Digitize your analogue images

Ian Lyons

A practical workflow guide
Do it once, do it right

LaserSoft Imaging®

EPSON®
EXCEED YOUR VISION

Presented in cooperation with Epson and LaserSoft Imaging

Introduction	3
Choosing the Software and Hardware	3
1. Scanning with more Details	4
2. Colors true to Nature	5
3. Bit Depth	6
4. Resolution	6
5. Scan Speed	7
6. Scanner Type and Graphics	8-9
7. Digitization and Archiving Workflow	10-19
Archiving your Work	20-21
Conclusion	22

Introduction

If you're anything like me you've probably got a drawer full of photographs that you'd love to preserve digitally, but the expense of getting them scanned professionally can't be justified. Well, the good news is that there's an easy way for you to scan the photographs yourself whilst still maintaining quality standards only slightly less than you would expect from a professional scanning service. Better still, it will cost you a lot less.

The following illustrated workflow shows how your slides are scanned, optimized and archived. Should you wish to make further enhancements in the future it's simply a matter of retrieving the optimized scan from the archive storage device and opening it into your favorite photo imaging software. Using this workflow, even the oldest of photographs can be easily enhanced and given a new lease of life.

Choosing the Software and Hardware

It is important that the scanner you intend using is capable of capturing all of the information contained in the original photograph. If a scanner does not capture all of the details and nuances contained within areas such as shadows and highlights, it cannot be recovered later, even when working with the best imaging software. We can see the scanner and scan software have an important role to play.

Specialists agree that a good scan depends on the combination of scanner, scanning software and possibly a post processing software.

However - good quality scans are obtained easier if the scanning software was specifically designed to handle the scanner's RAW data as compared to a well developed post processing software.

Today, SilverFast is considered the worldwide standard of professional scanning software.

1. Scanning with more details

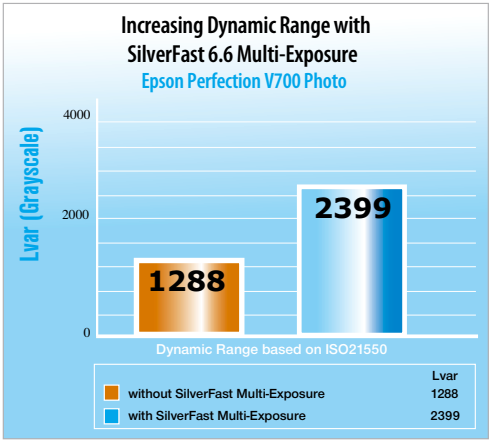
Professional photographers are well aware that it's the dynamic range that determines the quality of an image. To this end, it's widely acknowledged that multiple-exposure scans can ensure that the maximum dynamic range of the photograph is captured, which in turn significantly reduces noise, particularly when scanning color slide film.

SilverFast Multi-Exposure® has the potential to reveal even the finest nuances in the shadows and highlights, yet is still able to differentiate the blackest dark tones and the brightest light tones of the slide. Unlike conventional multi-sampling, SilverFast Multi-Exposure® performs multiple scans of the original photograph with different exposures. This way, the dynamic range of the scanner is effectively doubled. Thus, SilverFast scans are capable of covering the entire contrast range of modern slide films.

Details

Scan without Multi-Exposure

Scan with Multi-Exposure



2. Colors true to nature

Consistent colors and color management has been and is still in many cases a mystery for professionals and even more so for consumers. For a long time obtaining color consistent scans has been the domain of professional color consultants and operators, but not any longer.

SilverFast Ai IT8 Studio helps professionals and enables consumers to benefit from the added value of consistent colors whilst ignoring the sophisticated process behind it. With SilverFast Ai IT8 Studio users of all experience levels can quickly and easily calibrate their scanners so as to obtain color consistent scans.

The integral IT8 Calibration has become a fully automated process with SilverFast Ai IT8 Studio. Therefore, with SilverFast Ai IT8 Studio, it only takes a single mouse click to calibrate your scanner.

