

**DVO**

**GRAIN**

**GT**

**USER GUIDE**

# WHAT DOES IT DO?

**DVO Grain GT** is a fast grain management tool that makes full use of modern advanced CPU instruction sets. The **Filmworkz DVO Grain GT** algorithm is specifically designed to manage the look of film grain and to reduce unwanted electronic noise in film or video originated material. It can be used for:

- Restoration
- Compression pre-processing
- Image processing of new feature films, television and commercial material.

The **DVO Grain GT** algorithm incorporates the Emmy award-winning **PHAME** advanced motion estimation technology along with edge-preserving 3D spatial-temporal filters and temporal (recursive) filters to allow artists to produce clean, sharp pictures and to match the look of film grain from shot-to-shot (including grain matching for underexposed film).

The process of adaptively selecting the best mix of spatial and recursive filtering for each pixel is unique to the **DVO Grain GT** algorithm.

# HOW DO YOU USE IT?

DVO Grain GT works on the following platforms:



It's also coming soon to:



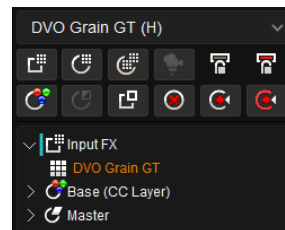
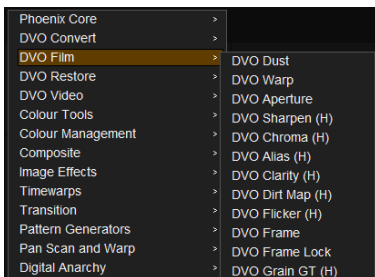
If you're already a Filmworkz veteran, you can jump right in and use **DVO Grain GT**, however if you need a hand getting going, check out these QuickStart Guides:

[PHOENIX QUICKSTART GUIDE](#)

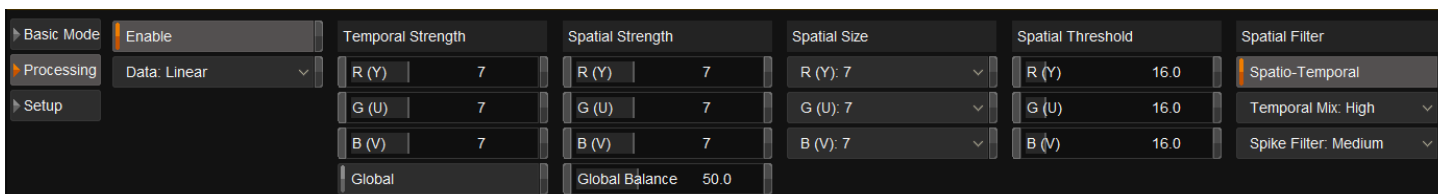
[NUCODA QUICKSTART GUIDE](#)

# GETTING STARTED

1. Launch your platform on your workstation.
2. Locate the toolbar, (positioned on the left-hand side of the interface)
3. Scan the toolbar options until you find the **DVO Grain GT** tool.

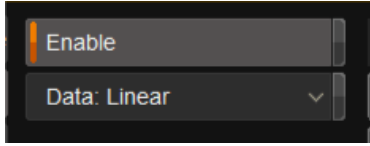


4. Click on it and the control panel under appears



# CONTROL PANEL EXPLAINED

## DATA FORMAT

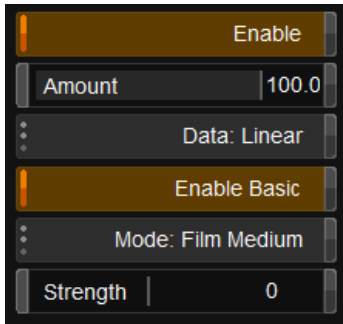


Select the data format of the image; video cameras typically use a Linear data format.

If the Data setting is incorrect, the result can be affected.

