



EIGEN INGENUITY



Product Information Sheet

Virtual Timeseries
(The Calculation Historian)

What are Virtual Timeseries?

Virtual timeseries behave exactly like ‘normal’ (i.e. real or raw) signals stored as tags in a data historian but they are evaluated only when they are called. They can be used in exactly the same way as normal tags in the Eigen Ingenuity User Interface (UI).

The Calculation Historian

Eigen Ingenuity has a built in Calculation Historian that lets you create virtual timeseries based on applying a mathematical or logical transform to the source data. For example, if you are measuring a pressure in ‘barg’ but want to plot it in ‘psig’ then you need to multiply it by 14.5. These virtual timeseries can be treated just the same as any other real timeseries (for example you can set limits & alerts or use as the basis for another virtual timeseries) but they are evaluated at runtime and do not need the values to be written back to a database. This lets you experiment and create quick calculations for analysis without worrying about filling up memory or waiting until historical values are recalculated.

Virtual timeseries can be nested and multiple different functions combined in a single timeseries to produce complex calculations.



The orange series is a virtual timeseries created by multiplying the original tag (blue) in ‘Barg’ by 14.5 to get ‘Psia’ and then timeshifting the results by 3 hours forwards.

Calculation types

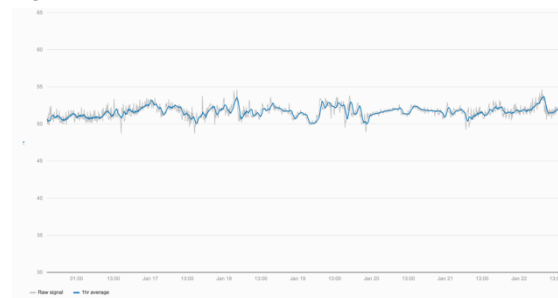
The Eigen Ingenuity Calculation Historian has the following built-in functions:

- Add
- Average
- Cumulative
- Differential
- Divide
- Exponent
- IfEquals
- IfTagExists
- Interpolate
- LN (Natural log)
- LOG (Log to base n)
- Maximum
- Mean
- Median
- Minimum
- Multiply
- NoBad
- Percent Deviation
- Power
- Square Root
- Standard Deviation
- Stepped
- Subtract
- Threshold
- Timeshift
- Timeshify_Dynamic
- Totalise
- Variance

Example use cases

Smoothing noisy signals

Averages can be applied to smooth out noisy signals



By applying an averaging function with a 1 hour window the underlying trends in the data can be seen more easily.

Logical expressions

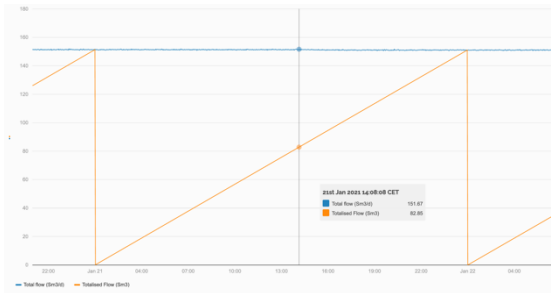
The green series in the trend below uses the Threshold function to create a virtual timeseries of the flow only when Pump B is running.



By using a Threshold function to only display the flowrate if the running signal is >0.5, a virtual timeseries is created that could drive a virtual flowmeter graphic.

Totaliser

Using the Totaliser function allows a value to be totalised over any window from 1 minute to years.



A flowrate in Sm³/d is totalised over 24hrs starting at midnight, giving the cumulative flow so far in any given day (orange line).

Combining two functions

Combining a Totaliser function with a Threshold function we can combine the two examples above to see the total amount of fluid pumped by Pump B in a year.



The virtual timeseries of the flow through Pump B is totalised in a second virtual timeseries over a window of a year starting at midnight on the 1st January..

Taking the Maximum of several tags

The Max function lets users create a virtual timeseries that only shows the maximum value at any time from two or more tags.



The upper trend shows the readings from two different transmitters. Using the Max function we are able to create a virtual timeseries (lower trend – black line) that always shows the maximum reading from either of these two transmitters.

For more information please contact us at info@eigen.co or book a demo on our website at www.eigen.co