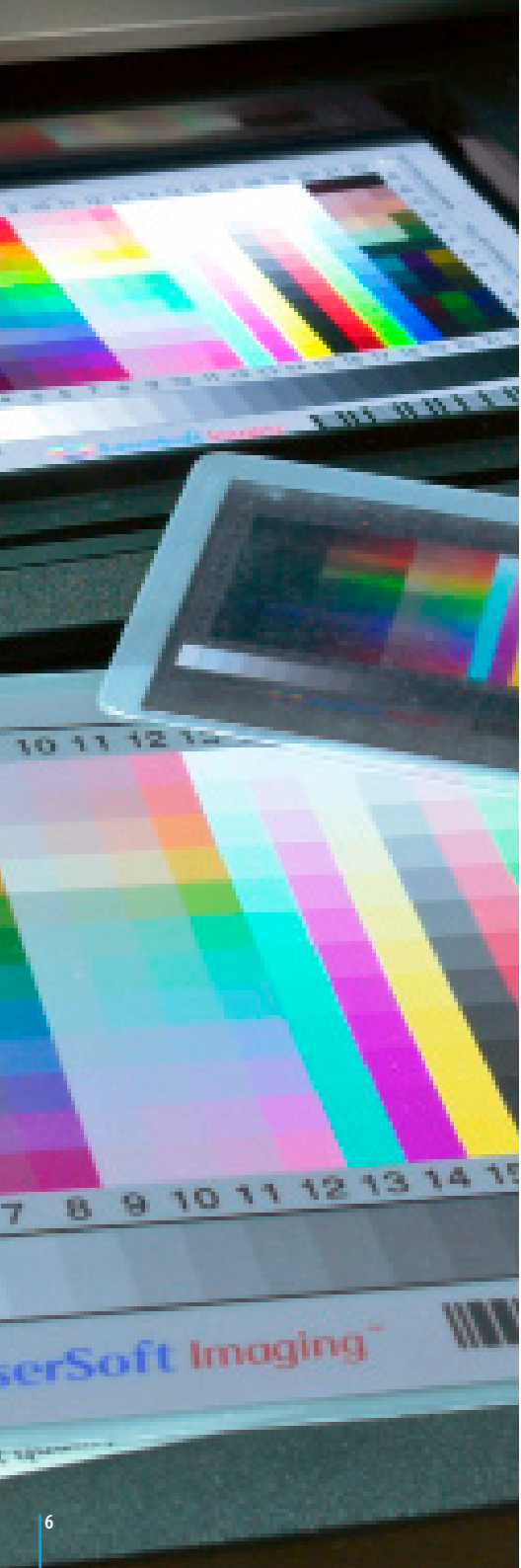
The ease with which SilverFast Ai IT8 Studio calibrates the scanner can be attributed to the combination of automatic frame detection and the integrated bar code technology imprinted on SilverFast IT8 targets. In effect, the complete calibration process is fully automatic. Just place the original LaserSoft Imaging IT8 target on to the scanner and press the IT8 Calibration start icon.

The bar code imprinted on every LaserSoft Imaging IT8 target (patented) ensures that SilverFast automatically identifies the required reference data.

The optimum color reproduction at the start of your imaging workflow will ensure maximum quality in your output.

Scan before Auto IT8 Calibration

Scan after Auto IT8 Calibration



3. Bit Depth

The 48Bit TIFF format was originally developed in order that raw scan data with extended dynamic range (HDR: High Dynamic Range) could be saved. Even scanners with only 30 or 36Bit capability generate their maximum output range in this format. So, regardless of the effective dynamic range supplied, the file will always become a 48Bit file. Normal scanning software tends to save images into a 24Bit file, discarding the extra information created by the scanner. However, 48Bit files retain all of the captured information and it's for this reason that they are capable of recording even the finest of color and tonal nuances.

4. Resolution

Great care needs to be taken when reading scanner specifications, especially when very large figures are quoted. The most important resolution figure is that attributed to optical resolution.
Generally, for photographs that were taken with a simple compact camera an optical resolution of around 2800 ppi is sufficient. However, for photographers, who use high quality SLR cameras, 4000 ppi should be considered the minimum optical resolution.

5. Scan Speed

For high resolution scans the time required to scan a photograph can take anywhere between one minute and one hour. The speed depends also on the software setup. For example, a multiple-exposure scan requires more time than a standard scan.

Much more crucial is the number of photographs that are to be scanned at once. The keyword here is “Batch Scans”. With SilverFast and a suitable scanner, batch scans are relatively straightforward, requiring no user intervention once the scanning process is started.

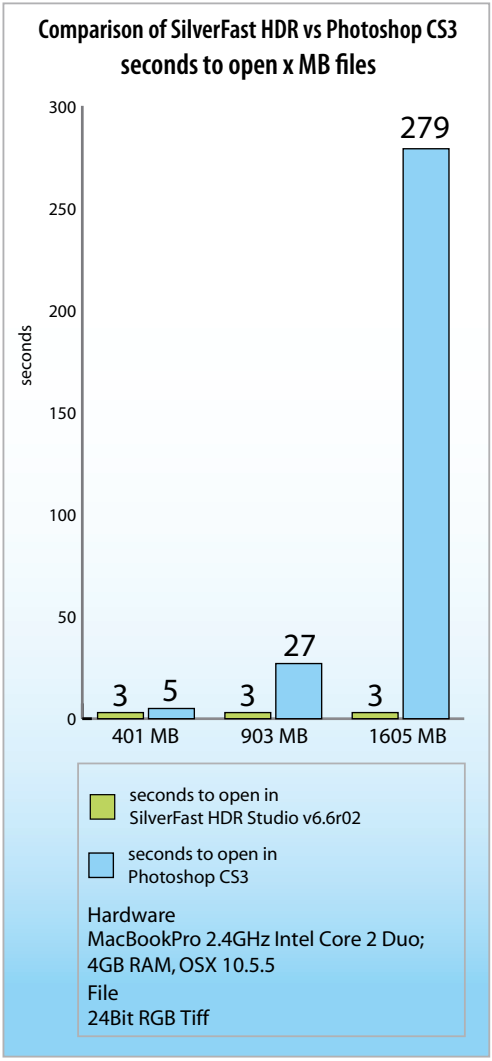
For the reasons outlined above we recommend that the digitization and archiving process is divided into two main stages; i.e. the process of image capture and the process of image optimization. We will discuss both later.