**Values:** Linear (default), Log

## BASIC MODE



DVO Grain GT's **Basic Mode** provides a simple way to control grain/noise reduction without sacrificing performance. This is a good starting point and may be all that's required in most cases.

Basic Mode will use only the settings in the first column shown to the left (except *Data* which is independent):

**Mode** - Pre-defined presets

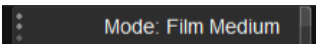
**Amount** - Defines the amount mixed with the input file.

**Strength** - Strength of the effect

### Notes:

- Adjusting any of the other DVO Grain GT parameters (e.g., Temporal or Spatial Strength, Spike Filter, Motion Estimation etc.) will automatically **disable** Basic Mode.
- Selecting a particular *Mode* (e.g., Film Coarse) will automatically **enable** Basic Mode.

## MODE (PRESETS)



The *Mode* sets the basic preset used for grain reduction. Each selected mode will set up the more advanced parameters automatically.

**Values:** Film Fine, Film Medium (default), Film Coarse, Video (Interlaced), Video (Progressive)

## STRENGTH



The amount of grain/noise reduction is set automatically in Basic Mode. The *Strength* control lets you fine-tune this and increase or decrease the amount of grain reduction.

**Values:** -2 - +2

**Default:** 0

## AMOUNT



*Amount* controls the mix between the processed image (with grain removed) and the input image to give the final output image.

This makes it possible to mix in some of the original grain into the processed picture for a better film look.

**Values:** 0 - 100%

**Default:** 100%

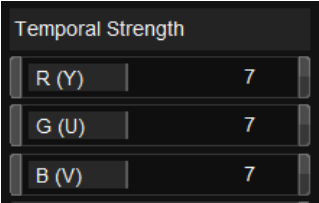


# ADVANCED METHODS

Leaving Basic Mode, we have an array of advanced modes and settings available to tune all aspects of the effect.

The best course of action is often to choose a *Basic Mode* preset that most closely matches your desired result and then adjust one or more advanced settings.

## TEMPORAL STRENGTH



The temporal or recursive filtering is the most effective filter in terms of reducing grain/noise. Use the numeric sliders to set the amount/level of temporal recursive filtering in each channel.

**Range:** 0 - 15

**Default:** 7

## GLOBAL / GLOBAL BALANCE

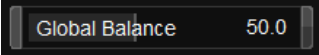


As an adaptive grain and noise reducer, we disable the temporal/recursive processing of all moving edges within the image to assist in the reduction of motion artifacts.

Turning on Global enables filtering of the **whole picture** regardless of motion for maximum temporal filtering.

Global should normally be left **Off** and only used in extreme situations but can be used to create a motion smearing effect.

## GLOBAL BALANCE



Global Balance allows a combination of the basic level of spatial filtering and motion adaptive spatial filtering. Maximum filtering is achieved in areas with motion according to spatial strength.

The Global Balance slider allows you to set a minimum level of spatial filtering, rather than having the level set entirely based on motion detection.

- Set to 0 (zero) - parts of the image with no motion will receive no spatial filtering
- Increasing the slider - increases the spatial filtering of areas with little or no motion

Global spatial filtering can be achieved by setting Global Balance to 100.

Important notes:

- Temporal filtering works in areas with no or little motion.
- Spatial filtering works in areas of motion.
- Global enables the filters to work on the entire picture.



# SPATIAL FILTERING

Edge-preserving spatial filtering complements the adaptive temporal filters by processing grain and noise in portions of the image that are detected as being in motion, while leaving non-moving areas unaffected.

Spatial filtering is done before the application of the temporal filters and works in unison with motion processing.

## SPATIAL STRENGTH

Spatial Strength

R (Y)	7
G (U)	7
B (V)	7

Spatial Strength is the overall level of spatial filtering applied in each channel. The values here should normally match the temporal strength.

