

DVO

GRAIN GT

OFX 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 is part of the Filmworkz OFX DVO Essentials plugin pack, which runs on **Resolve**, **Mistika** and **Scratch** for Windows, Mac and CentOS.

DVO Grain GT is also available in the following Filmworkz platforms:



PHOENIX



NUCODA



LOKI

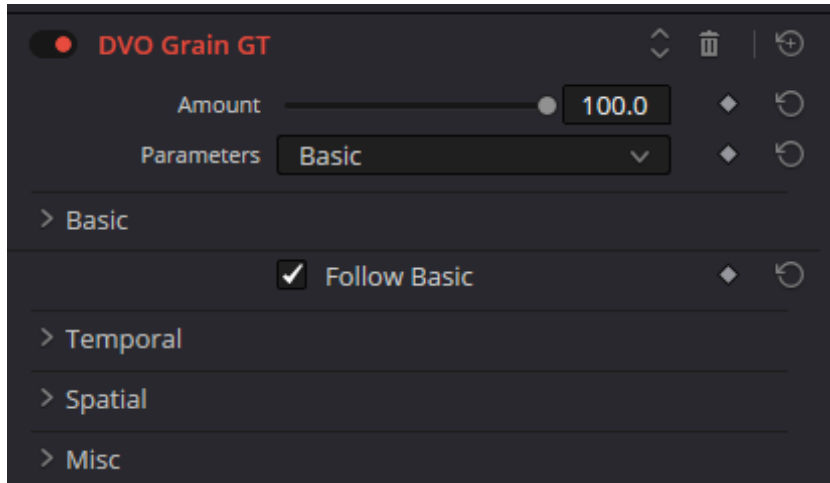
GETTING STARTED

Just locate & enable the DVO OFX tools in your chosen platform; for ease, we're showing the screenshots from Resolve in this User Guide so consult your manuals for any alternative system you're using.

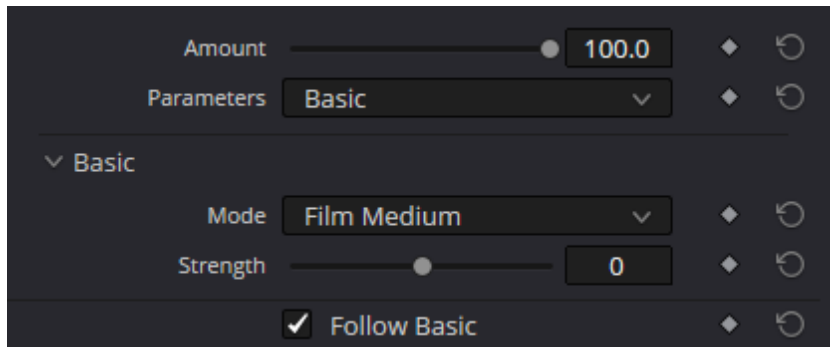
1. Launch Resolve on your workstation.
2. Open your project; to select the DVO effect, click on the Effects tab on the upper left side of the interface. On the Open FX section, open the Filters section and click on DVO.
3. To apply the effect, you can either double click or drag and drop on the selected clip(s) when using the Timeline tab. If you're in the Color page, select the effect using the Effects tab on the top left side of the interface and drag and drop on an existing node.
4. Click on the Effects section (or click on the grading node) and the control panel overleaf appears.



CONTROL PANEL EXPLAINED



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 included in the Basic section of the menu:

- Amount** - Defines the amount mixed with the input file.
- Mode** - Pre-defined presets
- Strength** - Strength of the effect

Notes:

- To adjust any of the other DVO Grain GT parameters (e.g., Temporal or Spatial Strength, Spike Filter, Motion Estimation etc.) you need to change the Parameters option from Basic to Advanced
- To select a particular *Mode* (e.g., Film Coarse) you need to keep the Parameters option in Basic Mode.
- To reset options after using Advanced mode, change back to Basic and check the Follow Basic option.

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, Film Coarse, Video (Interlaced), Video (Progressive)

Default: Film Medium



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

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.

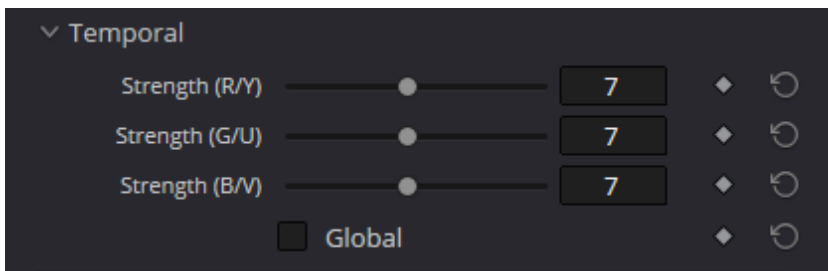
Values: 0 - 100%

Default: 100%

ADVANCED METHODS

Selecting Advanced 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: Varies according to selected Basic Mode

GLOBAL

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.



SPATIAL



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

Range: 0 - 15

Default: Varies according to selected Basic Mode

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 SIZE

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: Varies according to selected Basic Mode



SPATIAL THRESHOLD

Determines when to filter, depending on the intensity of the surrounding pixels.

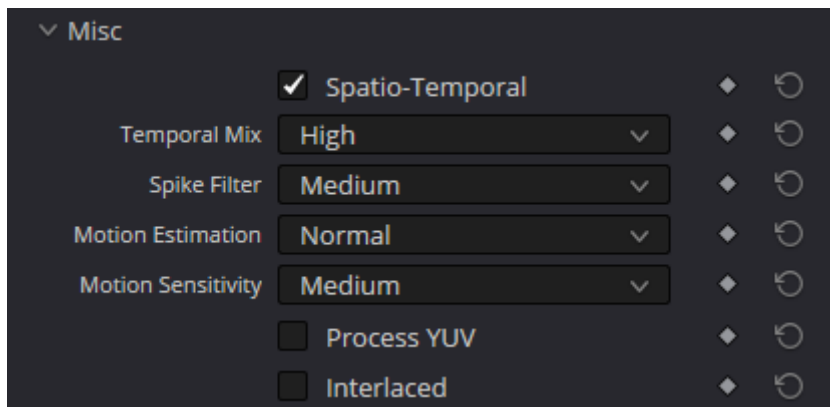
If there's a high enough intensity/contrast (e.g. an edge) between the grain/noise and surrounding pixels, filtering will **not** occur.

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: Varies according to selected Basic Mode

MISC



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.

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, Full

Default: High

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, Wide

Default: Medium

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

Default: Normal

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

Default: Medium

PROCESS YUV

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

INTERLACED

Enable to process fields (not frames).



WANNA KNOW

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