Although SilverFast Ai IT8 Studio is designed for image capture it incorporates two features that are designed to speed up the process of image optimization:

- The first feature (i.e. IT8 Color Calibration) discussed earlier saves a lot of time, since the additional color optimization of the scanned photograph is significantly reduced.

- The second feature is less obvious but nonetheless important. Normally, loading of large images (500 MB or higher) can be quite slow. For example, on slower hardware it can take up to 3 minutes or more to load an image of this size into Photoshop.

However, SilverFast HiRePP® (High Resolution Picture Performance) embeds a high resolution preview within the scanned image. This preview image dramatically speeds up the process of loading and working with large image files.



6. Scanner Type

Amongst numerous scanner types (i.e. high-end drum scanners, film scanners and flatbed scanners) flatbed units are considered to be the most flexible, and probably offer the best value for money, although this has usually been at the expense of image quality. That being said, flatbed scanner technology has made great advances in recent times. In particular, the Epson Perfection V750 PRO is a flatbed scanner with a 10 by 8 inch Transparency Unit (TPU) built into the lid. The maximum optical resolution of the V750 PRO is 6400 ppi for film material, and 4800 ppi for reflective material such as printed photographs. Although, these high resolutions only really make sense with film negatives or slides - with printed photographs such high resolutions are usually unnecessary.

The Epson Perfection V750 PRO also benefits from a high optical density (Dmax 4.0) and a Dual Lens System, both of which make a significant contribution to image quality when it comes to scanning either reflective or transparent materials. The V750's enhanced optical system (High-Pass Optics) consists of anti-reflective lens coatings and a high-reflection mirror. This technology also helps you achieve faster scans. The Dual Lens System is designed to optimize each scan by automatically selecting from two lenses for the desired scan resolution.

The built-in dust and scratch removal feature from Digital ICE Technologies enables you to automatically remove many surface defects from film and prints during the scanning process. Likewise, Digital ICE can be used to reduce grain when scanning black-and-white film.

The Epson Perfection V750 PRO is supplied with a range of film holders making it equally suitable for small, medium and large formats. For increased productivity, the film holders are designed to allow batch scans of multiple negatives and slides. In addition, due to narrower depth of focus at high optical resolutions the height of the film holders can be manually adjusted to optimize for the individual film type and mount thickness.

Taken together the attributes outlined above make the Epson Perfection V750 PRO uniquely able to produce fast high quality scans from both printed photographs and film.

Optimized Workflow

Example with 35mm slides

Picture Archive

Batch Scan

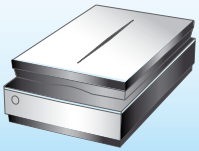
SilverFast Ai Studio

48 Bit RAW-Data
(or even optimized scans)

SilverFast HDR Studio

"Delocalized
Remote Processing"

Film Holder



Calibrated Scanner

Server, www,...

Optimized Scans

Example with two 35mm slide films

(= 72 slides)

Job order: two color slide films (each 36 slides) having different brands which were exposed individually (thus do not represent a series) are to be scanned: including color and gradation correction, sharpening, scaling.
Two scans: output A: 900%, 228 dpi CMYK; output B: 200%, 72 dpi RGB.

Classical workflow, slide after slide

Prescan, zoom, image optimization,
USM prescan, batch scans

Operator time: **= 540 min**

SilverFast Archive workflow with integrated JobManager

Batch scans, 48Bit RAW data

Machine time: **= 342 min**

Prescan, zoom, image optimization,
USM prescan, save to Jobmanager

Operator time: **= 209 min**

Operator time

331 min saved !

