



From the bumper crop of 22-megapixel medium-format digital backs on the market today, which to choose?

Let's take a look at six of these wallet-chomping monsters: the two versions of the Leaf Valeo 22; Imacon Ixpress 528C; Jenoptik Eyelike precision M22; Phase One H25; and Sinar 54H. The newly arrived Phase One P25 and the Sinar 54M were not available for testing before press time. The Phase One P25 does deserve special mention, as so far it's the only all-in-one portable solution.

For portrait and wedding photographers who specialize in location work, portability is a necessity. Accurate color balance is a necessity, too, but be careful not to cancel out the quality of light, which adds to the emotional charge of an image.

In each system reviewed here, the photographer creates sets of parameters for any given setup and subject matter and then uses batch processing to automatically develop the edit of the take.

Virtually all of the proprietary software packages run better or exclusively on Apple OS X v. 10.3.x and higher. Whether you use a Mac or the very latest versions of Windows, the image files are so large that you'll want high processor and bus speed, lots of RAM, acres of free hard drive space, and possibly two monitors, one for the image and another one for the control palettes.

Each system produces a distinct look and has a unique workflow pattern, but at

The 22MP zone

Software, setup and workflow distinguish digital camera backs



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If you are selling large prints to your clients, you'll really appreciate the smoothness and color from a 22-megapixel file. Equipment used: Leaf Valeo 22 back, Hasselblad H1 camera and Profoto D4 lights. To view studio test shots, go to www.ppmag.com/2004_22MP

the end of the road, the quality of each is uniformly excellent. Of course you'd expect that from any camera system priced over \$20,000. The processing quality in the proprietary software rivals—and in some instances surpasses—that of Adobe Photoshop CS. For jobs that require no editing or modification of image content, the photographer can bypass Photoshop altogether.

None of the systems is perfect for every need. As a rule, the less physically complex the system, the more pleasurable it is to work with it in the field. Each individual

high-end digital back also has its own characteristics with regard to exposure. While most of the systems have a default ISO setting of 50—the Sinar 54H and Eyelike precision M22 default to ISO 25—that doesn't mean individual backs are equally sensitive to light. This is a typical variable of individual sensors.

All of the backs need shims (a.k.a. foil stacks) between the camera adapter and the back itself to place the sensor precisely in the focal plane for a specific camera body, thus assuring the alignment of the sensor

plane with the focusing screen in that body.

Over each pixel site in an imaging sensor, there's either a red, green, or blue filter. These filters are arranged in what's known as a Bayer type RGB mosaic, in which two out of every four pixels sees only green light, one sees only red and the fourth pixel sees only blue light. In 1-shot mode, the back acts like every digital camera you have ever worked with (save ones with Foveon chips); the full set of RGB color information for each pixel site is calculated (interpolated) by the processing software, using data from that pixel and surrounding pixels.

In multi-shot modes, the camera makes either four or 16 separate exposures as the sensor moves precisely in increments of either 1-pixel (width and height) in 4-shot mode, or one-half pixel in 16-shot mode. This is done to eliminate the color

interpolation; each point in the image has its own set of two green, one red and one blue values. Obviously, multi-shot modes take longer and require the camera and subject to remain still and the light to be consistent from exposure to exposure. A 16-shot capture is four times larger than a 1-shot or 4-shot capture, which means that instead of dealing with a 126MB file, you process a 504MB file. Sixteen-shot mode captures even the detail that falls on the micron thin areas between pixel sites.

These are expensive tools—who buys them? No doubt a fair number of these are replacing older systems, and many are being sold to printers and large advertising and catalog studios, but a surprising number of high-end portrait shooters are now purchasing digital backs, too. One source was especially blunt: "Who is buying these

backs? Large operations that are putting small studios like yours out of business."

Imacon Ixpress 528C

There are three components in the Imacon Ixpress 528C system: the back, the Ixpress Image Bank and the Flexcolor software. The system can be used in single, 4-shot or 16-shot modes. A Kodak 36.9x49mm CCD produces 22-megapixel files when the camera is in 1-shot and 4-shot modes, or 88-megapixel files in 16-shot mode. Adapters are available for many medium-format cameras: Hasselblad CM, CW, ELD, ELX (the V series), and the 6x4.5cm format H1; the Mamiya 645 Pro, 645 AFD, RB and RZ 67; Contax 645 AF; Fuji GX680 I, II, III; and Rollei 600X and 600X AF. The Ixpress 528C also works with any view camera via the standard

(square format) Hasselblad adapter and a Hasselblad back adapter on the camera.

