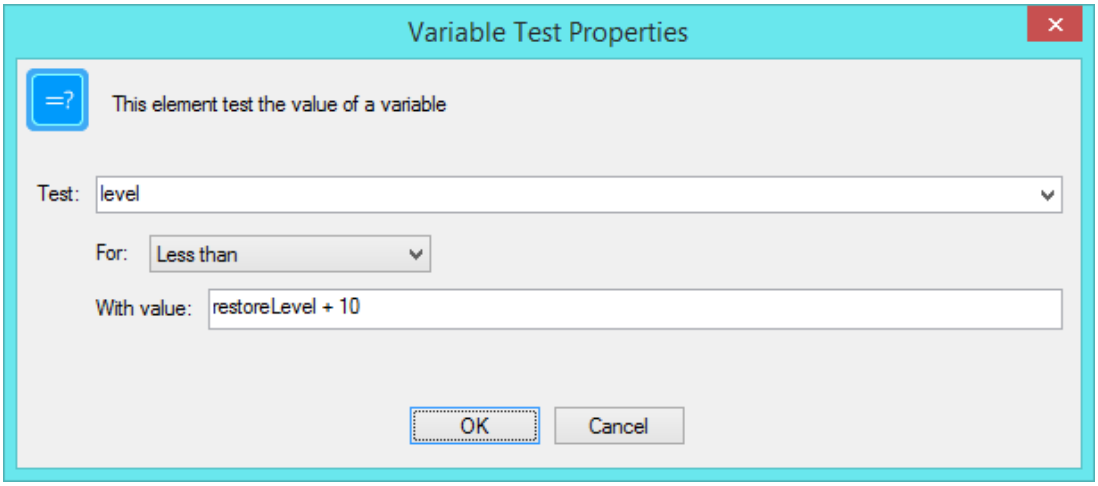
The HTTP element can have embedded expressions in the “Connect To”, “Send”, “Optional Headers”, and “Optional Data”. Note that while there is no “Embed Expression” button, using an expression in those locations is allowed.



The Var-Set element has many different options on what to assign to the named variable. When the "expression" option is selected, then an expression must be provided. Note that this is not a text string with embedded expressions, but rather the same expression as would appear in the Compute element.



The properties of the Var-Test element contain the "value" for the test comparison. While the properties dialog labels this as a "value", you can use an expression rather than a simple value. The expression is the same as you would use in the Compute-Test element.



##end##