



Advanced Tags for KEPServerEX[®]

Easy Guide

Advanced Tags for KEPServerEX enables Machine to Machine (M2M) tag linking, logic, and math functions for operational communications and analysis. It centralizes data processing on the communication server rather than across many client applications, and includes functionality to link two data tags, set a trigger based on logical states, and calculate new values from raw measures.

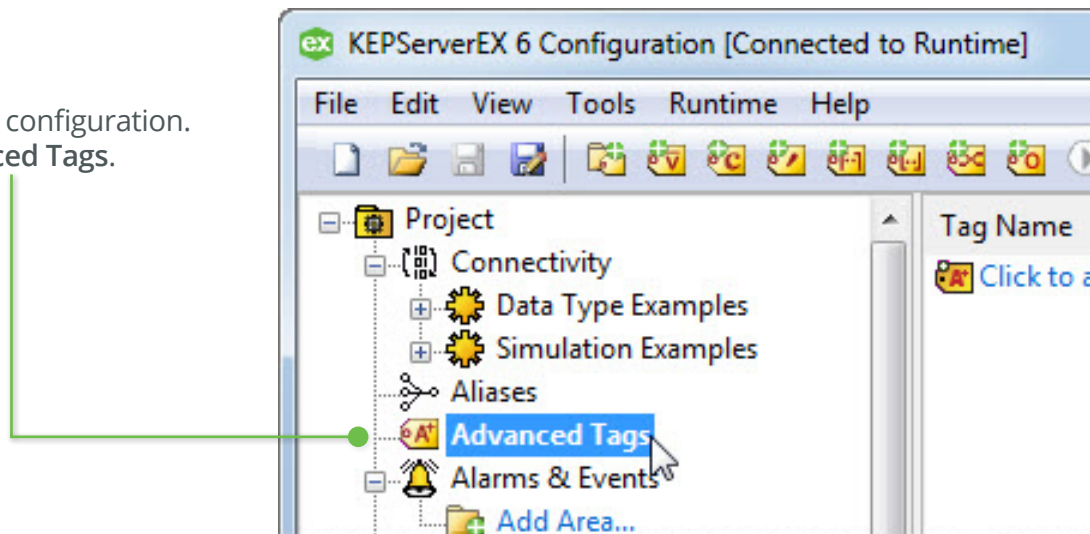
Follow the steps below to learn how to launch Advanced Tags and create six easy-to-use, pre-defined tags to execute math, logic, or analysis.

Follow the Steps

Step 1:

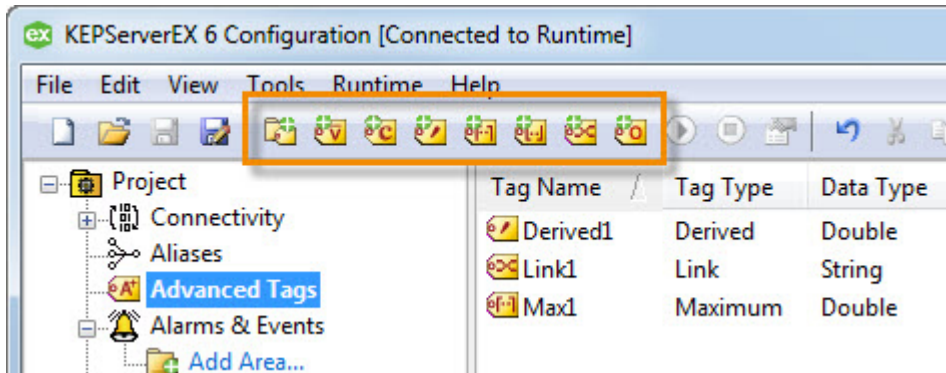
Launch Advanced Tags

To start, open the KEPServerEX configuration. In the **Tree View**, select **Advanced Tags**.

