by thomas white

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PHOTO > Electronic Imaging

Bang the drum

Outstanding performance tops drum scanners

The Imacon Flextight 848 is a stunning successor to the Flextight Precision II and III scanners. The Flextight 848 is the first CCD scanner ready to challenge, and best, a host of drum scanners.

When Imacon announced the Flextight 848 scanner at Photo Expo East in November, I was eager to get my hands on one. Imacon has a reputation for innovative design and scanners that deliver lots of performance for the price. The specifications for the Flextight 848 sounded impressive (4.8D-max, 8,000 ppi optical resolution). I had never tested a scanner that showed any improvements in image detail by scanning above 4,000 ppi and I wanted to see what Imacon could deliver.

Let's do the numbers

In order to test the resolution of the Flextight 848 scanner I scanned photographs of a lens test target created by Charles Sleicher for the purpose of testing 35mm camera lenses. (You can obtain a copy of the test chart by contacting Sleicher: casleicher@attbi.com.) In his testing, Sleicher has found that although his target includes resolutions up to 160 line pairs per millimeter (lp/mm) it's difficult to achieve resolutions above 100 lp/mm in practice, using the best cameras,

lenses, and films available.

If we convert 100 lp/mm to equivalent lines per inch, the result is approximately 5,080 individual lines per inch.
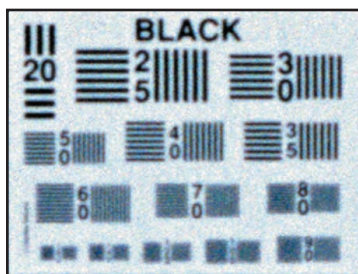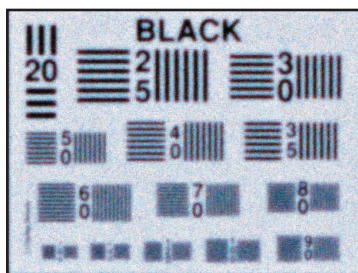

Figure 1

Figure 2

I have scanned a 35mm slide of Sleicher's test chart on a variety of scanners. The best scanners I had tested were similar to the Howtek HiResolve 8000 and could barely resolve the 80 lp/mm block of the test chart at 4,000 ppi scanning resolutions **(Figure 1)** and did virtually no better at better at 8,000

ppi **(Figure 2)**.

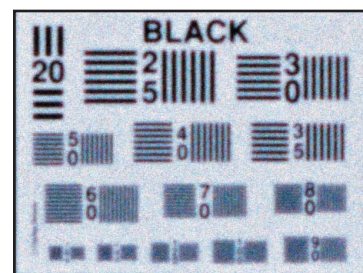Seeing results like this from other drum scanners caused me to

Figure 3

advise photographers and labs that I worked with not to bother scanning at optical resolutions higher than 4,000 ppi to 5,000 ppi— even though some drum scanners offer optical resolutions of 8,000 ppi to 10,000 ppi), since it made the file sizes huge and didn't seem to improve the quality of details in the final scans.
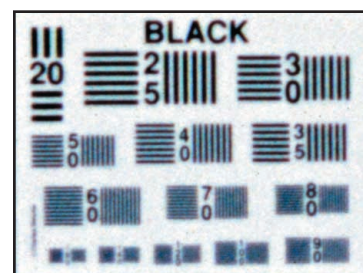
I scanned the Sleicher test slide

Figure 4

Figure 5 (left) and Figure 6 (right)

on the Imacon 848 scanner at 4,000 ppi **(Figure 3)** and got an image similar to ones from quality drum scanners at 4,000 ppi.

I also scanned the test slide at 5,000 ppi, the Imacon's maximum resolution, for 35mm film mounted in landscape orientation. I was pleased to see an image as good as the best drum scanners I had tested.

When I scanned the test slide at 8,000 ppi, my jaw dropped. The scan **(Figure 4)** showed by far the best reproduction of the test slide that I had ever seen from any scanner. The scanner seemed to have captured nearly all the detail in the test chart—detail that I had only been able to see with a 400X microscope previously.

I quickly scanned a few images from my archive to see if the results from the Sleicher test chart would translate into real-world images. Even on slightly soft images, scans from the Flextight 848 at 8,000 ppi showed detail I had never seen from any other scanner.

