

## What is new in DIAMANT-FILM Restoration V14 & V14.1?

The major innovations of this release compared to the previous versions are shortly described in the following.

In addition to this printed section, we also offer video tutorials. There are tutorials for general usage as well as for specific repair and filter parameters:

<https://www.hs-art.com/index.php/tutorials/video-tutorials-overview>

### Highlights

- New AI filter: DeepNoise (V14.1)
- StabCorner filter and updated portfolio of other stabilization filters (V14.1)
- Infrared Channel and painting in ALPHA-Layer (V14.1)
- Multi-User installation (V14.1)
- Pixel statistics for Dust filter (V14.1)
- *MAC version of the full DIAMANT-Film SUITE*
- *Artificial intelligence (AI): DeepInpaint, DeepScratch, DeepDust*
- *Improved ProRes workflow with significant less data in the data repository*

### Improvements

- Player provides continuous updates on Histogram and Waveform (V14.1)
- Improved integration of BlackMagic's Resolve Studio and DeckLink cards (Mac) (V14.1)
- Improved StabROITracking. Added scale and rotation. (V14.1)
- Improved IRCleaner. Added micro dust category. Fill holes. (V14.1)
- Added invert temporal offset in Clone Tool (V14.1)
- Add rotation and scale in PostTransform for Stabilize and StabAuto filter (V14.1)
- *Optimized render workflow*
- *Smooth playback engine*
- *Improved integration into third party workflows*
- *And many more....*

### Machine Learning & Artificial Intelligence (AI)

The new AI-filters require a proper RTX graphic card and an AI-package to be installed in addition to the Diamant-Film software. Due to the size of the file (~2 GB), it needs to be separately downloaded from our install-website.

#### I. DeepNoise

DeepNoise is a completely new development with revolutionary results in reduction of noise and grain. It is available in the experimental section of the filters since V14.1.

The filter analyses the neighbouring images and uses the such obtained information together with a pre-learned model to reduce the noise and grain of the current image. By design the method is free from motion artefacts and preserves all details.

## II. DeepDust

DeepDust combines different moving object detection methods in an intelligent way. Compared to the traditional Dust Filter, DeepDust is able to significantly reduce the number of false detections and increase the reliability of automatic film cleaning.

## III. DeepInpaint

DeepInpaint is also a new filter based on AI technology for spatio-temporal inpainting. The scratch filter has got a new repair method based on the DeepInpaint. It uses the new AI technology for an improved and content sensitive repair of detected vertical scratches.

The new DeepInpaint is a great alternative to the ExInPaintFilter and overcomes many drawbacks of this traditional filter, specifically in removing gate or camera hairs.

## IV. DeepScratch

DeepScratch is based on a traditional technique for detection of vertical (resp. horizontal) lines and the repair by machine learning techniques.

Its interface is very similar to the one of Scratch Filter, but in most of the cases the temporal repair is significantly improved. Only on transparent vertical lines, the traditional approach with revealing should be taken as an alternative

## Infrared (ALPHA) channel

The capabilities to work with and benefit from scanned infrared information has been reworked and further optimised.

### I. IR-Cleaner

The filter is analysing the infrared information, that is either coming from an external (=additional) source or that is stored internally as alpha-layer. As a result the detected infrared spots are classified into "micro", "small", "other" and "scratches". For each of the classified categories different repair methods can be selected.

Specifically the use of "ExInPaint" as a repair method has been optimized, so that it can now be used for "small" spots in realistic render times.

### II. Alpha-Layer

The alpha layer can now be displayed in the RM+ and what is more important: it can also be painted and adapted by the operator. Specifically paint tools and filters can be applied to modify the alpha layer in order to handle cross-talk, resulting from the infrared channels of the scanning process.

## Portfolio of Stabilization Filters

The whole portfolio of stabilisation filters have been re-worked and optimized.

### III. StabCorner

This is a completely new filter, specialized to stabilize on the image frame corners.

The so called "stretch mode" is similar to the the one from the related StabBorder filter and provides a way to de-warp and correct film shrinkage.

### I. StabROITracking

This new filter brings together the easy usage of the former StabROI filter and the flexibility of the StabTracking filter. Thus interactive stabilization reaches a new level and ensures the best possible control of the stabilization process.

### II. StabAuto

The StabAuto filter is further improved.

Animated application factors allow best possible stabilisation in difficult motion situations. The preservation and limiters work now also with automatic zooming. Setting the background color simplifies checking of the stabilisation results.

A feature for new splice bump correction is included.

### III. StabBorder

The mathematics for finding and tracking the borders has been improved reducing the false border detections significantly. The new detector allows for a wide automatic use in most situations.

A new mode where a single large ROI indicating the border has been added.

## Improvements of Restoration Filters

### I. Scratch

The classic Scratch filter has been reworked to allow better control on the detected scratches. The inpainting methods have been updated to the latest technologies.

Advanced contrast stretching methods help to detect scratches in difficult luminance situations.

### II. Dust

The classic dust filter received a new contrast enhancement method to work better on low contrast images and HDR content. The detection of simple small bright/dark spots have been improved to work better on scenes with high motion which allows less missed detections. The GPU acceleration for the dust filter has been improved for better performance.

### III. OTHER

- Flicker (now also on Mac)
- Transform: Adding blanking option
- Option to save output also on unchanged reference frames
- Added auto align to interpolate tool

### RestorationManager (RM)+

- Improved integration of the RM+ into DaVinci Resolve from BlackMagic. By using the API from Resolve Studio, RM+ can now be started like a plug-in and opens on the right position in the project
- Video output on BlackMagic cards is now also available on Mac
- New channel view options (RGB, YUV, HSV, LAB, Alpha, Inverted Alpha)
- Output on reference frames (configurable)
- Optimized timeline view
- Filter templates reworked
- Image still stores for better comparison

### Optimized QC methods

- Real-time refreshing and calculation of waveform and histogram views
- Improved high quality image display in all zoom levels
- Additional to LUTs a brightness and gamma display setting
- Improved annotation support
  - Reports with paintings on image
- New PDF Report
- Dust detection statistic on a graph

### Project Manager

- Multi-User Installation: DIAMANT-Film can now be installed on one workstation for individual Windows users. It is possible to configure an individual metadata-repository for any user or to share the repository for all users.
- Metadata-backup of the full repository can now be made. Optimisation in the processing speed results in short backup time, even with very large repositories
- Create “empty” projects with virtual black images. Such projects can then later be filled with real-data by using the “Additional Source” function of RM+
- Preview images from clip during import
- Change Original Path - allow also changing the file format
- Export: Create SideBySide with original

### File formats

- AVC-I MXF MainConcept plugin support
- For many file formats including PRORES 444 the export speed has been improved