

One Pole Adjustable Filter (0.435 update)

Notes

This application is similar to [UAP1104](#) except the equation update time is always 0.435 seconds.

Operating Description

The filter provides moving average of (k + 1) samples.

Example

Last answer $Out_n \cong (k+1) \times Average$

Then the next output $= \left(\frac{k}{k+1} \times Average \right) + \left(\frac{1 \times New Input}{k+1} \right)$

Or $Out_{New} = \frac{(k \times Out_{Old}) + New Input}{k+1}$

Instead of using this exact formula and to relate (k) to T90 filter response times a simplified formula is used

$$k \approx \frac{FiltTime}{1} - 1$$





where 1 (FiltTime is in seconds).

This simplification is achieved by setting the equation update time to 0.435Sec.

$$Out_{New} = \frac{(FiltTime - 1) \times Out_{Old} + New Input}{FiltTime}$$

The "Auto Evaluation" must be switched off for this example to work

USC Programs

File	Function	Comment
 Help		If unexpected results occur when loading the .usc file press back and click on help for instructions.
 UAP0024a.usc	Subtractor Ch1-CH2 with a 60sec filter response.	To achieve the subtractor function in this application 'NewInput' is equal to channel one minus channel two ($NewInput = Ch1 - Ch2$). To change filter time adjust Con_a with the access module or USC Config.
 UAP0024b.usc	Apply filter with a adjustable response time to measurement on CH1.	To change filter time adjust Con_a with the access module or USC Config. Con_a is set to 1200 for 20 minute response in this example.
 UAP0024c.usc	Apply filter (time set on CH2) to measurement on CH1.	CH1 is scaled to suit input or probe measurement required. CH2 is scaled to filter time range required in seconds (10 to 60 seconds default) and is usually used an a pot input.

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