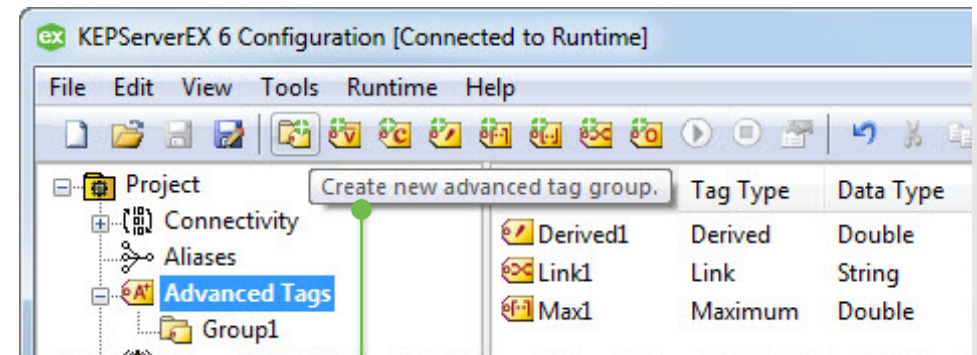


Step 2:**Create Tags**

Next, create tags using the quick add icons located in the toolbar or by right-clicking on the **Advanced Tags** icon.



In **Tag Properties**, enter a name for the tag and then define its parameters, which are unique to each type of Advanced Tag. See [Types of Tags](#) to learn more.



Optionally, define tag groups to organize multiple Advanced Tags.

Types of Tags: Link

Link Tags enable you to transfer data between two existing tags in the server. For example, you can take an output from an Allen-Bradley Programmable Logic Controller (PLC) and use it as an input for a Modbus register.

The data link will trigger when the data value has changed or on a set time interval. You can configure this trigger to always occur or to only occur when a certain condition is met (for example, if a bit from a PLC is high).

The Link Tag can be used in many different applications. For example, you can trigger a cooling process if a device temperature goes too high by linking data to a chiller system, or link recipe data from a SQL database to a PLC when the recipe changes.

Step 1:

Create a Link Tag

In the **Tree View**, right-click on the **Advanced Tags** icon and select **New Link Tag**. Enter a name for the tag.

In **Input**, click on the ellipsis located to the right of the text box and select the tag from the server from which data will be pulled. This example uses "Simulation Examples.Functions.Ramp1".

In **Output**, click on the ellipsis located to the right of the text box and select a tag where the input will be written. This example uses "Channel1.Device1.Tag2".

Leave all other settings at their default value and then click **OK** to exit the window and create the tag.

Step 2:

Check the Tag Output

Open the **OPC Quick Client** and locate the group for "Channel1.Device1". Verify that Tag2 is updating with values: this data is coming from the Ramp1 tag.

Types of Tags: Derived

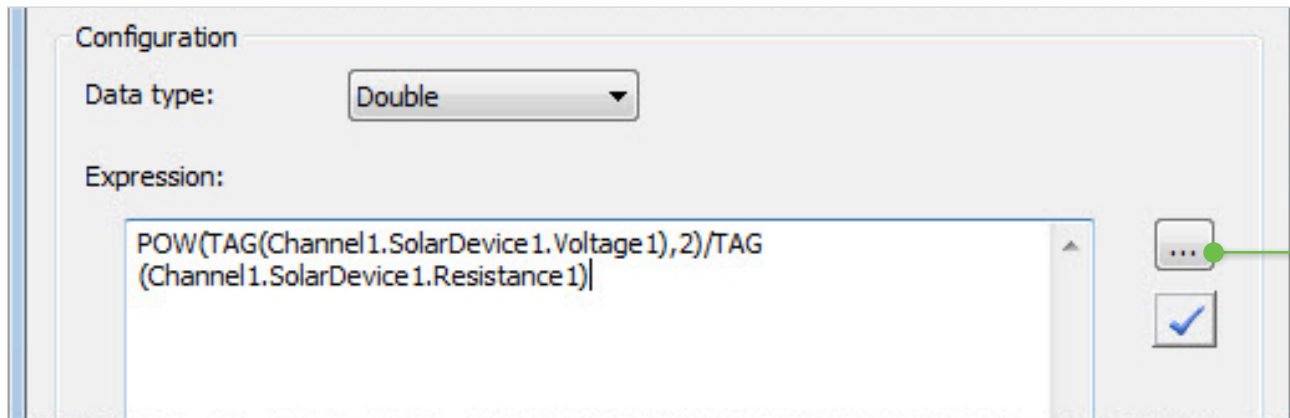
Derived Tags execute a math or logic operation using existing tags in the server. Expressions can be created using the value or quality of system tags and device tags paired with supporting operators. For example, in order to calculate power, you can subtract a DC offset from collected voltage data and then take the square of that voltage and divide by measured resistance.