7. Digitization and Archiving Workflow

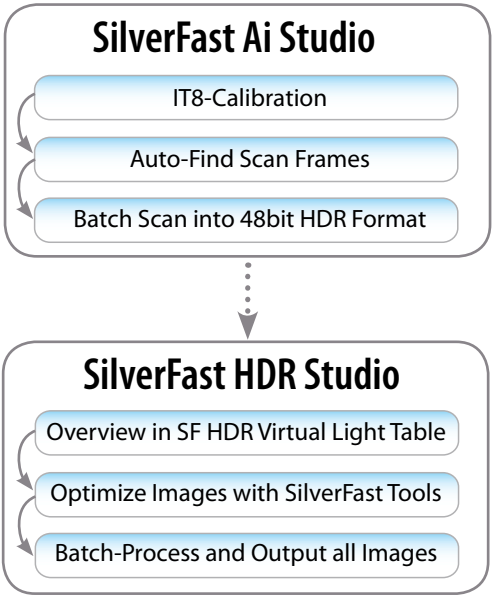


Figure 1 – SilverFast Universal Launcher

Figure 2 – IT8 Calibration

A: Set-Up and Capture Image raw data with SilverFast Ai IT8 Studio (Multi-Exposure®)

1. Start

- Start SilverFast Ai IT8 Studio (Multi-Exposure) with the SilverFast Universal Launcher.

2. IT8 Calibration

- Place the original LaserSoft Imaging IT8 target on the scanner and press the IT8 Calibration start button.
- A dialog confirms that the calibration was successful and reports the average deltaE, which is a measure of the calibration quality. A deltaE of 3 or less is considered very good.

3. Color Management and Metrics setup

- Open the SilverFast main dialog / Options / Tab "CMS".
- Set the Color Management pop-up for: "Internal -> Monitor:" to ColorSync (Mac) or ICM (Win).
- Set "Profiles for ColorSync" (Mac) or "ICM" (Win) so that "Internal" matches the working RGB color space used in your imaging software (Photoshop), e.g. ProPhoto or Adobe RGB 1998.
- Switch to the main dialog / Options / Tab "General". Choose "Color Model" (RGB or CMY) and "Units of Measure" (inch or cm) as the metrics for your work.

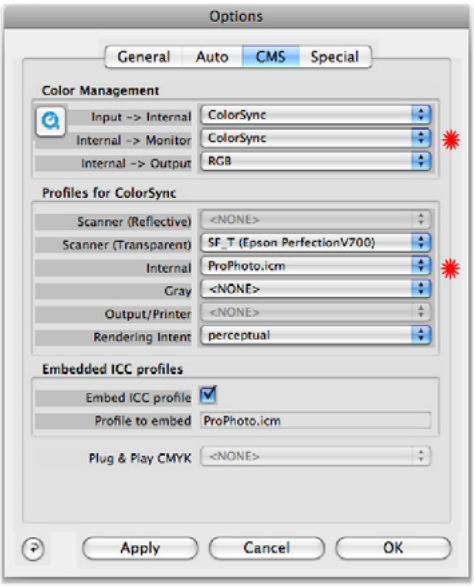


Figure 3 – "CMS" options setup

4. Open "General" palette and set "Scan Mode":

to Batch Mode (File) then set "Original":
to Reflective or Transparency.

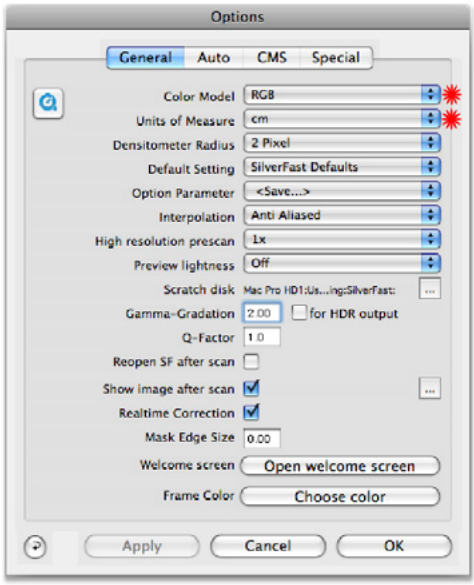


Figure 4 – "General" options setup

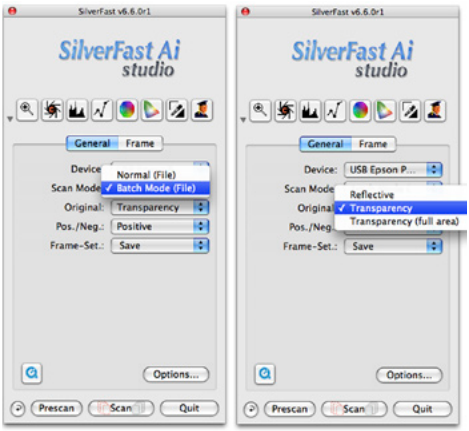


Figure 5 – "General" palette setup

5. Scan Type

Open "Frame" palette and choose "": 48Bit HDR Color. Note that with the exception of the zoom tool the Adjustments toolbar will be disabled.