The astounding consequence of these results is if you choose to capture the highest quality scans that the Flextight 848 can deliver, you will be scanning 35mm film at 8,000 ppi, which produces 257MB, 8-bit color files, or staggering 514MB 16-bit color files from 35mm film.

Bring in 'da noise, bring in 'da speed

A second reason I have never scanned at the 8,000 ppi or 10,000 ppi settings available on some drum scanners is that at higher resolution settings many scanners show an unpleasant amount of noise that appears most obviously as random variations of color in continuous tone areas of an image.

The Flextight 848 scanner boasts an impressive 4.8D-max value.

Buying a scanner based on a manufacturer's D-max number is a just like buying a car by looking at
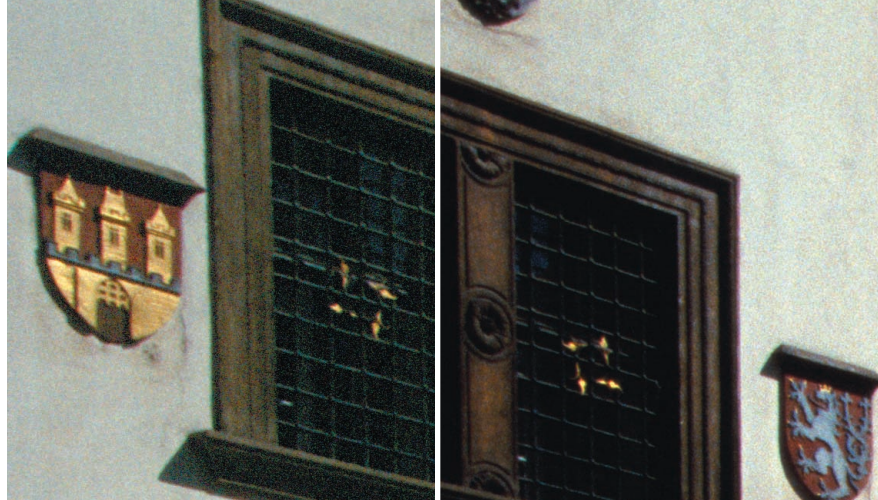
the maximum on the speedometer. A Yugo may have a speedometer that shows a maximum of 100 mph, but you can only imagine what the ride would be like. A Mercedes, on the other hand, may have a speedometer that shows a maximum of 160 mph, but what really matters is how well each car performs at the speeds you plan on driving.

The Flextight 848's D-max of 4.8 looks good on a spec sheet, but how smooth is the ride and how well can it handle a D-max of 3.6, which is the maximum density of Fujichrome Velvia 50 Professional RVP slide film?

Outstanding performance

A comparison look at detail of a scan from a Howtek HiResolve 8000 scanner **(Figure 5)** compared to the scans of the same slide from the Imacon Flextight 848 scanner **(Figure 6)** shows a dramatic difference between the two scanners.

After running a few test scans through the Flextight 848, I tried a few very dark slides that I had never been able to scan well with other scanners. The Flextight 848 handled these tough cases with ease, producing quality, printable images **(Figure 7)**.

With a scanner capable of making 514MB quality scans, the question of speed is very important. Imacon's spec sheet claims the scanner can maintain a consistent 50MB/minute of data. This must

have been calculated with the scanner set to scan 8-bit color files. In the case of my 550MB test scans from 35mm film, the scanner was able to complete the scans in 5:45 minutes each, giving a throughput rate of over 100MB/minute! (See chart for other film sizes, resolution, and scan times.)

It handles well, too!

Scan times alone can be very deceiving since they do not reflect the time needed to clean and mount the film in the carrier, conduct a pre-scan, make any adjustments necessary and remove the film from the carrier when the scan is complete. However, I took advantage (big-time) of having such a terrific scanner in my studio and scanned as many images from my photo archive as possible. I was consistently able to scan 10 files larger than 500MB per hour to disk from 35mm images at 8,000 ppi 16-bit color, while working alone.

The Flextight 848 uses an

Scanning times at maximum resolutions	
35mm @ 8,000 ppi (Portrait orientation)	5:42 min.
35mm @ 5,000 ppi (Landscape orientation)	3:18 min.
6x6 cm @ 3,200 ppi	3:45 min.
4x5 inch @ 2,040 ppi	3:50 min.

ingenious system of mounting the film and transporting it through the scanner. The film is clamped into a flexible magnetic carrier that resembles a refrigerator magnet clamped on top of a thin sheet of steel with a window in the middle for the film. To mount a piece of film, you lift the magnet and slide the film into place over the window opening and lower the magnetic layer back down. The whole procedure is fast and simple to learn. The film may shift slightly as it is drawn into the scanner, which may very occasionally lead to the need for a rescan.