Logical Operators	Mathematical Operators
Equal to (=)	Add and Subtract (+ and -)
Greater than (>)	Multiply and Divide (* and /)
Less than (<)	Modulo (%)
And (AND)	Power (POW)
Not (NOT)	Square Root (SQRT)
Or (OR)	Absolute (ABS)
	Cosine, Sine, and Tangent (COS, SIN, and TAN)
	Arc Cosine, Arc Sine, and Arc Tangent (ACOS, ASIN, and ATAN)

Step 1:

Create a Derived Tag

In the **Tree View**, right-click on the **Advanced Tags** icon and select **New Derived Tag**. Enter a name for the tag.



In **Expression**, click on the ellipsis located to the right of the text box. Select a tag from the project and click **Apply**. This example uses "Channel1.Device1.Tag1". Enter an asterisk (*) in the text box after the first tag.

Click on the ellipsis again and select another tag by which to multiply the first. This example uses "Channel1.Device1.Tag2".

Leave all other settings at their default values and then click **OK** to exit the window and create the tag.

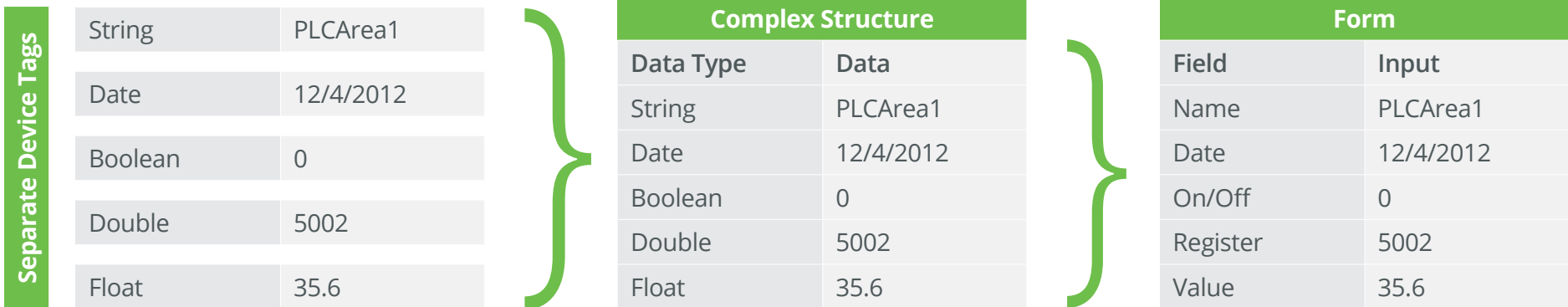
Step 2:

Check the Tag Output

Open the **OPC Quick Client** and select the "_AdvancedTags" group that was automatically created. The Derived Tag that was just created should be updating with the multiplied values.

Types of Tags: Complex

Complex Tags enable you to unify several tags into one complex XML structure that is represented in a single output tag with the String data type. This is helpful if you would like to transfer a bulk amount of data in only one tag and send that data in one transaction; for example, to populate a form with string data in one operation. Separate tags in the server can be designated as elements in the Complex Tag. You can trigger updates based on a zero to non-zero transition or at a set rate.