6. Load the film holder

Load images into film holder. Note that the Epson Perfection V750 PRO is supplied with a range of film holders.

Tip - Ensure that you follow the guidance provided in the documentation supplied with the scanner when loading the images into the film holder.

7. Press the Prescan button

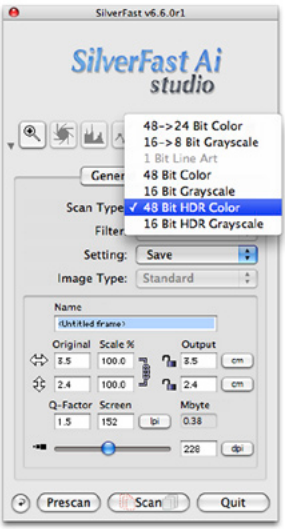


Figure 6 – "Frame" palette setup for HDR Color

8. Position and resize the scan frame

(colored red). If necessary zoom into image using the Zoom tool (i.e. press "+" button on adjustment toolbar), fine tune the size and position of scan frame, and zoom out.

Figure 7 – Prescan window showing scan "Frame" in red

9. Scaling

- Enter a "Name" for the frame e.g. Archive_Image.
- Set "Scale" to 100%, take care that the scaling lock is closed. Choose the optical resolution of the scanner by first pushing the resolution slider (lpi) to the extreme right (12800) then shifting back until the readout displays 6400 (i.e. the optical resolution of the Epson Perfection V750 PRO when scanning film).
- Set Q-Factor to 1.0

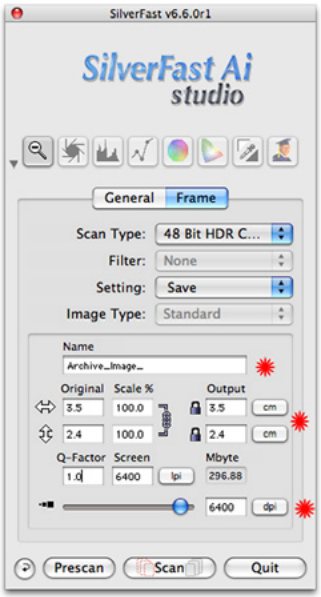


Figure 8 – "Frame" palette setup for image "Scaling"

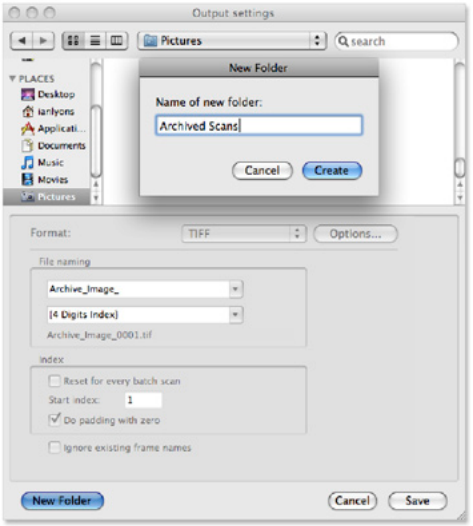


Figure 9 – "Output" settings for RAW files

Result:

For a 48Bit HDR raw file with integrated HiRePP® Preview (TIFF) from a 35mm slide "Mbyte" will indicate your file size at approximately 300 MB.

10. Dust and scratch removal

For automatic dust and scratch removal select "ICE" on Special Function toolbar [refer to Figure 7]. Digital ICE Lite - Speed is recommended.

11. Multi-Exposure®

Activate SilverFast "Multi-Exposure" button on Special Function toolbar [Figure 7]

12. Duplicate the scan frame

(i.e Alt + Click outside scan frame) then drag the copy frame to the next image. Zoom in and readjust the new frame. Zoom out, make another duplicate frame and copy it to the next image. Continue until all images are framed. Note that this process ensures that all settings applied in steps 9-11 above are also applied to subsequent images.

13. Batch Scan

Click the (Batch) "Scan" button
[refer to Figure 8]

- Choose "TIFF" as file format. Alternatively, you might prefer to work with JPEG2000, although TIFF is recommended.
- Select the target directory for your images, e.g. Desktop, and/or create a "New folder" on your disk drive.
- Enter a "Name" for the folder e.g. "Archive_Scans".
- Start the scanning process with "Save".

Result:

SilverFast will begin the raw scan production.

Note:

Depending upon the number and size of slides to be scanned, the whole process might take several hours.

B: Image Optimization with SilverFast HDR Studio

1. Start

- Start SilverFast HDR Studio with the SilverFast Universal Launcher.

2. Virtual Light Table

SilverFast Virtual Light Table (VLT) opens. Navigate to your image directory.