As the flexible magnetic film carrier is drawn into the scanner, it curves around two guide wheels that help the film to remain extremely flat as it is scanned from side to side.

This arcing of the film holder is the reason that the film sometimes shifts slightly during the scanning process inside the holder. It also leads to one minor drawback, since the film holders must be made slightly smaller than the image size of the film to hold the film securely. In practice it's only a problem with an image where it is important to scan 100 percent of the frame. The film holder obscures about 1mm of

Figure 7

a 35mm frame—about the same amount as a plastic slide mount.

Imacon supplies the scanner with four standard film holders for 35mm, 6x6cm, 6x7cm, and 4x5-inch film. There is a wide set of other film holders available from Imacon, including 12x17cm panoramic.

The maximum resolution of the scanner varies depending on the film size **(see chart)** with the curious result that you can get larger scans from 35mm than from medium-format or 4x5-inch sheet film. In practice, the maximum resolution for 4x5 film at 2,040 ppi will produce 8,000x10,000-pixel files that are large enough for making even 24x30-inch gallery

prints and 7,500x8,800-pixel files from medium-format film.

Software and color

Imacon's FlexColor 3.2 software for the Flextight 848 scanner is currently only available on the Macintosh platform (OS 9.x only). Imacon expects to have a Windows version of the software available in March. The version of the software I tested showed some annoying quirks in which saved options would reset at unpredictable times and the scanner and software seemed to have some difficulty in communicating exactly which film holder was loaded in the scanner. The FlexColor software would offer resolution options that didn't always match the film holder that I had mounted.

The FlexColor software is well-organized and understandable, and setting the software up to suit your workflow and remember these custom settings is straightforward.

The FlexColor software will default to settings that will produce good scans for most users. There is an auto-levels function that will help users making 8-bit color scans to capture a full dynamic range. If you are making 16-bit scans, the auto-levels function can be disabled, although it had a habit of jumping back on unexpectedly during several

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specs: Imacon Flextight 848

Top resolution: 8,000 ppi (dependent on original format)

Sensors: CCD (3x8,000 pixel)

Bit depth: 16 bit

Density: 4.8 D-max

Scan principle: Virtual Drum

Original type: film (negative/positive), print

Speed: 50MB/min.

Scan Modes: Color (24, 37, 48 bit), greyscale and line art; batch scanning and batch image processing

Software: FlexColor (Mac OS 9.x; PC version not yet released)

Format: 35mm to 12x17cm; reflex up to A4

Magnification: 20 percent to 3,800 percent

Maximum file size: 1.2GB

Interface: Standard SCSI and Firewire

Accessories: Bulk scanner holds up to 10 FlexTight holders and automatically feeds in each holder for scanning

MSRP: $17,995

of the scans I made. The software lets you configure the auto-levels function for the exact amount of shadow-highlight clipping that you want. You can also adjust the brightness, contrast, and color balance of an image using curves.

There is a selective color adjustment feature that will allow you to make adjustments to just one portion of the color spectrum. FlexColor supports sharpening an image at scan time with a control similar to Adobe Photoshop's Unsharp Mask filter.

If you prefer, you can turn it all off and capture scanner data raw or with an adjustable gamma setting. The FlexColor 3.2 software is one of the few applications versatile enough to let you configure the scanning process your way.

The problem of how to translate the reversed colors of color negative film with their orange masking layer is an area where most scanner programs fall far short. FlexColor 3.2 takes an admirable approach to handling color negative film. The software ships with a suite of color profiles for Kodak, Fujifilm, and Agfa consumer and professional films. In practice some of the color negative profiles were far better than others. I got very good scans from Kodak Professional Portra 160NC film, however with the Portra 160VC the colors were not as saturated as I would have expected from that film. The results of scanning an image on Fujicolor Superia film were disappointing, showing washed-out colors in the yellow parts of the gamut and excessively saturated blues.

The overall quality of the scans from the Flextight 848 is as good as any scanner on the market today, including some selling for two to four times the price. Combine this with the scanner's speed and ease of use and you have a scanner that will change the rules of the game in the digital world, allowing photographers and small labs to produce images that will surpass the best work from labs with expensive drum scanners. ◀

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