If the 528C is the eye of this system, the Ixpress Image Bank is the spinal cord. It stores up to 850 22-megapixel images, supplies power to the back and is the back's connection to the computer. You set basic imaging parameters on the Image Bank, and it supplies feedback about the image via the LCD on the back. Imacon provides a dedicated cable to connect the back to the Image Bank. I think it's a good idea to have at least one backup cable, and Imacon supplies an extra. The FireWire connection on the Image Bank is a generic FireWire port.

The 528C system is straightforward; the back handles well and is only a little bigger and heavier than a film magazine for the Hasselblad H1. The connection point for the dedicated cable to the Ixpress Image Bank pivots through 90 degrees so the cable conveniently hangs down whether the camera is oriented vertically or horizontally. The Image Bank has a built-in belt clip, but I would also like to see the addition of a standard 1/4-inch tripod thread for mounting

it to a tripod leg via a Bogen Superclamp.

For portraits, a fast capture rate is vital. The 528C can capture an image every two seconds. This can seem like a lifetime if you're used to 35mm motor-drives, but given the concurrent wait for your lights to recycle to full power, it isn't bad at all.

Imacon's Flexcolor 3.6.6 software quickly converts images from Imacon's proprietary FFF format to the desired output format. The onscreen layout of the tools is easy to grasp, and nearly intuitive, and automatically applies a certain amount of unsharp masking (USM). To neutralize the effect, some longtime users of Imacon scanning software suggest setting the sharpening level to -120 when processing the image.

Jenoptik Eyelike precision M22

The dynamic range of the M22 is 12 stops, and the system is single-, 4- and 16-shot capable. The Eyelike precision M22 is Mac compatible only, and needs to be tethered to an Apple Power Mac G4 or G5 tower or a G3 or G4 PowerBook. Adapters are available for most Hasselblad V series cameras, Mamiya 645 AFD, Rollei 6008

integral, Rollei 6008 E, Rollei 6003 Professional, and Rollei 6001 Professional medium-format cameras. The M22 can also be used with all large-format view cameras that accept a square-format Hasselblad film back.

Eyelike Capture Pro software is designed expressly for photography and is not re-purposed scanning software, as with Imacon and Leaf models. The workflow layout is clean, the nomenclature and onscreen navigation is direct, with one exception: to see a detail of the image you're working on, you access the Sharpness Control window instead of the Detail window, where it would seem to belong. The access to the Sharpness Control window is in the Preview window. In a basic work-path, you shoot the image, it goes into the selected Gallery, you select an image to preview, and from there go into the various development controls.

One of the best of the software's many excellent features is the directional button navigation in each menu, which can take you backward and forward through any changes you have made. For example, you

DIGITAL BACK	SENSOR ARRAY	TETHERED OR NON-TETHERED	OS PLATFORM COMPATIBILITY	COOLING METHOD	FRAME RATE	SINGLE-SHOT, MULTI-SHOT
Imacon Ixpress 528C	Kodak KAF-22000CE 36.9x49mm 9x9-micron pixel size	Either. Uses Ixpress Image Bank when tethered or untethered	Apple OS 9, OS X; Microsoft Windows 98, ME, NT, 2000, XP	Active cooling control	up to 1 frame every 2 seconds	1-shot, 4-shot, 16-shot, (no color interpolation is used in 4- & 16-shot modes)
Jenoptik Eyelike precision M22	Dalsa FTF4052 36x48mm 9x9-micron pixel size	Tethered only	Apple OS X	Active two-stage Peltier cooling	up to 1 frame every 3 seconds	1-shot, 4-shot, 16-shot, (no color interpolation used in 4- & 16-shot modes)
Leaf Valeo 22	Dalsa FTF4052 36x48mm 9x9-micron pixel size	Either. Uses 5GB or 10GB Leaf Digital Magazine & optional Leaf DP-67	Apple OS 9, OS X	Heat sink and cooling fan	40 to 60 frames per minute depending on the camera type	1-shot only
Phase One H25	Kodak KAF-22000CE 36.7x48.9mm 9x9-micron pixel size	Tethered only	Apple OS X; Microsoft Windows 98SE/2000/Me/XP	active	1.8 seconds per image	1-shot, 2-shot
Sinarback 54H	Kodak KAF-22000CE 36.7x49mm 9x9-micron pixel size	Tethered only (Sinar offers a tablet style PC)	Apple OS X	active	approx 15-20 frames per minute	1-, 4- and 16-shot modes

start with an overall good image that looks a little dark. Open the Exposure Control menu to view the histogram, then open the Brightness/Contrast control window and increase the brightness by +10; it still doesn't look bright enough, so you add another 10. That looks good onscreen, but according to the dynamically updated histogram (the original histogram is still visible as an underlying shadow), you are now clipping the highlights. The back arrow in Brightness/Control returns you to your first adjustment. Once you set up the parameters for developing an image, you can apply those parameters to process a set of images but never touch the original data.

