3. Expressions

This chapter is intended as a primer on how to apply expressions (programmatic commands) to Nuke parameters. It explains how to perform some common tasks with expressions (for example, how to link the values of one parameter to another), and concludes with a table all the functions that you may include as part of an expression.

Understanding Expression Syntax

You enter Nuke expressions in the expression dialog, which you can open by pressing the equals sign (**=**) on a parameter. In the dialog, you can enter text that either references values from other parameters (creating a linking expression) and/or applies mathematical functions of some kind to the current values.

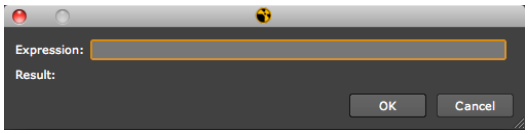
Linking Expressions

Through expressions, you can link the parameters from one node and control the values of the parameters in other nodes. When creating a linking expression, type the elements listed in the table below; remember to separate each element with a period.

Element	Description
Node name	The node with the source parameter (i.e., **Transform1**).
Parameter name	The name of the parameter with the source value (for example, **translate**).The name is defined internally, and may not match the parameter's label that appear in the Nuke interface. If necessary, hover over the parameter's field with your mouse pointer and its name will appear in the pop-up tool tip.
Child parameter name (optional)	Some parameters include child parameters, such as the fields for x and y axes, or red, green, and blue color channels). Child parameter names do match the label that appears before the parameter's field (for example, **x**).

Time (optional)	By default, linking expressions pull values from the current frame number, but you can read values from other frames, either statically or dynamically (that is, with a temporal offset). If you want to read in a static value for a given frame, you just type that frame number inside a set of parenthesis (for example, **(10)**). If you want to read in dynamic values but with an offset in time, type **t**, the variable for time, followed by a **+** (for a forward offset) or **-** (for a backward offset), followed by a number representing the number of frames worth of offset. For example, typing **(t-2)** would capture values that are two frames back from the current frame.

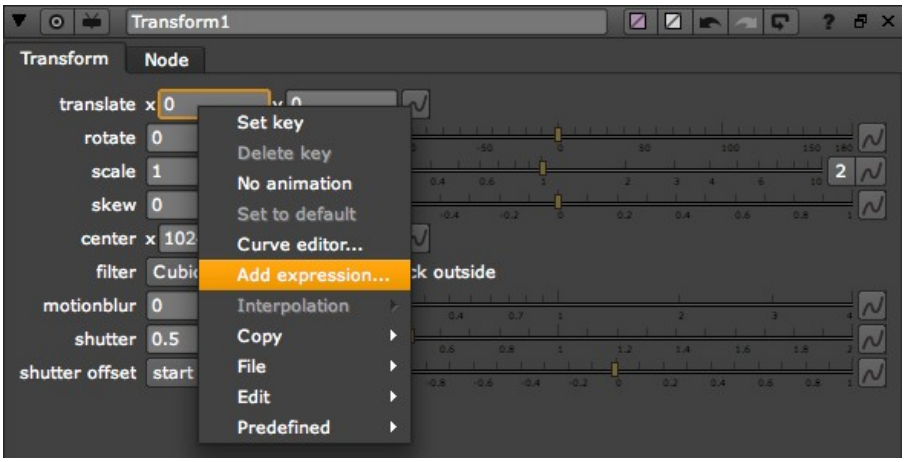
Thus, to create a linking expression that pulls the value from a Transform node's x translation field at the tenth frame, you would type **=** on a parameter to open the expression dialog, and then enter **Transform1.translate.x(10)** in the dialog's **Expression** field.



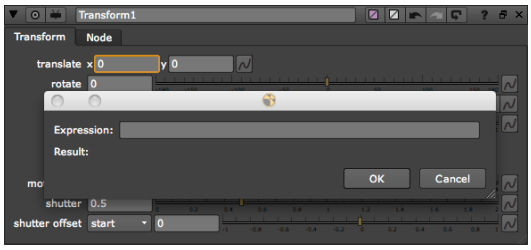
The steps below recap the process for creating a linking expression.

To reference values from another parameter (method #1):

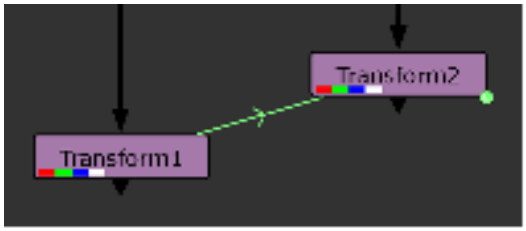
3. Click on the destination parameter (the one which will receive values from another parameter).
3. To display the expression dialog, right-click on the parameter and select **Add expression**,



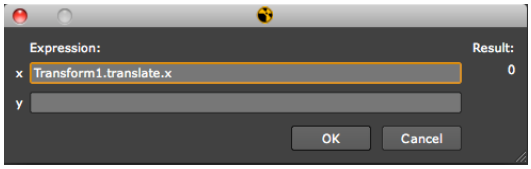
OR type **=** in the parameter field.



3. In the dialog that opens, type the name of the node containing the source parameter and a period. (Each node prominently displays its name on its face.)
3. Follow the name of the node by the source parameter's name and a period. (If you don't know the parameter's name, you can hover over its field in order to see it displayed in a tool tip.)
3. Optionally, type the child parameter's name and a period.
3. Optionally, type a frame number or offset variable in brackets (for example, **(2)** or **(t-2)**) in order to specify the frame or range of frame from which you pull values.
3. Click **OK**. This links the parameters, which turn blue. In the Node Graph, a green arrow appears between the nodes to indicate that they are linked via an expression.

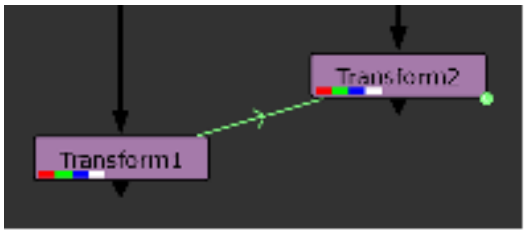


3. To edit the expression later on, right-click on the parameter and select **Edit expression** (or press **=** on the parameter). You can also click the animation button  and select **Edit expression** to edit expressions for all the parameters next to the button.



To reference values from another parameter (method #2):

3. **Ctrl/Cmd**+drag the parameter that has the values you want to use on top of the parameter that will receive these values. This links the parameters, which turn blue. In the Node Graph, a green arrow appears between the nodes to indicate that they are linked via an expression.



To view or edit the expression, right-click on the parameter and select **Edit expression**.

3. If you want to link several parameters at the same time, **Ctrl/Cmd**+drag the animation button  next to the source parameters on top of the animation button next to the destination parameters.

   To view or edit the expressions used to link the parameters, click the animation button and select **Edit expression**.

To link a parameter driven by an expression:

3. Create the linking expression according to the process described above (method #1).
3. Type the word **expression** in front of the actual expression.
3. Enclose all of the above in square brackets (for example, **[expression Transform1.translate.x]**).