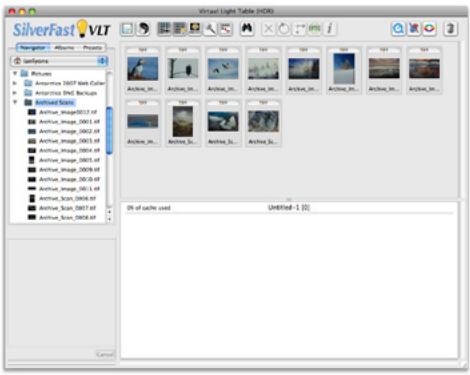


Figure 10 – Virtual Light Table (VLT)

3. Open SilverFast JobManager

4. Select images

from your image directories and drag them into SilverFast JobManager window. Ensure "Adjust images automatically" is active and click OK.

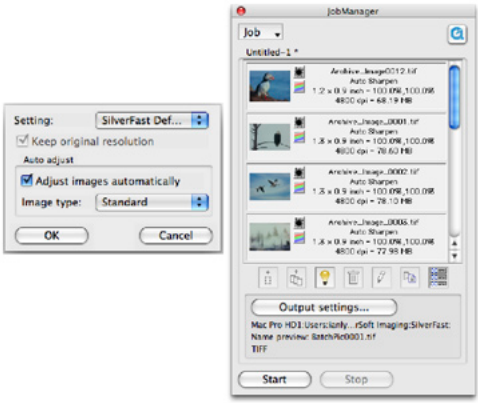


Figure 11 – JobManager dialog

5. Main menu

Switch from VLT to Main menu (with SF Eye symbol) and double click (open) the first image inside the JobManager window for preview.

Figure 12 – Adjust scan frame and crop image

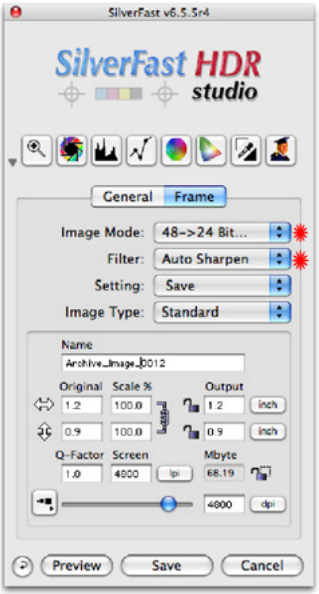


Figure 13 – Image mode and Filter setup

6. NegaFix®

Position scan frame, e.g. to adjust rotation and crop.

(7. For Negatives:)

Select Negative in (Pos./Neg.:) dialogue at "General" settings and define the necessary settings on the NegaFix® Dialogue.

8. Image Mode

Choose "Image Mode": 48->24 Bit Color at "Frame" settings.

9. Filter

Choose "Filter": Auto Sharpen or open the USM dialogue and define the sharpness manually (USM: Unsharp Masking)

10. Auto Adjust

Click the Image-Automatic (Highlight-Shadow-Midtone-Optimization) button

Figure 14 – Apply automatic image adjustment

11. Refine adjustments

Refine automatically applied image adjustments

- "Histogram" for adjustment of brightest, darkest pixels and color casts.
- If necessary: use the midtone pipette to neutralise shades, metals, or in general: areas which should be "neutral" grey.
- "Gradation Curves" adjustment, i.e. midtone-brightness and contrast.

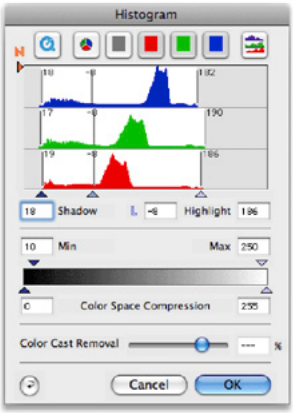


Figure 15 – Histogram Adjustments

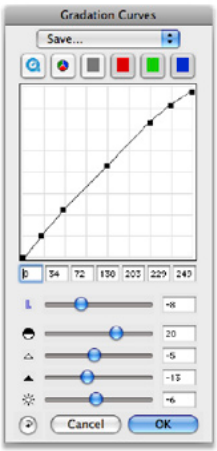


Figure 16 – Gradation Curves Adjustments

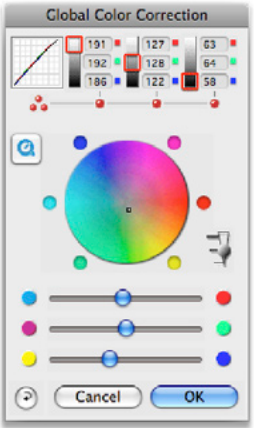


Figure 17 – Global Color Corrections

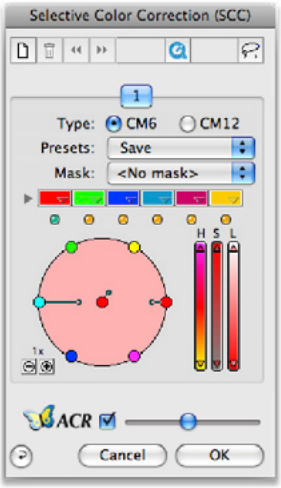


Figure 18 – Selective Color Corrections

12. Color Correction – if necessary

- Global Color Correction for overall color adjustments.
- Selective Color Correction for changing individual colors.