Range: 0 - 15

Default: 7

## SPATIAL SIZE

Spatial Size

R (Y)	7
G (U)	7
B (V)	7

The Spatial Size drop-down list adjusts the spatial size of the grain/noise in pixels for each channel. Setting R, G and B equally will give the best performance.

Values: 1, 3, 5, 7, 9

Default: 7

## SPATIAL THRESHOLD

Spatial Threshold

R (Y)	16.0
G (U)	16.0
B (V)	16.0

The spatial threshold determines when to filter, depending on the intensity of the surrounding pixels.

If there's a high enough intensity/contrast (e.g., an edge) between the grain/noise and surrounding pixels, filtering will **not** occur.

A low setting will only affect low intensity pixels (flat areas). A high setting will start to affect high intensity pixels (edges).

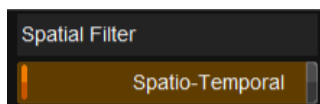
Range: 0 - 100

Default: 16



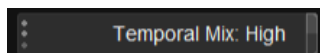
# SPATIAL FILTER

## SPATIO-TEMPORAL



If this is enabled, the filter becomes a **3D Spatio-Temporal Filter** (adding the use of temporal taps). This can enhance the noise reduction achieved. The default is on. **HEADING 2**

## TEMPORAL MIX



The temporal mix controls the balance between the spatial and temporal taps of the spatio-temporal filter.

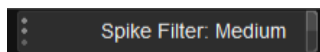
This setting affects the noise reduction achieved by the spatio-temporal filter, with more noise reduction for the higher settings.

For fast motion material and a higher than default spatial filter threshold setting, a high temporal mix setting may increase artifacts. In such cases, this setting may be lowered. For a lower than default spatial filter threshold setting, the *Full* setting may be used.

The default setting *High* should be safe in most circumstances.

**Values:** Low, Medium, High (default), Full

## SPIKE FILTER



This setting enhances the spatial filter performance by incorporating a *spike* adaptation.

The spike adaptation is a mechanism that allows the spatial filter to effectively handle abrupt changes or spikes in pixel values. These spikes can occur due to various factors like noise, sudden transitions, or outliers in the image data.

By incorporating a spike adaptation, the spatial filter becomes more adaptive and responsive to these abrupt changes. It can identify and adapt its filtering behavior to effectively suppress or mitigate the impact of the spikes while preserving the desired image details and structures.

The *Spike Filter* setting relates to the grain/noise characteristics:

- A low setting (e.g., Narrow) is suitable for smaller grain and noise sizes and/or less pronounced variations in amplitudes.
- A high setting (e.g., Wide) is suitable for larger grain/noise and/or more pronounced variations in amplitudes.

Setting this to **Narrow** in conjunction with Motion Sensitivity to **High** and Motion Estimation to **Best** can help avoid motion estimation errors caused by noisy/grainy material.

**Values:** Disable, Narrow, Medium (default), Wide

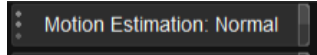


# MOTION



DVO Grain GT is a fully motion compensated noise/grain reducer. This means that much more aggressive settings can be used without introducing smearing.

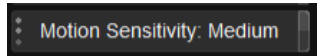
## MOTION ESTIMATION



The Best setting is good for **fast motion** but is slower than Normal. In almost all cases, Normal or Best should be used.

**Values:** Disable, Normal (default), Best

## MOTION SENSITIVITY



Motion Sensitivity adapts the temporal filtering with respect to grain size and intensity.

Motion Sensitivity has a great impact on processing and the type of filter (spatial/temporal) being used. It may be better to set Motion Sensitivity to Low rather than just increasing filter strengths.

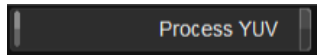
**Values:** Low, Medium (default), High

# VIDEO



For video source material.

## PROCESS YUV



Enable to process in YUV color space (not RGB).

## INTERLACED



Enable to process fields (not frames).



**WANNA KNOW**

# MORE?

**FORUM**

**WEBSITE**

**SALES**

