

IIR Filter PtByPt VI

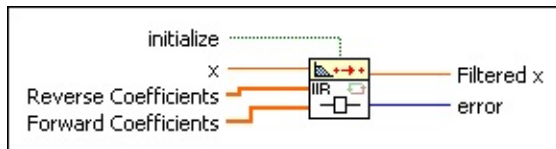
Owning Palette: [Filters PtByPt VIs](#)

Installed With: Full Development System

Filters x using the direct form IIR filter specified by **Reverse Coefficients** and **Forward Coefficients**.

This VI is similar to the [IIR Filter](#) VI.

Details



■ Place on the block diagram ■ Find on the **Functions** palette

TFI **initialize**, when TRUE, initializes the internal state of the VI.

DBL **x** is the input signal to filter.

DBL **Reverse Coefficients** is the reverse coefficients of the filter design. This VI does not place any restrictions on the coefficient arrays. If both coefficient arrays are empty, the VI performs no filtering and sets **Filtered X** to the value of **X**.

DBL **Forward Coefficients** is the forward coefficients of the filter design.

DBL **Filtered x** contains the result of filtering the input sequence **x** by convolution.

I32 **error** returns any **error** or warning from the VI. You can wire **error** to the [Error Cluster From Error Code](#) VI to convert the error code or warning into an error cluster.

IIR Filter PtByPt Details

The IIR Filter PtByPt VI obtains the elements of **Filtered X** using the following equation.

$$y_i = \frac{1}{a_0} \left(\sum_{j=0}^{N_b-1} b_j x_{i-j} - \sum_{k=1}^{N_a-1} a_k y_{i-k} \right),$$

where Y is **Filtered X**, N_b is the number of **Forward Coefficients**, b_j is **Forward Coefficients**, N_a is the number of **Reverse Coefficients**, and a_k is **Reverse Coefficients**.



Note You can use the IIR Filter PtByPt VI to perform FIR filtering by passing an empty array into **Reverse Coefficients**.