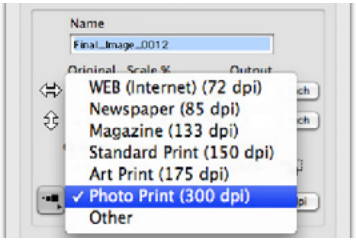


Figure 19 - "Frame" palette setup for image "Scaling"

13. Scaling

- Set "Scale" to the requested output size in metrics, e.g. cm. Choose the requested resolution for output, e.g. 300 lpi
- Ensure that Q-Factor is 1.0
- Enter a "Name" for the file

14. Save

"Save" and repeat steps 6-13 individually for every image.

15. Start JobManager process:

- Click on the “Edit” mode button of the JobManager (i.e. Pencil symbol) and confirm “OK”
- Select all of the images inside the JobManager window that you want to process, i.e. click the “all” button (right button), or select them individually
- Click on the Output settings button - (output-locations dialog appears)
- Select the target directory, e.g. “New folder”
- Select the file format, e.g. “TIFF”
- Click the “Save” button. The JobManager will now apply the appropriate saved adjustments to each image. A colored LED will indicate the status of each image as it is processed in JobManager. Additionally, a progress bar will indicate the total number of images to be processed along with actual progress.
- Click on the “Quit” button when the JobManager has processed all images. Confirm that you wish to close SilverFast HDR Studio by clicking the Yes button.

Figure 20 – JobManager process setup

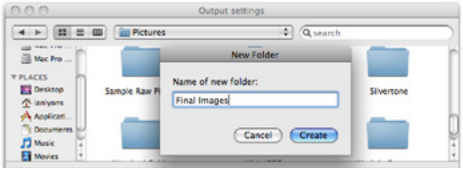
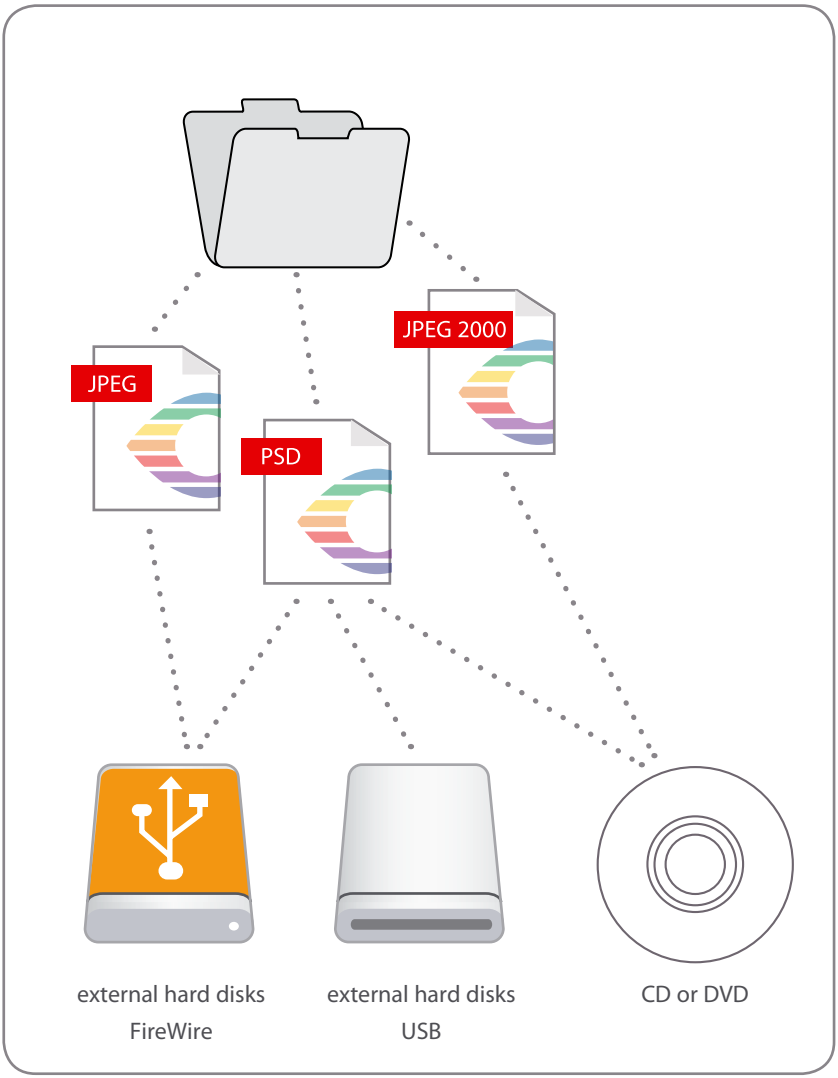


Figure 21 - “Output” settings for processed files

Figure 22 - JobManager processing files


JPEG
JPEG 2000
PSD
external hard disks
FireWire
external hard disks
USB
CD or DVD

Archiving your work

Now that you have digitized your photographs it's time to decide on the best file format and media type for storing them.