Leaf Valeo 22

For my shooting style and preferences, this back is great, yet frustrating to use. File quality and workflow are terrific, and the layout of the software interface is especially commendable. The Leaf Capture V8.2.2 suite of processing applications does a fine job of letting you know what the different icons stand for. Skin tones are marvelous. Leaf Capture applications are written exclusively for working in either Apple OS 9 or X. Compatible cameras for the Leaf Valeo 22 include Hasselblad H1, Hasselblad V series, Mamiya 645 AFD, RZ-67 Pro II, and RB-67 Pro SD, and most view cameras via the Hasselblad V type adapter.

What frustrated me about the Leaf Valeo 22 is the physical setup.

To shoot untethered with the camera mounted on a tripod, you need the Leaf Digital Magazine (LDM), two rechargeable lithium batteries to power the LDM and the back, a short proprietary FireWire cable to connect the back to the magazine, a special plate to mount the LDM underneath the camera, and a (heavy) special bracket to attach all of the above to a tripod.

You will also want the DP-67 so you can see a preview of what you are getting and set the various processing parameters for that image or for the shoot. That means you'll also need the cable to connect the DP-67 to

the camera back, though that cable has been eliminated in the recently announced Leaf Valeo Wi systems. With its very large (about 6x7 centimeters) LCD screen, the DP-67 is a terrific way to preview and program-in the basic parameters for image processing.

Phase One H25

Phase One gets excellent marks for its documentation, online tutorials, Capture One software, fast shooting (up to 40 frames per minute) and speedy processing workflow. The H25 is a tethered-only back, but we'll see a self-contained P25 shortly. Moiré can be controlled using Phase One's DeMoirize filter plug-in in Photoshop CS. Like Imacon's Flexcolor, Capture One software apparently always applies a fixed minimum amount of sharpening, or USM, to an image, even when you disable it (to turn it off completely, try setting the degree of sharpening to -120). Even with a 3-year-old 733MHz Apple G4, Capture One was the quickest of the lot to process an image and output it to Photoshop.

The Phase One H25 has a 3-year support warranty (if your back goes down, they send you a replacement until your back is repaired and returned). It fits all 6x6-centimeter Hasselblad cameras and all Mamiya RZ cameras via an adapter. It will also work on all 4x5 cameras when used with the Flexframe adapter, included with the H25. One very nice feature of the H25 is that, like Eyelike precision M22, you may orient it vertically or horizontally on a Hasselblad V body without having to tilt the camera over. Kevin Raber of Phase One says that 6x4.5-format cameras will be supported by the forthcoming P25 back.

Sinar 54H

Like all Sinar Bron Imaging products, this is a thoughtfully designed and solid imaging system. The Sinar backs need to be tethered, and, for location work, Sinar has the Sinar Action Module, a 14x11.5x4.3cm computer with a 4-inch wide LCD

screen. The Action Module comes with a user interchangeable 60GB hard drive and runs Sinar Capture Shop software. With the Sinar backs, you must set black point references for different shutter speeds. At one point I switched the camera from 1/2 second to 1 second without first resetting the black calibration, and the results were very strange; resetting the calibration fixed things immediately. So, even if your camera is capable of it, you should not use aperture priority.

For calibration, the Sinar system uses a GretagMacbeth Color Checker, preferably the Color Checker DC. Sinar recommends setting up the Color Checker parallel to the sensor plane for easy alignment of the measuring points in the software grid with the squares in the Color Checker. You can also tilt and swing the software grid to line-up the measuring points with the actual tilt of the Color Checker—nifty.

Sinar CaptureShop 4.0.12 does not automatically sharpen as aggressively as Capture One, but its menu is identical to the USM menu in Photoshop. All in all, Sinar CaptureShop 4.0.12 emulates the layout of Photoshop's menus and nomenclature more closely than the other software interfaces.

Sinar 54H adapters are available for virtually all Hasselblad cameras, the Mamiya RZ67, the Mamiya 645, the Fuji GX680, the Rollei 600x series, the Contax 645, the Bronica 645, the Horseman Digiflex, Sinar's own cameras, and most other 4x5 cameras.

Every time I talk about testing these models, people ask, "Which is best?" It's an understandable question, but there is no real answer beyond "it depends on what your primary needs are." From an image quality standpoint, you can't go wrong with any of these systems for 98 percent of the professional photographic assignments you're likely to encounter. My advice is, if you are really interested, arrange for a demo and, if possible, a trial use period. □