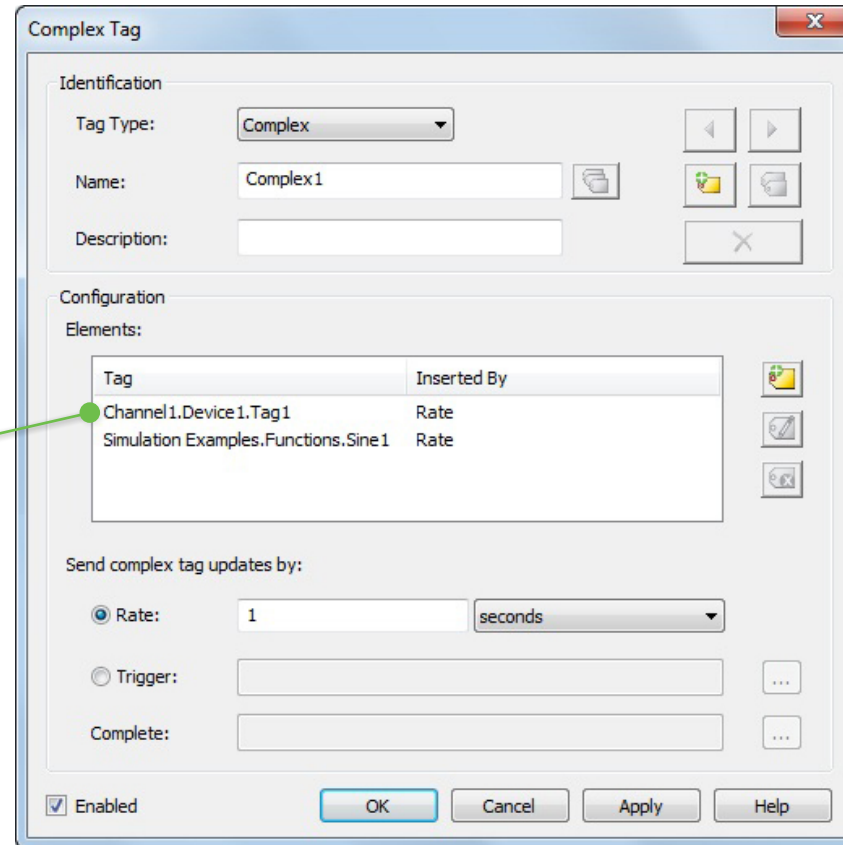
Step 1:

Create a Complex Tag

In the **Tree View**, right-click on the **Advanced Tags** icon and select **New Complex Tag**. Enter a name for the tag.

Locate **Elements** and then click **Add Element**. Select a tag from the project. Leave all other settings at their default values and then click **OK** to exit the window and add the tag.

Repeat this step one or more times to add additional tags as elements. This example uses "Channel1.Device1.Tag1" and "Simulation Examples.Functions.Sine1".

**Step 2:**

Check the Tag Output

Open the **OPC Quick Client** and select the "_AdvancedTags" group that was automatically created. The Complex Tag that was just created should be updating with an XML string that contains data for the tags added.

Types of Tags: Maximum, Minimum, and Average

Maximum, Minimum, and Average Tags enable you to perform simple yet useful analysis on a data tag, and trigger the computation on a zero to non-zero transition. For example, you can do the following:

- Find the minimum or maximum of part sizes in a production line to ensure products are within acceptable tolerances
- Average processing times over a day or several days to create a timing benchmark

Step 1:

Create an Average Tag

In the **Tree View**, right-click on the **Advanced Tags** icon and select **New Average Tag**. Enter a name for the tag.

In **Average**, click on the ellipsis located to the right of the text box and select a tag from the server. This example uses “Simulation Examples.Functions.Ramp1”.

In **Run**, click on the ellipsis located to the right of the text box and select a tag to trigger the calculation. This example uses “Data Type Examples.16 Bit Device.K Registers.Boolean1”.

Leave all other settings at their default values and click **OK** to exit the window and create the tag.

Step 2:

Check the Tag Output

Open the **OPC Quick Client** and select the tag group “Data Type Examples.16 Bit Device.K Registers”. Right-click on the tag “Data Type Examples.16 Bit Device.K Registers.Boolean1” and then select **Synchronous Write**.

In **Write Value**, enter 1 and then click **OK**. This will trigger the Average Tag to begin calculating.

Next, select the “_AdvancedTags” group. The Average Tag will be updating with values.

Types of Tags: Oracle Cumulative

Oracle Cumulative Tags enable you to determine the difference between a tag's current and previous values. This tag is defined by Oracle and is available to all OPC client applications. For example, the cumulative value for a counter that ranges from 0 to 100 would be calculated as displayed in the table below.

Samples	Mathematical Operators
5 @ 10:00	5 @ 10:00 (raw value)
45 @ 10:01	45 @ 10:01 (45-5)
95 @ 10:02	50 @ 10:02 (95-45)
4 @ 10:03	9 @ 10:03 ((4-95)+100)

Learn More

Access detailed technical information and examples in the [Advanced Tags product manual](#).

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