There are number of alternative file formats i.e. JPEG, JPEG 2000 or even PSD, and each have their supporters, but none are as widely used as TIFF. TIFF is also the industry-standard cross platform format, so, it's probably the best file format to save your digitized images in. TIFF also supports file compression where storage space is limited.

The most common storage options include hard disk and optical disks (i.e. CD or DVD). Obviously, the size and number of digitized photographs will have a bearing on your choice of storage media, but it should be remembered that digital archiving technology is continually developing. So, make sure that you don't end up using a media type that's nearing the end of its life. For example, compact disks (CDs) have limited capacity and can become unreadable after only a few years if not stored properly. Even DVDs are of little use if your storage needs run to many hundreds of gigabytes. My recommendation would be to use external hard disks, which can be connected to your computer via a USB or FireWire port when needed. External hard disks can be obtained in capacities ranging from a few 10's of gigabytes through to 2 terabytes, and there are plenty of options in between.

Conclusion

Whether you're a professional with high expectations or just a hobbyist with many photographs to scan, the Epson Perfection V750 PRO and SilverFast are the perfect combination.

With the Epson Perfection V750 PRO you can enjoy unparalleled performance when scanning: black-and-white or color negatives, color slides or photographic prints. The V750 PRO with its built-in TPU combined with SilverFast Ai Studio obtains better results than many dedicated film scanners, with the added advantage of allowing film scans up to 10 by 8 inches. The Dual Lens System, 6400 ppi resolution and High-pass optics are features that differentiate the V750 from other flatbed type scanners, making it uniquely suitable for archiving both film and printed photographs.

Features such as SilverFast Multi-Exposure® and automatic IT8 Calibration will ensure that you do justice to your original photographs with minimum effort.

SilverFast HDR 48Bit workflow ensures that you obtain the maximum quality digital archive images from your original photographs. If required, creative retouching can be done with Photoshop.

Beyond the scanning application SilverFast HDR Studio provides two additional and interesting highlights. This enhanced version of SilverFast HDR® can also read raw data from digital SLR cameras, making the processing of your digital images much easier and more convenient.

PrinTao is an integrated printing functionality that supports templates, allowing you to reduce repetitive steps in the layout process - either by predefined templates (included in PrinTao®) or by creating your own.

Any printer can be used with SilverFast HDR® Studio. Better still, you can print your images directly from your folders; create your customized layouts or even templates directly. The embedded color management eases the true-to-color printing and with the optional upgrade to SilverFast PhotoProof it offers to create contract proofs according to international standards. All in all, the Epson Perfection V750 PRO with SilverFast Ai IT8 Studio (Multi-Exposure®) and SilverFast HDR® Studio is a full input/output workflow solution for capturing and optimizing analogue and digital images with the added benefit of a professional standard output capability.

Customer's comments

«I need something that is consistent, predictable and reliable. With SilverFast I obtain those objectives, …»

Robert D. Vernon

«I have been a SilverFast user since 2001. I got the software then because it was recognized as the best available, and over the years it has only got better.»

Ricardo Barros

«The difference between the single pass scan and SilverFast's Multi-Exposure scan is nothing less than phenomenal. »

Steve Hoffmann,
Nature and Landscape Photographer

«What a fool I've been. ... I could have saved myself a boatload of wasted time. ... And from now on, I'm scanning things with SilverFast.»

Paul Butzi Photography

Headquarters:
LaserSoft Imaging AG
Luisenweg 6-8
24105 Kiel • Germany
Tel.: +49 (0) 431/5 60 09-0
Fax.: +49 (0) 431/5 60 09-96
E-Mail: info@SilverFast.com
http://www.SilverFast.com

Office USA:
LaserSoft Imaging Inc.
3212 Gulf Gate Drive
Sarasota, FL 34231, USA
Phone: (+1) 941-921-4815
Fax: (+1) 941-925-9417
E-Mail: sales@SilverFast.net
http://www.SilverFast.com

edp European Digital Press Awards 2008
BEST COLOR MANAGEMENT SOFTWARE

Ian Lyons
www.computer-darkroom.com

LaserSoft Imaging®

EPSON®
EXCEED YOUR VISION

Presented in cooporation with Epson and LaserSoft Imaging